



**erse**



# ÜRÜN KATALOĞU

## PRODUCT CATALOGUE



## HAKKIMIZDA

Erse Kablo, 1996 yılında kurularak, sektördeki deneyimini ve başarısını **“kalite, hizmet ve sürdürülebilirlik”** kavramlarıyla birleştirerek, kusursuz hizmet anlayışıyla faaliyet gösteren zayıf akım kablo üreticisidir.

Erse, merkez ofis ve modern üretim tesisleriyle İstanbul’da faaliyet göstermekte olup ürünleriyle, sunduğu kaliteli hizmetle, yarattığı güvenle tüm paydaşlarının memnuniyetini gözetmektedir. 25.000 m<sup>2</sup> alan üzerine kurulu, 20.000 m<sup>2</sup> kapalı alanı olan Silivri’deki tesislerinde, üretim ve lojistik faaliyetlerini modern ve kaliteli hizmet anlayışıyla gerçekleştirmektedir.

Erse ürün gamı içinde koaksiyel, kumanda, sinyal&kontrol, veri iletişim, lan kabloları, haberleşme, yangına dayanıklı kablolar, enstrüman, silikon, marin ve her tip özel kablo yer almaktadır. Erse pazar gücünü markalarıyla da sağlamlaştırarak, yangına dayanıklı ürün gruplarında **Ervital** ve **Ervital Firesafe**, kumanda kabloları grubunda **Erflex**, lan kabloları grubunda **Erline**, silikon kabloları grubunda **Simh Vital** markalarıyla genişleyen bir vizyona sahiptir.

Erse, güçlü mühendis kadrosuna sahip AR-GE departmanı ile müşteri beklentilerini öngören çözümler üretmektedir. Yenilikler takip edilerek, ürün ve kalite odaklı çalışmalar başarı ile sürdürülmektedir.

Ulusal ve uluslararası standartların gerekliliklerini karşılayan, üretimin her safhasında toplam kalite bilincinin göz önünde bulundurulduğu bir üretim anlayışına sahip olan Erse, sürdürülebilir kalitenin sağlanması, kalite sisteminin geliştirilmesi ve çalışan yetkinliğinin artırılması için planlanan kişisel gelişim ve teknik eğitimleriyle bunu desteklemektedir.

Erse, kurulduğu günden itibaren kalite standartlarına uygun, çevreye duyarlı çalışma anlayışı çerçevesinde **“Entegre Yönetim Sistemi” (ISO 9001, ISO 14001, OHSAS 18001)** oluşturarak bu sistemi belgelendirmiştir. Üretmiş olduğu ürünlerde ulusal ve uluslararası standartları esas alan Erse, **“TSE, VDE, Gümrük Birliği ve Yangın Sertifikası (Rusya), SASO (Suudi Arabistan), ABS, RINA, BV, DNV, LR, RoHS ve CE (LVD, CPR)”** normlarında ürün belgelerine sahiptir.

Erse, yurtiçindeki pazarlama, satış ve ihracat yapısıyla altyapı, inşaat, endüstri sektörlerinin çözüm ortağıdır. Marka, Türkiye pazarında liderliğini korurken, İstanbul Merkez Ofisi başta olmak üzere, Ankara Bölge Satış Ofisi, Bursa, İzmir, Adana Bölge Temsilcilikleriyle beraber, yurtiçindeki güçlü bayi sistemi yapısıyla yaygın ve geniş bir satış ağına sahiptir.

Yurtdışı pazarlarında deneyim sahibi olan Erse, İngiltere, Almanya olmak üzere tüm Avrupa; Asya, Ortadoğu ve Körfez Bölgelerinde 50’den fazla ülkeye yaptığı ihracatla önemli bir yere sahiptir. Erse ihracatta yapmış olduğu tüm faaliyetleriyle, uluslararası ticaretin gelişim ve değişiminde aktif bir rol üstlenmektedir.

Erse’yi tercih eden tüm yurtiçi/yurtdışı müşterileri, **“Ürün Sorumluluk Sigortası”** ile güvence altına alınarak, üretilen ürünlerden kaynaklı oluşabilecek bedeni ve maddi zararlara karşı korunmaktadır. Böylece müşteri memnuniyetine ve kaliteli hizmet değerlerine verilen önem bir kez daha gösterilmiştir.

Başarının ancak tüm kuruluşun sahiplendiği ve inandığı bir vizyon ile gerçekleşeceğine inanan Erse Kablo, yurtiçi ve yurtdışında kalite standartlarına uygun, katma değeri yüksek ürünleriyle taleplere en kısa sürede cevap veren müşteri ilişkileri ve hizmet odaklı çalışma anlayışıyla sektöre yön vermeye devam ediyor. Erse, üretimdeki teknolojik gücünü, çalışanlarının dinamizmi ve deneyimiyle birleştirerek ve sürekli gelişimi destekleyen, değer yaratan marka imajıyla sektörde ayırt edilerek fark yaratıyor.

## ABOUT US

Erse Kablo, established in 1996, is a manufacturer of weak current cables operating with an excellent service approach by combining its experience and success in the sector with the concepts of “**quality, service and sustainability**”.

Erse operates in its head office and modern manufacturing facilities in Istanbul and takes care of the satisfaction of all its stakeholders with its products, quality service and confidence. It carries out its manufacturing and logistics operations with modern and quality service approach in its facilities in Silivri/Istanbul founded on a total area of 25.000 m<sup>2</sup> consisting of a closed area of 20.000 m<sup>2</sup>.

Erse's product range includes coaxial, control, signal&control, data communication, lan cables, communication, fire resistant cables, instrument, silicone, marin panel wires and all types of special cables. Erse has an extending vision with the brands of **Ervital** and **Ervital Firesafe** in the fire resistant product groups, **Erflex** in the control cables group, **Erline** in the lan cables group and **Simh Vital** in the silicon cables group; and it has strengthened its market power with these brands.

Erse together with its AR-GE department of professional engineer staff offers solutions for the customer expectations. It carries out successfully the product and quality-oriented studies by following innovations.

Erse has a manufacturing approach that meets the requirements of national and international standards and total quality consciousness are taken into consideration at every stage in manufacturing; and it supports this approach through the personal development and technical training that is organized in order to provide sustainable quality, improve the quality system and increase employee competence.

Erse has developed and documented “**Integrated Management System**” (ISO 9001, ISO 14001, OHSAS 18001) within the framework of a work approach complying with the environment consciousness and the quality standards since its establishment. Manufacturing the products based on national and international standards, Erse has the product certificates in the norms of “**TSE, VDE, Customs Union and Fire Certificate (Russia), SASO (Saudi Arabia), ABS, RINA, BV, DNV, LR, RoHS and CE (LVD, CPR)**”.

Erse is the solution partner of the infrastructure, construction, industry sectors with its domestic marketing, sales and export structures. Keeping the leadership position in the Turkish market, the brand has a widespread and extensive sales network through its strong domestic dealer system along with especially İstanbul Head Office, Ankara Regional Sales Office, Bursa, İzmir and Adana Regional Representatives.

Having experience in the foreign markets, Erse has a significant position with its exports to all over Europe, especially England and Germany; over 50 countries in Asia, the Middle East and the Gulf Regions. Besides, Erse plays an active role in the development and change of international trade through all its export operations.

All domestic/foreign customers who prefer Erse are guaranteed by the “**Product Liability Insurance**” and protected against the physical and material damages that may arise from the products manufactured. Thus, it has once again proved that it gives the importance to customer satisfaction and quality service values.

Believing that success will be reached only with a vision that is adopted and internalized by the entire institution, Erse Kablo continues to lead the sector through its customer relations and service-oriented work approach that meet the demands as soon as possible with the products with high added value at national and international quality standards. Combining its technological power in manufacturing with the dynamism and experience of its employees, it is distinguished in the sector with the brand image which creates value and supports continuous development.

## YURTIÇİ PAZARLAMA VE SATIŞ

Yurtiçinde geniş satış ağına sahip Erse Kablo; İstanbul Merkez Ofisi başta olmak üzere, Ankara Bölge Satış Ofisi, Bursa, İzmir, Adana Bölge Temsilcilikleriyle beraber, bölgelere göre yapılandırılmış güçlü bayi sistemine sahiptir.

Satış ekibinin hızlı ve çözüm üreten stratejileriyle sağlanan hizmet kalitesi, sektörde fark yaratmaktadır. Erse, yurtiçi pazarlama ve satıştaki başarısını **“kalite, şeffaflık ve çözüm odaklılık”** kavramlarıyla birleştirmektedir.

Erse, alt yapıda yüksek kaliteli çözümleriyle, prestijli ve büyük projelerin şartnamelerinde yer alarak, tercih edilen bir markadır. Erse, imzasını taşıyan proje referanslarıyla marka bilinirliğini sağlamlaştırmıştır.

Yurtiçi ekibi, Erse markasının değerini, bilinirliğini, güvenilirliğini korumak ve arttırmak adına etkin bir role sahiptir. Satış faaliyetlerinde; teklif taleplerinin kısa sürede hazırlanarak iş ortaklarına sunulup takip edilmesi, satış öncesi ve satış sonrası hizmetlerin sağlanması, teknik destek verilmesi, özel kablo ihtiyaçlarının karşılanması, talep edilen ürünlerin teknik özellikleri ve kalite dokümantasyonu konusunda bilgi ve geri dönüş sunularak, müşteri beklenti ve ihtiyaçları ön planda tutulmaktadır.

Tüm paydaşlarının eşit memnuniyetini gözeterek, çözüm ortaklığı sunan Erse; alt yapı, inşaat ve endüstri sektörleriyle birlikte bu sektörlere hizmet sağlayan firmalar tarafından da ilk sırada tercih edilen, Türkiye'nin zayıf akımda lider kablo markasıdır.

## DOMESTIC MARKETING & SALES

Having a wide domestic sales network, Erse Kablo has a strong dealer system, structured according to the regions, along with especially İstanbul Head Office, Ankara Regional Sales Office, Bursa, İzmir and Adana Regional Representatives.

The quality of service provided by fast and solution-oriented strategies of the sales team is distinguished in the sector. Erse combines its success in domestic marketing and sales with the concepts of **“quality, transparency and solution orientation”**.

Taking place in specifications of prestigious and important projects with its high-quality infrastructure solutions, Erse is a preferred brand. With the project references bearing its signature, it has strengthened its brand popularity.

The domestic team has an active role in maintaining and enhancing the value, popularity, and reliability of the Erse brand. Customer expectations and requirements are prioritized in sales operations by preparing the requests for proposal in a short time, offering them to business partners and following them, providing pre-sale and after-sale services, giving technical support, meeting the requirements for special cables and giving information and feedbacks about the technical specifications and quality documentations of the demanded products.

Providing solution partnership based on equal satisfaction of all stakeholders, Erse is a leading cable brand in the weak current cable market in Turkey and firstly preferred by the companies providing services to the sectors such as infrastructure, construction and industry.



# İHRACAT

Erse Kablo, uluslararası kalite standartlarındaki, katma değeri yüksek ürünleri ve üstün hizmet kalitesiyle global pazarların rekabetçi ve etkin role sahip kablo üreticilerinden biridir.

Erse, zayıf akım kablo üretimi üzerine uzun yıllara dayanan deneyimini, ihracatta izlediği başarılı pazarlama ve satış stratejileri, çözüm odaklı yaklaşımlarıyla birleştirerek; kısa sürede yurtdışı pazarlarında tanınan ve tercih edilen markalardan biri haline gelmiştir.

Erse, başta İngiltere, Almanya olmak üzere tüm Avrupa; Asya, Ortadoğu ve Körfez Bölgelerinde 50'den fazla ülkeye yaptığı ihracatla; altyapı, inşaat, endüstri sektörlerindeki birçok önemli firma ve uluslararası projenin çözüm ortakları arasında yer almaktadır.

Erse, toplam kalite ve entegre yönetim sistemine dayanan çalışma anlayışıyla; gelen talepleri analiz ederek, en doğru çözümleri en kısa sürede müşterilerine sunmaktadır.

Yurtdışı pazarlarında deneyim sahibi olan Erse ihracat ekibi, yapmış olduğu tüm bu faaliyetlerle, sektöründe yer alan uluslararası ticaretin gelişim ve değişiminde aktif bir rol üstlenmektedir.



## EXPORT

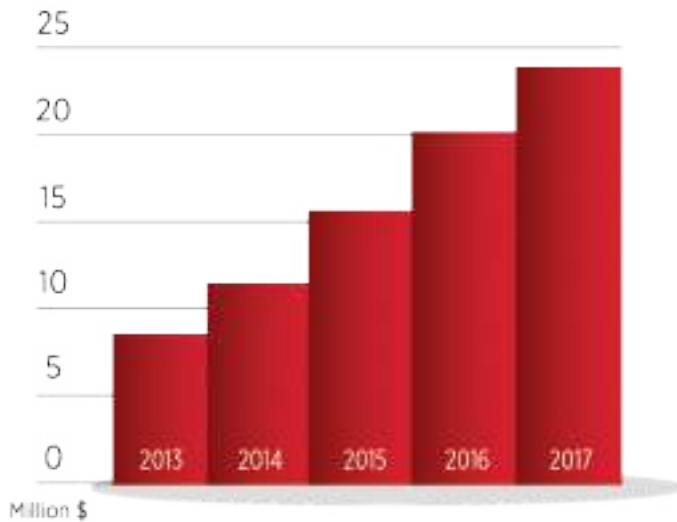
Erse Kablo is one of the cable manufacturers which play a competitive and active role in the global markets with high added value products and service quality in international quality standards.

Erse has quickly become one of the recognized and preferred brands in foreign markets by combining its long-standing experience in weak current cable manufacturing with successful marketing and sales strategies in export and solution-oriented approach.

It is one of the solution partners of the most important companies and international projects in infrastructure, construction, industry sectors with its export to all over Europe, especially England and Germany and over 50 countries in Asia, Middle East and Gulf Regions.

Erse analyzes the incoming requests and offers the most accurate solutions to the customers within the shortest time in accordance with a work approach based on total quality and integrated management system.

Having experience in foreign markets, Erse's export team plays an active role in the development and change of international trade in the sector with all of its operations.



## AR-GE & KALİTE

Erse Kablo, “**kaliteye ve kalitenin sürekliliği**”ne büyük önem vererek, yurtiçi/yurtdışı müşteri gereksinimlerini ve memnuniyetini ön planda tutarak, ulusal ve uluslararası standartların gerekliliklerini karşılayan, tüm süreçlerinde toplam kalite bilincinin göz önünde bulundurulduğu bir üretim anlayışına sahiptir.

Erse, sürdürülebilir kalitenin sağlanması, yönetim sistemlerinin geliştirilmesi ve çalışan yetkinliğinin artırılması için kişisel gelişim ve teknik eğitimler düzenlemektedir. Erse “**toplam kalite yönetiminin**” bir takım çalışması olduğunun bilincindedir. Bu anlamda tüm paydaşları ile (çalışan, tedarikçi, müşteri ve çevre) bu anlayışı benimsemektedir.

Erse, kurulduğu günden itibaren kalite standartlarına uygun, çevreye duyarlı çalışma anlayışı çerçevesinde “**Entegre Yönetim Sistemi**” (ISO 9001, ISO 14001, OHSAS 18001) oluşturarak bu sistemi belgelendirmiştir. Üretmiş olduğu ürünlerde ulusal ve uluslararası standartları esas alan Erse, “**TSE, VDE, Gümrük Birliği ve Yangın Sertifikası (Rusya), SASO (Suudi Arabistan), ABS, RINA, BV, DNV, LR, RoHS ve CE (LVD, CPR)**” normlarında ürün belgelerine sahiptir.

Erse, mevcut AR-GE’inde inovasyon&araştırma ve fizibilite&ürün portföyü geliştirme süreçlerini üniversitelerle iş birliği çerçevesinde yürütmektedir.

Erse, gerekli tüm test ve kontrolleri fabrika bünyesinde yer alan modern laboratuvarında gerçekleştirir. Üretilen kablolar üzerinde uygulanan test ve kontroller ERP sistemi üzerinde kayıt altına alınarak, talebe göre paydaşlarına sunulmaktadır.

Erse, sürekli koruduğu ve geliştirdiği ürün kalitesi ile müşteri odaklı üretim-çözüm sistemi kurmuştur. Erse, kalite politikasıyla, müşterilerin güvenle tercih edebilecekleri, standartlara uygun ürünlerin üretilmesini hedeflemektedir. Bu hedef doğrultusunda; Kalite, Çevre, İş Sağlığı ve Güvenliği yönetim sistemlerinde, çalışanlarının süreçlerde aldığı rolü etkinleştirerek, amaç ve hedeflerini belirler, gözden geçirir, uygular.

Erse, yenilikleri takip ederek, rakiplerinden her zaman bir adım önde olmayı hedefleyerek, hizmette sürdürülebilir kalite bilinciyle hareket ederek, dünya rekabetine uyumlu ilerlemektedir.



## R&D and QUALITY

Giving great importance to **“quality and continuity of quality”** and prioritizing requirements and satisfaction of domestic/foreign customers, Erse Kablo has a manufacturing approach in which the requirements of national and international standards are met and total quality consciousness is considered in all its processes.

Erse organizes personal development and technical training in order to provide sustainable quality, improve management systems and increase employees' competence. Erse is aware that **“total quality management”** is a team work. For this reason, Erse together with all stakeholders (employees, suppliers, customers and the environment) adopts this approach.

Erse has developed and documented **“Integrated Management System” (ISO 9001, ISO 14001, OHSAS 18001)** within the framework of a work approach complying with the environment consciousness and the quality standards since its establishment. Manufacturing the products based on national and international standards, Erse has product certificates in the norms of **“TSE, VDE, Customs Union and Fire Certificate (Russia), SASO (Saudi Arabia), ABS, RINA, BV, DNV, LR, RoHS and CE (LVD, CPR)”**.

Erse carries out its development processes of innovation&research and feasibility&product portfolio in its existing R&D in cooperation with the universities.

Erse conducts all necessary tests and controls in its modern laboratories in the factory. The tests and controls applied on the cables are recorded through ERP system and provided to the stakeholders upon demand.

Erse has established a customer oriented production-solution system with product quality that it always maintains and develops. With its quality policy, Erse aims to manufacture products in accordance with the standards which the customers can prefer confidently. In line with this purpose, Erse determines, observes and applies the objectives and purposes by activating the role of its employees in the processes of the Quality, Environment, Occupational Health and Safety management systems.

Erse aims to be one step ahead of its competitors at all times by operating with sustainable quality conscious in service and following the innovations and it has progressed in keeping with world competition.



## KOAKSİYEL KABLOLAR

COAXIAL CABLES

A. 12-37

## SİNYAL ve KONTROL KABLOLARI

SIGNAL & CONTROL CABLES

B1. 42-98

## ERFLEX KUMANDA KABLOLARI

ERFLEX CONTROL CABLES

B2. 103-123

## ERVITAL YANGINA DAYANIKLI SİNYAL KONTROL KABLOLARI

ERVITAL FIRE RESISTANT SIGNAL CONTROL CABLES

C1. 127-143

## ERVITAL YANGINA DAYANIKLI ENERJİ KABLOLARI

ERVITAL FIRE RESISTANT ENERGY CABLES

C2. 148-154

## HABERLEŞME KABLOLARI

TELECOMMUNICATION CABLES

D. 160-171

## ERLINE VERİ İLETİŞİM KABLOLARI

ERLINE DATA TRANSMISSION CABLES

E. 176-197

## SIMH VITAL SİLİKON KABLOLAR

SIMH VITAL SILICONE CABLES

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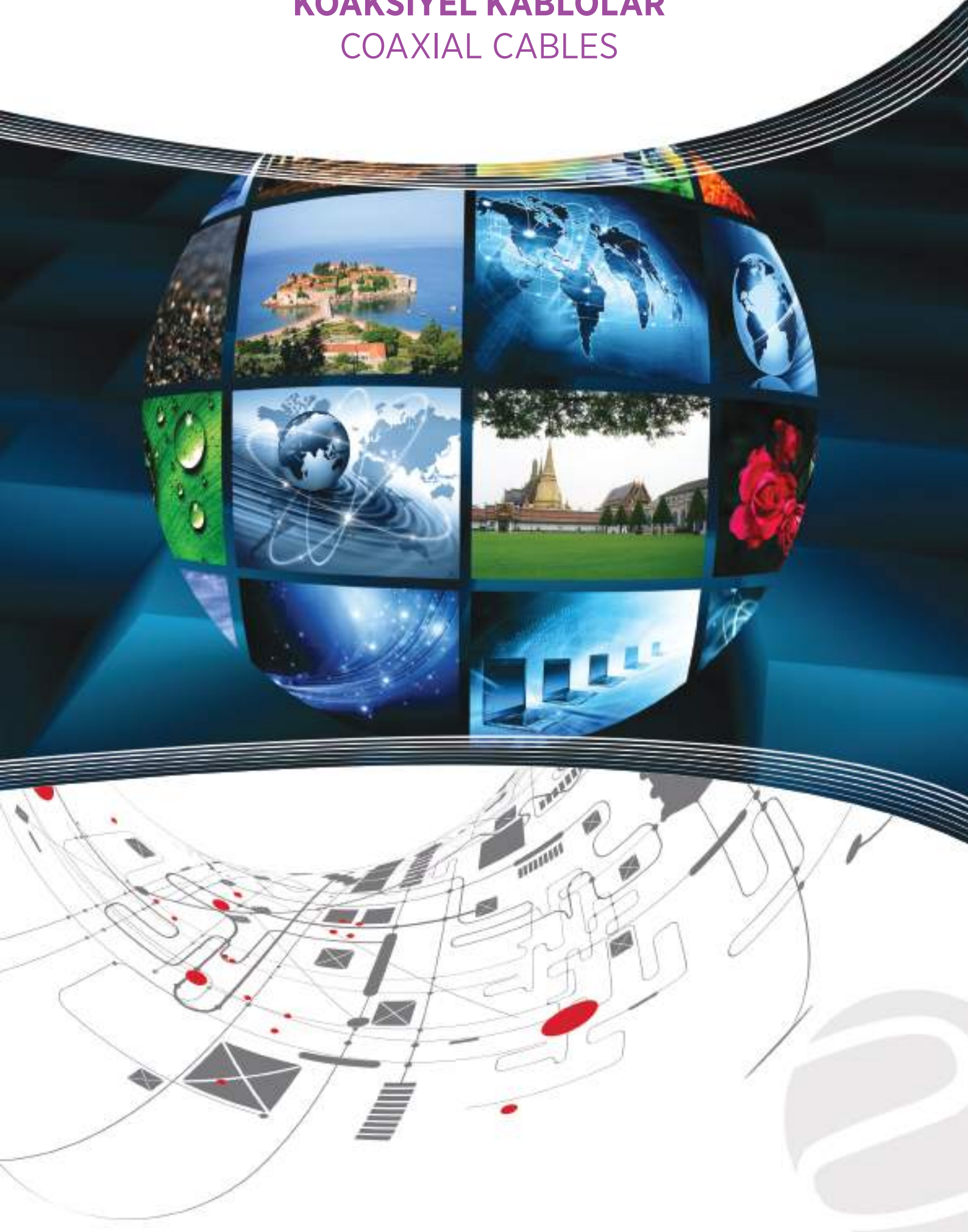
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# KOAKSİYEL KABLolar

## COAXIAL CABLES





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# RG 59/U-4 Cu/Al



## KULLANIM ALANLARI

Bina içi CATV, CCTV sistemlerinde dağıtım kablosu ve düşük zayıflama istenen uydu sistemlerinde bağlantı kablosu olarak kullanılır.

## APPLICATION

It is used as a distribution cable for indoor CATV, CCTV systems and as a connection cable for satellite systems where lower attenuation is required.

## KABLO YAPISI

|                    |                             |
|--------------------|-----------------------------|
| 1-İletken          | 0,80mm Ø Elektrolitik Bakır |
| 2-Yalıtkan         | 3,70mm Ø Fiziksel Köpük PE  |
| 3-1.Ekran          | Al-Pes Bant (100% Kapama)   |
| 4-2.Ekran          | Alüminyum Örgü              |
| 5-Kılıf            | 5,80mm Ø PVC Kompaund Beyaz |
| 6-Toplam Ağırlık   | 35kg/km                     |
| 7-Standart Uzunluk | 100/500/1000/2000m          |

## CONSTRUCTION

|                   |                              |
|-------------------|------------------------------|
| 1-Conductor       | 0,80mm Ø Electrolytic Copper |
| 2-Insulation      | 3,70mm Ø Physical Foam PE    |
| 3-1.Screen        | Al-Pes Tape (100% Coverage)  |
| 4-2.Screen        | Aluminium Braid              |
| 5-Sheath          | 5,80mm Ø PVC Compound White  |
| 6-Total Weight    | 35kg/km                      |
| 7-Standard Length | 100/500/1000/2000m           |

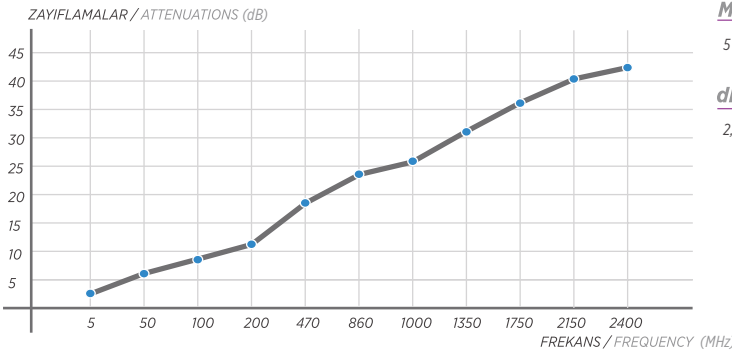
## TEKNİK ÖZELLİKLER

### TECHNICAL CHARACTERISTICS

| YALITIM DİRENCİ<br>INSULATION<br>RESISTANCE | EFEKTİF KAPASİTE<br>MUTUAL<br>CAPACITANCE | YAYILMA HIZI<br>VELOCITY OF<br>PROPAGATION | ÇALIŞMA VOLTAJİ<br>OPERATING<br>VOLTAGE | TEST VOLTAJİ<br>TEST VOLTAGE | BÜKÜLM YARIÇAPI<br>BENDING RADIUS | ÇALIŞMA SICAKLIĞI<br>TEMPERATURE RANGE | EMPEDANS<br>IMPEDANCE | ALEV GECİKTİRİCİLİK TESTİ<br>FLAME RETARDANT TEST |
|---------------------------------------------|-------------------------------------------|--------------------------------------------|-----------------------------------------|------------------------------|-----------------------------------|----------------------------------------|-----------------------|---------------------------------------------------|
| >2000MΩxkm                                  | 53±2pF/m                                  | 82%                                        | 1,1kV                                   | 2,5kV                        | 15x Cable Ø                       | - 40°C - +70°C                         | 75±3Ω                 | IEC 60332-1-2<br>DIN EN 60332-1-2<br>EN 60332-1-2 |

## ELEKTRİKSEL ÖZELLİKLER

### ELECTRICAL CHARACTERISTICS



## ZAYIFLAMALAR (20°C)

### ATTENUATIONS (20°C)

MHz

5 200 400 800 1000 2150 2400 3000

dB/100m

2,85 12,3 17,2 24,3 28,1 40,1 45 48,2

# RG 59/U-4 Cu/Al HFFR



## KULLANIM ALANLARI

-Bina içi CATV, CCTV sistemlerinde dağıtım kablosu ve düşük zayıflama istenen uydu sistemlerinde bağlantı kablosu olarak kullanılır.  
-Yapısı itibarıyla alev geciktirici özelliğe sahip bu kablolar insanların yoğun olduğu (alışveriş merkezleri, oteller vb.) ortamlarda, yangın esnasında ortaya çıkan duman ve korozif gazların insan sağlığını tehdit etmemesi istenilen yerlerde kullanılır.

## KABLO YAPISI

|                    |                                        |
|--------------------|----------------------------------------|
| 1-İletken          | 0,80mm Ø Elektrolitik Bakır            |
| 2-Yalıtkan         | 3,70mm Ø Fiziksel Köpük PE             |
| 3-1.Ekran          | Al-Pes Bant (100% Kapama)              |
| 4-2.Ekran          | Alüminyum Örgü                         |
| 5-Kılıf            | 5,80mm Ø HFFR Kompaund Siyah ya da Gri |
| 6-Toplam Ağırlık   | 35kg/km                                |
| 7-Standart Uzunluk | 100/500/1000/2000m                     |

## APPLICATION

-It is used as a distribution cable for indoor CATV, CCTV systems and as a connection cable for satellite systems where lower attenuation is required.  
-These cables which have flame retardant characteristics by their design are used in places where people are densely populated (such as shopping centers, hotels etc.) and in places where no smoke and corrosive gases required which emitted by fire that threatens human health.

## CONSTRUCTION

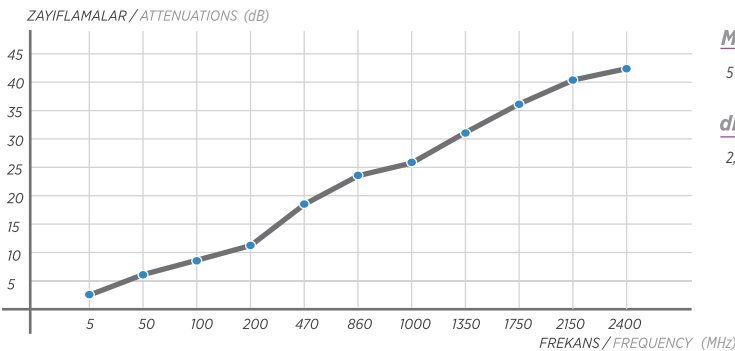
|                   |                                      |
|-------------------|--------------------------------------|
| 1-Conductor       | 0,80mm Ø Electrolytic Copper         |
| 2-Insulation      | 3,70mm Ø Physical Foam PE            |
| 3-1.Screen        | Al-Pes Tape (100% Coverage)          |
| 4-2.Screen        | Aluminium Braid                      |
| 5-Sheath          | 5,80mm Ø HFFR Compound Black or Grey |
| 6-Total Weight    | 35kg/km                              |
| 7-Standard Length | 100/500/1000/2000m                   |

## TEKNİK ÖZELLİKLER

### TECHNICAL CHARACTERISTICS

| YALITIM DİRENCİ<br>INSULATION<br>RESISTANCE       | EFEKTİF KAPASİTE<br>MUTUAL<br>CAPACITANCE   | YAYILMA HIZI<br>VELOCITY OF<br>PROPAGATION                        | ÇALIŞMA VOLTAJI<br>OPERATING<br>VOLTAGE  | TEST VOLTAJI<br>TEST VOLTAGE                  | BÜKÜLM YARIÇAPI<br>BENDING RADIUS | ÇALIŞMA SICAKLIĞI<br>TEMPERATURE RANGE | EMPEDANS<br>IMPEDANCE |
|---------------------------------------------------|---------------------------------------------|-------------------------------------------------------------------|------------------------------------------|-----------------------------------------------|-----------------------------------|----------------------------------------|-----------------------|
| >2000MΩxkm                                        | 53±2pF/m                                    | 82%                                                               | 1,1kV                                    | 2,5kV                                         | 15x Cable Ø                       | - 40°C - +70°C                         | 75±3Ω                 |
| ALEV GECİKTİRİCİLİK TESTİ<br>FLAME RETARDANT TEST | DUMAN YOĞUNLUĞU TESTİ<br>SMOKE DENSITY TEST | KOROZİF GAZ TESTİ<br>TEST ON CORROSIVENESS<br>OF COMBUSTION GASES | HALOJENSİZLİK TESTİ<br>HALOGEN FREE TEST | ALEV YAYILIMI TESTİ<br>FLAME PROPAGATION TEST |                                   |                                        |                       |
| IEC 60332-1-2                                     | IEC 61034-2                                 | IEC 60754-2                                                       | IEC 60754-1                              | IEC 60332-3-25                                |                                   |                                        |                       |

## ELEKTRİKSEL ÖZELLİKLER ELECTRICAL CHARACTERISTICS



## ZAYIFLAMALAR (20°C) ATTENUATIONS (20°C)

| MHz     | 5    | 200  | 400  | 800  | 1000 | 2150 | 2400 | 3000 |
|---------|------|------|------|------|------|------|------|------|
| dB/100m | 2,85 | 12,3 | 17,2 | 24,3 | 28,1 | 40,1 | 45   | 48,2 |

# RG 59/U-6 Cu/Cu



## KULLANIM ALANLARI

Bina içi CATV, CCTV sistemlerinde dağıtım kablosu ve düşük zayıflama istenen uydu sistemlerinde bağlantı kablosu olarak kullanılır.

## APPLICATION

It is used as a distribution cable for indoor CATV, CCTV systems and as a connection cable for satellite systems where lower attenuation is required.

## KABLO YAPISI

|                    |                             |
|--------------------|-----------------------------|
| 1-İletken          | 0,80mm Ø Elektrolitik Bakır |
| 2-Yalıtkan         | 3,70mm Ø Fiziksel Köpük PE  |
| 3-1.Ekran          | Cu-Pes Bant (100% Kapama)   |
| 4-2.Ekran          | Elektrolitik Bakır Örgü     |
| 5-Kılıf            | 5,80mm Ø PVC Kompaund Beyaz |
| 6-Toplam Ağırlık   | 39kg/km                     |
| 7-Standart Uzunluk | 100/500/1000/2000m          |

## CONSTRUCTION

|                   |                              |
|-------------------|------------------------------|
| 1-Conductor       | 0,80mm Ø Electrolytic Copper |
| 2-Insulation      | 3,70mm Ø Physical Foam PE    |
| 3-1.Screen        | Cu-Pes Tape (100% Coverage)  |
| 4-2.Screen        | Electrolytic Copper Braid    |
| 5-Sheath          | 5,80mm Ø PVC Compound White  |
| 6-Total Weight    | 39kg/km                      |
| 7-Standard Length | 100/500/1000/2000m           |

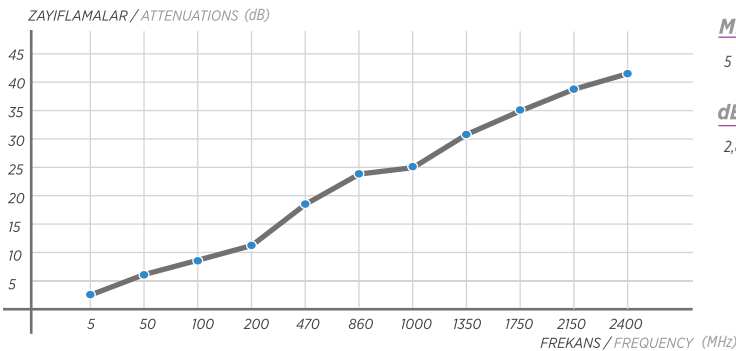
## TEKNİK ÖZELLİKLER

### TECHNICAL CHARACTERISTICS

| YALITIM DİRENCİ<br>INSULATION<br>RESISTANCE | EFEKTİF KAPASİTE<br>MUTUAL<br>CAPACITANCE | YAYILMA HIZI<br>VELOCITY OF<br>PROPAGATION | ÇALIŞMA VOLTAJI<br>OPERATING<br>VOLTAGE | TEST VOLTAJI<br>TEST VOLTAGE | BÜKÜLME YARIÇAPI<br>BENDING RADIUS | ÇALIŞMA SICAKLIĞI<br>TEMPERATURE RANGE | EMPEDANS<br>IMPEDANCE | ALEV GECİKTİRİCİLİK TESTİ<br>FLAME RETARDANT TEST |
|---------------------------------------------|-------------------------------------------|--------------------------------------------|-----------------------------------------|------------------------------|------------------------------------|----------------------------------------|-----------------------|---------------------------------------------------|
| >2000MΩxkm                                  | 53±2pF/m                                  | 82%                                        | 1,1kV                                   | 2,5kV                        | 15x Cable Ø                        | - 40°C - +70°C                         | 75±3Ω                 | IEC 60332-1-2<br>DIN EN 60332-1-2<br>EN 60332-1-2 |

## ELEKTRİKSEL ÖZELLİKLER

### ELECTRICAL CHARACTERISTICS



## ZAYIFLAMALAR (20°C)

### ATTENUATIONS (20°C)

MHz

5 200 400 800 1000 2150 2400 3000

dB/100m

2,85 12,3 17,2 24,3 28,1 40,1 45 48,2

# RG 59/U-6 Cu/Cu HFFR



## KULLANIM ALANLARI

Bina içi CATV, CCTV sistemlerinde dağıtım kablosu ve düşük zayıflama istenen uydu sistemlerinde bağlantı kablosu olarak kullanılır.

-Yapısı itibarıyla alev geciktirici özelliğe sahip bu kablolar insanların yoğun olduğu (alışveriş merkezleri, oteller vb.) ortamlarda, yangın esnasında ortaya çıkan duman ve korozif gazların insan sağlığını tehdit etmemesi istenilen yerlerde kullanılır.

## KABLO YAPISI

|                    |                                        |
|--------------------|----------------------------------------|
| 1-İletken          | 0,80mm Ø Elektrolitik Bakır            |
| 2-Yalıtkan         | 3,70mm Ø Fiziksel Köpük PE             |
| 3-1.Ekran          | Cu-Pes Bant (100% Kapama)              |
| 4-2.Ekran          | Elektrolitik Bakır Örgü                |
| 5-Kılıf            | 5,80mm Ø HFFR Kompaund Siyah ya da Gri |
| 6-Toplam Ağırlık   | 39kg/km                                |
| 7-Standart Uzunluk | 100/500/1000/2000m                     |

## APPLICATION

-It is used as a distribution cable for indoor CATV, CCTV systems and as a connection cable for satellite systems where lower attenuation is required.  
-These cables which have flame retardant characteristics by their design are used in places where people are densely populated (such as shopping centers, hotels etc.) and places in which it is required that there is no smoke and corrosive gases emitted by fire which threatens to human health.

## CONSTRUCTION

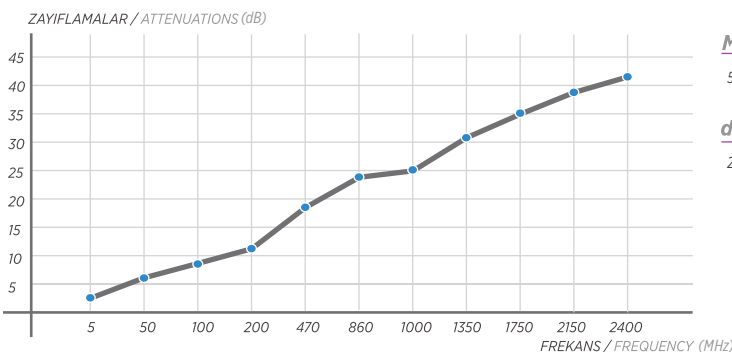
|                   |                                      |
|-------------------|--------------------------------------|
| 1-Conductor       | 0,80mm Ø Electrolytic Copper         |
| 2-Insulation      | 3,70mm Ø Physical Foam PE            |
| 3-1.Screen        | Cu-Pes Tape (100% Coverage)          |
| 4-2.Screen        | Electrolytic Copper Braid            |
| 5-Sheath          | 5,80mm Ø HFFR Compound Black or Grey |
| 6-Total Weight    | 39kg/km                              |
| 7-Standard Length | 100/500/1000/2000m                   |

## TEKNİK ÖZELLİKLER

### TECHNICAL CHARACTERISTICS

| YALITIM DİRENCİ<br>INSULATION<br>RESISTANCE       | EFEKTİF KAPASİTE<br>MUTUAL<br>CAPACITANCE   | YAYILMA HIZI<br>VELOCITY OF<br>PROPAGATION                        | ÇALIŞMA VOLTAJİ<br>OPERATING<br>VOLTAGE  | TEST VOLTAJİ<br>TEST VOLTAGE                  | BÜKÜLM YARIÇAPI<br>BENDING RADIUS | ÇALIŞMA SICAKLIĞI<br>TEMPERATURE RANGE | EMPEDANS<br>IMPEDANCE |
|---------------------------------------------------|---------------------------------------------|-------------------------------------------------------------------|------------------------------------------|-----------------------------------------------|-----------------------------------|----------------------------------------|-----------------------|
| >2000MΩxkm                                        | 53±2pF/m                                    | 82%                                                               | 1,1kV                                    | 2,5kV                                         | 15x Cable Ø                       | - 40°C - +70°C                         | 75±3Ω                 |
| ALEV GECİKTİRİCİLİK TESTİ<br>FLAME RETARDANT TEST | DUMAN YOĞUNLUĞU TESTİ<br>SMOKE DENSITY TEST | KOROZİF GAZ TESTİ<br>TEST ON CORROSIVENESS<br>OF COMBUSTION GASES | HALOJENSİZLİK TESTİ<br>HALOGEN FREE TEST | ALEV YAYILIMI TESTİ<br>FLAME PROPAGATION TEST |                                   |                                        |                       |
| IEC 60332-1-2                                     | IEC 61034-2                                 | IEC 60754-2                                                       | IEC 60754-1                              | IEC 60332-3-25                                |                                   |                                        |                       |

## ELEKTRİKSEL ÖZELLİKLER ELECTRICAL CHARACTERISTICS



## ZAYIFLAMALAR (20°C) ATTENUATIONS (20°C)

| MHz     | 5    | 200  | 400  | 800  | 1000 | 2150 | 2400 | 3000 |
|---------|------|------|------|------|------|------|------|------|
| dB/100m | 2,85 | 12,3 | 17,2 | 24,3 | 28,1 | 40,1 | 45   | 48,2 |

# RG 6/U-4 Cu/CuSn



## KULLANIM ALANLARI

Bina içi CATV, CCTV sistemlerinde dağıtım kablosu ve düşük zayıflama istenen uydu sistemlerinde bağlantı kablosu olarak kullanılır.

## APPLICATION

It is used as a distribution cable for indoor CATV, CCTV systems and as a connection cable for satellite systems where lower attenuation required.

## KABLO YAPISI

|                    |                             |
|--------------------|-----------------------------|
| 1-İletken          | 1,02mm Ø Elektrolitik Bakır |
| 2-Yalıtkan         | 4,60mm Ø Fiziksel Köpük PE  |
| 3-1.Ekran          | Al-Pes Bant (100% Kapama)   |
| 4-2.Ekran          | Kalaylı Bakır Örgü          |
| 5-Kılıf            | 6,80mm Ø PVC Kompaund Beyaz |
| 6-Toplam Ağırlık   | 50kg/km                     |
| 7-Standart Uzunluk | 100/500/1000/2000m          |

## CONSTRUCTION

|                   |                              |
|-------------------|------------------------------|
| 1-Conductor       | 1,02mm Ø Electrolytic Copper |
| 2-Insulation      | 4,60mm Ø Physical Foam PE    |
| 3-1.Screen        | Al-Pes Tape (100% Coverage)  |
| 4-2.Screen        | Tinned Copper Braid          |
| 5-Sheath          | 6,80mm Ø PVC Compound White  |
| 6-Total Weight    | 50kg/km                      |
| 7-Standard Length | 100/500/1000/2000m           |

## TEKNİK ÖZELLİKLER

### TECHNICAL CHARACTERISTICS

| YALITIM DİRENCİ<br>INSULATION<br>RESISTANCE | EFEKTİF KAPASİTE<br>MUTUAL<br>CAPACITANCE | YAYILMA HIZI<br>VELOCITY OF<br>PROPAGATION | ÇALIŞMA VOLTAJI<br>OPERATING<br>VOLTAGE | TEST VOLTAJI<br>TEST VOLTAGE | BÜKÜLME YARIÇAPI<br>BENDING RADIUS | ÇALIŞMA SICAKLIĞI<br>TEMPERATURE RANGE | EMPEDANS<br>IMPEDANCE | ALEV GECİKTİRİCİLİK TESTİ<br>FLAME RETARDANT TEST |
|---------------------------------------------|-------------------------------------------|--------------------------------------------|-----------------------------------------|------------------------------|------------------------------------|----------------------------------------|-----------------------|---------------------------------------------------|
| >2000MΩxkm                                  | 53±2pF/m                                  | 82%                                        | 1,3kV                                   | 3kV                          | 20x Cable Ø                        | - 40°C - +70°C                         | 75±3Ω                 | IEC 60332-1-2<br>DIN EN 60332-1-2<br>EN 60332-1-2 |

## ELEKTRİKSEL ÖZELLİKLER

### ELECTRICAL CHARACTERISTICS

## ZAYIFLAMALAR (20°C)

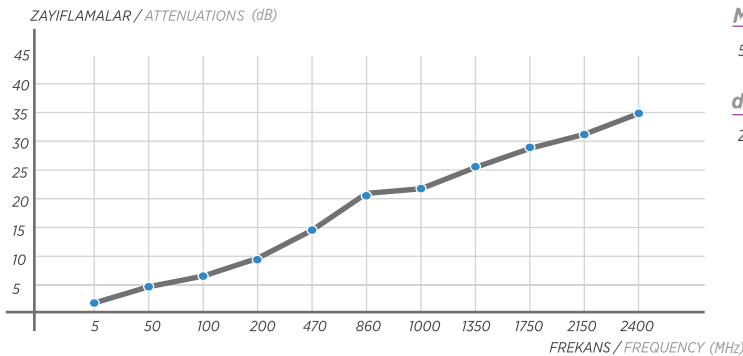
### ATTENUATIONS (20°C)

#### MHz

5 200 400 800 1000 2150 2400 3000

#### dB/100m

2,8 9,3 13,7 19,1 22 32,5 35,1 39,3



# RG 6/U-4 Cu/CuSn HFFR



## KULLANIM ALANLARI

-Bina içi CATV, CCTV sistemlerinde dağıtım kablosu ve düşük zayıflama istenen uydu sistemlerinde bağlantı kablosu olarak kullanılır.  
-Yapısı itibarıyla alev geciktirici özelliğe sahip bu kablolar insanların yoğun olduğu (alışveriş merkezleri, oteller vb.) ortamlarda, yangın esnasında ortaya çıkan duman ve korozif gazların insan sağlığını tehdit etmemesi istenilen yerlerde kullanılır.

## KABLO YAPISI

|                    |                                        |
|--------------------|----------------------------------------|
| 1-İletken          | 1,02mm Ø Elektrolitik Bakır            |
| 2-Yalıtkan         | 4,60mm Ø Fiziksel Köpük PE             |
| 3-1.Ekran          | Al-Pes Bant (100% Kapama)              |
| 4-2.Ekran          | Kalaylı Bakır Örgü                     |
| 5-Kılıf            | 6,80mm Ø HFFR Kompaund Siyah ya da Gri |
| 6-Toplam Ağırlık   | 50kg/km                                |
| 7-Standart Uzunluk | 100/500/1000/2000m                     |

## APPLICATION

-It is used as a distribution cable for indoor CATV, CCTV systems and as a connection cable for satellite systems where lower attenuation is required.  
-These cables which have flame retardant characteristics by their design are used in places where people are densely populated (such as shopping centers, hotels etc.) and places in which it is required that there is no smoke and corrosive gases emitted by fire which threats to human health.

## CONSTRUCTION

|                   |                                      |
|-------------------|--------------------------------------|
| 1-Conductor       | 1,02mm Ø Electrolytic Copper         |
| 2-Insulation      | 4,60mm Ø Physical Foam PE            |
| 3-1.Screen        | Al-Pes Tape (100% Coverage)          |
| 4-2.Screen        | Tinned Copper Braid                  |
| 5-Sheath          | 6,80mm Ø HFFR Compound Black or Grey |
| 6-Total Weight    | 50kg/km                              |
| 7-Standard Length | 100/500/1000/2000m                   |

## TEKNİK ÖZELLİKLER TECHNICAL CHARACTERISTICS

| YALITIM DİRENCİ<br>INSULATION<br>RESISTANCE       | EFEKTİF KAPASİTE<br>MUTUAL<br>CAPACITANCE   | YAYILMA HIZI<br>VELOCITY OF<br>PROPAGATION                        | ÇALIŞMA VOLTAJİ<br>OPERATING<br>VOLTAGE  | TEST VOLTAJİ<br>TEST VOLTAGE                  | BÜKÜLM YARICIPI<br>BENDING RADIUS | ÇALIŞMA SICAKLIĞI<br>TEMPERATURE RANGE | EMPEDANS<br>IMPEDANCE |
|---------------------------------------------------|---------------------------------------------|-------------------------------------------------------------------|------------------------------------------|-----------------------------------------------|-----------------------------------|----------------------------------------|-----------------------|
| >2000MΩxkm                                        | 53±2pF/m                                    | 82%                                                               | 1,3kV                                    | 3kV                                           | 20x Cable Ø                       | - 40°C - +70°C                         | 75±3Ω                 |
| ALEV GECİKTİRİCİLİK TESTİ<br>FLAME RETARDANT TEST | DUMAN YOĞUNLUĞU TESTİ<br>SMOKE DENSITY TEST | KOROZİF GAZ TESTİ<br>TEST ON CORROSIVENESS<br>OF COMBUSTION GASES | HALOJENSİZLİK TESTİ<br>HALOGEN FREE TEST | ALEV YAYILIMI TESTİ<br>FLAME PROPAGATION TEST |                                   |                                        |                       |
| IEC 60332-1-2                                     | IEC 61034-2                                 | IEC 60754-2                                                       | IEC 60754-1                              | IEC 60332-3-25                                |                                   |                                        |                       |

## ELEKTRİKSEL ÖZELLİKLER ELECTRICAL CHARACTERISTICS

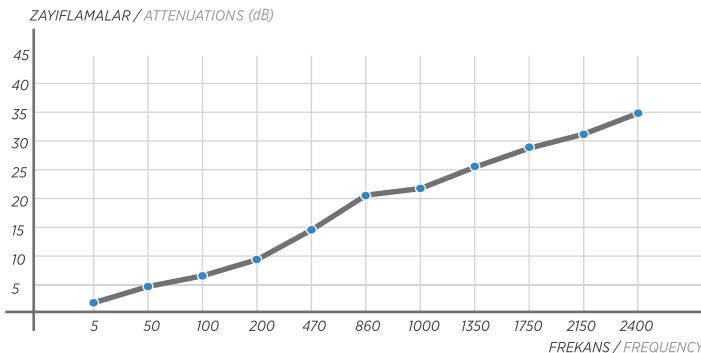
## ZAYIFLAMALAR (20°C) ATTENUATIONS (20°C)

MHz

5 200 400 800 1000 2150 2400 3000

dB/100m

2,8 9,3 13,7 19,1 22 32,5 35,1 39,3



# RG 6/U-4 Cu/Al



Class  
**C**



## KULLANIM ALANLARI

Bina içi CATV, CCTV sistemlerinde dağıtım kablosu ve düşük zayıflama istenen uydu sistemlerinde bağlantı kablosu olarak kullanılır.

## APPLICATION

It is used as a distribution cable for indoor CATV, CCTV systems and as a connection cable for satellite systems where lower attenuation is required.

## KABLO YAPISI

|                    |                             |
|--------------------|-----------------------------|
| 1-İletken          | 1,02mm Ø Elektrolitik Bakır |
| 2-Yalıtkan         | 4,60mm Ø Fiziksel Köpük PE  |
| 3-1.Ekran          | Al-Pes Bant (100% Kapama)   |
| 4-2.Ekran          | Alüminyum Örgü              |
| 5-Kılıf            | 6,80mm Ø PVC Kompaund Beyaz |
| 6-Toplam Ağırlık   | 47kg/km                     |
| 7-Standart Uzunluk | 100/500/1000/2000m          |

## CONSTRUCTION

|                   |                              |
|-------------------|------------------------------|
| 1-Conductor       | 1,02mm Ø Electrolytic Copper |
| 2-Insulation      | 4,60mm Ø Physical Foam PE    |
| 3-1.Screen        | Al-Pes Tape (100% Coverage)  |
| 4-2.Screen        | Aluminium Braid              |
| 5-Sheath          | 6,80mm Ø PVC Compound White  |
| 6-Total Weight    | 47kg/km                      |
| 7-Standard Length | 100/500/1000/2000m           |

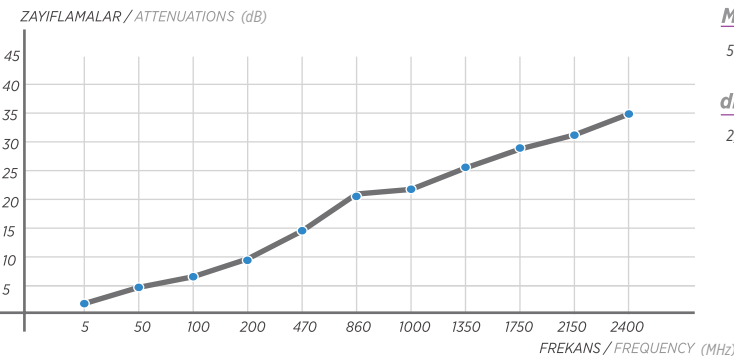
## TEKNİK ÖZELLİKLER

### TECHNICAL CHARACTERISTICS

| YALITIM DİRENCİ<br>INSULATION<br>RESISTANCE | EFEKTİF KAPASİTE<br>MUTUAL<br>CAPACITANCE | YAYILMA HIZI<br>VELOCITY OF<br>PROPAGATION | ÇALIŞMA VOLTAJI<br>OPERATING<br>VOLTAGE | TEST VOLTAJI<br>TEST VOLTAGE | BÜKÜLME YARIÇAPI<br>BENDING RADIUS | ÇALIŞMA SICAKLIĞI<br>TEMPERATURE RANGE | EMPEDANS<br>IMPEDANCE | ALEV GECİKTİRİCİLİK TESTİ<br>FLAME RETARDANT TEST |
|---------------------------------------------|-------------------------------------------|--------------------------------------------|-----------------------------------------|------------------------------|------------------------------------|----------------------------------------|-----------------------|---------------------------------------------------|
| >2000MΩxkm                                  | 53±2pF/m                                  | 82%                                        | 1,3kV                                   | 3kV                          | 20x Cable Ø                        | - 40°C - +70°C                         | 75±3Ω                 | IEC 60332-1-2<br>DIN EN 60332-1-2<br>EN 60332-1-2 |

## ELEKTRİKSEL ÖZELLİKLER

### ELECTRICAL CHARACTERISTICS



## ZAYIFLAMALAR (20°C)

### ATTENUATIONS (20°C)

| MHz     | 5   | 200 | 400  | 800  | 1000 | 2150 | 2400 | 3000 |
|---------|-----|-----|------|------|------|------|------|------|
| dB/100m | 2,8 | 9,3 | 13,7 | 19,1 | 22   | 32,5 | 35,1 | 39,3 |

# RG 6/U-4 Cu/Al HFFR



Class  
**C**



## KULLANIM ALANLARI

-Bina içi CATV, CCTV sistemlerinde dağıtım kablosu ve düşük zayıflama istenen uydu sistemlerinde bağlantı kablosu olarak kullanılır.  
-Yapısı itibarıyla alev geciktirici özelliğe sahip bu kablolar insanların yoğun olduğu (alışveriş merkezleri, oteller vb.) ortamlarda, yangın esnasında ortaya çıkan duman ve korozyif gazların insan sağlığını tehdit etmemesi istenilen yerlerde kullanılır.

## KABLO YAPISI

|                    |                                        |
|--------------------|----------------------------------------|
| 1-İletken          | 1,02mm Ø Elektrolitik Bakır            |
| 2-Yalıtkan         | 4,60mm Ø Fiziksel Köpük PE             |
| 3-1.Ekran          | Al-Pes Bant (100% Kapama)              |
| 4-2.Ekran          | Alüminyum Örgü                         |
| 5-Kılıf            | 6,80mm Ø HFFR Kompaund Siyah ya da Gri |
| 6-Toplam Ağırlık   | 47kg/km                                |
| 7-Standart Uzunluk | 100/500/1000/2000m                     |

## APPLICATION

-It is used as a distribution cable for indoor CATV, CCTV systems and as a connection cable for satellite systems where lower attenuation is required.  
-These cables which have flame retardant characteristics by their design are used in places where people are densely populated (such as shopping centers, hotels etc.) and places in which it is required that there is no smoke and corrosive gases emitted by fire which threats to human health.

## CONSTRUCTION

|                   |                                      |
|-------------------|--------------------------------------|
| 1-Conductor       | 1,02mm Ø Electrolytic Copper         |
| 2-Insulation      | 4,60mm Ø Physical Foam PE            |
| 3-1.Screen        | Al-Pes Tape (100% Coverage)          |
| 4-2.Screen        | Aluminium Braid                      |
| 5-Sheath          | 6,80mm Ø HFFR Compound Black or Grey |
| 6-Total Weight    | 47kg/km                              |
| 7-Standard Length | 100/500/1000/2000m                   |

## TEKNİK ÖZELLİKLER

### TECHNICAL CHARACTERISTICS

| YALITIM DİRENCİ<br>INSULATION<br>RESISTANCE       | EFEKTİF KAPASİTE<br>MUTUAL<br>CAPACITANCE   | YAYILMA HIZI<br>VELOCITY OF<br>PROPAGATION                         | ÇALIŞMA VOLTAJİ<br>OPERATING<br>VOLTAGE  | TEST VOLTAJİ<br>TEST VOLTAGE                  | BÜKÜLME YARI ÇAPI<br>BENDING RADIUS | ÇALIŞMA SICAKLIĞI<br>TEMPERATURE RANGE | EMPEDANS<br>IMPEDANCE |
|---------------------------------------------------|---------------------------------------------|--------------------------------------------------------------------|------------------------------------------|-----------------------------------------------|-------------------------------------|----------------------------------------|-----------------------|
| >2000MΩxkm                                        | 53±2pF/m                                    | 82%                                                                | 1,3kV                                    | 3kV                                           | 20x Cable Ø                         | - 40°C - +70°C                         | 75±3Ω                 |
| ALEV GECİKTİRİCİLİK TESTİ<br>FLAME RETARDANT TEST | DUMAN YOĞUNLUĞU TESTİ<br>SMOKE DENSITY TEST | KOROZYİF GAZ TESTİ<br>TEST ON CORROSIVENESS<br>OF COMBUSTION GASES | HALOJENSİZLİK TESTİ<br>HALOGEN FREE TEST | ALEV YAYILIMI TESTİ<br>FLAME PROPAGATION TEST |                                     |                                        |                       |
| IEC 60332-1-2                                     | IEC 61034-2                                 | IEC 60754-2                                                        | IEC 60754-1                              | IEC 60332-3-25                                |                                     |                                        |                       |

## ELEKTRİKSEL ÖZELLİKLER ELECTRICAL CHARACTERISTICS

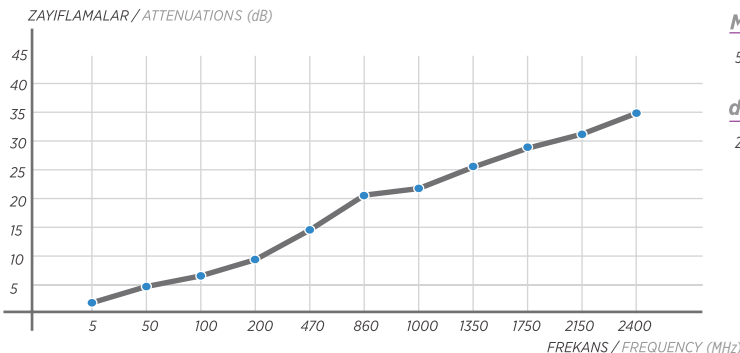
## ZAYIFLAMALAR (20°C) ATTENUATIONS (20°C)

MHz

5 200 400 800 1000 2150 2400 3000

dB/100m

2,8 9,3 13,7 19,1 22 32,5 35,1 39,3



# RG 6/U-4 Cu/CuSn TRISHIELD



Class  
**A+**



## KULLANIM ALANLARI

-Bina içi CATV, CCTV sistemlerinde dağıtım kablosu ve düşük zayıflama istenen uydu sistemlerinde bağlantı kablosu olarak kullanılır.

## APPLICATION

-It is used as a distribution cable for indoor CATV, CCTV systems and as a connection cable for satellite systems where lower attenuation required.

## KABLO YAPISI

|                    |                             |
|--------------------|-----------------------------|
| 1-İletken          | 1,02mm Ø Elektrolitik Bakır |
| 2-Yalıtkan         | 4,60mm Ø Fiziksel Köpük PE  |
| 3-1.Ekran          | Al-Pes Bant (100% Kapama)   |
| 4-2.Ekran          | Kalaylı Bakır Örgü          |
| 5-3.Ekran          | Al-Pes Bant (100% Kapama)   |
| 6-Kılıf            | 7mm Ø PVC Kompaund Beyaz    |
| 7-Toplam Ağırlık   | 49kg/km                     |
| 8-Standart Uzunluk | 100/500/1000/2000m          |

## CONSTRUCTION

|                   |                              |
|-------------------|------------------------------|
| 1-Conductor       | 1,02mm Ø Electrolytic Copper |
| 2-Insulation      | 4,60mm Ø Physical Foam PE    |
| 3-1.Screen        | Al-Pes Tape (100% Coverage)  |
| 4-2.Screen        | Tinned Copper Braid          |
| 5-3.Screen        | Al-Pes Tape (100% Coverage)  |
| 6-Sheath          | 7mm Ø PVC Compound White     |
| 7-Total Weight    | 49kg/km                      |
| 8-Standard Length | 100/500/1000/2000m           |

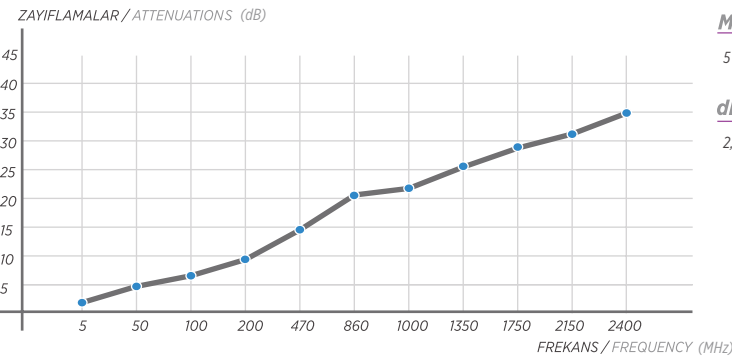
## TEKNİK ÖZELLİKLER

### TECHNICAL CHARACTERISTICS

| YALITIM DİRENCİ<br>INSULATION<br>RESISTANCE | EFEKTİF KAPASİTE<br>MUTUAL<br>CAPACITANCE | YAYILMA HIZI<br>VELOCITY OF<br>PROPAGATION | ÇALIŞMA VOLTAJI<br>OPERATING<br>VOLTAGE | TEST VOLTAJI<br>TEST VOLTAGE | BÜKÜLME YARIÇAPI<br>BENDING RADIUS | ÇALIŞMA SICAKLIĞI<br>TEMPERATURE RANGE | EMPEDANS<br>IMPEDANCE | ALEV GECİKTİRİCİLİK TESTİ<br>FLAME RETARDANT TEST |
|---------------------------------------------|-------------------------------------------|--------------------------------------------|-----------------------------------------|------------------------------|------------------------------------|----------------------------------------|-----------------------|---------------------------------------------------|
| >2000MΩxkm                                  | 53±2pF/m                                  | 82%                                        | 1,3kV                                   | 3kV                          | 20x Cable Ø                        | - 40°C - +70°C                         | 75±3Ω                 | IEC 60332-1-2<br>DIN EN 60332-1-2<br>EN 60332-1-2 |

## ELEKTRİKSEL ÖZELLİKLER

### ELECTRICAL CHARACTERISTICS



## ZAYIFLAMALAR (20°C)

### ATTENUATIONS (20°C)

MHz

5 200 400 800 1000 2150 2400 3000

dB/100m

2,8 9,3 13,7 19,1 22 32,5 35,1 39,3

# RG 6/U-4 Cu/CuSn TRISHIELD HFFR



Class  
**A+**



## KULLANIM ALANLARI

-Bina içi CATV, CCTV sistemlerinde dağıtım kablosu ve düşük zayıflama istenen uydu sistemlerinde bağlantı kablosu olarak kullanılır.  
-Yapısı itibarıyla alev geciktirici özelliğe sahip bu kablolar insanların yoğun olduğu (alışveriş merkezleri, oteller vb.) ortamlarda, yangın esnasında ortaya çıkan duman ve korozyif gazların insan sağlığını tehdit etmemesi istenilen yerlerde kullanılır.

## KABLO YAPISI

|                    |                             |
|--------------------|-----------------------------|
| 1-İletken          | 1,02mm Ø Elektrolitik Bakır |
| 2-Yalıtkan         | 4,60mm Ø Fiziksel Köpük PE  |
| 3-1.Ekran          | Al-Pes Bant (100% Kapama)   |
| 4-2.Ekran          | Kalaylı Bakır Örgü          |
| 5-3.Ekran          | Al-Pes Bant (100% Kapama)   |
| 6-Kılıf            | 7mm Ø HFFR Kompaund Gri     |
| 7-Toplam Ağırlık   | 49kg/km                     |
| 8-Standart Uzunluk | 100/500/1000/2000m          |

## APPLICATION

-It is used as a distribution cable for indoor CATV, CCTV systems and as a connection cable for satellite systems where lower attenuation is required.  
-These cables which have flame retardant characteristics by their design are used in places where people are densely populated (such as shopping centers, hotels etc.) and places in which it is required that there is no smoke and corrosive gases emitted by fire which threatens to human health.

## CONSTRUCTION

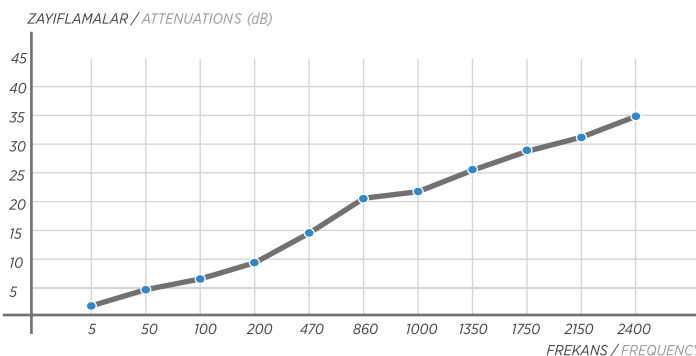
|                   |                              |
|-------------------|------------------------------|
| 1-Conductor       | 1,02mm Ø Electrolytic Copper |
| 2-Insulation      | 4,60mm Ø Physical Foam PE    |
| 3-1.Screen        | Al-Pes Tape (100% Coverage)  |
| 4-2.Screen        | Tinned Copper Braid          |
| 5-3.Screen        | Al-Pes Tape (100% Coverage)  |
| 6-Sheath          | 7mm Ø HFFR Compound Grey     |
| 7-Total Weight    | 49kg/km                      |
| 8-Standard Length | 100/500/1000/2000m           |

## TEKNİK ÖZELLİKLER

### TECHNICAL CHARACTERISTICS

| YALITIM DİRENCİ<br>INSULATION<br>RESISTANCE       | EFEKTİF KAPASİTE<br>MUTUAL<br>CAPACITANCE   | YAYILMA HIZI<br>VELOCITY OF<br>PROPAGATION                         | ÇALIŞMA VOLTAJİ<br>OPERATING<br>VOLTAGE  | TEST VOLTAJİ<br>TEST VOLTAGE                  | BÜKÜLM YARIÇAPI<br>BENDING RADIUS | ÇALIŞMA SICAKLIĞI<br>TEMPERATURE RANGE | EMPEDANS<br>IMPEDANCE |
|---------------------------------------------------|---------------------------------------------|--------------------------------------------------------------------|------------------------------------------|-----------------------------------------------|-----------------------------------|----------------------------------------|-----------------------|
| >2000MΩxkm                                        | 53±2pF/m                                    | 82%                                                                | 1,3kV                                    | 3kV                                           | 20x Cable Ø                       | - 40°C - +70°C                         | 75±3Ω                 |
| ALEV GECİKTİRİCİLİK TESTİ<br>FLAME RETARDANT TEST | DUMAN YOĞUNLUĞU TESTİ<br>SMOKE DENSITY TEST | KOROZYİF GAZ TESTİ<br>TEST ON CORROSIVENESS<br>OF COMBUSTION GASES | HALOJENSİZLİK TESTİ<br>HALOGEN FREE TEST | ALEV YAYILIMI TESTİ<br>FLAME PROPAGATION TEST |                                   |                                        |                       |
| IEC 60332-1-2                                     | IEC 61034-2                                 | IEC 60754-2                                                        | IEC 60754-1                              | IEC 60332-3-25                                |                                   |                                        |                       |

## ELEKTRİKSEL ÖZELLİKLER ELECTRICAL CHARACTERISTICS



## ZAYIFLAMALAR (20°C) ATTENUATIONS (20°C)

| MHz     | 5   | 200 | 400  | 800  | 1000 | 2150 | 2400 | 3000 |
|---------|-----|-----|------|------|------|------|------|------|
| dB/100m | 2,8 | 9,3 | 13,7 | 19,1 | 22   | 32,5 | 35,1 | 39,3 |

# RG 6/U-6 Cu/Cu



Class  
**B**



## KULLANIM ALANLARI

-Bina içi CATV, CCTV sistemlerinde dağıtım kablosu ve düşük zayıflama istenen uydu sistemlerinde bağlantı kablosu olarak kullanılır.

## APPLICATION

-It is used as a distribution cable for indoor CATV, CCTV systems and as a connection cable for satellite systems where lower attenuation is required.

## KABLO YAPISI

|                    |                                   |
|--------------------|-----------------------------------|
| 1-İletken          | 1,02mm Ø Elektrolitik Bakır       |
| 2-Yalıtkan         | 4,60mm Ø Fiziksel Köpük PE        |
| 3-1.Ekran          | Cu-Pes Bant (100% Kapama)         |
| 4-2.Ekran          | Elektrolitik Bakır Örgü           |
| 5-Kılıf            | 6,80mm Ø PVC Kompaund Siyah/Yeşil |
| 6-Toplam Ağırlık   | PVC 52kg/km                       |
| 7-Standart Uzunluk | 100/500/1000/2000m                |

## CONSTRUCTION

|                   |                                   |
|-------------------|-----------------------------------|
| 1-Conductor       | 1,02mm Ø Electrolytic Copper      |
| 2-Insulation      | 4,60mm Ø Physical Foam PE         |
| 3-1.Screen        | Cu-Pes Tape (100% Coverage)       |
| 4-2.Screen        | Electrolytic Copper Braid         |
| 5-Sheath          | 6,80mm Ø PVC Compound Black/Green |
| 6-Total Weight    | PVC 52kg/km                       |
| 7-Standard Length | 100/500/1000/2000m                |

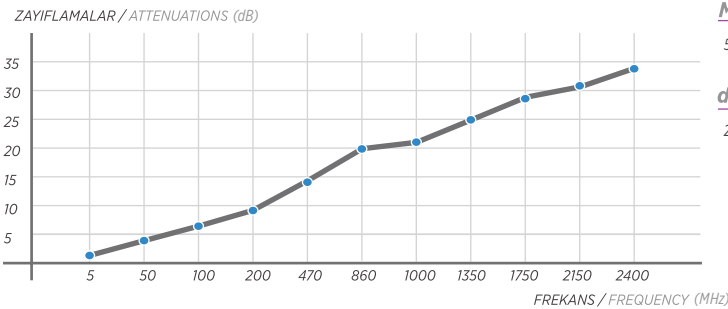
## TEKNİK ÖZELLİKLER

### TECHNICAL CHARACTERISTICS

| YALITIM DİRENCİ<br>INSULATION<br>RESISTANCE | EFEKTİF KAPASİTE<br>MUTUAL<br>CAPACITANCE | YAYILMA HIZI<br>VELOCITY OF<br>PROPAGATION | ÇALIŞMA VOLTAJI<br>OPERATING<br>VOLTAGE | TEST VOLTAJI<br>TEST VOLTAGE | BÜKÜLME YARIÇAPI<br>BENDING RADIUS | ÇALIŞMA SICAKLIĞI<br>TEMPERATURE RANGE | EMPEDANS<br>IMPEDANCE | ALEV GECİKTİRİCİLİK TESTİ<br>FLAME RETARDANT TEST |
|---------------------------------------------|-------------------------------------------|--------------------------------------------|-----------------------------------------|------------------------------|------------------------------------|----------------------------------------|-----------------------|---------------------------------------------------|
| >2000MΩxkm                                  | 53±2pF/m                                  | 82%                                        | 1,3kV                                   | 3kV                          | 20x Cable Ø                        | - 40°C - +70°C                         | 75±3Ω                 | IEC 60332-1-2<br>DIN EN 60332-1-2<br>EN 60332-1-2 |

## ELEKTRİKSEL ÖZELLİKLER

### ELECTRICAL CHARACTERISTICS



## ZAYIFLAMALAR (20°C)

### ATTENUATIONS (20°C)

| MHz     | 5   | 200 | 400  | 800  | 1000 | 2150 | 2400 | 3000 |
|---------|-----|-----|------|------|------|------|------|------|
| dB/100m | 2,8 | 9,3 | 13,7 | 19,1 | 22   | 32,5 | 35,1 | 39,3 |

## NOTLAR

Bina dışı uygulamalar için PE kılıflı versiyonu mevcuttur.  
Alev geciktiricilik testi; PVC kılıflı kablolar için uygulanmaktadır.

\*:PVC kılıflı kablolar için.

## NOTES

PE sheath is available for outdoor application.  
Flame retardant test is applied for PVC sheathed cables.

\*:For PVC sheathed cables.

# RG 6/U-6 Cu/Cu HFFR



Class  
**B**



## KULLANIM ALANLARI

-Bina içi CATV, CCTV sistemlerinde dağıtım kablosu ve düşük zayıflama istenen uydu sistemlerinde bağlantı kablosu olarak kullanılır.

-Yapısı itibarıyla alev geciktirici özelliğe sahip bu kablolar insanların yoğun olduğu (alışveriş merkezleri, oteller vb.) ortamlarda, yangın esnasında ortaya çıkan duman ve korozif gazların insan sağlığını tehdit etmemesi istenilen yerlerde kullanılır.

## KABLO YAPISI

|                    |                                        |
|--------------------|----------------------------------------|
| 1-İletken          | 1,02mm Ø Elektrolitik Bakır            |
| 2-Yalıtkan         | 4,60mm Ø Fiziksel Köpük PE             |
| 3-1.Ekran          | Cu-Pes Bant (100% Kapama)              |
| 4-2.Ekran          | Elektrolitik Bakır Örgü                |
| 5-Kılıf            | 6,80mm Ø HFFR Kompaund Siyah ya da Gri |
| 6-Toplam Ağırlık   | 52kg/km                                |
| 7-Standart Uzunluk | 100/500/1000/2000m                     |

## APPLICATION

-It is used as a distribution cable for indoor CATV, CCTV systems and as a connection cable for satellite systems where lower attenuation is required.

-These cables which have flame retardant characteristics by their design are used in places where people are densely populated (such as shopping centers, hotels etc.) and places in which it is required that there is no smoke and corrosive gases emitted by fire which threatens to human health.

## CONSTRUCTION

|                   |                                      |
|-------------------|--------------------------------------|
| 1-Conductor       | 1,02mm Ø Electrolytic Copper         |
| 2-Insulation      | 4,60mm Ø Physical Foam PE            |
| 3-1.Screen        | Cu-Pes Tape (100% Coverage)          |
| 4-2.Screen        | Electrolytic Copper Braid            |
| 5-Sheath          | 6,80mm Ø HFFR Compound Black or Grey |
| 6-Total Weight    | 52kg/km                              |
| 7-Standard Length | 100/500/1000/2000m                   |

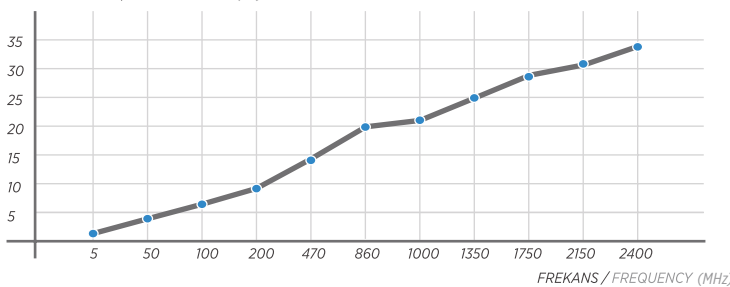
## TEKNİK ÖZELLİKLER

### TECHNICAL CHARACTERISTICS

| YALITIM DİRENCİ<br>INSULATION<br>RESISTANCE       | EFEKTİF KAPASİTE<br>MUTUAL<br>CAPACITANCE   | YAYILMA HIZI<br>VELOCITY OF<br>PROPAGATION                        | ÇALIŞMA VOLTAJI<br>OPERATING<br>VOLTAGE  | TEST VOLTAJI<br>TEST VOLTAGE                  | BÜKÜLME YARIÇAPI<br>BENDING RADIUS | ÇALIŞMA SICAKLIĞI<br>TEMPERATURE RANGE | EMPEDANS<br>IMPEDANCE |
|---------------------------------------------------|---------------------------------------------|-------------------------------------------------------------------|------------------------------------------|-----------------------------------------------|------------------------------------|----------------------------------------|-----------------------|
| >2000MΩxkm                                        | 53±2pF/m                                    | 82%                                                               | 1,3kV                                    | 3kV                                           | 20x Cable Ø                        | - 40°C - +70°C                         | 75±3Ω                 |
| ALEV GECİKTİRİCİLİK TESTİ<br>FLAME RETARDANT TEST | DUMAN YOĞUNLUĞU TESTİ<br>SMOKE DENSITY TEST | KOROZİF GAZ TESTİ<br>TEST ON CORROSIVENESS<br>OF COMBUSTION GASES | HALOJENSİZLİK TESTİ<br>HALOGEN FREE TEST | ALEV YAYILIMI TESTİ<br>FLAME PROPAGATION TEST |                                    |                                        |                       |
| IEC 60332-1-2                                     | IEC 61034-2                                 | IEC 60754-2                                                       | IEC 60754-1                              | IEC 60332-3-25                                |                                    |                                        |                       |

## ELEKTRİKSEL ÖZELLİKLER ELECTRICAL CHARACTERISTICS

ZAYIFLAMALAR / ATTENUATIONS (dB)



## ZAYIFLAMALAR (20°C) ATTENUATIONS (20°C)

MHz

5 200 400 800 1000 2150 2400 3000

dB/100m

2,8 9,3 13,7 19,1 22 32,5 35,1 39,3

# RG 6/U-6 Cu/Cu TRISHIELD



Class  
**A+**



## KULLANIM ALANLARI

-Bina içi CATV, CCTV sistemlerinde dağıtım kablosu ve düşük zayıflama istenen uydu sistemlerinde bağlantı kablosu olarak kullanılır.  
-PE kılıf, harici ve yer altı şebekelerinde kullanılır.

## APPLICATION

-It is used as a distribution cable for indoor CATV, CCTV systems and as a connection.  
-PE sheath is used as a connection cable in outdoor and underground networks.

## KABLO YAPISI

|                           |                             |
|---------------------------|-----------------------------|
| <b>1-İletken</b>          | 1,02mm Ø Elektrolitik Bakır |
| <b>2-Yalıtkan</b>         | 4,60mm Ø Fiziksel Köpük PE  |
| <b>3-1.Ekran</b>          | Cu-Pes Bant (100% Kapama)   |
| <b>4-2.Ekran</b>          | Elektrolitik Bakır Örgü     |
| <b>5-3.Ekran</b>          | Cu-Pes Bant (100% Kapama)   |
| <b>6-Kılıf</b>            | 7mm Ø PVC Kompaund Beyaz    |
| <b>7-Toplam Ağırlık</b>   | PVC 55kg/km                 |
| <b>8-Standart Uzunluk</b> | 100/500/1000/2000m          |

## CONSTRUCTION

|                          |                              |
|--------------------------|------------------------------|
| <b>1-Conductor</b>       | 1,02mm Ø Electrolytic Copper |
| <b>2-Insulation</b>      | 4,60mm Ø Physical Foam PE    |
| <b>3-1.Screen</b>        | Cu-Pes Tape (100% Coverage)  |
| <b>4-2.Screen</b>        | Electrolytic Copper Braid    |
| <b>5-3.Screen</b>        | Cu-Pes Tape (100% Coverage)  |
| <b>6-Sheath</b>          | 7mm Ø PVC Compound White     |
| <b>7-Total Weight</b>    | PVC 55kg/km                  |
| <b>8-Standard Length</b> | 100/500/1000/2000m           |

## TEKNİK ÖZELLİKLER

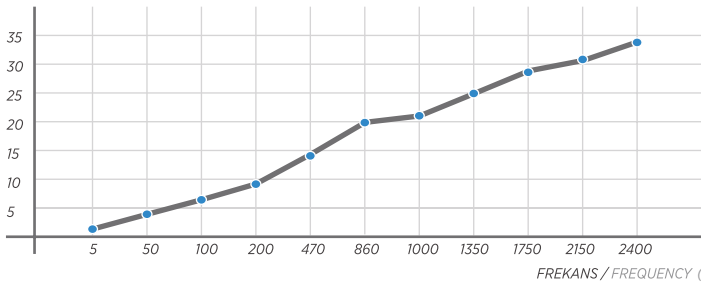
### TECHNICAL CHARACTERISTICS

| YALITIM DİRENCİ<br>INSULATION<br>RESISTANCE | EFEKTİF KAPASİTE<br>MUTUAL<br>CAPACITANCE | YAYILMA HIZI<br>VELOCITY OF<br>PROPAGATION | ÇALIŞMA VOLTAJİ<br>OPERATING<br>VOLTAGE | TEST VOLTAJİ<br>TEST VOLTAGE | BÜKÜLME YARIÇAPİ<br>BENDING RADIUS | ÇALIŞMA SICAKLIĞI<br>TEMPERATURE RANGE | EMPEDANS<br>IMPEDANCE | ALEV GECİKTİRİCİLİK TESTİ<br>FLAME RETARDANT TEST |
|---------------------------------------------|-------------------------------------------|--------------------------------------------|-----------------------------------------|------------------------------|------------------------------------|----------------------------------------|-----------------------|---------------------------------------------------|
| >2000MΩxkm                                  | 53±2pF/m                                  | 82%                                        | 1,3kV                                   | 3kV                          | 20x Cable Ø                        | - 40°C - +70°C                         | 75±3Ω                 | IEC 60332-1-2<br>DIN EN 60332-1-2<br>EN 60332-1-2 |

## ELEKTRİKSEL ÖZELLİKLER

### ELECTRICAL CHARACTERISTICS

ZAYIFLAMALAR / ATTENUATIONS (dB)



FREKANS / FREQUENCY (MHz)

## ZAYIFLAMALAR (20°C)

### ATTENUATIONS (20°C)

MHz

5 200 400 800 1000 2150 2400 3000

dB/100m

2,8 9,3 13,7 19,1 22 32,5 35,1 39,3

## NOTLAR

Bina dışı uygulamalar için PE kılıflı versiyonu mevcuttur.  
Alev geciktiricilik testi; PVC kılıflı kablolar için uygulanmaktadır.

\*:PVC kılıflı kablolar için.

## NOTES

PE sheath is available for outdoor application.  
Flame retardant test is applied for PVC sheathed cables.

\*:For PVC sheathed cables.

# RG 11/U-4 Cu/Al HFFR



## KULLANIM ALANLARI

-Bina içi CATV, CCTV sistemlerinde dağıtım kablosu ve düşük zayıflama istenen uydu sistemlerinde bağlantı kablosu olarak kullanılır.  
-Yapısı itibarıyla alev geciktirici özelliğe sahip bu kablolar insanların yoğun olduğu (alışveriş merkezleri, oteller vb.) ortamlarda, yangın esnasında ortaya çıkan duman ve korozif gazların insan sağlığını tehdit etmemesi istenilen yerlerde kullanılır.

## APPLICATION

-It is used as a distribution cable for indoor CATV, CCTV systems and as a connection cable for satellite systems where lower attenuation is required.  
-These cables which have flame retardant characteristics by their design are used in places where people are densely populated (such as shopping centers, hotels etc.) and places in which it is required that there is no smoke and corrosive gases emitted by fire which threatens human health.

## KABLO YAPISI

|                    |                                         |
|--------------------|-----------------------------------------|
| 1-İletken          | 1,63mm Ø Elektrolitik Bakır             |
| 2-Yalıtkan         | 7,20mm Ø Fiziksel Köpük PE              |
| 3-1.Ekran          | Al-Pes Bant (100% Kapama)               |
| 4-2.Ekran          | Alüminyum Örgü                          |
| 5-Kılıf            | 10,30mm Ø HFFR Kompaund Siyah ya da Gri |
| 6-Toplam Ağırlık   | 94kg/km                                 |
| 7-Standart Uzunluk | 100/500/1000/2000m                      |

## CONSTRUCTION

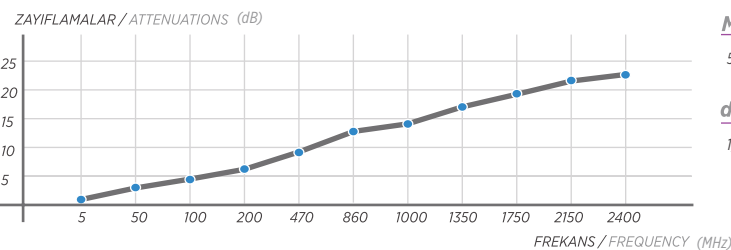
|                   |                                       |
|-------------------|---------------------------------------|
| 1-Conductor       | 1,63mm Ø Electrolytic Copper          |
| 2-Insulation      | 7,20mm Ø Physical Foam PE             |
| 3-1.Screen        | Al-Pes Tape (100% Coverage)           |
| 4-2.Screen        | Aluminium Braid                       |
| 5-Sheath          | 10,30mm Ø HFFR Compound Black or Grey |
| 6-Total Weight    | 94kg/km                               |
| 7-Standard Length | 100/500/1000/2000m                    |

## TEKNİK ÖZELLİKLER

### TECHNICAL CHARACTERISTICS

| YALITIM DİRENCİ<br>INSULATION<br>RESISTANCE       | EFEKTİF KAPASİTE<br>MUTUAL<br>CAPACITANCE   | YAYILMA HIZI<br>VELOCITY OF<br>PROPAGATION                        | ÇALIŞMA VOLTAJI<br>OPERATING<br>VOLTAGE  | TEST VOLTAJI<br>TEST VOLTAGE                  | BÜKÜLME YARIÇAPI<br>BENDING RADIUS | ÇALIŞMA SICAKLIĞI<br>TEMPERATURE RANGE | EMPEDANS<br>IMPEDANCE |
|---------------------------------------------------|---------------------------------------------|-------------------------------------------------------------------|------------------------------------------|-----------------------------------------------|------------------------------------|----------------------------------------|-----------------------|
| >2000MΩxkm                                        | 53±2pF/m                                    | 82%                                                               | 2kV                                      | 5kV                                           | 20x Cable Ø                        | - 40°C - +70°C                         | 75±3Ω                 |
| ALEV GECİKTİRİCİLİK TESTİ<br>FLAME RETARDANT TEST | DUMAN YOĞUNLUĞU TESTİ<br>SMOKE DENSITY TEST | KOROZİF GAZ TESTİ<br>TEST ON CORROSIVENESS<br>OF COMBUSTION GASES | HALOJENSİZLİK TESTİ<br>HALOGEN FREE TEST | ALEV YAYILIMI TESTİ<br>FLAME PROPAGATION TEST |                                    |                                        |                       |
| IEC 60332-1-2                                     | IEC 61034-2                                 | IEC 60754-2                                                       | IEC 60754-1                              | IEC 60332-3-25                                |                                    |                                        |                       |

## ELEKTRİKSEL ÖZELLİKLER ELECTRICAL CHARACTERISTICS



## ZAYIFLAMALAR (20°C) ATTENUATIONS (20°C)

| MHz     | 5   | 200 | 400 | 800  | 1000 | 2150 | 2400 | 3000 |
|---------|-----|-----|-----|------|------|------|------|------|
| dB/100m | 1,8 | 6,7 | 9,5 | 13,5 | 15,3 | 23   | 25,6 | 29,9 |

# RG 6/U-6 Cu/Cu TRISHIELD HFFR



Class  
**A+**



## KULLANIM ALANLARI

-Bina içi CATV, CCTV sistemlerinde dağıtım kablosu ve düşük zayıflama istenen uydu sistemlerinde bağlantı kablosu olarak kullanılır.  
-Yapısı itibarıyla alev geciktirici özelliğe sahip bu kablolar insanların yoğun olduğu (alışveriş merkezleri, oteller vb.) ortamlarda, yangın esnasında ortaya çıkan duman ve korozif gazların insan sağlığını tehdit etmemesi istenilen yerlerde kullanılır.

## KABLO YAPISI

|                    |                             |
|--------------------|-----------------------------|
| 1-İletken          | 1,02mm Ø Elektrolitik Bakır |
| 2-Yalıtkan         | 4,60mm Ø Fiziksel Köpük PE  |
| 3-1.Ekran          | Cu-Pes Bant (100% Kapama)   |
| 4-2.Ekran          | Elektrolitik Bakır Örgü     |
| 5-3.Ekran          | Cu-Pes Bant (100% Kapama)   |
| 6-Kılıf            | 7mm Ø HFFR Kompaund Gri     |
| 7-Toplam Ağırlık   | 55kg/km                     |
| 8-Standart Uzunluk | 100/500/1000/2000m          |

## APPLICATION

-It is used as a distribution cable for indoor CATV, CCTV systems and as a connection cable for satellite systems where lower attenuation is required.  
-These cables which have flame retardant characteristics by their design are used in places where people are densely populated (such as shopping centers, hotels etc.) and places in which it is required that there is no smoke and corrosive gases emitted by fire which threatens to human health.

## CONSTRUCTION

|                   |                              |
|-------------------|------------------------------|
| 1-Conductor       | 1,02mm Ø Electrolytic Copper |
| 2-Insulation      | 4,60mm Ø Physical Foam PE    |
| 3-1.Screen        | Cu-Pes Tape (100% Coverage)  |
| 4-2.Screen        | Electrolytic Copper Braid    |
| 5-3.Screen        | Cu-Pes Tape (100% Coverage)  |
| 6-Sheath          | 7mm Ø HFFR Compound Grey     |
| 7-Total Weight    | 55kg/km                      |
| 8-Standard Length | 100/500/1000/2000m           |

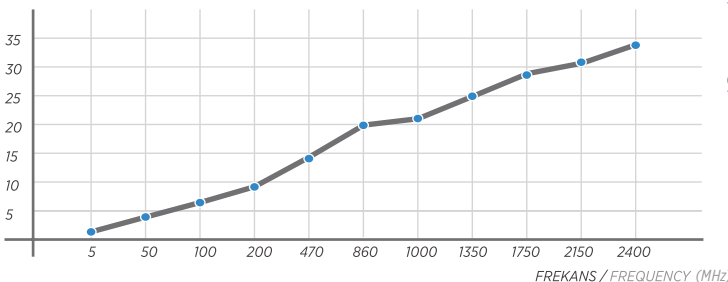
## TEKNİK ÖZELLİKLER

### TECHNICAL CHARACTERISTICS

| YALITIM DİRENCİ<br>INSULATION<br>RESISTANCE       | EFEKTİF KAPASİTE<br>MUTUAL<br>CAPACITANCE   | YAYILMA HIZI<br>VELOCITY OF<br>PROPAGATION                        | ÇALIŞMA VOLTAJI<br>OPERATING<br>VOLTAGE  | TEST VOLTAJI<br>TEST VOLTAGE                  | BÜKÜLM YARICAPI<br>BENDING RADIUS | ÇALIŞMA SICAKLIĞI<br>TEMPERATURE RANGE | EMPEDANS<br>IMPEDANCE |
|---------------------------------------------------|---------------------------------------------|-------------------------------------------------------------------|------------------------------------------|-----------------------------------------------|-----------------------------------|----------------------------------------|-----------------------|
| >2000MΩxkm                                        | 53±2pF/m                                    | 82%                                                               | 1,3kV                                    | 3kV                                           | 20x Cable Ø                       | - 40°C - +70°C                         | 75±3Ω                 |
| ALEV GECİKTİRİCİLİK TESTİ<br>FLAME RETARDANT TEST | DUMAN YOĞUNLUĞU TESTİ<br>SMOKE DENSITY TEST | KOROZİF GAZ TESTİ<br>TEST ON CORROSIVENESS<br>OF COMBUSTION GASES | HALOJENSİZLİK TESTİ<br>HALOGEN FREE TEST | ALEV YAYILIMI TESTİ<br>FLAME PROPAGATION TEST |                                   |                                        |                       |
| IEC 60332-1-2                                     | IEC 61034-2                                 | IEC 60754-2                                                       | IEC 60754-1                              | IEC 60332-3-25                                |                                   |                                        |                       |

## ELEKTRİKSEL ÖZELLİKLER ELECTRICAL CHARACTERISTICS

ZAYIFLAMALAR / ATTENUATIONS (dB)



## ZAYIFLAMALAR (20°C) ATTENUATIONS (20°C)

MHz

5 200 400 800 1000 2150 2400 3000

dB/100m

2,8 9,3 13,7 19,1 22 32,5 35,1 39,3

# RG 11/U-4 Cu/CuSn



## KULLANIM ALANLARI

-Bina içi CATV, CCTV sistemlerinde dağıtım kablosu ve düşük zayıflama istenen uydu sistemlerinde bağlantı kablosu olarak kullanılır.  
-PE kılıf, harici ve yer altı şebekelerinde kullanılır.

## APPLICATION

-It is used as a distribution cable for indoor CATV, CCTV systems and as a connection cable for satellite systems where lower attenuation is required.  
-PE sheath is used as a connection cable in outdoor and underground networks.

## KABLO YAPISI

|                    |                                      |
|--------------------|--------------------------------------|
| 1-İletken          | 1,63mm Ø Elektrolitik Bakır          |
| 2-Yalıtkan         | 7,20mm Ø Fiziksel Köpük PE           |
| 3-1.Ekran          | Al-Pes Bant (100% Kapama)            |
| 4-2.Ekran          | Kalaylı Bakır Örgü                   |
| 5-Kılıf            | 10,30mm Ø PVC Kompaund Siyah/Kırmızı |
| 6-Toplam Ağırlık   | PVC 97kg/km                          |
| 7-Standart Uzunluk | 100/500/1000/2000m                   |

## CONSTRUCTION

|                   |                                  |
|-------------------|----------------------------------|
| 1-Conductor       | 1,63mm Ø Electrolytic Copper     |
| 2-Insulation      | 7,20mm Ø Physical Foam PE        |
| 3-1.Screen        | Al-Pes Tape (100% Coverage)      |
| 4-2.Screen        | Tinned Copper Braid              |
| 5-Sheath          | 10,30mm Ø PVC Compound Black/Red |
| 6- Total Weight   | PVC 97kg/km                      |
| 7-Standard Length | 100/500/1000/2000m               |

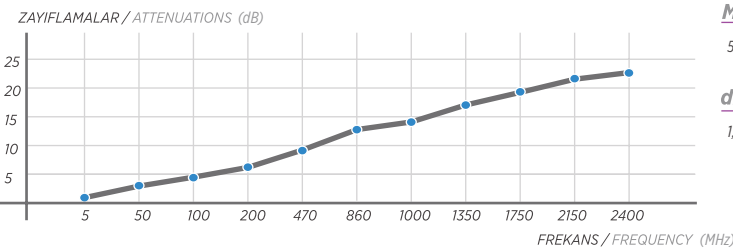
## TEKNİK ÖZELLİKLER

### TECHNICAL CHARACTERISTICS

| YALITIM DİRENCİ<br>INSULATION<br>RESISTANCE | EFEKTİF KAPASİTE<br>MUTUAL<br>CAPACITANCE | YAYILMA HIZI<br>VELOCITY OF<br>PROPAGATION | ÇALIŞMA VOLTAJİ<br>OPERATING<br>VOLTAGE | TEST VOLTAJİ<br>TEST VOLTAGE | BÜKÜLME YARIÇAPI<br>BENDING RADIUS | ÇALIŞMA SICAKLIĞI<br>TEMPERATURE RANGE | EMPEDANS<br>IMPEDANCE | ALEV GECİKTİRİCİLİK TESTİ<br>FLAME RETARDANT TEST |
|---------------------------------------------|-------------------------------------------|--------------------------------------------|-----------------------------------------|------------------------------|------------------------------------|----------------------------------------|-----------------------|---------------------------------------------------|
| >2000MΩxkm                                  | 53±2pF/m                                  | 82%                                        | 2kV                                     | 5kV                          | 20x Cable Ø                        | - 40°C - +70°C                         | 75±3Ω                 | IEC 60332-1-2<br>DIN EN 60332-1-2<br>EN 60332-1-2 |

## ELEKTRİKSEL ÖZELLİKLER

### ELECTRICAL CHARACTERISTICS



## ZAYIFLAMALAR (20°C)

### ATTENUATIONS (20°C)

MHz

5 200 400 800 1000 2150 2400 3000

dB/100m

1,8 6,7 9,5 13,5 15,3 23 25,6 29,9

## NOTLAR

Bina dışı uygulamalar için PE kılıflı versiyonu mevcuttur.  
Alev geciktiricilik testi; PVC kılıflı kablolar için uygulanmaktadır.

\*:PVC kılıflı kablolar için.

## NOTES

PE sheath is available for outdoor application.  
Flame retardant test is applied for PVC sheathed cables.

\*:For PVC sheathed cables.

# RG 11/U-4 Cu/CuSn HFFR



## KULLANIM ALANLARI

-Bina içi CATV, CCTV sistemlerinde dağıtım kablosu ve düşük zayıflama istenen uydü sistemlerinde bağlantı kablosu olarak kullanılır.  
-Yapısı itibarıyla alev geciktirici özelliğe sahip bu kablolar insanların yoğun olduğu (alışveriş merkezleri, oteller vb.) ortamlarda, yangın esnasında ortaya çıkan duman ve korozyif gazların insan sağlığını tehdit etmemesi istenilen yerlerde kullanılır.

## KABLO YAPISI

|                    |                                         |
|--------------------|-----------------------------------------|
| 1-İletken          | 1,63mm Ø Elektrolitik Bakır             |
| 2-Yalıtkan         | 7,20mm Ø Fiziksel Köpük PE              |
| 3-1.Ekran          | Al-Pes Bant (100% Kapama)               |
| 4-2.Ekran          | Kalaylı Bakır Örgü                      |
| 5-Kılıf            | 10,30mm Ø HFFR Kompaund Siyah ya da Gri |
| 6-Toplam Ağırlık   | 101kg/km                                |
| 7-Standart Uzunluk | 100/500/1000/2000m                      |

## APPLICATION

-It is used as a distribution cable for indoor CATV, CCTV systems and as a connection cable for satellite systems where lower attenuation is required.  
-These cables which have flame retardant characteristics by their design are used in places where people are densely populated (such as shopping centers, hotels etc.) and places in which it is required that there is no smoke and corrosive gases emitted by fire which threatens to human health.

## CONSTRUCTION

|                   |                                       |
|-------------------|---------------------------------------|
| 1-Conductor       | 1,63mm Ø Electrolytic Copper          |
| 2-Insulation      | 7,20mm Ø Physical Foam PE             |
| 3-1.Screen        | Al-Pes Tape (100% Coverage)           |
| 4-2.Screen        | Tinned Copper Braid                   |
| 5-Sheath          | 10,30mm Ø HFFR Compound Black or Grey |
| 6-Total Weight    | 101kg/km                              |
| 7-Standard Length | 100/500/1000/2000m                    |

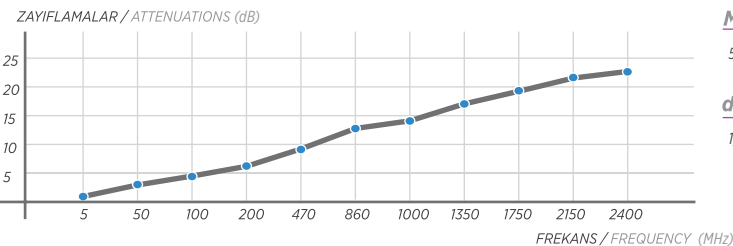
## TEKNİK ÖZELLİKLER

### TECHNICAL CHARACTERISTICS

| YALITIM DİRENCİ<br>INSULATION<br>RESISTANCE       | EFEKTİF KAPASİTE<br>MUTUAL<br>CAPACITANCE   | YAYILMA HIZI<br>VELOCITY OF<br>PROPAGATION                         | ÇALIŞMA VOLTAJI<br>OPERATING<br>VOLTAGE  | TEST VOLTAJI<br>TEST VOLTAGE                  | BÜKÜLME YARIÇAP<br>BENDING RADIUS | ÇALIŞMA SICAKLIĞI<br>TEMPERATURE RANGE | EMPEDANS<br>IMPEDANCE |
|---------------------------------------------------|---------------------------------------------|--------------------------------------------------------------------|------------------------------------------|-----------------------------------------------|-----------------------------------|----------------------------------------|-----------------------|
| >2000MΩxkm                                        | 53±2pF/m                                    | 82%                                                                | 2kV                                      | 5kV                                           | 20x Cable Ø                       | -40°C - +70°C                          | 75±3Ω                 |
| ALEV GECİKTİRİCİLİK TESTİ<br>FLAME RETARDANT TEST | DUMAN YOĞUNLUĞU TESTİ<br>SMOKE DENSITY TEST | KOROZYİF GAZ TESTİ<br>TEST ON CORROSIVENESS<br>OF COMBUSTION GASES | HALOJENSİZLİK TESTİ<br>HALOGEN FREE TEST | ALEV YAYILIMI TESTİ<br>FLAME PROPAGATION TEST |                                   |                                        |                       |
| IEC 60332-1-2                                     | IEC 61034-2                                 | IEC 60754-2                                                        | IEC 60754-1                              | IEC 60332-3-25                                |                                   |                                        |                       |

## ELEKTRİKSEL ÖZELLİKLER

### ELECTRICAL CHARACTERISTICS



## ZAYIFLAMALAR (20°C) ATTENUATIONS (20°C)

| MHz     | 5   | 200 | 400 | 800  | 1000 | 2150 | 2400 | 3000 |
|---------|-----|-----|-----|------|------|------|------|------|
| dB/100m | 1,8 | 6,7 | 9,5 | 13,5 | 15,3 | 23   | 25,6 | 29,9 |

# RG 11/U-4 Cu/Al



## KULLANIM ALANLARI

- Bina içi CATV, CCTV sistemlerinde dağıtım kablosu ve düşük zayıflama istenen uydu sistemlerinde bağlantı kablosu olarak kullanılır.
- PE kılıf, harici ve yer altı şebekelerinde kullanılır.

## KABLO YAPISI

|                    |                                      |
|--------------------|--------------------------------------|
| 1-İletken          | 1,63mm Ø Elektrolitik Bakır          |
| 2-Yalıtkan         | 7,20mm Ø Fiziksel Köpük PE           |
| 3-1.Ekran          | Al-Pes Bant (100% Kapama)            |
| 4-2.Ekran          | Alüminyum Örgü                       |
| 5-Kılıf            | 10,30mm Ø PVC Kompaund Siyah/Kırmızı |
| 6-Toplam Ağırlık   | PVC 94kg/km                          |
| 7-Standart Uzunluk | 100/500/1000/2000m                   |

## APPLICATION

- It is used as a distribution cable for indoor CATV, CCTV systems and as a connection cable for satellite systems where lower attenuation is required.
- PE sheath is used as a connection cable in outdoor and underground networks.

## CONSTRUCTION

|                   |                                  |
|-------------------|----------------------------------|
| 1-Conductor       | 1,63mm Ø Electrolytic Copper     |
| 2-Insulation      | 7,20mm Ø Physical Foam PE        |
| 3-1.Screen        | Al-Pes Tape (100% Coverage)      |
| 4-2.Screen        | Aluminium Braid                  |
| 5-Sheath          | 10,30mm Ø PVC Compound Black/Red |
| 6-Total Weight    | PVC 94kg/km                      |
| 7-Standard Length | 100/500/1000/2000m               |

## TEKNİK ÖZELLİKLER

### TECHNICAL CHARACTERISTICS

| YALITIM DİRENCİ<br>INSULATION<br>RESISTANCE | EFEKTİF KAPASİTE<br>MUTUAL<br>CAPACITANCE | YAYILMA HIZI<br>VELOCITY OF<br>PROPAGATION | ÇALIŞMA VOLTAJİ<br>OPERATING<br>VOLTAGE | TEST VOLTAJİ<br>TEST VOLTAGE | BÜKÜLME YARIÇAPI<br>BENDING RADIUS | ÇALIŞMA SICAKLIĞI<br>TEMPERATURE RANGE | EMPEDANS<br>IMPEDANCE | ALEV GECİKTİRİCİLİK TESTİ<br>FLAME RETARDANT TEST |
|---------------------------------------------|-------------------------------------------|--------------------------------------------|-----------------------------------------|------------------------------|------------------------------------|----------------------------------------|-----------------------|---------------------------------------------------|
| >2000MΩxkm                                  | 53±2pF/m                                  | 82%                                        | 2kV                                     | 5kV                          | 20x Cable Ø                        | - 40°C - +70°C                         | 75±3Ω                 | IEC 60332-1-2<br>DIN EN 60332-1-2<br>EN 60332-1-2 |

## ELEKTRİKSEL ÖZELLİKLER

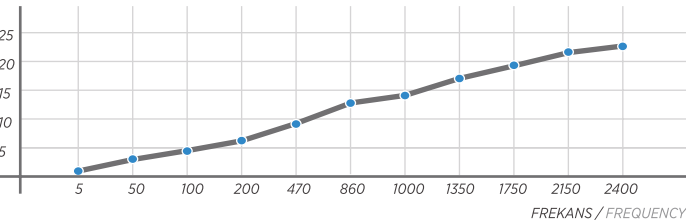
### ELECTRICAL CHARACTERISTICS

## ZAYIFLAMALAR (20°C)

### ATTENUATIONS (20°C)

ZAYIFLAMALAR / ATTENUATIONS (dB)

MHz



|     |     |     |      |      |      |      |      |
|-----|-----|-----|------|------|------|------|------|
| 5   | 200 | 400 | 800  | 1000 | 2150 | 2400 | 3000 |
| 1,8 | 6,7 | 9,5 | 13,5 | 15,3 | 23   | 25,6 | 29,9 |

## NOTLAR

Bina dışı uygulamalar için PE kılıflı versiyonu mevcuttur.  
Alev geciktiricilik testi; PVC kılıflı kablolar için uygulanmaktadır.

\*:PVC kılıflı kablolar için.

## NOTES

PE sheath is available for outdoor application.  
Flame retardant test is applied for PVC sheathed cables.

\*:For PVC sheathed cables.

# RG 11/U-6 Cu/Cu



## KULLANIM ALANLARI

- Bina içi CATV, CCTV sistemlerinde dağıtım kablosu ve düşük zayıflama istenen uydu sistemlerinde bağlantı kablosu olarak kullanılır.
- PE kılıf, harici ve yer altı şebekelerinde kullanılır.

## KABLO YAPISI

|                    |                                    |
|--------------------|------------------------------------|
| 1-İletken          | 1,63mm Ø Elektrolitik Bakır        |
| 2-Yalıtkan         | 7,20mm Ø Fiziksel Köpük PE         |
| 3-1.Ekran          | Cu-Pes Bant (100% Kapama)          |
| 4-2.Ekran          | Elektrolitik Bakır Örgü            |
| 5-Kılıf            | 10,30mm Ø PVC Kompaund Siyah/Yeşil |
| 6-Toplam Ağırlık   | PVC 100kg/km                       |
| 7-Standart Uzunluk | 100/500/1000/2000m                 |

## APPLICATION

- It is used as a distribution cable for indoor CATV, CCTV systems and as a connection cable for satellite systems where lower attenuation is required.
- PE sheath is used as a connection cable in outdoor and underground networks.

## CONSTRUCTION

|                   |                                    |
|-------------------|------------------------------------|
| 1-Conductor       | 1,63mm Ø Electrolytic Copper       |
| 2-Insulation      | 7,20mm Ø Physical Foam PE          |
| 3-1.Screen        | Cu-Pes Tape (100% Coverage)        |
| 4-2.Screen        | Electrolytic Copper Braid          |
| 5-Sheath          | 10,30mm Ø PVC Compound Black/Green |
| 6-Total Weight    | PVC 100kg/km                       |
| 7-Standard Length | 100/500/1000/2000m                 |

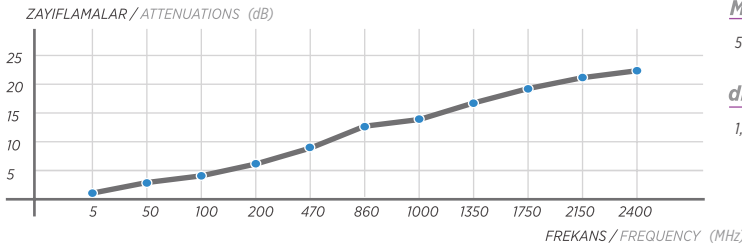
## TEKNİK ÖZELLİKLER

### TECHNICAL CHARACTERISTICS

| YALITIM DİRENCİ<br>INSULATION<br>RESISTANCE | EFEKTİF KAPASİTE<br>MUTUAL<br>CAPACITANCE | YAYILMA HIZI<br>VELOCITY OF<br>PROPAGATION | ÇALIŞMA VOLTAJI<br>OPERATING<br>VOLTAGE | TEST VOLTAJI<br>TEST VOLTAGE | BÜKÜLME YARIÇAP<br>BENDING RADIUS | ÇALIŞMA SICAKLIĞI<br>TEMPERATURE RANGE | EMPEDANS<br>IMPEDANCE | ALEV GECİKTİRİCİLİK TESTİ<br>FLAME RETARDANT TEST |
|---------------------------------------------|-------------------------------------------|--------------------------------------------|-----------------------------------------|------------------------------|-----------------------------------|----------------------------------------|-----------------------|---------------------------------------------------|
| >2000MΩxkm                                  | 53±2pF/m                                  | 82%                                        | 2kV                                     | 5kV                          | 20x Cable Ø                       | - 40°C - +70°C                         | 75±3Ω                 | IEC 60332-1-2<br>DIN EN 60332-1-2<br>EN 60332-1-2 |

## ELEKTRİKSEL ÖZELLİKLER

### ELECTRICAL CHARACTERISTICS



## ZAYIFLAMALAR (20°C)

### ATTENUATIONS (20°C)

#### MHz

5 200 400 800 1000 2150 2400 3000

#### dB/100m

1,8 6,7 9,5 13,5 15,3 23 25,6 29,9

## NOTLAR

Bina dışı uygulamalar için PE kılıflı versiyonu mevcuttur.  
Alev geciktiricilik testi; PVC kılıflı kablolar için uygulanmaktadır.

\*:PVC kılıflı kablolar için.

## NOTES

PE sheath is available for outdoor application.  
Flame retardant test is applied for PVC sheathed cables.

\*:For PVC sheathed cables.

# RG 11/U-6 Cu/Cu HFFR



Class  
**B**



## KULLANIM ALANLARI

-Bina içi CATV, CCTV sistemlerinde dağıtım kablosu ve düşük zayıflama istenen uydu sistemlerinde bağlantı kablosu olarak kullanılır.  
-Yapısı itibarıyla alev geciktirici özelliğe sahip bu kablolar insanların yoğun olduğu (alışveriş merkezleri, oteller vb.) ortamlarda, yangın esnasında ortaya çıkan duman ve korozif gazların insan sağlığını tehdit etmemesi istenilen yerlerde kullanılır.

## APPLICATION

-It is used as a distribution cable for indoor CATV, CCTV systems and as a connection cable for satellite systems where lower attenuation is required.  
-These cables which have flame retardant characteristics by their design are used in places where people are densely populated (such as shopping centers, hotels etc.) and places in which it is required that there is no smoke and corrosive gases emitted by fire which threatens human health.

## KABLO YAPISI

|                    |                                         |
|--------------------|-----------------------------------------|
| 1-İletken          | 1,63mm Ø Elektrolitik Bakır             |
| 2-Yalıtkan         | 7,20mm Ø Fiziksel Köpük PE              |
| 3-1.Ekran          | Cu-Pes Bant (100% Kapama)               |
| 4-2.Ekran          | Elektrolitik Bakır Örgü                 |
| 5-Kılıf            | 10,50mm Ø HFFR Kompaund Siyah ya da Gri |
| 6-Toplam Ağırlık   | 100kg/km                                |
| 7-Standart Uzunluk | 100/500/1000/2000m                      |

## CONSTRUCTION

|                   |                                       |
|-------------------|---------------------------------------|
| 1-Conductor       | 1,63mm Ø Electrolytic Copper          |
| 2-Insulation      | 7,20mm Ø Physical Foam PE             |
| 3-1.Screen        | Cu-Pes Tape (100% Coverage)           |
| 4-2.Screen        | Electrolytic Copper Braid             |
| 5-Sheath          | 10,50mm Ø HFFR Compound Black or Grey |
| 6-Total Weight    | 100kg/km                              |
| 7-Standard Length | 100/500/1000/2000m                    |

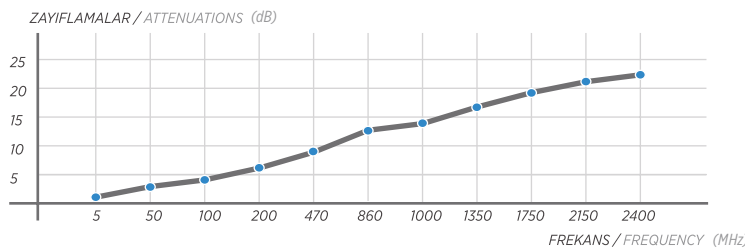
## TEKNİK ÖZELLİKLER

### TECHNICAL CHARACTERISTICS

| YALITIM DİRENCİ<br>INSULATION<br>RESISTANCE       | EFEKTİF KAPASİTE<br>MUTUAL<br>CAPACITANCE   | YAYILMA HIZI<br>VELOCITY OF<br>PROPAGATION                        | ÇALIŞMA VOLTAJI<br>OPERATING<br>VOLTAGE  | TEST VOLTAJI<br>TEST VOLTAGE                  | BÜKÜLME YARIÇAPI<br>BENDING RADIUS | ÇALIŞMA SICAKLIĞI<br>TEMPERATURE RANGE | EMPEDANS<br>IMPEDANCE |
|---------------------------------------------------|---------------------------------------------|-------------------------------------------------------------------|------------------------------------------|-----------------------------------------------|------------------------------------|----------------------------------------|-----------------------|
| >2000MΩxkm                                        | 53±2pF/m                                    | 82%                                                               | 1,kV                                     | 2,5kV                                         | 15x Cable Ø                        | - 40°C - +70°C                         | 75±3Ω                 |
| ALEV GECİKTİRİCİLİK TESTİ<br>FLAME RETARDANT TEST | DUMAN YOĞUNLUĞU TESTİ<br>SMOKE DENSITY TEST | KOROZİF GAZ TESTİ<br>TEST ON CORROSIVENESS<br>OF COMBUSTION GASES | HALOJENSİZLİK TESTİ<br>HALOGEN FREE TEST | ALEV YAYILIMI TESTİ<br>FLAME PROPAGATION TEST |                                    |                                        |                       |
| IEC 60332-1-2                                     | IEC 61034-2                                 | IEC 60754-2                                                       | IEC 60754-1                              | IEC 60332-3-25                                |                                    |                                        |                       |

## ELEKTRİKSEL ÖZELLİKLER ELECTRICAL CHARACTERISTICS

## ZAYIFLAMALAR (20°C) ATTENUATIONS (20°C)



MHz

5 200 400 800 1000 2150 2400 3000

dB/100m

1,8 6,7 9,5 13,5 15,3 23 25,6 29,9

# RG 11/U-6 Cu/Cu TRISHIELD



## KULLANIM ALANLARI

-Bina içi CATV, CCTV sistemlerinde dağıtım kablosu ve düşük zayıflama istenen uydu sistemlerinde bağlantı kablosu olarak kullanılır.  
-PE kılıf, harici ve yer altı şebekelerinde kullanılır.

## APPLICATION

-It is used as a distribution cable for indoor CATV, CCTV systems and as a connection cable for satellite systems where lower attenuation is required.  
-PE sheath is used as a connection cable in outdoor and underground networks.

## KABLO YAPISI

|                    |                              |
|--------------------|------------------------------|
| 1-İletken          | 1,63mm Ø Elektrolitik Bakır  |
| 2-Yalıtkan         | 7,20mm Ø Fiziksel Köpük PE   |
| 3-1.Ekran          | Cu-Pes Bant (100% Kapama)    |
| 4-2.Ekran          | Elektrolitik Bakır Örgü      |
| 5-3.Ekran          | Cu-Pes Bant (100% Kapama)    |
| 6-Kılıf            | 10,30mm Ø PVC Kompaund Siyah |
| 7-Toplam Ağırlık   | PVC 105kg/km                 |
| 8-Standart Uzunluk | 100/500/1000/2000m           |

## CONSTRUCTION

|                   |                              |
|-------------------|------------------------------|
| 1-Conductor       | 1,63mm Ø Electrolytic Copper |
| 2-Insulation      | 7,20mm Ø Physical Foam PE    |
| 3-1.Screen        | Cu-Pes Tape (100% Coverage)  |
| 4-2.Screen        | Electrolytic Copper Braid    |
| 5-3.Screen        | Cu-Pes Tape (100% Coverage)  |
| 6-Sheath          | 10,30mm Ø PVC Compound Black |
| 7-Total Weight    | PVC 105kg/km                 |
| 8-Standard Length | 100/500/1000/2000m           |

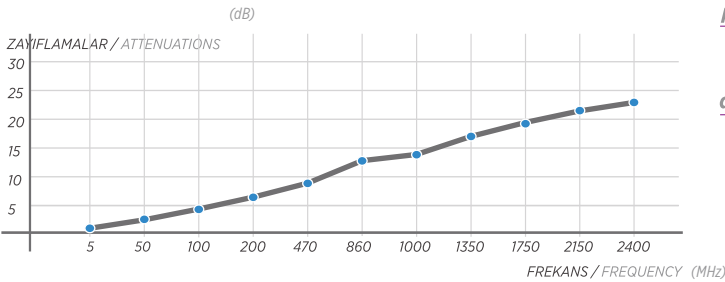
## TEKNİK ÖZELLİKLER

### TECHNICAL CHARACTERISTICS

| YALITIM DİRENCİ<br>INSULATION<br>RESISTANCE | EFEKTİF KAPASİTE<br>MUTUAL<br>CAPACITANCE | YAYILMA HIZI<br>VELOCITY OF<br>PROPAGATION | ÇALIŞMA VOLTAJI<br>OPERATING<br>VOLTAGE | TEST VOLTAJI<br>TEST VOLTAGE | BÜKÜLME YARIÇAPI<br>BENDING RADIUS | ÇALIŞMA SICAKLIĞI<br>TEMPERATURE RANGE | EMPEDANS<br>IMPEDANCE | ALEV GECİKTİRİCİLİK TESTİ<br>FLAME RETARDANT TEST |
|---------------------------------------------|-------------------------------------------|--------------------------------------------|-----------------------------------------|------------------------------|------------------------------------|----------------------------------------|-----------------------|---------------------------------------------------|
| >2000MΩxkm                                  | 53±2pF/m                                  | 82%                                        | 2kV                                     | 5kV                          | 20x Cable Ø                        | - 40°C - +70°C                         | 75±3Ω                 | IEC 60332-1-2<br>DIN EN 60332-1-2<br>EN 60332-1-2 |

## ELEKTRİKSEL ÖZELLİKLER

### ELECTRICAL CHARACTERISTICS



## ZAYIFLAMALAR (20°C)

### ATTENUATIONS (20°C)

| MHz     | 5   | 200 | 400 | 800  | 1000 | 2150 | 2400 | 3000 |
|---------|-----|-----|-----|------|------|------|------|------|
| dB/100m | 1,8 | 6,7 | 9,5 | 13,5 | 15,3 | 23   | 25,6 | 29,9 |

## NOTLAR

Bina dışı uygulamalar için PE kılıflı versiyonu mevcuttur.  
Alev geciktiricilik testi; PVC kılıflı kablolar için uygulanmaktadır.

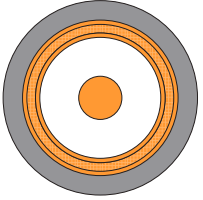
TP \*:PVC kılıflı kablolar için.

## NOTES

PE sheath is available for outdoor application.  
Flame retardant test is applied for PVC sheathed cables.

TP \*:For PVC sheathed cables.

# RG 11/U-6 Cu/Cu TRISHIELD HFFR



Class  
**A+**



## KULLANIM ALANLARI

-Bina içi CATV, CCTV sistemlerinde dağıtım kablosu ve düşük zayıflama istenen uydu sistemlerinde bağlantı kablosu olarak kullanılır.  
-Yapısı itibarıyla alev geciktirici özelliğe sahip bu kablolar insanların yoğun olduğu (alışveriş merkezleri, oteller vb.) ortamlarda, yangın esnasında ortaya çıkan duman ve korozif gazların insan sağlığını tehdit etmemesi istenilen yerlerde kullanılır.

## KABLO YAPISI

|                    |                             |
|--------------------|-----------------------------|
| 1-İletken          | 1,63mm Ø Elektrolitik Bakır |
| 2-Yalıtkan         | 7,20mm Ø Fiziksel Köpük PE  |
| 3-1.Ekran          | Cu-Pes Bant (100% Kapama)   |
| 4-2.Ekran          | Elektrolitik Bakır Örgü     |
| 5-3.Ekran          | Cu-Pes Bant (100% Kapama)   |
| 6-Kılıf            | 10,30mm Ø HFFR Kompaund Gri |
| 7-Toplam Ağırlık   | 105kg/km                    |
| 8-Standart Uzunluk | 100/500/1000/2000m          |

## APPLICATION

-It is used as a distribution cable for indoor CATV, CCTV systems and as a connection cable for satellite systems where lower attenuation is required.  
-These cables which have flame retardant characteristics by their design are used in places where people are densely populated (such as shopping centers, hotels etc.) and places in which it is required that there is no smoke and corrosive gases emitted by fire which threatens human health.

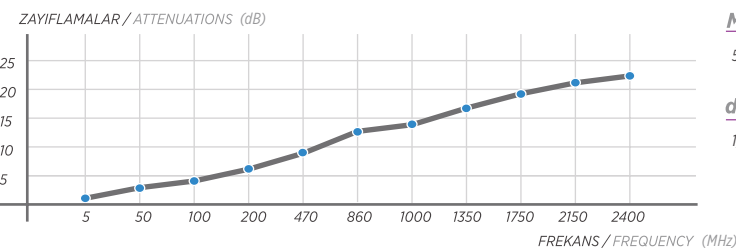
## CONSTRUCTION

|                   |                              |
|-------------------|------------------------------|
| 1-Conductor       | 1,63mm Ø Electrolytic Copper |
| 2-Insulation      | 7,20mm Ø Physical Foam PE    |
| 3-1.Screen        | Cu-Pes Tape (100% Coverage)  |
| 4-2.Screen        | Electrolytic Copper Braid    |
| 5-3.Screen        | Cu-Pes Tape (100% Coverage)  |
| 6-Sheath          | 10,30mm Ø HFFR Compound Grey |
| 7-Total Weight    | 105kg/km                     |
| 8-Standard Length | 100/500/1000/2000m           |

## TEKNİK ÖZELLİKLER TECHNICAL CHARACTERISTICS

| YALITIM DİRENCİ<br>INSULATION<br>RESISTANCE       | EFEKTİF KAPASİTE<br>MUTUAL<br>CAPACITANCE   | YAYILMA HIZI<br>VELOCITY OF<br>PROPAGATION                        | ÇALIŞMA VOLTAJI<br>OPERATING<br>VOLTAGE  | TEST VOLTAJI<br>TEST VOLTAGE                  | BÜKÜLM YARIÇAPI<br>BENDING RADIUS | ÇALIŞMA SICAKLIĞI<br>TEMPERATURE RANGE | EMPEDANS<br>IMPEDANCE |
|---------------------------------------------------|---------------------------------------------|-------------------------------------------------------------------|------------------------------------------|-----------------------------------------------|-----------------------------------|----------------------------------------|-----------------------|
| >2000MΩxkm                                        | 53±2pF/m                                    | 82%                                                               | 2kV                                      | 5kV                                           | 20x Cable Ø                       | -40°C - +70°C                          | 75±3Ω                 |
| ALEV GECİKTİRİCİLİK TESTİ<br>FLAME RETARDANT TEST | DUMAN YOĞUNLUĞU TESTİ<br>SMOKE DENSITY TEST | KOROZİF GAZ TESTİ<br>TEST ON CORROSIVENESS<br>OF COMBUSTION GASES | HALOJENSİZLİK TESTİ<br>HALOGEN FREE TEST | ALEV YAYILIMI TESTİ<br>FLAME PROPAGATION TEST |                                   |                                        |                       |
| IEC 60332-1-2                                     | IEC 61034-2                                 | IEC 60754-2                                                       | IEC 60754-1                              | IEC 60332-3-25                                |                                   |                                        |                       |

## ELEKTRİKSEL ÖZELLİKLER ELECTRICAL CHARACTERISTICS



## ZAYIFLAMALAR (20°C) ATTENUATIONS (20°C)

| MHz     | 5   | 200 | 400 | 800  | 1000 | 2150 | 2400 | 3000 |
|---------|-----|-----|-----|------|------|------|------|------|
| dB/100m | 1,8 | 6,7 | 9,5 | 13,5 | 15,3 | 23   | 25,6 | 29,9 |

# COAXIAL MINI/U-6 Cu/Cu



## KULLANIM ALANLARI

-Bina içi CATV, CCTV sistemlerinde dağıtım kablosu ve düşük zayıflama istenen uydu sistemlerinde bağlantı kablosu olarak kullanılır.

## APPLICATION

-It is used as a distribution cable for indoor CATV, CCTV systems and as a connection cable for satellite systems where lower attenuation is required.

## KABLO YAPISI

|                    |                              |
|--------------------|------------------------------|
| 1-İletken          | 0,65mm Ø Elektrolitik Bakır  |
| 2-Yalıtkan         | 2,90mm Ø Fiziksel Köpük PE   |
| 3-1.Ekran          | Cu-Pes Bant (100% Kapama)    |
| 4-2.Ekran          | Elektrolitik Bakır Örgü      |
| 5-Kılıf            | 4,40mm Ø PVC Kompaund, Yeşil |
| 6-Toplam Ağırlık   | PVC 30kg/km                  |
| 7-Standart Uzunluk | 100/500/1000/2000m           |

## CONSTRUCTION

|                   |                              |
|-------------------|------------------------------|
| 1-Conductor       | 0,65mm Ø Electrolytic Copper |
| 2-Insulation      | 2,90mm Ø Physical Foam PE    |
| 3-1.Screen        | Cu-Pes Tape (100% Coverage)  |
| 4-2.Screen        | Electrolytic Copper Braid    |
| 5-Sheath          | 4,40mm Ø PVC Compound, Green |
| 6-Total Weight    | PVC 30kg/km                  |
| 7-Standard Length | 100/500/1000/2000m           |

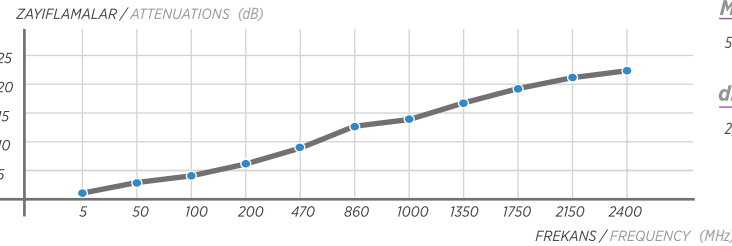
## TEKNİK ÖZELLİKLER

### TECHNICAL CHARACTERISTICS

| YALITIM DİRENCİ<br>INSULATION<br>RESISTANCE | EFEKTİF KAPASİTE<br>MUTUAL<br>CAPACITANCE | YAYILMA HIZI<br>VELOCITY OF<br>PROPAGATION | ÇALIŞMA VOLTAJI<br>OPERATING<br>VOLTAGE | TEST VOLTAJI<br>TEST VOLTAGE | BÜKÜLME YARIÇAP<br>BENDING RADIUS | ÇALIŞMA SICAKLIĞI<br>TEMPERATURE RANGE | EMPEDANS<br>IMPEDANCE | ALEV GECİKTİRİCİLİK TESTİ<br>FLAME RETARDANT TEST |
|---------------------------------------------|-------------------------------------------|--------------------------------------------|-----------------------------------------|------------------------------|-----------------------------------|----------------------------------------|-----------------------|---------------------------------------------------|
| >2000MΩxkm                                  | 53±2pF/m                                  | 82%                                        | 1kV                                     | 2500 V                       | 20xCableØ                         | - 40°C - +70°C                         | 75±3Ω                 | IEC 60332-1-2<br>DIN EN 60332-1-2<br>EN 60332-1-2 |

## ELEKTRİKSEL ÖZELLİKLER

### ELECTRICAL CHARACTERISTICS



## ZAYIFLAMALAR (20°C)

### ATTENUATIONS (20°C)

MHz

5 200 400 800 1000 2150 2400 3000

dB/100m

2,88 14 19,3 29 31,46 48,1 52 57,65

# COAXIAL MINI/U-6 Cu/Cu HFFR



## KULLANIM ALANLARI

-Bina içi CATV, CCTV sistemlerinde dağıtım kablosu ve düşük zayıflama istenen uydu sistemlerinde bağlantı kablosu olarak kullanılır.

-Yapısı itibarıyla alev geciktirici özelliğe sahip bu kablolar insanların yoğun olduğu (alışveriş merkezleri, oteller vb.) ortamlarda, yangın esnasında ortaya çıkan duman ve korozif gazların insan sağlığını tehdit etmemesi istenilen yerlerde kullanılır.

## KABLO YAPISI

|                    |                               |
|--------------------|-------------------------------|
| 1-İletken          | 0,65mm Ø Elektrolitik Bakır   |
| 2-Yalıtkan         | 2,90mm Ø Fiziksel Köpük PE    |
| 3-1.Ekran          | Cu-Pes Bant (100% Kapama)     |
| 4-2.Ekran          | Elektrolitik Bakır Örgü       |
| 5-Kılıf            | 4,40mm Ø HFFR Kompaund, Yeşil |
| 6-Toplam Ağırlık   | 30kg/km                       |
| 7-Standart Uzunluk | 100/500/1000/2000m            |

## APPLICATION

-It is used as a distribution cable for indoor CATV, CCTV systems and as a connection cable for satellite systems where lower attenuation is required.

-These cables which have flame retardant characteristics by their design are used in places where people are densely populated (such as shopping centers, hotels etc.) and places in which it is required that there is no smoke and corrosive gases emitted by fire which threatens to human health.

## CONSTRUCTION

|                   |                               |
|-------------------|-------------------------------|
| 1-Conductor       | 0,65mm Ø Electrolytic Copper  |
| 2-Insulation      | 2,90mm Ø Physical Foam PE     |
| 3-1.Screen        | Cu-Pes Tape (100% Coverage)   |
| 4-2.Screen        | Electrolytic Copper Braid     |
| 5-Sheath          | 4,40mm Ø HFFR Compound, Green |
| 6-Total Weight    | 30kg/km                       |
| 7-Standard Length | 100/500/1000/2000m            |

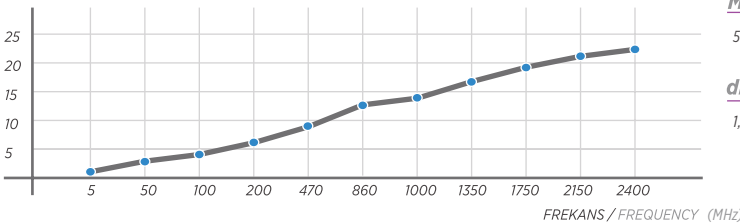
## TEKNİK ÖZELLİKLER

### TECHNICAL CHARACTERISTICS

| YALITIM DİRENCİ<br>INSULATION<br>RESISTANCE    | EFEKTİF KAPASİTE<br>MUTUAL<br>CAPACITANCE                         | YAYILMA HIZI<br>VELOCITY OF<br>PROPAGATION | ÇALIŞMA VOLTAJI<br>OPERATING<br>VOLTAGE          | TEST VOLTAJI<br>TEST VOLTAGE | BÜKÜLME YARIÇAPI<br>BENDING RADIUS | ÇALIŞMA SICAKLIĞI<br>TEMPERATURE RANGE | EMPEDANS<br>IMPEDANCE | ALEV GECİKTİRİCİLİK TESTİ<br>FLAME RETARDANT TEST |
|------------------------------------------------|-------------------------------------------------------------------|--------------------------------------------|--------------------------------------------------|------------------------------|------------------------------------|----------------------------------------|-----------------------|---------------------------------------------------|
| >2000MΩxkm                                     | 53±2pF/m                                                          | 82%                                        | 1kV                                              | 2500 V                       | 20x Cable Ø                        | - 40°C - +70°C                         | 75±3Ω                 | IEC 60332-1-2                                     |
| DUMAN<br>YOĞUNLUĞU TESTİ<br>SMOKE DENSITY TEST | KOROZİF GAZ TESTİ<br>TEST ON CORROSIVENESS<br>OF COMBUSTION GASES | HALOJENSİZLİK TESTİ<br>HALOGEN FREE TEST   | ALEV YAYILIMI TESTİ<br>FLAME PROPAGATION<br>TEST |                              |                                    |                                        |                       |                                                   |
| IEC 61034-2                                    | IEC 60754-2                                                       | IEC 60754-1                                | IEC 60332-3-25                                   |                              |                                    |                                        |                       |                                                   |

## ELEKTRİKSEL ÖZELLİKLER ELECTRICAL CHARACTERISTICS

ZAYIFLAMALAR / ATTENUATIONS (dB)



## ZAYIFLAMALAR (20°C) ATTENUATIONS (20°C)

MHz

5 200 400 800 1000 2150 2400 3000

dB/100m

1,8 6,7 9,5 13,5 15,3 23 25,6 29,9

## CCTV AI HFFR



## KULLANIM ALANLARI

- Kapalı devre tv ve kamera sistemlerinde kısa mesafeli video, ses ve sinyal iletiminde kullanılırlar.
- Bu tür kompozit kablolar kullanım amaçlarına göre farklı kesitlerde üretilmektedir.
- Yapısı itibarıyla alev geciktirici özelliğe sahip bu kablolar insanların yoğun olduğu (alışveriş merkezleri, oteller vb.) ortamlarda, yangın esnasında ortaya çıkan duman ve korozif gazların insan sağlığını tehdit etmemesi istenilen yerlerde kullanılır.

## KABLO YAPISI

- 1 -İletkenler**
- Koaksiyel 7x0,20mm Ø Bükülü Elektrolitik Bakır
  - Sinyal Damarları 0,22mm<sup>2</sup> Bükülü Elektrolitik Bakır
  - Kontrol Damarları 0,50mm<sup>2</sup> Bükülü Elektrolitik Bakır
- 2 -Yalıtkanlar**
- Koaksiyel 2,50mm Ø Solid PE
  - Sinyal Damarları Solid PE ya da HFFR Kompaund
  - Kontrol Damarları HFFR Kompaund
- 3 -Koaksiyel Ekran** Al-Pes Bant + Alüminyum Örgü
- 4 -Genel Ekran** Al-Pes Bant (100% Kapama)
- 5 -Kılıf** HFFR Kompaund
- 6 -Kılıf Rengi** RAL 7001 Gri

## APPLICATION

- They are used in closed-circuit tv and camera systems, video, sound and signal transmission in short range.
- These composite cables are produced in different sections according to their respective applications.
- These cables which have flame retardant characteristics by their design are used in places where people are densely populated (such as shopping centers, hotels etc.) and places in which it is required that there is no smoke and corrosive gases emitted by fire which threatens to human health .

## CONSTRUCTION

- 1 -Conductors**
- Coaxial 7x0,20mm Ø Stranded Electrolytic Copper
  - Signal Cores 0,22mm<sup>2</sup> Stranded Electrolytic Copper
  - Control Cores 0,50mm<sup>2</sup> Stranded Electrolytic Copper
- 2 -Insulations**
- Coaxial 2,50mm Ø Solid PE
  - Signal Cores Solid PE or HFFR Compound
  - Control Cores HFFR Compound
- 3 -Coax Screen** Al-Pes Tape + Aluminium Braid
- 4 -Overall Screen** Al-Pes Tape (100% Coverage)
- 5 -Sheath** HFFR Compound
- 6 -Sheath Colour** RAL 7001 Grey

## TEKNİK ÖZELLİKLER

## TECHNICAL CHARACTERISTICS

| İLETKEN DİRENCİ<br>CONDUCTOR<br>RESISTANCE                   | EFEKTİF KAPASİTE<br>MUTUAL<br>CAPACITANCE                         | EMPEDANS<br>IMPEDANCE                    | ÇALIŞMA VOLTAJI<br>OPERATING<br>VOLTAGE     | TEST VOLTAJI<br>TEST VOLTAGE | BÜKÜLME YARIÇAPI<br>BENDING RADIUS | ÇALIŞMA SICAKLIĞI<br>TEMPERATURE RANGE | ALEV YAYILIMI TESTİ<br>FLAME PROPAGATION TEST |
|--------------------------------------------------------------|-------------------------------------------------------------------|------------------------------------------|---------------------------------------------|------------------------------|------------------------------------|----------------------------------------|-----------------------------------------------|
| 0.22mm <sup>2</sup> = 79Ω/km<br>0.50mm <sup>2</sup> = 39Ω/km | 67pF/m                                                            | 75±3Ω                                    | 250V                                        | 1200V                        | 10x Cable Ø                        | - 30°C - +70°C                         | IEC 60332-1-2                                 |
| ALEV GECİKTİRİCİLİK TESTİ<br>FLAME RETARDANT TEST            | KOROZİF GAZ TESTİ<br>TEST ON CORROSIVENESS<br>OF COMBUSTION GASES | HALOJENSİZLİK TESTİ<br>HALOGEN FREE TEST | DUMAN YOĞUNLUĞU TESTİ<br>SMOKE DENSITY TEST |                              |                                    |                                        |                                               |
| IEC 60332-1-2                                                | IEC 60754-2                                                       | IEC 60754-1                              | IEC 61034-2                                 |                              |                                    |                                        |                                               |

| KOD NO<br>CODE NR. | DAMAR SAYISI VE KESİTİ (mm <sup>2</sup> )<br>NUMBER OF CORE AND CROSS SECTION<br>(mm <sup>2</sup> ) | KABLO ÇAPI (mm)<br>OVERALL DIAMETER<br>(mm) | Bakır AĞIRLIĞI (kg/km)<br>COPPER WEIGHT<br>(kg/km) | YAKLAŞIK KABLO AĞIRLIĞI (kg/km)<br>APPROX. CABLE WEIGHT<br>(kg/km) | STANDART<br>UZUNLUK (m)<br>STANDARD LENGTH (m) |
|--------------------|-----------------------------------------------------------------------------------------------------|---------------------------------------------|----------------------------------------------------|--------------------------------------------------------------------|------------------------------------------------|
| 317001117          | MINI COAX + (2 x 0,50 + 1 x 0,22)mm <sup>2</sup>                                                    | 6,00                                        | 24                                                 | 55                                                                 | 100/500/1000                                   |
| 317001119          | MINI COAX + (2 x 0,50 + 2 x 0,22)mm <sup>2</sup>                                                    | 6,00                                        | 26                                                 | 57                                                                 | 100/500/1000                                   |
| 317001120          | MINI COAX + (2 x 0,50 + 3 x 0,22)mm <sup>2</sup>                                                    | 6,00                                        | 28                                                 | 58                                                                 | 100/500/1000                                   |
| 317001121          | MINI COAX + (2 x 0,50 + 4 x 0,22)mm <sup>2</sup>                                                    | 6,00                                        | 30                                                 | 60                                                                 | 100/500/1000                                   |
| 317001131          | MINI COAX + (2 x 0,50 + 6 x 0,22)mm <sup>2</sup>                                                    | 6,50                                        | 34                                                 | 63                                                                 | 100/500/1000                                   |
| 317001126          | MINI COAX + 12 x 0,22mm <sup>2</sup>                                                                | 8,00                                        | 36                                                 | 85                                                                 | 100/500/1000                                   |

## CCTV AI



## KULLANIM ALANLARI

- Kapalı devre tv ve kamera sistemlerinde kısa mesafeli video, ses ve sinyal iletiminde kullanılırlar.
- Bu tür kompozit kablolar kullanım amaçlarına göre farklı kesitlerde üretilmektedir.

## APPLICATION

- They are used in closed-circuit tv and camera systems, video, sound and signal transmission in short range.
- These composite cables are produced in different sections according to their respective applications.

## KABLO YAPISI

- İletkenler**
  - Koaksiyel 7x0,20mm Ø Bükülü Elektrolitik Bakır
  - Sinyal Damarları 0,22mm<sup>2</sup> Bükülü Elektrolitik Bakır
  - Kontrol Damarları 0,50mm<sup>2</sup> Bükülü Elektrolitik Bakır
- Yalıtkanlar**
  - Koaksiyel 2,50mm Ø Solid PE
  - Sinyal Damarları Solid PE ya da PVC Kompaund
  - Kontrol Damarları PVC Kompaund
- Koaksiyel Ekran** Al-Pes Bant + Alüminyum Örgü
- Genel Ekran** Al-Pes Bant (100% Kapama)
- Kılıf** PVC Kompaund
- Kılıf Rengi** RAL 7032 Gri

## CONSTRUCTION

- Conductors**
  - Coaxial 7x0,20mm Ø Stranded Electrolytic Copper
  - Signal Cores 0,22mm<sup>2</sup> Stranded Electrolytic Copper
  - Control Cores 0,50mm<sup>2</sup> Stranded Electrolytic Copper
- Insulations**
  - Coaxial 2,50mm Ø Solid PE
  - Signal Cores Solid PE or PVC Compound
  - Control Cores PVC Compound
- Coax Screen** Al-Pes Tape + Aluminium Braid
- Overall Screen** Al-Pes Tape (100% Coverage)
- Sheath** PVC Compound
- Sheath Colour** RAL 7032 Grey

## TEKNİK ÖZELLİKLER

## TECHNICAL CHARACTERISTICS

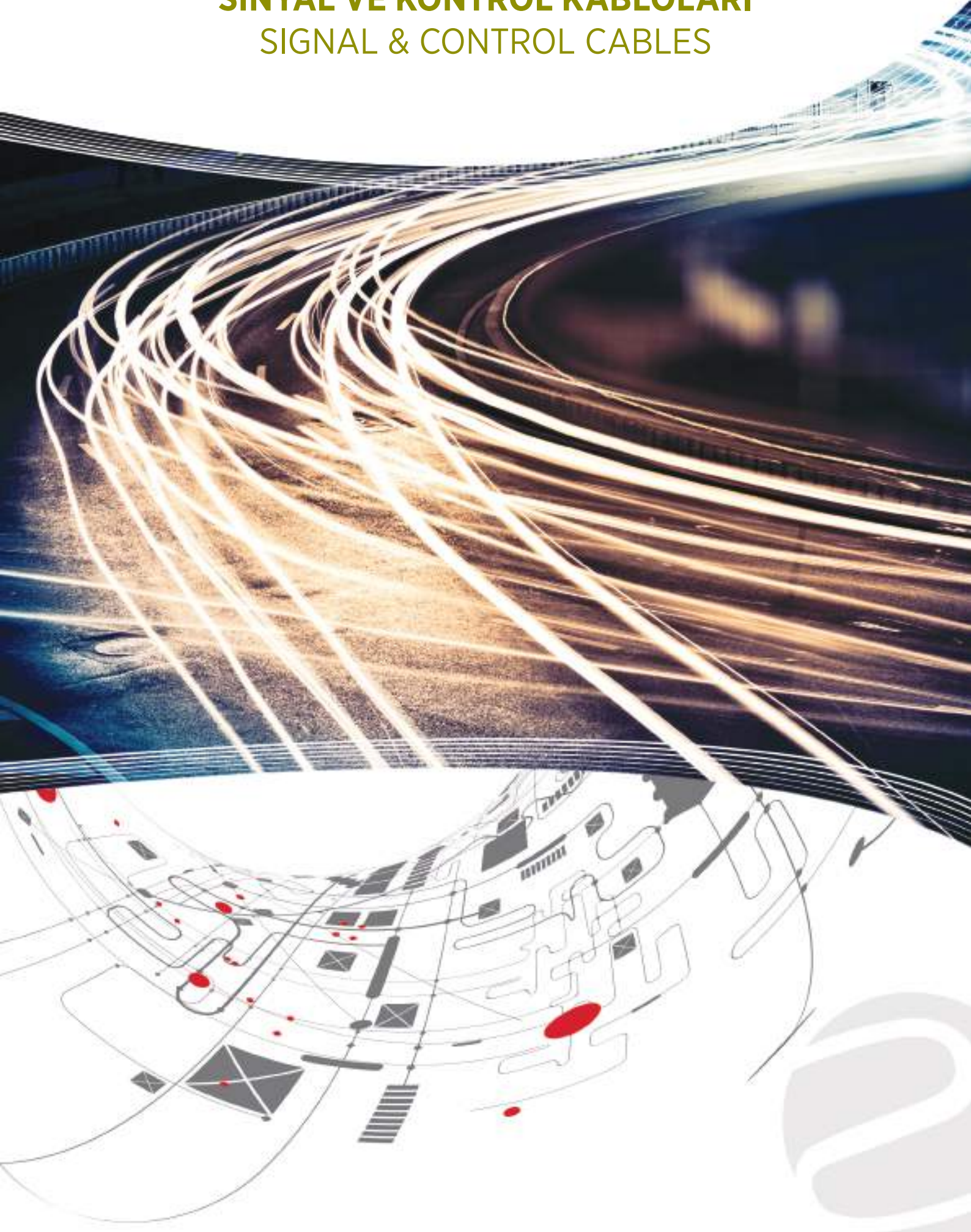
| İLETKEN DİRENCİ<br>CONDUCTOR<br>RESISTANCE                   | EFEKTİF KAPASİTE<br>MUTUAL<br>CAPACITANCE | EMPEDANS<br>IMPEDANCE | ÇALIŞMA VOLTAJİ<br>OPERATING<br>VOLTAGE | TEST VOLTAJİ<br>TEST VOLTAGE | BÜKÜLME YARIÇAPI<br>BENDING RADIUS | ÇALIŞMA SICAKLIĞI<br>TEMPERATURE RANGE | ALEV GECİKTİRİCİLİK TESTİ<br>FLAME RETARDANT TEST |
|--------------------------------------------------------------|-------------------------------------------|-----------------------|-----------------------------------------|------------------------------|------------------------------------|----------------------------------------|---------------------------------------------------|
| 0.22mm <sup>2</sup> = 79Ω/km<br>0.50mm <sup>2</sup> = 39Ω/km | 67pF/m                                    | 75±3Ω                 | 250V                                    | 1200V                        | 10x Cable Ø                        | - 30°C - +70°C                         | IEC 60332-1-2<br>DIN EN 60332-1-2<br>EN 60332-1-2 |

| KOD NO<br>CODE NR. | DAMAR SAYISI VE KESİTİ (mm <sup>2</sup> )<br>NUMBER OF CORE AND CROSS SECTION<br>(mm <sup>2</sup> ) | KABLO ÇAPI (mm)<br>OVERALL DIAMETER<br>(mm) | Bakır AĞIRLIĞI (kg/km)<br>COPPER WEIGHT<br>(kg/km) | YAKLAŞIK KABLO AĞIRLIĞI (kg/km)<br>APPROX. CABLE WEIGHT<br>(kg/km) | STANDART<br>UZUNLUK (mt)<br>STANDARD LENGTH (m) |
|--------------------|-----------------------------------------------------------------------------------------------------|---------------------------------------------|----------------------------------------------------|--------------------------------------------------------------------|-------------------------------------------------|
| 317000111          | MINI COAX + (2 x 0,50 + 1 x 0,22)mm <sup>2</sup>                                                    | 6,00                                        | 24                                                 | 55                                                                 | 100/500/1000                                    |
| 317000112          | MINI COAX + (2 x 0,50 + 2 x 0,22)mm <sup>2</sup>                                                    | 6,00                                        | 26                                                 | 57                                                                 | 100/500/1000                                    |
| 317000134          | MINI COAX + (2 x 0,50 + 3 x 0,22)mm <sup>2</sup>                                                    | 6,00                                        | 28                                                 | 58                                                                 | 100/500/1000                                    |
| 317000135          | MINI COAX + (2 x 0,50 + 4 x 0,22)mm <sup>2</sup>                                                    | 6,00                                        | 30                                                 | 60                                                                 | 100/500/1000                                    |
| 317000136          | MINI COAX + (2 x 0,50 + 6 x 0,22)mm <sup>2</sup>                                                    | 6,50                                        | 34                                                 | 63                                                                 | 100/500/1000                                    |
| 317000129          | MINI COAX + 12 x 0,22mm <sup>2</sup>                                                                | 8,00                                        | 36                                                 | 85                                                                 | 100/500/1000                                    |



# SİNYAL VE KONTROL KABLOLARI

## SIGNAL & CONTROL CABLES





|                      |    |
|----------------------|----|
| LIYY .....           | 42 |
| LIHH .....           | 45 |
| LIYY-TP .....        | 48 |
| LIHH-TP .....        | 51 |
| LIYCY .....          | 54 |
| LIHCH .....          | 57 |
| LIYCY-TP .....       | 60 |
| LIHCH-TP .....       | 63 |
| LIYCY-CY .....       | 66 |
| JE-LIYCY...Bd .....  | 67 |
| LIY(St)Y .....       | 68 |
| LIH(St)H .....       | 71 |
| LIY(St)Y-TP .....    | 74 |
| LIH(St)H-TP .....    | 77 |
| LIY(St)CY .....      | 80 |
| LI2Y(St)Y .....      | 83 |
| LI2Y(St)CY .....     | 84 |
| LI2Y(St)CH .....     | 85 |
| LIH(St)CH .....      | 86 |
| LIY(St)CY-TP .....   | 89 |
| LIH(St)CH-TP .....   | 92 |
| J-Y(St)Y...Lg .....  | 95 |
| JE-H(St)H...Bd ..... | 97 |

LIYY



ESNEK KABLO YAPISI/İNCELTİLMİŞ DIŞ ÇAP/KÜÇÜK BÜKÜLME YARIÇAPI/ALEV GECİKTİRİCİ ÖZELLİK  
FLEXIBLE CABLE DESIGN/REDUCED OUTER DIAMETER/SMALL BENDING RADIUS/FLAME RETARDANT  
CHARACTERISTIC

TSEK

EAC

RoHS  
Compliant

CE

## KULLANIM ALANLARI

- Enstrüman ve Kontrol Mühendisliğinde
- Endüstriyel Elektronikte
- Bilgisayar ve Ofis Makinelerinde
- Bina İçi Haberleşme Sistemlerinde
- Bina İçi Ses Sistemlerinde
- Güvenlik Sistemlerinde

## APPLICATION

- Instrumentation and Control Engineering
- Industrial Electronics
- Computers and Office Machines
- Indoor Communication Systems
- Indoor Sound Systems
- Security Systems

## KABLO YAPISI

- 1-İletken** IEC 60228; DIN VDE 0295; EN 60228 Sınıf 5  
Bükülü Elektrolitik Tavlı Bakır
- 2-Yalıtkan** EN 50290-2-21 PVC Kompaund
- 3-Yalıtım Renk** DIN 47100
- 4-Büküm** Uygun adımda katlar halinde
- 5-Ayırıcı Bant** Pes Bant
- 6-Kılıf** EN 50290-2-22 PVC Kompaund
- 7-Kılıf Rengi** RAL 7001 Gri

## CONSTRUCTION

- 1-Conductor** IEC 60228; DIN VDE 0295; EN 60228 Class 5  
Stranded Electrolytic Bare Copper
- 2-Insulation** EN 50290-2-21 PVC Compound
- 3-Colour Code** DIN 47100
- 4-Stranding** In layers of optimum pitch
- 5-Wrapping** Pes Tape
- 6-Sheath** EN 50290-2-22 PVC Compound
- 7-Sheath Colour** RAL 7001 Grey

## TEKNİK ÖZELLİKLER TECHNICAL CHARACTERISTICS

| İLETKEN DİRENCİ<br>CONDUCTOR<br>RESISTANCE | YALITIM DİRENCİ<br>INSULATION<br>RESISTANCE | EFEKTİF KAPASİTE<br>MUTUAL<br>CAPACITANCE      | AKIM TAŞIMA KAPASİTESİ<br>CURRENT CARRYING<br>CAPACITY | ÇALIŞMA VOLTAJI<br>OPERATING<br>VOLTAGE | TEST VOLTAJI<br>TEST VOLTAGE                                                       | BÜKÜLME YARIÇAPI<br>BENDING RADIUS                                               | ÇALIŞMA SICAKLIĞI<br>TEMPERATURE RANGE | ALEV GECİKTİRİCİLİK<br>TESTİ<br>FLAME RETARDANT TEST |                                                   |
|--------------------------------------------|---------------------------------------------|------------------------------------------------|--------------------------------------------------------|-----------------------------------------|------------------------------------------------------------------------------------|----------------------------------------------------------------------------------|----------------------------------------|------------------------------------------------------|---------------------------------------------------|
| mm <sup>2</sup>                            | Ω/km                                        | MΩxkm                                          | mm <sup>2</sup><br>pt/m                                | mm <sup>2</sup><br>A                    | 0,22mm <sup>2</sup> /0,34mm <sup>2</sup> = 250V<br>≥0,50mm <sup>2</sup> = 300/500V | 0,22mm <sup>2</sup> /0,34mm <sup>2</sup> = 1200V<br>≥0,50mm <sup>2</sup> = 2000V | 7,5x Cable Ø                           | - 30°C - +70°C                                       | IEC 60332-1-2<br>DIN EN 60332-1-2<br>EN 60332-1-2 |
| 0,22                                       | 79                                          | 0,22mm <sup>2</sup> /0,34mm <sup>2</sup> = 200 | 0,22 110                                               | 0,22 2,5                                |                                                                                    |                                                                                  |                                        |                                                      |                                                   |
| 0,34                                       | 56                                          | ≥0,50mm <sup>2</sup> = 20                      | 0,34 110                                               | 0,34 4,5                                |                                                                                    |                                                                                  |                                        |                                                      |                                                   |
| 0,50                                       | 39                                          |                                                | 0,50 120                                               | 0,50 6,0                                |                                                                                    |                                                                                  |                                        |                                                      |                                                   |
| 0,75                                       | 26                                          |                                                | 0,75 120                                               | 0,75 13                                 |                                                                                    |                                                                                  |                                        |                                                      |                                                   |
| 1,0                                        | 19,5                                        |                                                | 1,0 120                                                | 1,0 16                                  |                                                                                    |                                                                                  |                                        |                                                      |                                                   |
| 1,5                                        | 13,3                                        |                                                | 1,5 120                                                | 1,5 20                                  |                                                                                    |                                                                                  |                                        |                                                      |                                                   |
| 2,5                                        | 7,98                                        |                                                | 2,5 120                                                | 2,5 25                                  |                                                                                    |                                                                                  |                                        |                                                      |                                                   |

## NOTLAR

Esnek yapıları ile dar alanlarda rahatlıkla uygulanabilirler.  
Bu tip kablolar dış ortamlarda kullanıma uygun değildir.  
**LIYY-OZ:** Yeşil/sarı toprak koruma damarsız kablo.  
**LIYY-JZ:** Yeşil/sarı toprak koruma damarlı kablo.

## NOTES

With its flexible design it can easily be used in narrow spaces.  
These cables are not suitable for outdoor use.  
**LIYY-OZ:** Without green/yellow earthing core.  
**LIYY-JZ:** With green/yellow earthing core.

| KOD NO<br>CODE NR. | DAMAR SAYISI VE KESİTİ (mm <sup>2</sup> )<br>NUMBER OF CORE AND CROSS<br>SECTION (mm <sup>2</sup> ) | KABLO ÇAPİ (mm)<br>OVERALL DIAMETER<br>(mm) | BAKIR AĞIRLIĞI (kg/km)<br>COPPER WEIGHT<br>(kg/km) | YAKLAŞIK KABLO AĞIRLIĞI (kg/km)<br>APPROX. CABLE WEIGHT<br>(kg/km) | STANDART<br>UZUNLUK (m)<br>STANDARD LENGTH (m) |
|--------------------|-----------------------------------------------------------------------------------------------------|---------------------------------------------|----------------------------------------------------|--------------------------------------------------------------------|------------------------------------------------|
| 320022023          | 2 x 0,22                                                                                            | 3,40                                        | 4                                                  | 14                                                                 | 100/500/1000                                   |
| 320022033          | 3 x 0,22                                                                                            | 3,80                                        | 7                                                  | 18                                                                 | 100/500/1000                                   |
| 320022043          | 4 x 0,22                                                                                            | 4,10                                        | 9                                                  | 23                                                                 | 100/500/1000                                   |
| 320022053          | 5 x 0,22                                                                                            | 4,40                                        | 11                                                 | 27                                                                 | 100/500/1000                                   |
| 320122063          | 6 x 0,22                                                                                            | 4,80                                        | 12                                                 | 34                                                                 | 100/500/1000                                   |
| 320122083          | 8 x 0,22                                                                                            | 5,20                                        | 14                                                 | 43                                                                 | 100/500/1000                                   |
| 320122103          | 10 x 0,22                                                                                           | 6,00                                        | 20                                                 | 51                                                                 | 100/500/1000                                   |
| 320122123          | 12 x 0,22                                                                                           | 6,20                                        | 25                                                 | 60                                                                 | 100/500/1000                                   |
| 320122143          | 14 x 0,22                                                                                           | 6,90                                        | 29                                                 | 74                                                                 | 100/500/1000                                   |
| 320122163          | 16 x 0,22                                                                                           | 7,20                                        | 33                                                 | 83                                                                 | 100/500/1000                                   |
| 320122183          | 18 x 0,22                                                                                           | 7,50                                        | 38                                                 | 101                                                                | 100/500/1000                                   |
| 320122203          | 20 x 0,22                                                                                           | 7,70                                        | 41                                                 | 110                                                                | 100/500/1000                                   |
| 320034023          | 2 x 0,34                                                                                            | 3,80                                        | 6                                                  | 19                                                                 | 100/500/1000                                   |
| 320034033          | 3 x 0,34                                                                                            | 4,30                                        | 10                                                 | 25                                                                 | 100/500/1000                                   |
| 320034043          | 4 x 0,34                                                                                            | 4,60                                        | 13                                                 | 31                                                                 | 100/500/1000                                   |
| 320034053          | 5 x 0,34                                                                                            | 5,00                                        | 15                                                 | 41                                                                 | 100/500/1000                                   |
| 320134063          | 6 x 0,34                                                                                            | 5,40                                        | 19                                                 | 46                                                                 | 100/500/1000                                   |
| 320134083          | 8 x 0,34                                                                                            | 5,80                                        | 25                                                 | 60                                                                 | 100/500/1000                                   |
| 320134103          | 10 x 0,34                                                                                           | 7,00                                        | 31                                                 | 80                                                                 | 100/500/1000                                   |
| 320134123          | 12 x 0,34                                                                                           | 7,20                                        | 38                                                 | 92                                                                 | 100/500/1000                                   |
| 320134143          | 14 x 0,34                                                                                           | 7,80                                        | 44                                                 | 103                                                                | 100/500/1000                                   |
| 320134163          | 16 x 0,34                                                                                           | 8,20                                        | 50                                                 | 112                                                                | 100/500/1000                                   |
| 320134183          | 18 x 0,34                                                                                           | 8,50                                        | 57                                                 | 125                                                                | 100/500/1000                                   |
| 320134203          | 20 x 0,34                                                                                           | 8,80                                        | 63                                                 | 136                                                                | 100/500/1000                                   |
| 320050023          | 2 x 0,50                                                                                            | 4,90                                        | 9                                                  | 27                                                                 | 100/500/1000                                   |
| 320050033          | 3 x 0,50                                                                                            | 5,10                                        | 14                                                 | 44                                                                 | 100/500/1000                                   |
| 320050043          | 4 x 0,50                                                                                            | 5,60                                        | 17                                                 | 52                                                                 | 100/500/1000                                   |
| 320050053          | 5 x 0,50                                                                                            | 6,20                                        | 21                                                 | 63                                                                 | 100/500/1000                                   |
| 320150063          | 6 x 0,50                                                                                            | 6,90                                        | 25                                                 | 76                                                                 | 100/500/1000                                   |
| 320150073          | 7 x 0,50                                                                                            | 6,90                                        | 29                                                 | 81                                                                 | 100/500/1000                                   |
| 320150083          | 8 x 0,50                                                                                            | 7,20                                        | 34                                                 | 88                                                                 | 100/500/1000                                   |
| 320150103          | 10 x 0,50                                                                                           | 8,70                                        | 41                                                 | 101                                                                | 100/500/1000                                   |
| 320150123          | 12 x 0,50                                                                                           | 8,90                                        | 50                                                 | 121                                                                | 100/500/1000                                   |
| 320150143          | 14 x 0,50                                                                                           | 9,60                                        | 58                                                 | 143                                                                | 100/500/1000                                   |
| 320150163          | 16 x 0,50                                                                                           | 10,20                                       | 66                                                 | 160                                                                | 100/500/1000                                   |
| 320150183          | 18 x 0,50                                                                                           | 10,70                                       | 75                                                 | 178                                                                | 100/500/1000                                   |
| 320150203          | 20 x 0,50                                                                                           | 11,10                                       | 83                                                 | 191                                                                | 100/500/1000                                   |
| 320075023          | 2 x 0,75                                                                                            | 5,30                                        | 14                                                 | 35                                                                 | 100/500/1000                                   |
| 320075033          | 3 x 0,75                                                                                            | 5,60                                        | 22                                                 | 44                                                                 | 100/500/1000                                   |
| 320075043          | 4 x 0,75                                                                                            | 6,00                                        | 27                                                 | 58                                                                 | 100/500/1000                                   |
| 320075053          | 5 x 0,75                                                                                            | 7,20                                        | 35                                                 | 72                                                                 | 100/500/1000                                   |
| 320175063          | 6 x 0,75                                                                                            | 7,50                                        | 42                                                 | 88                                                                 | 100/500/1000                                   |
| 320175073          | 7 x 0,75                                                                                            | 7,50                                        | 45                                                 | 92                                                                 | 100/500/1000                                   |
| 320175083          | 8 x 0,75                                                                                            | 7,90                                        | 54                                                 | 109                                                                | 100/500/1000                                   |
| 320175103          | 10 x 0,75                                                                                           | 9,50                                        | 66                                                 | 134                                                                | 100/500/1000                                   |
| 320175123          | 12 x 0,75                                                                                           | 9,80                                        | 79                                                 | 157                                                                | 100/500/1000                                   |
| 320175143          | 14 x 0,75                                                                                           | 10,50                                       | 92                                                 | 184                                                                | 100/500/1000                                   |
| 320175163          | 16 x 0,75                                                                                           | 11,10                                       | 102                                                | 208                                                                | 100/500/1000                                   |
| 320175183          | 18 x 0,75                                                                                           | 12,10                                       | 118                                                | 237                                                                | 100/500/1000                                   |
| 320175203          | 20 x 0,75                                                                                           | 12,50                                       | 128                                                | 255                                                                | 100/500/1000                                   |

LIYY

| KOD NO<br>CODE NR. | DAMAR SAYISI VE KESİTİ (mm <sup>2</sup> )<br>NUMBER OF CORE AND CROSS<br>SECTION (mm <sup>2</sup> ) | KABLO ÇAPI (mm)<br>OVERALL DIAMETER<br>(mm) | BAKIR AĞIRLIĞI (kg/km)<br>COPPER WEIGHT<br>(kg/km) | YAKLAŞIK KABLO AĞIRLIĞI (kg/km)<br>APPROX. CABLE WEIGHT<br>(kg/km) | STANDART<br>UZUNLUK (m)<br>STANDARD LENGTH (m) |
|--------------------|-----------------------------------------------------------------------------------------------------|---------------------------------------------|----------------------------------------------------|--------------------------------------------------------------------|------------------------------------------------|
| 320001023          | 2 x 1                                                                                               | 5,70                                        | 17                                                 | 47                                                                 | 100/500/1000                                   |
| 320001033          | 3 x 1                                                                                               | 6,00                                        | 25                                                 | 61                                                                 | 100/500/1000                                   |
| 320001043          | 4 x 1                                                                                               | 6,70                                        | 34                                                 | 76                                                                 | 100/500/1000                                   |
| 320001053          | 5 x 1                                                                                               | 7,20                                        | 43                                                 | 93                                                                 | 100/500/1000                                   |
| 320101063          | 6 x 1                                                                                               | 8,00                                        | 52                                                 | 112                                                                | 100/500/1000                                   |
| 320101073          | 7 x 1                                                                                               | 8,00                                        | 61                                                 | 129                                                                | 100/500/1000                                   |
| 320101083          | 8 x 1                                                                                               | 8,50                                        | 70                                                 | 136                                                                | 100/500/1000                                   |
| 320101103          | 10 x 1                                                                                              | 10,40                                       | 88                                                 | 179                                                                | 100/500/1000                                   |
| 320101123          | 12 x 1                                                                                              | 10,80                                       | 104                                                | 197                                                                | 100/500/1000                                   |
| 320101143          | 14 x 1                                                                                              | 11,30                                       | 122                                                | 224                                                                | 100/500/1000                                   |
| 320101163          | 16 x 1                                                                                              | 11,50                                       | 138                                                | 251                                                                | 100/500/1000                                   |
| 320101183          | 18 x 1                                                                                              | 13,10                                       | 157                                                | 295                                                                | 100/500/1000                                   |
| 320101203          | 20 x 1                                                                                              | 13,50                                       | 170                                                | 318                                                                | 100/500/1000                                   |
| 320015023          | 2 x 1,5                                                                                             | 6,10                                        | 26                                                 | 52                                                                 | 100/500/1000                                   |
| 320015033          | 3 x 1,5                                                                                             | 6,60                                        | 40                                                 | 71                                                                 | 100/500/1000                                   |
| 320015043          | 4 x 1,5                                                                                             | 7,20                                        | 51                                                 | 90                                                                 | 100/500/1000                                   |
| 320015053          | 5 x 1,5                                                                                             | 8,00                                        | 64                                                 | 116                                                                | 100/500/1000                                   |
| 320115063          | 6 x 1,5                                                                                             | 8,70                                        | 76                                                 | 139                                                                | 100/500/1000                                   |
| 320115073          | 7 x 1,5                                                                                             | 8,70                                        | 88                                                 | 151                                                                | 100/500/1000                                   |
| 320115083          | 8 x 1,5                                                                                             | 9,30                                        | 101                                                | 175                                                                | 100/500/1000                                   |
| 320115103          | 10 x 1,5                                                                                            | 11,30                                       | 127                                                | 217                                                                | 100/500/1000                                   |
| 320115123          | 12 x 1,5                                                                                            | 11,60                                       | 152                                                | 246                                                                | 100/500/1000                                   |
| 320115143          | 14 x 1,5                                                                                            | 12,60                                       | 178                                                | 294                                                                | 100/500/1000                                   |
| 320115163          | 16 x 1,5                                                                                            | 13,40                                       | 201                                                | 331                                                                | 100/500/1000                                   |
| 320115183          | 18 x 1,5                                                                                            | 14,00                                       | 225                                                | 368                                                                | 100/500/1000                                   |
| 320115203          | 20 x 1,5                                                                                            | 15,00                                       | 248                                                | 401                                                                | 100/500/1000                                   |
| 320025023          | 2 x 2,5                                                                                             | 7,70                                        | 42                                                 | 78                                                                 | 100/500/1000                                   |
| 320025033          | 3 x 2,5                                                                                             | 8,10                                        | 63                                                 | 109                                                                | 100/500/1000                                   |
| 320025043          | 4 x 2,5                                                                                             | 8,90                                        | 84                                                 | 140                                                                | 100/500/1000                                   |
| 320025053          | 5 x 2,5                                                                                             | 10,10                                       | 105                                                | 171                                                                | 100/500/1000                                   |
| 320125063          | 6 x 2,5                                                                                             | 11,00                                       | 126                                                | 211                                                                | 100/500/1000                                   |
| 320125073          | 7 x 2,5                                                                                             | 11,00                                       | 147                                                | 236                                                                | 100/500/1000                                   |
| 320125083          | 8 x 2,5                                                                                             | 11,60                                       | 170                                                | 274                                                                | 100/500/1000                                   |
| 320125103          | 10 x 2,5                                                                                            | 14,50                                       | 208                                                | 340                                                                | 100/500/1000                                   |
| 320125123          | 12 x 2,5                                                                                            | 14,90                                       | 243                                                | 402                                                                | 100/500/1000                                   |
| 320125143          | 14 x 2,5                                                                                            | 15,70                                       | 287                                                | 460                                                                | 100/500/1000                                   |
| 320125163          | 16 x 2,5                                                                                            | 16,90                                       | 328                                                | 524                                                                | 100/500/1000                                   |
| 320125183          | 18 x 2,5                                                                                            | 17,80                                       | 368                                                | 595                                                                | 100/500/1000                                   |
| 320125203          | 20 x 2,5                                                                                            | 18,40                                       | 413                                                | 647                                                                | 100/500/1000                                   |

LIHH



ESNEK KABLO YAPISI/İNCELTİLMİŞ DIŞ ÇAP/KÜÇÜK BÜKÜLME YARIÇAPI/ALEV GECİKTİRİCİ ÖZELLİK/DÜŞÜK DUMAN YOĞUNLUĞU/ZEHİRLİ VE KOROZİF GAZLARDAN ARINDIRILMIŞ  
FLEXIBLE CABLE DESIGN/REDUCED OUTER DIAMETER/SMALL BENDING RADIUS/FLAME RETARDANT CHARACTERISTIC/LOW SMOKE EMISSION/WITHOUT POISONED AND CORROSIVE GASES



## KULLANIM ALANLARI

İnsanların yoğun olarak bulunduğu kapalı ortamlarda  
-Enstrüman ve Kontrol Mühendisliğinde  
-Endüstriyel Elektronikte  
-Bilgisayar ve Ofis Makinelerinde  
-Bina İçi Haberleşme Sistemlerinde  
-Bina İçi Ses Sistemlerinde  
-İnsan hayatının, değerli malzemelerin ve ekipmanların korunması gereken yerlerde

## KABLO YAPISI

|                       |                                                                              |
|-----------------------|------------------------------------------------------------------------------|
| <b>1-İletken</b>      | IEC 60228; DIN VDE 0295; EN 60228 Sınıf 5<br>Bükülü Elektrolitik Tavlı Bakır |
| <b>2-Yalıtkan</b>     | EN 50290-2-26 HFFR Kompaund                                                  |
| <b>3-Yalıtım Renk</b> | DIN 47100                                                                    |
| <b>4-Büküm</b>        | Uygun adımda katlar halinde                                                  |
| <b>5-Ayırıcı Bant</b> | Pes Bant                                                                     |
| <b>6-Kılıf</b>        | EN 50290-2-27 HFFR Kompaund                                                  |
| <b>7-Kılıf Rengi</b>  | RAL 7001 Gri                                                                 |

## APPLICATION

In closed areas where people are densely populated  
-Instrumentation and Control Engineering  
-Industrial Electronics  
-Computers and Office Machines  
-Indoor Communication Systems  
-Indoor Sound Systems  
-In places where human life and valuable materials and equipment need to be protected

## CONSTRUCTION

|                        |                                                                                |
|------------------------|--------------------------------------------------------------------------------|
| <b>1-Conductor</b>     | IEC 60228; DIN VDE 0295; EN 60228 Class 5<br>Stranded Electrolytic Bare Copper |
| <b>2-Insulation</b>    | EN 50290-2-26 HFFR Compound                                                    |
| <b>3-Colour Code</b>   | DIN 47100                                                                      |
| <b>4-Stranding</b>     | In layers of optimum pitch                                                     |
| <b>5-Wrapping</b>      | Pes Tape                                                                       |
| <b>6-Sheath</b>        | EN 50290-2-27 HFFR Compound                                                    |
| <b>7-Sheath Colour</b> | RAL 7001 Grey                                                                  |

## TEKNİK ÖZELLİKLER TECHNICAL CHARACTERISTICS

| İLETKEN DİRENCİ<br>CONDUCTOR<br>RESISTANCE | YALITIM DİRENCİ<br>INSULATION<br>RESISTANCE    | EFEKTİF KAPASİTE<br>MUTUAL<br>CAPACITANCE | AKIM TAŞIMA KAPASİTESİ<br>CURRENT CARRYING<br>CAPACITY | ÇALIŞMA VOLTAJİ<br>OPERATING<br>VOLTAGE                                             | TEST VOLTAJİ<br>TEST VOLTAGE                                                      | BÜKÜLME YARIÇAPI<br>BENDING RADIUS | ÇALIŞMA SICAKLIĞI<br>TEMPERATURE RANGE | ALEV GECİKTİRİCİLİK<br>TESTİ<br>FLAME RETARDANT TEST |
|--------------------------------------------|------------------------------------------------|-------------------------------------------|--------------------------------------------------------|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------|----------------------------------------|------------------------------------------------------|
| mm <sup>2</sup> Ω/km                       | MΩxkm                                          | mm <sup>2</sup> pF/m                      | mm <sup>2</sup> A                                      | 0,22mm <sup>2</sup> /0,34mm <sup>2</sup> = 250V<br>≥ 0,50mm <sup>2</sup> = 300/500V | 0,22mm <sup>2</sup> /0,34mm <sup>2</sup> = 1200V<br>≥ 0,50mm <sup>2</sup> = 2000V | 10x Cable Ø                        | - 30°C - +80°C                         | IEC 60332-1-2<br>DIN EN 60332-1-2<br>EN 60332-1-2    |
| 0,22 79                                    | 0,22mm <sup>2</sup> /0,34mm <sup>2</sup> = 200 | 0,22 110                                  | 0,22 2,5                                               |                                                                                     |                                                                                   |                                    |                                        |                                                      |
| 0,34 56                                    | ≥ 0,50mm <sup>2</sup> = 20                     | 0,34 110                                  | 0,34 4,5                                               |                                                                                     |                                                                                   |                                    |                                        |                                                      |
| 0,50 39                                    |                                                | 0,50 120                                  | 0,50 6,0                                               |                                                                                     |                                                                                   |                                    |                                        |                                                      |
| 0,75 26                                    |                                                | 0,75 120                                  | 0,75 13                                                |                                                                                     |                                                                                   |                                    |                                        |                                                      |
| 1,0 19,5                                   |                                                | 1,0 120                                   | 1,0 16                                                 |                                                                                     |                                                                                   |                                    |                                        |                                                      |
| 1,5 13,3                                   |                                                | 1,5 120                                   | 1,5 20                                                 |                                                                                     |                                                                                   |                                    |                                        |                                                      |
| 2,5 7,98                                   |                                                | 2,5 120                                   | 2,5 25                                                 |                                                                                     |                                                                                   |                                    |                                        |                                                      |

DUMAN YOĞUNLUĞU TESTİ  
SMOKE DENSITY TEST

IEC 61034-2  
VDE 0482-1034-2  
EN 61034-2

KOROZİF GAZ TESTİ  
TEST ON CORROSIVENESS OF COMBUSTION GASES

IEC 60754-2  
VDE 0482-754-2  
EN 60754-2

HALOJENSİZLİK TESTİ  
HALOGEN FREE TEST

IEC 60754-1  
VDE 0482-754-1  
EN 60754-1

ALEV YAYILIMI TESTİ  
FLAME PROPAGATION TEST

IEC 60332-3-24  
DIN EN 60332-3-24  
EN 60332-3-24

## NOTLAR

Esnek yapıları ile dar alanlarda rahatlıkla uygulanabilirler.  
Bu tip kablolar dış ortamlarda kullanıma uygun değildir.  
**LIYY-OZ:** Yeşil/sarı toprak koruma damarsız kablo.  
**LIYY-JZ:** Yeşil/sarı toprak koruma damarlı kablo.

## NOTES

With its flexible design it can easily be used in narrow spaces.  
These cables are not suitable for outdoor use.  
**LIYY-OZ:** Without green/yellow earthing core.  
**LIYY-JZ:** With green/yellow earthing core.

**LIHH**

| KOD NO<br>CODE NR. | DAMAR SAYISI VE KESİTİ (mm <sup>2</sup> )<br>NUMBER OF CORE AND CROSS<br>SECTION (mm <sup>2</sup> ) | KABLO ÇAPİ (mm)<br>OVERALL DIAMETER<br>(mm) | BAKIR AĞIRLIĞI (kg/km)<br>COPPER WEIGHT<br>(kg/km) | YAKLAŞIK KABLO AĞIRLIĞI (kg/km)<br>APPROX. CABLE WEIGHT<br>(kg/km) | STANDART<br>UZUNLUK (mt)<br>STANDARD LENGTH (m) |
|--------------------|-----------------------------------------------------------------------------------------------------|---------------------------------------------|----------------------------------------------------|--------------------------------------------------------------------|-------------------------------------------------|
| 320322023          | 2 x 0,22                                                                                            | 3,50                                        | 4                                                  | 15                                                                 | 100/500/1000                                    |
| 320322033          | 3 x 0,22                                                                                            | 3,90                                        | 7                                                  | 19                                                                 | 100/500/1000                                    |
| 320322043          | 4 x 0,22                                                                                            | 4,20                                        | 9                                                  | 26                                                                 | 100/500/1000                                    |
| 320322053          | 5 x 0,22                                                                                            | 4,50                                        | 11                                                 | 30                                                                 | 100/500/1000                                    |
| 320322063          | 6 x 0,22                                                                                            | 4,90                                        | 12                                                 | 36                                                                 | 100/500/1000                                    |
| 320322083          | 8 x 0,22                                                                                            | 5,30                                        | 14                                                 | 45                                                                 | 100/500/1000                                    |
| 320322103          | 10 x 0,22                                                                                           | 6,10                                        | 20                                                 | 54                                                                 | 100/500/1000                                    |
| 320322123          | 12 x 0,22                                                                                           | 6,30                                        | 25                                                 | 63                                                                 | 100/500/1000                                    |
| 320322143          | 14 x 0,22                                                                                           | 7,00                                        | 29                                                 | 78                                                                 | 100/500/1000                                    |
| 320322163          | 16 x 0,22                                                                                           | 7,30                                        | 33                                                 | 97                                                                 | 100/500/1000                                    |
| 320322183          | 18 x 0,22                                                                                           | 7,60                                        | 38                                                 | 100                                                                | 100/500/1000                                    |
| 320322203          | 20 x 0,22                                                                                           | 7,80                                        | 41                                                 | 106                                                                | 100/500/1000                                    |
| 320334023          | 2 x 0,34                                                                                            | 3,90                                        | 6                                                  | 20                                                                 | 100/500/1000                                    |
| 320334033          | 3 x 0,34                                                                                            | 4,40                                        | 10                                                 | 26                                                                 | 100/500/1000                                    |
| 320334043          | 4 x 0,34                                                                                            | 4,70                                        | 13                                                 | 33                                                                 | 100/500/1000                                    |
| 320334053          | 5 x 0,34                                                                                            | 5,10                                        | 15                                                 | 43                                                                 | 100/500/1000                                    |
| 320334063          | 6 x 0,34                                                                                            | 5,50                                        | 19                                                 | 48                                                                 | 100/500/1000                                    |
| 320334083          | 8 x 0,34                                                                                            | 5,90                                        | 25                                                 | 63                                                                 | 100/500/1000                                    |
| 320334103          | 10 x 0,34                                                                                           | 7,10                                        | 31                                                 | 84                                                                 | 100/500/1000                                    |
| 320334123          | 12 x 0,34                                                                                           | 7,30                                        | 38                                                 | 97                                                                 | 100/500/1000                                    |
| 320334143          | 14 x 0,34                                                                                           | 7,90                                        | 45                                                 | 105                                                                | 100/500/1000                                    |
| 320334163          | 16 x 0,34                                                                                           | 8,30                                        | 51                                                 | 117                                                                | 100/500/1000                                    |
| 320334183          | 18 x 0,34                                                                                           | 8,60                                        | 57                                                 | 128                                                                | 100/500/1000                                    |
| 320334203          | 20 x 0,34                                                                                           | 9,00                                        | 64                                                 | 143                                                                | 100/500/1000                                    |
| 320350023          | 2 x 0,50                                                                                            | 5,00                                        | 9                                                  | 29                                                                 | 100/500/1000                                    |
| 320350033          | 3 x 0,50                                                                                            | 5,20                                        | 14                                                 | 36                                                                 | 100/500/1000                                    |
| 320350043          | 4 x 0,50                                                                                            | 5,60                                        | 18                                                 | 44                                                                 | 100/500/1000                                    |
| 320350053          | 5 x 0,50                                                                                            | 6,20                                        | 24                                                 | 53                                                                 | 100/500/1000                                    |
| 320350063          | 6 x 0,50                                                                                            | 6,70                                        | 29                                                 | 67                                                                 | 100/500/1000                                    |
| 320350073          | 7 x 0,50                                                                                            | 6,70                                        | 34                                                 | 73                                                                 | 100/500/1000                                    |
| 320350083          | 8 x 0,50                                                                                            | 7,30                                        | 37                                                 | 88                                                                 | 100/500/1000                                    |
| 320350103          | 10 x 0,50                                                                                           | 8,40                                        | 47                                                 | 106                                                                | 100/500/1000                                    |
| 320350123          | 12 x 0,50                                                                                           | 8,70                                        | 54                                                 | 127                                                                | 100/500/1000                                    |
| 320350143          | 14 x 0,50                                                                                           | 9,30                                        | 62                                                 | 143                                                                | 100/500/1000                                    |
| 320350163          | 16 x 0,50                                                                                           | 9,80                                        | 70                                                 | 160                                                                | 100/500/1000                                    |
| 320350183          | 18 x 0,50                                                                                           | 10,30                                       | 76                                                 | 177                                                                | 100/500/1000                                    |
| 320350203          | 20 x 0,50                                                                                           | 10,80                                       | 88                                                 | 193                                                                | 100/500/1000                                    |
| 320375023          | 2 x 0,75                                                                                            | 5,20                                        | 13                                                 | 34                                                                 | 100/500/1000                                    |
| 320375033          | 3 x 0,75                                                                                            | 5,60                                        | 19                                                 | 43                                                                 | 100/500/1000                                    |
| 320375043          | 4 x 0,75                                                                                            | 6,10                                        | 25                                                 | 61                                                                 | 100/500/1000                                    |
| 320375053          | 5 x 0,75                                                                                            | 6,80                                        | 31                                                 | 73                                                                 | 100/500/1000                                    |
| 320375063          | 6 x 0,75                                                                                            | 7,60                                        | 38                                                 | 87                                                                 | 100/500/1000                                    |
| 320375073          | 7 x 0,75                                                                                            | 7,60                                        | 44                                                 | 97                                                                 | 100/500/1000                                    |
| 320375083          | 8 x 0,75                                                                                            | 8,00                                        | 51                                                 | 114                                                                | 100/500/1000                                    |
| 320375103          | 10 x 0,75                                                                                           | 9,60                                        | 64                                                 | 141                                                                | 100/500/1000                                    |
| 320375123          | 12 x 0,75                                                                                           | 9,90                                        | 76                                                 | 165                                                                | 100/500/1000                                    |
| 320375143          | 14 x 0,75                                                                                           | 10,60                                       | 89                                                 | 184                                                                | 100/500/1000                                    |
| 320375163          | 16 x 0,75                                                                                           | 11,20                                       | 101                                                | 207                                                                | 100/500/1000                                    |
| 320375183          | 18 x 0,75                                                                                           | 12,20                                       | 115                                                | 242                                                                | 100/500/1000                                    |
| 320375203          | 20 x 0,75                                                                                           | 12,60                                       | 128                                                | 264                                                                | 100/500/1000                                    |

LIHH

| KOD NO<br>CODE NR. | DAMAR SAYISI VE KESİTİ (mm <sup>2</sup> )<br>NUMBER OF CORE AND CROSS<br>SECTION (mm <sup>2</sup> ) | KABLO ÇAPİ (mm)<br>OVERALL DIAMETER<br>(mm) | BAKIR AĞIRLIĞI (kg/km)<br>COPPER WEIGHT<br>(kg/km) | YAKLAŞIK KABLO AĞIRLIĞI (kg/km)<br>APPROX. CABLE WEIGHT<br>(kg/km) | STANDART<br>UZUNLUK (mt)<br>STANDARD LENGTH (m) |
|--------------------|-----------------------------------------------------------------------------------------------------|---------------------------------------------|----------------------------------------------------|--------------------------------------------------------------------|-------------------------------------------------|
| 320301023          | 2 x 1                                                                                               | 5,80                                        | 17                                                 | 49                                                                 | 100/500/1000                                    |
| 320301033          | 3 x 1                                                                                               | 6,10                                        | 26                                                 | 64                                                                 | 100/500/1000                                    |
| 320301043          | 4 x 1                                                                                               | 6,80                                        | 34                                                 | 80                                                                 | 100/500/1000                                    |
| 320301053          | 5 x 1                                                                                               | 7,30                                        | 44                                                 | 98                                                                 | 100/500/1000                                    |
| 320301063          | 6 x 1                                                                                               | 7,90                                        | 52                                                 | 118                                                                | 100/500/1000                                    |
| 320301073          | 7 x 1                                                                                               | 7,90                                        | 61                                                 | 122                                                                | 100/500/1000                                    |
| 320301083          | 8 x 1                                                                                               | 8,60                                        | 70                                                 | 137                                                                | 100/500/1000                                    |
| 320301103          | 10 x 1                                                                                              | 10,30                                       | 87                                                 | 173                                                                | 100/500/1000                                    |
| 320301123          | 12 x 1                                                                                              | 10,30                                       | 104                                                | 196                                                                | 100/500/1000                                    |
| 320301143          | 14 x 1                                                                                              | 11,10                                       | 122                                                | 225                                                                | 100/500/1000                                    |
| 320301163          | 16 x 1                                                                                              | 11,60                                       | 138                                                | 254                                                                | 100/500/1000                                    |
| 320301183          | 18 x 1                                                                                              | 12,60                                       | 157                                                | 295                                                                | 100/500/1000                                    |
| 320301203          | 20 x 1                                                                                              | 13,30                                       | 178                                                | 323                                                                | 100/500/1000                                    |
| 320315023          | 2 x 1,5                                                                                             | 6,00                                        | 26                                                 | 60                                                                 | 100/500/1000                                    |
| 320315033          | 3 x 1,5                                                                                             | 6,70                                        | 40                                                 | 80                                                                 | 100/500/1000                                    |
| 320315043          | 4 x 1,5                                                                                             | 7,30                                        | 51                                                 | 101                                                                | 100/500/1000                                    |
| 320315053          | 5 x 1,5                                                                                             | 7,90                                        | 64                                                 | 119                                                                | 100/500/1000                                    |
| 320315063          | 6 x 1,5                                                                                             | 8,50                                        | 76                                                 | 141                                                                | 100/500/1000                                    |
| 320315073          | 7 x 1,5                                                                                             | 8,50                                        | 88                                                 | 152                                                                | 100/500/1000                                    |
| 320315083          | 8 x 1,5                                                                                             | 9,40                                        | 101                                                | 176                                                                | 100/500/1000                                    |
| 320315103          | 10 x 1,5                                                                                            | 11,10                                       | 127                                                | 215                                                                | 100/500/1000                                    |
| 320315123          | 12 x 1,5                                                                                            | 11,70                                       | 152                                                | 261                                                                | 100/500/1000                                    |
| 320315143          | 14 x 1,5                                                                                            | 12,40                                       | 178                                                | 297                                                                | 100/500/1000                                    |
| 320315163          | 16 x 1,5                                                                                            | 13,10                                       | 201                                                | 335                                                                | 100/500/1000                                    |
| 320315183          | 18 x 1,5                                                                                            | 13,60                                       | 222                                                | 372                                                                | 100/500/1000                                    |
| 320315203          | 20 x 1,5                                                                                            | 14,40                                       | 247                                                | 409                                                                | 100/500/1000                                    |

## LIYY-TP



ESNEK KABLO YAPISI/İNCELTİLMİŞ DIŞ ÇAP/KÜÇÜK BÜKÜLME YARIÇAPI/ALEV GECİKTİRİCİ ÖZELLİK  
FLEXIBLE CABLE DESIGN/REDUCED OUTER DIAMETER/SMALL BENDING RADIUS/FLAME RETARDANT CHARACTERISTIC



## KULLANIM ALANLARI

- Enstrüman ve Kontrol Mühendisliğinde
- Endüstriyel Elektronikte
- Bilgisayar ve Ofis Makinelerinde
- Bina İçi Haberleşme Sistemlerinde
- Bina İçi Ses Sistemlerinde
- Güvenlik Sistemlerinde

## APPLICATION

- Instrumentation and Control Engineering
- Industrial Electronics
- Computers and Office Machines
- Indoor Communication Systems
- Indoor Sound Systems
- Security Systems

## KABLO YAPISI

- 1-İletken** IEC 60228; DIN VDE 0295; EN 60228 Sınıf 5  
Bükülü Elektrolitik Tavlı Bakır
- 2-Yalıtkan** EN 50290-2-21 PVC Kompaund
- 3-Yalıtım Renk** DIN 47100
- 4-Büküm** Çift büküm katlar halinde
- 5-Ayırıcı Bant** Pes Bant
- 6-Kılıf** EN 50290-2-22 PVC Kompaund
- 7-Kılıf Rengi** RAL 7001 Gri

## CONSTRUCTION

- 1-Conductor** IEC 60228; DIN VDE 0295; EN 60228 Class 5  
Stranded Electrolytic Bare Copper
- 2-Insulation** EN 50290-2-21 PVC Compound
- 3-Colour Code** DIN 47100
- 4-Stranding** Pairwise pairs in layers
- 5-Wrapping** Pes Tape
- 6-Sheath** EN 50290-2-22 PVC Compound
- 7-Sheath Colour** RAL 7001 Grey

TEKNİK ÖZELLİKLER  
TECHNICAL CHARACTERISTICS

| İLETKEN DİRENCİ<br>CONDUCTOR<br>RESISTANCE |      | YALITIM DİRENCİ<br>INSULATION<br>RESISTANCE                                  | EFEKTİF KAPASİTE<br>MUTUAL<br>CAPACITANCE |      | AKIM TAŞIMA KAPASİTESİ<br>CURRENT CARRYING<br>CAPACITY |     | ÇALIŞMA VOLTAJİ<br>OPERATING<br>VOLTAGE                                             | TEST VOLTAJİ<br>TEST VOLTAGE                                                      | BÜKÜLME YARIÇAPI<br>BENDING RADIUS | ÇALIŞMA SICAKLIĞI<br>TEMPERATURE RANGE | ALEV GECİKTİRİCİLİK<br>TESTİ<br>FLAME RETARDANT TEST |
|--------------------------------------------|------|------------------------------------------------------------------------------|-------------------------------------------|------|--------------------------------------------------------|-----|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------|----------------------------------------|------------------------------------------------------|
| mm <sup>2</sup>                            | Ω/km | MΩxkm                                                                        | mm <sup>2</sup>                           | pF/m | mm <sup>2</sup>                                        | A   | 0,22mm <sup>2</sup> /0,34mm <sup>2</sup> = 250V<br>≥ 0,50mm <sup>2</sup> = 300/500V | 0,22mm <sup>2</sup> /0,34mm <sup>2</sup> = 1200V<br>≥ 0,50mm <sup>2</sup> = 2000V | 7,5x Cable Ø                       | - 30°C - +70°C                         | IEC 60332-1-2<br>DIN EN 60332-1-2<br>EN 60332-1-2    |
| 0,22                                       | 79   | 0,22mm <sup>2</sup> /0,34mm <sup>2</sup> = 200<br>≥ 0,50mm <sup>2</sup> = 20 | 0,22                                      | 110  | 0,22                                                   | 2,5 |                                                                                     |                                                                                   |                                    |                                        |                                                      |
| 0,34                                       | 56   |                                                                              | 0,34                                      | 110  | 0,34                                                   | 4,5 |                                                                                     |                                                                                   |                                    |                                        |                                                      |
| 0,50                                       | 39   |                                                                              | 0,50                                      | 120  | 0,50                                                   | 6,0 |                                                                                     |                                                                                   |                                    |                                        |                                                      |
| 0,75                                       | 26   |                                                                              | 0,75                                      | 120  | 0,75                                                   | 13  |                                                                                     |                                                                                   |                                    |                                        |                                                      |
| 1,0                                        | 19,5 |                                                                              | 1,0                                       | 120  | 1,0                                                    | 16  |                                                                                     |                                                                                   |                                    |                                        |                                                      |
| 1,5                                        | 13,3 |                                                                              | 1,5                                       | 120  | 1,5                                                    | 20  |                                                                                     |                                                                                   |                                    |                                        |                                                      |
| 2,5                                        | 7,98 |                                                                              | 2,5                                       | 120  | 2,5                                                    | 25  |                                                                                     |                                                                                   |                                    |                                        |                                                      |

## NOTLAR

Esnek yapıları ile dar alanlarda rahatlıkla uygulanabilirler.  
Bu tip kablolar dış ortamlarda kullanıma uygun değildir.  
**LIYY-TP-OZ:** Numara kodlu siyah damarlar.

## NOTES

With its flexible design it can easily be used in narrow spaces.  
These cables are not suitable for outdoor use.  
**LIYY-TP-OZ:** Number coded black cores.

## LIYY-TP

| KOD NO<br>CODE NR. | ÇİFT SAYISI VE KESİTİ (mm <sup>2</sup> )<br>NUMBER OF PAIRS AND CROSS SECTION<br>(mm <sup>2</sup> ) | KABLO ÇAPİ (mm)<br>OVERALL DIAMETER<br>(mm) | BAKIR AĞIRLIĞI (kg/km)<br>COPPER WEIGHT<br>(kg/km) | YAKLAŞIK KABLO AĞIRLIĞI (kg/km)<br>APPROX. CABLE WEIGHT<br>(kg/km) | STANDART<br>UZUNLUK (mt)<br>STANDARD LENGTH (m) |
|--------------------|-----------------------------------------------------------------------------------------------------|---------------------------------------------|----------------------------------------------------|--------------------------------------------------------------------|-------------------------------------------------|
| 320222023          | 2 x 2 x 0,22                                                                                        | 5,10                                        | 8                                                  | 28                                                                 | 100/500/1000                                    |
| 320222033          | 3 x 2 x 0,22                                                                                        | 5,40                                        | 13                                                 | 37                                                                 | 100/500/1000                                    |
| 320222043          | 4 x 2 x 0,22                                                                                        | 5,90                                        | 17                                                 | 49                                                                 | 100/500/1000                                    |
| 320222053          | 5 x 2 x 0,22                                                                                        | 6,80                                        | 21                                                 | 62                                                                 | 100/500/1000                                    |
| 320222063          | 6 x 2 x 0,22                                                                                        | 7,30                                        | 26                                                 | 73                                                                 | 100/500/1000                                    |
| 320222083          | 8 x 2 x 0,22                                                                                        | 8,10                                        | 33                                                 | 82                                                                 | 100/500/1000                                    |
| 320222103          | 10 x 2 x 0,22                                                                                       | 9,30                                        | 42                                                 | 100                                                                | 100/500/1000                                    |
| 320222123          | 12 x 2 x 0,22                                                                                       | 9,50                                        | 51                                                 | 122                                                                | 100/500/1000                                    |
| 320222143          | 14 x 2 x 0,22                                                                                       | 10,10                                       | 60                                                 | 142                                                                | 100/500/1000                                    |
| 320222163          | 16 x 2 x 0,22                                                                                       | 10,70                                       | 68                                                 | 165                                                                | 100/500/1000                                    |
| 320222183          | 18 x 2 x 0,22                                                                                       | 11,30                                       | 76                                                 | 177                                                                | 100/500/1000                                    |
| 320222203          | 20 x 2 x 0,22                                                                                       | 12,40                                       | 84                                                 | 202                                                                | 100/500/1000                                    |
| 320234023          | 2 x 2 x 0,34                                                                                        | 5,70                                        | 13                                                 | 37                                                                 | 100/500/1000                                    |
| 320234033          | 3 x 2 x 0,34                                                                                        | 6,10                                        | 19                                                 | 50                                                                 | 100/500/1000                                    |
| 320234043          | 4 x 2 x 0,34                                                                                        | 6,90                                        | 26                                                 | 71                                                                 | 100/500/1000                                    |
| 320234053          | 5 x 2 x 0,34                                                                                        | 7,70                                        | 32                                                 | 84                                                                 | 100/500/1000                                    |
| 320234063          | 6 x 2 x 0,34                                                                                        | 8,30                                        | 38                                                 | 97                                                                 | 100/500/1000                                    |
| 320234073          | 7 x 2 x 0,34                                                                                        | 8,80                                        | 45                                                 | 106                                                                | 100/500/1000                                    |
| 320234083          | 8 x 2 x 0,34                                                                                        | 9,30                                        | 51                                                 | 121                                                                | 100/500/1000                                    |
| 320234103          | 10 x 2 x 0,34                                                                                       | 10,50                                       | 64                                                 | 146                                                                | 100/500/1000                                    |
| 320234123          | 12 x 2 x 0,34                                                                                       | 10,80                                       | 77                                                 | 170                                                                | 100/500/1000                                    |
| 320234143          | 14 x 2 x 0,34                                                                                       | 11,50                                       | 90                                                 | 190                                                                | 100/500/1000                                    |
| 320234163          | 16 x 2 x 0,34                                                                                       | 12,60                                       | 102                                                | 225                                                                | 100/500/1000                                    |
| 320234183          | 18 x 2 x 0,34                                                                                       | 13,30                                       | 115                                                | 250                                                                | 100/500/1000                                    |
| 320234203          | 20 x 2 x 0,34                                                                                       | 14,10                                       | 128                                                | 270                                                                | 100/500/1000                                    |
| 320250023          | 2 x 2 x 0,50                                                                                        | 7,20                                        | 19                                                 | 51                                                                 | 100/500/1000                                    |
| 320250033          | 3 x 2 x 0,50                                                                                        | 7,70                                        | 29                                                 | 67                                                                 | 100/500/1000                                    |
| 320250043          | 4 x 2 x 0,50                                                                                        | 8,40                                        | 38                                                 | 93                                                                 | 100/500/1000                                    |
| 320250053          | 5 x 2 x 0,50                                                                                        | 9,60                                        | 47                                                 | 111                                                                | 100/500/1000                                    |
| 320250063          | 6 x 2 x 0,50                                                                                        | 10,50                                       | 53                                                 | 124                                                                | 100/500/1000                                    |
| 320250073          | 7 x 2 x 0,50                                                                                        | 11,10                                       | 62                                                 | 151                                                                | 100/500/1000                                    |
| 320250083          | 8 x 2 x 0,50                                                                                        | 11,50                                       | 70                                                 | 170                                                                | 100/500/1000                                    |
| 320250103          | 10 x 2 x 0,50                                                                                       | 13,50                                       | 87                                                 | 211                                                                | 100/500/1000                                    |
| 320250123          | 12 x 2 x 0,50                                                                                       | 13,80                                       | 107                                                | 246                                                                | 100/500                                         |
| 320250143          | 14 x 2 x 0,50                                                                                       | 14,70                                       | 120                                                | 275                                                                | 100/500                                         |
| 320250163          | 16 x 2 x 0,50                                                                                       | 15,70                                       | 140                                                | 307                                                                | 100/500                                         |
| 320250183          | 18 x 2 x 0,50                                                                                       | 16,70                                       | 155                                                | 345                                                                | 100/500                                         |
| 320250203          | 20 x 2 x 0,50                                                                                       | 17,70                                       | 170                                                | 378                                                                | 100/500                                         |
| 320275023          | 2 x 2 x 0,75                                                                                        | 7,90                                        | 26                                                 | 64                                                                 | 100/500/1000                                    |
| 320275033          | 3 x 2 x 0,75                                                                                        | 8,40                                        | 39                                                 | 91                                                                 | 100/500/1000                                    |
| 320275043          | 4 x 2 x 0,75                                                                                        | 9,50                                        | 52                                                 | 120                                                                | 100/500/1000                                    |
| 320275053          | 5 x 2 x 0,75                                                                                        | 10,50                                       | 65                                                 | 144                                                                | 100/500/1000                                    |
| 320275063          | 6 x 2 x 0,75                                                                                        | 11,50                                       | 78                                                 | 172                                                                | 100/500/1000                                    |
| 320275073          | 7 x 2 x 0,75                                                                                        | 12,60                                       | 91                                                 | 197                                                                | 100/500/1000                                    |
| 320275083          | 8 x 2 x 0,75                                                                                        | 13,00                                       | 104                                                | 219                                                                | 100/500                                         |
| 320275103          | 10 x 2 x 0,75                                                                                       | 14,80                                       | 130                                                | 273                                                                | 100/500                                         |
| 320275123          | 12 x 2 x 0,75                                                                                       | 15,10                                       | 156                                                | 310                                                                | 100/500                                         |
| 320275143          | 14 x 2 x 0,75                                                                                       | 16,30                                       | 182                                                | 357                                                                | 100/500                                         |
| 320275163          | 16 x 2 x 0,75                                                                                       | 17,40                                       | 208                                                | 403                                                                | 100/500                                         |
| 320275183          | 18 x 2 x 0,75                                                                                       | 18,30                                       | 234                                                | 443                                                                | 100/500                                         |
| 320275203          | 20 x 2 x 0,75                                                                                       | 19,50                                       | 260                                                | 487                                                                | 100/500                                         |

## LIYY-TP

| KOD NO<br>CODE NR. | ÇİFT SAYISI VE KESİTİ (mm <sup>2</sup> )<br>NUMBER OF PAIRS AND CROSS SECTION<br>(mm <sup>2</sup> ) | KABLO ÇAPİ (mm)<br>OVERALL DIAMETER<br>(mm) | BAKIR AĞIRLIĞI (kg/km)<br>COPPER WEIGHT<br>(kg/km) | YAKLAŞIK KABLO AĞIRLIĞI (kg/km)<br>APPROX. CABLE WEIGHT<br>(kg/km) | STANDART<br>UZUNLUK (mt)<br>STANDARD LENGTH (m) |
|--------------------|-----------------------------------------------------------------------------------------------------|---------------------------------------------|----------------------------------------------------|--------------------------------------------------------------------|-------------------------------------------------|
| 320201023          | 2 x 2 x 1                                                                                           | 8,60                                        | 36                                                 | 88                                                                 | 100/500/1000                                    |
| 320201033          | 3 x 2 x 1                                                                                           | 9,40                                        | 54                                                 | 122                                                                | 100/500/1000                                    |
| 320201043          | 4 x 2 x 1                                                                                           | 10,30                                       | 72                                                 | 153                                                                | 100/500/1000                                    |
| 320201053          | 5 x 2 x 1                                                                                           | 11,50                                       | 90                                                 | 180                                                                | 100/500/1000                                    |
| 320201063          | 6 x 2 x 1                                                                                           | 13,00                                       | 108                                                | 225                                                                | 100/500/1000                                    |
| 320201073          | 7 x 2 x 1                                                                                           | 13,70                                       | 126                                                | 250                                                                | 100/500/1000                                    |
| 320201083          | 8 x 2 x 1                                                                                           | 14,20                                       | 140                                                | 275                                                                | 100/500                                         |
| 320201103          | 10 x 2 x 1                                                                                          | 16,20                                       | 175                                                | 340                                                                | 100/500                                         |
| 320201123          | 12 x 2 x 1                                                                                          | 16,70                                       | 210                                                | 388                                                                | 100/500                                         |
| 320201143          | 14 x 2 x 1                                                                                          | 17,80                                       | 245                                                | 450                                                                | 100/500                                         |
| 320201163          | 16 x 2 x 1                                                                                          | 19,00                                       | 280                                                | 503                                                                | 100/500                                         |
| 320201183          | 18 x 2 x 1                                                                                          | 20,00                                       | 316                                                | 555                                                                | 100/500                                         |
| 320201203          | 20 x 2 x 1                                                                                          | 21,40                                       | 350                                                | 615                                                                | 100/500                                         |
| 320215023          | 2 x 2 x 1,5                                                                                         | 9,50                                        | 52                                                 | 111                                                                | 100/500/1000                                    |
| 320215033          | 3 x 2 x 1,5                                                                                         | 10,10                                       | 78                                                 | 145                                                                | 100/500/1000                                    |
| 320215043          | 4 x 2 x 1,5                                                                                         | 11,10                                       | 104                                                | 185                                                                | 100/500/1000                                    |
| 320215053          | 5 x 2 x 1,5                                                                                         | 12,80                                       | 130                                                | 230                                                                | 100/500/1000                                    |
| 320215063          | 6 x 2 x 1,5                                                                                         | 13,90                                       | 150                                                | 274                                                                | 100/500/1000                                    |
| 320215073          | 7 x 2 x 1,5                                                                                         | 14,80                                       | 178                                                | 302                                                                | 100/500/1000                                    |
| 320215083          | 8 x 2 x 1,5                                                                                         | 15,30                                       | 208                                                | 337                                                                | 100/500                                         |
| 320215103          | 10 x 2 x 1,5                                                                                        | 17,60                                       | 255                                                | 425                                                                | 100/500                                         |
| 320215123          | 12 x 2 x 1,5                                                                                        | 18,00                                       | 305                                                | 486                                                                | 100/500                                         |
| 320215143          | 14 x 2 x 1,5                                                                                        | 19,20                                       | 353                                                | 557                                                                | 100/500                                         |
| 320215163          | 16 x 2 x 1,5                                                                                        | 20,60                                       | 400                                                | 633                                                                | 100/500                                         |
| 320215183          | 18 x 2 x 1,5                                                                                        | 21,70                                       | 448                                                | 700                                                                | 100/500                                         |
| 320215203          | 20 x 2 x 1,5                                                                                        | 23,50                                       | 505                                                | 793                                                                | 100/500                                         |
| 320225023          | 2 x 2 x 2,5                                                                                         | 11,70                                       | 88                                                 | 171                                                                | 100/500/1000                                    |
| 320225033          | 3 x 2 x 2,5                                                                                         | 12,90                                       | 126                                                | 251                                                                | 100/500/1000                                    |
| 320225043          | 4 x 2 x 2,5                                                                                         | 14,30                                       | 168                                                | 291                                                                | 100/500/1000                                    |
| 320225053          | 5 x 2 x 2,5                                                                                         | 15,80                                       | 210                                                | 361                                                                | 100/500/1000                                    |
| 320225063          | 6 x 2 x 2,5                                                                                         | 17,50                                       | 255                                                | 433                                                                | 100/500                                         |
| 320225073          | 7 x 2 x 2,5                                                                                         | 18,60                                       | 294                                                | 484                                                                | 100/500                                         |
| 320225083          | 8 x 2 x 2,5                                                                                         | 19,30                                       | 334                                                | 542                                                                | 100/500                                         |
| 320225103          | 10 x 2 x 2,5                                                                                        | 21,90                                       | 410                                                | 665                                                                | 100/500                                         |
| 320225123          | 12 x 2 x 2,5                                                                                        | 22,80                                       | 490                                                | 798                                                                | 100/500                                         |
| 320225143          | 14 x 2 x 2,5                                                                                        | 24,40                                       | 572                                                | 917                                                                | 100/500                                         |
| 320225163          | 16 x 2 x 2,5                                                                                        | 26,10                                       | 653                                                | 1050                                                               | 100/500                                         |
| 320225183          | 18 x 2 x 2,5                                                                                        | 27,60                                       | 734                                                | 1165                                                               | 100/500                                         |
| 320225203          | 20 x 2 x 2,5                                                                                        | 29,50                                       | 815                                                | 1290                                                               | 100/500                                         |

# LIHH-TP



ESNEK KABLO YAPISI/İNCELTİLMİŞ DIŞ ÇAP/KÜÇÜK BÜKÜLME YARIÇAPI/ALEV GECİKTİRİCİ ÖZELLİK/DÜŞÜK DUMAN YOĞUNLUĞU/ZEHİRLİ VE KOROZİF GAZLARDAN ARINDIRILMIŞ  
FLEXIBLE CABLE DESIGN/REDUCED OUTER DIAMETER/SMALL BENDING RADIUS/FLAME RETARDANT CHARACTERISTIC/LOW SMOKE EMISSION/WITHOUT POISONED AND CORROSIVE GASES



## KULLANIM ALANLARI

İnsanların yoğun olarak bulunduğu kapalı ortamlarda  
-Enstrüman ve Kontrol Mühendisliğinde  
-Endüstriyel Elektronikte  
-Bilgisayar ve Ofis Makinelerinde  
-Bina İçi Haberleşme Sistemlerinde  
-Bina İçi Ses Sistemlerinde  
-İnsan hayatının, değerli malzemelerin ve ekipmanların korunması gereken yerlerde

## APPLICATION

In closed areas where people are densely populated  
-Instrumentation and Control Engineering  
-Industrial Electronics  
-Computers and Office Machines  
-Indoor Communication Systems  
-Indoor Sound Systems  
-In places where human life and valuable materials and equipment need to be protected

## KABLO YAPISI

|                       |                                                                              |
|-----------------------|------------------------------------------------------------------------------|
| <b>1-İletken</b>      | IEC 60228; DIN VDE 0295; EN 60228 Sınıf 5<br>Bükülü Elektrolitik Tavlı Bakır |
| <b>2-Yalıtkan</b>     | EN 50290-2-26 HFFR Kompaund                                                  |
| <b>3-Yalıtım Renk</b> | DIN 47100                                                                    |
| <b>4-Büküm</b>        | Çift büküm katlar halinde                                                    |
| <b>5-Ayırıcı Bant</b> | Pes Bant                                                                     |
| <b>6-Kılıf</b>        | EN 50290-2-27 HFFR Kompaund                                                  |
| <b>7-Kılıf Rengi</b>  | RAL 7001 Gri                                                                 |

## CONSTRUCTION

|                        |                                                                                |
|------------------------|--------------------------------------------------------------------------------|
| <b>1-Conductor</b>     | IEC 60228; DIN VDE 0295; EN 60228 Class 5<br>Stranded Electrolytic Bare Copper |
| <b>2-Insulation</b>    | EN 50290-2-26 HFFR Compound                                                    |
| <b>3-Colour Code</b>   | DIN 47100                                                                      |
| <b>4-Stranding</b>     | Pairwise pairs in layers                                                       |
| <b>5-Wrapping</b>      | Pes Tape                                                                       |
| <b>6-Sheath</b>        | EN 50290-2-27 HFFR Compound                                                    |
| <b>7-Sheath Colour</b> | RAL 7001 Grey                                                                  |

## TEKNİK ÖZELLİKLER TECHNICAL CHARACTERISTICS

| İLETKEN DİRENCİ<br>CONDUCTOR<br>RESISTANCE | YALITIM DİRENCİ<br>INSULATION<br>RESISTANCE    | EFEKTİF KAPASİTE<br>MUTUAL<br>CAPACITANCE | AKIM TAŞIMA KAPASİTESİ<br>CURRENT CARRYING<br>CAPACITY | ÇALIŞMA VOLTAJI<br>OPERATING<br>VOLTAGE                                             | TEST VOLTAJI<br>TEST VOLTAGE                                                      | BÜKÜLME YARIÇAPI<br>BENDING RADIUS | ÇALIŞMA SICAKLIĞI<br>TEMPERATURE<br>RANGE | ALEV GECİKTİRİCİLİK<br>TESTİ<br>FLAME RETARDANT TEST |
|--------------------------------------------|------------------------------------------------|-------------------------------------------|--------------------------------------------------------|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------|-------------------------------------------|------------------------------------------------------|
| mm <sup>2</sup> Ω/km                       | MΩxkm                                          | mm <sup>2</sup> pF/m                      | mm <sup>2</sup> A                                      | 0,22mm <sup>2</sup> /0,34mm <sup>2</sup> = 250V<br>≥ 0,50mm <sup>2</sup> = 300/500V | 0,22mm <sup>2</sup> /0,34mm <sup>2</sup> = 1200V<br>≥ 0,50mm <sup>2</sup> = 2000V | 10x Cable Ø                        | - 30°C - +70°C                            | IEC 60332-1-2<br>DIN EN 60332-1-2<br>EN 60332-1-2    |
| 0,22 79                                    | 0,22mm <sup>2</sup> /0,34mm <sup>2</sup> = 200 | 0,22 100                                  | 0,22 2,5                                               |                                                                                     |                                                                                   |                                    |                                           |                                                      |
| 0,34 56                                    | ≥ 0,50mm <sup>2</sup> = 20                     | 0,34 100                                  | 0,34 4,5                                               |                                                                                     |                                                                                   |                                    |                                           |                                                      |
| 0,50 39                                    |                                                | 0,50 120                                  | 0,50 6,0                                               |                                                                                     |                                                                                   |                                    |                                           |                                                      |
| 0,75 26                                    |                                                | 0,75 120                                  | 0,75 13                                                |                                                                                     |                                                                                   |                                    |                                           |                                                      |
| 1,0 19,5                                   |                                                | 1,0 130                                   | 1,0 16                                                 |                                                                                     |                                                                                   |                                    |                                           |                                                      |
| 1,5 13,3                                   |                                                | 1,5 140                                   | 1,5 20                                                 |                                                                                     |                                                                                   |                                    |                                           |                                                      |
| 2,5 7,98                                   |                                                | 2,5 150                                   | 2,5 25                                                 |                                                                                     |                                                                                   |                                    |                                           |                                                      |

DUMAN YOĞUNLUĞU TESTİ  
SMOKE DENSITY TEST

IEC 61034-2  
VDE 0482-1034-2  
EN 61034-2

KOROZİF GAZ TESTİ  
TEST ON CORROSIVENESS  
OF COMBUSTION GASES

IEC 60754-2  
VDE 0482-754-2  
EN 60754-2

HALOJENSİZLİK TESTİ  
HALOGEN FREE TEST

IEC 60754-1  
VDE 0482-754-1  
EN 60754-1

ALEV YAYILIMI TESTİ  
FLAME PROPAGATION TEST

IEC 60332-3-24  
DIN EN 60332-3-24  
EN 60332-3-24

## NOTLAR

Esnek yapıları ile dar alanlarda rahatlıkla uygulanabilirler.  
Bu tip kablolar dış ortamlarda kullanıma uygun değildir.  
**LIHH-TP-OZ:** Numara kodlu siyah damarlar.

## NOTES

With its flexible design it can easily be used in narrow spaces.  
These cables are not suitable for outdoor use.  
**LIHH-TP-OZ:** Number coded black cores.

## LIHH-TP

| KOD NO<br>CODE NR. | ÇİFT SAYISI VE KESİTİ (mm <sup>2</sup> )<br>NUMBER OF PAIRS AND CROSS SECTION<br>(mm <sup>2</sup> ) | KABLO ÇAPI (mm)<br>OVERALL DIAMETER<br>(mm) | BAKIR AĞIRLIĞI (kg/km)<br>COPPER WEIGHT<br>(kg/km) | YAKLAŞIK KABLO AĞIRLIĞI (kg/km)<br>APPROX. CABLE WEIGHT<br>(kg/km) | STANDART<br>UZUNLUK (m)<br>STANDARD LENGTH (m) |
|--------------------|-----------------------------------------------------------------------------------------------------|---------------------------------------------|----------------------------------------------------|--------------------------------------------------------------------|------------------------------------------------|
| 320422023          | 2 x 2 x 0,22                                                                                        | 5,20                                        | 9                                                  | 29                                                                 | 100/500/1000                                   |
| 320422033          | 3 x 2 x 0,22                                                                                        | 5,50                                        | 13                                                 | 39                                                                 | 100/500/1000                                   |
| 320422043          | 4 x 2 x 0,22                                                                                        | 6,00                                        | 17                                                 | 51                                                                 | 100/500/1000                                   |
| 320422053          | 5 x 2 x 0,22                                                                                        | 6,90                                        | 21                                                 | 65                                                                 | 100/500/1000                                   |
| 320422063          | 6 x 2 x 0,22                                                                                        | 7,40                                        | 26                                                 | 77                                                                 | 100/500/1000                                   |
| 320422083          | 8 x 2 x 0,22                                                                                        | 8,20                                        | 33                                                 | 95                                                                 | 100/500/1000                                   |
| 320422103          | 10 x 2 x 0,22                                                                                       | 9,40                                        | 41                                                 | 118                                                                | 100/500/1000                                   |
| 320422123          | 12 x 2 x 0,22                                                                                       | 9,60                                        | 49                                                 | 133                                                                | 100/500/1000                                   |
| 320422143          | 14 x 2 x 0,22                                                                                       | 10,20                                       | 57                                                 | 151                                                                | 100/500/1000                                   |
| 320422163          | 16 x 2 x 0,22                                                                                       | 10,80                                       | 65                                                 | 173                                                                | 100/500/1000                                   |
| 320422183          | 18 x 2 x 0,22                                                                                       | 11,40                                       | 73                                                 | 185                                                                | 100/500/1000                                   |
| 320422203          | 20 x 2 x 0,22                                                                                       | 12,50                                       | 81                                                 | 212                                                                | 100/500/1000                                   |
| 320434023          | 2 x 2 x 0,34                                                                                        | 5,70                                        | 13                                                 | 39                                                                 | 100/500/1000                                   |
| 320434033          | 3 x 2 x 0,34                                                                                        | 6,00                                        | 19                                                 | 52                                                                 | 100/500/1000                                   |
| 320434043          | 4 x 2 x 0,34                                                                                        | 7,00                                        | 26                                                 | 75                                                                 | 100/500/1000                                   |
| 320434053          | 5 x 2 x 0,34                                                                                        | 7,80                                        | 32                                                 | 88                                                                 | 100/500/1000                                   |
| 320434063          | 6 x 2 x 0,34                                                                                        | 8,40                                        | 38                                                 | 102                                                                | 100/500/1000                                   |
| 320434073          | 7 x 2 x 0,34                                                                                        | 8,90                                        | 45                                                 | 111                                                                | 100/500/1000                                   |
| 320434083          | 8 x 2 x 0,34                                                                                        | 9,40                                        | 51                                                 | 126                                                                | 100/500/1000                                   |
| 320434103          | 10 x 2 x 0,34                                                                                       | 10,60                                       | 64                                                 | 151                                                                | 100/500/1000                                   |
| 320434123          | 12 x 2 x 0,34                                                                                       | 10,90                                       | 77                                                 | 175                                                                | 100/500/1000                                   |
| 320434143          | 14 x 2 x 0,34                                                                                       | 11,60                                       | 90                                                 | 205                                                                | 100/500/1000                                   |
| 320434163          | 16 x 2 x 0,34                                                                                       | 12,70                                       | 102                                                | 240                                                                | 100/500/1000                                   |
| 320434183          | 18 x 2 x 0,34                                                                                       | 13,40                                       | 115                                                | 255                                                                | 100/500/1000                                   |
| 320434203          | 20 x 2 x 0,34                                                                                       | 14,20                                       | 128                                                | 279                                                                | 100/500/1000                                   |
| 320450023          | 2 x 2 x 0,50                                                                                        | 7,30                                        | 19                                                 | 60                                                                 | 100/500/1000                                   |
| 320450033          | 3 x 2 x 0,50                                                                                        | 7,80                                        | 28                                                 | 70                                                                 | 100/500/1000                                   |
| 320450043          | 4 x 2 x 0,50                                                                                        | 8,50                                        | 38                                                 | 97                                                                 | 100/500/1000                                   |
| 320450053          | 5 x 2 x 0,50                                                                                        | 9,80                                        | 47                                                 | 116                                                                | 100/500/1000                                   |
| 320450063          | 6 x 2 x 0,50                                                                                        | 10,60                                       | 57                                                 | 130                                                                | 100/500/1000                                   |
| 320450073          | 7 x 2 x 0,50                                                                                        | 11,20                                       | 66                                                 | 158                                                                | 100/500/1000                                   |
| 320450083          | 8 x 2 x 0,50                                                                                        | 11,60                                       | 70                                                 | 178                                                                | 100/500/1000                                   |
| 320450103          | 10 x 2 x 0,50                                                                                       | 13,60                                       | 87                                                 | 221                                                                | 100/500/1000                                   |
| 320450123          | 12 x 2 x 0,50                                                                                       | 13,90                                       | 107                                                | 258                                                                | 100/500                                        |
| 320450143          | 14 x 2 x 0,50                                                                                       | 14,80                                       | 125                                                | 290                                                                | 100/500                                        |
| 320450163          | 16 x 2 x 0,50                                                                                       | 15,80                                       | 142                                                | 320                                                                | 100/500                                        |
| 320450183          | 18 x 2 x 0,50                                                                                       | 16,80                                       | 155                                                | 350                                                                | 100/500                                        |
| 320450203          | 20 x 2 x 0,50                                                                                       | 17,80                                       | 170                                                | 394                                                                | 100/500                                        |

## LIHH-TP

| KOD NO<br>CODE NR. | ÇİFT SAYISI VE KESİTİ (mm <sup>2</sup> )<br>NUMBER OF PAIRS AND CROSS SECTION<br>(mm <sup>2</sup> ) | KABLO ÇAPI (mm)<br>OVERALL DIAMETER<br>(mm) | BAKIR AĞIRLIĞI (kg/km)<br>COPPER WEIGHT<br>(kg/km) | YAKLAŞIK KABLO AĞIRLIĞI (kg/km)<br>APPROX. CABLE WEIGHT<br>(kg/km) | STANDART<br>UZUNLUK (mt)<br>STANDARD LENGTH (m) |
|--------------------|-----------------------------------------------------------------------------------------------------|---------------------------------------------|----------------------------------------------------|--------------------------------------------------------------------|-------------------------------------------------|
| 320475023          | 2 x 2 x 0,75                                                                                        | 8,00                                        | 26                                                 | 67                                                                 | 100/500/1000                                    |
| 320475033          | 3 x 2 x 0,75                                                                                        | 8,50                                        | 39                                                 | 95                                                                 | 100/500/1000                                    |
| 320475043          | 4 x 2 x 0,75                                                                                        | 9,60                                        | 52                                                 | 126                                                                | 100/500/1000                                    |
| 320475053          | 5 x 2 x 0,75                                                                                        | 10,60                                       | 65                                                 | 151                                                                | 100/500/1000                                    |
| 320475063          | 6 x 2 x 0,75                                                                                        | 11,60                                       | 78                                                 | 180                                                                | 100/500/1000                                    |
| 320475073          | 7 x 2 x 0,75                                                                                        | 12,70                                       | 91                                                 | 207                                                                | 100/500/1000                                    |
| 320475083          | 8 x 2 x 0,75                                                                                        | 13,10                                       | 104                                                | 230                                                                | 100/500                                         |
| 320475103          | 10 x 2 x 0,75                                                                                       | 14,90                                       | 130                                                | 284                                                                | 100/500                                         |
| 320475123          | 12 x 2 x 0,75                                                                                       | 15,20                                       | 156                                                | 317                                                                | 100/500                                         |
| 320475143          | 14 x 2 x 0,75                                                                                       | 16,40                                       | 182                                                | 370                                                                | 100/500                                         |
| 320475163          | 16 x 2 x 0,75                                                                                       | 17,50                                       | 208                                                | 418                                                                | 100/500                                         |
| 320475183          | 18 x 2 x 0,75                                                                                       | 18,40                                       | 230                                                | 459                                                                | 100/500                                         |
| 320475203          | 20 x 2 x 0,75                                                                                       | 19,60                                       | 260                                                | 505                                                                | 100/500                                         |
| 320401023          | 2 x 2 x 1                                                                                           | 8,60                                        | 36                                                 | 92                                                                 | 100/500/1000                                    |
| 320401033          | 3 x 2 x 1                                                                                           | 9,40                                        | 54                                                 | 128                                                                | 100/500/1000                                    |
| 320401043          | 4 x 2 x 1                                                                                           | 10,40                                       | 72                                                 | 160                                                                | 100/500/1000                                    |
| 320401053          | 5 x 2 x 1                                                                                           | 11,50                                       | 90                                                 | 185                                                                | 100/500/1000                                    |
| 320401063          | 6 x 2 x 1                                                                                           | 13,00                                       | 108                                                | 227                                                                | 100/500/1000                                    |
| 320401073          | 7 x 2 x 1                                                                                           | 13,70                                       | 120                                                | 253                                                                | 100/500/1000                                    |
| 320401083          | 8 x 2 x 1                                                                                           | 14,20                                       | 140                                                | 280                                                                | 100/500                                         |
| 320401103          | 10 x 2 x 1                                                                                          | 16,10                                       | 175                                                | 342                                                                | 100/500                                         |
| 320401123          | 12 x 2 x 1                                                                                          | 16,70                                       | 210                                                | 402                                                                | 100/500                                         |
| 320401143          | 14 x 2 x 1                                                                                          | 17,80                                       | 245                                                | 459                                                                | 100/500                                         |
| 320401163          | 16 x 2 x 1                                                                                          | 19,00                                       | 272                                                | 521                                                                | 100/500                                         |
| 320401183          | 18 x 2 x 1                                                                                          | 20,00                                       | 315                                                | 573                                                                | 100/500                                         |
| 320401203          | 20 x 2 x 1                                                                                          | 21,30                                       | 345                                                | 632                                                                | 100/500                                         |
| 320415023          | 2 x 2 x 1,5                                                                                         | 9,40                                        | 52                                                 | 117                                                                | 100/500/1000                                    |
| 320415033          | 3 x 2 x 1,5                                                                                         | 10,10                                       | 78                                                 | 150                                                                | 100/500/1000                                    |
| 320415043          | 4 x 2 x 1,5                                                                                         | 11,20                                       | 104                                                | 190                                                                | 100/500/1000                                    |
| 320415053          | 5 x 2 x 1,5                                                                                         | 12,80                                       | 130                                                | 240                                                                | 100/500/1000                                    |
| 320415063          | 6 x 2 x 1,5                                                                                         | 13,90                                       | 151                                                | 280                                                                | 100/500/1000                                    |
| 320415073          | 7 x 2 x 1,5                                                                                         | 14,80                                       | 177                                                | 310                                                                | 100/500/1000                                    |
| 320415083          | 8 x 2 x 1,5                                                                                         | 15,30                                       | 204                                                | 348                                                                | 100/500                                         |
| 320415103          | 10 x 2 x 1,5                                                                                        | 17,60                                       | 246                                                | 433                                                                | 100/500                                         |
| 320415123          | 12 x 2 x 1,5                                                                                        | 18,00                                       | 295                                                | 501                                                                | 100/500                                         |
| 320415143          | 14 x 2 x 1,5                                                                                        | 19,20                                       | 345                                                | 574                                                                | 100/500                                         |
| 320415163          | 16 x 2 x 1,5                                                                                        | 20,50                                       | 390                                                | 654                                                                | 100/500                                         |
| 320415183          | 18 x 2 x 1,5                                                                                        | 21,60                                       | 440                                                | 719                                                                | 100/500                                         |
| 320415203          | 20 x 2 x 1,5                                                                                        | 23,40                                       | 490                                                | 817                                                                | 100/500                                         |

LIYCY



İYİ EMC\* ÖZELLİK/ESNEK KABLO YAPISI/İNCELTİLMİŞ DIŞ ÇAP/KÜÇÜK BÜKÜLME YARIÇAPI/ALEV GECİKTİRİCİ ÖZELLİK  
GOOD EMC\* CHARACTERISTIC/FLEXIBLE CABLE DESIGN/REDUCED OUTER DIAMETER/SMALL BENDING RADIUS/  
FLAME RETARDANT CHARACTERISTIC



## KULLANIM ALANLARI

Elektromanyetik karışım ve girişimlerin olduğu

- Enstrüman ve Kontrol Mühendisliğinde
- Endüstriyel Elektronikte
- Bilgisayar ve Ofis Makinelerinde
- Bina İçi Haberleşme Sistemlerinde
- Bina İçi Ses Sistemlerinde
- Güvenlik Sistemlerinde

## APPLICATION

In places where electro-magnetic interference and influence exists

- Instrumentation and Control Engineering
- Industrial Electronics
- Computers and Office Machines
- Indoor Communication Systems
- Indoor Sound Systems
- Security Systems

## KABLO YAPISI

- 1-İletken** IEC 60228; DIN VDE 0295; EN 60228 Sınıf 5  
Bükülü Elektrolitik Tavlı Bakır
- 2-Yalıtkan** EN 50290-2-21 PVC Kompaund
- 3-Yalıtım Renk** DIN 47100
- 4-Büküm** Uygun adımda katlar halinde
- 5-Ayırıcı Bant** Pes Bant
- 6-Ekran** Kalaylı Bakır Örgü
- 7-Kılıf** EN 50290-2-22 PVC Kompaund
- 8-Kılıf Rengi** RAL 7001 Gri

## CONSTRUCTION

- 1-Conductor** IEC 60228; DIN VDE 0295; EN 60228 Class 5  
Stranded Electrolytic Bare Copper
- 2-Insulation** EN 50290-2-21 PVC Compound
- 3-Colour Code** DIN 47100
- 4-Stranding** In layers of optimum pitch
- 5-Wrapping** Pes Tape
- 6-Screen** Tinned Copper Braid
- 7-Sheath** EN 50290-2-22 PVC Compound
- 8-Sheath Colour** RAL 7001 Grey

## TEKNİK ÖZELLİKLER TECHNICAL CHARACTERISTICS

| İLETKEN DİRENCİ<br>CONDUCTOR<br>RESISTANCE | YALITIM DİRENCİ<br>INSULATION<br>RESISTANCE    | EFEKTİF KAPASİTE<br>MUTUAL<br>CAPACITANCE | EMPEDANS<br>IMPEDANCE | İNDÜKTANS<br>INDUCTANCE | AKIM TAŞIMA KAPASİTESİ<br>CURRENT CARRYING<br>CAPACITY | ÇALIŞMA VOLTAJI<br>OPERATING<br>VOLTAGE                                             | TEST VOLTAJI<br>TEST VOLTAGE                                                      |
|--------------------------------------------|------------------------------------------------|-------------------------------------------|-----------------------|-------------------------|--------------------------------------------------------|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
| mm <sup>2</sup> Ω/km                       | MΩxkm                                          | mm <sup>2</sup> pF/m                      | 78Ω                   | 0,67mH/km               | mm <sup>2</sup> A                                      | 0,22mm <sup>2</sup> /0,34mm <sup>2</sup> = 250V<br>≥ 0,50mm <sup>2</sup> = 300/500V | 0,22mm <sup>2</sup> /0,34mm <sup>2</sup> = 1200V<br>≥ 0,50mm <sup>2</sup> = 2000V |
| 0,22 79                                    | 0,22mm <sup>2</sup> /0,34mm <sup>2</sup> = 200 | 0,22 110                                  |                       |                         | 0,22 2,5                                               |                                                                                     |                                                                                   |
| 0,34 56                                    | ≥ 0,50mm <sup>2</sup> = 20                     | 0,34 110                                  |                       |                         | 0,34 4,5                                               |                                                                                     |                                                                                   |
| 0,50 39                                    |                                                | 0,50 120                                  |                       |                         | 0,50 6,0                                               |                                                                                     |                                                                                   |
| 0,75 26                                    |                                                | 0,75 120                                  |                       |                         | 0,75 13                                                |                                                                                     |                                                                                   |
| 1,0 19,5                                   |                                                | 1,0 130                                   |                       |                         | 1,0 16                                                 |                                                                                     |                                                                                   |
| 1,5 13,3                                   |                                                | 1,5 140                                   |                       |                         | 1,5 20                                                 |                                                                                     |                                                                                   |
| 2,5 7,98                                   |                                                | 2,5 150                                   |                       |                         | 2,5 25                                                 |                                                                                     |                                                                                   |

| BÜKÜLME YARIÇAPI<br>BENDING RADIUS | ÇALIŞMA SICAKLIĞI<br>TEMPERATURE RANGE | ALEV GECİKTİRİCİLİK TESTİ<br>FLAME RETARDANT TEST | EMC*<br>EMC*                                            |
|------------------------------------|----------------------------------------|---------------------------------------------------|---------------------------------------------------------|
| 10x Cable Ø                        | - 30°C - +70°C                         | IEC 60332-1-2<br>DIN EN 60332-1-2<br>EN 60332-1-2 | ELEKTROMANYETİK UYUMLU<br>ELECTROMAGNETIC COMPATIBILITY |

## NOTLAR

Esnek yapıları ile dar alanlarda rahatlıkla uygulanabilirler.

Bu tip kablolar dış ortamlarda kullanıma uygun değildir.

**LIYCY-OZ:** Yeşil/sarı toprak koruma damarsız kablo.

**LIYCY-JZ:** Yeşil/sarı toprak koruma damarlı kablo.

## NOTES

With its flexible design it can easily be used in narrow spaces.

These cables are not suitable for outdoor use.

**LIYCY-OZ:** Without green/yellow earthing core.

**LIYCY-JZ:** With green/yellow earthing core.

LIYCY

| KOD NO<br>CODE NR. | DAMAR SAYISI VE KESİTİ (mm <sup>2</sup> )<br>NUMBER OF CORE AND CROSS<br>SECTION (mm <sup>2</sup> ) | KABLO ÇAPİ (mm)<br>OVERALL DIAMETER<br>(mm) | BAKIR AĞIRLIĞI (kg/km)<br>COPPER WEIGHT<br>(kg/km) | YAKLAŞIK KABLO AĞIRLIĞI (kg/km)<br>APPROX. CABLE WEIGHT<br>(kg/km) | STANDART<br>UZUNLUK (mt)<br>STANDARD LENGTH (m) |
|--------------------|-----------------------------------------------------------------------------------------------------|---------------------------------------------|----------------------------------------------------|--------------------------------------------------------------------|-------------------------------------------------|
| 321022023          | 2 x 0,22                                                                                            | 4,10                                        | 12                                                 | 25                                                                 | 100/500/1000                                    |
| 321022033          | 3 x 0,22                                                                                            | 4,30                                        | 16                                                 | 28                                                                 | 100/500/1000                                    |
| 321022043          | 4 x 0,22                                                                                            | 4,70                                        | 18                                                 | 37                                                                 | 100/500/1000                                    |
| 321022053          | 5 x 0,22                                                                                            | 5,00                                        | 22                                                 | 42                                                                 | 100/500/1000                                    |
| 321122063          | 6 x 0,22                                                                                            | 5,30                                        | 24                                                 | 48                                                                 | 100/500/1000                                    |
| 321122083          | 8 x 0,22                                                                                            | 5,60                                        | 30                                                 | 58                                                                 | 100/500/1000                                    |
| 321122103          | 10 x 0,22                                                                                           | 6,60                                        | 36                                                 | 75                                                                 | 100/500/1000                                    |
| 321122123          | 12 x 0,22                                                                                           | 7,10                                        | 42                                                 | 86                                                                 | 100/500/1000                                    |
| 321122143          | 14 x 0,22                                                                                           | 7,40                                        | 48                                                 | 91                                                                 | 100/500/1000                                    |
| 321122163          | 16 x 0,22                                                                                           | 7,70                                        | 52                                                 | 103                                                                | 100/500/1000                                    |
| 321122183          | 18 x 0,22                                                                                           | 8,00                                        | 56                                                 | 110                                                                | 100/500/1000                                    |
| 321122203          | 20 x 0,22                                                                                           | 8,20                                        | 62                                                 | 120                                                                | 100/500/1000                                    |
| 321034023          | 2 x 0,34                                                                                            | 4,60                                        | 14                                                 | 29                                                                 | 100/500/1000                                    |
| 321034033          | 3 x 0,34                                                                                            | 4,80                                        | 17                                                 | 34                                                                 | 100/500/1000                                    |
| 321034043          | 4 x 0,34                                                                                            | 5,10                                        | 20                                                 | 44                                                                 | 100/500/1000                                    |
| 321034053          | 5 x 0,34                                                                                            | 5,60                                        | 24                                                 | 53                                                                 | 100/500/1000                                    |
| 321134063          | 6 x 0,34                                                                                            | 5,90                                        | 28                                                 | 60                                                                 | 100/500/1000                                    |
| 321134083          | 8 x 0,34                                                                                            | 6,20                                        | 35                                                 | 72                                                                 | 100/500/1000                                    |
| 321134103          | 10 x 0,34                                                                                           | 7,60                                        | 43                                                 | 87                                                                 | 100/500/1000                                    |
| 321134123          | 12 x 0,34                                                                                           | 7,90                                        | 50                                                 | 100                                                                | 100/500/1000                                    |
| 321134143          | 14 x 0,34                                                                                           | 8,30                                        | 57                                                 | 116                                                                | 100/500/1000                                    |
| 321134163          | 16 x 0,34                                                                                           | 8,70                                        | 64                                                 | 128                                                                | 100/500/1000                                    |
| 321134183          | 18 x 0,34                                                                                           | 9,20                                        | 71                                                 | 140                                                                | 100/500/1000                                    |
| 321134203          | 20 x 0,34                                                                                           | 9,70                                        | 80                                                 | 153                                                                | 100/500/1000                                    |
| 321050023          | 2 x 0,50                                                                                            | 5,40                                        | 17                                                 | 31                                                                 | 100/500/1000                                    |
| 321050033          | 3 x 0,50                                                                                            | 5,60                                        | 21                                                 | 51                                                                 | 100/500/1000                                    |
| 321050043          | 4 x 0,50                                                                                            | 6,10                                        | 26                                                 | 64                                                                 | 100/500/1000                                    |
| 321050053          | 5 x 0,50                                                                                            | 6,90                                        | 31                                                 | 74                                                                 | 100/500/1000                                    |
| 321150063          | 6 x 0,50                                                                                            | 7,40                                        | 36                                                 | 86                                                                 | 100/500/1000                                    |
| 321150073          | 7 x 0,50                                                                                            | 7,40                                        | 41                                                 | 93                                                                 | 100/500/1000                                    |
| 321150083          | 8 x 0,50                                                                                            | 7,70                                        | 46                                                 | 105                                                                | 100/500/1000                                    |
| 321150103          | 10 x 0,50                                                                                           | 9,40                                        | 56                                                 | 129                                                                | 100/500/1000                                    |
| 321150123          | 12 x 0,50                                                                                           | 9,60                                        | 66                                                 | 140                                                                | 100/500/1000                                    |
| 321150143          | 14 x 0,50                                                                                           | 10,10                                       | 75                                                 | 160                                                                | 100/500/1000                                    |
| 321150163          | 16 x 0,50                                                                                           | 10,70                                       | 86                                                 | 180                                                                | 100/500/1000                                    |
| 321150183          | 18 x 0,50                                                                                           | 11,20                                       | 94                                                 | 196                                                                | 100/500/1000                                    |
| 321150203          | 20 x 0,50                                                                                           | 11,60                                       | 105                                                | 215                                                                | 100/500/1000                                    |
| 321075023          | 2 x 0,75                                                                                            | 5,80                                        | 20                                                 | 53                                                                 | 100/500/1000                                    |
| 321075033          | 3 x 0,75                                                                                            | 6,10                                        | 30                                                 | 64                                                                 | 100/500/1000                                    |
| 321075043          | 4 x 0,75                                                                                            | 6,70                                        | 42                                                 | 77                                                                 | 100/500/1000                                    |
| 321075053          | 5 x 0,75                                                                                            | 7,40                                        | 48                                                 | 94                                                                 | 100/500/1000                                    |
| 321175063          | 6 x 0,75                                                                                            | 8,00                                        | 57                                                 | 110                                                                | 100/500/1000                                    |
| 321175073          | 7 x 0,75                                                                                            | 8,00                                        | 64                                                 | 113                                                                | 100/500/1000                                    |
| 321175083          | 8 x 0,75                                                                                            | 8,40                                        | 72                                                 | 125                                                                | 100/500/1000                                    |
| 321175103          | 10 x 0,75                                                                                           | 10,20                                       | 83                                                 | 155                                                                | 100/500/1000                                    |
| 321175123          | 12 x 0,75                                                                                           | 10,50                                       | 101                                                | 176                                                                | 100/500/1000                                    |
| 321175143          | 14 x 0,75                                                                                           | 11,00                                       | 106                                                | 200                                                                | 100/500/1000                                    |
| 321175163          | 16 x 0,75                                                                                           | 11,60                                       | 120                                                | 225                                                                | 100/500/1000                                    |
| 321175183          | 18 x 0,75                                                                                           | 12,60                                       | 134                                                | 261                                                                | 100/500/1000                                    |
| 321175203          | 20 x 0,75                                                                                           | 13,00                                       | 146                                                | 280                                                                | 100/500/1000                                    |

LIYCY

| KOD NO<br>CODE NR. | DAMAR SAYISI VE KESİTİ (mm <sup>2</sup> )<br>NUMBER OF CORE AND CROSS<br>SECTION (mm <sup>2</sup> ) | KABLO ÇAPİ (mm)<br>OVERALL DIAMETER<br>(mm) | BAKIR AĞIRLIĞI (kg/km)<br>COPPER WEIGHT<br>(kg/km) | YAKLAŞIK KABLO AĞIRLIĞI (kg/km)<br>APPROX. CABLE WEIGHT<br>(kg/km) | STANDART<br>UZUNLUK (m)<br>STANDARD LENGTH (m) |
|--------------------|-----------------------------------------------------------------------------------------------------|---------------------------------------------|----------------------------------------------------|--------------------------------------------------------------------|------------------------------------------------|
| 321001023          | 2 x 1                                                                                               | 6,20                                        | 27                                                 | 61                                                                 | 100/500/1000                                   |
| 321001033          | 3 x 1                                                                                               | 6,70                                        | 36                                                 | 76                                                                 | 100/500/1000                                   |
| 321001043          | 4 x 1                                                                                               | 7,20                                        | 47                                                 | 91                                                                 | 100/500/1000                                   |
| 321001053          | 5 x 1                                                                                               | 7,90                                        | 55                                                 | 109                                                                | 100/500/1000                                   |
| 321101063          | 6 x 1                                                                                               | 8,50                                        | 65                                                 | 127                                                                | 100/500/1000                                   |
| 321101073          | 7 x 1                                                                                               | 8,50                                        | 73                                                 | 136                                                                | 100/500/1000                                   |
| 321101083          | 8 x 1                                                                                               | 9,20                                        | 82                                                 | 153                                                                | 100/500/1000                                   |
| 321101103          | 10 x 1                                                                                              | 10,90                                       | 103                                                | 190                                                                | 100/500/1000                                   |
| 321101123          | 12 x 1                                                                                              | 11,30                                       | 120                                                | 215                                                                | 100/500/1000                                   |
| 321101143          | 14 x 1                                                                                              | 12,20                                       | 147                                                | 254                                                                | 100/500/1000                                   |
| 321101163          | 16 x 1                                                                                              | 12,50                                       | 156                                                | 282                                                                | 100/500/1000                                   |
| 321101183          | 18 x 1                                                                                              | 13,60                                       | 174                                                | 317                                                                | 100/500/1000                                   |
| 321101203          | 20 x 1                                                                                              | 14,00                                       | 195                                                | 339                                                                | 100/500/1000                                   |
| 321015023          | 2 x 1,5                                                                                             | 6,80                                        | 35                                                 | 79                                                                 | 100/500/1000                                   |
| 321015033          | 3 x 1,5                                                                                             | 7,10                                        | 48                                                 | 99                                                                 | 100/500/1000                                   |
| 321015043          | 4 x 1,5                                                                                             | 7,70                                        | 61                                                 | 108                                                                | 100/500/1000                                   |
| 321015053          | 5 x 1,5                                                                                             | 8,50                                        | 76                                                 | 135                                                                | 100/500/1000                                   |
| 321115063          | 6 x 1,5                                                                                             | 9,30                                        | 88                                                 | 160                                                                | 100/500/1000                                   |
| 321115073          | 7 x 1,5                                                                                             | 9,30                                        | 101                                                | 170                                                                | 100/500/1000                                   |
| 321115083          | 8 x 1,5                                                                                             | 9,80                                        | 114                                                | 190                                                                | 100/500/1000                                   |
| 321115103          | 10 x 1,5                                                                                            | 12,20                                       | 141                                                | 245                                                                | 100/500/1000                                   |
| 321115123          | 12 x 1,5                                                                                            | 12,50                                       | 168                                                | 280                                                                | 100/500/1000                                   |
| 321115143          | 14 x 1,5                                                                                            | 13,10                                       | 190                                                | 313                                                                | 100/500/1000                                   |
| 321115163          | 16 x 1,5                                                                                            | 13,90                                       | 216                                                | 353                                                                | 100/500/1000                                   |
| 321115183          | 18 x 1,5                                                                                            | 14,50                                       | 244                                                | 392                                                                | 100/500/1000                                   |
| 321115203          | 20 x 1,5                                                                                            | 15,50                                       | 270                                                | 426                                                                | 100/500/1000                                   |
| 321025023          | 2 x 2,5                                                                                             | 8,20                                        | 53                                                 | 102                                                                | 100/500/1000                                   |
| 321025033          | 3 x 2,5                                                                                             | 8,40                                        | 75                                                 | 135                                                                | 100/500/1000                                   |
| 321025043          | 4 x 2,5                                                                                             | 9,60                                        | 97                                                 | 169                                                                | 100/500/1000                                   |
| 321025053          | 5 x 2,5                                                                                             | 10,60                                       | 120                                                | 201                                                                | 100/500/1000                                   |
| 321125063          | 6 x 2,5                                                                                             | 11,50                                       | 141                                                | 244                                                                | 100/500/1000                                   |
| 321125073          | 7 x 2,5                                                                                             | 11,50                                       | 161                                                | 260                                                                | 100/500/1000                                   |
| 321125083          | 8 x 2,5                                                                                             | 12,50                                       | 185                                                | 305                                                                | 100/500/1000                                   |
| 321125103          | 10 x 2,5                                                                                            | 15,00                                       | 230                                                | 371                                                                | 100/500/1000                                   |
| 321125123          | 12 x 2,5                                                                                            | 15,40                                       | 271                                                | 422                                                                | 100/500/1000                                   |
| 321125143          | 14 x 2,5                                                                                            | 16,40                                       | 314                                                | 502                                                                | 100/500/1000                                   |
| 321125163          | 16 x 2,5                                                                                            | 17,40                                       | 354                                                | 561                                                                | 100/500/1000                                   |
| 321125183          | 18 x 2,5                                                                                            | 18,30                                       | 395                                                | 625                                                                | 100/500/1000                                   |
| 321125203          | 20 x 2,5                                                                                            | 18,90                                       | 437                                                | 676                                                                | 100/500/1000                                   |

**LIHCH**

ESNEK KABLO YAPISI/İNCELTİLMİŞ DIŞ ÇAP/KÜÇÜK BÜKÜLME YARIÇAPI/İYİ EMC\* ÖZELLİK/ALEV GECİKTİRİCİ ÖZELLİK/DÜŞÜK DUMAN YOĞUNLUĞU/ZEHİRLİ VE KOROZİF GAZLARDAN ARINDIRILMIŞ  
FLEXIBLE CABLE DESIGN/REDUCED OUTER DIAMETER/SMALL BENDING RADIUS/GOOD EMC\* CHARACTERISTIC/FLAME RETARDANT CHARACTERISTIC/LOW SMOKE EMISSION/WITHOUT POISONED AND CORROSIVE GASES



## KULLANIM ALANLARI

Elektromanyetik karışım ve girişimlerin olduğu  
İnsanların yoğun olarak bulunduğu kapalı ortamlarda  
-Enstrüman ve Kontrol Mühendisliğinde  
-Endüstriyel Elektronikte  
-Bilgisayar ve Ofis Makinelerinde  
-Bina İçi Haberleşme Sistemlerinde  
-Bina İçi Ses Sistemlerinde  
-İnsan hayatının, değerli malzemelerin ve ekipmanların korunması gereken yerlerde

## KABLO YAPISI

|                       |                                                                              |
|-----------------------|------------------------------------------------------------------------------|
| <b>1-İletken</b>      | IEC 60228; DIN VDE 0295; EN 60228 Sınıf 5<br>Bükülü Elektrolitik Tavlı Bakır |
| <b>2-Yalıtkan</b>     | EN 50290-2-26 HFFR Kompaund                                                  |
| <b>3-Yalıtım Renk</b> | DIN 47100                                                                    |
| <b>4-Büküm</b>        | Uygun adımda katlar halinde                                                  |
| <b>5-Ayırıcı Bant</b> | Pes Bant                                                                     |
| <b>6-Ekran</b>        | Kalaylı Bakır Örgü                                                           |
| <b>7-Kılıf</b>        | EN 50290-2-27 HFFR Kompaund                                                  |
| <b>8-Kılıf Rengi</b>  | RAL 7001 Gri                                                                 |

## APPLICATION

In places where electro-magnetic interference and influence exists  
In closed areas where people are densely populated  
-Instrumentation and Control Engineering  
-Industrial Electronics  
-Computers and Office Machines  
-Indoor Communication Systems  
-Indoor Sound Systems  
-In places where human life and valuable materials and equipment need to be protected

## CONSTRUCTION

|                        |                                                                                |
|------------------------|--------------------------------------------------------------------------------|
| <b>1-Conductor</b>     | IEC 60228; DIN VDE 0295; EN 60228 Class 5<br>Stranded Electrolytic Bare Copper |
| <b>2-Insulation</b>    | EN 50290-2-26 HFFR Compound                                                    |
| <b>3-Colour Code</b>   | DIN 47100                                                                      |
| <b>4-Stranding</b>     | In layers of optimum pitch                                                     |
| <b>5-Wrapping</b>      | Pes Tape                                                                       |
| <b>6-Screen</b>        | Tinned Copper Braid                                                            |
| <b>7-Sheath</b>        | EN 50290-2-27 HFFR Compound                                                    |
| <b>8-Sheath Colour</b> | RAL 7001 Grey                                                                  |

## TEKNİK ÖZELLİKLER TECHNICAL CHARACTERISTICS

| İLETKEN DİRENCİ<br>CONDUCTOR<br>RESISTANCE | YALITIM DİRENCİ<br>INSULATION<br>RESISTANCE    | EFEKTİF KAPASİTE<br>MUTUAL<br>CAPACITANCE | EMPEDANS<br>IMPEDANCE | İNDÜKTANS<br>INDUCTANCE | AKIM TAŞIMA KAPASİTESİ<br>CURRENT CARRYING<br>CAPACITY | ÇALIŞMA VOLTAJI<br>OPERATING<br>VOLTAGE                                             | TEST VOLTAJI<br>TEST VOLTAGE                                                      |
|--------------------------------------------|------------------------------------------------|-------------------------------------------|-----------------------|-------------------------|--------------------------------------------------------|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
| mm <sup>2</sup> Ω/km                       | MΩxkm                                          | mm <sup>2</sup> pF/m                      | 78Ω                   | 0,67mH/km               | mm <sup>2</sup> A                                      | 0,22mm <sup>2</sup> /0,34mm <sup>2</sup> = 250V<br>≥ 0,50mm <sup>2</sup> = 300/500V | 0,22mm <sup>2</sup> /0,34mm <sup>2</sup> = 1200V<br>≥ 0,50mm <sup>2</sup> = 2000V |
| 0,22 79                                    | 0,22mm <sup>2</sup> /0,34mm <sup>2</sup> = 200 | 0,22 110                                  |                       |                         | 0,22 2,5                                               |                                                                                     |                                                                                   |
| 0,34 56                                    | ≥ 0,50mm <sup>2</sup> = 20                     | 0,34 110                                  |                       |                         | 0,34 4,5                                               |                                                                                     |                                                                                   |
| 0,50 39                                    |                                                | 0,50 120                                  |                       |                         | 0,50 6,0                                               |                                                                                     |                                                                                   |
| 0,75 26                                    |                                                | 0,75 120                                  |                       |                         | 0,75 13                                                |                                                                                     |                                                                                   |
| 1,0 19,5                                   |                                                | 1,0 130                                   |                       |                         | 1,0 16                                                 |                                                                                     |                                                                                   |
| 1,5 13,3                                   |                                                | 1,5 140                                   |                       |                         | 1,5 20                                                 |                                                                                     |                                                                                   |
| 2,5 7,98                                   |                                                | 2,5 150                                   |                       |                         | 2,5 25                                                 |                                                                                     |                                                                                   |

| BÜKÜLME YARIÇAPI<br>BENDING RADIUS | ÇALIŞMA SICAKLIĞI<br>TEMPERATURE RANGE | ALEV GECİKTİRİCİLİK TESTİ<br>FLAME RETARDANT TEST | EMC*<br>EMC*                                            | DUMAN YOĞUNLUĞU<br>TESTİ<br>SMOKE DENSITY TEST | KOROZİF GAZ TESTİ<br>TEST ON CORROSIVENESS<br>OF COMBUSTION GASES | HALOJENSİZLİK TESTİ<br>HALOGEN FREE TEST    | ALEV YAYILIMI TESTİ<br>FLAME PROPAGATION TEST        |
|------------------------------------|----------------------------------------|---------------------------------------------------|---------------------------------------------------------|------------------------------------------------|-------------------------------------------------------------------|---------------------------------------------|------------------------------------------------------|
| 15x Cable Ø                        | - 30°C - +70°C                         | IEC 60332-1-2<br>DIN EN 60332-1-2<br>EN 60332-1-2 | ELEKTROMANYETİK UYUMLU<br>ELECTROMAGNETIC COMPATIBILITY | IEC 61034-2<br>VDE 0482-1034-2<br>EN 61034-2   | IEC 60754-2<br>VDE 0482-754-2<br>EN 60754-2                       | IEC 60754-1<br>VDE 0482-754-1<br>EN 60754-1 | IEC 60332-3-24<br>DIN EN 60332-3-24<br>EN 60332-3-24 |

## NOTLAR

Esnek yapıları ile dar alanlarda rahatlıkla uygulanabilirler.  
**LIHCH-OZ:** Sarı/yeşil toprak koruma damarsız kablo.  
**LIHCH-JZ:** Sarı/yeşil toprak koruma damarlı kablo.

## NOTES

With its flexible design it can easily be used in narrow spaces.  
**LIHCH-OZ:** Without green/yellow earthing core.  
**LIHCH-JZ:** With green/yellow earthing core.

LIHCH

| KOD NO<br>CODE NR. | DAMAR SAYISI VE KESİTİ (mm <sup>2</sup> )<br>NUMBER OF CORE AND CROSS<br>SECTION (mm <sup>2</sup> ) | KABLO ÇAPİ (mm)<br>OVERALL DIAMETER<br>(mm) | BAKIR AĞIRLIĞI (kg/km)<br>COPPER WEIGHT<br>(kg/km) | YAKLAŞIK KABLO AĞIRLIĞI (kg/km)<br>APPROX. CABLE WEIGHT<br>(kg/km) | STANDART<br>UZUNLUK (mt)<br>STANDARD LENGTH (m) |
|--------------------|-----------------------------------------------------------------------------------------------------|---------------------------------------------|----------------------------------------------------|--------------------------------------------------------------------|-------------------------------------------------|
| 321322023          | 2 x 0,22                                                                                            | 4,20                                        | 11                                                 | 26                                                                 | 100/500/1000                                    |
| 321322033          | 3 x 0,22                                                                                            | 4,30                                        | 13                                                 | 29                                                                 | 100/500/1000                                    |
| 321322043          | 4 x 0,22                                                                                            | 4,70                                        | 15                                                 | 39                                                                 | 100/500/1000                                    |
| 321322053          | 5 x 0,22                                                                                            | 5,00                                        | 17                                                 | 44                                                                 | 100/500/1000                                    |
| 321322063          | 6 x 0,22                                                                                            | 5,30                                        | 22                                                 | 50                                                                 | 100/500/1000                                    |
| 321322083          | 8 x 0,22                                                                                            | 5,60                                        | 25                                                 | 61                                                                 | 100/500/1000                                    |
| 321322103          | 10 x 0,22                                                                                           | 6,70                                        | 30                                                 | 79                                                                 | 100/500/1000                                    |
| 321322123          | 12 x 0,22                                                                                           | 7,10                                        | 35                                                 | 90                                                                 | 100/500/1000                                    |
| 321322143          | 14 x 0,22                                                                                           | 7,40                                        | 40                                                 | 100                                                                | 100/500/1000                                    |
| 321322163          | 16 x 0,22                                                                                           | 7,70                                        | 45                                                 | 104                                                                | 100/500/1000                                    |
| 321322183          | 18 x 0,22                                                                                           | 8,00                                        | 50                                                 | 110                                                                | 100/500/1000                                    |
| 321322203          | 20 x 0,22                                                                                           | 8,30                                        | 52                                                 | 121                                                                | 100/500/1000                                    |
| 321334023          | 2 x 0,34                                                                                            | 4,60                                        | 17                                                 | 30                                                                 | 100/500/1000                                    |
| 321334033          | 3 x 0,34                                                                                            | 4,80                                        | 20                                                 | 36                                                                 | 100/500/1000                                    |
| 321334043          | 4 x 0,34                                                                                            | 5,20                                        | 25                                                 | 46                                                                 | 100/500/1000                                    |
| 321334053          | 5 x 0,34                                                                                            | 5,60                                        | 31                                                 | 56                                                                 | 100/500/1000                                    |
| 321334063          | 6 x 0,34                                                                                            | 5,90                                        | 34                                                 | 63                                                                 | 100/500/1000                                    |
| 321334083          | 8 x 0,34                                                                                            | 6,20                                        | 38                                                 | 76                                                                 | 100/500/1000                                    |
| 321334103          | 10 x 0,34                                                                                           | 7,60                                        | 43                                                 | 96                                                                 | 100/500/1000                                    |
| 321334123          | 12 x 0,34                                                                                           | 7,90                                        | 51                                                 | 109                                                                | 100/500/1000                                    |
| 321334143          | 14 x 0,34                                                                                           | 8,20                                        | 60                                                 | 120                                                                | 100/500/1000                                    |
| 321334163          | 16 x 0,34                                                                                           | 8,70                                        | 68                                                 | 132                                                                | 100/500/1000                                    |
| 321334183          | 18 x 0,34                                                                                           | 9,20                                        | 75                                                 | 144                                                                | 100/500/1000                                    |
| 321334203          | 20 x 0,34                                                                                           | 9,60                                        | 84                                                 | 161                                                                | 100/500/1000                                    |
| 321350023          | 2 x 0,50                                                                                            | 5,40                                        | 17                                                 | 33                                                                 | 100/500/1000                                    |
| 321350033          | 3 x 0,50                                                                                            | 5,60                                        | 21                                                 | 54                                                                 | 100/500/1000                                    |
| 321350043          | 4 x 0,50                                                                                            | 6,20                                        | 27                                                 | 67                                                                 | 100/500/1000                                    |
| 321350053          | 5 x 0,50                                                                                            | 6,90                                        | 31                                                 | 78                                                                 | 100/500/1000                                    |
| 321350063          | 6 x 0,50                                                                                            | 7,40                                        | 36                                                 | 90                                                                 | 100/500/1000                                    |
| 321350073          | 7 x 0,50                                                                                            | 7,40                                        | 42                                                 | 98                                                                 | 100/500/1000                                    |
| 321350083          | 8 x 0,50                                                                                            | 7,70                                        | 45                                                 | 104                                                                | 100/500/1000                                    |
| 321350103          | 10 x 0,50                                                                                           | 9,60                                        | 56                                                 | 135                                                                | 100/500/1000                                    |
| 321350123          | 12 x 0,50                                                                                           | 9,70                                        | 68                                                 | 150                                                                | 100/500/1000                                    |
| 321350143          | 14 x 0,50                                                                                           | 10,10                                       | 75                                                 | 164                                                                | 100/500/1000                                    |
| 321350163          | 16 x 0,50                                                                                           | 10,70                                       | 83                                                 | 185                                                                | 100/500/1000                                    |
| 321350183          | 18 x 0,50                                                                                           | 11,20                                       | 95                                                 | 203                                                                | 100/500/1000                                    |
| 321350203          | 20 x 0,50                                                                                           | 11,60                                       | 102                                                | 217                                                                | 100/500/1000                                    |
| 321375023          | 2 x 0,75                                                                                            | 5,80                                        | 18                                                 | 56                                                                 | 100/500/1000                                    |
| 321375033          | 3 x 0,75                                                                                            | 6,10                                        | 30                                                 | 67                                                                 | 100/500/1000                                    |
| 321375043          | 4 x 0,75                                                                                            | 6,70                                        | 35                                                 | 81                                                                 | 100/500/1000                                    |
| 321375053          | 5 x 0,75                                                                                            | 7,40                                        | 43                                                 | 99                                                                 | 100/500/1000                                    |
| 321375063          | 6 x 0,75                                                                                            | 8,00                                        | 51                                                 | 109                                                                | 100/500/1000                                    |
| 321375073          | 7 x 0,75                                                                                            | 8,00                                        | 56                                                 | 115                                                                | 100/500/1000                                    |
| 321375083          | 8 x 0,75                                                                                            | 8,40                                        | 64                                                 | 128                                                                | 100/500/1000                                    |
| 321375103          | 10 x 0,75                                                                                           | 10,20                                       | 80                                                 | 162                                                                | 100/500/1000                                    |
| 321375123          | 12 x 0,75                                                                                           | 10,50                                       | 94                                                 | 184                                                                | 100/500/1000                                    |
| 321375143          | 14 x 0,75                                                                                           | 11,00                                       | 107                                                | 206                                                                | 100/500/1000                                    |
| 321375163          | 16 x 0,75                                                                                           | 11,60                                       | 120                                                | 230                                                                | 100/500/1000                                    |
| 321375183          | 18 x 0,75                                                                                           | 12,60                                       | 143                                                | 267                                                                | 100/500/1000                                    |
| 321375203          | 20 x 0,75                                                                                           | 13,00                                       | 155                                                | 285                                                                | 100/500/1000                                    |

## LIHCH

| KOD NO<br>CODE NR. | DAMAR SAYISI VE KESİTİ (mm <sup>2</sup> )<br>NUMBER OF CORE AND CROSS<br>SECTION (mm <sup>2</sup> ) | KABLO ÇAPİ (mm)<br>OVERALL DIAMETER<br>(mm) | BAKIR AĞIRLIĞI (kg/km)<br>COPPER WEIGHT<br>(kg/km) | YAKLAŞIK KABLO AĞIRLIĞI (kg/km)<br>APPROX. CABLE WEIGHT<br>(kg/km) | STANDART<br>UZUNLUK (m)<br>STANDARD LENGTH (m) |
|--------------------|-----------------------------------------------------------------------------------------------------|---------------------------------------------|----------------------------------------------------|--------------------------------------------------------------------|------------------------------------------------|
| 321301023          | 2 x 1                                                                                               | 6,20                                        | 28                                                 | 64                                                                 | 100/500/1000                                   |
| 321301033          | 3 x 1                                                                                               | 6,70                                        | 37                                                 | 80                                                                 | 100/500/1000                                   |
| 321301043          | 4 x 1                                                                                               | 7,20                                        | 46                                                 | 95                                                                 | 100/500/1000                                   |
| 321301053          | 5 x 1                                                                                               | 7,90                                        | 56                                                 | 114                                                                | 100/500/1000                                   |
| 321301063          | 6 x 1                                                                                               | 8,50                                        | 66                                                 | 131                                                                | 100/500/1000                                   |
| 321301073          | 7 x 1                                                                                               | 8,50                                        | 74                                                 | 140                                                                | 100/500/1000                                   |
| 321301083          | 8 x 1                                                                                               | 9,20                                        | 83                                                 | 160                                                                | 100/500/1000                                   |
| 321301103          | 10 x 1                                                                                              | 10,90                                       | 104                                                | 195                                                                | 100/500/1000                                   |
| 321301123          | 12 x 1                                                                                              | 11,30                                       | 121                                                | 222                                                                | 100/500/1000                                   |
| 321301143          | 14 x 1                                                                                              | 12,20                                       | 139                                                | 262                                                                | 100/500/1000                                   |
| 321301163          | 16 x 1                                                                                              | 12,40                                       | 156                                                | 291                                                                | 100/500/1000                                   |
| 321301183          | 18 x 1                                                                                              | 13,60                                       | 175                                                | 326                                                                | 100/500/1000                                   |
| 321301203          | 20 x 1                                                                                              | 14,00                                       | 195                                                | 350                                                                | 100/500/1000                                   |
| 321315023          | 2 x 1,5                                                                                             | 6,80                                        | 34                                                 | 76                                                                 | 100/500/1000                                   |
| 321315033          | 3 x 1,5                                                                                             | 7,10                                        | 48                                                 | 93                                                                 | 100/500/1000                                   |
| 321315043          | 4 x 1,5                                                                                             | 7,70                                        | 61                                                 | 111                                                                | 100/500/1000                                   |
| 321315053          | 5 x 1,5                                                                                             | 8,50                                        | 75                                                 | 136                                                                | 100/500/1000                                   |
| 321315063          | 6 x 1,5                                                                                             | 8,70                                        | 88                                                 | 158                                                                | 100/500/1000                                   |
| 321315073          | 7 x 1,5                                                                                             | 8,70                                        | 100                                                | 170                                                                | 100/500/1000                                   |
| 321315083          | 8 x 1,5                                                                                             | 9,80                                        | 113                                                | 194                                                                | 100/500/1000                                   |
| 321315103          | 10 x 1,5                                                                                            | 12,20                                       | 151                                                | 248                                                                | 100/500/1000                                   |
| 321315123          | 12 x 1,5                                                                                            | 12,50                                       | 166                                                | 283                                                                | 100/500/1000                                   |
| 321315143          | 14 x 1,5                                                                                            | 13,10                                       | 191                                                | 321                                                                | 100/500/1000                                   |
| 321315163          | 16 x 1,5                                                                                            | 13,90                                       | 216                                                | 363                                                                | 100/500/1000                                   |
| 321315183          | 18 x 1,5                                                                                            | 14,50                                       | 245                                                | 402                                                                | 100/500/1000                                   |
| 321315203          | 20 x 1,5                                                                                            | 15,50                                       | 268                                                | 437                                                                | 100/500/1000                                   |

## LIYCY-TP



İYİ EMC\* ÖZELLİK/ESNEK KABLO YAPISI/İNCELTİLMİŞ DIŞ ÇAP/KÜÇÜK BÜKÜLME YARIÇAPI/ALEV GECİKTİRİCİ ÖZELLİK  
GOOD EMC\* CHARACTERISTIC/FLEXIBLE CABLE DESIGN/REDUCED OUTER DIAMETER/SMALL BENDING RADIUS/  
FLAME RETARDANT CHARACTERISTIC



## KULLANIM ALANLARI

Elektromanyetik karışım ve girişimlerin olduğu

- Enstrüman ve Kontrol Mühendisliğinde
- Endüstriyel Elektronikte
- Bilgisayar ve Ofis Makinelerinde
- Bina İçi Haberleşme Sistemlerinde
- Bina İçi Ses Sistemlerinde
- Güvenlik Sistemlerinde

## APPLICATION

In places where electro-magnetic interference and influence exists

- Instrumentation and Control Engineering
- Industrial Electronics
- Computers and Office Machines
- Indoor Communication Systems
- Indoor Sound Systems
- Security Systems

## KABLO YAPISI

- 1-İletken** IEC 60228; DIN VDE 0295; EN 60228 Sınıf 5  
Bükülü Elektrolitik Tavlı Bakır
- 2-Yalıtkan** EN 50290-2-21 PVC Kompaund
- 3-Yalıtım Renk** DIN 47100
- 4-Büküm** Çift büküm katlar halinde
- 5-Ayırıcı Bant** Pes Bant
- 6-Ekran** Kalaylı Bakır Örgü
- 7-Kılıf** EN 50290-2-22 PVC Kompaund
- 8-Kılıf Rengi** RAL 7001 Gri

## CONSTRUCTION

- 1-Conductor** IEC 60228; DIN VDE 0295; EN 60228 Class 5  
Stranded Electrolytic Bare Copper
- 2-Insulation** EN 50290-2-21 PVC Compound
- 3-Colour Code** DIN 47100
- 4-Stranding** Pairwise pairs in layers
- 5-Wrapping** Pes Tape
- 6-Screen** Tinned Copper Braid
- 7-Sheath** EN 50290-2-22 PVC Compound
- 8-Sheath Colour** RAL 7001 Grey

TEKNİK ÖZELLİKLER  
TECHNICAL CHARACTERISTICS

| İLETKEN DİRENCİ<br>CONDUCTOR<br>RESISTANCE | YALITIM DİRENCİ<br>INSULATION<br>RESISTANCE    | EFEKTİF KAPASİTE<br>MUTUAL<br>CAPACITANCE | EMPEDANS<br>IMPEDANCE | İNDÜKTANS<br>INDUCTANCE | AKIM TAŞIMA KAPASİTESİ<br>CURRENT CARRYING<br>CAPACITY | ÇALIŞMA VOLTAJİ<br>OPERATING<br>VOLTAGE         | TEST VOLTAJİ<br>TEST VOLTAGE                     |
|--------------------------------------------|------------------------------------------------|-------------------------------------------|-----------------------|-------------------------|--------------------------------------------------------|-------------------------------------------------|--------------------------------------------------|
| mm <sup>2</sup> Ω/km                       | MΩxkm                                          | mm <sup>2</sup> pF/m                      |                       |                         | mm <sup>2</sup> A                                      |                                                 |                                                  |
| 0,22    79                                 | 0,22mm <sup>2</sup> /0,34mm <sup>2</sup> = 200 | 0,22    110                               | 78Ω                   | 0,67mH/km               | 0,22    2,5                                            | 0,22mm <sup>2</sup> /0,34mm <sup>2</sup> = 250V | 0,22mm <sup>2</sup> /0,34mm <sup>2</sup> = 1200V |
| 0,34    56                                 | ≥ 0,50mm <sup>2</sup> = 20                     | 0,34    110                               |                       |                         | 0,34    4,5                                            | ≥ 0,50mm <sup>2</sup> = 300/500V                | ≥ 0,50mm <sup>2</sup> = 2000V                    |
| 0,50    39                                 |                                                | 0,50    120                               |                       |                         | 0,50    6,0                                            |                                                 |                                                  |
| 0,75    26                                 |                                                | 0,75    120                               |                       |                         | 0,75    13                                             |                                                 |                                                  |
| 1,0    19,5                                |                                                | 1,0    130                                |                       |                         | 1,0    16                                              |                                                 |                                                  |
| 1,5    13,3                                |                                                | 1,5    140                                |                       |                         | 1,5    20                                              |                                                 |                                                  |
| 2,5    7,98                                |                                                | 2,5    150                                |                       |                         | 2,5    25                                              |                                                 |                                                  |

| BÜKÜLME YARIÇAPI<br>BENDING RADIUS | ÇALIŞMA SICAKLIĞI<br>TEMPERATURE RANGE | ALEV GECİKTİRİCİLİK TESTİ<br>FLAME RETARDANT TEST | EMC*<br>EMC*                                            |
|------------------------------------|----------------------------------------|---------------------------------------------------|---------------------------------------------------------|
| 10x Cable Ø                        | -30°C - +70°C                          | IEC 60332-1-2<br>DIN EN 60332-1-2<br>EN 60332-1-2 | ELEKTROMANYETİK UYUMLU<br>ELECTROMAGNETIC COMPATIBILITY |

## NOTLAR

Esnek yapıları ile dar alanlarda rahatlıkla uygulanabilirler.  
Bu tip kablolar dış ortamlarda kullanıma uygun değildir.  
**LIYCY-TP-OZ:** Numara kodlu siyah damarlar.

## NOTES

With its flexible design it can easily be used in narrow spaces.  
These cables are not suitable for outdoor use.  
**LIYCY-TP-OZ:** Number coded black cores.

## LIYCY-TP

| KOD NO<br>CODE NR. | ÇİFT SAYISI VE KESİTİ (mm <sup>2</sup> )<br>NUMBER OF PAIRS AND CROSS SECTION<br>(mm <sup>2</sup> ) | KABLO ÇAPI (mm)<br>OVERALL DIAMETER<br>(mm) | BAKIR AĞIRLIĞI (kg/km)<br>COPPER WEIGHT<br>(kg/km) | YAKLAŞIK KABLO AĞIRLIĞI (kg/km)<br>APPROX. CABLE WEIGHT<br>(kg/km) | STANDART<br>UZUNLUK (mt)<br>STANDARD LENGTH (m) |
|--------------------|-----------------------------------------------------------------------------------------------------|---------------------------------------------|----------------------------------------------------|--------------------------------------------------------------------|-------------------------------------------------|
| 321222023          | 2 x 2 x 0,22                                                                                        | 5,60                                        | 16                                                 | 44                                                                 | 100/500/1000                                    |
| 321222033          | 3 x 2 x 0,22                                                                                        | 5,90                                        | 20                                                 | 57                                                                 | 100/500/1000                                    |
| 321222043          | 4 x 2 x 0,22                                                                                        | 6,60                                        | 25                                                 | 66                                                                 | 100/500/1000                                    |
| 321222053          | 5 x 2 x 0,22                                                                                        | 7,30                                        | 31                                                 | 75                                                                 | 100/500/1000                                    |
| 321222063          | 6 x 2 x 0,22                                                                                        | 7,90                                        | 35                                                 | 86                                                                 | 100/500/1000                                    |
| 321222073          | 7 x 2 x 0,22                                                                                        | 8,30                                        | 43                                                 | 98                                                                 | 100/500/1000                                    |
| 321222083          | 8 x 2 x 0,22                                                                                        | 8,60                                        | 50                                                 | 105                                                                | 100/500/1000                                    |
| 321222103          | 10 x 2 x 0,22                                                                                       | 9,80                                        | 57                                                 | 130                                                                | 100/500/1000                                    |
| 321222123          | 12 x 2 x 0,22                                                                                       | 10,00                                       | 65                                                 | 145                                                                | 100/500/1000                                    |
| 321222143          | 14 x 2 x 0,22                                                                                       | 10,60                                       | 75                                                 | 168                                                                | 100/500/1000                                    |
| 321222163          | 16 x 2 x 0,22                                                                                       | 11,20                                       | 85                                                 | 180                                                                | 100/500/1000                                    |
| 321222183          | 18 x 2 x 0,22                                                                                       | 12,20                                       | 91                                                 | 206                                                                | 100/500/1000                                    |
| 321222203          | 20 x 2 x 0,22                                                                                       | 12,90                                       | 103                                                | 225                                                                | 100/500/1000                                    |
| 321234023          | 2 x 2 x 0,34                                                                                        | 6,20                                        | 22                                                 | 51                                                                 | 100/500/1000                                    |
| 321234033          | 3 x 2 x 0,34                                                                                        | 6,80                                        | 30                                                 | 70                                                                 | 100/500/1000                                    |
| 321234043          | 4 x 2 x 0,34                                                                                        | 7,40                                        | 36                                                 | 81                                                                 | 100/500/1000                                    |
| 321234053          | 5 x 2 x 0,34                                                                                        | 8,20                                        | 44                                                 | 90                                                                 | 100/500/1000                                    |
| 321234063          | 6 x 2 x 0,34                                                                                        | 8,80                                        | 52                                                 | 108                                                                | 100/500/1000                                    |
| 321234073          | 7 x 2 x 0,34                                                                                        | 9,60                                        | 58                                                 | 126                                                                | 100/500/1000                                    |
| 321234083          | 8 x 2 x 0,34                                                                                        | 9,80                                        | 65                                                 | 140                                                                | 100/500/1000                                    |
| 321234103          | 10 x 2 x 0,34                                                                                       | 11,00                                       | 79                                                 | 166                                                                | 100/500/1000                                    |
| 321234123          | 12 x 2 x 0,34                                                                                       | 11,30                                       | 94                                                 | 184                                                                | 100/500/1000                                    |
| 321234143          | 14 x 2 x 0,34                                                                                       | 12,50                                       | 106                                                | 218                                                                | 100/500/1000                                    |
| 321234163          | 16 x 2 x 0,34                                                                                       | 13,20                                       | 122                                                | 243                                                                | 100/500/1000                                    |
| 321234183          | 18 x 2 x 0,34                                                                                       | 13,90                                       | 134                                                | 267                                                                | 100/500/1000                                    |
| 321234203          | 20 x 2 x 0,34                                                                                       | 14,60                                       | 149                                                | 292                                                                | 100/500/1000                                    |
| 321250023          | 2 x 2 x 0,50                                                                                        | 7,70                                        | 28                                                 | 72                                                                 | 100/500/1000                                    |
| 321250033          | 3 x 2 x 0,50                                                                                        | 8,30                                        | 36                                                 | 88                                                                 | 100/500/1000                                    |
| 321250043          | 4 x 2 x 0,50                                                                                        | 9,00                                        | 46                                                 | 106                                                                | 100/500/1000                                    |
| 321250053          | 5 x 2 x 0,50                                                                                        | 10,30                                       | 56                                                 | 122                                                                | 100/500/1000                                    |
| 321250063          | 6 x 2 x 0,50                                                                                        | 11,10                                       | 66                                                 | 154                                                                | 100/500/1000                                    |
| 321250073          | 7 x 2 x 0,50                                                                                        | 11,70                                       | 76                                                 | 166                                                                | 100/500/1000                                    |
| 321250083          | 8 x 2 x 0,50                                                                                        | 12,40                                       | 85                                                 | 192                                                                | 100/500/1000                                    |
| 321250103          | 10 x 2 x 0,50                                                                                       | 14,10                                       | 105                                                | 235                                                                | 100/500/1000                                    |
| 321250123          | 12 x 2 x 0,50                                                                                       | 14,30                                       | 125                                                | 262                                                                | 100/500/1000                                    |
| 321250143          | 14 x 2 x 0,50                                                                                       | 15,20                                       | 144                                                | 300                                                                | 100/500/1000                                    |
| 321250163          | 16 x 2 x 0,50                                                                                       | 16,40                                       | 161                                                | 340                                                                | 100/500/1000                                    |
| 321250183          | 18 x 2 x 0,50                                                                                       | 17,20                                       | 178                                                | 372                                                                | 100/500/1000                                    |
| 321250203          | 20 x 2 x 0,50                                                                                       | 18,20                                       | 196                                                | 407                                                                | 100/500/1000                                    |
| 321275023          | 2 x 2 x 0,75                                                                                        | 8,30                                        | 37                                                 | 85                                                                 | 100/500/1000                                    |
| 321275033          | 3 x 2 x 0,75                                                                                        | 9,00                                        | 51                                                 | 103                                                                | 100/500/1000                                    |
| 321275043          | 4 x 2 x 0,75                                                                                        | 10,00                                       | 65                                                 | 124                                                                | 100/500/1000                                    |
| 321275053          | 5 x 2 x 0,75                                                                                        | 11,00                                       | 80                                                 | 152                                                                | 100/500/1000                                    |
| 321275063          | 6 x 2 x 0,75                                                                                        | 12,40                                       | 95                                                 | 203                                                                | 100/500/1000                                    |
| 321275073          | 7 x 2 x 0,75                                                                                        | 13,10                                       | 110                                                | 220                                                                | 100/500/1000                                    |
| 321275083          | 8 x 2 x 0,75                                                                                        | 13,70                                       | 125                                                | 243                                                                | 100/500/1000                                    |
| 321275103          | 10 x 2 x 0,75                                                                                       | 15,30                                       | 155                                                | 296                                                                | 100/500/1000                                    |
| 321275123          | 12 x 2 x 0,75                                                                                       | 15,60                                       | 180                                                | 331                                                                | 100/500/1000                                    |
| 321275143          | 14 x 2 x 0,75                                                                                       | 16,80                                       | 207                                                | 383                                                                | 100/500/1000                                    |
| 321275163          | 16 x 2 x 0,75                                                                                       | 17,90                                       | 231                                                | 432                                                                | 100/500/1000                                    |
| 321275183          | 18 x 2 x 0,75                                                                                       | 18,90                                       | 260                                                | 473                                                                | 100/500/1000                                    |
| 321275203          | 20 x 2 x 0,75                                                                                       | 20,00                                       | 288                                                | 534                                                                | 100/500/1000                                    |

## LIYCY-TP

| KOD NO<br>CODENR. | ÇİFT SAYISI VE KESİTİ (mm <sup>2</sup> )<br>NUMBER OF PAIRS AND CROSS SECTION<br>(mm <sup>2</sup> ) | KABLO ÇAPI (mm)<br>OVERALL DIAMETER<br>(mm) | BAKIR AĞIRLIĞI (kg/km)<br>COPPER WEIGHT<br>(kg/km) | YAKLAŞIK KABLO AĞIRLIĞI (kg/km)<br>APPROX. CABLE WEIGHT<br>(kg/km) | STANDART<br>UZUNLUK (mt)<br>STANDARD LENGTH (m) |
|-------------------|-----------------------------------------------------------------------------------------------------|---------------------------------------------|----------------------------------------------------|--------------------------------------------------------------------|-------------------------------------------------|
| 321201023         | 2 x 2 x 1                                                                                           | 9,00                                        | 50                                                 | 100                                                                | 100/500/1000                                    |
| 321201033         | 3 x 2 x 1                                                                                           | 9,90                                        | 65                                                 | 128                                                                | 100/500/1000                                    |
| 321201043         | 4 x 2 x 1                                                                                           | 10,60                                       | 85                                                 | 163                                                                | 100/500/1000                                    |
| 321201053         | 5 x 2 x 1                                                                                           | 12,50                                       | 106                                                | 206                                                                | 100/500/1000                                    |
| 321201063         | 6 x 2 x 1                                                                                           | 13,60                                       | 125                                                | 245                                                                | 100/500                                         |
| 321201073         | 7 x 2 x 1                                                                                           | 14,00                                       | 144                                                | 266                                                                | 100/500                                         |
| 321201083         | 8 x 2 x 1                                                                                           | 14,60                                       | 162                                                | 293                                                                | 100/500                                         |
| 321201103         | 10 x 2 x 1                                                                                          | 16,90                                       | 200                                                | 364                                                                | 100/500                                         |
| 321201123         | 12 x 2 x 1                                                                                          | 17,30                                       | 234                                                | 416                                                                | 100/500                                         |
| 321201143         | 14 x 2 x 1                                                                                          | 18,30                                       | 270                                                | 473                                                                | 100/500                                         |
| 321201163         | 16 x 2 x 1                                                                                          | 19,50                                       | 306                                                | 534                                                                | 100/500                                         |
| 321201183         | 18 x 2 x 1                                                                                          | 20,50                                       | 340                                                | 588                                                                | 100/500                                         |
| 321201203         | 20 x 2 x 1                                                                                          | 21,70                                       | 380                                                | 646                                                                | 100/500                                         |
| 321215023         | 2 x 2 x 1,5                                                                                         | 9,80                                        | 67                                                 | 130                                                                | 100/500/1000                                    |
| 321215033         | 3 x 2 x 1,5                                                                                         | 10,50                                       | 90                                                 | 160                                                                | 100/500/1000                                    |
| 321215043         | 4 x 2 x 1,5                                                                                         | 11,50                                       | 118                                                | 200                                                                | 100/500/1000                                    |
| 321215053         | 5 x 2 x 1,5                                                                                         | 13,20                                       | 145                                                | 251                                                                | 100/500/1000                                    |
| 321215063         | 6 x 2 x 1,5                                                                                         | 14,30                                       | 170                                                | 293                                                                | 100/500                                         |
| 321215073         | 7 x 2 x 1,5                                                                                         | 15,20                                       | 196                                                | 326                                                                | 100/500                                         |
| 321215083         | 8 x 2 x 1,5                                                                                         | 15,70                                       | 220                                                | 362                                                                | 100/500                                         |
| 321215103         | 10 x 2 x 1,5                                                                                        | 18,00                                       | 275                                                | 450                                                                | 100/500                                         |
| 321215123         | 12 x 2 x 1,5                                                                                        | 18,50                                       | 319                                                | 516                                                                | 100/500                                         |
| 321215143         | 14 x 2 x 1,5                                                                                        | 19,70                                       | 372                                                | 589                                                                | 100/500                                         |
| 321215163         | 16 x 2 x 1,5                                                                                        | 21,00                                       | 425                                                | 668                                                                | 100/500                                         |
| 321215183         | 18 x 2 x 1,5                                                                                        | 22,00                                       | 475                                                | 735                                                                | 100/500                                         |
| 321215203         | 20 x 2 x 1,5                                                                                        | 24,00                                       | 525                                                | 832                                                                | 100/500                                         |
| 321225023         | 2 x 2 x 2,5                                                                                         | 12,50                                       | 100                                                | 200                                                                | 100/500/1000                                    |
| 321225033         | 3 x 2 x 2,5                                                                                         | 13,30                                       | 145                                                | 281                                                                | 100/500/1000                                    |
| 321225043         | 4 x 2 x 2,5                                                                                         | 14,70                                       | 186                                                | 315                                                                | 100/500/1000                                    |
| 321225053         | 5 x 2 x 2,5                                                                                         | 16,50                                       | 228                                                | 391                                                                | 100/500/1000                                    |
| 321225063         | 6 x 2 x 2,5                                                                                         | 18,00                                       | 275                                                | 461                                                                | 100/500                                         |
| 321225073         | 7 x 2 x 2,5                                                                                         | 19,10                                       | 314                                                | 514                                                                | 100/500                                         |
| 321225083         | 8 x 2 x 2,5                                                                                         | 19,80                                       | 358                                                | 674                                                                | 100/500                                         |
| 321225103         | 10 x 2 x 2,5                                                                                        | 22,80                                       | 443                                                | 723                                                                | 100/500                                         |
| 321225123         | 12 x 2 x 2,5                                                                                        | 23,30                                       | 525                                                | 836                                                                | 100/500                                         |
| 321225143         | 14 x 2 x 2,5                                                                                        | 24,90                                       | 610                                                | 958                                                                | 100/500                                         |
| 321225163         | 16 x 2 x 2,5                                                                                        | 26,60                                       | 700                                                | 1098                                                               | 100/500                                         |
| 321225183         | 18 x 2 x 2,5                                                                                        | 28,50                                       | 785                                                | 1235                                                               | 100/500                                         |
| 321225203         | 20 x 2 x 2,5                                                                                        | 30,20                                       | 870                                                | 1362                                                               | 100/500                                         |

# LIHCH-TP



ESNEK KABLO YAPISI/İNCELTİLMİŞ DIŞ ÇAP/KÜÇÜK BÜKÜLME YARIÇAPI/İYİ EMC\* ÖZELLİK/ALEV GECİKTİRİCİ ÖZELLİK/DÜŞÜK DUMAN YOĞUNLUĞU/ZEHİRLİ VE KOROZİF GAZLARDAN ARINDIRILMIŞ  
FLEXIBLE CABLE DESIGN/REDUCED OUTER DIAMETER/SMALL BENDING RADIUS/GOOD EMC\* CHARACTERISTIC/FLAME RETARDANT CHARACTERISTIC/LOW SMOKE EMISSION/WITHOUT POISONED AND CORROSIVE GASES



## KULLANIM ALANLARI

Elektromanyetik karışım ve girişimlerin olduğu  
İnsanların yoğun olarak bulunduğu kapalı ortamlarda  
-Enstrüman ve Kontrol Mühendisliğinde  
-Endüstriyel Elektronikte  
-Bilgisayar ve Ofis Makinelerinde  
-Bina İçi Haberleşme Sistemlerinde  
-Bina İçi Ses Sistemlerinde  
-İnsan hayatının, değerli malzemelerin ve ekipmanların korunması gereken yerlerde

## APPLICATION

In places where electro-magnetic interference and influence exists  
In closed areas where people are densely populated  
-Instrumentation and Control Engineering  
-Industrial Electronics  
-Computers and Office Machines  
-Indoor Communication Systems  
-Indoor Sound Systems  
-In places where human life and valuable materials and equipment need to be protected

## KABLO YAPISI

|                       |                                                                              |
|-----------------------|------------------------------------------------------------------------------|
| <b>1-İletken</b>      | IEC 60228; DIN VDE 0295; EN 60228 Sınıf 5<br>Bükülü Elektrolitik Tavlı Bakır |
| <b>2-Yalıtkan</b>     | EN 50290-2-26 HFFR Kompaund                                                  |
| <b>3-Yalıtım Renk</b> | DIN 47100                                                                    |
| <b>4-Büküm</b>        | Çift büküm katlar halinde                                                    |
| <b>5-Ayırıcı Bant</b> | Pes Bant                                                                     |
| <b>6-Ekran</b>        | Kalaylı Bakır Örgü                                                           |
| <b>7-Kılıf</b>        | EN 50290-2-27 HFFR Kompaund                                                  |
| <b>8-Kılıf Rengi</b>  | RAL 7001 Gri                                                                 |

## CONSTRUCTION

|                        |                                                                                |
|------------------------|--------------------------------------------------------------------------------|
| <b>1-Conductor</b>     | IEC 60228; DIN VDE 0295; EN 60228 Class 5<br>Stranded Electrolytic Bare Copper |
| <b>2-Insulation</b>    | EN 50290-2-26 HFFR Compound                                                    |
| <b>3-Colour Code</b>   | DIN 47100                                                                      |
| <b>4-Stranding</b>     | Pairwise pairs in layers                                                       |
| <b>5-Wrapping</b>      | Pes Tape                                                                       |
| <b>6-Screen</b>        | Tinned Copper Braid                                                            |
| <b>7-Sheath</b>        | EN 50290-2-27 HFFR Compound                                                    |
| <b>8-Sheath Colour</b> | RAL 7001 Grey                                                                  |

## TEKNİK ÖZELLİKLER TECHNICAL CHARACTERISTICS

| İLETKEN DİRENCİ<br>CONDUCTOR<br>RESISTANCE | YALITIM DİRENCİ<br>INSULATION<br>RESISTANCE    | EFEKTİF KAPASİTE<br>MUTUAL<br>CAPACITANCE         | EMPEDANS<br>IMPEDANCE                                   | İNDÜKTANS<br>INDUCTANCE                        | AKIM TAŞIMA KAPASİTESİ<br>CURRENT CARRYING<br>CAPACITY            | ÇALIŞMA VOLTAJI<br>OPERATING<br>VOLTAGE                                             | TEST VOLTAJI<br>TEST VOLTAGE                                                      |
|--------------------------------------------|------------------------------------------------|---------------------------------------------------|---------------------------------------------------------|------------------------------------------------|-------------------------------------------------------------------|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
| mm <sup>2</sup> Ω/km                       | MΩxkm                                          | mm <sup>2</sup> pF/m                              | 78Ω                                                     | 0,67mH/km                                      | mm <sup>2</sup> A                                                 | 0,22mm <sup>2</sup> /0,34mm <sup>2</sup> = 250V<br>≥ 0,50mm <sup>2</sup> = 300/500V | 0,22mm <sup>2</sup> /0,34mm <sup>2</sup> = 1200V<br>≥ 0,50mm <sup>2</sup> = 2000V |
| 0,22 79                                    | 0,22mm <sup>2</sup> /0,34mm <sup>2</sup> = 200 | 0,22 110                                          |                                                         |                                                | 0,22 2,5                                                          |                                                                                     |                                                                                   |
| 0,34 56                                    | ≥ 0,50mm <sup>2</sup> = 20                     | 0,34 110                                          |                                                         |                                                | 0,34 4,5                                                          |                                                                                     |                                                                                   |
| 0,50 39                                    |                                                | 0,50 120                                          |                                                         |                                                | 0,50 6,0                                                          |                                                                                     |                                                                                   |
| 0,75 26                                    |                                                | 0,75 120                                          |                                                         |                                                | 0,75 13                                                           |                                                                                     |                                                                                   |
| 1,0 19,5                                   |                                                | 1,0 130                                           |                                                         |                                                | 1,0 16                                                            |                                                                                     |                                                                                   |
| 1,5 13,3                                   |                                                | 1,5 140                                           |                                                         |                                                | 1,5 20                                                            |                                                                                     |                                                                                   |
| 2,5 7,98                                   |                                                | 2,5 150                                           |                                                         |                                                | 2,5 25                                                            |                                                                                     |                                                                                   |
| BÜKÜLME YARIÇAPI<br>BENDING RADIUS         | ÇALIŞMA SICAKLIĞI<br>TEMPERATURE RANGE         | ALEV GECİKTİRİCİLİK TESTİ<br>FLAME RETARDANT TEST | EMC*<br>EMC*                                            | DUMAN YOĞUNLUĞU<br>TESTİ<br>SMOKE DENSITY TEST | KOROZİF GAZ TESTİ<br>TEST ON CORROSIVENESS<br>OF COMBUSTION GASES | HALOJENSİZLİK TESTİ<br>HALOGEN FREE TEST                                            | ALEV YAYILIMI TESTİ<br>FLAME PROPAGATION TEST                                     |
| 15x Cable Ø                                | - 30°C - +70°C                                 | IEC 60332-1-2<br>DIN EN 60332-1-2<br>EN 60332-1-2 | ELEKTROMANYETİK UYUMLU<br>ELECTROMAGNETIC COMPATIBILITY | IEC 61034-2<br>VDE 0482-1034-2<br>EN 61034-2   | IEC 60754-2<br>VDE 0482-754-2<br>EN 60754-2                       | IEC 60754-1<br>VDE 0482-754-1<br>EN 60754-1                                         | IEC 60332-3-24<br>DIN EN 60332-3-24<br>EN 60332-3-24                              |

## NOTLAR

Esnek yapıları ile dar alanlarda rahatlıkla uygulanabilirler.  
**LIHCH-TP-OZ:** Numara kodlu siyah damarlar.

## NOTES

With its flexible design it can easily be used in narrow spaces.  
**LIHCH-TP-OZ:** Number coded black cores.

## LIHCH-TP

| KOD NO<br>CODE NR. | ÇİFT SAYISI VE KESİTİ (mm <sup>2</sup> )<br>NUMBER OF PAIRS AND CROSS SECTION<br>(mm <sup>2</sup> ) | KABLO ÇAPİ (mm)<br>OVERALL DIAMETER<br>(mm) | BAKIR AĞIRLIĞI (kg/km)<br>COPPER WEIGHT<br>(kg/km) | YAKLAŞIK KABLO AĞIRLIĞI (kg/km)<br>APPROX. CABLE WEIGHT<br>(kg/km) | STANDART<br>UZUNLUK (mt)<br>STANDARD LENGTH (m) |
|--------------------|-----------------------------------------------------------------------------------------------------|---------------------------------------------|----------------------------------------------------|--------------------------------------------------------------------|-------------------------------------------------|
| 321422023          | 2 x 2 x 0,22                                                                                        | 5,60                                        | 16                                                 | 46                                                                 | 100/500/1000                                    |
| 321422033          | 3 x 2 x 0,22                                                                                        | 5,90                                        | 20                                                 | 60                                                                 | 100/500/1000                                    |
| 321422043          | 4 x 2 x 0,22                                                                                        | 6,60                                        | 25                                                 | 70                                                                 | 100/500/1000                                    |
| 321422053          | 5 x 2 x 0,22                                                                                        | 7,30                                        | 30                                                 | 80                                                                 | 100/500/1000                                    |
| 321422063          | 6 x 2 x 0,22                                                                                        | 7,80                                        | 35                                                 | 90                                                                 | 100/500/1000                                    |
| 321422073          | 7 x 2 x 0,22                                                                                        | 8,30                                        | 40                                                 | 100                                                                | 100/500/1000                                    |
| 321422083          | 8 x 2 x 0,22                                                                                        | 8,60                                        | 45                                                 | 109                                                                | 100/500/1000                                    |
| 321422103          | 10 x 2 x 0,22                                                                                       | 9,80                                        | 54                                                 | 133                                                                | 100/500/1000                                    |
| 321422123          | 12 x 2 x 0,22                                                                                       | 10,00                                       | 63                                                 | 150                                                                | 100/500/1000                                    |
| 321422143          | 14 x 2 x 0,22                                                                                       | 10,60                                       | 75                                                 | 170                                                                | 100/500/1000                                    |
| 321422163          | 16 x 2 x 0,22                                                                                       | 11,20                                       | 85                                                 | 186                                                                | 100/500/1000                                    |
| 321422183          | 18 x 2 x 0,22                                                                                       | 12,20                                       | 90                                                 | 216                                                                | 100/500/1000                                    |
| 321422203          | 20 x 2 x 0,22                                                                                       | 12,90                                       | 100                                                | 236                                                                | 100/500/1000                                    |
| 321434023          | 2 x 2 x 0,34                                                                                        | 6,20                                        | 25                                                 | 53                                                                 | 100/500/1000                                    |
| 321434033          | 3 x 2 x 0,34                                                                                        | 6,80                                        | 30                                                 | 74                                                                 | 100/500/1000                                    |
| 321434043          | 4 x 2 x 0,34                                                                                        | 7,30                                        | 36                                                 | 83                                                                 | 100/500/1000                                    |
| 321434053          | 5 x 2 x 0,34                                                                                        | 8,10                                        | 45                                                 | 100                                                                | 100/500/1000                                    |
| 321434063          | 6 x 2 x 0,34                                                                                        | 8,80                                        | 55                                                 | 112                                                                | 100/500/1000                                    |
| 321434073          | 7 x 2 x 0,34                                                                                        | 9,60                                        | 60                                                 | 135                                                                | 100/500/1000                                    |
| 321434083          | 8 x 2 x 0,34                                                                                        | 9,90                                        | 68                                                 | 146                                                                | 100/500/1000                                    |
| 321434103          | 10 x 2 x 0,34                                                                                       | 11,00                                       | 80                                                 | 170                                                                | 100/500/1000                                    |
| 321434123          | 12 x 2 x 0,34                                                                                       | 11,30                                       | 95                                                 | 175                                                                | 100/500/1000                                    |
| 321434143          | 14 x 2 x 0,34                                                                                       | 12,40                                       | 106                                                | 227                                                                | 100/500/1000                                    |
| 321434163          | 16 x 2 x 0,34                                                                                       | 13,10                                       | 125                                                | 253                                                                | 100/500/1000                                    |
| 321434183          | 18 x 2 x 0,34                                                                                       | 13,80                                       | 138                                                | 276                                                                | 100/500/1000                                    |
| 321434203          | 20 x 2 x 0,34                                                                                       | 14,60                                       | 150                                                | 303                                                                | 100/500/1000                                    |
| 321450023          | 2 x 2 x 0,50                                                                                        | 7,70                                        | 28                                                 | 76                                                                 | 100/500/1000                                    |
| 321450033          | 3 x 2 x 0,50                                                                                        | 8,20                                        | 36                                                 | 92                                                                 | 100/500/1000                                    |
| 321450043          | 4 x 2 x 0,50                                                                                        | 9,00                                        | 46                                                 | 110                                                                | 100/500/1000                                    |
| 321450053          | 5 x 2 x 0,50                                                                                        | 10,30                                       | 56                                                 | 132                                                                | 100/500/1000                                    |
| 321450063          | 6 x 2 x 0,50                                                                                        | 11,10                                       | 67                                                 | 156                                                                | 100/500/1000                                    |
| 321450073          | 7 x 2 x 0,50                                                                                        | 11,70                                       | 76                                                 | 172                                                                | 100/500/1000                                    |
| 321450083          | 8 x 2 x 0,50                                                                                        | 12,50                                       | 86                                                 | 200                                                                | 100/500/1000                                    |
| 321450103          | 10 x 2 x 0,50                                                                                       | 14,10                                       | 106                                                | 242                                                                | 100/500/1000                                    |
| 321450123          | 12 x 2 x 0,50                                                                                       | 14,30                                       | 125                                                | 273                                                                | 100/500                                         |
| 321450143          | 14 x 2 x 0,50                                                                                       | 15,20                                       | 143                                                | 309                                                                | 100/500                                         |
| 321450163          | 16 x 2 x 0,50                                                                                       | 16,40                                       | 160                                                | 354                                                                | 100/500                                         |
| 321450183          | 18 x 2 x 0,50                                                                                       | 17,20                                       | 178                                                | 386                                                                | 100/500                                         |
| 321450203          | 20 x 2 x 0,50                                                                                       | 18,20                                       | 196                                                | 424                                                                | 100/500                                         |

## LIHCH-TP

| KOD NO<br>CODE NR. | ÇİFT SAYISI VE KESİTİ (mm <sup>2</sup> )<br>NUMBER OF PAIRS AND CROSS SECTION<br>(mm <sup>2</sup> ) | KABLO ÇAPİ (mm)<br>OVERALL DIAMETER<br>(mm) | BAKIR AĞIRLIĞI (kg/km)<br>COPPER WEIGHT<br>(kg/km) | YAKLAŞIK KABLO AĞIRLIĞI (kg/km)<br>APPROX. CABLE WEIGHT<br>(kg/km) | STANDART<br>UZUNLUK (mt)<br>STANDARD LENGTH (m) |
|--------------------|-----------------------------------------------------------------------------------------------------|---------------------------------------------|----------------------------------------------------|--------------------------------------------------------------------|-------------------------------------------------|
| 321475023          | 2 x 2 x 0,75                                                                                        | 8,30                                        | 37                                                 | 89                                                                 | 100/500/1000                                    |
| 321475033          | 3 x 2 x 0,75                                                                                        | 9,00                                        | 55                                                 | 110                                                                | 100/500/1000                                    |
| 321475043          | 4 x 2 x 0,75                                                                                        | 10,00                                       | 64                                                 | 140                                                                | 100/500/1000                                    |
| 321475053          | 5 x 2 x 0,75                                                                                        | 11,20                                       | 80                                                 | 170                                                                | 100/500/1000                                    |
| 321475063          | 6 x 2 x 0,75                                                                                        | 12,40                                       | 95                                                 | 206                                                                | 100/500/1000                                    |
| 321475073          | 7 x 2 x 0,75                                                                                        | 13,10                                       | 110                                                | 228                                                                | 100/500/1000                                    |
| 321475083          | 8 x 2 x 0,75                                                                                        | 13,60                                       | 125                                                | 256                                                                | 100/500/1000                                    |
| 321475103          | 10 x 2 x 0,75                                                                                       | 15,30                                       | 155                                                | 302                                                                | 100/500/1000                                    |
| 321475123          | 12 x 2 x 0,75                                                                                       | 15,60                                       | 180                                                | 342                                                                | 100/500/1000                                    |
| 321475143          | 14 x 2 x 0,75                                                                                       | 16,90                                       | 207                                                | 400                                                                | 100/500/1000                                    |
| 321475163          | 16 x 2 x 0,75                                                                                       | 17,90                                       | 234                                                | 447                                                                | 100/500/1000                                    |
| 321475183          | 18 x 2 x 0,75                                                                                       | 18,90                                       | 260                                                | 490                                                                | 100/500/1000                                    |
| 321475203          | 20 x 2 x 0,75                                                                                       | 20,00                                       | 287                                                | 537                                                                | 100/500/1000                                    |
| 321401023          | 2 x 2 x 1                                                                                           | 9,00                                        | 50                                                 | 106                                                                | 100/500/1000                                    |
| 321401033          | 3 x 2 x 1                                                                                           | 9,90                                        | 65                                                 | 136                                                                | 100/500/1000                                    |
| 321401043          | 4 x 2 x 1                                                                                           | 10,60                                       | 85                                                 | 166                                                                | 100/500/1000                                    |
| 321401053          | 5 x 2 x 1                                                                                           | 12,40                                       | 105                                                | 215                                                                | 100/500/1000                                    |
| 321401063          | 6 x 2 x 1                                                                                           | 13,60                                       | 125                                                | 250                                                                | 100/500/1000                                    |
| 321401073          | 7 x 2 x 1                                                                                           | 14,10                                       | 145                                                | 275                                                                | 100/500/1000                                    |
| 321401083          | 8 x 2 x 1                                                                                           | 14,50                                       | 161                                                | 304                                                                | 100/500                                         |
| 321401103          | 10 x 2 x 1                                                                                          | 16,90                                       | 200                                                | 378                                                                | 100/500                                         |
| 321401123          | 12 x 2 x 1                                                                                          | 17,30                                       | 234                                                | 430                                                                | 100/500                                         |
| 321401143          | 14 x 2 x 1                                                                                          | 18,30                                       | 270                                                | 490                                                                | 100/500                                         |
| 321401163          | 16 x 2 x 1                                                                                          | 19,50                                       | 306                                                | 552                                                                | 100/500                                         |
| 321401183          | 18 x 2 x 1                                                                                          | 20,50                                       | 340                                                | 607                                                                | 100/500                                         |
| 321401203          | 20 x 2 x 1                                                                                          | 21,70                                       | 380                                                | 667                                                                | 100/500                                         |
| 321415023          | 2 x 2 x 1,5                                                                                         | 9,90                                        | 65                                                 | 132                                                                | 100/500/1000                                    |
| 321415033          | 3 x 2 x 1,5                                                                                         | 10,50                                       | 90                                                 | 163                                                                | 100/500/1000                                    |
| 321415043          | 4 x 2 x 1,5                                                                                         | 11,50                                       | 115                                                | 203                                                                | 100/500/1000                                    |
| 321415053          | 5 x 2 x 1,5                                                                                         | 13,20                                       | 145                                                | 259                                                                | 100/500/1000                                    |
| 321415063          | 6 x 2 x 1,5                                                                                         | 14,30                                       | 170                                                | 302                                                                | 100/500/1000                                    |
| 321415073          | 7 x 2 x 1,5                                                                                         | 15,20                                       | 195                                                | 336                                                                | 100/500/1000                                    |
| 321415083          | 8 x 2 x 1,5                                                                                         | 15,70                                       | 220                                                | 373                                                                | 100/500/1000                                    |
| 321415103          | 10 x 2 x 1,5                                                                                        | 18,00                                       | 275                                                | 463                                                                | 100/500/1000                                    |
| 321415123          | 12 x 2 x 1,5                                                                                        | 18,40                                       | 320                                                | 530                                                                | 100/500/1000                                    |
| 321415143          | 14 x 2 x 1,5                                                                                        | 19,70                                       | 380                                                | 596                                                                | 100/500                                         |
| 321415163          | 16 x 2 x 1,5                                                                                        | 21,00                                       | 430                                                | 686                                                                | 100/500                                         |
| 321415183          | 18 x 2 x 1,5                                                                                        | 22,10                                       | 480                                                | 755                                                                | 100/500                                         |
| 321415203          | 20 x 2 x 1,5                                                                                        | 23,90                                       | 532                                                | 857                                                                | 100/500                                         |

## LIYCY-CY



İYİ EMC\* ÖZELLİK/ESNEK KABLO YAPISI/KÜÇÜK BÜKÜLME YARIÇAPI/ALEV GECİKTİRİCİ ÖZELLİK  
GOOD EMC\* CHARACTERISTIC/FLEXIBLE CABLE DESIGN/SMALL BENDING RADIUS/FLAME RETARDANT CHARACTERISTIC



## KULLANIM ALANLARI

Elektromanyetik karışım ve girişimlerin olduğu

- Enstrüman ve Kontrol Mühendisliğinde
- Endüstriyel Elektronikte
- Bilgisayar ve Ofis Makinelerinde
- Bina İçi Haberleşme Sistemlerinde
- Bina İçi Ses Sistemlerinde
- Güvenlik Sistemlerinde

## APPLICATION

In places where electro-magnetic interference and influence exists

- Instrumentation and Control Engineering
- Industrial Electronics
- Computers and Office Machines
- Indoor Communication Systems
- Indoor Sound Systems
- Security Systems

## KABLO YAPISI

- 1-İletken** IEC 60228; DIN VDE 0295; EN 60228 Sınıf 5  
Bükülü Elektrolitik Tavlı Bakır
- 2-Yalıtkan** EN 50290-2-21 PVC Kompaund
- 3-Yalıtım Renk** DIN 47100
- 4-Bireysel Ekran** Pes Bant; Kalaylı Bakır Örgü
- 5-İç Kılıf** EN 50290-2-22 PVC Kompaund
- 6-Büküm** Ekranlanmış ve kılıflanmış çiftlerin katlar halinde bükümü
- 7-Ayırıcı Bant** Pes Bant
- 8-Ekran** Kalaylı Bakır Örgü
- 9-Dış Kılıf** EN 50290-2-22 PVC Kompaund
- 10-Kılıf Rengi** RAL 7001 Gri

## CONSTRUCTION

- 1-Conductor** IEC 60228; DIN VDE 0295; EN 60228 Class 5  
Stranded Electrolytic Bare Copper
- 2-Insulation** EN 50290-2-21 PVC Compound
- 3-Colour Code** DIN 47100
- 4-Individual Screen** Pes Tape; Tinned Copper Braid
- 5-Inner Sheath** EN 50290-2-22 PVC Compound
- 6-Stranding** Screened and sheathed pairs stranded in layers
- 7-Wrapping** Pes Tape
- 8-Screen** Tinned Copper Braid
- 9-Outer Sheath** EN 50290-2-22 PVC Compound
- 10-Sheath Colour** RAL 7001 Grey

TEKNİK ÖZELLİKLER  
TECHNICAL CHARACTERISTICS

| İLETKEN DİRENCİ<br>CONDUCTOR<br>RESISTANCE | YALITIM DİRENCİ<br>INSULATION<br>RESISTANCE    | EFEKTİF KAPASİTE<br>MUTUAL<br>CAPACITANCE | EMPEDANS<br>IMPEDANCE | İNDÜKTANS<br>INDUCTANCE | AKIM TAŞIMA KAPASİTESİ<br>CURRENT CARRYING<br>CAPACITY | ÇALIŞMA VOLTAJİ<br>OPERATING<br>VOLTAGE                                             | TEST VOLTAJİ<br>TEST VOLTAGE                                                      |
|--------------------------------------------|------------------------------------------------|-------------------------------------------|-----------------------|-------------------------|--------------------------------------------------------|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
| mm <sup>2</sup> Ω/km                       | MΩxkm                                          | mm <sup>2</sup> pF/m                      | 78Ω                   | 0,67mH/km               | mm <sup>2</sup> A                                      | 0,22mm <sup>2</sup> /0,34mm <sup>2</sup> = 250V<br>≥ 0,50mm <sup>2</sup> = 300/500V | 0,22mm <sup>2</sup> /0,34mm <sup>2</sup> = 1200V<br>≥ 0,50mm <sup>2</sup> = 2000V |
| 0,22    79                                 | 0,22mm <sup>2</sup> /0,34mm <sup>2</sup> = 200 | 0,22    110                               |                       |                         | 0,22    2,5                                            |                                                                                     |                                                                                   |
| 0,34    56                                 | ≥ 0,50mm <sup>2</sup> = 20                     | 0,34    110                               |                       |                         | 0,34    4,5                                            |                                                                                     |                                                                                   |
| 0,50    39                                 |                                                | 0,50    120                               |                       |                         | 0,50    6,0                                            |                                                                                     |                                                                                   |
| 0,75    26                                 |                                                | 0,75    120                               |                       |                         | 0,75    13                                             |                                                                                     |                                                                                   |
| 1,0    19,5                                |                                                | 1,0    130                                |                       |                         | 1,0    16                                              |                                                                                     |                                                                                   |
| 1,5    13,3                                |                                                | 1,5    140                                |                       |                         | 1,5    20                                              |                                                                                     |                                                                                   |
| 2,5    7,98                                |                                                | 2,5    150                                |                       |                         | 2,5    25                                              |                                                                                     |                                                                                   |

BÜKÜLME YARIÇAPI  
BENDING RADIUS

ÇALIŞMA SICAKLIĞI  
TEMPERATURE RANGE

ALEV GECİKTİRİCİLİK TESTİ  
FLAME RETARDANT TEST

EMC\*  
EMC\*

10x Cable Ø

-30°C - +70°C

IEC 60332-1-2  
DIN EN 60332-1-2  
EN 60332-1-2

ELEKTROMANYETİK UYUMLU  
ELECTROMAGNETIC COMPATIBILITY

## NOTLAR

Esnek yapıları ile dar alanlarda rahatlıkla uygulanabilirler.  
Bu tip kablolar dış ortamlarda kullanıma uygun değildir.

## NOTES

With its flexible design it can easily be used in narrow spaces.  
These cables are not suitable for outdoor use.

# JE-LIYCY...Bd



İYİ EMC\* ÖZELLİK/ESNEK KABLO YAPISI/İNCELTİLMİŞ DIŞ ÇAP/KÜÇÜK BÜKÜLME YARIÇAPI/ALEV GECİKTİRİCİ ÖZELLİK  
GOOD EMC\* CHARACTERISTIC/FLEXIBLE CABLE DESIGN/REDUCED OUTER DIAMETER/SMALL BENDING RADIUS/  
FLAME RETARDANT CHARACTERISTIC



## KULLANIM ALANLARI

- Elektromanyetik karışım ve girişimlerin olduğu  
-Enstrüman ve Kontrol Mühendisliğinde  
-Endüstriyel Elektronikte  
-Bilgisayar ve Ofis Makinelerinde  
-Bina İçi Haberleşme Sistemlerinde  
-Bina İçi Ses Sistemlerinde  
-Güvenlik Sistemlerinde

## KABLO YAPISI

- 1-İletken** IEC 60228; DIN VDE 0295; EN 60228 Sınıf 2  
Bükülü Elektrolitik Tavlı Bakır (7x0,30)  
**2-Yalıtkan** EN 50290-2-21 PVC Kompaund  
**3-Yalıtım Renk** VDE 0815  
**4-Büküm** 4 çiftli grupların katlar halinde bükümü  
**5-Ayırıcı Bant** Pes Bant  
**6-Ekran** Kalaylı Bakır Örgü  
**7-Kılıf** EN 50290-2-22 PVC Kompaund  
**8-Kılıf Rengi** RAL 7032 Gri ya da RAL 5015 Mavi

## APPLICATION

- In places where electro-magnetic interference and influence exists  
-Instrumentation and Control Engineering  
-Industrial Electronics  
-Computers and Office Machines  
-Indoor Communication Systems  
-Indoor Sound Systems  
-Security Systems

## CONSTRUCTION

- 1-Conductor** IEC 60228 ;DIN VDE 0295;EN 60228 Class 2  
Stranded Electrolytic Bare Copper (7x0,30)  
**2-Insulation** EN 50290-2-21 PVC Compound  
**3-Colour Code** VDE 0815  
**4-Stranding** 4 pair groups stranded in layers  
**5-Wrapping** Pes Tape  
**6-Screen** Tinned Copper Braid  
**7-Sheath** EN 50290-2-22 PVC Compound  
**8-Sheath Colour** RAL 7032 Grey or RAL 5015 Blue

## TEKNİK ÖZELLİKLER TECHNICAL CHARACTERISTICS

| ÇEVİRİM DİRENCİ<br>LOOP<br>RESISTANCE |      | YALITIM DİRENCİ<br>INSULATION<br>RESISTANCE | EFEKTİF KAPASİTE<br>MUTUAL<br>CAPACITANCE         |      | EMPEDANS<br>IMPEDANCE                                   | İNDÜKTANS<br>INDUCTANCE | AKIM TAŞIMA KAPASİTESİ<br>CURRENT CARRYING<br>CAPACITY |     | ÇALIŞMA VOLTAJİ<br>OPERATING<br>VOLTAGE | TEST VOLTAJİ<br>TEST VOLTAGE |
|---------------------------------------|------|---------------------------------------------|---------------------------------------------------|------|---------------------------------------------------------|-------------------------|--------------------------------------------------------|-----|-----------------------------------------|------------------------------|
| mm²                                   | Ω/km | 100MΩxkm                                    | mm²                                               | pf/m | 78Ω                                                     | 0,62mH/km               | mm²                                                    | A   | 0,50mm² = 225V                          | 0,50mm² = 2000V              |
| 0,50                                  | 78,4 |                                             | 0,50                                              | 100  |                                                         |                         | 0,50                                                   | 6,0 |                                         |                              |
| BÜKÜLME YARIÇAPI<br>BENDING RADIUS    |      | ÇALIŞMA SICAKLIĞI<br>TEMPERATURE RANGE      | ALEV GECİKTİRİCİLİK TESTİ<br>FLAME RETARDANT TEST |      | EMC*<br>EMC*                                            |                         |                                                        |     |                                         |                              |
| 7,5x Cable Ø                          |      | - 30°C - +70°C                              | IEC 60332-1-2<br>DIN EN 60332-1-2<br>EN 60332-1-2 |      | ELEKTROMANYETİK UYUMLU<br>ELECTROMAGNETIC COMPATIBILITY |                         |                                                        |     |                                         |                              |
| RENK KODLAMASI<br>COLOUR CODE         |      | GRUP ÇİFT RENKLERİ<br>GROUP PAIRS COLOURS   |                                                   |      |                                                         |                         |                                                        |     |                                         |                              |

| Çift/Pairs    | 1           | 2           | 3           | 4           |
|---------------|-------------|-------------|-------------|-------------|
| A Damarı/Core | Mavi/Blue   | Gri/Grey    | Yeşil/Green | Beyaz/White |
| B Damarı/Core | Kırmızı/Red | Sarı/Yellow | Kahve/Brown | Siyah/Black |

Kablolar 4 çiftli gruplardan oluşur

Cables are composed of 4 pair groups

4 veya daha fazla çiftli gruplar halinde her bir gruba numaralı şerit bant uygulanır

If there are 4 or more pair groups, numbered tapes are applied to each pair group

## NOTLAR

Esnek yapıları ile dar alanlarda rahatlıkla uygulanabilirler.  
Bu tip kablolar dış ortamlarda kullanıma uygun değildir.

2 Çiftli kablolarda damarlar yıldız dörtlü şekilde bükülür

For 2 pair groups cable, cores are twisted together to form a star quad

1-Çift: a-damarı mavi

b-damarı kırmızı

1-Pair: a-core blue

b-core red

2-Çift: a-damarı gri

b-damarı sarı

2-Pair: a-core grey

b-core yellow

## NOTES

With its flexible design it can easily be used in narrow spaces.  
These cables are not suitable for outdoor use.

LIY(St)Y



İYİ EMC\* ÖZELLİK/ESNEK KABLO YAPISI/İNCELTİLMİŞ DIŞ ÇAP/KÜÇÜK BÜKÜLME YARIÇAPI/ALEV GECİKTİRİCİ ÖZELLİK  
GOOD EMC\* CHARACTERISTIC/FLEXIBLE CABLE DESIGN/REDUCED OUTER DIAMETER/SMALL BENDING RADIUS/  
FLAME RETARDANT CHARACTERISTIC



## KULLANIM ALANLARI

Elektromanyetik karışım ve girişimlerin olduğu

- Enstrüman ve Kontrol Mühendisliğinde
- Endüstriyel Elektronikte
- Bilgisayar ve Ofis Makinelerinde
- Bina İçi Haberleşme Sistemlerinde
- Bina İçi Ses Sistemlerinde
- Güvenlik Sistemlerinde

## APPLICATION

In places where electro-magnetic interference and influence exists

- Instrumentation and Control Engineering
- Industrial Electronics
- Computers and Office Machines
- Indoor Communication Systems
- Indoor Sound Systems
- Security Systems

## KABLO YAPISI

- 1-İletken** IEC 60228; DIN VDE 0295; EN 60228 Sınıf 5  
Bükülü Elektrolitik Tavlı Bakır
- 2-Yalıtkan** EN 50290-2-21 PVC Kompaund
- 3-Yalıtım Renk** DIN 47100
- 4-Büküm** Uygun adımda katlar halinde
- 5-Ayırıcı Bant** Pes Bant
- 6-Ekran** Kalaylı Bakır Toprak Teli + Al-Pes Bant
- 7-Kılıf** EN 50290-2-22 PVC Kompaund
- 8-Kılıf Rengi** RAL 7001 Gri

## CONSTRUCTION

- 1-Conductor** IEC 60228; DIN VDE 0295; EN 60228 Class 5  
Stranded Electrolytic Bare Copper
- 2-Insulation** EN 50290-2-21 PVC Compound
- 3-Colour Code** DIN 47100
- 4-Stranding** In layers of optimum pitch
- 5-Wrapping** Pes Tape
- 6-Screen** Tinned Copper Drain Wire + Al-Pes Tape
- 7-Sheath** EN 50290-2-22 PVC Compound
- 8-Sheath Colour** RAL 7001 Grey

## TEKNİK ÖZELLİKLER TECHNICAL CHARACTERISTICS

| İLETKEN DİRENCİ<br>CONDUCTOR<br>RESISTANCE | YALITIM DİRENCİ<br>INSULATION<br>RESISTANCE    | EFEKTİF KAPASİTE<br>MUTUAL<br>CAPACITANCE         | EMPEDANS<br>IMPEDANCE                                   | İNDÜKTANS<br>INDUCTANCE | AKIM TAŞIMA KAPASİTESİ<br>CURRENT CARRYING<br>CAPACITY | ÇALIŞMA VOLTAJİ<br>OPERATING<br>VOLTAGE                                             | TEST VOLTAJİ<br>TEST VOLTAGE                                                      |
|--------------------------------------------|------------------------------------------------|---------------------------------------------------|---------------------------------------------------------|-------------------------|--------------------------------------------------------|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
| mm <sup>2</sup> Ω/km                       | MΩxkm                                          | mm <sup>2</sup> pF/m                              | 78Ω                                                     | 0,67mH/km               | mm <sup>2</sup> A                                      | 0,22mm <sup>2</sup> /0,34mm <sup>2</sup> = 250V<br>≥ 0,50mm <sup>2</sup> = 300/500V | 0,22mm <sup>2</sup> /0,34mm <sup>2</sup> = 1200V<br>≥ 0,50mm <sup>2</sup> = 2000V |
| 0,22    79                                 | 0,22mm <sup>2</sup> /0,34mm <sup>2</sup> = 200 | 0,22    110                                       |                                                         |                         | 0,22    2,5                                            |                                                                                     |                                                                                   |
| 0,34    56                                 | ≥ 0,50mm <sup>2</sup> = 20                     | 0,34    110                                       |                                                         |                         | 0,34    4,5                                            |                                                                                     |                                                                                   |
| 0,50    39                                 |                                                | 0,50    120                                       |                                                         |                         | 0,50    6,0                                            |                                                                                     |                                                                                   |
| 0,75    26                                 |                                                | 0,75    120                                       |                                                         |                         | 0,75    13                                             |                                                                                     |                                                                                   |
| 1,0    19,5                                |                                                | 1,0    130                                        |                                                         |                         | 1,0    16                                              |                                                                                     |                                                                                   |
| 1,5    13,3                                |                                                | 1,5    140                                        |                                                         |                         | 1,5    20                                              |                                                                                     |                                                                                   |
| 2,5    7,98                                |                                                | 2,5    150                                        |                                                         |                         | 2,5    25                                              |                                                                                     |                                                                                   |
| BÜKÜLME YARIÇAPI<br>BENDING RADIUS         | ÇALIŞMA SICAKLIĞI<br>TEMPERATURE RANGE         | ALEV GECİKTİRİCİLİK TESTİ<br>FLAME RETARDANT TEST | EMC*                                                    |                         |                                                        |                                                                                     |                                                                                   |
| 10x Cable Ø                                | -30°C - +70°C                                  | IEC 60332-1-2<br>DIN EN 60332-1-2<br>EN 60332-1-2 | ELEKTROMANYETİK UYUMLU<br>ELECTROMAGNETIC COMPATIBILITY |                         |                                                        |                                                                                     |                                                                                   |

## NOTLAR

Esnek yapıları ile dar alanlarda rahatlıkla uygulanabilirler.

Bu tip kablolar dış ortamlarda kullanıma uygun değildir.

**LIY(St)Y-OZ:** Numara kodlu siyah damarlar.

## NOTES

With its flexible design it can easily be used in narrow spaces.

These cables are not suitable for outdoor use.

**LIY(St)Y-OZ:** Number coded black cores.

LIY(St)Y

| KOD NO<br>CODENR. | DAMAR SAYISI VE KESİTİ (mm <sup>2</sup> )<br>NUMBER OF CORE AND<br>CROSS SECTION (mm <sup>2</sup> ) | KABLO ÇAPI (mm)<br>OVERALL DIAMETER<br>(mm) | BAKIR AĞIRLIĞI (kg/km)<br>COPPER WEIGHT<br>(kg/km) | YAKLAŞIK KABLO AĞIRLIĞI (kg/km)<br>APPROX. CABLE WEIGHT<br>(kg/km) | STANDART<br>UZUNLUK (mt)<br>STANDARD LENGTH (m) |
|-------------------|-----------------------------------------------------------------------------------------------------|---------------------------------------------|----------------------------------------------------|--------------------------------------------------------------------|-------------------------------------------------|
| 322022023         | 2 x 0,22                                                                                            | 3,90                                        | 7                                                  | 20                                                                 | 100/500/1000                                    |
| 322022033         | 3 x 0,22                                                                                            | 4,10                                        | 9                                                  | 24                                                                 | 100/500/1000                                    |
| 322022043         | 4 x 0,22                                                                                            | 4,50                                        | 11                                                 | 30                                                                 | 100/500/1000                                    |
| 322022053         | 5 x 0,22                                                                                            | 4,70                                        | 13                                                 | 37                                                                 | 100/500/1000                                    |
| 326922063         | 6 x 0,22                                                                                            | 5,20                                        | 14                                                 | 42                                                                 | 100/500/1000                                    |
| 326922083         | 8 x 0,22                                                                                            | 5,50                                        | 18                                                 | 53                                                                 | 100/500/1000                                    |
| 326922103         | 10 x 0,22                                                                                           | 6,50                                        | 22                                                 | 66                                                                 | 100/500/1000                                    |
| 326922123         | 12 x 0,22                                                                                           | 6,80                                        | 27                                                 | 75                                                                 | 100/500/1000                                    |
| 326922143         | 14 x 0,22                                                                                           | 7,10                                        | 31                                                 | 88                                                                 | 100/500/1000                                    |
| 326922163         | 16 x 0,22                                                                                           | 7,60                                        | 35                                                 | 98                                                                 | 100/500/1000                                    |
| 326922183         | 18 x 0,22                                                                                           | 7,90                                        | 40                                                 | 103                                                                | 100/500/1000                                    |
| 326922203         | 20 x 0,22                                                                                           | 8,10                                        | 43                                                 | 113                                                                | 100/500/1000                                    |
| 322034023         | 2 x 0,34                                                                                            | 4,30                                        | 8                                                  | 28                                                                 | 100/500/1000                                    |
| 322034033         | 3 x 0,34                                                                                            | 4,50                                        | 12                                                 | 34                                                                 | 100/500/1000                                    |
| 322034043         | 4 x 0,34                                                                                            | 5,10                                        | 15                                                 | 43                                                                 | 100/500/1000                                    |
| 322034053         | 5 x 0,34                                                                                            | 5,50                                        | 17                                                 | 52                                                                 | 100/500/1000                                    |
| 326934063         | 6 x 0,34                                                                                            | 5,80                                        | 21                                                 | 58                                                                 | 100/500/1000                                    |
| 326934083         | 8 x 0,34                                                                                            | 6,10                                        | 28                                                 | 75                                                                 | 100/500/1000                                    |
| 326934103         | 10 x 0,34                                                                                           | 7,50                                        | 33                                                 | 93                                                                 | 100/500/1000                                    |
| 326934123         | 12 x 0,34                                                                                           | 7,80                                        | 40                                                 | 106                                                                | 100/500/1000                                    |
| 326934143         | 14 x 0,34                                                                                           | 8,20                                        | 47                                                 | 110                                                                | 100/500/1000                                    |
| 326934163         | 16 x 0,34                                                                                           | 8,60                                        | 53                                                 | 122                                                                | 100/500/1000                                    |
| 326934183         | 18 x 0,34                                                                                           | 8,90                                        | 59                                                 | 133                                                                | 100/500/1000                                    |
| 326934203         | 20 x 0,34                                                                                           | 9,20                                        | 66                                                 | 144                                                                | 100/500/1000                                    |
| 322050023         | 2 x 0,50                                                                                            | 5,20                                        | 11                                                 | 32                                                                 | 100/500/1000                                    |
| 322050033         | 3 x 0,50                                                                                            | 5,40                                        | 16                                                 | 40                                                                 | 100/500/1000                                    |
| 322050043         | 4 x 0,50                                                                                            | 6,00                                        | 20                                                 | 50                                                                 | 100/500/1000                                    |
| 322050053         | 5 x 0,50                                                                                            | 6,60                                        | 25                                                 | 61                                                                 | 100/500/1000                                    |
| 326950063         | 6 x 0,50                                                                                            | 7,30                                        | 27                                                 | 75                                                                 | 100/500/1000                                    |
| 326950073         | 7 x 0,50                                                                                            | 7,30                                        | 31                                                 | 82                                                                 | 100/500/1000                                    |
| 326950083         | 8 x 0,50                                                                                            | 7,60                                        | 36                                                 | 98                                                                 | 100/500/1000                                    |
| 326950103         | 10 x 0,50                                                                                           | 9,50                                        | 43                                                 | 116                                                                | 100/500/1000                                    |
| 326950123         | 12 x 0,50                                                                                           | 9,70                                        | 51                                                 | 138                                                                | 100/500/1000                                    |
| 326950143         | 14 x 0,50                                                                                           | 10,20                                       | 61                                                 | 156                                                                | 100/500/1000                                    |
| 326950163         | 16 x 0,50                                                                                           | 10,80                                       | 69                                                 | 180                                                                | 100/500/1000                                    |
| 326950183         | 18 x 0,50                                                                                           | 11,30                                       | 77                                                 | 200                                                                | 100/500/1000                                    |
| 326950203         | 20 x 0,50                                                                                           | 11,70                                       | 86                                                 | 210                                                                | 100/500/1000                                    |
| 322075023         | 2 x 0,75                                                                                            | 5,60                                        | 18                                                 | 44                                                                 | 100/500/1000                                    |
| 322075033         | 3 x 0,75                                                                                            | 5,90                                        | 24                                                 | 54                                                                 | 100/500/1000                                    |
| 322075043         | 4 x 0,75                                                                                            | 6,30                                        | 30                                                 | 66                                                                 | 100/500/1000                                    |
| 322075053         | 5 x 0,75                                                                                            | 7,20                                        | 37                                                 | 82                                                                 | 100/500/1000                                    |
| 326975063         | 6 x 0,75                                                                                            | 7,80                                        | 43                                                 | 95                                                                 | 100/500/1000                                    |
| 326975073         | 7 x 0,75                                                                                            | 7,80                                        | 50                                                 | 104                                                                | 100/500/1000                                    |
| 326975083         | 8 x 0,75                                                                                            | 8,20                                        | 56                                                 | 122                                                                | 100/500/1000                                    |
| 326975103         | 10 x 0,75                                                                                           | 10,10                                       | 69                                                 | 149                                                                | 100/500/1000                                    |
| 326975123         | 12 x 0,75                                                                                           | 10,50                                       | 81                                                 | 172                                                                | 100/500/1000                                    |
| 326975143         | 14 x 0,75                                                                                           | 11,00                                       | 94                                                 | 201                                                                | 100/500/1000                                    |
| 326975163         | 16 x 0,75                                                                                           | 11,60                                       | 107                                                | 223                                                                | 100/500/1000                                    |
| 326975183         | 18 x 0,75                                                                                           | 12,20                                       | 119                                                | 246                                                                | 100/500/1000                                    |
| 326975203         | 20 x 0,75                                                                                           | 13,00                                       | 132                                                | 278                                                                | 100/500/1000                                    |

LIY(St)Y

| KOD NO<br>CODENR. | DAMAR SAYISI VE KESİTİ (mm <sup>2</sup> )<br>NUMBER OF CORE AND<br>CROSS SECTION (mm <sup>2</sup> ) | KABLO ÇAPI (mm)<br>OVERALL DIAMETER<br>(mm) | BAKIR AĞIRLIĞI (kg/km)<br>COPPER WEIGHT<br>(kg/km) | YAKLAŞIK KABLO AĞIRLIĞI (kg/km)<br>APPROX. CABLE WEIGHT<br>(kg/km) | STANDART<br>UZUNLUK (mt)<br>STANDARD LENGTH (m) |
|-------------------|-----------------------------------------------------------------------------------------------------|---------------------------------------------|----------------------------------------------------|--------------------------------------------------------------------|-------------------------------------------------|
| 322001023         | 2 x 1                                                                                               | 6,10                                        | 22                                                 | 52                                                                 | 100/500/1000                                    |
| 322001033         | 3 x 1                                                                                               | 6,40                                        | 31                                                 | 67                                                                 | 100/500/1000                                    |
| 322001043         | 4 x 1                                                                                               | 6,90                                        | 39                                                 | 86                                                                 | 100/500/1000                                    |
| 322001053         | 5 x 1                                                                                               | 7,30                                        | 48                                                 | 106                                                                | 100/500/1000                                    |
| 326901063         | 6 x 1                                                                                               | 8,40                                        | 56                                                 | 123                                                                | 100/500/1000                                    |
| 326901073         | 7 x 1                                                                                               | 8,40                                        | 65                                                 | 130                                                                | 100/500/1000                                    |
| 326901083         | 8 x 1                                                                                               | 8,90                                        | 73                                                 | 145                                                                | 100/500/1000                                    |
| 326901103         | 10 x 1                                                                                              | 11,00                                       | 90                                                 | 186                                                                | 100/500/1000                                    |
| 326901123         | 12 x 1                                                                                              | 11,40                                       | 108                                                | 215                                                                | 100/500/1000                                    |
| 326901143         | 14 x 1                                                                                              | 11,90                                       | 125                                                | 242                                                                | 100/500/1000                                    |
| 326901163         | 16 x 1                                                                                              | 12,10                                       | 145                                                | 270                                                                | 100/500/1000                                    |
| 326901183         | 18 x 1                                                                                              | 13,70                                       | 160                                                | 315                                                                | 100/500/1000                                    |
| 326901203         | 20 x 1                                                                                              | 14,10                                       | 180                                                | 338                                                                | 100/500/1000                                    |
| 322015023         | 2 x 1,5                                                                                             | 6,50                                        | 29                                                 | 72                                                                 | 100/500/1000                                    |
| 322015033         | 3 x 1,5                                                                                             | 6,80                                        | 42                                                 | 86                                                                 | 100/500/1000                                    |
| 322015043         | 4 x 1,5                                                                                             | 7,60                                        | 54                                                 | 108                                                                | 100/500/1000                                    |
| 322015053         | 5 x 1,5                                                                                             | 8,40                                        | 66                                                 | 130                                                                | 100/500/1000                                    |
| 326915063         | 6 x 1,5                                                                                             | 9,50                                        | 78                                                 | 166                                                                | 100/500/1000                                    |
| 326915073         | 7 x 1,5                                                                                             | 9,50                                        | 90                                                 | 172                                                                | 100/500/1000                                    |
| 326915083         | 8 x 1,5                                                                                             | 9,90                                        | 103                                                | 190                                                                | 100/500/1000                                    |
| 326915103         | 10 x 1,5                                                                                            | 11,90                                       | 129                                                | 234                                                                | 100/500/1000                                    |
| 326915123         | 12 x 1,5                                                                                            | 12,20                                       | 154                                                | 270                                                                | 100/500/1000                                    |
| 326915143         | 14 x 1,5                                                                                            | 13,20                                       | 179                                                | 315                                                                | 100/500/1000                                    |
| 326915163         | 16 x 1,5                                                                                            | 14,00                                       | 203                                                | 355                                                                | 100/500/1000                                    |
| 326915183         | 18 x 1,5                                                                                            | 14,60                                       | 226                                                | 393                                                                | 100/500/1000                                    |
| 326915203         | 20 x 1,5                                                                                            | 15,60                                       | 250                                                | 427                                                                | 100/500/1000                                    |
| 322025023         | 2 x 2,5                                                                                             | 8,00                                        | 46                                                 | 97                                                                 | 100/500/1000                                    |
| 322025033         | 3 x 2,5                                                                                             | 8,50                                        | 66                                                 | 125                                                                | 100/500/1000                                    |
| 322025043         | 4 x 2,5                                                                                             | 9,20                                        | 86                                                 | 157                                                                | 100/500/1000                                    |
| 322025053         | 5 x 2,5                                                                                             | 10,70                                       | 109                                                | 194                                                                | 100/500/1000                                    |
| 326925063         | 6 x 2,5                                                                                             | 11,60                                       | 130                                                | 232                                                                | 100/500/1000                                    |
| 326925073         | 7 x 2,5                                                                                             | 11,60                                       | 152                                                | 260                                                                | 100/500/1000                                    |
| 326925083         | 8 x 2,5                                                                                             | 12,20                                       | 172                                                | 294                                                                | 100/500/1000                                    |
| 326925103         | 10 x 2,5                                                                                            | 15,10                                       | 216                                                | 369                                                                | 100/500/1000                                    |
| 326925123         | 12 x 2,5                                                                                            | 15,40                                       | 256                                                | 426                                                                | 100/500/1000                                    |
| 326925143         | 14 x 2,5                                                                                            | 16,30                                       | 293                                                | 487                                                                | 100/500/1000                                    |
| 326925163         | 16 x 2,5                                                                                            | 17,30                                       | 334                                                | 550                                                                | 100/500/1000                                    |
| 326925183         | 18 x 2,5                                                                                            | 18,50                                       | 372                                                | 631                                                                | 100/500/1000                                    |
| 326925203         | 20 x 2,5                                                                                            | 19,20                                       | 413                                                | 682                                                                | 100/500/1000                                    |

## LIH(St)H



ESNEK KABLO YAPISI/İNCELTİLMİŞ DIŞ ÇAP/KÜÇÜK BÜKÜLME YARIÇAPI/İYİ EMC\* ÖZELLİK/ALEV GECİKTİRİCİ ÖZELLİK/DÜŞÜK DUMAN YOĞUNLUĞU/ZEHİRLİ VE KOROZİF GAZLARDAN ARINDIRILMIŞ  
FLEXIBLE CABLE DESIGN/REDUCED OUTER DIAMETER/SMALL BENDING RADIUS/GOOD EMC\* CHARACTERISTIC/FLAME RETARDANT CHARACTERISTIC/LOW SMOKE EMISSION/WITHOUT POISONED AND CORROSIVE GASES



## KULLANIM ALANLARI

Elektromanyetik karışım ve girişimlerin olduğu  
İnsanların yoğun olarak bulunduğu kapalı ortamlarda  
-Enstrüman ve Kontrol Mühendisliğinde  
-Endüstriyel Elektronikte  
-Bilgisayar ve Ofis Makinelerinde  
-Bina İçi Haberleşme Sistemlerinde  
-Bina İçi Ses Sistemlerinde  
-İnsan hayatının, değerli malzemelerin ve ekipmanların korunması  
gereken yerlerde

## KABLO YAPISI

|                       |                                                                              |
|-----------------------|------------------------------------------------------------------------------|
| <b>1-İletken</b>      | IEC 60228; DIN VDE 0295; EN 60228 Sınıf 5<br>Bükülü Elektrolitik Tavlı Bakır |
| <b>2-Yalıtkan</b>     | EN 50290-2-26 HFFR Kompaund                                                  |
| <b>3-Yalıtım Renk</b> | DIN 47100                                                                    |
| <b>4-Büküm</b>        | Uygun adımda katlar halinde                                                  |
| <b>5-Ayırıcı Bant</b> | Pes Bant                                                                     |
| <b>6-Ekran</b>        | Kalaylı Bakır Toprak Teli + Al-Pes Bant                                      |
| <b>7-Kılıf</b>        | EN 50290-2-27 HFFR Kompaund                                                  |
| <b>8-Kılıf Rengi</b>  | RAL 7001 Gri                                                                 |

## APPLICATION

In places where electro-magnetic interference and influence exists  
In closed areas where people are densely populated  
-Instrumentation and Control Engineering  
-Industrial Electronics  
-Computers and Office Machines  
-Indoor Communication Systems  
-Indoor Sound Systems  
-In places where human life and valuable materials and equipment  
need to be protected

## CONSTRUCTION

|                        |                                                                                |
|------------------------|--------------------------------------------------------------------------------|
| <b>1-Conductor</b>     | IEC 60228; DIN VDE 0295; EN 60228 Class 5<br>Stranded Electrolytic Bare Copper |
| <b>2-Insulation</b>    | EN 50290-2-26 HFFR Compound                                                    |
| <b>3-Colour Code</b>   | DIN 47100                                                                      |
| <b>4-Stranding</b>     | In layers of optimum pitch                                                     |
| <b>5-Wrapping</b>      | Pes Tape                                                                       |
| <b>6-Screen</b>        | Tinned Copper Drain Wire + Al-Pes Tape                                         |
| <b>7-Sheath</b>        | EN 50290-2-27 HFFR Compound                                                    |
| <b>8-Sheath Colour</b> | RAL 7001 Grey                                                                  |

TEKNİK ÖZELLİKLER  
TECHNICAL CHARACTERISTICS

| İLETKEN DİRENCİ<br>CONDUCTOR<br>RESISTANCE | YALITIM DİRENCİ<br>INSULATION<br>RESISTANCE    | EFEKTİF KAPASİTE<br>MUTUAL<br>CAPACITANCE         | EMPEDANS<br>IMPEDANCE                                   | İNDÜKTANS<br>INDUCTANCE                        | AKIM TAŞIMA KAPASİTESİ<br>CURRENT CARRYING<br>CAPACITY            | ÇALIŞMA VOLTAJİ<br>OPERATING<br>VOLTAGE                                             | TEST VOLTAJİ<br>TEST VOLTAGE                                                      |
|--------------------------------------------|------------------------------------------------|---------------------------------------------------|---------------------------------------------------------|------------------------------------------------|-------------------------------------------------------------------|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
| mm <sup>2</sup> Ω/km                       | MΩxkm                                          | mm <sup>2</sup> pF/m                              | 78Ω                                                     | 0,67mH/km                                      | mm <sup>2</sup> A                                                 | 0,22mm <sup>2</sup> /0,34mm <sup>2</sup> = 250V<br>≥ 0,50mm <sup>2</sup> = 300/500V | 0,22mm <sup>2</sup> /0,34mm <sup>2</sup> = 1200V<br>≥ 0,50mm <sup>2</sup> = 2000V |
| 0,22    79                                 | 0,22mm <sup>2</sup> /0,34mm <sup>2</sup> = 200 | 0,22    110                                       |                                                         |                                                | 0,22    2,5                                                       |                                                                                     |                                                                                   |
| 0,34    56                                 | ≥ 0,50mm <sup>2</sup> = 20                     | 0,34    110                                       |                                                         |                                                | 0,34    4,5                                                       |                                                                                     |                                                                                   |
| 0,50    39                                 |                                                | 0,50    120                                       |                                                         |                                                | 0,50    6,0                                                       |                                                                                     |                                                                                   |
| 0,75    26                                 |                                                | 0,75    120                                       |                                                         |                                                | 0,75    13                                                        |                                                                                     |                                                                                   |
| 1,0    19,5                                |                                                | 1,0    130                                        |                                                         |                                                | 1,0    16                                                         |                                                                                     |                                                                                   |
| 1,5    13,3                                |                                                | 1,5    140                                        |                                                         |                                                | 1,5    20                                                         |                                                                                     |                                                                                   |
| 2,5    7,98                                |                                                | 2,5    150                                        |                                                         |                                                | 2,5    25                                                         |                                                                                     |                                                                                   |
| BÜKÜLME YARIÇAPI<br>BENDING RADIUS         | ÇALIŞMA SICAKLIĞI<br>TEMPERATURE RANGE         | ALEV GECİKTİRİCİLİK TESTİ<br>FLAME RETARDANT TEST | EMC*<br>EMC*                                            | DUMAN YOĞUNLUĞU<br>TESTİ<br>SMOKE DENSITY TEST | KOROZİF GAZ TESTİ<br>TEST ON CORROSIVENESS<br>OF COMBUSTION GASES | HALOJENSİZLİK TESTİ<br>HALOGEN FREE TEST                                            | ALEV YAYILIMI TESTİ<br>FLAME PROPAGATION TEST                                     |
| 15x Cable Ø                                | - 30°C - +70°C                                 | IEC 60332-1-2<br>DIN EN 60332-1-2<br>EN 60332-1-2 | ELEKTROMANYETİK UYUMLU<br>ELECTROMAGNETIC COMPATIBILITY | IEC 61034-2<br>VDE 0482-1034-2<br>EN 61034-2   | IEC 60754-2<br>VDE 0482-754-2<br>EN 60754-2                       | IEC 60754-1<br>VDE 0482-754-1<br>EN 60754-1                                         | IEC 60332-3-24<br>DIN EN 60332-3-24<br>EN 60332-3-24                              |

## NOTLAR

Esnek yapıları ile dar alanlarda rahatlıkla uygulanabilirler.  
Bu tip kablolar dış ortamlarda kullanıma uygun değildir.  
LIH(St)H-OZ: Numara kodlu siyah damarlar.

## NOTES

With its flexible design it can easily be used in narrow spaces.  
These cables are not suitable for outdoor use.  
LIH(St)H-OZ: Number coded black cores.

## LIH(St)H

| KOD NO<br>CODENR. | DAMAR SAYISI VE KESİTİ (mm <sup>2</sup> )<br>NUMBER OF CORE AND CROSS<br>SECTION (mm <sup>2</sup> ) | KABLO ÇAPI (mm)<br>OVERALL DIAMETER<br>(mm) | BAKIR AĞIRLIĞI (kg/km)<br>COPPER WEIGHT<br>(kg/km) | YAKLAŞIK KABLO AĞIRLIĞI (kg/km)<br>APPROX. CABLE WEIGHT<br>(kg/km) | STANDART<br>UZUNLUK (m)<br>STANDARD LENGTH (m) |
|-------------------|-----------------------------------------------------------------------------------------------------|---------------------------------------------|----------------------------------------------------|--------------------------------------------------------------------|------------------------------------------------|
| 322222023         | 2 x 0,22                                                                                            | 3,70                                        | 6                                                  | 21                                                                 | 100/500/1000                                   |
| 322222033         | 3 x 0,22                                                                                            | 4,10                                        | 9                                                  | 25                                                                 | 100/500/1000                                   |
| 322222043         | 4 x 0,22                                                                                            | 4,40                                        | 11                                                 | 32                                                                 | 100/500/1000                                   |
| 322222053         | 5 x 0,22                                                                                            | 4,70                                        | 13                                                 | 39                                                                 | 100/500/1000                                   |
| 322222063         | 6 x 0,22                                                                                            | 5,00                                        | 14                                                 | 44                                                                 | 100/500/1000                                   |
| 322222083         | 8 x 0,22                                                                                            | 5,30                                        | 19                                                 | 56                                                                 | 100/500/1000                                   |
| 322222103         | 10 x 0,22                                                                                           | 6,30                                        | 23                                                 | 69                                                                 | 100/500/1000                                   |
| 322222123         | 12 x 0,22                                                                                           | 6,70                                        | 27                                                 | 79                                                                 | 100/500/1000                                   |
| 322222143         | 14 x 0,22                                                                                           | 7,00                                        | 31                                                 | 87                                                                 | 100/500/1000                                   |
| 322222163         | 16 x 0,22                                                                                           | 7,30                                        | 35                                                 | 95                                                                 | 100/500/1000                                   |
| 322222183         | 18 x 0,22                                                                                           | 7,60                                        | 39                                                 | 105                                                                | 100/500/1000                                   |
| 322222203         | 20 x 0,22                                                                                           | 8,00                                        | 43                                                 | 112                                                                | 100/500/1000                                   |
| 322234023         | 2 x 0,34                                                                                            | 4,30                                        | 8                                                  | 29                                                                 | 100/500/1000                                   |
| 322234033         | 3 x 0,34                                                                                            | 4,50                                        | 12                                                 | 32                                                                 | 100/500/1000                                   |
| 322234043         | 4 x 0,34                                                                                            | 4,90                                        | 15                                                 | 45                                                                 | 100/500/1000                                   |
| 322234053         | 5 x 0,34                                                                                            | 5,20                                        | 17                                                 | 55                                                                 | 100/500/1000                                   |
| 322234063         | 6 x 0,34                                                                                            | 5,60                                        | 21                                                 | 61                                                                 | 100/500/1000                                   |
| 322234083         | 8 x 0,34                                                                                            | 5,90                                        | 27                                                 | 73                                                                 | 100/500/1000                                   |
| 322234103         | 10 x 0,34                                                                                           | 7,40                                        | 33                                                 | 90                                                                 | 100/500/1000                                   |
| 322234123         | 12 x 0,34                                                                                           | 7,70                                        | 40                                                 | 100                                                                | 100/500/1000                                   |
| 322234143         | 14 x 0,34                                                                                           | 8,00                                        | 47                                                 | 110                                                                | 100/500/1000                                   |
| 322234163         | 16 x 0,34                                                                                           | 8,50                                        | 53                                                 | 123                                                                | 100/500/1000                                   |
| 322234183         | 18 x 0,34                                                                                           | 8,80                                        | 60                                                 | 134                                                                | 100/500/1000                                   |
| 322234203         | 20 x 0,34                                                                                           | 9,00                                        | 66                                                 | 144                                                                | 100/500/1000                                   |
| 322250023         | 2 x 0,50                                                                                            | 4,90                                        | 13                                                 | 34                                                                 | 100/500/1000                                   |
| 322250033         | 3 x 0,50                                                                                            | 5,20                                        | 16                                                 | 42                                                                 | 100/500/1000                                   |
| 322250043         | 4 x 0,50                                                                                            | 5,60                                        | 20                                                 | 53                                                                 | 100/500/1000                                   |
| 322250053         | 5 x 0,50                                                                                            | 6,10                                        | 22                                                 | 64                                                                 | 100/500/1000                                   |
| 322250063         | 6 x 0,50                                                                                            | 6,60                                        | 25                                                 | 79                                                                 | 100/500/1000                                   |
| 322250073         | 7 x 0,50                                                                                            | 6,60                                        | 31                                                 | 86                                                                 | 100/500/1000                                   |
| 322250083         | 8 x 0,50                                                                                            | 7,40                                        | 36                                                 | 103                                                                | 100/500/1000                                   |
| 322250103         | 10 x 0,50                                                                                           | 8,50                                        | 43                                                 | 113                                                                | 100/500                                        |
| 322250123         | 12 x 0,50                                                                                           | 8,80                                        | 51                                                 | 128                                                                | 100/500                                        |
| 322250143         | 14 x 0,50                                                                                           | 9,40                                        | 60                                                 | 148                                                                | 100/500                                        |
| 322250163         | 16 x 0,50                                                                                           | 9,90                                        | 68                                                 | 166                                                                | 100/500                                        |
| 322250183         | 18 x 0,50                                                                                           | 10,40                                       | 76                                                 | 184                                                                | 100/500                                        |
| 322250203         | 20 x 0,50                                                                                           | 10,80                                       | 86                                                 | 200                                                                | 100/500                                        |
| 322275023         | 2 x 0,75                                                                                            | 5,30                                        | 20                                                 | 46                                                                 | 100/500/1000                                   |
| 322275033         | 3 x 0,75                                                                                            | 5,60                                        | 24                                                 | 57                                                                 | 100/500/1000                                   |
| 322275043         | 4 x 0,75                                                                                            | 6,10                                        | 29                                                 | 69                                                                 | 100/500/1000                                   |
| 322275053         | 5 x 0,75                                                                                            | 6,60                                        | 36                                                 | 86                                                                 | 100/500/1000                                   |
| 322275063         | 6 x 0,75                                                                                            | 7,40                                        | 44                                                 | 99                                                                 | 100/500/1000                                   |
| 322275073         | 7 x 0,75                                                                                            | 7,40                                        | 47                                                 | 109                                                                | 100/500/1000                                   |
| 322275083         | 8 x 0,75                                                                                            | 9,40                                        | 56                                                 | 128                                                                | 100/500/1000                                   |
| 322275103         | 10 x 0,75                                                                                           | 9,40                                        | 68                                                 | 156                                                                | 100/500/1000                                   |
| 322275123         | 12 x 0,75                                                                                           | 9,90                                        | 81                                                 | 167                                                                | 100/500/1000                                   |
| 322275143         | 14 x 0,75                                                                                           | 10,40                                       | 93                                                 | 190                                                                | 100/500/1000                                   |
| 322275163         | 16 x 0,75                                                                                           | 10,90                                       | 104                                                | 212                                                                | 100/500/1000                                   |
| 322275183         | 18 x 0,75                                                                                           | 11,80                                       | 120                                                | 247                                                                | 100/500/1000                                   |
| 322275203         | 20 x 0,75                                                                                           | 12,50                                       | 130                                                | 270                                                                | 100/500/1000                                   |

## LIH(St)H

| KOD NO<br>CODENR. | DAMAR SAYISI VE KESİTİ (mm <sup>2</sup> )<br>NUMBER OF CORE AND CROSS<br>SECTION (mm <sup>2</sup> ) | KABLO ÇAPİ (mm)<br>OVERALL DIAMETER<br>(mm) | BAKIR AĞIRLIĞI (kg/km)<br>COPPER WEIGHT<br>(kg/km) | YAKLAŞIK KABLO AĞIRLIĞI (kg/km)<br>APPROX. CABLE WEIGHT<br>(kg/km) | STANDART<br>UZUNLUK (mt)<br>STANDARD LENGTH (m) |
|-------------------|-----------------------------------------------------------------------------------------------------|---------------------------------------------|----------------------------------------------------|--------------------------------------------------------------------|-------------------------------------------------|
| 322201023         | 2 x 1                                                                                               | 5,70                                        | 23                                                 | 55                                                                 | 100/500/1000                                    |
| 322201033         | 3 x 1                                                                                               | 6,10                                        | 27                                                 | 70                                                                 | 100/500/1000                                    |
| 322201043         | 4 x 1                                                                                               | 6,60                                        | 37                                                 | 90                                                                 | 100/500/1000                                    |
| 322201053         | 5 x 1                                                                                               | 7,40                                        | 45                                                 | 111                                                                | 100/500/1000                                    |
| 322201063         | 6 x 1                                                                                               | 8,00                                        | 54                                                 | 129                                                                | 100/500/1000                                    |
| 322201073         | 7 x 1                                                                                               | 8,00                                        | 62                                                 | 140                                                                | 100/500/1000                                    |
| 322201083         | 8 x 1                                                                                               | 8,60                                        | 71                                                 | 154                                                                | 100/500/1000                                    |
| 322201103         | 10 x 1                                                                                              | 10,40                                       | 86                                                 | 197                                                                | 100/500/1000                                    |
| 322201123         | 12 x 1                                                                                              | 10,40                                       | 105                                                | 230                                                                | 100/500/1000                                    |
| 322201143         | 14 x 1                                                                                              | 11,20                                       | 120                                                | 260                                                                | 100/500                                         |
| 322201163         | 16 x 1                                                                                              | 11,80                                       | 137                                                | 300                                                                | 100/500                                         |
| 322201183         | 18 x 1                                                                                              | 12,80                                       | 155                                                | 345                                                                | 100/500                                         |
| 322201203         | 20 x 1                                                                                              | 13,40                                       | 175                                                | 370                                                                | 100/500                                         |
| 322215023         | 2 x 1,5                                                                                             | 6,00                                        | 29                                                 | 61                                                                 | 100/500/1000                                    |
| 322215033         | 3 x 1,5                                                                                             | 6,50                                        | 40                                                 | 75                                                                 | 100/500/1000                                    |
| 322215043         | 4 x 1,5                                                                                             | 7,40                                        | 52                                                 | 100                                                                | 100/500/1000                                    |
| 322215053         | 5 x 1,5                                                                                             | 8,00                                        | 63                                                 | 115                                                                | 100/500/1000                                    |
| 322215063         | 6 x 1,5                                                                                             | 8,60                                        | 75                                                 | 138                                                                | 100/500/1000                                    |
| 322215073         | 7 x 1,5                                                                                             | 8,60                                        | 86                                                 | 150                                                                | 100/500/1000                                    |
| 322215083         | 8 x 1,5                                                                                             | 9,50                                        | 100                                                | 173                                                                | 100/500/1000                                    |
| 322215103         | 10 x 1,5                                                                                            | 11,20                                       | 126                                                | 210                                                                | 100/500/1000                                    |
| 322215123         | 12 x 1,5                                                                                            | 11,80                                       | 150                                                | 260                                                                | 100/500/1000                                    |
| 322215143         | 14 x 1,5                                                                                            | 12,50                                       | 176                                                | 300                                                                | 100/500/1000                                    |
| 322215163         | 16 x 1,5                                                                                            | 13,20                                       | 200                                                | 340                                                                | 100/500/1000                                    |
| 322215183         | 18 x 1,5                                                                                            | 13,70                                       | 220                                                | 377                                                                | 100/500/1000                                    |
| 322215203         | 20 x 1,5                                                                                            | 14,50                                       | 250                                                | 414                                                                | 100/500/1000                                    |

# LIY(St)Y-TP



İYİ EMC\* ÖZELLİK/ESNEK KABLO YAPISI/İNCELTİLMİŞ DIŞ ÇAP/KÜÇÜK BÜKÜLME YARIÇAPI/ALEV GECİKTİRİCİ ÖZELLİK  
GOOD EMC\* CHARACTERISTIC/FLEXIBLE CABLE DESIGN/REDUCED OUTER DIAMETER/SMALL BENDING RADIUS/  
FLAME RETARDANT CHARACTERISTIC



## KULLANIM ALANLARI

Elektromanyetik karışım ve girişimlerin olduğu

- Enstrüman ve Kontrol Mühendisliğinde
- Endüstriyel Elektronikte
- Bilgisayar ve Ofis Makinelerinde
- Bina İçi Haberleşme Sistemlerinde
- Bina İçi Ses Sistemlerinde
- Güvenlik Sistemlerinde

## APPLICATION

In places where electro-magnetic interference and influence exists

- Instrumentation and Control Engineering
- Industrial Electronics
- Computers and Office Machines
- Indoor Communication Systems
- Indoor Sound Systems
- Security Systems

## KABLO YAPISI

|                       |                                                                              |
|-----------------------|------------------------------------------------------------------------------|
| <b>1-İletken</b>      | IEC 60228; DIN VDE 0295; EN 60228 Sınıf 5<br>Bükülü Elektrolitik Tavlı Bakır |
| <b>2-Yalıtkan</b>     | EN 50290-2-21 PVC Kompaund                                                   |
| <b>3-Yalıtım Renk</b> | DIN 47100                                                                    |
| <b>4-Büküm</b>        | Çift büküm katlar halinde                                                    |
| <b>5-Ayırıcı Bant</b> | Pes Bant                                                                     |
| <b>6-Ekran</b>        | Kalaylı Bakır Toprak Teli + Al-Pes Bant                                      |
| <b>7-Kılıf</b>        | EN 50290-2-22 PVC Kompaund                                                   |
| <b>8-Kılıf Rengi</b>  | RAL 7001 Gri                                                                 |

## CONSTRUCTION

|                        |                                                                                |
|------------------------|--------------------------------------------------------------------------------|
| <b>1-Conductor</b>     | IEC 60228; DIN VDE 0295; EN 60228 Class 5<br>Stranded Electrolytic Bare Copper |
| <b>2-Insulation</b>    | EN 50290-2-21 PVC Compound                                                     |
| <b>3-Colour Code</b>   | DIN 47100                                                                      |
| <b>4-Stranding</b>     | Pairwise pairs in layers                                                       |
| <b>5-Wrapping</b>      | Pes Tape                                                                       |
| <b>6-Screen</b>        | Tinned Copper Drain Wire + Al-Pes Tape                                         |
| <b>7-Sheath</b>        | EN 50290-2-22 PVC Compound                                                     |
| <b>8-Sheath Colour</b> | RAL 7001 Grey                                                                  |

## TEKNİK ÖZELLİKLER TECHNICAL CHARACTERISTICS

| İLETKEN DİRENCİ<br>CONDUCTOR<br>RESISTANCE | YALITIM DİRENCİ<br>INSULATION<br>RESISTANCE    | EFEKTİF KAPASİTE<br>MUTUAL<br>CAPACITANCE         | EMPEDANS<br>IMPEDANCE                                   | İNDÜKTANS<br>INDUCTANCE | AKIM TAŞIMA KAPASİTESİ<br>CURRENT CARRYING<br>CAPACITY | ÇALIŞMA VOLTAJİ<br>OPERATING<br>VOLTAGE                                             | TEST VOLTAJİ<br>TEST VOLTAGE                                                      |
|--------------------------------------------|------------------------------------------------|---------------------------------------------------|---------------------------------------------------------|-------------------------|--------------------------------------------------------|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
| mm <sup>2</sup> Ω/km                       | MΩxkm                                          | mm <sup>2</sup> pF/m                              | 78Ω                                                     | 0,67mH/km               | mm <sup>2</sup> A                                      | 0,22mm <sup>2</sup> /0,34mm <sup>2</sup> = 250V<br>≥ 0,50mm <sup>2</sup> = 300/500V | 0,22mm <sup>2</sup> /0,34mm <sup>2</sup> = 1200V<br>≥ 0,50mm <sup>2</sup> = 2000V |
| 0,22    79                                 | 0,22mm <sup>2</sup> /0,34mm <sup>2</sup> = 200 | 0,22    110                                       |                                                         |                         | 0,22    2,5                                            |                                                                                     |                                                                                   |
| 0,34    56                                 | ≥ 0,50mm <sup>2</sup> = 20                     | 0,34    110                                       |                                                         |                         | 0,34    4,5                                            |                                                                                     |                                                                                   |
| 0,50    39                                 |                                                | 0,50    120                                       |                                                         |                         | 0,50    6,0                                            |                                                                                     |                                                                                   |
| 0,75    26                                 |                                                | 0,75    120                                       |                                                         |                         | 0,75    13                                             |                                                                                     |                                                                                   |
| 1,0    19,5                                |                                                | 1,0    130                                        |                                                         |                         | 1,0    16                                              |                                                                                     |                                                                                   |
| 1,5    13,3                                |                                                | 1,5    140                                        |                                                         |                         | 1,5    20                                              |                                                                                     |                                                                                   |
| 2,5    7,98                                |                                                | 2,5    150                                        |                                                         |                         | 2,5    25                                              |                                                                                     |                                                                                   |
| BÜKÜLME YARIÇAPI<br>BENDING RADIUS         | ÇALIŞMA SICAKLIĞI<br>TEMPERATURE RANGE         | ALEV GECİKTİRİCİLİK TESTİ<br>FLAME RETARDANT TEST | EMC*<br>EMC*                                            |                         |                                                        |                                                                                     |                                                                                   |
| 10x Cable Ø                                | -30°C - +70°C                                  | IEC 60332-1-2<br>DIN EN 60332-1-2<br>EN 60332-1-2 | ELEKTROMANYETİK UYUMLU<br>ELECTROMAGNETIC COMPATIBILITY |                         |                                                        |                                                                                     |                                                                                   |

## NOTLAR

Esnek yapıları ile dar alanlarda rahatlıkla uygulanabilirler.  
Bu tip kablolar dış ortamlarda kullanıma uygun değildir.  
**LIY(St)Y-TP-OZ:** Numara kodlu siyah damarlar.

## NOTES

With its flexible design it can easily be used in narrow spaces.  
These cables are not suitable for outdoor use.  
**LIY(St)Y-TP-OZ:** Number coded black cores.

## LIY(St)Y-TP

| KOD NO<br>CODE NR. | ÇİFT SAYISLI VE KESİTİ (mm <sup>2</sup> )<br>NUMBER OF PAIRS AND<br>CROSS SECTION (mm <sup>2</sup> ) | KABLO ÇAPI (mm)<br>OVERALL DIAMETER<br>(mm) | BAKIR AĞIRLIĞI (kg/km)<br>COPPER WEIGHT<br>(kg/km) | YAKLAŞIK KABLO AĞIRLIĞI (kg/km)<br>APPROX. CABLE WEIGHT<br>(kg/km) | STANDART<br>UZUNLUK (mt)<br>STANDARD LENGTH (m) |
|--------------------|------------------------------------------------------------------------------------------------------|---------------------------------------------|----------------------------------------------------|--------------------------------------------------------------------|-------------------------------------------------|
| 322122023          | 2 x 2 x 0,22                                                                                         | 5,50                                        | 11                                                 | 32                                                                 | 100/500/1000                                    |
| 322122033          | 3 x 2 x 0,22                                                                                         | 5,80                                        | 15                                                 | 42                                                                 | 100/500/1000                                    |
| 322122043          | 4 x 2 x 0,22                                                                                         | 6,30                                        | 19                                                 | 60                                                                 | 100/500/1000                                    |
| 322122053          | 5 x 2 x 0,22                                                                                         | 7,00                                        | 23                                                 | 69                                                                 | 100/500/1000                                    |
| 322122063          | 6 x 2 x 0,22                                                                                         | 7,70                                        | 28                                                 | 79                                                                 | 100/500/1000                                    |
| 322122073          | 7 x 2 x 0,22                                                                                         | 8,20                                        | 32                                                 | 89                                                                 | 100/500/1000                                    |
| 322122083          | 8 x 2 x 0,22                                                                                         | 8,50                                        | 36                                                 | 107                                                                | 100/500/1000                                    |
| 322122103          | 10 x 2 x 0,22                                                                                        | 9,90                                        | 44                                                 | 126                                                                | 100/500/1000                                    |
| 322122123          | 12 x 2 x 0,22                                                                                        | 10,10                                       | 53                                                 | 141                                                                | 100/500/1000                                    |
| 322122143          | 14 x 2 x 0,22                                                                                        | 10,70                                       | 61                                                 | 160                                                                | 100/500/1000                                    |
| 322122163          | 16 x 2 x 0,22                                                                                        | 11,30                                       | 70                                                 | 175                                                                | 100/500/1000                                    |
| 322122183          | 18 x 2 x 0,22                                                                                        | 11,90                                       | 78                                                 | 195                                                                | 100/500/1000                                    |
| 322122203          | 20 x 2 x 0,22                                                                                        | 13,00                                       | 87                                                 | 223                                                                | 100/500/1000                                    |
| 322134023          | 2 x 2 x 0,34                                                                                         | 6,10                                        | 15                                                 | 41                                                                 | 100/500/1000                                    |
| 322134033          | 3 x 2 x 0,34                                                                                         | 6,50                                        | 21                                                 | 56                                                                 | 100/500/1000                                    |
| 322134043          | 4 x 2 x 0,34                                                                                         | 7,10                                        | 28                                                 | 76                                                                 | 100/500/1000                                    |
| 322134053          | 5 x 2 x 0,34                                                                                         | 8,10                                        | 34                                                 | 91                                                                 | 100/500/1000                                    |
| 322134063          | 6 x 2 x 0,34                                                                                         | 8,70                                        | 40                                                 | 104                                                                | 100/500/1000                                    |
| 322134073          | 7 x 2 x 0,34                                                                                         | 9,20                                        | 47                                                 | 114                                                                | 100/500/1000                                    |
| 322134083          | 8 x 2 x 0,34                                                                                         | 10,00                                       | 53                                                 | 134                                                                | 100/500/1000                                    |
| 322134103          | 10 x 2 x 0,34                                                                                        | 11,10                                       | 66                                                 | 161                                                                | 100/500/1000                                    |
| 322134123          | 12 x 2 x 0,34                                                                                        | 11,20                                       | 79                                                 | 185                                                                | 100/500/1000                                    |
| 322134143          | 14 x 2 x 0,34                                                                                        | 12,10                                       | 92                                                 | 205                                                                | 100/500/1000                                    |
| 322134163          | 16 x 2 x 0,34                                                                                        | 13,20                                       | 104                                                | 242                                                                | 100/500/1000                                    |
| 322134183          | 18 x 2 x 0,34                                                                                        | 13,90                                       | 116                                                | 266                                                                | 100/500/1000                                    |
| 322134203          | 20 x 2 x 0,34                                                                                        | 14,70                                       | 130                                                | 290                                                                | 100/500/1000                                    |
| 322150023          | 2 x 2 x 0,50                                                                                         | 7,60                                        | 19                                                 | 58                                                                 | 100/500/1000                                    |
| 322150033          | 3 x 2 x 0,50                                                                                         | 8,10                                        | 27                                                 | 75                                                                 | 100/500/1000                                    |
| 322150043          | 4 x 2 x 0,50                                                                                         | 8,80                                        | 36                                                 | 100                                                                | 100/500/1000                                    |
| 322150053          | 5 x 2 x 0,50                                                                                         | 10,20                                       | 44                                                 | 120                                                                | 100/500/1000                                    |
| 322150063          | 6 x 2 x 0,50                                                                                         | 11,10                                       | 53                                                 | 140                                                                | 100/500/1000                                    |
| 322150073          | 7 x 2 x 0,50                                                                                         | 11,70                                       | 62                                                 | 165                                                                | 100/500/1000                                    |
| 322150083          | 8 x 2 x 0,50                                                                                         | 12,10                                       | 70                                                 | 180                                                                | 100/500/1000                                    |
| 322150103          | 10 x 2 x 0,50                                                                                        | 14,10                                       | 87                                                 | 230                                                                | 100/500/1000                                    |
| 322150123          | 12 x 2 x 0,50                                                                                        | 14,40                                       | 105                                                | 260                                                                | 100/500/1000                                    |
| 322150143          | 14 x 2 x 0,50                                                                                        | 15,30                                       | 120                                                | 300                                                                | 100/500/1000                                    |
| 322150163          | 16 x 2 x 0,50                                                                                        | 16,30                                       | 138                                                | 328                                                                | 100/500/1000                                    |
| 322150183          | 18 x 2 x 0,50                                                                                        | 17,10                                       | 155                                                | 362                                                                | 100/500/1000                                    |
| 322150203          | 20 x 2 x 0,50                                                                                        | 18,50                                       | 170                                                | 413                                                                | 100/500/1000                                    |
| 322175023          | 2 x 2 x 0,75                                                                                         | 8,30                                        | 30                                                 | 80                                                                 | 100/500/1000                                    |
| 322175033          | 3 x 2 x 0,75                                                                                         | 8,80                                        | 43                                                 | 96                                                                 | 100/500/1000                                    |
| 322175043          | 4 x 2 x 0,75                                                                                         | 10,10                                       | 56                                                 | 130                                                                | 100/500/1000                                    |
| 322175053          | 5 x 2 x 0,75                                                                                         | 11,20                                       | 70                                                 | 153                                                                | 100/500/1000                                    |
| 322175063          | 6 x 2 x 0,75                                                                                         | 12,10                                       | 82                                                 | 182                                                                | 100/500/1000                                    |
| 322175073          | 7 x 2 x 0,75                                                                                         | 13,20                                       | 94                                                 | 210                                                                | 100/500/1000                                    |
| 322175083          | 8 x 2 x 0,75                                                                                         | 13,70                                       | 110                                                | 232                                                                | 100/500/1000                                    |
| 322175103          | 10 x 2 x 0,75                                                                                        | 15,30                                       | 135                                                | 288                                                                | 100/500/1000                                    |
| 322175123          | 12 x 2 x 0,75                                                                                        | 15,70                                       | 160                                                | 335                                                                | 100/500/1000                                    |
| 322175143          | 14 x 2 x 0,75                                                                                        | 16,70                                       | 185                                                | 373                                                                | 100/500/1000                                    |
| 322175163          | 16 x 2 x 0,75                                                                                        | 18,20                                       | 210                                                | 434                                                                | 100/500/1000                                    |
| 322175183          | 18 x 2 x 0,75                                                                                        | 19,10                                       | 236                                                | 483                                                                | 100/500/1000                                    |
| 322175203          | 20 x 2 x 0,75                                                                                        | 20,30                                       | 265                                                | 525                                                                | 100/500/1000                                    |

## LIY(St)Y-TP

| KOD NO<br>CODE NR. | ÇİFT SAYISI VE KESİTİ (mm <sup>2</sup> )<br>NUMBER OF PAIRS AND<br>CROSS SECTION (mm <sup>2</sup> ) | KABLO ÇAPİ (mm)<br>OVERALL DIAMETER<br>(mm) | BAKIR AĞIRLIĞI (kg/km)<br>COPPER WEIGHT<br>(kg/km) | YAKLAŞIK KABLO AĞIRLIĞI (kg/km)<br>APPROX. CABLE WEIGHT<br>(kg/km) | STANDART<br>UZUNLUK (mt)<br>STANDARD LENGTH (m) |
|--------------------|-----------------------------------------------------------------------------------------------------|---------------------------------------------|----------------------------------------------------|--------------------------------------------------------------------|-------------------------------------------------|
| 3 2 2 1 0 1 0 2 3  | 2 x 2 x 1                                                                                           | 8,80                                        | 39                                                 | 99                                                                 | 100/500/1000                                    |
| 3 2 2 1 0 1 0 3 3  | 3 x 2 x 1                                                                                           | 9,90                                        | 56                                                 | 134                                                                | 100/500/1000                                    |
| 3 2 2 1 0 1 0 4 3  | 4 x 2 x 1                                                                                           | 10,90                                       | 74                                                 | 160                                                                | 100/500/1000                                    |
| 3 2 2 1 0 1 0 5 3  | 5 x 2 x 1                                                                                           | 12,00                                       | 93                                                 | 195                                                                | 100/500/1000                                    |
| 3 2 2 1 0 1 0 6 3  | 6 x 2 x 1                                                                                           | 13,50                                       | 110                                                | 241                                                                | 100/500/1000                                    |
| 3 2 2 1 0 1 0 7 3  | 7 x 2 x 1                                                                                           | 14,20                                       | 126                                                | 270                                                                | 100/500/1000                                    |
| 3 2 2 1 0 1 0 8 3  | 8 x 2 x 1                                                                                           | 14,70                                       | 143                                                | 300                                                                | 100/500/1000                                    |
| 3 2 2 1 0 1 1 0 3  | 10 x 2 x 1                                                                                          | 16,60                                       | 176                                                | 353                                                                | 100/500/1000                                    |
| 3 2 2 1 0 1 1 2 3  | 12 x 2 x 1                                                                                          | 17,00                                       | 216                                                | 405                                                                | 100/500/1000                                    |
| 3 2 2 1 0 1 1 4 3  | 14 x 2 x 1                                                                                          | 18,60                                       | 245                                                | 480                                                                | 100/500/1000                                    |
| 3 2 2 1 0 1 1 6 3  | 16 x 2 x 1                                                                                          | 19,90                                       | 280                                                | 538                                                                | 100/500/1000                                    |
| 3 2 2 1 0 1 1 8 3  | 18 x 2 x 1                                                                                          | 20,80                                       | 315                                                | 600                                                                | 100/500/1000                                    |
| 3 2 2 1 0 1 2 0 3  | 20 x 2 x 1                                                                                          | 22,50                                       | 348                                                | 672                                                                | 100/500/1000                                    |
| 3 2 2 1 1 5 0 2 3  | 2 x 2 x 1,5                                                                                         | 9,90                                        | 56                                                 | 123                                                                | 100/500/1000                                    |
| 3 2 2 1 1 5 0 3 3  | 3 x 2 x 1,5                                                                                         | 10,60                                       | 80                                                 | 160                                                                | 100/500/1000                                    |
| 3 2 2 1 1 5 0 4 3  | 4 x 2 x 1,5                                                                                         | 11,60                                       | 107                                                | 200                                                                | 100/500/1000                                    |
| 3 2 2 1 1 5 0 5 3  | 5 x 2 x 1,5                                                                                         | 13,30                                       | 130                                                | 250                                                                | 100/500/1000                                    |
| 3 2 2 1 1 5 0 6 3  | 6 x 2 x 1,5                                                                                         | 14,40                                       | 157                                                | 305                                                                | 100/500/1000                                    |
| 3 2 2 1 1 5 0 7 3  | 7 x 2 x 1,5                                                                                         | 15,30                                       | 176                                                | 325                                                                | 100/500/1000                                    |
| 3 2 2 1 1 5 0 8 3  | 8 x 2 x 1,5                                                                                         | 15,80                                       | 200                                                | 360                                                                | 100/500/1000                                    |
| 3 2 2 1 1 5 1 0 3  | 10 x 2 x 1,5                                                                                        | 18,30                                       | 250                                                | 454                                                                | 100/500/1000                                    |
| 3 2 2 1 1 5 1 2 3  | 12 x 2 x 1,5                                                                                        | 18,70                                       | 306                                                | 522                                                                | 100/500/1000                                    |
| 3 2 2 1 1 5 1 4 3  | 14 x 2 x 1,5                                                                                        | 19,90                                       | 348                                                | 600                                                                | 100/500/1000                                    |
| 3 2 2 1 1 5 1 6 3  | 16 x 2 x 1,5                                                                                        | 21,60                                       | 400                                                | 700                                                                | 100/500/1000                                    |
| 3 2 2 1 1 5 1 8 3  | 18 x 2 x 1,5                                                                                        | 23,60                                       | 448                                                | 770                                                                | 100/500/1000                                    |
| 3 2 2 1 1 5 2 0 3  | 20 x 2 x 1,5                                                                                        | 24,10                                       | 495                                                | 840                                                                | 100/500/1000                                    |
| 3 2 2 1 2 5 0 2 3  | 2 x 2 x 2,5                                                                                         | 12,30                                       | 92                                                 | 175                                                                | 100/500/1000                                    |
| 3 2 2 1 2 5 0 3 3  | 3 x 2 x 2,5                                                                                         | 13,40                                       | 130                                                | 256                                                                | 100/500/1000                                    |
| 3 2 2 1 2 5 0 4 3  | 4 x 2 x 2,5                                                                                         | 14,80                                       | 170                                                | 314                                                                | 100/500/1000                                    |
| 3 2 2 1 2 5 0 5 3  | 5 x 2 x 2,5                                                                                         | 16,40                                       | 210                                                | 382                                                                | 100/500/1000                                    |
| 3 2 2 1 2 5 0 6 3  | 6 x 2 x 2,5                                                                                         | 18,30                                       | 250                                                | 460                                                                | 100/500/1000                                    |
| 3 2 2 1 2 5 0 7 3  | 7 x 2 x 2,5                                                                                         | 19,40                                       | 290                                                | 518                                                                | 100/500/1000                                    |
| 3 2 2 1 2 5 0 8 3  | 8 x 2 x 2,5                                                                                         | 20,10                                       | 332                                                | 580                                                                | 100/500/1000                                    |
| 3 2 2 1 2 5 1 0 3  | 10 x 2 x 2,5                                                                                        | 23,10                                       | 413                                                | 730                                                                | 100/500/1000                                    |
| 3 2 2 1 2 5 1 2 3  | 12 x 2 x 2,5                                                                                        | 23,60                                       | 495                                                | 841                                                                | 100/500/1000                                    |
| 3 2 2 1 2 5 1 4 3  | 14 x 2 x 2,5                                                                                        | 25,60                                       | 579                                                | 987                                                                | 100/500/1000                                    |
| 3 2 2 1 2 5 1 6 3  | 16 x 2 x 2,5                                                                                        | 27,30                                       | 660                                                | 1120                                                               | 100/500/1000                                    |
| 3 2 2 1 2 5 1 8 3  | 18 x 2 x 2,5                                                                                        | 28,80                                       | 740                                                | 1245                                                               | 100/500/1000                                    |
| 3 2 2 1 2 5 2 0 3  | 20 x 2 x 2,5                                                                                        | 30,90                                       | 824                                                | 1390                                                               | 100/500/1000                                    |

# LIH(St)H-TP



ESNEK KABLO YAPISI/İNCELTİLMİŞ DIŞ ÇAP/KÜÇÜK BÜKÜLME YARIÇAPI/İYİ EMC\* ÖZELLİK/ALEV GECİKTİRİCİ ÖZELLİK/DÜŞÜK DUMAN YOĞUNLUĞU/ZEHİRLİ VE KOROZİF GAZLARDAN ARINDIRILMIŞ  
FLEXIBLE CABLE DESIGN/REDUCED OUTER DIAMETER/SMALL BENDING RADIUS/GOOD EMC\* CHARACTERISTIC/FLAME RETARDANT CHARACTERISTIC/LOW SMOKE EMISSION/WITHOUT POISONED AND CORROSIVE GASES



## KULLANIM ALANLARI

Elektromanyetik karışım ve girişimlerin olduğu  
İnsanların yoğun olarak bulunduğu kapalı ortamlarda  
-Enstrüman ve Kontrol Mühendisliğinde  
-Endüstriyel Elektronikte  
-Bilgisayar ve Ofis Makinelerinde  
-Bina İçi Haberleşme Sistemlerinde  
-Bina İçi Ses Sistemlerinde  
-İnsan hayatının, değerli malzemelerin ve ekipmanların korunması  
gereken yerlerde

## KABLO YAPISI

|                       |                                                                              |
|-----------------------|------------------------------------------------------------------------------|
| <b>1-İletken</b>      | IEC 60228; DIN VDE 0295; EN 60228 Sınıf 5<br>Bükülü Elektrolitik Tavlı Bakır |
| <b>2-Yalıtkan</b>     | EN 50290-2-26 HFFR Kompaund                                                  |
| <b>3-Yalıtım Renk</b> | DIN 47100                                                                    |
| <b>4-Büküm</b>        | Çift büküm katlar halinde                                                    |
| <b>5-Ayırıcı Bant</b> | Pes Bant                                                                     |
| <b>6-Ekran</b>        | Kalaylı Bakır Toprak Teli + Al-Pes Bant                                      |
| <b>7-Kılıf</b>        | EN 50290-2-27 HFFR Kompaund                                                  |
| <b>8-Kılıf Rengi</b>  | RAL 7001 Gri                                                                 |

## APPLICATION

In places where electro-magnetic interference and influence exists  
In closed areas where people are densely populated  
-Instrumentation and Control Engineering  
-Industrial Electronics  
-Computers and Office Machines  
-Indoor Communication Systems  
-Indoor Sound Systems  
-In places where human life and valuable materials and  
equipment need to be protected

## CONSTRUCTION

|                        |                                                                                |
|------------------------|--------------------------------------------------------------------------------|
| <b>1-Conductor</b>     | IEC 60228; DIN VDE 0295; EN 60228 Class 5<br>Stranded Electrolytic Bare Copper |
| <b>2-Insulation</b>    | EN 50290-2-26 HFFR Compound                                                    |
| <b>3-Colour Code</b>   | DIN 47100                                                                      |
| <b>4-Stranding</b>     | Pairwise pairs in layers                                                       |
| <b>5-Wrapping</b>      | Pes Tape                                                                       |
| <b>6-Screen</b>        | Tinned Copper Drain Wire + Al-Pes Tape                                         |
| <b>7-Sheath</b>        | EN 50290-2-27 HFFR Compound                                                    |
| <b>8-Sheath Colour</b> | RAL 7001 Grey                                                                  |

## TEKNİK ÖZELLİKLER TECHNICAL CHARACTERISTICS

| İLETKEN DİRENCİ<br>CONDUCTOR<br>RESISTANCE | YALITIM DİRENCİ<br>INSULATION<br>RESISTANCE | EFEKTİF KAPASİTE<br>MUTUAL<br>CAPACITANCE                                    | EMPEDANS<br>IMPEDANCE                                   | İNDÜKTANS<br>INDUCTANCE                        | AKIM TAŞIMA KAPASİTESİ<br>CURRENT CARRYING<br>CAPACITY            | ÇALIŞMA VOLTAJİ<br>OPERATING<br>VOLTAGE                                             | TEST VOLTAJİ<br>TEST VOLTAGE                                                      |
|--------------------------------------------|---------------------------------------------|------------------------------------------------------------------------------|---------------------------------------------------------|------------------------------------------------|-------------------------------------------------------------------|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
| mm <sup>2</sup><br>Ω/km                    | MΩxkm                                       | mm <sup>2</sup><br>pF/m                                                      | 78Ω                                                     | 0,67mH/km                                      | mm <sup>2</sup><br>A                                              | 0,22mm <sup>2</sup> /0,34mm <sup>2</sup> = 250V<br>≥ 0,50mm <sup>2</sup> = 300/500V | 0,22mm <sup>2</sup> /0,34mm <sup>2</sup> = 1200V<br>≥ 0,50mm <sup>2</sup> = 2000V |
| 0,22                                       | 79                                          | 0,22mm <sup>2</sup> /0,34mm <sup>2</sup> = 200<br>≥ 0,50mm <sup>2</sup> = 20 |                                                         |                                                | 0,22                                                              | 2,5                                                                                 |                                                                                   |
| 0,34                                       | 56                                          |                                                                              |                                                         |                                                | 0,34                                                              | 4,5                                                                                 |                                                                                   |
| 0,50                                       | 39                                          |                                                                              |                                                         |                                                | 0,50                                                              | 6,0                                                                                 |                                                                                   |
| 0,75                                       | 26                                          |                                                                              |                                                         |                                                | 0,75                                                              | 13                                                                                  |                                                                                   |
| 1,0                                        | 19,5                                        |                                                                              |                                                         |                                                | 1,0                                                               | 16                                                                                  |                                                                                   |
| 1,5                                        | 13,3                                        |                                                                              |                                                         |                                                | 1,5                                                               | 20                                                                                  |                                                                                   |
| 2,5                                        | 7,98                                        |                                                                              |                                                         |                                                | 2,5                                                               | 25                                                                                  |                                                                                   |
| BÜKÜLME YARIÇAPI<br>BENDING RADIUS         | ÇALIŞMA SICAKLIĞI<br>TEMPERATURE RANGE      | ALEV GECİKTİRİCİLİK TESTİ<br>FLAME RETARDANT TEST                            | EMC*<br>EMC*                                            | DUMAN YOĞUNLUĞU<br>TESTİ<br>SMOKE DENSITY TEST | KOROZİF GAZ TESTİ<br>TEST ON CORROSIVENESS<br>OF COMBUSTION GASES | HALOJENSİZLİK TESTİ<br>HALOGEN FREE TEST                                            | ALEV YAYILIMI TESTİ<br>FLAME PROPAGATION TEST                                     |
| 15x Cable Ø                                | - 30°C - +70°C                              | IEC 60332-1-2<br>DIN EN 60332-1-2<br>EN 60332-1-2                            | ELEKTROMANYETİK UYUMLU<br>ELECTROMAGNETIC COMPATIBILITY | IEC 61034-2<br>VDE 0482-1034-2<br>EN 61034-2   | IEC 60754-2<br>VDE 0482-754-2<br>EN 60754-2                       | IEC 60754-1<br>VDE 0482-754-1<br>EN 60754-1                                         | IEC 60332-3-24<br>DIN EN 60332-3-24<br>EN 60332-3-24                              |

## NOTLAR

Esnek yapıları ile dar alanlarda rahatlıkla uygulanabilirler.  
Bu tip kablolar dış ortamlarda kullanıma uygun değildir.  
**LIH(St)H-TP-OZ:** Numara kodlu siyah damarlar.

## NOTES

With its flexible design it can easily be used in narrow spaces.  
These cables are not suitable for outdoor use.  
**LIH(St)H-TP-OZ:** Number coded black cores.

## LIH(St)H-TP

| KOD NO<br>CODE NR. | ÇİFT SAYISI VE KESİTİ (mm <sup>2</sup> )<br>NUMBER OF PAIRS AND<br>CROSS SECTION (mm <sup>2</sup> ) | KABLO ÇAPI (mm)<br>OVERALL DIAMETER<br>(mm) | BAKIR AĞIRLIĞI (kg/km)<br>COPPER WEIGHT<br>(kg/km) | YAKLAŞIK KABLO AĞIRLIĞI (kg/km)<br>APPROX. CABLE WEIGHT<br>(kg/km) | STANDART<br>UZUNLUK (m)<br>STANDARD LENGTH (m) |
|--------------------|-----------------------------------------------------------------------------------------------------|---------------------------------------------|----------------------------------------------------|--------------------------------------------------------------------|------------------------------------------------|
| 322322023          | 2 x 2 x 0,22                                                                                        | 5,50                                        | 11                                                 | 37                                                                 | 100/500/1000                                   |
| 322322033          | 3 x 2 x 0,22                                                                                        | 5,80                                        | 15                                                 | 44                                                                 | 100/500/1000                                   |
| 322322043          | 4 x 2 x 0,22                                                                                        | 6,30                                        | 19                                                 | 69                                                                 | 100/500/1000                                   |
| 322322053          | 5 x 2 x 0,22                                                                                        | 7,00                                        | 23                                                 | 72                                                                 | 100/500/1000                                   |
| 322322063          | 6 x 2 x 0,22                                                                                        | 7,70                                        | 28                                                 | 83                                                                 | 100/500/1000                                   |
| 322322073          | 7 x 2 x 0,22                                                                                        | 8,20                                        | 32                                                 | 93                                                                 | 100/500/1000                                   |
| 322322083          | 8 x 2 x 0,22                                                                                        | 8,50                                        | 36                                                 | 112                                                                | 100/500/1000                                   |
| 322322103          | 10 x 2 x 0,22                                                                                       | 9,90                                        | 44                                                 | 137                                                                | 100/500/1000                                   |
| 322322123          | 12 x 2 x 0,22                                                                                       | 10,10                                       | 53                                                 | 150                                                                | 100/500/1000                                   |
| 322322143          | 14 x 2 x 0,22                                                                                       | 10,70                                       | 61                                                 | 170                                                                | 100/500/1000                                   |
| 322322163          | 16 x 2 x 0,22                                                                                       | 11,30                                       | 70                                                 | 180                                                                | 100/500/1000                                   |
| 322322183          | 18 x 2 x 0,22                                                                                       | 11,90                                       | 78                                                 | 204                                                                | 100/500/1000                                   |
| 322322203          | 20 x 2 x 0,22                                                                                       | 13,00                                       | 87                                                 | 226                                                                | 100/500/1000                                   |
| 322334023          | 2 x 2 x 0,34                                                                                        | 6,10                                        | 15                                                 | 43                                                                 | 100/500/1000                                   |
| 322334033          | 3 x 2 x 0,34                                                                                        | 6,50                                        | 21                                                 | 59                                                                 | 100/500/1000                                   |
| 322334043          | 4 x 2 x 0,34                                                                                        | 7,10                                        | 27                                                 | 76                                                                 | 100/500/1000                                   |
| 322334053          | 5 x 2 x 0,34                                                                                        | 8,20                                        | 34                                                 | 95                                                                 | 100/500/1000                                   |
| 322334063          | 6 x 2 x 0,34                                                                                        | 8,70                                        | 40                                                 | 109                                                                | 100/500/1000                                   |
| 322334073          | 7 x 2 x 0,34                                                                                        | 9,20                                        | 47                                                 | 129                                                                | 100/500/1000                                   |
| 322334083          | 8 x 2 x 0,34                                                                                        | 9,90                                        | 53                                                 | 140                                                                | 100/500/1000                                   |
| 322334103          | 10 x 2 x 0,34                                                                                       | 11,10                                       | 66                                                 | 167                                                                | 100/500/1000                                   |
| 322334123          | 12 x 2 x 0,34                                                                                       | 11,20                                       | 79                                                 | 193                                                                | 100/500/1000                                   |
| 322334143          | 14 x 2 x 0,34                                                                                       | 12,10                                       | 92                                                 | 213                                                                | 100/500/1000                                   |
| 322334163          | 16 x 2 x 0,34                                                                                       | 13,20                                       | 104                                                | 250                                                                | 100/500/1000                                   |
| 322334183          | 18 x 2 x 0,34                                                                                       | 13,90                                       | 117                                                | 274                                                                | 100/500/1000                                   |
| 322334203          | 20 x 2 x 0,34                                                                                       | 14,70                                       | 130                                                | 300                                                                | 100/500/1000                                   |
| 322350023          | 2 x 2 x 0,50                                                                                        | 7,60                                        | 19                                                 | 61                                                                 | 100/500/1000                                   |
| 322350033          | 3 x 2 x 0,50                                                                                        | 8,10                                        | 27                                                 | 78                                                                 | 100/500/1000                                   |
| 322350043          | 4 x 2 x 0,50                                                                                        | 8,80                                        | 36                                                 | 105                                                                | 100/500/1000                                   |
| 322350053          | 5 x 2 x 0,50                                                                                        | 10,20                                       | 44                                                 | 126                                                                | 100/500/1000                                   |
| 322350063          | 6 x 2 x 0,50                                                                                        | 11,10                                       | 53                                                 | 155                                                                | 100/500/1000                                   |
| 322350073          | 7 x 2 x 0,50                                                                                        | 11,70                                       | 63                                                 | 173                                                                | 100/500/1000                                   |
| 322350083          | 8 x 2 x 0,50                                                                                        | 12,10                                       | 70                                                 | 202                                                                | 100/500/1000                                   |
| 322350103          | 10 x 2 x 0,50                                                                                       | 14,10                                       | 86                                                 | 241                                                                | 100/500/1000                                   |
| 322350123          | 12 x 2 x 0,50                                                                                       | 14,40                                       | 106                                                | 270                                                                | 100/500/1000                                   |
| 322350143          | 14 x 2 x 0,50                                                                                       | 15,30                                       | 120                                                | 305                                                                | 100/500/1000                                   |
| 322350163          | 16 x 2 x 0,50                                                                                       | 16,30                                       | 138                                                | 348                                                                | 100/500/1000                                   |
| 322350183          | 18 x 2 x 0,50                                                                                       | 17,10                                       | 155                                                | 377                                                                | 100/500/1000                                   |
| 322350203          | 20 x 2 x 0,50                                                                                       | 18,50                                       | 170                                                | 428                                                                | 100/500/1000                                   |

## LIH(St)H-TP

| KOD NO<br>CODE NR. | ÇİFT SAYISI VE KESİTİ (mm <sup>2</sup> )<br>NUMBER OF PAIRS AND<br>CROSS SECTION (mm <sup>2</sup> ) | KABLO ÇAPI (mm)<br>OVERALL DIAMETER<br>(mm) | BAKIR AĞIRLIĞI (kg/km)<br>COPPER WEIGHT<br>(kg/km) | YAKLAŞIK KABLO AĞIRLIĞI (kg/km)<br>APPROX. CABLE WEIGHT<br>(kg/km) | STANDART<br>UZUNLUK (mt)<br>STANDARD LENGTH (m) |
|--------------------|-----------------------------------------------------------------------------------------------------|---------------------------------------------|----------------------------------------------------|--------------------------------------------------------------------|-------------------------------------------------|
| 322375023          | 2 x 2 x 0,75                                                                                        | 8,30                                        | 31                                                 | 75                                                                 | 100/500/1000                                    |
| 322375033          | 3 x 2 x 0,75                                                                                        | 8,80                                        | 45                                                 | 100                                                                | 100/500/1000                                    |
| 322375043          | 4 x 2 x 0,75                                                                                        | 10,20                                       | 58                                                 | 136                                                                | 100/500/1000                                    |
| 322375053          | 5 x 2 x 0,75                                                                                        | 11,20                                       | 70                                                 | 160                                                                | 100/500/1000                                    |
| 322375063          | 6 x 2 x 0,75                                                                                        | 12,20                                       | 83                                                 | 191                                                                | 100/500/1000                                    |
| 322375073          | 7 x 2 x 0,75                                                                                        | 13,20                                       | 95                                                 | 220                                                                | 100/500/1000                                    |
| 322375083          | 8 x 2 x 0,75                                                                                        | 13,70                                       | 107                                                | 243                                                                | 100/500/1000                                    |
| 322375103          | 10 x 2 x 0,75                                                                                       | 15,30                                       | 133                                                | 302                                                                | 100/500/1000                                    |
| 322375123          | 12 x 2 x 0,75                                                                                       | 15,70                                       | 160                                                | 341                                                                | 100/500/1000                                    |
| 322375143          | 14 x 2 x 0,75                                                                                       | 16,70                                       | 185                                                | 390                                                                | 100/500/1000                                    |
| 322375163          | 16 x 2 x 0,75                                                                                       | 18,20                                       | 212                                                | 455                                                                | 100/500/1000                                    |
| 322375183          | 18 x 2 x 0,75                                                                                       | 19,10                                       | 235                                                | 500                                                                | 100/500/1000                                    |
| 322375203          | 20 x 2 x 0,75                                                                                       | 20,40                                       | 265                                                | 546                                                                | 100/500/1000                                    |
| 322301023          | 2 x 2 x 1                                                                                           | 8,80                                        | 40                                                 | 104                                                                | 100/500/1000                                    |
| 322301033          | 3 x 2 x 1                                                                                           | 9,90                                        | 56                                                 | 140                                                                | 100/500/1000                                    |
| 322301043          | 4 x 2 x 1                                                                                           | 10,90                                       | 74                                                 | 170                                                                | 100/500/1000                                    |
| 322301053          | 5 x 2 x 1                                                                                           | 12,00                                       | 92                                                 | 202                                                                | 100/500/1000                                    |
| 322301063          | 6 x 2 x 1                                                                                           | 13,50                                       | 110                                                | 250                                                                | 100/500/1000                                    |
| 322301073          | 7 x 2 x 1                                                                                           | 14,20                                       | 126                                                | 275                                                                | 100/500/1000                                    |
| 322301083          | 8 x 2 x 1                                                                                           | 14,70                                       | 143                                                | 304                                                                | 100/500/1000                                    |
| 322301103          | 10 x 2 x 1                                                                                          | 16,60                                       | 178                                                | 367                                                                | 100/500/1000                                    |
| 322301123          | 12 x 2 x 1                                                                                          | 17,00                                       | 216                                                | 420                                                                | 100/500/1000                                    |
| 322301143          | 14 x 2 x 1                                                                                          | 18,50                                       | 246                                                | 496                                                                | 100/500/1000                                    |
| 322301163          | 16 x 2 x 1                                                                                          | 19,70                                       | 278                                                | 560                                                                | 100/500/1000                                    |
| 322301183          | 18 x 2 x 1                                                                                          | 20,80                                       | 315                                                | 671                                                                | 100/500/1000                                    |
| 322301203          | 20 x 2 x 1                                                                                          | 22,50                                       | 348                                                | 733                                                                | 100/500/1000                                    |
| 322315023          | 2 x 2 x 1,5                                                                                         | 9,90                                        | 53                                                 | 130                                                                | 100/500/1000                                    |
| 322315033          | 3 x 2 x 1,5                                                                                         | 10,60                                       | 77                                                 | 166                                                                | 100/500/1000                                    |
| 322315043          | 4 x 2 x 1,5                                                                                         | 11,60                                       | 107                                                | 204                                                                | 100/500/1000                                    |
| 322315053          | 5 x 2 x 1,5                                                                                         | 13,30                                       | 127                                                | 260                                                                | 100/500/1000                                    |
| 322315063          | 6 x 2 x 1,5                                                                                         | 14,40                                       | 157                                                | 301                                                                | 100/500/1000                                    |
| 322315073          | 7 x 2 x 1,5                                                                                         | 15,30                                       | 176                                                | 336                                                                | 100/500/1000                                    |
| 322315083          | 8 x 2 x 1,5                                                                                         | 15,80                                       | 200                                                | 372                                                                | 100/500/1000                                    |
| 322315103          | 10 x 2 x 1,5                                                                                        | 18,30                                       | 250                                                | 470                                                                | 100/500/1000                                    |
| 322315123          | 12 x 2 x 1,5                                                                                        | 18,70                                       | 300                                                | 538                                                                | 100/500/1000                                    |
| 322315143          | 14 x 2 x 1,5                                                                                        | 19,90                                       | 350                                                | 614                                                                | 100/500/1000                                    |
| 322315163          | 16 x 2 x 1,5                                                                                        | 21,70                                       | 400                                                | 714                                                                | 100/500/1000                                    |
| 322315183          | 18 x 2 x 1,5                                                                                        | 22,80                                       | 442                                                | 791                                                                | 100/500/1000                                    |
| 322315203          | 20 x 2 x 1,5                                                                                        | 24,20                                       | 500                                                | 864                                                                | 100/500/1000                                    |

## LIY(St)CY



İYİ EMC\* ÖZELLİK/ESNEK KABLO YAPISI/İNCELTİLMİŞ DIŞ ÇAP/KÜÇÜK BÜKÜLME YARIÇAPI/ALEV GECİKTİRİCİ ÖZELLİK  
GOOD EMC\* CHARACTERISTIC/FLEXIBLE CABLE DESIGN/REDUCED OUTER DIAMETER/SMALL BENDING RADIUS/  
FLAME RETARDANT CHARACTERISTIC



## KULLANIM ALANLARI

Elektromanyetik karışım ve girişimlerin olduğu

- Enstrüman ve Kontrol Mühendisliğinde
- Endüstriyel Elektronikte
- Bilgisayar ve Ofis Makinelerinde
- Bina İçi Haberleşme Sistemlerinde
- Bina İçi Ses Sistemlerinde
- Güvenlik Sistemlerinde

## APPLICATION

In places where electro-magnetic interference and influence exists

- Instrumentation and Control Engineering
- Industrial Electronics
- Computers and Office Machines
- Indoor Communication Systems
- Indoor Sound Systems
- Security Systems

## KABLO YAPISI

|                       |                                                                              |
|-----------------------|------------------------------------------------------------------------------|
| <b>1-İletken</b>      | IEC 60228; DIN VDE 0295; EN 60228 Sınıf 5<br>Bükülü Elektrolitik Tavlı Bakır |
| <b>2-Yalıtkan</b>     | EN 50290-2-21 PVC Kompaund                                                   |
| <b>3-Yalıtım Renk</b> | DIN 47100                                                                    |
| <b>4-Büküm</b>        | Uygun adımda katlar halinde                                                  |
| <b>5-Ayırıcı Bant</b> | Pes Bant                                                                     |
| <b>6-Ekran</b>        | Al-Pes Bant + Kalaylı Bakır Örgü                                             |
| <b>7-Kılıf</b>        | EN 50290-2-22 PVC Kompaund                                                   |
| <b>8-Kılıf Rengi</b>  | RAL 7001 Gri                                                                 |

## CONSTRUCTION

|                        |                                                                                |
|------------------------|--------------------------------------------------------------------------------|
| <b>1-Conductor</b>     | IEC 60228; DIN VDE 0295; EN 60228 Class 5<br>Stranded Electrolytic Bare Copper |
| <b>2-Insulation</b>    | EN 50290-2-21 PVC Compound                                                     |
| <b>3-Colour Code</b>   | DIN 47100                                                                      |
| <b>4-Stranding</b>     | In layers of optimum pitch                                                     |
| <b>5-Wrapping</b>      | Pes Tape                                                                       |
| <b>6-Screen</b>        | Al-Pes Tape + Tinned Copper Braid                                              |
| <b>7-Sheath</b>        | EN 50290-2-22 PVC Compound                                                     |
| <b>8-Sheath Colour</b> | RAL 7001 Grey                                                                  |

TEKNİK ÖZELLİKLER  
TECHNICAL CHARACTERISTICS

| İLETKEN DİRENCİ<br>CONDUCTOR<br>RESISTANCE |      | YALITIM DİRENCİ<br>INSULATION<br>RESISTANCE                                  | EFEKTİF KAPASİTE<br>MUTUAL<br>CAPACITANCE         |                                                   | EMPEDANS<br>IMPEDANCE                                   | İNDÜKTANS<br>INDUCTANCE | AKIM TAŞIMA KAPASİTESİ<br>CURRENT CARRYING<br>CAPACITY |     | ÇALIŞMA VOLTAJİ<br>OPERATING<br>VOLTAGE                                             | TEST VOLTAJİ<br>TEST VOLTAGE                                                      |
|--------------------------------------------|------|------------------------------------------------------------------------------|---------------------------------------------------|---------------------------------------------------|---------------------------------------------------------|-------------------------|--------------------------------------------------------|-----|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
| mm <sup>2</sup>                            | Ω/km | MΩxkm                                                                        | mm <sup>2</sup>                                   | pt/m                                              | 78Ω                                                     | 0,67mH/km               | mm <sup>2</sup>                                        | A   | 0,22mm <sup>2</sup> /0,34mm <sup>2</sup> = 250V<br>≥ 0,50mm <sup>2</sup> = 300/500V | 0,22mm <sup>2</sup> /0,34mm <sup>2</sup> = 1200V<br>≥ 0,50mm <sup>2</sup> = 2000V |
| 0,22                                       | 79   | 0,22mm <sup>2</sup> /0,34mm <sup>2</sup> = 200<br>≥ 0,50mm <sup>2</sup> = 20 | 0,22                                              | 110                                               |                                                         |                         | 0,22                                                   | 2,5 |                                                                                     |                                                                                   |
| 0,34                                       | 56   |                                                                              | 0,34                                              | 110                                               |                                                         |                         | 0,34                                                   | 4,5 |                                                                                     |                                                                                   |
| 0,50                                       | 39   |                                                                              | 0,50                                              | 120                                               |                                                         |                         | 0,50                                                   | 6,0 |                                                                                     |                                                                                   |
| 0,75                                       | 26   |                                                                              | 0,75                                              | 120                                               |                                                         |                         | 0,75                                                   | 13  |                                                                                     |                                                                                   |
| 1,0                                        | 19,5 |                                                                              | 1,0                                               | 130                                               |                                                         |                         | 1,0                                                    | 16  |                                                                                     |                                                                                   |
| 1,5                                        | 13,3 |                                                                              | 1,5                                               | 140                                               |                                                         |                         | 1,5                                                    | 20  |                                                                                     |                                                                                   |
| 2,5                                        | 7,98 |                                                                              | 2,5                                               | 150                                               |                                                         |                         | 2,5                                                    | 25  |                                                                                     |                                                                                   |
| BÜKÜLME YARIÇAPI<br>BENDING RADIUS         |      |                                                                              | ÇALIŞMA SICAKLIĞI<br>TEMPERATURE RANGE            | ALEV GECİKTİRİCİLİK TESTİ<br>FLAME RETARDANT TEST |                                                         | EMC*<br>EMC*            |                                                        |     |                                                                                     |                                                                                   |
| 10x Cable Ø                                |      | - 30°C - +70°C                                                               | IEC 60332-1-2<br>DIN EN 60332-1-2<br>EN 60332-1-2 |                                                   | ELEKTROMANYETİK UYUMLU<br>ELECTROMAGNETIC COMPATIBILITY |                         |                                                        |     |                                                                                     |                                                                                   |

## NOTLAR

Esnek yapıları ile dar alanlarda rahatlıkla uygulanabilirler.

Bu tip kablolar dış ortamlarda kullanıma uygun değildir.

LIY(St)CY-OZ: Numara kodlu siyah damarlar.

## NOTES

With its flexible design it can easily be used in narrow spaces.

These cables are not suitable for outdoor use.

LIY(St)CY-OZ: Number coded black cores.

LIY(ST)CY

| KOD NO<br>CODE NR. | DAMAR SAYISI VE KESİTİ (mm <sup>2</sup> )<br>NUMBER OF CORE AND CROSS<br>SECTION (mm <sup>2</sup> ) | KABLO ÇAP (mm)<br>OVERALL DIAMETER<br>(mm) | BAKIR AĞIRLIĞI (kg/km)<br>COPPER WEIGHT<br>(kg/km) | YAKLAŞIK KABLO AĞIRLIĞI (kg/km)<br>APPROX. CABLE WEIGHT<br>(kg/km) | STANDART<br>UZUNLUK (m)<br>STANDARD LENGTH (m) |
|--------------------|-----------------------------------------------------------------------------------------------------|--------------------------------------------|----------------------------------------------------|--------------------------------------------------------------------|------------------------------------------------|
| 322422023          | 2 x 0,22                                                                                            | 4,20                                       | 12                                                 | 26                                                                 | 100/500/1000                                   |
| 322422033          | 3 x 0,22                                                                                            | 4,40                                       | 15                                                 | 29                                                                 | 100/500/1000                                   |
| 322422043          | 4 x 0,22                                                                                            | 4,70                                       | 18                                                 | 38                                                                 | 100/500/1000                                   |
| 322422053          | 5 x 0,22                                                                                            | 5,00                                       | 17                                                 | 43                                                                 | 100/500/1000                                   |
| 326822063          | 6 x 0,22                                                                                            | 5,50                                       | 20                                                 | 49                                                                 | 100/500/1000                                   |
| 326822083          | 8 x 0,22                                                                                            | 5,80                                       | 28                                                 | 63                                                                 | 100/500/1000                                   |
| 326822103          | 10 x 0,22                                                                                           | 6,80                                       | 31                                                 | 77                                                                 | 100/500/1000                                   |
| 326822123          | 12 x 0,22                                                                                           | 7,10                                       | 36                                                 | 83                                                                 | 100/500/1000                                   |
| 326822143          | 14 x 0,22                                                                                           | 7,40                                       | 40                                                 | 92                                                                 | 100/500/1000                                   |
| 326822163          | 16 x 0,22                                                                                           | 7,90                                       | 45                                                 | 103                                                                | 100/500/1000                                   |
| 326822183          | 18 x 0,22                                                                                           | 8,20                                       | 50                                                 | 112                                                                | 100/500/1000                                   |
| 326822203          | 20 x 0,22                                                                                           | 8,40                                       | 55                                                 | 121                                                                | 100/500/1000                                   |
| 322434023          | 2 x 0,34                                                                                            | 4,70                                       | 14                                                 | 31                                                                 | 100/500/1000                                   |
| 322434033          | 3 x 0,34                                                                                            | 4,90                                       | 17                                                 | 36                                                                 | 100/500/1000                                   |
| 322434043          | 4 x 0,34                                                                                            | 5,60                                       | 20                                                 | 46                                                                 | 100/500/1000                                   |
| 322434053          | 5 x 0,34                                                                                            | 5,90                                       | 25                                                 | 55                                                                 | 100/500/1000                                   |
| 326834063          | 6 x 0,34                                                                                            | 6,20                                       | 27                                                 | 62                                                                 | 100/500/1000                                   |
| 326834083          | 8 x 0,34                                                                                            | 6,50                                       | 35                                                 | 74                                                                 | 100/500/1000                                   |
| 326834103          | 10 x 0,34                                                                                           | 7,90                                       | 43                                                 | 93                                                                 | 100/500/1000                                   |
| 326834123          | 12 x 0,34                                                                                           | 8,20                                       | 50                                                 | 106                                                                | 100/500/1000                                   |
| 326834143          | 14 x 0,34                                                                                           | 8,60                                       | 57                                                 | 126                                                                | 100/500/1000                                   |
| 326834163          | 16 x 0,34                                                                                           | 9,00                                       | 65                                                 | 138                                                                | 100/500/1000                                   |
| 326834183          | 18 x 0,34                                                                                           | 9,30                                       | 76                                                 | 146                                                                | 100/500/1000                                   |
| 326834203          | 20 x 0,34                                                                                           | 9,70                                       | 80                                                 | 163                                                                | 100/500/1000                                   |
| 322450023          | 2 x 0,50                                                                                            | 5,70                                       | 17                                                 | 45                                                                 | 100/500/1000                                   |
| 322450033          | 3 x 0,50                                                                                            | 5,90                                       | 21                                                 | 53                                                                 | 100/500/1000                                   |
| 322450043          | 4 x 0,50                                                                                            | 6,40                                       | 28                                                 | 66                                                                 | 100/500/1000                                   |
| 322450053          | 5 x 0,50                                                                                            | 7,00                                       | 30                                                 | 76                                                                 | 100/500/1000                                   |
| 326850063          | 6 x 0,50                                                                                            | 7,70                                       | 38                                                 | 88                                                                 | 100/500/1000                                   |
| 326850073          | 7 x 0,50                                                                                            | 7,70                                       | 41                                                 | 95                                                                 | 100/500/1000                                   |
| 326850083          | 8 x 0,50                                                                                            | 8,00                                       | 45                                                 | 106                                                                | 100/500/1000                                   |
| 326850103          | 10 x 0,50                                                                                           | 9,90                                       | 60                                                 | 132                                                                | 100/500/1000                                   |
| 326850123          | 12 x 0,50                                                                                           | 10,10                                      | 70                                                 | 154                                                                | 100/500/1000                                   |
| 326850143          | 14 x 0,50                                                                                           | 10,60                                      | 76                                                 | 179                                                                | 100/500/1000                                   |
| 326850163          | 16 x 0,50                                                                                           | 11,20                                      | 86                                                 | 191                                                                | 100/500/1000                                   |
| 326850183          | 18 x 0,50                                                                                           | 11,70                                      | 94                                                 | 210                                                                | 100/500/1000                                   |
| 326850203          | 20 x 0,50                                                                                           | 12,10                                      | 105                                                | 225                                                                | 100/500/1000                                   |
| 322475023          | 2 x 0,75                                                                                            | 6,10                                       | 25                                                 | 55                                                                 | 100/500/1000                                   |
| 322475033          | 3 x 0,75                                                                                            | 6,40                                       | 30                                                 | 66                                                                 | 100/500/1000                                   |
| 322475043          | 4 x 0,75                                                                                            | 6,80                                       | 35                                                 | 79                                                                 | 100/500/1000                                   |
| 322475053          | 5 x 0,75                                                                                            | 7,70                                       | 43                                                 | 96                                                                 | 100/500/1000                                   |
| 326875063          | 6 x 0,75                                                                                            | 8,30                                       | 53                                                 | 112                                                                | 100/500/1000                                   |
| 326875073          | 7 x 0,75                                                                                            | 8,30                                       | 58                                                 | 121                                                                | 100/500/1000                                   |
| 326875083          | 8 x 0,75                                                                                            | 8,70                                       | 64                                                 | 130                                                                | 100/500/1000                                   |
| 326875103          | 10 x 0,75                                                                                           | 10,70                                      | 80                                                 | 164                                                                | 100/500/1000                                   |
| 326875123          | 12 x 0,75                                                                                           | 11,00                                      | 96                                                 | 192                                                                | 100/500/1000                                   |
| 326875143          | 14 x 0,75                                                                                           | 11,50                                      | 110                                                | 213                                                                | 100/500/1000                                   |
| 326875163          | 16 x 0,75                                                                                           | 12,10                                      | 120                                                | 240                                                                | 100/500/1000                                   |
| 326875183          | 18 x 0,75                                                                                           | 12,70                                      | 136                                                | 265                                                                | 100/500/1000                                   |
| 326875203          | 20 x 0,75                                                                                           | 13,50                                      | 150                                                | 296                                                                | 100/500/1000                                   |

## LIY(ST)CY

| KOD NO<br>CODE NR. | DAMAR SAYISI VE KESİTİ (mm <sup>2</sup> )<br>NUMBER OF CORE AND CROSS<br>SECTION (mm <sup>2</sup> ) | KABLO ÇAPI (mm)<br>OVERALL DIAMETER<br>(mm) | BAKIR AĞIRLIĞI (kg/km)<br>COPPER WEIGHT<br>(kg/km) | YAKLAŞIK KABLO AĞIRLIĞI (kg/km)<br>APPROX. CABLE WEIGHT<br>(kg/km) | STANDART<br>UZUNLUK (mt)<br>STANDARD LENGTH (m) |
|--------------------|-----------------------------------------------------------------------------------------------------|---------------------------------------------|----------------------------------------------------|--------------------------------------------------------------------|-------------------------------------------------|
| 322401023          | 2 x 1                                                                                               | 6,50                                        | 28                                                 | 66                                                                 | 100/500/1000                                    |
| 322401033          | 3 x 1                                                                                               | 6,80                                        | 38                                                 | 78                                                                 | 100/500/1000                                    |
| 322401043          | 4 x 1                                                                                               | 7,30                                        | 46                                                 | 93                                                                 | 100/500/1000                                    |
| 322401053          | 5 x 1                                                                                               | 7,70                                        | 56                                                 | 113                                                                | 100/500/1000                                    |
| 326801063          | 6 x 1                                                                                               | 8,80                                        | 66                                                 | 130                                                                | 100/500/1000                                    |
| 326801073          | 7 x 1                                                                                               | 8,80                                        | 75                                                 | 140                                                                | 100/500/1000                                    |
| 326801083          | 8 x 1                                                                                               | 9,30                                        | 85                                                 | 160                                                                | 100/500/1000                                    |
| 326801103          | 10 x 1                                                                                              | 11,40                                       | 104                                                | 203                                                                | 100/500/1000                                    |
| 326801123          | 12 x 1                                                                                              | 11,80                                       | 122                                                | 231                                                                | 100/500/1000                                    |
| 326801143          | 14 x 1                                                                                              | 12,30                                       | 140                                                | 260                                                                | 100/500/1000                                    |
| 326801163          | 16 x 1                                                                                              | 12,50                                       | 156                                                | 286                                                                | 100/500/1000                                    |
| 326801183          | 18 x 1                                                                                              | 14,10                                       | 175                                                | 332                                                                | 100/500/1000                                    |
| 326801203          | 20 x 1                                                                                              | 14,50                                       | 196                                                | 357                                                                | 100/500/1000                                    |
| 322415023          | 2 x 1,5                                                                                             | 6,90                                        | 35                                                 | 70                                                                 | 100/500/1000                                    |
| 322415033          | 3 x 1,5                                                                                             | 7,20                                        | 50                                                 | 90                                                                 | 100/500/1000                                    |
| 322415043          | 4 x 1,5                                                                                             | 7,80                                        | 61                                                 | 106                                                                | 100/500/1000                                    |
| 322415053          | 5 x 1,5                                                                                             | 8,80                                        | 76                                                 | 135                                                                | 100/500/1000                                    |
| 326815063          | 6 x 1,5                                                                                             | 9,90                                        | 88                                                 | 166                                                                | 100/500/1000                                    |
| 326815073          | 7 x 1,5                                                                                             | 9,90                                        | 100                                                | 180                                                                | 100/500/1000                                    |
| 326815083          | 8 x 1,5                                                                                             | 10,30                                       | 114                                                | 200                                                                | 100/500/1000                                    |
| 326815103          | 10 x 1,5                                                                                            | 12,30                                       | 140                                                | 250                                                                | 100/500/1000                                    |
| 326815123          | 12 x 1,5                                                                                            | 12,60                                       | 166                                                | 286                                                                | 100/500/1000                                    |
| 326815143          | 14 x 1,5                                                                                            | 13,70                                       | 190                                                | 328                                                                | 100/500/1000                                    |
| 326815163          | 16 x 1,5                                                                                            | 14,40                                       | 216                                                | 370                                                                | 100/500/1000                                    |
| 326815183          | 18 x 1,5                                                                                            | 15,00                                       | 245                                                | 410                                                                | 100/500/1000                                    |
| 326815203          | 20 x 1,5                                                                                            | 16,00                                       | 270                                                | 444                                                                | 100/500/1000                                    |
| 322425023          | 2 x 2,5                                                                                             | 8,30                                        | 55                                                 | 105                                                                | 100/500/1000                                    |
| 322425033          | 3 x 2,5                                                                                             | 8,90                                        | 76                                                 | 134                                                                | 100/500/1000                                    |
| 322425043          | 4 x 2,5                                                                                             | 9,70                                        | 100                                                | 168                                                                | 100/500/1000                                    |
| 322425053          | 5 x 2,5                                                                                             | 11,10                                       | 120                                                | 204                                                                | 100/500/1000                                    |
| 326825063          | 6 x 2,5                                                                                             | 12,00                                       | 140                                                | 248                                                                | 100/500/1000                                    |
| 326825073          | 7 x 2,5                                                                                             | 12,00                                       | 161                                                | 275                                                                | 100/500/1000                                    |
| 326825083          | 8 x 2,5                                                                                             | 12,60                                       | 185                                                | 304                                                                | 100/500/1000                                    |
| 326825103          | 10 x 2,5                                                                                            | 15,50                                       | 230                                                | 390                                                                | 100/500                                         |
| 326825123          | 12 x 2,5                                                                                            | 15,90                                       | 270                                                | 445                                                                | 100/500                                         |
| 326825143          | 14 x 2,5                                                                                            | 16,70                                       | 310                                                | 508                                                                | 100/500                                         |
| 326825163          | 16 x 2,5                                                                                            | 17,70                                       | 252                                                | 580                                                                | 100/500                                         |
| 326825183          | 18 x 2,5                                                                                            | 19,00                                       | 395                                                | 649                                                                | 100/500                                         |
| 326825203          | 20 x 2,5                                                                                            | 19,60                                       | 438                                                | 710                                                                | 100/500                                         |

# LI2Y(St)Y



İYİ EMC\* ÖZELLİK/ESNEK KABLO YAPISI/İNCELTİLMİŞ DIŞ ÇAP/KÜÇÜK BÜKÜLME YARIÇAPI/ALEV GECİKTİRİCİ ÖZELLİK  
GOOD EMC\* CHARACTERISTIC/FLEXIBLE CABLE DESIGN/REDUCED OUTER DIAMETER/SMALL BENDING RADIUS  
FLAME RETARDANT CHARACTERISTIC



## KULLANIM ALANLARI

Elektromanyetik karışım ve girişimlerin yüksek olduğu  
-Enstrüman ve Kontrol Mühendisliğinde  
-Endüstriyel Elektronikte  
-Bilgisayar ve Ofis Makinelerinde  
-Otomasyon Sistemlerinde  
-Yüksek Hızlı Data Sistemlerinde

## APPLICATION

In places where electro-magnetic interference and influence exists  
-Instrumentation and Control Engineering  
-Industrial Electronics  
-Computers and Office Machines  
-Automation Systems  
-High Transmission Rates in Data Processing Systems

## KABLO YAPISI

|                       |                                                            |
|-----------------------|------------------------------------------------------------|
| <b>1-İletken</b>      | IEC 60228; DIN VDE 0295; EN 60228<br>Sınıf 2 ya da Sınıf 5 |
| <b>2-Yalıtkan</b>     | EN 50290-2-23 PE Kompaund                                  |
| <b>3-Yalıtım Renk</b> | DIN 47100                                                  |
| <b>4-Büküm</b>        | Uygun adımda katlar halinde                                |
| <b>5-Ayırıcı Bant</b> | Pes Bant                                                   |
| <b>6-Ekran</b>        | Kalaylı Bakır Toprak Teli + Al-Pes Bant                    |
| <b>7-Kılıf</b>        | EN 50290-2-22 PVC Kompaund                                 |
| <b>8-Kılıf Rengi</b>  | RAL 7001 Gri                                               |

## CONSTRUCTION

|                        |                                                         |
|------------------------|---------------------------------------------------------|
| <b>1-Conductor</b>     | IEC-60228; DIN VDE 0295; EN 60228<br>Class 2 or Class 5 |
| <b>2-Insulation</b>    | EN 50290-2-23 PE Compound                               |
| <b>3-Colour Code</b>   | DIN 47100                                               |
| <b>4-Stranding</b>     | In layers of optimum pitch                              |
| <b>5-Wrapping</b>      | Pes Tape                                                |
| <b>6-Screen</b>        | Tinned Copper Drain Wire + Al-Pes Tape                  |
| <b>7-Sheath</b>        | EN 50290-2-22 PVC Compound                              |
| <b>8-Sheath Colour</b> | RAL 7001 Grey                                           |

## TEKNİK ÖZELLİKLER TECHNICAL CHARACTERISTICS

| İLETKEN DİRENCİ<br>CONDUCTOR<br>RESISTANCE | YALITIM DİRENCİ<br>INSULATION<br>RESISTANCE | EFEKTİF KAPASİTE<br>MUTUAL CAPACITANCE                  | ÇALIŞMA VOLTAJI<br>OPERATING<br>VOLTAGE           | İNDÜKTANS<br>INDUCTANCE | AKIM TAŞIMA<br>KAPASİTESİ<br>CURRENT LOAD | ÇALIŞMA VOLTAJI<br>OPERATING<br>VOLTAGE                                             | TEST VOLTAJI<br>TEST VOLTAGE                                                      |
|--------------------------------------------|---------------------------------------------|---------------------------------------------------------|---------------------------------------------------|-------------------------|-------------------------------------------|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
| mm <sup>2</sup> Ω/km                       | 5000MΩxkm                                   | 70pF/m                                                  | 300/500V                                          | 0.67mH/km               | mm <sup>2</sup> A                         | 0,22mm <sup>2</sup> /0,34mm <sup>2</sup> = 250V<br>≥ 0,50mm <sup>2</sup> = 300/500V | 0,22mm <sup>2</sup> /0,34mm <sup>2</sup> = 1200V<br>≥ 0,50mm <sup>2</sup> = 2000V |
| 0,22 79                                    |                                             |                                                         |                                                   |                         | 0,22 2,5                                  |                                                                                     |                                                                                   |
| 0,34 56                                    |                                             |                                                         |                                                   |                         | 0,34 4,5                                  |                                                                                     |                                                                                   |
| 0,5 39                                     |                                             |                                                         |                                                   |                         | 0,5 6                                     |                                                                                     |                                                                                   |
| 0,75 26                                    |                                             |                                                         |                                                   |                         | 0,75 13                                   |                                                                                     |                                                                                   |
| 1 19,5                                     |                                             |                                                         |                                                   |                         | 1 16                                      |                                                                                     |                                                                                   |
| 1,5 13,3                                   |                                             |                                                         |                                                   |                         | 1,5 20                                    |                                                                                     |                                                                                   |
| 2,5 7,98                                   |                                             |                                                         |                                                   |                         | 2,5 25                                    |                                                                                     |                                                                                   |
| BÜKÜLME YARIÇAPI<br>BENDING RADIUS         | ÇALIŞMA SICAKLIĞI<br>TEMPERATURE RANGE      | EMC*<br>EMC*                                            | ALEV GECİKTİRİCİLİK TESTİ<br>FLAME RETARDANT TEST |                         |                                           |                                                                                     |                                                                                   |
| 10x Cable Ø                                | - 30°C - +70°C                              | ELEKTROMANYETİK UYUMLU<br>ELECTROMAGNETIC COMPATIBILITY | IEC 60332-1-2<br>DIN EN 60332-1-2<br>EN 60332-1-2 |                         |                                           |                                                                                     |                                                                                   |

## NOTLAR

Esnek yapıları ile dar alanlarda rahatlıkla uygulanabilirler.  
Bu tip kablolar dış ortamlarda kullanıma uygun değildir.  
**LI2Y(St)Y-OZ:** Numara kodlu siyah damarlar.

## NOTES

With its flexible design it can easily be used in narrow spaces.  
These cables are not suitable for outdoor use.  
**LI2Y(St)Y-OZ:** Number coded black cores.

# LI2Y(St)CY



İYİ EMC\* ÖZELLİK/ESNEK KABLO YAPISI/İNCELTİLMİŞ DIŞ ÇAP/KÜÇÜK BÜKÜLME YARIÇAPI/ALEV GECİKTİRİCİ ÖZELLİK  
GOOD EMC\* CHARACTERISTIC/FLEXIBLE CABLE DESIGN/REDUCED OUTER DIAMETER/SMALL BENDING RADIUS/  
FLAME RETARDANT CHARACTERISTIC



## KULLANIM ALANLARI

Elektromanyetik karışım ve girişimlerin olduğu

- Elektrik Santrallerinde
- Enstrüman ve Kontrol Mühendisliğinde
- Endüstriyel Elektronikte
- Bilgisayar ve Ofis Makinelerinde
- Bina İçi Haberleşme Sistemlerinde
- Bina İçi Ses Sistemlerinde
- Güvenlik Sistemlerinde

## APPLICATION

In places where electro-magnetic interference and influence exists

- Instrumentation and Control Engineering
- Industrial Electronics
- Computers and Office Machines
- Indoor Communication Systems
- Indoor Sound Systems
- Security Systems

## KABLO YAPISI

|                       |                                                            |
|-----------------------|------------------------------------------------------------|
| <b>1-İletken</b>      | IEC 60228; DIN VDE 0295; EN 60228<br>Sınıf 2 ya da Sınıf 5 |
| <b>2-Yalıtkan</b>     | EN 50290-2-23 PE Kompaund                                  |
| <b>3-Yalıtım Renk</b> | DIN 47100                                                  |
| <b>4-Büküm</b>        | Uygun adımda katlar halinde                                |
| <b>5-Ayırıcı Bant</b> | Pes Bant                                                   |
| <b>6-Ekran</b>        | Al-Pes Bant + Kalaylı Bakır Örgü                           |
| <b>7-Kılıf</b>        | EN 50290-2-22 PVC Kompaund                                 |
| <b>8-Kılıf Rengi</b>  | RAL 7001 Gri                                               |

## CONSTRUCTION

|                        |                                                         |
|------------------------|---------------------------------------------------------|
| <b>1-Conductor</b>     | IEC-60228; DIN VDE 0295; EN 60228<br>Class 2 or Class 5 |
| <b>2-Insulation</b>    | EN 50290-2-23 PE Compound                               |
| <b>3-Colour Code</b>   | DIN 47100                                               |
| <b>4-Stranding</b>     | In layers of optimum pitch                              |
| <b>5-Wrapping</b>      | Pes Tape                                                |
| <b>6-Screen</b>        | Al-Pes Tape + Tinned Copper Braid                       |
| <b>7-Sheath</b>        | EN 50290-2-22 PVC Compound                              |
| <b>8-Sheath Colour</b> | RAL 7001 Grey                                           |

## TEKNİK ÖZELLİKLER TECHNICAL CHARACTERISTICS

| İLETKEN DİRENCİ<br>CONDUCTOR<br>RESISTANCE | YALITIM DİRENCİ<br>INSULATION<br>RESISTANCE | EFEKTİF KAPASİTE<br>MUTUAL CAPACITANCE                  | ÇALIŞMA VOLTAJİ<br>OPERATING<br>VOLTAGE           | İNDÜKTANS<br>INDUCTANCE | AKIM TAŞIMA<br>KAPASİTESİ<br>CURRENT LOAD | ÇALIŞMA VOLTAJİ<br>OPERATING<br>VOLTAGE                                            | TEST VOLTAJİ<br>TEST VOLTAGE                                                      |
|--------------------------------------------|---------------------------------------------|---------------------------------------------------------|---------------------------------------------------|-------------------------|-------------------------------------------|------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
| mm <sup>2</sup> Ω/km                       | 5000MΩxkm                                   | 70pF/m                                                  | 300/500V                                          | 0.67mH/km               | mm <sup>2</sup> A                         | 0,22mm <sup>2</sup> /0,34mm <sup>2</sup> =250V<br>≥ 0,50mm <sup>2</sup> = 300/500V | 0,22mm <sup>2</sup> /0,34mm <sup>2</sup> = 1200V<br>≥ 0,50mm <sup>2</sup> = 2000V |
| 0,22 79                                    |                                             |                                                         |                                                   |                         | 0,22 2,5                                  |                                                                                    |                                                                                   |
| 0,34 56                                    |                                             |                                                         |                                                   |                         | 0,34 4,5                                  |                                                                                    |                                                                                   |
| 0,5 39                                     |                                             |                                                         |                                                   |                         | 0,5 6                                     |                                                                                    |                                                                                   |
| 0,75 26                                    |                                             |                                                         |                                                   |                         | 0,75 13                                   |                                                                                    |                                                                                   |
| 1 19,5                                     |                                             |                                                         |                                                   |                         | 1 16                                      |                                                                                    |                                                                                   |
| 1,5 13,3                                   |                                             |                                                         |                                                   |                         | 1,5 20                                    |                                                                                    |                                                                                   |
| 2,5 7,98                                   |                                             |                                                         |                                                   |                         | 2,5 25                                    |                                                                                    |                                                                                   |
| BÜKÜLME YARIÇAPI<br>BENDING RADIUS         | ÇALIŞMA SICAKLIĞI<br>TEMPERATURE RANGE      | EMC*<br>EMC*                                            | ALEV GECİKTİRİCİLİK TESTİ<br>FLAME RETARDANT TEST |                         |                                           |                                                                                    |                                                                                   |
| 10x Cable Ø                                | - 30°C - +70°C                              | ELEKTROMANYETİK UYUMLU<br>ELECTROMAGNETIC COMPATIBILITY | IEC 60332-1-2<br>DIN EN 60332-1-2<br>EN 60332-1-2 |                         |                                           |                                                                                    |                                                                                   |

## NOTLAR

Esnek yapıları ile dar alanlarda rahatlıkla uygulanabilirler.  
Bu tip kablolar dış ortamlarda kullanıma uygun değildir.  
**LI2Y(St)Y-OZ:** Numara kodlu siyah damarlar.

## NOTES

With its flexible design it can easily be used in narrow spaces.  
These cables are not suitable for outdoor use.  
**LI2Y(St)Y-OZ:** Number coded black cores.

# LI2Y(St)CH



İYİ EMC\* ÖZELLİK/ESNEK KABLO YAPISI/İNCELTİLMİŞ DIŞ ÇAP/KÜÇÜK BÜKÜLME YARIÇAPI/ALEV GECİKTİRİCİ ÖZELLİK/DÜŞÜK DUMAN YOĞUNLUĞU/ZEHİRLİ VE KOROZİF GAZLARDAN ARINDIRILMIŞ

GOOD EMC\* CHARACTERISTIC/FLEXIBLE CABLE DESIGN/REDUCED OUTER DIAMETER/SMALL BENDING RADIUS FLAME RETARDANT CHARACTERISTIC/LOW SMOKE EMISSION/WITHOUT POISONED AND CORROSIVE GASES



## KULLANIM ALANLARI

Elektromanyetik karışım ve girişimlerin olduğu İnsanların yoğun olarak bulunduğu kapalı ortamlarda

- Enstrüman ve Kontrol Mühendisliğinde
- Endüstriyel Elektronikte
- Bilgisayar ve Ofis Makinelerinde
- Bina İçi Haberleşme Sistemlerinde
- Bina İçi Ses Sistemlerinde
- İnsan hayatının ve önemli malzemelerin korunması gereken yerlerde

## APPLICATION

In places where electro-magnetic interference and influence exists In closed areas where people are densely populated

- Instrumentation and Control Engineering
- Industrial Electronics
- Computers and Office Machines
- Indoor Communication Systems
- Indoor Sound Systems
- In places where human life and valuable materials and equipment need to be protected

## KABLO YAPISI

|                       |                                                            |
|-----------------------|------------------------------------------------------------|
| <b>1-İletken</b>      | IEC 60228; DIN VDE 0295; EN 60228<br>Sınıf 2 ya da Sınıf 5 |
| <b>2-Yalıtkan</b>     | EN 50290-2-23 PE Kompaund                                  |
| <b>3-Yalıtım Renk</b> | DIN 47100                                                  |
| <b>4-Büküm</b>        | Uygun adımda katlar halinde                                |
| <b>5-Ayırıcı Bant</b> | Pes Bant                                                   |
| <b>6-Ekran</b>        | Al-Pes Bant + Kalaylı Bakır Örgü                           |
| <b>7-Kılıf</b>        | EN 50290-2-27 HFFR Kompaund                                |
| <b>8-Kılıf Rengi</b>  | RAL 7001 Gri                                               |

## CONSTRUCTION

|                        |                                                         |
|------------------------|---------------------------------------------------------|
| <b>1-Conductor</b>     | IEC-60228; DIN VDE 0295; EN 60228<br>Class 2 or Class 5 |
| <b>2-Insulation</b>    | EN 50290-2-23 PE Compound                               |
| <b>3-Colour Code</b>   | DIN 47100                                               |
| <b>4-Stranding</b>     | In layers of optimum pitch                              |
| <b>5-Wrapping</b>      | Pes Tape                                                |
| <b>6-Screen</b>        | Al-Pes Tape + Tinned Copper Braid                       |
| <b>7-Sheath</b>        | EN 50290-2-27 HFFR Compound                             |
| <b>8-Sheath Colour</b> | RAL 7001 Grey                                           |

## TEKNİK ÖZELLİKLER TECHNICAL CHARACTERISTICS

| İLETKEN DİRENCİ<br>CONDUCTOR<br>RESISTANCE | YALITIM DİRENCİ<br>INSULATION<br>RESISTANCE | EFEKTİF KAPASİTE<br>MUTUAL CAPACITANCE                  | ÇALIŞMA VOLTAJI<br>OPERATING<br>VOLTAGE           | İNDÜKTANS<br>INDUCTANCE                      | AKIM TAŞIMA<br>KAPASİTESİ<br>CURRENT LOAD                         | ÇALIŞMA VOLTAJI<br>OPERATING<br>VOLTAGE                                            | TEST VOLTAJI<br>TEST VOLTAGE                                                      |
|--------------------------------------------|---------------------------------------------|---------------------------------------------------------|---------------------------------------------------|----------------------------------------------|-------------------------------------------------------------------|------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
| mm <sup>2</sup> Ω/km                       | 5000MΩxkm                                   | 70pF/m                                                  | 300/500V                                          | 0.67mH/km                                    | mm <sup>2</sup> A                                                 | 0,22mm <sup>2</sup> /0,34mm <sup>2</sup> =250V<br>≥ 0,50mm <sup>2</sup> = 300/500V | 0,22mm <sup>2</sup> /0,34mm <sup>2</sup> = 1200V<br>≥ 0,50mm <sup>2</sup> = 2000V |
| 0,22    79                                 |                                             |                                                         |                                                   |                                              | 0,22    2,5                                                       |                                                                                    |                                                                                   |
| 0,34    56                                 |                                             |                                                         |                                                   |                                              | 0,34    4,5                                                       |                                                                                    |                                                                                   |
| 0,5    39                                  |                                             |                                                         |                                                   |                                              | 0,5    6                                                          |                                                                                    |                                                                                   |
| 0,75    26                                 |                                             |                                                         |                                                   |                                              | 0,75    13                                                        |                                                                                    |                                                                                   |
| 1    19,5                                  |                                             |                                                         |                                                   |                                              | 1    16                                                           |                                                                                    |                                                                                   |
| 1,5    13,3                                |                                             |                                                         |                                                   |                                              | 1,5    20                                                         |                                                                                    |                                                                                   |
| 2,5    7,98                                |                                             |                                                         |                                                   |                                              | 2,5    25                                                         |                                                                                    |                                                                                   |
| BÜKÜLME YARIÇAPI<br>BENDING RADIUS         | ÇALIŞMA SICAKLIĞI<br>TEMPERATURE RANGE      | EMC*<br>EMC*                                            | ALEV GECİKTİRİCİLİK TESTİ<br>FLAME RETARDANT TEST | DUMAN YOĞUNLUĞU TESTİ<br>SMOKE DENSITY TEST  | KOROZİF GAZ TESTİ<br>TEST ON CORROSIVENESS<br>OF COMBUSTION GASES | HALOJENSİZLİK TESTİ<br>HALOGEN FREE TEST                                           | ALEV YAYILIMI TESTİ<br>FLAME PROPAGATION TEST                                     |
| 10x Cable Ø                                | - 30°C - +70°C                              | ELEKTROMANYETİK UYUMLU<br>ELECTROMAGNETIC COMPATIBILITY | IEC 60332-1-2<br>DIN EN 60332-1-2<br>EN 60332-1-2 | IEC 61034-2<br>VDE 0482-1034-2<br>EN 61034-2 | IEC 60754-2<br>VDE 0482-754-2<br>EN 60754-2                       | IEC 60754-1<br>VDE 0482-754-1<br>EN 60754-1                                        | IEC 60332-3-24<br>DIN EN 60332-3-24<br>EN 60332-3-24                              |

## NOTLAR

Esnek yapıları ile dar alanlarda rahatlıkla uygulanabilirler. Bu tip kablolar dış ortamlarda kullanıma uygun değildir.

**LI2Y(St)CH-OZ:** Numara kodlu siyah damarlar.

## NOTES

With its flexible design it can easily be used in narrow spaces. These cables are not suitable for outdoor use.

**LI2Y(St)CH-OZ:** Number coded black cores.

# LIH(St)CH



ESNEK KABLO YAPISI/İNCELTİLMİŞ DİŞ ÇAP/KÜÇÜK BÜKÜLME YARIÇAPI/İYİ EMC\* ÖZELLİK/ALEV GECİKTİRİCİ ÖZELLİK/DÜŞÜK DUMAN YOĞUNLUĞU/ZEHİRLİ VE KOROZİF GAZLARDAN ARINDIRILMIŞ  
FLEXIBLE CABLE DESIGN/REDUCED OUTER DIAMETER/SMALL BENDING RADIUS/GOOD EMC\* CHARACTERISTIC/FLAME RETARDANT CHARACTERISTIC/LOW SMOKE EMISSION/WITHOUT POISONED AND CORROSIVE GASES



## KULLANIM ALANLARI

Elektromanyetik karışım ve girişimlerin olduğu  
İnsanların yoğun olarak bulunduğu kapalı ortamlarda  
-Enstrüman ve Kontrol Mühendisliğinde  
-Endüstriyel Elektronikte  
-Bilgisayar ve Ofis Makinelerinde  
-Bina İçi Haberleşme Sistemlerinde  
-Bina İçi Ses Sistemlerinde  
-İnsan hayatının, değerli malzemelerin ve ekipmanların korunması  
gereken yerlerde

## KABLO YAPISI

|                       |                                                                              |
|-----------------------|------------------------------------------------------------------------------|
| <b>1-İletken</b>      | IEC 60228; DIN VDE 0295; EN 60228 Sınıf 5<br>Bükülü Elektrolitik Tavlı Bakır |
| <b>2-Yalıtkan</b>     | EN 50290-2-26 HFFR Kompaund                                                  |
| <b>3-Yalıtım Renk</b> | DIN 47100                                                                    |
| <b>4-Büküm</b>        | Uygun adımda katlar halinde                                                  |
| <b>5-Ayırıcı Bant</b> | Pes Bant                                                                     |
| <b>6-Ekran</b>        | Al-Pes Bant + Kalaylı Bakır Örgü                                             |
| <b>7-Kılıf</b>        | EN 50290-2-27 HFFR Kompaund                                                  |
| <b>8-Kılıf Rengi</b>  | RAL 7001 Gri                                                                 |

## APPLICATION

In places where electro-magnetic interference and influence exists  
In closed areas where people are densely populated  
-Instrumentation and Control Engineering  
-Industrial Electronics  
-Computers and Office Machines  
-Indoor Communication Systems  
-Indoor Sound Systems  
-In places where human life and valuable materials and equipment need  
to be protected

## CONSTRUCTION

|                        |                                                                                |
|------------------------|--------------------------------------------------------------------------------|
| <b>1-Conductor</b>     | IEC 60228; DIN VDE 0295; EN 60228 Class 5<br>Stranded Electrolytic Bare Copper |
| <b>2-Insulation</b>    | EN 50290-2-26 HFFR Compound                                                    |
| <b>3-Colour Code</b>   | DIN 47100                                                                      |
| <b>4-Stranding</b>     | In layers of optimum pitch                                                     |
| <b>5-Wrapping</b>      | Pes Tape                                                                       |
| <b>6-Screen</b>        | Al-Pes Tape + Tinned Copper Braid                                              |
| <b>7-Sheath</b>        | EN 50290-2-27 HFFR Compound                                                    |
| <b>8-Sheath Colour</b> | RAL 7001 Grey                                                                  |

## TEKNİK ÖZELLİKLER TECHNICAL CHARACTERISTICS

| İLETKEN DİRENCİ<br>CONDUCTOR<br>RESISTANCE | YALITIM DİRENCİ<br>INSULATION<br>RESISTANCE    | EFEKTİF KAPASİTE<br>MUTUAL<br>CAPACITANCE         | EMPEDANS<br>IMPEDANCE                                   | İNDÜKTANS<br>INDUCTANCE                        | AKIM TAŞIMA KAPASİTESİ<br>CURRENT CARRYING<br>CAPACITY            | ÇALIŞMA VOLTAJI<br>OPERATING<br>VOLTAGE                                             | TEST VOLTAJI<br>TEST VOLTAGE                                                      |
|--------------------------------------------|------------------------------------------------|---------------------------------------------------|---------------------------------------------------------|------------------------------------------------|-------------------------------------------------------------------|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
| mm <sup>2</sup> Ω/km                       | MΩxkm                                          | mm <sup>2</sup> pF/m                              | 78Ω                                                     | 0,67mH/km                                      | mm <sup>2</sup> A                                                 | 0,22mm <sup>2</sup> /0,34mm <sup>2</sup> = 250V<br>≥ 0,50mm <sup>2</sup> = 300/500V | 0,22mm <sup>2</sup> /0,34mm <sup>2</sup> = 1200V<br>≥ 0,50mm <sup>2</sup> = 2000V |
| 0,22 79                                    | 0,22mm <sup>2</sup> /0,34mm <sup>2</sup> = 200 | 0,22 100                                          |                                                         |                                                | 0,22 2,5                                                          |                                                                                     |                                                                                   |
| 0,34 56                                    | ≥ 0,50mm <sup>2</sup> = 20                     | 0,34 110                                          |                                                         |                                                | 0,34 4,5                                                          |                                                                                     |                                                                                   |
| 0,50 39                                    |                                                | 0,50 120                                          |                                                         |                                                | 0,50 6,0                                                          |                                                                                     |                                                                                   |
| 0,75 26                                    |                                                | 0,75 120                                          |                                                         |                                                | 0,75 13                                                           |                                                                                     |                                                                                   |
| 1,0 19,5                                   |                                                | 1,0 130                                           |                                                         |                                                | 1,0 16                                                            |                                                                                     |                                                                                   |
| 1,5 13,3                                   |                                                | 1,5 140                                           |                                                         |                                                | 1,5 20                                                            |                                                                                     |                                                                                   |
| 2,5 7,98                                   |                                                | 2,5 150                                           |                                                         |                                                | 2,5 25                                                            |                                                                                     |                                                                                   |
| BÜKÜLME YARIÇAPI<br>BENDING RADIUS         | ÇALIŞMA SICAKLIĞI<br>TEMPERATURE RANGE         | ALEV GECİKTİRİCİLİK TESTİ<br>FLAME RETARDANT TEST | EMC*<br>EMC*                                            | DUMAN YOĞUNLUĞU<br>TESTİ<br>SMOKE DENSITY TEST | KOROZİF GAZ TESTİ<br>TEST ON CORROSIVENESS<br>OF COMBUSTION GASES | HALOJENSİZLİK<br>TESTİ<br>HALOGEN FREE TEST                                         | ALEV YAYILIMI TESTİ<br>FLAME PROPAGATION TEST                                     |
| 15x Cable Ø                                | - 30°C - +70°C                                 | IEC 60332-1-2<br>DIN EN 60332-1-2<br>EN 60332-1-2 | ELEKTROMANYETİK UYUMLU<br>ELECTROMAGNETIC COMPATIBILITY | IEC 61034-2<br>VDE 0482-1034-2<br>EN 61034-2   | IEC 60754-2<br>VDE 0482-754-2<br>EN 60754-2                       | IEC 60754-1<br>VDE 0482-754-1<br>EN 60754-1                                         | IEC 60332-3-24<br>DIN EN 60332-3-24<br>EN 60332-3-24                              |

## NOTLAR

Esnek yapıları ile dar alanlarda rahatlıkla uygulanabilirler.  
Bu tip kablolar dış ortamlarda kullanıma uygun değildir.  
**LIH(St)CH-OZ:** Numara kodlu siyah damarlar.

## NOTES

With its flexible design it can easily be used in narrow spaces.  
These cables are not suitable for outdoor use.  
**LIH(St)CH-OZ:** Number coded black cores.

## LIH(St)CH

| KOD NO<br>CODE NR. | DAMAR SAYISI VE KESİTİ (mm <sup>2</sup> )<br>NUMBER OF CORE AND CROSS<br>SECTION (mm <sup>2</sup> ) | KABLO ÇAPİ (mm)<br>OVERALL DIAMETER<br>(mm) | BAKIR AĞIRLIĞI (kg/km)<br>COPPER WEIGHT<br>(kg/km) | YAKLAŞIK KABLO AĞIRLIĞI (kg/km)<br>APPROX. CABLE WEIGHT<br>(kg/km) | STANDART<br>UZUNLUK (mt)<br>STANDARD LENGTH (m) |
|--------------------|-----------------------------------------------------------------------------------------------------|---------------------------------------------|----------------------------------------------------|--------------------------------------------------------------------|-------------------------------------------------|
| 322622023          | 2 x 0,22                                                                                            | 4,20                                        | 13                                                 | 27                                                                 | 100/500/1000                                    |
| 322622033          | 3 x 0,22                                                                                            | 4,40                                        | 16                                                 | 30                                                                 | 100/500/1000                                    |
| 322622043          | 4 x 0,22                                                                                            | 4,70                                        | 19                                                 | 39                                                                 | 100/500/1000                                    |
| 322622053          | 5 x 0,22                                                                                            | 5,00                                        | 21                                                 | 45                                                                 | 100/500/1000                                    |
| 322622063          | 6 x 0,22                                                                                            | 5,50                                        | 25                                                 | 51                                                                 | 100/500/1000                                    |
| 322622083          | 8 x 0,22                                                                                            | 5,80                                        | 30                                                 | 63                                                                 | 100/500/1000                                    |
| 322622103          | 10 x 0,22                                                                                           | 6,80                                        | 31                                                 | 80                                                                 | 100/500/1000                                    |
| 322622123          | 12 x 0,22                                                                                           | 7,10                                        | 38                                                 | 92                                                                 | 100/500/1000                                    |
| 322622143          | 14 x 0,22                                                                                           | 7,40                                        | 40                                                 | 100                                                                | 100/500/1000                                    |
| 322622163          | 16 x 0,22                                                                                           | 7,90                                        | 45                                                 | 110                                                                | 100/500/1000                                    |
| 322622183          | 18 x 0,22                                                                                           | 8,20                                        | 51                                                 | 120                                                                | 100/500/1000                                    |
| 322622203          | 20 x 0,22                                                                                           | 8,40                                        | 55                                                 | 130                                                                | 100/500/1000                                    |
| 322634023          | 2 x 0,34                                                                                            | 4,70                                        | 16                                                 | 32                                                                 | 100/500/1000                                    |
| 322634033          | 3 x 0,34                                                                                            | 4,90                                        | 18                                                 | 38                                                                 | 100/500/1000                                    |
| 322634043          | 4 x 0,34                                                                                            | 5,50                                        | 21                                                 | 48                                                                 | 100/500/1000                                    |
| 322634053          | 5 x 0,34                                                                                            | 5,90                                        | 26                                                 | 58                                                                 | 100/500/1000                                    |
| 322634063          | 6 x 0,34                                                                                            | 6,20                                        | 31                                                 | 65                                                                 | 100/500/1000                                    |
| 322634083          | 8 x 0,34                                                                                            | 6,50                                        | 36                                                 | 78                                                                 | 100/500/1000                                    |
| 322634103          | 10 x 0,34                                                                                           | 7,90                                        | 45                                                 | 98                                                                 | 100/500/1000                                    |
| 322634123          | 12 x 0,34                                                                                           | 8,20                                        | 52                                                 | 116                                                                | 100/500/1000                                    |
| 322634143          | 14 x 0,34                                                                                           | 8,60                                        | 60                                                 | 126                                                                | 100/500/1000                                    |
| 322634163          | 16 x 0,34                                                                                           | 9,00                                        | 66                                                 | 140                                                                | 100/500/1000                                    |
| 322634183          | 18 x 0,34                                                                                           | 9,30                                        | 75                                                 | 151                                                                | 100/500/1000                                    |
| 322634203          | 20 x 0,34                                                                                           | 9,70                                        | 80                                                 | 165                                                                | 100/500/1000                                    |
| 322650023          | 2 x 0,50                                                                                            | 5,70                                        | 18                                                 | 52                                                                 | 100/500/1000                                    |
| 322650033          | 3 x 0,50                                                                                            | 5,90                                        | 21                                                 | 60                                                                 | 100/500/1000                                    |
| 322650043          | 4 x 0,50                                                                                            | 6,40                                        | 23                                                 | 70                                                                 | 100/500/1000                                    |
| 322650053          | 5 x 0,50                                                                                            | 7,00                                        | 30                                                 | 81                                                                 | 100/500/1000                                    |
| 322650063          | 6 x 0,50                                                                                            | 7,70                                        | 35                                                 | 96                                                                 | 100/500/1000                                    |
| 322650073          | 7 x 0,50                                                                                            | 7,70                                        | 42                                                 | 101                                                                | 100/500/1000                                    |
| 322650083          | 8 x 0,50                                                                                            | 8,00                                        | 46                                                 | 110                                                                | 100/500/1000                                    |
| 322650103          | 10 x 0,50                                                                                           | 9,90                                        | 56                                                 | 143                                                                | 100/500/1000                                    |
| 322650123          | 12 x 0,50                                                                                           | 10,10                                       | 68                                                 | 160                                                                | 100/500/1000                                    |
| 322650143          | 14 x 0,50                                                                                           | 10,60                                       | 76                                                 | 178                                                                | 100/500/1000                                    |
| 322650163          | 16 x 0,50                                                                                           | 11,20                                       | 86                                                 | 200                                                                | 100/500/1000                                    |
| 322650183          | 18 x 0,50                                                                                           | 11,70                                       | 95                                                 | 217                                                                | 100/500/1000                                    |
| 322650203          | 20 x 0,50                                                                                           | 12,10                                       | 105                                                | 232                                                                | 100/500/1000                                    |
| 322675023          | 2 x 0,75                                                                                            | 6,10                                        | 25                                                 | 57                                                                 | 100/500/1000                                    |
| 322675033          | 3 x 0,75                                                                                            | 6,40                                        | 30                                                 | 68                                                                 | 100/500/1000                                    |
| 322675043          | 4 x 0,75                                                                                            | 6,80                                        | 35                                                 | 82                                                                 | 100/500/1000                                    |
| 322675053          | 5 x 0,75                                                                                            | 7,70                                        | 45                                                 | 99                                                                 | 100/500/1000                                    |
| 322675063          | 6 x 0,75                                                                                            | 8,30                                        | 55                                                 | 116                                                                | 100/500/1000                                    |
| 322675073          | 7 x 0,75                                                                                            | 8,30                                        | 60                                                 | 126                                                                | 100/500/1000                                    |
| 322675083          | 8 x 0,75                                                                                            | 8,70                                        | 66                                                 | 134                                                                | 100/500/1000                                    |
| 322675103          | 10 x 0,75                                                                                           | 10,70                                       | 82                                                 | 174                                                                | 100/500/1000                                    |
| 322675123          | 12 x 0,75                                                                                           | 11,00                                       | 96                                                 | 197                                                                | 100/500/1000                                    |
| 322675143          | 14 x 0,75                                                                                           | 11,50                                       | 110                                                | 220                                                                | 100/500/1000                                    |
| 322675163          | 16 x 0,75                                                                                           | 12,10                                       | 121                                                | 245                                                                | 100/500/1000                                    |
| 322675183          | 18 x 0,75                                                                                           | 12,70                                       | 136                                                | 270                                                                | 100/500/1000                                    |
| 322675203          | 20 x 0,75                                                                                           | 13,50                                       | 148                                                | 302                                                                | 100/500/1000                                    |

## LIH(St)CH

| KOD NO<br>CODE NR. | DAMAR SAYISI VE KESİTİ (mm <sup>2</sup> )<br>NUMBER OF CORE AND CROSS<br>SECTION (mm <sup>2</sup> ) | KABLO ÇAPI (mm)<br>OVERALL DIAMETER<br>(mm) | BAKIR AĞIRLIĞI (kg/km)<br>COPPER WEIGHT<br>(kg/km) | YAKLAŞIK KABLO AĞIRLIĞI (kg/km)<br>APPROX. CABLE WEIGHT<br>(kg/km) | STANDART<br>UZUNLUK (mt)<br>STANDARD LENGTH (m) |
|--------------------|-----------------------------------------------------------------------------------------------------|---------------------------------------------|----------------------------------------------------|--------------------------------------------------------------------|-------------------------------------------------|
| 322601023          | 2 x 1                                                                                               | 6,50                                        | 28                                                 | 71                                                                 | 100/500/1000                                    |
| 322601033          | 3 x 1                                                                                               | 6,80                                        | 37                                                 | 86                                                                 | 100/500/1000                                    |
| 322601043          | 4 x 1                                                                                               | 7,30                                        | 46                                                 | 95                                                                 | 100/500/1000                                    |
| 322601053          | 5 x 1                                                                                               | 7,70                                        | 56                                                 | 115                                                                | 100/500/1000                                    |
| 322601063          | 6 x 1                                                                                               | 8,80                                        | 66                                                 | 135                                                                | 100/500/1000                                    |
| 322601073          | 7 x 1                                                                                               | 8,80                                        | 74                                                 | 150                                                                | 100/500/1000                                    |
| 322601083          | 8 x 1                                                                                               | 9,30                                        | 83                                                 | 165                                                                | 100/500/1000                                    |
| 322601103          | 10 x 1                                                                                              | 11,40                                       | 104                                                | 208                                                                | 100/500/1000                                    |
| 322601123          | 12 x 1                                                                                              | 11,80                                       | 121                                                | 241                                                                | 100/500/1000                                    |
| 322601143          | 14 x 1                                                                                              | 12,30                                       | 139                                                | 265                                                                | 100/500/1000                                    |
| 322601163          | 16 x 1                                                                                              | 12,50                                       | 156                                                | 294                                                                | 100/500/1000                                    |
| 322601183          | 18 x 1                                                                                              | 14,10                                       | 176                                                | 344                                                                | 100/500/1000                                    |
| 322601203          | 20 x 1                                                                                              | 14,50                                       | 195                                                | 370                                                                | 100/500/1000                                    |
| 322615023          | 2 x 1,5                                                                                             | 6,90                                        | 36                                                 | 78                                                                 | 100/500/1000                                    |
| 322615033          | 3 x 1,5                                                                                             | 7,20                                        | 49                                                 | 95                                                                 | 100/500/1000                                    |
| 322615043          | 4 x 1,5                                                                                             | 7,80                                        | 61                                                 | 114                                                                | 100/500/1000                                    |
| 322615053          | 5 x 1,5                                                                                             | 8,80                                        | 76                                                 | 143                                                                | 100/500/1000                                    |
| 322615063          | 6 x 1,5                                                                                             | 9,90                                        | 90                                                 | 174                                                                | 100/500/1000                                    |
| 322615073          | 7 x 1,5                                                                                             | 9,90                                        | 100                                                | 186                                                                | 100/500/1000                                    |
| 322615083          | 8 x 1,5                                                                                             | 10,30                                       | 114                                                | 206                                                                | 100/500/1000                                    |
| 322615103          | 10 x 1,5                                                                                            | 12,30                                       | 141                                                | 253                                                                | 100/500/1000                                    |
| 322615123          | 12 x 1,5                                                                                            | 12,60                                       | 166                                                | 287                                                                | 100/500/1000                                    |
| 322615143          | 14 x 1,5                                                                                            | 13,60                                       | 190                                                | 338                                                                | 100/500/1000                                    |
| 322615163          | 16 x 1,5                                                                                            | 14,40                                       | 216                                                | 380                                                                | 100/500/1000                                    |
| 322615183          | 18 x 1,5                                                                                            | 15,00                                       | 245                                                | 421                                                                | 100/500/1000                                    |
| 322615203          | 20 x 1,5                                                                                            | 16,00                                       | 268                                                | 456                                                                | 100/500/1000                                    |

# LIY(St)CY-TP



İYİ EMC\* ÖZELLİK/ESNEK KABLO YAPISI/İNCELTİLMİŞ DIŞ ÇAP/KÜÇÜK BÜKÜLME YARIÇAPI/ALEV GECİKTİRİCİ ÖZELLİK  
GOOD EMC\* CHARACTERISTIC/FLEXIBLE CABLE DESIGN/REDUCED OUTER DIAMETER/SMALL BENDING RADIUS/  
FLAME RETARDANT CHARACTERISTIC



## KULLANIM ALANLARI

Elektromanyetik karışım ve girişimlerin olduğu

- Enstrüman ve Kontrol Mühendisliğinde
- Endüstriyel Elektronikte
- Bilgisayar ve Ofis Makinelerinde
- Bina İçi Haberleşme Sistemlerinde
- Bina İçi Ses Sistemlerinde
- Güvenlik Sistemlerinde

## APPLICATION

In places where electro-magnetic interference and influence exists

- Instrumentation and Control Engineering
- Industrial Electronics
- Computers and Office Machines
- Indoor Communication Systems
- Indoor Sound Systems
- Security Systems

## KABLO YAPISI

|                       |                                                                              |
|-----------------------|------------------------------------------------------------------------------|
| <b>1-İletken</b>      | IEC 60228; DIN VDE 0295; EN 60228 Sınıf 5<br>Bükülü Elektrolitik Tavlı Bakır |
| <b>2-Yalıtkan</b>     | EN 50290-2-21 PVC Kompaund                                                   |
| <b>3-Yalıtım Renk</b> | DIN 47100                                                                    |
| <b>4-Büküm</b>        | Çift büküm katlar halinde                                                    |
| <b>5-Ayırıcı Bant</b> | Pes Bant                                                                     |
| <b>6-Ekran</b>        | Al-Pes Bant + Kalaylı Bakır Örgü                                             |
| <b>7-Kılıf</b>        | EN 50290-2-22 PVC Kompaund                                                   |
| <b>8-Kılıf Rengi</b>  | RAL 7001 Gri                                                                 |

## CONSTRUCTION

|                        |                                                                                |
|------------------------|--------------------------------------------------------------------------------|
| <b>1-Conductor</b>     | IEC 60228; DIN VDE 0295; EN 60228 Class 5<br>Stranded Electrolytic Bare Copper |
| <b>2-Insulation</b>    | EN 50290-2-21 PVC Compound                                                     |
| <b>3-Colour Code</b>   | DIN 47100                                                                      |
| <b>4-Stranding</b>     | Pairwise pairs in layers                                                       |
| <b>5-Wrapping</b>      | Pes Tape                                                                       |
| <b>6-Screen</b>        | Al-Pes Tape + Tinned Copper Braid                                              |
| <b>7-Sheath</b>        | EN 50290-2-22 PVC Compound                                                     |
| <b>8-Sheath Colour</b> | RAL 7001 Grey                                                                  |

## TEKNİK ÖZELLİKLER TECHNICAL CHARACTERISTICS

| İLETKEN DİRENCİ<br>CONDUCTOR<br>RESISTANCE | YALITIM DİRENCİ<br>INSULATION<br>RESISTANCE                                           | EFEKTİF KAPASİTE<br>MUTUAL<br>CAPACITANCE                                                                | EMPEDANS<br>IMPEDANCE                                   | İNDÜKTANS<br>INDUCTANCE | AKIM TAŞIMA KAPASİTESİ<br>CURRENT CARRYING<br>CAPACITY                                            | ÇALIŞMA VOLTAJİ<br>OPERATING<br>VOLTAGE                                             | TEST VOLTAJİ<br>TEST VOLTAGE                                                      |
|--------------------------------------------|---------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|---------------------------------------------------------|-------------------------|---------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
| mm <sup>2</sup><br>Ω/km                    | MΩxkm<br>0,22mm <sup>2</sup> /0,34mm <sup>2</sup> = 200<br>≥ 0,50mm <sup>2</sup> = 20 | mm <sup>2</sup><br>pt/m<br>0,22 110<br>0,34 110<br>0,50 120<br>0,75 120<br>1,0 130<br>1,5 140<br>2,5 150 | 78Ω                                                     | 0,67mH/km               | mm <sup>2</sup><br>A<br>0,22 2,5<br>0,34 4,5<br>0,50 6,0<br>0,75 13<br>1,0 16<br>1,5 20<br>2,5 25 | 0,22mm <sup>2</sup> /0,34mm <sup>2</sup> = 250V<br>≥ 0,50mm <sup>2</sup> = 300/500V | 0,22mm <sup>2</sup> /0,34mm <sup>2</sup> = 1200V<br>≥ 0,50mm <sup>2</sup> = 2000V |
|                                            |                                                                                       |                                                                                                          |                                                         |                         |                                                                                                   |                                                                                     |                                                                                   |
| BÜKÜLME YARIÇAPI<br>BENDING RADIUS         | ÇALIŞMA SICAKLIĞI<br>TEMPERATURE RANGE                                                | ALEV GECİKTİRİCİLİK TESTİ<br>FLAME RETARDANT TEST                                                        | EMC*<br>EMC*                                            |                         |                                                                                                   |                                                                                     |                                                                                   |
| 10x Cable Ø                                | - 30°C - +70°C                                                                        | IEC 60332-1-2<br>DIN EN 60332-1-2<br>EN 60332-1-2                                                        | ELEKTROMANYETİK UYUMLU<br>ELECTROMAGNETIC COMPATIBILITY |                         |                                                                                                   |                                                                                     |                                                                                   |

## NOTLAR

Esnek yapıları ile dar alanlarda rahatlıkla uygulanabilirler.  
Bu tip kablolar dış ortamlarda kullanıma uygun değildir.  
**LIY(St)CY-TP-OZ:** Numara kodlu siyah damarlar.

## NOTES

With its flexible design it can easily be used in narrow spaces.  
These cables are not suitable for outdoor use.  
**LIY(St)CY-TP-OZ:** Number coded black cores.

## LIY(ST)CY-TP

| KOD NO<br>CODE NR. | ÇİFT SAYISI VE KESİTİ (mm <sup>2</sup> )<br>NUMBER OF PAIRS AND<br>CROSS SECTION (mm <sup>2</sup> ) | KABLO ÇAPI (mm)<br>OVERALL DIAMETER<br>(mm) | BAKIR AĞIRLIĞI (kg/km)<br>COPPER WEIGHT<br>(kg/km) | YAKLAŞIK KABLO AĞIRLIĞI (kg/km)<br>APPROX. CABLE WEIGHT<br>(kg/km) | STANDART<br>UZUNLUK (mt)<br>STANDARD LENGTH (m) |
|--------------------|-----------------------------------------------------------------------------------------------------|---------------------------------------------|----------------------------------------------------|--------------------------------------------------------------------|-------------------------------------------------|
| 322522023          | 2 x 2 x 0,22                                                                                        | 5,90                                        | 20                                                 | 44                                                                 | 100/500/1000                                    |
| 322522033          | 3 x 2 x 0,22                                                                                        | 6,20                                        | 21                                                 | 58                                                                 | 100/500/1000                                    |
| 322522043          | 4 x 2 x 0,22                                                                                        | 6,70                                        | 28                                                 | 67                                                                 | 100/500/1000                                    |
| 322522053          | 5 x 2 x 0,22                                                                                        | 7,40                                        | 33                                                 | 78                                                                 | 100/500/1000                                    |
| 322522063          | 6 x 2 x 0,22                                                                                        | 8,10                                        | 36                                                 | 92                                                                 | 100/500/1000                                    |
| 322522073          | 7 x 2 x 0,22                                                                                        | 8,60                                        | 41                                                 | 101                                                                | 100/500/1000                                    |
| 322522083          | 8 x 2 x 0,22                                                                                        | 8,90                                        | 46                                                 | 111                                                                | 100/500/1000                                    |
| 322522103          | 10 x 2 x 0,22                                                                                       | 10,30                                       | 56                                                 | 140                                                                | 100/500/1000                                    |
| 322522123          | 12 x 2 x 0,22                                                                                       | 10,50                                       | 63                                                 | 154                                                                | 100/500/1000                                    |
| 322522143          | 14 x 2 x 0,22                                                                                       | 11,20                                       | 73                                                 | 173                                                                | 100/500/1000                                    |
| 322522163          | 16 x 2 x 0,22                                                                                       | 11,70                                       | 81                                                 | 192                                                                | 100/500/1000                                    |
| 322522183          | 18 x 2 x 0,22                                                                                       | 12,30                                       | 92                                                 | 210                                                                | 100/500/1000                                    |
| 322522203          | 20 x 2 x 0,22                                                                                       | 13,40                                       | 102                                                | 240                                                                | 100/500/1000                                    |
| 322534023          | 2 x 2 x 0,34                                                                                        | 6,50                                        | 23                                                 | 52                                                                 | 100/500/1000                                    |
| 322534033          | 3 x 2 x 0,34                                                                                        | 6,90                                        | 30                                                 | 71                                                                 | 100/500/1000                                    |
| 322534043          | 4 x 2 x 0,34                                                                                        | 7,50                                        | 37                                                 | 83                                                                 | 100/500/1000                                    |
| 322534053          | 5 x 2 x 0,34                                                                                        | 8,50                                        | 45                                                 | 109                                                                | 100/500/1000                                    |
| 322534063          | 6 x 2 x 0,34                                                                                        | 9,10                                        | 53                                                 | 115                                                                | 100/500/1000                                    |
| 322534073          | 7 x 2 x 0,34                                                                                        | 9,60                                        | 60                                                 | 128                                                                | 100/500/1000                                    |
| 322534083          | 8 x 2 x 0,34                                                                                        | 10,30                                       | 66                                                 | 148                                                                | 100/500/1000                                    |
| 322534103          | 10 x 2 x 0,34                                                                                       | 11,50                                       | 80                                                 | 175                                                                | 100/500/1000                                    |
| 322534123          | 12 x 2 x 0,34                                                                                       | 11,60                                       | 94                                                 | 196                                                                | 100/500/1000                                    |
| 322534143          | 14 x 2 x 0,34                                                                                       | 12,50                                       | 107                                                | 225                                                                | 100/500/1000                                    |
| 322534163          | 16 x 2 x 0,34                                                                                       | 13,60                                       | 121                                                | 260                                                                | 100/500/1000                                    |
| 322534183          | 18 x 2 x 0,34                                                                                       | 14,30                                       | 138                                                | 285                                                                | 100/500/1000                                    |
| 322534203          | 20 x 2 x 0,34                                                                                       | 15,10                                       | 150                                                | 315                                                                | 100/500/1000                                    |
| 322550023          | 2 x 2 x 0,50                                                                                        | 8,00                                        | 30                                                 | 73                                                                 | 100/500/1000                                    |
| 322550033          | 3 x 2 x 0,50                                                                                        | 8,50                                        | 38                                                 | 89                                                                 | 100/500/1000                                    |
| 322550043          | 4 x 2 x 0,50                                                                                        | 9,20                                        | 50                                                 | 105                                                                | 100/500/1000                                    |
| 322550053          | 5 x 2 x 0,50                                                                                        | 10,60                                       | 56                                                 | 139                                                                | 100/500/1000                                    |
| 322550063          | 6 x 2 x 0,50                                                                                        | 11,50                                       | 70                                                 | 155                                                                | 100/500/1000                                    |
| 322550073          | 7 x 2 x 0,50                                                                                        | 12,00                                       | 75                                                 | 182                                                                | 100/500/1000                                    |
| 322550083          | 8 x 2 x 0,50                                                                                        | 12,50                                       | 85                                                 | 204                                                                | 100/500/1000                                    |
| 322550103          | 10 x 2 x 0,50                                                                                       | 14,50                                       | 106                                                | 249                                                                | 100/500/1000                                    |
| 322550123          | 12 x 2 x 0,50                                                                                       | 14,80                                       | 123                                                | 283                                                                | 100/500/1000                                    |
| 322550143          | 14 x 2 x 0,50                                                                                       | 15,70                                       | 141                                                | 315                                                                | 100/500/1000                                    |
| 322550163          | 16 x 2 x 0,50                                                                                       | 16,70                                       | 158                                                | 352                                                                | 100/500/1000                                    |
| 322550183          | 18 x 2 x 0,50                                                                                       | 17,50                                       | 177                                                | 387                                                                | 100/500/1000                                    |
| 322550203          | 20 x 2 x 0,50                                                                                       | 18,90                                       | 196                                                | 438                                                                | 100/500/1000                                    |
| 322575023          | 2 x 2 x 0,75                                                                                        | 8,60                                        | 40                                                 | 87                                                                 | 100/500/1000                                    |
| 322575033          | 3 x 2 x 0,75                                                                                        | 9,20                                        | 55                                                 | 103                                                                | 100/500/1000                                    |
| 322575043          | 4 x 2 x 0,75                                                                                        | 10,40                                       | 66                                                 | 143                                                                | 100/500/1000                                    |
| 322575053          | 5 x 2 x 0,75                                                                                        | 11,50                                       | 85                                                 | 174                                                                | 100/500/1000                                    |
| 322575063          | 6 x 2 x 0,75                                                                                        | 12,50                                       | 96                                                 | 201                                                                | 100/500/1000                                    |
| 322575073          | 7 x 2 x 0,75                                                                                        | 13,60                                       | 110                                                | 232                                                                | 100/500/1000                                    |
| 322575083          | 8 x 2 x 0,75                                                                                        | 14,00                                       | 125                                                | 257                                                                | 100/500/1000                                    |
| 322575103          | 10 x 2 x 0,75                                                                                       | 15,70                                       | 155                                                | 315                                                                | 100/500/1000                                    |
| 322575123          | 12 x 2 x 0,75                                                                                       | 16,10                                       | 180                                                | 341                                                                | 100/500/1000                                    |
| 322575143          | 14 x 2 x 0,75                                                                                       | 17,10                                       | 205                                                | 396                                                                | 100/500/1000                                    |
| 322575163          | 16 x 2 x 0,75                                                                                       | 18,60                                       | 235                                                | 467                                                                | 100/500/1000                                    |
| 322575183          | 18 x 2 x 0,75                                                                                       | 19,50                                       | 260                                                | 509                                                                | 100/500/1000                                    |
| 322575203          | 20 x 2 x 0,75                                                                                       | 20,70                                       | 285                                                | 553                                                                | 100/500/1000                                    |

## LIY(St)CY-TP

| KOD NO<br>CODE NR. | ÇİFT SAYISI VE KESİTİ (mm <sup>2</sup> )<br>NUMBER OF PAIRS AND<br>CROSS SECTION (mm <sup>2</sup> ) | KABLO ÇAPI (mm)<br>OVERALL DIAMETER<br>(mm) | BAKIR AĞIRLIĞI (kg/km)<br>COPPER WEIGHT<br>(kg/km) | YAKLAŞIK KABLO AĞIRLIĞI (kg/km)<br>APPROX. CABLE WEIGHT<br>(kg/km) | STANDART<br>UZUNLUK (mt)<br>STANDARD LENGTH (m) |
|--------------------|-----------------------------------------------------------------------------------------------------|---------------------------------------------|----------------------------------------------------|--------------------------------------------------------------------|-------------------------------------------------|
| 322501023          | 2 x 2 x 1                                                                                           | 9,30                                        | 48                                                 | 110                                                                | 100/500/1000                                    |
| 322501033          | 3 x 2 x 1                                                                                           | 10,30                                       | 66                                                 | 143                                                                | 100/500/1000                                    |
| 322501043          | 4 x 2 x 1                                                                                           | 11,30                                       | 85                                                 | 175                                                                | 100/500/1000                                    |
| 322501053          | 5 x 2 x 1                                                                                           | 12,40                                       | 107                                                | 210                                                                | 100/500/1000                                    |
| 322501063          | 6 x 2 x 1                                                                                           | 13,90                                       | 125                                                | 256                                                                | 100/500/1000                                    |
| 322501073          | 7 x 2 x 1                                                                                           | 14,60                                       | 140                                                | 284                                                                | 100/500/1000                                    |
| 322501083          | 8 x 2 x 1                                                                                           | 15,10                                       | 160                                                | 313                                                                | 100/500                                         |
| 322501103          | 10 x 2 x 1                                                                                          | 17,00                                       | 200                                                | 376                                                                | 100/500                                         |
| 322501123          | 12 x 2 x 1                                                                                          | 17,40                                       | 233                                                | 428                                                                | 100/500                                         |
| 322501143          | 14 x 2 x 1                                                                                          | 18,90                                       | 268                                                | 504                                                                | 100/500                                         |
| 322501163          | 16 x 2 x 1                                                                                          | 20,10                                       | 306                                                | 565                                                                | 100/500                                         |
| 322501183          | 18 x 2 x 1                                                                                          | 21,10                                       | 340                                                | 627                                                                | 100/500                                         |
| 322501203          | 20 x 2 x 1                                                                                          | 22,80                                       | 377                                                | 702                                                                | 100/500                                         |
| 322515023          | 2 x 2 x 1,5                                                                                         | 10,30                                       | 65                                                 | 137                                                                | 100/500/1000                                    |
| 322515033          | 3 x 2 x 1,5                                                                                         | 11,00                                       | 90                                                 | 170                                                                | 100/500/1000                                    |
| 322515043          | 4 x 2 x 1,5                                                                                         | 12,00                                       | 116                                                | 215                                                                | 100/500/1000                                    |
| 322515053          | 5 x 2 x 1,5                                                                                         | 13,70                                       | 145                                                | 270                                                                | 100/500/1000                                    |
| 322515063          | 6 x 2 x 1,5                                                                                         | 14,80                                       | 168                                                | 316                                                                | 100/500                                         |
| 322515073          | 7 x 2 x 1,5                                                                                         | 15,70                                       | 196                                                | 345                                                                | 100/500                                         |
| 322515083          | 8 x 2 x 1,5                                                                                         | 16,20                                       | 220                                                | 381                                                                | 100/500                                         |
| 322515103          | 10 x 2 x 1,5                                                                                        | 18,70                                       | 275                                                | 480                                                                | 100/500                                         |
| 322515123          | 12 x 2 x 1,5                                                                                        | 19,20                                       | 320                                                | 547                                                                | 100/500                                         |
| 322515143          | 14 x 2 x 1,5                                                                                        | 20,30                                       | 373                                                | 622                                                                | 100/500                                         |
| 322515163          | 16 x 2 x 1,5                                                                                        | 22,00                                       | 425                                                | 721                                                                | 100/500                                         |
| 322515183          | 18 x 2 x 1,5                                                                                        | 23,20                                       | 475                                                | 800                                                                | 100/500                                         |
| 322515203          | 20 x 2 x 1,5                                                                                        | 24,60                                       | 525                                                | 872                                                                | 100/500                                         |
| 322525023          | 2 x 2 x 2,5                                                                                         | 12,60                                       | 100                                                | 204                                                                | 100/500/1000                                    |
| 322525033          | 3 x 2 x 2,5                                                                                         | 13,80                                       | 145                                                | 264                                                                | 100/500/1000                                    |
| 322525043          | 4 x 2 x 2,5                                                                                         | 15,20                                       | 186                                                | 329                                                                | 100/500/1000                                    |
| 322525053          | 5 x 2 x 2,5                                                                                         | 16,80                                       | 228                                                | 403                                                                | 100/500/1000                                    |
| 322525063          | 6 x 2 x 2,5                                                                                         | 18,70                                       | 275                                                | 492                                                                | 100/500                                         |
| 322525073          | 7 x 2 x 2,5                                                                                         | 19,80                                       | 316                                                | 546                                                                | 100/500                                         |
| 322525083          | 8 x 2 x 2,5                                                                                         | 20,50                                       | 358                                                | 608                                                                | 100/500                                         |
| 322525103          | 10 x 2 x 2,5                                                                                        | 22,50                                       | 442                                                | 754                                                                | 100/500                                         |
| 322525123          | 12 x 2 x 2,5                                                                                        | 24,00                                       | 525                                                | 874                                                                | 100/500                                         |
| 322525143          | 14 x 2 x 2,5                                                                                        | 26,00                                       | 610                                                | 1019                                                               | 100/500                                         |
| 322525163          | 16 x 2 x 2,5                                                                                        | 27,70                                       | 693                                                | 1153                                                               | 100/500                                         |
| 322525183          | 18 x 2 x 2,5                                                                                        | 29,20                                       | 776                                                | 1284                                                               | 100/500                                         |
| 322525203          | 20 x 2 x 2,5                                                                                        | 31,30                                       | 860                                                | 1428                                                               | 100/500                                         |

# LIH(St)CH-TP



ESNEK KABLO YAPISI/İNCELTMİŞ DİŞ ÇAP/KÜÇÜK BÜKÜLME YARIÇAPI/İYİ EMC\* ÖZELLİK/ALEV GECİKTİRİCİ ÖZELLİK/DÜŞÜK DUMAN YOĞUNLUĞU/ZEHİRLİ VE KOROZİF GAZLARDAN ARINDIRILMIŞ  
FLEXIBLE CABLE DESIGN/REDUCED OUTER DIAMETER/SMALL BENDING RADIUS/GOOD EMC\* CHARACTERISTIC/FLAME RETARDANT CHARACTERISTIC/LOW SMOKE EMISSION/WITHOUT POISONED AND CORROSIVE GASES



## KULLANIM ALANLARI

Elektromanyetik karışım ve girişimlerin olduğu  
İnsanların yoğun olarak bulunduğu kapalı ortamlarda  
-Enstrüman ve Kontrol Mühendisliğinde  
-Endüstriyel Elektronikte  
-Bilgisayar ve Ofis Makinelerinde  
-Bina İçi Haberleşme Sistemlerinde  
-Bina İçi Ses Sistemlerinde  
-İnsan hayatının, değerli malzemelerin ve ekipmanların korunması gereken yerlerde

## APPLICATION

In places where electro-magnetic interference and influence exists  
In closed areas where people are densely populated  
-Instrumentation and Control Engineering  
-Industrial Electronics  
-Computers and Office Machines  
-Indoor Communication Systems  
-Indoor Sound Systems  
-In places where human life and valuable materials and equipment need to be protected

## KABLO YAPISI

|                       |                                                                              |
|-----------------------|------------------------------------------------------------------------------|
| <b>1-İletken</b>      | IEC 60228; DIN VDE 0295; EN 60228 Sınıf 5<br>Bükülü Elektrolitik Tavlı Bakır |
| <b>2-Yalıtkan</b>     | EN 50290-2-26 HFFR Kompaund                                                  |
| <b>3-Yalıtım Renk</b> | DIN 47100                                                                    |
| <b>4-Büküm</b>        | Çift büküm katlar halinde                                                    |
| <b>5-Ayırıcı Bant</b> | Pes Bant                                                                     |
| <b>6-Ekran</b>        | Al-Pes Bant + Kalaylı Bakır Örgü                                             |
| <b>7-Kılıf</b>        | EN 50290-2-27 HFFR Kompaund                                                  |
| <b>8-Kılıf Rengi</b>  | RAL 7001 Gri                                                                 |

## CONSTRUCTION

|                        |                                                                                |
|------------------------|--------------------------------------------------------------------------------|
| <b>1-Conductor</b>     | IEC 60228; DIN VDE 0295; EN 60228 Class 5<br>Stranded Electrolytic Bare Copper |
| <b>2-Insulation</b>    | EN 50290-2-26 HFFR Compound                                                    |
| <b>3-Colour Code</b>   | DIN 47100                                                                      |
| <b>4-Stranding</b>     | Pairwise pairs in layers                                                       |
| <b>5-Wrapping</b>      | Pes Tape                                                                       |
| <b>6-Screen</b>        | Al-Pes Tape + Tinned Copper Braid                                              |
| <b>7-Sheath</b>        | EN 50290-2-27 HFFR Compound                                                    |
| <b>8-Sheath Colour</b> | RAL 7001 Grey                                                                  |

## TEKNİK ÖZELLİKLER TECHNICAL CHARACTERISTICS

| İLETKEN DİRENCİ<br>CONDUCTOR<br>RESISTANCE | YALITIM DİRENCİ<br>INSULATION<br>RESISTANCE    | EFEKTİF KAPASİTE<br>MUTUAL<br>CAPACITANCE         | EMPEDANS<br>IMPEDANCE                                   | İNDÜKTANS<br>INDUCTANCE                        | AKIM TAŞIMA KAPASİTESİ<br>CURRENT CARRYING<br>CAPACITY            | ÇALIŞMA VOLTAJI<br>CURRENT CARRYING<br>CAPACITY                                     | TEST VOLTAJI<br>TEST VOLTAGE                                                      |
|--------------------------------------------|------------------------------------------------|---------------------------------------------------|---------------------------------------------------------|------------------------------------------------|-------------------------------------------------------------------|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
| mm <sup>2</sup> Ω/km                       | MΩxkm                                          | mm <sup>2</sup> pF/m                              | 78Ω                                                     | 0,67mH/km                                      | mm <sup>2</sup> A                                                 | 0,22mm <sup>2</sup> /0,34mm <sup>2</sup> = 250V<br>≥ 0,50mm <sup>2</sup> = 300/500V | 0,22mm <sup>2</sup> /0,34mm <sup>2</sup> = 1200V<br>≥ 0,50mm <sup>2</sup> = 2000V |
| 0,22 79                                    | 0,22mm <sup>2</sup> /0,34mm <sup>2</sup> = 200 | 0,22 100                                          |                                                         |                                                | 0,22 2,5                                                          |                                                                                     |                                                                                   |
| 0,34 56                                    | ≥ 0,50mm <sup>2</sup> = 20                     | 0,34 110                                          |                                                         |                                                | 0,34 4,5                                                          |                                                                                     |                                                                                   |
| 0,50 39                                    |                                                | 0,50 120                                          |                                                         |                                                | 0,50 6,0                                                          |                                                                                     |                                                                                   |
| 0,75 26                                    |                                                | 0,75 120                                          |                                                         |                                                | 0,75 13                                                           |                                                                                     |                                                                                   |
| 1,0 19,5                                   |                                                | 1,0 130                                           |                                                         |                                                | 1,0 16                                                            |                                                                                     |                                                                                   |
| 1,5 13,3                                   |                                                | 1,5 140                                           |                                                         |                                                | 1,5 20                                                            |                                                                                     |                                                                                   |
| 2,5 7,98                                   |                                                | 2,5 150                                           |                                                         |                                                | 2,5 25                                                            |                                                                                     |                                                                                   |
| BÜKÜLME YARIÇAPI<br>BENDING RADIUS         | ÇALIŞMA SICAKLIĞI<br>TEMPERATURE RANGE         | ALEV GECİKTİRİCİLİK TESTİ<br>FLAME RETARDANT TEST | EMC*<br>EMC*                                            | DUMAN YOĞUNLUĞU<br>TESTİ<br>SMOKE DENSITY TEST | KOROZİF GAZ TESTİ<br>TEST ON CORROSIVENESS<br>OF COMBUSTION GASES | HALOJENSİZLİK TESTİ<br>HALOGEN FREE TEST                                            | ALEV YAYILIMI TESTİ<br>FLAME PROPAGATION TEST                                     |
| 15x Cable Ø                                | - 30°C - +70°C                                 | IEC 60332-1-2<br>DIN EN 60332-1-2<br>EN 60332-1-2 | ELEKTROMANYETİK UYUMLU<br>ELECTROMAGNETIC COMPATIBILITY | IEC 61034-2<br>VDE 0482-1034-2<br>EN 61034-2   | IEC 60754-2<br>VDE 0482-754-2<br>EN 60754-2                       | IEC 60754-1<br>VDE 0482-754-1<br>EN 60754-2                                         | IEC 60332-3-24<br>DIN EN 60332-3-24<br>EN 60332-3-24                              |

## NOTLAR

Esnek yapıları ile dar alanlarda rahatlıkla uygulanabilirler.  
Bu tip kablolar dış ortamlarda kullanıma uygun değildir.  
**LIH(St)CH-TP-OZ:** Numara kodlu siyah damarlar.

## NOTES

With its flexible design it can easily be used in narrow spaces.  
These cables are not suitable for outdoor use.  
**LIH(St)CH-TP-OZ:** Number coded black cores.

## LIH(St)CH-TP

| KOD NO<br>CODE NR. | ÇİFT SAYISIVE KESİTİ (mm <sup>2</sup> )<br>NUMBER OF PAIRS AND<br>CROSS SECTION (mm <sup>2</sup> ) | KABLO ÇAPI (mm)<br>OVERALL DIAMETER<br>(mm) | BAKIR AĞIRLIĞI (kg/km)<br>COPPER WEIGHT<br>(kg/km) | YAKLAŞIK KABLO AĞIRLIĞI (kg/km)<br>APPROX. CABLE WEIGHT<br>(kg/km) | STANDART<br>UZUNLUK (m)<br>STANDARD LENGTH (m) |
|--------------------|----------------------------------------------------------------------------------------------------|---------------------------------------------|----------------------------------------------------|--------------------------------------------------------------------|------------------------------------------------|
| 3 2 2 7 2 2 0 2 3  | 2 x 2 x 0,22                                                                                       | 5,90                                        | 18                                                 | 46                                                                 | 100/500/1000                                   |
| 3 2 2 7 2 2 0 3 3  | 3 x 2 x 0,22                                                                                       | 6,20                                        | 23                                                 | 61                                                                 | 100/500/1000                                   |
| 3 2 2 7 2 2 0 4 3  | 4 x 2 x 0,22                                                                                       | 6,70                                        | 28                                                 | 70                                                                 | 100/500/1000                                   |
| 3 2 2 7 2 2 0 5 3  | 5 x 2 x 0,22                                                                                       | 7,40                                        | 31                                                 | 80                                                                 | 100/500/1000                                   |
| 3 2 2 7 2 2 0 6 3  | 6 x 2 x 0,22                                                                                       | 8,10                                        | 37                                                 | 100                                                                | 100/500/1000                                   |
| 3 2 2 7 2 2 0 7 3  | 7 x 2 x 0,22                                                                                       | 8,60                                        | 43                                                 | 108                                                                | 100/500/1000                                   |
| 3 2 2 7 2 2 0 8 3  | 8 x 2 x 0,22                                                                                       | 8,90                                        | 47                                                 | 116                                                                | 100/500/1000                                   |
| 3 2 2 7 2 2 1 0 3  | 10 x 2 x 0,22                                                                                      | 10,30                                       | 56                                                 | 144                                                                | 100/500/1000                                   |
| 3 2 2 7 2 2 1 2 3  | 12 x 2 x 0,22                                                                                      | 10,50                                       | 65                                                 | 161                                                                | 100/500/1000                                   |
| 3 2 2 7 2 2 1 4 3  | 14 x 2 x 0,22                                                                                      | 11,10                                       | 75                                                 | 185                                                                | 100/500/1000                                   |
| 3 2 2 7 2 2 1 6 3  | 16 x 2 x 0,22                                                                                      | 11,70                                       | 80                                                 | 200                                                                | 100/500/1000                                   |
| 3 2 2 7 2 2 1 8 3  | 18 x 2 x 0,22                                                                                      | 12,30                                       | 90                                                 | 215                                                                | 100/500/1000                                   |
| 3 2 2 7 2 2 2 0 3  | 20 x 2 x 0,22                                                                                      | 13,40                                       | 100                                                | 250                                                                | 100/500/1000                                   |
| 3 2 2 7 3 4 0 2 3  | 2 x 2 x 0,34                                                                                       | 6,40                                        | 25                                                 | 55                                                                 | 100/500/1000                                   |
| 3 2 2 7 3 4 0 3 3  | 3 x 2 x 0,34                                                                                       | 6,90                                        | 30                                                 | 74                                                                 | 100/500/1000                                   |
| 3 2 2 7 3 4 0 4 3  | 4 x 2 x 0,34                                                                                       | 7,50                                        | 40                                                 | 86                                                                 | 100/500/1000                                   |
| 3 2 2 7 3 4 0 5 3  | 5 x 2 x 0,34                                                                                       | 8,50                                        | 46                                                 | 107                                                                | 100/500/1000                                   |
| 3 2 2 7 3 4 0 6 3  | 6 x 2 x 0,34                                                                                       | 9,10                                        | 55                                                 | 121                                                                | 100/500/1000                                   |
| 3 2 2 7 3 4 0 7 3  | 7 x 2 x 0,34                                                                                       | 9,60                                        | 60                                                 | 137                                                                | 100/500/1000                                   |
| 3 2 2 7 3 4 0 8 3  | 8 x 2 x 0,34                                                                                       | 10,30                                       | 66                                                 | 155                                                                | 100/500/1000                                   |
| 3 2 2 7 3 4 1 0 3  | 10 x 2 x 0,34                                                                                      | 11,50                                       | 80                                                 | 181                                                                | 100/500/1000                                   |
| 3 2 2 7 3 4 1 2 3  | 12 x 2 x 0,34                                                                                      | 11,60                                       | 95                                                 | 203                                                                | 100/500/1000                                   |
| 3 2 2 7 3 4 1 4 3  | 14 x 2 x 0,34                                                                                      | 12,50                                       | 105                                                | 230                                                                | 100/500/1000                                   |
| 3 2 2 7 3 4 1 6 3  | 16 x 2 x 0,34                                                                                      | 13,60                                       | 120                                                | 266                                                                | 100/500/1000                                   |
| 3 2 2 7 3 4 1 8 3  | 18 x 2 x 0,34                                                                                      | 14,30                                       | 135                                                | 294                                                                | 100/500/1000                                   |
| 3 2 2 7 3 4 2 0 3  | 20 x 2 x 0,34                                                                                      | 15,10                                       | 150                                                | 321                                                                | 100/500/1000                                   |
| 3 2 2 7 5 0 0 2 3  | 2 x 2 x 0,50                                                                                       | 8,00                                        | 30                                                 | 73                                                                 | 100/500/1000                                   |
| 3 2 2 7 5 0 0 3 3  | 3 x 2 x 0,50                                                                                       | 8,50                                        | 40                                                 | 93                                                                 | 100/500/1000                                   |
| 3 2 2 7 5 0 0 4 3  | 4 x 2 x 0,50                                                                                       | 9,20                                        | 50                                                 | 120                                                                | 100/500/1000                                   |
| 3 2 2 7 5 0 0 5 3  | 5 x 2 x 0,50                                                                                       | 10,60                                       | 56                                                 | 145                                                                | 100/500/1000                                   |
| 3 2 2 7 5 0 0 6 3  | 6 x 2 x 0,50                                                                                       | 11,50                                       | 68                                                 | 161                                                                | 100/500/1000                                   |
| 3 2 2 7 5 0 0 7 3  | 7 x 2 x 0,50                                                                                       | 12,00                                       | 76                                                 | 191                                                                | 100/500/1000                                   |
| 3 2 2 7 5 0 0 8 3  | 8 x 2 x 0,50                                                                                       | 12,50                                       | 84                                                 | 204                                                                | 100/500/1000                                   |
| 3 2 2 7 5 0 1 0 3  | 10 x 2 x 0,50                                                                                      | 14,50                                       | 106                                                | 258                                                                | 100/500/1000                                   |
| 3 2 2 7 5 0 1 2 3  | 12 x 2 x 0,50                                                                                      | 14,80                                       | 121                                                | 290                                                                | 100/500/1000                                   |
| 3 2 2 7 5 0 1 4 3  | 14 x 2 x 0,50                                                                                      | 15,70                                       | 140                                                | 326                                                                | 100/500/1000                                   |
| 3 2 2 7 5 0 1 6 3  | 16 x 2 x 0,50                                                                                      | 16,70                                       | 160                                                | 364                                                                | 100/500/1000                                   |
| 3 2 2 7 5 0 1 8 3  | 18 x 2 x 0,50                                                                                      | 17,50                                       | 176                                                | 401                                                                | 100/500/1000                                   |
| 3 2 2 7 5 0 2 0 3  | 20 x 2 x 0,50                                                                                      | 18,90                                       | 194                                                | 456                                                                | 100/500/1000                                   |
| 3 2 2 7 7 5 0 2 3  | 2 x 2 x 0,75                                                                                       | 8,60                                        | 40                                                 | 91                                                                 | 100/500/1000                                   |
| 3 2 2 7 7 5 0 3 3  | 3 x 2 x 0,75                                                                                       | 9,20                                        | 55                                                 | 120                                                                | 100/500/1000                                   |
| 3 2 2 7 7 5 0 4 3  | 4 x 2 x 0,75                                                                                       | 10,40                                       | 66                                                 | 156                                                                | 100/500/1000                                   |
| 3 2 2 7 7 5 0 5 3  | 5 x 2 x 0,75                                                                                       | 11,50                                       | 80                                                 | 182                                                                | 100/500/1000                                   |
| 3 2 2 7 7 5 0 6 3  | 6 x 2 x 0,75                                                                                       | 12,50                                       | 96                                                 | 208                                                                | 100/500                                        |
| 3 2 2 7 7 5 0 7 3  | 7 x 2 x 0,75                                                                                       | 13,60                                       | 110                                                | 243                                                                | 100/500                                        |
| 3 2 2 7 7 5 0 8 3  | 8 x 2 x 0,75                                                                                       | 14,00                                       | 123                                                | 269                                                                | 100/500                                        |
| 3 2 2 7 7 5 1 0 3  | 10 x 2 x 0,75                                                                                      | 15,70                                       | 150                                                | 320                                                                | 100/500                                        |
| 3 2 2 7 7 5 1 2 3  | 12 x 2 x 0,75                                                                                      | 16,10                                       | 176                                                | 362                                                                | 100/500                                        |
| 3 2 2 7 7 5 1 4 3  | 14 x 2 x 0,75                                                                                      | 17,10                                       | 205                                                | 410                                                                | 100/500                                        |
| 3 2 2 7 7 5 1 6 3  | 16 x 2 x 0,75                                                                                      | 18,60                                       | 230                                                | 476                                                                | 100/500                                        |
| 3 2 2 7 7 5 1 8 3  | 18 x 2 x 0,75                                                                                      | 19,50                                       | 260                                                | 530                                                                | 100/500                                        |
| 3 2 2 7 7 5 2 0 3  | 20 x 2 x 0,75                                                                                      | 20,70                                       | 286                                                | 575                                                                | 100/500                                        |

## LIH(St)CH-TP

| KOD NO<br>CODE NR. | ÇİFT SAYISI VE KESİTİ (mm <sup>2</sup> )<br>NUMBER OF PAIRS AND<br>CROSS SECTION (mm <sup>2</sup> ) | KABLO ÇAPI (mm)<br>OVERALL DIAMETER<br>(mm) | BAKIR AĞIRLIĞI (kg/km)<br>COPPER WEIGHT<br>(kg/km) | YAKLAŞIK KABLO AĞIRLIĞI (kg/km)<br>APPROX. CABLE WEIGHT<br>(kg/km) | STANDART<br>UZUNLUK (mt)<br>STANDARD LENGTH (m) |
|--------------------|-----------------------------------------------------------------------------------------------------|---------------------------------------------|----------------------------------------------------|--------------------------------------------------------------------|-------------------------------------------------|
| 322701023          | 2 x 2 x 1                                                                                           | 9,30                                        | 51                                                 | 119                                                                | 100/500/1000                                    |
| 322701043          | 3 x 2 x 1                                                                                           | 10,30                                       | 71                                                 | 135                                                                | 100/500/1000                                    |
| 322701053          | 4 x 2 x 1                                                                                           | 11,30                                       | 86                                                 | 185                                                                | 100/500/1000                                    |
| 322701053          | 5 x 2 x 1                                                                                           | 12,40                                       | 105                                                | 215                                                                | 100/500/1000                                    |
| 322701063          | 6 x 2 x 1                                                                                           | 13,90                                       | 125                                                | 264                                                                | 100/500                                         |
| 322701073          | 7 x 2 x 1                                                                                           | 14,60                                       | 141                                                | 294                                                                | 100/500                                         |
| 322701083          | 8 x 2 x 1                                                                                           | 15,10                                       | 160                                                | 322                                                                | 100/500                                         |
| 322701103          | 10 x 2 x 1                                                                                          | 17,00                                       | 196                                                | 387                                                                | 100/500                                         |
| 322701123          | 12 x 2 x 1                                                                                          | 17,40                                       | 230                                                | 441                                                                | 100/500                                         |
| 322701143          | 14 x 2 x 1                                                                                          | 18,90                                       | 268                                                | 521                                                                | 100/500                                         |
| 322701163          | 16 x 2 x 1                                                                                          | 20,10                                       | 310                                                | 584                                                                | 100/500                                         |
| 322701183          | 18 x 2 x 1                                                                                          | 21,10                                       | 338                                                | 646                                                                | 100/500                                         |
| 322701203          | 20 x 2 x 1                                                                                          | 22,60                                       | 378                                                | 727                                                                | 100/500                                         |
| 322715023          | 2 x 2 x 1,5                                                                                         | 10,30                                       | 68                                                 | 143                                                                | 100/500/1000                                    |
| 322715033          | 3 x 2 x 1,5                                                                                         | 11,00                                       | 90                                                 | 179                                                                | 100/500/1000                                    |
| 322715043          | 4 x 2 x 1,5                                                                                         | 12,00                                       | 114                                                | 216                                                                | 100/500/1000                                    |
| 322715053          | 5 x 2 x 1,5                                                                                         | 13,70                                       | 140                                                | 273                                                                | 100/500/1000                                    |
| 322715063          | 6 x 2 x 1,5                                                                                         | 14,80                                       | 170                                                | 319                                                                | 100/500/1000                                    |
| 322715073          | 7 x 2 x 1,5                                                                                         | 15,70                                       | 195                                                | 354                                                                | 100/500                                         |
| 322715083          | 8 x 2 x 1,5                                                                                         | 16,20                                       | 220                                                | 400                                                                | 100/500                                         |
| 322715103          | 10 x 2 x 1,5                                                                                        | 18,70                                       | 270                                                | 500                                                                | 100/500                                         |
| 322715123          | 12 x 2 x 1,5                                                                                        | 19,10                                       | 320                                                | 563                                                                | 100/500                                         |
| 322715143          | 14 x 2 x 1,5                                                                                        | 20,30                                       | 370                                                | 640                                                                | 100/500                                         |
| 322715163          | 16 x 2 x 1,5                                                                                        | 22,00                                       | 420                                                | 743                                                                | 100/500                                         |
| 322715183          | 18 x 2 x 1,5                                                                                        | 23,10                                       | 475                                                | 822                                                                | 100/500                                         |
| 322715203          | 20 x 2 x 1,5                                                                                        | 24,50                                       | 525                                                | 897                                                                | 100/500                                         |

# J-Y(St)Y...Lg



KÜÇÜK BÜKÜLME YARIÇAPI/ALEV GECİKTİRİCİ ÖZELLİK  
SMALL BENDING RADIUS/FLAME RETARDANT CHARACTERISTIC



## KULLANIM ALANLARI

- Enstrüman ve Kontrol Mühendisliğinde
- Endüstriyel Elektronikte
- Bilgisayar ve Ofis Makinelerinde
- Bina İçi Haberleşme Sistemlerinde
- Bina İçi Ses Sistemlerinde
- Güvenlik Sistemlerinde

## APPLICATION

- Instrumentation and Control Engineering
- Industrial Electronics
- Computers and Office Machines
- Indoor Communication Systems
- Indoor Sound Systems
- Security Systems

## KABLO YAPISI

|                       |                                                                 |
|-----------------------|-----------------------------------------------------------------|
| <b>1-İletken</b>      | IEC 60228; DIN VDE 0295; EN 60228 Sınıf 1<br>Elektrolitik Bakır |
| <b>2-Yalıtkan</b>     | EN 50290-2-21 PVC Kompaund                                      |
| <b>3-Yalıtım Renk</b> | VDE 0815                                                        |
| <b>4-Büküm</b>        | Çift büküm katlar halinde                                       |
| <b>5-Ayırıcı Bant</b> | Pes Bant                                                        |
| <b>6-Ekran</b>        | Kalaylı Toprak Teli + Al-Pes Bant                               |
| <b>7-Kılıf</b>        | EN 50290-2-22 PVC Kompaund                                      |
| <b>8-Kılıf Rengi</b>  | RAL 3000 Kırmızı                                                |

## CONSTRUCTION

|                        |                                                                        |
|------------------------|------------------------------------------------------------------------|
| <b>1-Conductor</b>     | IEC 60228; DIN VDE 0295; EN 60228 Class 1<br>Electrolytic Solid Copper |
| <b>2-Insulation</b>    | EN 50290-2-21 PVC Compound                                             |
| <b>3-Colour Code</b>   | VDE 0815                                                               |
| <b>4-Stranding</b>     | Pair in Layers                                                         |
| <b>5-Wrapping</b>      | Pes Tape                                                               |
| <b>6-Screen</b>        | Tinned Drain Wire + Al-Pes Tape                                        |
| <b>7-Sheath</b>        | EN 50290-2-22 PVC Compound                                             |
| <b>8-Sheath Colour</b> | RAL 3000 Red                                                           |

## TEKNİK ÖZELLİKLER TECHNICAL CHARACTERISTICS

| ÇEVİRİM DİRENCİ<br>LOOP<br>RESISTANCE | YALITIM DİRENCİ<br>INSULATION<br>RESISTANCE | EFEKTİF KAPASİTE<br>MUTUAL<br>CAPACITANCE | ÇALIŞMA VOLTAJİ<br>OPERATING<br>VOLTAGE | TEST VOLTAJİ<br>TEST VOLTAGE         | BÜKÜLME YARIÇAPI<br>BENDING RADIUS | ÇALIŞMA SICAKLIĞI<br>TEMPERATURE RANGE                                  | ALEV GECİKTİRİCİLİK TESTİ<br>FLAME RETARDANT TEST |
|---------------------------------------|---------------------------------------------|-------------------------------------------|-----------------------------------------|--------------------------------------|------------------------------------|-------------------------------------------------------------------------|---------------------------------------------------|
| Ω/km                                  | 100MΩxkm                                    | 100nF/km (Max)                            | 300V                                    | 0,6mm/0,8mm = 800V<br>≥1,0mm = 1000V | 10x Cable Ø                        | Hareketli/Mobile<br>- 5°C - +50°C<br><br>Sabit/Stable<br>- 30°C - +70°C | IEC 60332-1-2<br>DIN EN 60332-1-2<br>EN 60332-1-2 |
| 0,6 mm 130                            |                                             |                                           |                                         |                                      |                                    |                                                                         |                                                   |
| 0,8 mm 73,2                           |                                             |                                           |                                         |                                      |                                    |                                                                         |                                                   |
| 1,0 mm 44,6                           |                                             |                                           |                                         |                                      |                                    |                                                                         |                                                   |
| 1,5 mm² 24,6                          |                                             |                                           |                                         |                                      |                                    |                                                                         |                                                   |
| 2,5 mm² 15,1                          |                                             |                                           |                                         |                                      |                                    |                                                                         |                                                   |

## NOTLAR

Bu tip kablolar besleme kablosu olarak yer altı tesisatlarında kullanılmak için uygun değildir.

## NOTES

This type of cables are not suitable to be used as feeder cables or for underground installations.

# J-Y(St)Y...Lg

| KOD NO<br>CODE NR. | ÇİFT SAYISI VE İLETKEN ÇAPI (mm)<br>NUMBER OF PAIRS AND WIRE<br>DIAMETER (mm) | KABLO ÇAPI (mm)<br>OVERALL DIAMETER<br>(mm) | BAKIR AĞIRLIĞI (kg/km)<br>COPPER WEIGHT<br>(kg/km) | YAKLAŞIK KABLO AĞIRLIĞI (kg/km)<br>APPROX. CABLE WEIGHT<br>(kg/km) | STANDART<br>UZUNLUK (m)<br>STANDARD LENGTH (m) |
|--------------------|-------------------------------------------------------------------------------|---------------------------------------------|----------------------------------------------------|--------------------------------------------------------------------|------------------------------------------------|
| 340706015          | 1 x 2 x 0,60                                                                  | 4,70                                        | 8                                                  | 31                                                                 | 100/500/1000                                   |
| 340706025          | 2 x 2 x 0,60                                                                  | 5,20                                        | 13                                                 | 40                                                                 | 100/500/1000                                   |
| 340706035          | 3 x 2 x 0,60                                                                  | 6,20                                        | 18                                                 | 52                                                                 | 100/500/1000                                   |
| 340706045          | 4 x 2 x 0,60                                                                  | 6,90                                        | 23                                                 | 60                                                                 | 100/500/1000                                   |
| 340706065          | 6 x 2 x 0,60                                                                  | 7,90                                        | 34                                                 | 83                                                                 | 100/500/1000                                   |
| 340706085          | 8 x 2 x 0,60                                                                  | 8,80                                        | 46                                                 | 105                                                                | 100/500/1000                                   |
| 340706105          | 10 x 2 x 0,60                                                                 | 9,60                                        | 56                                                 | 126                                                                | 100/500/1000                                   |
| 340708015          | 1 x 2 x 0,80                                                                  | 5,50                                        | 13                                                 | 40                                                                 | 100/500/1000                                   |
| 340708025          | 2 x 2 x 0,80                                                                  | 6,10                                        | 23                                                 | 60                                                                 | 100/500/1000                                   |
| 340708035          | 3 x 2 x 0,80                                                                  | 7,60                                        | 32                                                 | 80                                                                 | 100/500/1000                                   |
| 340708045          | 4 x 2 x 0,80                                                                  | 8,50                                        | 38                                                 | 100                                                                | 100/500/1000                                   |
| 340708065          | 6 x 2 x 0,80                                                                  | 9,80                                        | 60                                                 | 130                                                                | 100/500/1000                                   |
| 340708085          | 8 x 2 x 0,80                                                                  | 11,00                                       | 76                                                 | 170                                                                | 100/500/1000                                   |
| 340708105          | 10 x 2 x 0,80                                                                 | 12,10                                       | 96                                                 | 201                                                                | 100/500/1000                                   |
| 340701015          | 1 x 2 x 1                                                                     | 5,90                                        | 21                                                 | 48                                                                 | 100/500/1000                                   |
| 340701025          | 2 x 2 x 1                                                                     | 6,60                                        | 33                                                 | 67                                                                 | 100/500/1000                                   |
| 340701035          | 3 x 2 x 1                                                                     | 8,20                                        | 49                                                 | 109                                                                | 100/500/1000                                   |
| 340701045          | 4 x 2 x 1                                                                     | 9,20                                        | 65                                                 | 132                                                                | 100/500/1000                                   |
| 340701065          | 6 x 2 x 1                                                                     | 10,80                                       | 94                                                 | 180                                                                | 100/500/1000                                   |
| 340701085          | 8 x 2 x 1                                                                     | 12,60                                       | 120                                                | 237                                                                | 100/500/1000                                   |
| 340701105          | 10 x 2 x 1                                                                    | 13,60                                       | 150                                                | 281                                                                | 100/500/1000                                   |

| KOD NO<br>CODE NR. | ÇİFT SAYISI VE İLETKEN ÇAPI (mm <sup>2</sup> )<br>NUMBER OF PAIRS AND<br>WIRE DIAMETER (mm <sup>2</sup> ) | KABLO ÇAPI (mm)<br>OVERALL DIAMETER<br>(mm) | BAKIR AĞIRLIĞI (kg/km)<br>COPPER WEIGHT<br>(kg/km) | YAKLAŞIK KABLO AĞIRLIĞI (kg/km)<br>APPROX. CABLE WEIGHT<br>(kg/km) | STANDART<br>UZUNLUK (m)<br>STANDARD LENGTH (m) |
|--------------------|-----------------------------------------------------------------------------------------------------------|---------------------------------------------|----------------------------------------------------|--------------------------------------------------------------------|------------------------------------------------|
| 340215015          | 1 x 2 x 1,5                                                                                               | 7,50                                        | 34                                                 | 84                                                                 | 100/500/1000                                   |
| 340215025          | 2 x 2 x 1,5                                                                                               | 8,50                                        | 59                                                 | 127                                                                | 100/500/1000                                   |
| 340215035          | 3 x 2 x 1,5                                                                                               | 11,00                                       | 85                                                 | 173                                                                | 100/500/1000                                   |
| 340215045          | 4 x 2 x 1,5                                                                                               | 12,80                                       | 112                                                | 233                                                                | 100/500/1000                                   |
| 340215065          | 6 x 2 x 1,5                                                                                               | 15,10                                       | 164                                                | 321                                                                | 100/500/1000                                   |
| 340215085          | 8 x 2 x 1,5                                                                                               | 17,00                                       | 218                                                | 404                                                                | 100/500/1000                                   |
| 340215105          | 10 x 2 x 1,5                                                                                              | 19,10                                       | 275                                                | 511                                                                | 100/500/1000                                   |

# JE-H(St)H...Bd



KÜÇÜK BÜKÜLME YARIÇAPI/ALEV GECİKTİRİCİ ÖZELLİK/DÜŞÜK DUMAN YOĞUNLUĞU/  
ZEHİRLİ VE KOROZİF GAZLARDAN ARINDIRILMIŞ  
SMALL BENDING RADIUS/FLAME RETARDANT CHARACTERISTIC/  
LOW SMOKE EMISSION/WITHOUT POISONED AND CORROSIVE GASES



## KULLANIM ALANLARI

İnsanların yoğun olarak bulunduğu kapalı ortamlarda  
-Enstrüman ve Kontrol Mühendisliğinde  
-Endüstriyel Elektronikte  
-Bilgisayar ve Ofis Makinelerinde  
-Bina İçi Haberleşme Sistemlerinde  
-Güvenlik ve Yangın İhbar Sistemlerinde  
-İnsan hayatının, değerli malzemelerin ve ekipmanların korunması gereken yerlerde

## APPLICATION

In closed areas where people are densely populated  
-Instrumentation and Control Engineering  
-Industrial Electronics  
-Computers and Office Machines  
-Indoor Communication Systems  
-Safety and Fire Alarm Systems  
-In places where human life and valuable materials and equipment need to be protected

## KABLO YAPISI

|                       |                                                                 |
|-----------------------|-----------------------------------------------------------------|
| <b>1-İletken</b>      | IEC 60228; DIN VDE 0295; EN 60228 Sınıf 1<br>Electrolitik Bakır |
| <b>2-Yalıtkan</b>     | EN 50290-2-26 HFFR Kompaund                                     |
| <b>3-Yalıtım Renk</b> | VDE 0815                                                        |
| <b>4-Büküm</b>        | Çift büküm katlar halinde                                       |
| <b>5-Ayırıcı Bant</b> | Pes Bant                                                        |
| <b>6-Ekran</b>        | Kalaylı Toprak Teli + Al-Pes Bant                               |
| <b>7-Kılıf</b>        | EN 50290-2-27 HFFR Kompaund                                     |
| <b>8-Kılıf Rengi</b>  | RAL 3000 Kırmızı ya da RAL 7001 Gri                             |

## CONSTRUCTION

|                        |                                                                  |
|------------------------|------------------------------------------------------------------|
| <b>1-Conductor</b>     | IEC 60228; DIN VDE 0295; EN 60228 Class 1<br>Electrolytic Copper |
| <b>2-Insulation</b>    | EN 50290-2-26 HFFR Compound                                      |
| <b>3-Colour Code</b>   | VDE 0815                                                         |
| <b>4-Stranding</b>     | Pairwise pairs in layers                                         |
| <b>5-Wrapping</b>      | Pes Tape                                                         |
| <b>6-Screen</b>        | Tinned Drain Wire + Al-Pes Tape                                  |
| <b>7-Sheath</b>        | EN 50290-2-27 HFFR Compound                                      |
| <b>8-Sheath Colour</b> | RAL 3000 Red or RAL7001 Grey                                     |

## TEKNİK ÖZELLİKLER TECHNICAL CHARACTERISTICS

| ÇEVİRİM DİRENCİ<br>LOOP<br>RESISTANCE          | YALITIM DİRENCİ<br>INSULATION<br>RESISTANCE                       | EFEKTİF KAPASİTE<br>MUTUAL<br>CAPACITANCE   | ÇALIŞMA VOLTAJI<br>OPERATING<br>VOLTAGE              | TEST VOLTAJI<br>TEST VOLTAGE          | BÜKÜLME YARIÇAPI<br>BENDING RADIUS | ÇALIŞMA SICAKLIĞI<br>TEMPERATURE RANGE                                  | ALEV GECİKTİRİCİLİK TESTİ<br>FLAME RETARDANT TEST |
|------------------------------------------------|-------------------------------------------------------------------|---------------------------------------------|------------------------------------------------------|---------------------------------------|------------------------------------|-------------------------------------------------------------------------|---------------------------------------------------|
| Ω/km                                           | 100MΩxkm                                                          | 100nF/km (Max)                              | 300V                                                 | 0,6mm/0,8mm = 800V<br>≥ 1,0mm = 1000V | 10x Cable Ø                        | Hareketli/Mobile<br>- 5°C - +50°C<br><br>Sabit/Stable<br>- 30°C - +70°C | IEC 60332-1-2<br>DIN EN 60332-1-2<br>EN 60332-1-2 |
| 0,6 mm 130                                     |                                                                   |                                             |                                                      |                                       |                                    |                                                                         |                                                   |
| 0,8 mm 73,2                                    |                                                                   |                                             |                                                      |                                       |                                    |                                                                         |                                                   |
| 1,0 mm 44,6                                    |                                                                   |                                             |                                                      |                                       |                                    |                                                                         |                                                   |
| 1,5 mm <sup>2</sup> 24,6                       |                                                                   |                                             |                                                      |                                       |                                    |                                                                         |                                                   |
| 2,5 mm <sup>2</sup> 15,1                       |                                                                   |                                             |                                                      |                                       |                                    |                                                                         |                                                   |
| DUMAN YOĞUNLUĞU<br>TESTİ<br>SMOKE DENSITY TEST | KOROZİF GAZ TESTİ<br>TEST ON CORROSIVENESS<br>OF COMBUSTION GASES | HALOJENSİZLİK TESTİ<br>HALOGEN FREE TEST    | ALEV YAYILIMI TESTİ<br>FLAME PROPAGATION TEST        |                                       |                                    |                                                                         |                                                   |
| IEC 61034-2<br>VDE 0482-1034-2<br>EN 61034-2   | IEC 60754-2<br>VDE 0482-754-2<br>EN 60754-2                       | IEC 60754-1<br>VDE 0482-754-1<br>EN 60754-1 | IEC 60332-3-24<br>DIN EN 60332-3-24<br>EN 60332-3-24 |                                       |                                    |                                                                         |                                                   |

## NOTLAR

Bu tip kablolar besleme kablosu olarak ve yer altı tesisatlarında kullanılmak için uygun değildir.

## NOTES

This type of cables are not suitable to be used as feeder cables or for underground installations

# JE-H(St)H...Bd

| KOD NO<br>CODE NR. | ÇİFT SAYISI VE İLETKEN ÇAPI (mm)<br>NUMBER OF PAIRS AND WIRE<br>DIAMETER (mm) | KABLO ÇAPI (mm)<br>OVERALL DIAMETER<br>(mm) | BAKIR AĞIRLIĞI (kg/km)<br>COPPER WEIGHT<br>(kg/km) | YAKLAŞIK KABLO AĞIRLIĞI (kg/km)<br>APPROX. CABLE WEIGHT<br>(kg/km) | STANDART<br>UZUNLUK (m)<br>STANDARD LENGTH (m) |
|--------------------|-------------------------------------------------------------------------------|---------------------------------------------|----------------------------------------------------|--------------------------------------------------------------------|------------------------------------------------|
| 3 4110 6 015       | 1 x 2 x 0,60                                                                  | 4,80                                        | 10                                                 | 40                                                                 | 500/1000/2000                                  |
| 3 4110 6 025       | 2 x 2 x 0,60                                                                  | 5,30                                        | 16                                                 | 52                                                                 | 500/1000/2000                                  |
| 3 4110 6 045       | 4 x 2 x 0,60                                                                  | 7,00                                        | 26                                                 | 75                                                                 | 500/1000/2000                                  |
| 3 4110 6 085       | 8 x 2 x 0,60                                                                  | 11,80                                       | 50                                                 | 140                                                                | 500/1000/2000                                  |
| 3 4110 8 015       | 1 x 2 x 0,80                                                                  | 5,40                                        | 10                                                 | 42                                                                 | 500/1000/2000                                  |
| 3 4110 8 025       | 2 x 2 x 0,80                                                                  | 6,00                                        | 20                                                 | 62                                                                 | 500/1000/2000                                  |
| 3 4110 8 045       | 4 x 2 x 0,80                                                                  | 8,40                                        | 38                                                 | 102                                                                | 500/1000/2000                                  |
| 3 4110 8 085       | 8 x 2 x 0,80                                                                  | 10,90                                       | 76                                                 | 172                                                                | 500/1000/2000                                  |
| 3 4110 10 015      | 1 x 2 x 1                                                                     | 5,90                                        | 20                                                 | 35                                                                 | 500/1000/2000                                  |
| 3 4110 10 025      | 2 x 2 x 1                                                                     | 6,20                                        | 35                                                 | 75                                                                 | 500/1000/2000                                  |
| 3 4110 10 045      | 4 x 2 x 1                                                                     | 9,20                                        | 65                                                 | 133                                                                | 500/1000/2000                                  |
| 3 4110 10 085      | 8 x 2 x 1                                                                     | 16,70                                       | 124                                                | 264                                                                | 500/1000/2000                                  |

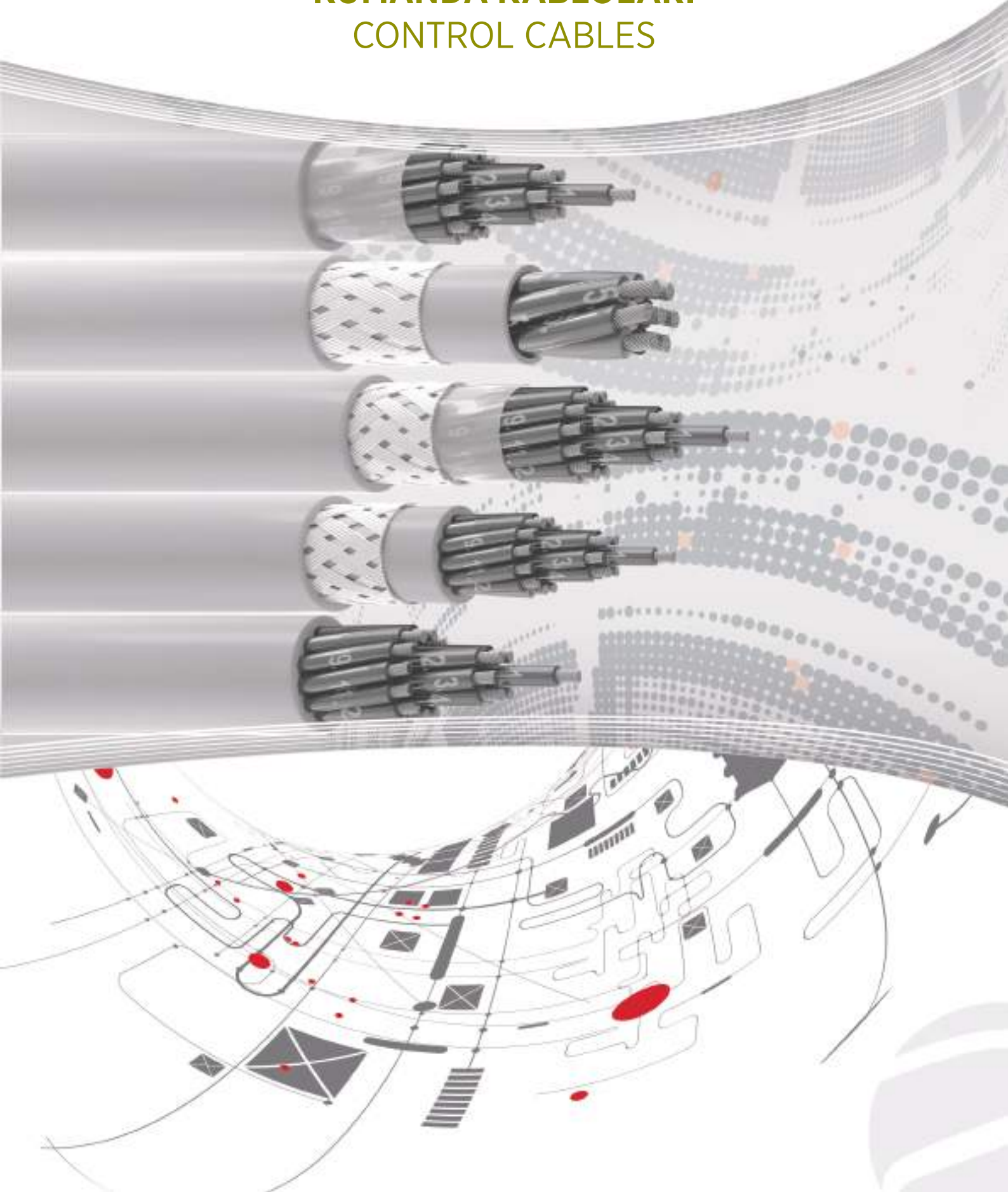
| KOD NO<br>CODE NR. | ÇİFT SAYISI VE İLETKEN ÇAPI (mm)<br>NUMBER OF PAIRS AND WIRE<br>DIAMETER (mm) | KABLO ÇAPI (mm)<br>OVERALL DIAMETER<br>(mm) | BAKIR AĞIRLIĞI (kg/km)<br>COPPER WEIGHT<br>(kg/km) | YAKLAŞIK KABLO AĞIRLIĞI (kg/km)<br>APPROX. CABLE WEIGHT<br>(kg/km) | STANDART<br>UZUNLUK (m)<br>STANDARD LENGTH (m) |
|--------------------|-------------------------------------------------------------------------------|---------------------------------------------|----------------------------------------------------|--------------------------------------------------------------------|------------------------------------------------|
| 3 4111 5 015       | 1 x 2 x 1,5                                                                   | 7,50                                        | 35                                                 | 84                                                                 | 500/1000/2000                                  |
| 3 4111 5 025       | 2 x 2 x 1,5                                                                   | 8,50                                        | 60                                                 | 127                                                                | 500/1000/2000                                  |
| 3 4111 5 045       | 4 x 2 x 1,5                                                                   | 12,90                                       | 115                                                | 234                                                                | 500/1000/2000                                  |





# ERFLEX

## KUMANDA KABLOLARI CONTROL CABLES



|                                                |     |
|------------------------------------------------|-----|
| ERFLEX 130-CY / YSLCY .....                    | 103 |
| ERFLEX 130-Y / YSLY .....                      | 104 |
| ERFLEX 130-YCY / YSLYCY .....                  | 107 |
| ERFLEX 130-H / HSLH .....                      | 110 |
| ERFLEX 130-HCH / HSLHCH .....                  | 111 |
| ERFLEX 130-CH / HSLCH .....                    | 112 |
| ERFLEX 120-Y / H05VV5-F (NYSLYö) .....         | 113 |
| ERFLEX 120-YCY / H05VVC4V5-K (NYSLYCYö) .....  | 116 |
| ERFLEX 130-YSY / YSLYQY .....                  | 119 |
| ERFLEX SERVO 160-CY / 2YSLCY .....             | 120 |
| ERFLEX SERVO 160-CYK / 2YSLCYK .....           | 121 |
| ERFLEX SERVO 160-CY (3+) / 2YSLCY (3+) .....   | 122 |
| ERFLEX SERVO 160-CYK (3+) / 2YSLCYK (3+) ..... | 123 |

# ERFLEX 130-CY / YSLCY



İYİ EMC\* ÖZELLİK/ESNEK KABLO YAPISI/İNCELTİLMİŞ DIŞ ÇAP/KÜÇÜK BÜKÜLME YARIÇAPI/ALEV GECİKTİRİCİ ÖZELLİK  
GOOD EMC\* CHARACTERISTIC/FLEXIBLE CABLE DESIGN/REDUCED OUTER DIAMETER/SMALL BENDING RADIUS/  
FLAME RETARDANT CHARACTERISTIC



## KULLANIM ALANLARI

Elektromanyetik karışım ve girişimlerin olduğu

- Enstrüman ve Kontrol Mühendisliği
- Endüstriyel Elektronik
- Ölçme ve kontrol amaçlı olarak makine üretiminde
- Montaj ve Üretim Hatlarında
- Islak kuru ve nemli ortamlarda
- Mekanik zorlanmaların düşük olduğu yerlerde kullanılır

## APPLICATION

In places where electro-magnetic interference and influence exists

- Instrumentation and Control Engineering
- Industrial Electronics
- In machine production as measurement and control cable
- Production and Assembly Lines
- Dry, moist and wet places
- In places where low mechanical stresses exist

## KABLO YAPISI

|                       |                                                                              |
|-----------------------|------------------------------------------------------------------------------|
| <b>1-İletken</b>      | IEC 60228; DIN EN 60228; EN 60228 Sınıf 5<br>Bükülü Elektrolitik Tavlı Bakır |
| <b>2-Yalıtkan</b>     | EN 50363-3 PVC Kompaund                                                      |
| <b>3-Yalıtım Renk</b> | DIN VDE 0293; TS EN 50334 veya Siyah yalıtkan, beyaz numara kodlu            |
| <b>4-Büküm</b>        | Uygun adımda katlar halinde                                                  |
| <b>5-Ayırıcı Bant</b> | PES Bant                                                                     |
| <b>6-Ekran</b>        | Kalaylı Bakır Örgü                                                           |
| <b>7-Kılıf</b>        | EN 50363-4-1 PVC Kompaund                                                    |
| <b>8-Kılıf Rengi</b>  | RAL 7001 Gri                                                                 |

## CONSTRUCTION

|                        |                                                                                |
|------------------------|--------------------------------------------------------------------------------|
| <b>1-Conductor</b>     | IEC 60228; DIN EN 60228; EN 60228 Class 5<br>Stranded Electrolytic Bare Copper |
| <b>2-Insulation</b>    | EN 50363-3 PVC Compound                                                        |
| <b>3-Colour Code</b>   | DIN VDE 0293; TS EN 50334 or Black insulated cores with white number Imprinted |
| <b>4-Stranding</b>     | In layers of optimum pitch                                                     |
| <b>5-Wrapping</b>      | PES Tape                                                                       |
| <b>6-Screen</b>        | Tinned Copper Braid                                                            |
| <b>7-Sheath</b>        | EN 50363-4-1 PVC Compound                                                      |
| <b>8-Sheath Colour</b> | RAL 7001 Grey                                                                  |

## TEKNİK ÖZELLİKLER TECHNICAL CHARACTERISTICS

| İLETKEN DİRENÇİ<br>CONDUCTOR<br>RESISTANCE | YALITIM DİRENÇİ<br>INSULATION<br>RESISTANCE | AKIM TAŞIMA KAPASİTESİ<br>CURRENT CARRYING<br>CAPACITY | ÇALIŞMA VOLTAJİ<br>OPERATING<br>VOLTAGE | TEST VOLTAJİ<br>TEST VOLTAGE | BÜKÜLME YARIÇAPI<br>BENDING RADIUS | ÇALIŞMA SICAKLIĞI<br>TEMPERATURE RANGE                                  | ALEV GECİKTİRİCİLİK<br>TESTİ<br>FLAME RETARDANT TEST |
|--------------------------------------------|---------------------------------------------|--------------------------------------------------------|-----------------------------------------|------------------------------|------------------------------------|-------------------------------------------------------------------------|------------------------------------------------------|
| mm <sup>2</sup> Ω/km                       | 20MΩxkm                                     | mm <sup>2</sup> A                                      | 300V/500V                               | 2000V                        | 10x Cable Ø                        | Hareketli / Mobile<br>-5°C-+70°C Sabit<br>Sabit / Stable<br>-30°C-+70°C | IEC 60332-1-2<br>DIN EN 60332-1-2<br>EN 60332-1-2    |
| 0,5 39                                     |                                             | 0,5 6,0                                                |                                         |                              |                                    |                                                                         |                                                      |
| 0,75 26                                    |                                             | 0,75 13                                                |                                         |                              |                                    |                                                                         |                                                      |
| 1,0 19,5                                   |                                             | 1,0 16                                                 |                                         |                              |                                    |                                                                         |                                                      |
| 1,5 13,3                                   |                                             | 1,5 20                                                 |                                         |                              |                                    |                                                                         |                                                      |
| 2,5 7,98                                   |                                             | 2,5 25                                                 |                                         |                              |                                    |                                                                         |                                                      |

## NOTLAR

\*EMC: Elektromanyetik uyumlu

Esnek yapıları ile dar alanlarda rahatlıkla uygulanabilirler.

Bu tip kablolar dış ortamlarda kullanıma uygun değildir.

**OZ:** Siyah yalıtım+Sarı/Yeşil toprak koruma damarsız

**JZ:** Siyah yalıtım+Sarı/Yeşil toprak koruma damarı

**OB:** Renk kodlu yalıtım+Sarı/Yeşil toprak koruma damarsız

**JB:** Renk kodlu yalıtım +Sarı/Yeşil toprak koruma damarı

## NOTES

\*EMC: Electromagnetic compatibility

With their flexible design they can easily be used in narrow spaces.

These cables are not suitable for outdoor use.

**OZ:** Black insulation+Without Green/Yellow earthing core

**JZ:** Black insulation+Green/Yellow earthing core

**OB:** Colour code insulation+Without Green/Yellow earthing core

**JB:** Colour code insulation+With Green/Yellow earthing core

# ERFLEX 130-Y / YSLY



ESNEK KABLO YAPISI/KÜÇÜK BÜKÜLME YARIÇAPI/ALEV GECİKTİRİCİ ÖZELLİK  
FLEXIBLE CABLE DESIGN/SMALL BENDING RADIUS/FLAME RETARDANT CHARACTERISTIC



## KULLANIM ALANLARI

- Enstrüman ve Kontrol Mühendisliği
- Endüstriyel Elektronik
- Ölçme ve kontrol amaçlı olarak makine üretiminde
- Montaj ve Üretim Hatlarında
- Islak kuru ve nemli ortamlarda
- Mekanik zorlanmaların düşük olduğu yerlerde kullanılır

## APPLICATION

- Instrumentation and Control Engineering
- Industrial Electronics
- In machine production as measurement and control cable
- Production and Assembly Lines
- Dry, moist and wet places
- In places where low mechanical stresses exist

## KABLO YAPISI

|                       |                                                                              |
|-----------------------|------------------------------------------------------------------------------|
| <b>1-İletken</b>      | IEC 60228; DIN EN 60228; EN 60228 Sınıf 5<br>Bükülü Elektrolitik Tavlı Bakır |
| <b>2-Yalıtkan</b>     | EN 50363-3 PVC Kompaund                                                      |
| <b>3-Yalıtım Renk</b> | DIN VDE 0293; TS EN 50334 veya Siyah yalıtkan,<br>beyaz numara kodlu         |
| <b>4-Büküm</b>        | Uygun adımda katlar halinde                                                  |
| <b>5-Kılıf</b>        | EN 50363-4-1 PVC Kompaund                                                    |
| <b>6-Kılıf Rengi</b>  | RAL 7001 Gri                                                                 |

## CONSTRUCTION

|                        |                                                                                   |
|------------------------|-----------------------------------------------------------------------------------|
| <b>1-Conductor</b>     | IEC 60228; DIN EN 60228; EN 60228 Class 5<br>Stranded Electrolytic Bare Copper    |
| <b>2-Insulation</b>    | EN 50363-3 PVC Compound                                                           |
| <b>3-Colour Code</b>   | DIN VDE 0293; TS EN 50334 or Black insulated cores with<br>white number Imprinted |
| <b>4-Stranding</b>     | In layers of optimum pitch                                                        |
| <b>5-Sheath</b>        | EN 50363-4-1 PVC Compound                                                         |
| <b>6-Sheath Colour</b> | RAL 7001 Grey                                                                     |

## TEKNİK ÖZELLİKLER TECHNICAL CHARACTERISTICS

| İLETKEN DİRENCİ<br>CONDUCTOR<br>RESISTANCE | YALITIM DİRENCİ<br>INSULATION<br>RESISTANCE | AKIM TAŞIMA KAPASİTESİ<br>CURRENT CARRYING<br>CAPACITY | ÇALIŞMA VOLTAJİ<br>OPERATING<br>VOLTAGE | TEST VOLTAJİ<br>TEST VOLTAGE | BÜKÜLME YARIÇAPI<br>BENDING RADIUS | ÇALIŞMA SICAKLIĞI<br>TEMPERATURE RANGE                                  | ALEV GECİKTİRİCİLİK TESTİ<br>FLAME RETARDANT TEST |
|--------------------------------------------|---------------------------------------------|--------------------------------------------------------|-----------------------------------------|------------------------------|------------------------------------|-------------------------------------------------------------------------|---------------------------------------------------|
| mm <sup>2</sup> Ω/km                       | 20MΩxkm                                     | mm <sup>2</sup> A                                      | 300/500V                                | 2000V                        | 7,5x Cable Ø                       | Hareketli / Mobile<br>-5°C-+70°C Sabit<br>Sabit / Stable<br>-30°C-+70°C | IEC 60332-1-2<br>DIN EN 60332-1-2<br>EN 60332-1-2 |
| 0,5 39                                     |                                             | 0,5 6,0                                                |                                         |                              |                                    |                                                                         |                                                   |
| 0,75 26                                    |                                             | 0,75 13                                                |                                         |                              |                                    |                                                                         |                                                   |
| 1,0 19,5                                   |                                             | 1,0 16                                                 |                                         |                              |                                    |                                                                         |                                                   |
| 1,5 13,3                                   |                                             | 1,5 20                                                 |                                         |                              |                                    |                                                                         |                                                   |
| 2,5 7,98                                   |                                             | 2,5 25                                                 |                                         |                              |                                    |                                                                         |                                                   |

## NOTLAR

Esnek yapıları ile dar alanlarda rahatlıkla uygulanabilirler.  
Bu tip kablolar dış ortamlarda kullanıma uygun değildir.  
**OZ:** Siyah yalıtım+Sarı/Yeşil toprak koruma damarsız  
**JZ:** Siyah yalıtım+Sarı/Yeşil toprak koruma damarı  
**OB:** Renk kodlu yalıtım+Sarı/Yeşil toprak koruma damarsız  
**JB:** Renk kodlu yalıtım +Sarı/Yeşil toprak koruma damarı

## NOTES

With their flexible design they can easily be used in narrow spaces.  
These cables are not suitable for outdoor use.  
**OZ:** Black insulation+Without Green/Yellow earthing core  
**JZ:** Black insulation+Green/Yellow earthing core  
**OB:** Colour code insulation+Without Green/Yellow earthing core  
**JB:** Colour code insulation+With Green/Yellow earthing core

# ERFLEX 130-Y / YSLY

| KOD NO<br>CODE NR. | DAMAR SAYISI VE KESİTİ (mm <sup>2</sup> )<br>NUMBER OF CORE AND CROSS<br>SECTION (mm <sup>2</sup> ) | KABLO ÇAPİ (mm)<br>OVERALL DIAMETER<br>(mm) | BAKIR AĞIRLIĞI (kg/km)<br>COPPER WEIGHT<br>(kg/km) | YAKLAŞIK KABLO AĞIRLIĞI (kg/km)<br>APPROX. CABLE WEIGHT<br>(kg/km) | STANDART<br>UZUNLUK (m)<br>STANDARD LENGTH (m) |
|--------------------|-----------------------------------------------------------------------------------------------------|---------------------------------------------|----------------------------------------------------|--------------------------------------------------------------------|------------------------------------------------|
| 331250023          | 2 x 0,50                                                                                            | 5,10                                        | 10                                                 | 39                                                                 | 100/500/1000                                   |
| 331250033          | 3 x 0,50                                                                                            | 5,40                                        | 15                                                 | 46                                                                 | 100/500/1000                                   |
| 331250043          | 4 x 0,50                                                                                            | 5,80                                        | 18                                                 | 53                                                                 | 100/500/1000                                   |
| 331250053          | 5 x 0,50                                                                                            | 6,40                                        | 23                                                 | 65                                                                 | 100/500/1000                                   |
| 331250063          | 6 x 0,50                                                                                            | 7,10                                        | 26                                                 | 81                                                                 | 100/500/1000                                   |
| 331250073          | 7 x 0,50                                                                                            | 7,10                                        | 30                                                 | 90                                                                 | 100/500/1000                                   |
| 331250083          | 8 x 0,50                                                                                            | 7,70                                        | 36                                                 | 105                                                                | 100/500/1000                                   |
| 331250103          | 10 x 0,50                                                                                           | 9,10                                        | 45                                                 | 135                                                                | 100/500/1000                                   |
| 331250123          | 12 x 0,50                                                                                           | 9,40                                        | 53                                                 | 155                                                                | 100/500/1000                                   |
| 331250143          | 14 x 0,50                                                                                           | 10,00                                       | 60                                                 | 170                                                                | 100/500/1000                                   |
| 331250163          | 16 x 0,50                                                                                           | 10,60                                       | 70                                                 | 186                                                                | 100/500/1000                                   |
| 331250183          | 18 x 0,50                                                                                           | 11,10                                       | 76                                                 | 208                                                                | 100/500/1000                                   |
| 331250193          | 19 x 0,50                                                                                           | 11,10                                       | 80                                                 | 213                                                                | 100/500/1000                                   |
| 331250213          | 21 x 0,50                                                                                           | 11,90                                       | 90                                                 | 244                                                                | 100/500/1000                                   |
| 331250243          | 24 x 0,50                                                                                           | 13,30                                       | 100                                                | 291                                                                | 100/500/1000                                   |
| 331250303          | 30 x 0,50                                                                                           | 14,00                                       | 126                                                | 333                                                                | 100/500/1000                                   |
| 331250363          | 36 x 0,50                                                                                           | 15,30                                       | 155                                                | 404                                                                | 100/500/1000                                   |
| 331275023          | 2 x 0,75                                                                                            | 5,50                                        | 14                                                 | 47                                                                 | 100/500/1000                                   |
| 331275033          | 3 x 0,75                                                                                            | 5,80                                        | 21                                                 | 59                                                                 | 100/500/1000                                   |
| 331275043          | 4 x 0,75                                                                                            | 6,30                                        | 27                                                 | 73                                                                 | 100/500/1000                                   |
| 331275053          | 5 x 0,75                                                                                            | 7,10                                        | 34                                                 | 92                                                                 | 100/500/1000                                   |
| 331275063          | 6 x 0,75                                                                                            | 7,70                                        | 41                                                 | 108                                                                | 100/500/1000                                   |
| 331275073          | 7 x 0,75                                                                                            | 7,70                                        | 48                                                 | 115                                                                | 100/500/1000                                   |
| 331275083          | 8 x 0,75                                                                                            | 8,50                                        | 54                                                 | 132                                                                | 100/500/1000                                   |
| 331275103          | 10 x 0,75                                                                                           | 10,10                                       | 64                                                 | 162                                                                | 100/500/1000                                   |
| 331275123          | 12 x 0,75                                                                                           | 10,40                                       | 77                                                 | 194                                                                | 100/500/1000                                   |
| 331275143          | 14 x 0,75                                                                                           | 11,10                                       | 90                                                 | 218                                                                | 100/500/1000                                   |
| 331275163          | 16 x 0,75                                                                                           | 11,70                                       | 103                                                | 240                                                                | 100/500/1000                                   |
| 331275183          | 18 x 0,75                                                                                           | 12,30                                       | 117                                                | 273                                                                | 100/500/1000                                   |
| 331275193          | 19 x 0,75                                                                                           | 12,30                                       | 124                                                | 280                                                                | 100/500/1000                                   |
| 331275213          | 21 x 0,75                                                                                           | 12,90                                       | 136                                                | 309                                                                | 100/500/1000                                   |
| 331275243          | 24 x 0,75                                                                                           | 14,50                                       | 156                                                | 370                                                                | 100/500/1000                                   |
| 331275303          | 30 x 0,75                                                                                           | 15,50                                       | 195                                                | 438                                                                | 100/500/1000                                   |
| 331275363          | 36 x 0,75                                                                                           | 16,90                                       | 230                                                | 504                                                                | 100/500/1000                                   |
| 331201023          | 2 x 1                                                                                               | 5,80                                        | 19                                                 | 56                                                                 | 100/500/1000                                   |
| 331201033          | 3 x 1                                                                                               | 6,10                                        | 28                                                 | 68                                                                 | 100/500/1000                                   |
| 331201043          | 4 x 1                                                                                               | 6,80                                        | 36                                                 | 86                                                                 | 100/500/1000                                   |
| 331201053          | 5 x 1                                                                                               | 7,50                                        | 45                                                 | 110                                                                | 100/500/1000                                   |
| 331201063          | 6 x 1                                                                                               | 8,10                                        | 55                                                 | 128                                                                | 100/500/1000                                   |
| 331201073          | 7 x 1                                                                                               | 8,10                                        | 61                                                 | 138                                                                | 100/500/1000                                   |
| 331201083          | 8 x 1                                                                                               | 9,40                                        | 70                                                 | 165                                                                | 100/500/1000                                   |
| 331201103          | 10 x 1                                                                                              | 10,30                                       | 87                                                 | 200                                                                | 100/500/1000                                   |
| 331201123          | 12 x 1                                                                                              | 10,60                                       | 105                                                | 225                                                                | 100/500/1000                                   |
| 331201143          | 14 x 1                                                                                              | 11,30                                       | 123                                                | 259                                                                | 100/500/1000                                   |
| 331201163          | 16 x 1                                                                                              | 11,90                                       | 140                                                | 285                                                                | 100/500/1000                                   |
| 331201183          | 18 x 1                                                                                              | 12,80                                       | 156                                                | 315                                                                | 100/500/1000                                   |
| 331201193          | 19 x 1                                                                                              | 12,80                                       | 165                                                | 328                                                                | 100/500/1000                                   |
| 331201213          | 21 x 1                                                                                              | 13,50                                       | 188                                                | 365                                                                | 100/500/1000                                   |
| 331201243          | 24 x 1                                                                                              | 14,60                                       | 206                                                | 419                                                                | 100/500/1000                                   |
| 331201303          | 30 x 1                                                                                              | 17,00                                       | 260                                                | 537                                                                | 100/500/1000                                   |
| 331201363          | 36 x 1                                                                                              | 17,50                                       | 310                                                | 635                                                                | 100/500/1000                                   |

# ERFLEX 130-Y / YSLY

| KOD NO<br>CODENR. | DAMAR SAYISI VE KESİTİ (mm <sup>2</sup> )<br>NUMBER OF CORE AND CROSS<br>SECTION (mm <sup>2</sup> ) | KABLO ÇAPI (mm)<br>OVERALL DIAMETER<br>(mm) | BAKIR AĞIRLIĞI (kg/km)<br>COPPER WEIGHT<br>(kg/km) | YAKLAŞIK KABLO AĞIRLIĞI (kg/km)<br>APPROX. CABLE WEIGHT<br>(kg/km) | STANDART<br>UZUNLUK (m)<br>STANDARD LENGTH (m) |
|-------------------|-----------------------------------------------------------------------------------------------------|---------------------------------------------|----------------------------------------------------|--------------------------------------------------------------------|------------------------------------------------|
| 331215023         | 2 x 1,5                                                                                             | 6,30                                        | 26                                                 | 71                                                                 | 100/500/1000                                   |
| 331215033         | 3 x 1,5                                                                                             | 6,90                                        | 39                                                 | 89                                                                 | 100/500/1000                                   |
| 331215043         | 4 x 1,5                                                                                             | 7,50                                        | 51                                                 | 110                                                                | 100/500/1000                                   |
| 331215053         | 5 x 1,5                                                                                             | 8,50                                        | 63                                                 | 137                                                                | 100/500/1000                                   |
| 331215063         | 6 x 1,5                                                                                             | 9,10                                        | 75                                                 | 157                                                                | 100/500/1000                                   |
| 331215073         | 7 x 1,5                                                                                             | 9,10                                        | 88                                                 | 173                                                                | 100/500/1000                                   |
| 331215083         | 8 x 1,5                                                                                             | 10,00                                       | 103                                                | 206                                                                | 100/500/1000                                   |
| 331215103         | 10 x 1,5                                                                                            | 11,90                                       | 128                                                | 258                                                                | 100/500/1000                                   |
| 331215123         | 12 x 1,5                                                                                            | 12,30                                       | 150                                                | 282                                                                | 100/500/1000                                   |
| 331215143         | 14 x 1,5                                                                                            | 13,10                                       | 175                                                | 338                                                                | 100/500/1000                                   |
| 331215163         | 16 x 1,5                                                                                            | 13,90                                       | 198                                                | 381                                                                | 100/500/1000                                   |
| 331215183         | 18 x 1,5                                                                                            | 14,70                                       | 223                                                | 414                                                                | 100/500/1000                                   |
| 331215193         | 19 x 1,5                                                                                            | 14,70                                       | 235                                                | 425                                                                | 100/500/1000                                   |
| 331215213         | 21 x 1,5                                                                                            | 15,40                                       | 256                                                | 487                                                                | 100/500/1000                                   |
| 331215243         | 24 x 1,5                                                                                            | 17,30                                       | 296                                                | 530                                                                | 100/500/1000                                   |
| 331215303         | 30 x 1,5                                                                                            | 18,50                                       | 368                                                | 660                                                                | 100/500/1000                                   |
| 331215363         | 36 x 1,5                                                                                            | 20,10                                       | 440                                                | 780                                                                | 100/500/1000                                   |
| 331225023         | 2 x 2,5                                                                                             | 7,90                                        | 43                                                 | 113                                                                | 100/500/1000                                   |
| 331225033         | 3 x 2,5                                                                                             | 8,60                                        | 64                                                 | 140                                                                | 100/500/1000                                   |
| 331225043         | 4 x 2,5                                                                                             | 9,40                                        | 84                                                 | 174                                                                | 100/500/1000                                   |
| 331225053         | 5 x 2,5                                                                                             | 10,60                                       | 106                                                | 214                                                                | 100/500/1000                                   |
| 331225063         | 6 x 2,5                                                                                             | 11,60                                       | 127                                                | 263                                                                | 100/500/1000                                   |
| 331225073         | 7 x 2,5                                                                                             | 11,60                                       | 145                                                | 283                                                                | 100/500/1000                                   |
| 331225083         | 8 x 2,5                                                                                             | 12,50                                       | 166                                                | 318                                                                | 100/500/1000                                   |
| 331225103         | 10 x 2,5                                                                                            | 15,10                                       | 206                                                | 406                                                                | 100/500/1000                                   |
| 331225123         | 12 x 2,5                                                                                            | 15,60                                       | 246                                                | 465                                                                | 100/500/1000                                   |
| 331225143         | 14 x 2,5                                                                                            | 16,60                                       | 286                                                | 526                                                                | 100/500/1000                                   |
| 331225163         | 16 x 2,5                                                                                            | 17,60                                       | 327                                                | 594                                                                | 100/500/1000                                   |
| 331225183         | 18 x 2,5                                                                                            | 18,60                                       | 368                                                | 673                                                                | 100/500/1000                                   |
| 331225193         | 19 x 2,5                                                                                            | 18,60                                       | 388                                                | 700                                                                | 100/500/1000                                   |
| 331225213         | 21 x 2,5                                                                                            | 19,70                                       | 430                                                | 764                                                                | 100/500/1000                                   |
| 331225243         | 24 x 2,5                                                                                            | 22,10                                       | 490                                                | 893                                                                | 100/500/1000                                   |
| 331225303         | 30 x 2,5                                                                                            | 23,60                                       | 610                                                | 1072                                                               | 100/500/1000                                   |
| 331225363         | 36 x 2,5                                                                                            | 25,60                                       | 731                                                | 1258                                                               | 100/500/1000                                   |

# ERFLEX 130-YCY / YSLYCY



İYİ EMC\* ÖZELLİK / ESNEK KABLO YAPISI / KÜÇÜK BÜKÜLME YARIÇAPI / ALEV GECİKTİRİCİ ÖZELLİK /  
GOOD EMC\* CHARACTERISTIC / FLEXIBLE CABLE DESIGN / SMALL BENDING RADIUS / FLAME RETARDANT CHARACTERISTIC



## KULLANIM ALANLARI

Elektromanyetik karışım ve girişimlerin olduğu  
-Enstrüman ve Kontrol Mühendisliğinde  
-Akaryakıt Pompalarında  
-Ölçme ve kontrol amaçlı olarak makine üretiminde  
-Montaj ve Üretim Hatlarında  
-Kuru ve nemli ortamlarda  
-Mekanik zorlanmaların orta derece olduğu yerlerde kullanılır

## APPLICATION

In places where electro-magnetic interference and influence exists  
-Instrumentation and Control Engineering  
-Fuel Oil Pumps  
-In machine production as measurement and control cable  
-Production and Assembly Lines  
-Dry and humid places  
-In places where medium level mechanical stresses exist

## KABLO YAPISI

|                       |                                                                              |
|-----------------------|------------------------------------------------------------------------------|
| <b>1-İletken</b>      | IEC 60228; DIN EN 60228; EN 60228 Sınıf 5<br>Bükülü Elektrolitik Tavlı Bakır |
| <b>2-Yalıtkan</b>     | EN 50363-3 PVC Kompaund                                                      |
| <b>3-Yalıtım Renk</b> | DIN VDE 0293; TS EN 50334 veya Siyah damar,<br>beyaz numara kodlu            |
| <b>4-Büküm</b>        | Uygun adımda katlar halinde                                                  |
| <b>5-İç Kılıf</b>     | EN 50363-4-1 PVC Kompaund                                                    |
| <b>6-Ekran</b>        | Kalaylı Bakır Örgü                                                           |
| <b>7-Dış Kılıf</b>    | EN 50363-4-1 PVC Kompaund                                                    |
| <b>8-Kılıf Rengi</b>  | RAL 7001 Gri ya da Şeffaf                                                    |

## CONSTRUCTION

|                        |                                                                                |
|------------------------|--------------------------------------------------------------------------------|
| <b>1-Conductor</b>     | IEC 60228; DIN EN 60228; EN 60228 Class 5<br>Stranded Electrolytic Bare Copper |
| <b>2-Insulation</b>    | EN 50363-3 PVC Compound                                                        |
| <b>3-Colour Code</b>   | DIN VDE 0293; TS EN 50334 or Black cores with<br>white number Imprinted        |
| <b>4-Stranding</b>     | In layers of optimum pitch                                                     |
| <b>5-Inner Sheath</b>  | EN 50363-4-1 PVC Compound                                                      |
| <b>6-Screen</b>        | Tinned Copper Braid                                                            |
| <b>7-Outer Sheath</b>  | EN 50363-4-1 PVC Compound                                                      |
| <b>8-Sheath Colour</b> | RAL 7001 Grey or Transparent                                                   |

## TEKNİK ÖZELLİKLER TECHNICAL CHARACTERISTICS

| İLETKEN DİRENCİ<br>CONDUCTOR<br>RESISTANCE | YALITIM DİRENCİ<br>INSULATION<br>RESISTANCE | AKIM TAŞIMA KAPASİTESİ<br>CURRENT CARRYING<br>CAPACITY | ÇALIŞMA VOLTAJI<br>OPERATING<br>VOLTAGE | TEST VOLTAJI<br>TEST VOLTAGE | BÜKÜLME YARIÇAPI<br>BENDING RADIUS | ÇALIŞMA SICAKLIĞI<br>TEMPERATURE RANGE                                  | ALEV GECİKTİRİCİLİK TESTİ<br>FLAME RETARDANT TEST |
|--------------------------------------------|---------------------------------------------|--------------------------------------------------------|-----------------------------------------|------------------------------|------------------------------------|-------------------------------------------------------------------------|---------------------------------------------------|
| mm <sup>2</sup> Ω/km                       | 20MΩxkm                                     | mm <sup>2</sup> A                                      | 300/500V                                | 2000V                        | 10x Cable Ø                        | Hareketli / Mobile<br>-5°C-+70°C Sabit<br>Sabit / Stable<br>-30°C-+70°C | IEC 60332-1-2<br>DIN EN 60332-1-2<br>EN 60332-1-2 |
| 0,5 39                                     |                                             | 0,5 6,0                                                |                                         |                              |                                    |                                                                         |                                                   |
| 0,75 26                                    |                                             | 0,75 13                                                |                                         |                              |                                    |                                                                         |                                                   |
| 1,0 19,5                                   |                                             | 1,0 16                                                 |                                         |                              |                                    |                                                                         |                                                   |
| 1,5 13,3                                   |                                             | 1,5 20                                                 |                                         |                              |                                    |                                                                         |                                                   |
| 2,5 7,98                                   |                                             | 2,5 25                                                 |                                         |                              |                                    |                                                                         |                                                   |

## NOTLAR

\*EMC: Elektromanyetik uyumlu  
Esnek yapıları ile dar alanlarda rahatlıkla uygulanabilirler.  
Bu tip kablolar dış ortamlarda kullanıma uygun değildir.  
**OZ:** Siyah yalıtım+Sarı/Yeşil toprak koruma damarsız  
**JZ:** Siyah yalıtım+Sarı/Yeşil toprak koruma damarı  
**OB:** Renk kodlu yalıtım+Sarı/Yeşil toprak koruma damarsız  
**JB:** Renk kodlu yalıtım +Sarı/Yeşil toprak koruma damarı

## NOTES

\*EMC: Electromagnetic compatibility  
With their flexible design they can easily be used in narrow spaces.  
These cables are not suitable for outdoor use.  
**OZ:** Black insulation+Without Green/Yellow earthing core  
**JZ:** Black insulation+Green/Yellow earthing core  
**OB:** Colour code insulation+Without Green/Yellow earthing core  
**JB:** Colour code insulation+With Green/Yellow earthing core

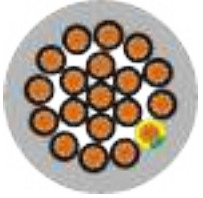
# ERFLEX 130-YCY / YSLYCY

| KOD NO<br>CODE NR. | DAMAR SAYISI VE KESİTİ (mm <sup>2</sup> )<br>NUMBER OF CORE AND CROSS<br>SECTION (mm <sup>2</sup> ) | KABLO ÇAPİ (mm)<br>OVERALL DIAMETER<br>(mm) | BAKIR AĞIRLIĞI (kg/km)<br>COPPER WEIGHT<br>(kg/km) | YAKLAŞIK KABLO AĞIRLIĞI (kg/km)<br>APPROX. CABLE WEIGHT<br>(kg/km) | STANDART<br>UZUNLUK (mt)<br>STANDARD LENGTH (m) |
|--------------------|-----------------------------------------------------------------------------------------------------|---------------------------------------------|----------------------------------------------------|--------------------------------------------------------------------|-------------------------------------------------|
| 331450023          | 2 x 0,50                                                                                            | 6,70                                        | 20                                                 | 80                                                                 | 100/500/1000                                    |
| 331450033          | 3 x 0,50                                                                                            | 7,20                                        | 26                                                 | 87                                                                 | 100/500/1000                                    |
| 331450043          | 4 x 0,50                                                                                            | 7,60                                        | 30                                                 | 97                                                                 | 100/500/1000                                    |
| 331450053          | 5 x 0,50                                                                                            | 8,40                                        | 36                                                 | 114                                                                | 100/500/1000                                    |
| 331450063          | 6 x 0,50                                                                                            | 9,10                                        | 45                                                 | 129                                                                | 100/500/1000                                    |
| 331450073          | 7 x 0,50                                                                                            | 9,10                                        | 46                                                 | 133                                                                | 100/500/1000                                    |
| 331450083          | 8 x 0,50                                                                                            | 9,70                                        | 49                                                 | 142                                                                | 100/500/1000                                    |
| 331450103          | 10 x 0,50                                                                                           | 11,10                                       | 63                                                 | 195                                                                | 100/500/1000                                    |
| 331450123          | 12 x 0,50                                                                                           | 11,40                                       | 71                                                 | 209                                                                | 100/500/1000                                    |
| 331450143          | 14 x 0,50                                                                                           | 12,30                                       | 85                                                 | 242                                                                | 100/500/1000                                    |
| 331450163          | 16 x 0,50                                                                                           | 13,00                                       | 100                                                | 271                                                                | 100/500/1000                                    |
| 331450183          | 18 x 0,50                                                                                           | 13,70                                       | 106                                                | 299                                                                | 100/500/1000                                    |
| 331450193          | 19 x 0,50                                                                                           | 13,70                                       | 112                                                | 303                                                                | 100/500/1000                                    |
| 331450213          | 21 x 0,50                                                                                           | 14,30                                       | 121                                                | 330                                                                | 100/500/1000                                    |
| 331450243          | 24 x 0,50                                                                                           | 15,70                                       | 138                                                | 373                                                                | 100/500/1000                                    |
| 331450303          | 30 x 0,50                                                                                           | 16,70                                       | 165                                                | 451                                                                | 100/500/1000                                    |
| 331450363          | 36 x 0,50                                                                                           | 18,30                                       | 200                                                | 536                                                                | 100/500                                         |
| 331475023          | 2 x 0,75                                                                                            | 7,30                                        | 28                                                 | 87                                                                 | 100/500/1000                                    |
| 331475033          | 3 x 0,75                                                                                            | 7,60                                        | 35                                                 | 104                                                                | 100/500/1000                                    |
| 331475043          | 4 x 0,75                                                                                            | 8,10                                        | 42                                                 | 118                                                                | 100/500/1000                                    |
| 331475053          | 5 x 0,75                                                                                            | 9,10                                        | 50                                                 | 139                                                                | 100/500/1000                                    |
| 331475063          | 6 x 0,75                                                                                            | 9,70                                        | 56                                                 | 155                                                                | 100/500/1000                                    |
| 331475073          | 7 x 0,75                                                                                            | 9,70                                        | 65                                                 | 167                                                                | 100/500/1000                                    |
| 331475083          | 8 x 0,75                                                                                            | 10,50                                       | 75                                                 | 191                                                                | 100/500/1000                                    |
| 331475103          | 10 x 0,75                                                                                           | 12,30                                       | 91                                                 | 242                                                                | 100/500/1000                                    |
| 331475123          | 12 x 0,75                                                                                           | 12,60                                       | 110                                                | 270                                                                | 100/500/1000                                    |
| 331475143          | 14 x 0,75                                                                                           | 13,50                                       | 121                                                | 295                                                                | 100/500/1000                                    |
| 331475163          | 16 x 0,75                                                                                           | 14,10                                       | 138                                                | 325                                                                | 100/500/1000                                    |
| 331475183          | 18 x 0,75                                                                                           | 14,70                                       | 155                                                | 370                                                                | 100/500/1000                                    |
| 331475193          | 19 x 0,75                                                                                           | 14,70                                       | 160                                                | 375                                                                | 100/500/1000                                    |
| 331475213          | 21 x 0,75                                                                                           | 15,90                                       | 169                                                | 424                                                                | 100/500/1000                                    |
| 331475243          | 24 x 0,75                                                                                           | 17,30                                       | 200                                                | 500                                                                | 100/500                                         |
| 331475303          | 30 x 0,75                                                                                           | 18,10                                       | 240                                                | 561                                                                | 100/500                                         |
| 331475363          | 36 x 0,75                                                                                           | 19,90                                       | 286                                                | 674                                                                | 100/500                                         |
| 331401023          | 2 x 1                                                                                               | 7,70                                        | 30                                                 | 100                                                                | 100/500/1000                                    |
| 331401033          | 3 x 1                                                                                               | 8,10                                        | 43                                                 | 114                                                                | 100/500/1000                                    |
| 331401043          | 4 x 1                                                                                               | 9,00                                        | 53                                                 | 140                                                                | 100/500/1000                                    |
| 331401053          | 5 x 1                                                                                               | 9,70                                        | 61                                                 | 161                                                                | 100/500/1000                                    |
| 331401063          | 6 x 1                                                                                               | 10,50                                       | 70                                                 | 187                                                                | 100/500/1000                                    |
| 331401073          | 7 x 1                                                                                               | 10,50                                       | 80                                                 | 196                                                                | 100/500/1000                                    |
| 331401083          | 8 x 1                                                                                               | 11,40                                       | 92                                                 | 220                                                                | 100/500/1000                                    |
| 331401103          | 10 x 1                                                                                              | 13,30                                       | 120                                                | 300                                                                | 100/500/1000                                    |
| 331401123          | 12 x 1                                                                                              | 13,60                                       | 135                                                | 319                                                                | 100/500/1000                                    |
| 331401143          | 14 x 1                                                                                              | 14,20                                       | 154                                                | 353                                                                | 100/500/1000                                    |
| 331401163          | 16 x 1                                                                                              | 15,50                                       | 173                                                | 408                                                                | 100/500/1000                                    |
| 331401183          | 18 x 1                                                                                              | 16,10                                       | 190                                                | 451                                                                | 100/500/1000                                    |
| 331401193          | 19 x 1                                                                                              | 16,10                                       | 200                                                | 451                                                                | 100/500/1000                                    |
| 331401213          | 21 x 1                                                                                              | 17,00                                       | 225                                                | 507                                                                | 100/500                                         |
| 331401243          | 24 x 1                                                                                              | 18,70                                       | 258                                                | 601                                                                | 100/500                                         |
| 331401303          | 30 x 1                                                                                              | 20,10                                       | 310                                                | 704                                                                | 100/500                                         |
| 331401363          | 36 x 1                                                                                              | 21,80                                       | 470                                                | 820                                                                | 100/500                                         |

# ERFLEX 130-YCY / YSLYCY

| KOD NO<br>CODENR. | DAMAR SAYISI VE KESİTİ (mm <sup>2</sup> )<br>NUMBER OF CORE AND CROSS<br>SECTION (mm <sup>2</sup> ) | KABLO ÇAPİ (mm)<br>OVERALL DIAMETER<br>(mm) | BAKIR AĞIRLIĞI (kg/km)<br>COPPER WEIGHT<br>(kg/km) | YAKLAŞIK KABLO AĞIRLIĞI (kg/km)<br>APPROX. CABLE WEIGHT<br>(kg/km) | STANDART<br>UZUNLUK (m)<br>STANDARD LENGTH (m) |
|-------------------|-----------------------------------------------------------------------------------------------------|---------------------------------------------|----------------------------------------------------|--------------------------------------------------------------------|------------------------------------------------|
| 331415023         | 2 x 1,5                                                                                             | 8,10                                        | 40                                                 | 113                                                                | 100/500/1000                                   |
| 331415033         | 3 x 1,5                                                                                             | 8,70                                        | 55                                                 | 134                                                                | 100/500/1000                                   |
| 331415043         | 4 x 1,5                                                                                             | 9,50                                        | 70                                                 | 156                                                                | 100/500/1000                                   |
| 331415053         | 5 x 1,5                                                                                             | 10,40                                       | 84                                                 | 193                                                                | 100/500/1000                                   |
| 331415063         | 6 x 1,5                                                                                             | 11,30                                       | 96                                                 | 218                                                                | 100/500/1000                                   |
| 331415073         | 7 x 1,5                                                                                             | 11,30                                       | 108                                                | 230                                                                | 100/500/1000                                   |
| 331415083         | 8 x 1,5                                                                                             | 12,20                                       | 126                                                | 270                                                                | 100/500/1000                                   |
| 331415103         | 10 x 1,5                                                                                            | 14,30                                       | 155                                                | 356                                                                | 100/500/1000                                   |
| 331415123         | 12 x 1,5                                                                                            | 15,10                                       | 185                                                | 402                                                                | 100/500/1000                                   |
| 331415143         | 14 x 1,5                                                                                            | 15,70                                       | 208                                                | 441                                                                | 100/500/1000                                   |
| 331415163         | 16 x 1,5                                                                                            | 16,40                                       | 231                                                | 484                                                                | 100/500/1000                                   |
| 331415183         | 18 x 1,5                                                                                            | 17,30                                       | 265                                                | 545                                                                | 100/500                                        |
| 331415193         | 19 x 1,5                                                                                            | 17,30                                       | 276                                                | 556                                                                | 100/500                                        |
| 331415203         | 20 x 1,5                                                                                            | 18,00                                       | 295                                                | 596                                                                | 100/500                                        |
| 331415243         | 24 x 1,5                                                                                            | 20,40                                       | 350                                                | 743                                                                | 100/500                                        |
| 331415303         | 30 x 1,5                                                                                            | 21,80                                       | 426                                                | 862                                                                | 100/500                                        |
| 331415363         | 36 x 1,5                                                                                            | 23,40                                       | 525                                                | 1042                                                               | 100/500                                        |
| 331425023         | 2 x 2,5                                                                                             | 10,10                                       | 45                                                 | 150                                                                | 100/500/1000                                   |
| 331425033         | 3 x 2,5                                                                                             | 10,60                                       | 85                                                 | 196                                                                | 100/500/1000                                   |
| 331425043         | 4 x 2,5                                                                                             | 11,80                                       | 103                                                | 236                                                                | 100/500/1000                                   |
| 331425053         | 5 x 2,5                                                                                             | 12,90                                       | 135                                                | 290                                                                | 100/500/1000                                   |
| 331425063         | 6 x 2,5                                                                                             | 14,00                                       | 155                                                | 342                                                                | 100/500/1000                                   |
| 331425073         | 7 x 2,5                                                                                             | 14,00                                       | 176                                                | 365                                                                | 100/500/1000                                   |
| 331425083         | 8 x 2,5                                                                                             | 15,30                                       | 200                                                | 424                                                                | 100/500/1000                                   |
| 331425103         | 10 x 2,5                                                                                            | 17,70                                       | 250                                                | 454                                                                | 100/500                                        |
| 331425123         | 12 x 2,5                                                                                            | 18,40                                       | 296                                                | 618                                                                | 100/500                                        |
| 331425143         | 14 x 2,5                                                                                            | 19,40                                       | 338                                                | 696                                                                | 100/500                                        |
| 331425163         | 16 x 2,5                                                                                            | 20,80                                       | 386                                                | 781                                                                | 100/500                                        |
| 331425183         | 18 x 2,5                                                                                            | 21,90                                       | 426                                                | 868                                                                | 100/500                                        |
| 331425193         | 19 x 2,5                                                                                            | 21,90                                       | 448                                                | 887                                                                | 100/500                                        |

# ERFLEX 130-H / HSLH



ESNEK KABLO YAPISI/KÜÇÜK BÜKÜLME YARIÇAPI/ALEV GECİKTİRİCİ ÖZELLİK/DÜŞÜK DUMAN YOĞUNLUĞU/  
ZEHİRLİ VE KOROZİF GAZLARDAN ARINDIRILMIŞ  
FLEXIBLE CABLE DESIGN/SMALL BENDING RADIUS/FLAME RETARDANT CHARACTERISTIC/LOW SMOKE EMISSION/  
WITHOUT POISONED AND CORROSIVE GASES



## KULLANIM ALANLARI

İnsanların yoğun olarak bulunduğu kapalı ortamlarda  
-Enstrüman ve Kontrol Mühendisliği  
-Enerji İstasyonlarında  
-Ölçme, ve kontrol amaçlı olarak makine üretiminde  
-Montaj ve Üretim Hatlarında  
-Mekanik zorlanmaların orta derecede olduğu yerlerde  
-İnsan hayatının, değerli malzemelerin ve ekipmanların korunması  
gereken yerlerde kullanılır

## APPLICATION

In covered places where people are densely found  
-Instrumentation and Control Engineering  
-Energy Stations  
-In machine production as measurement and control cable  
-Production and Assembly Lines  
-In places where medium level mechanical stresses exist  
-In places where human life and valuable materials and equipment need  
to be protected

## KABLO YAPISI

|                       |                                                                              |
|-----------------------|------------------------------------------------------------------------------|
| <b>1-İletken</b>      | IEC 60228; DIN EN 60228; EN 60228 Sınıf 5<br>Bükülü Elektrolitik Tavlı Bakır |
| <b>2-Yalıtkan</b>     | EN 50363-7 HFFR Kompaund                                                     |
| <b>3-Yalıtım Renk</b> | DIN VDE 0293; TS EN 50363-7 veya<br>Siyah yalıtkan, beyaz numara kodlu       |
| <b>4-Büküm</b>        | Uygun adımda katlar halinde                                                  |
| <b>5-Kılıf</b>        | EN 50363-8 HFFR Kompaund                                                     |
| <b>6-Kılıf Rengi</b>  | RAL 7001 Gri                                                                 |

## CONSTRUCTION

|                        |                                                                                   |
|------------------------|-----------------------------------------------------------------------------------|
| <b>1-Conductor</b>     | EC 60228; DIN EN 60228; EN 60228 Class 5<br>Stranded Electrolytic Bare Copper     |
| <b>2-Insulation</b>    | EN 50363-7 HFFR Compound                                                          |
| <b>3-Colour Code</b>   | DIN VDE 0293; TS EN 50334 or Black insulated<br>cores with white number Imprinted |
| <b>4-Stranding</b>     | In layers of optimum pitch                                                        |
| <b>5-Sheath</b>        | EN 50363-8 HFFR Compound                                                          |
| <b>6-Sheath Colour</b> | RAL 7001 Grey                                                                     |

## TEKNİK ÖZELLİKLER TECHNICAL CHARACTERISTICS

| İLETKEN DİRENCİ<br>CONDUCTOR<br>RESISTANCE     | YALITIM DİRENCİ<br>INSULATION<br>RESISTANCE                       | AKIM TAŞIMA KAPASİTESİ<br>CURRENT CARRYING<br>CAPACITY | ÇALIŞMA VOLTAJI<br>OPERATING<br>VOLTAGE              | TEST VOLTAJI<br>TEST VOLTAGE | BÜKÜLME YARIÇAPI<br>BENDING RADIUS | ÇALIŞMA SICAKLIĞI<br>TEMPERATURE RANGE                                  | ALEV GECİKTİRİCİLİK TESTİ<br>FLAME RETARDANT TEST |
|------------------------------------------------|-------------------------------------------------------------------|--------------------------------------------------------|------------------------------------------------------|------------------------------|------------------------------------|-------------------------------------------------------------------------|---------------------------------------------------|
| mm <sup>2</sup> Ω/km                           | 20MΩxkm                                                           | mm <sup>2</sup> A                                      | 300V/500V                                            | 2000V                        | 10x Cable Ø                        | Hareketli / Mobile<br>-5°C +70°C Sabit<br>Sabit / Stable<br>-30°C +70°C | IEC 60332-1-2<br>DIN EN 60332-1-2<br>EN 60332-1-2 |
| 0,5 39                                         |                                                                   | 0,5 6,0                                                |                                                      |                              |                                    |                                                                         |                                                   |
| 0,75 26                                        |                                                                   | 0,75 13                                                |                                                      |                              |                                    |                                                                         |                                                   |
| 1,0 19,5                                       |                                                                   | 1,0 16                                                 |                                                      |                              |                                    |                                                                         |                                                   |
| 1,5 13,3                                       |                                                                   | 1,5 20                                                 |                                                      |                              |                                    |                                                                         |                                                   |
| 2,5 7,98                                       |                                                                   | 2,5 25                                                 |                                                      |                              |                                    |                                                                         |                                                   |
| DUMAN YOĞUNLUĞU<br>TESTİ<br>SMOKE DENSITY TEST | KOROZİF GAZ TESTİ<br>TEST ON CORROSIVENESS<br>OF COMBUSTION GASES | HALOJENSİZLİK TESTİ<br>HALOGEN FREE TEST               | ALEV YAYILIMI TESTİ<br>FLAME PROPAGATION TEST        |                              |                                    |                                                                         |                                                   |
| IEC 61034-2<br>VDE 0482-1034-2<br>EN 61034-2   | IEC 60754-2<br>VDE 0482-754-1/2<br>EN 60754-2                     | IEC 60754-1<br>VDE 0482-754-2<br>EN 60754-2            | IEC 60332-3-24<br>DIN EN 60332-3-24<br>EN 60332-3-24 |                              |                                    |                                                                         |                                                   |

## NOTLAR

Esnek yapıları ile dar alanlarda rahatlıkla uygulanabilirler.  
Bu tip kablolar dış ortamlarda kullanıma uygun değildir.  
**OZ:** Siyah yalıtım+Sarı/Yeşil toprak koruma damarsız  
**JZ:** Siyah yalıtım+Sarı/Yeşil toprak koruma damarı  
**OB:** Renk kodlu yalıtım+Sarı/Yeşil toprak koruma damarsız  
**JB:** Renk kodlu yalıtım +Sarı/Yeşil toprak koruma damarı

## NOTES

With their flexible design they can easily be used in narrow spaces.  
These cables are not suitable for outdoor use.  
**OZ:** Black insulation+Without Green/Yellow earthing core  
**JZ:** Black insulation+Green/Yellow earthing core  
**OB:** Colour code insulation+Without Green/Yellow earthing core  
**JB:** Colour code insulation+With Green/Yellow earthing core

# ERFLEX 130-HCH / HSLHCH



İYİ EMC\* ÖZELLİK/ESNEK KABLO YAPISI/İNCELTİLMİŞ DIŞ ÇAP/KÜÇÜK BÜKÜLME YARIÇAPI/ALEV GECİKTİRİCİ ÖZELLİK  
GOOD EMC\* CHARACTERISTIC/FLEXIBLE CABLE DESIGN/REDUCED OUTER DIAMETER/SMALL BENDING RADIUS/  
FLAME RETARDANT CHARACTERISTIC



## KULLANIM ALANLARI

Elektromanyetik karışım ve girişimlerin olduğu  
İnsanların yoğun olarak bulunduğu kapalı ortamlarda  
-Enstrüman ve Kontrol Mühendisliği  
-Enerji İstasyonlarında  
-Ölçme, ve kontrol amaçlı olarak makine üretiminde  
-Montaj ve Üretim Hatlarında  
-Mekanik zorlanmaların orta derecede olduğu yerlerde  
-İnsan hayatının, değerli malzemelerin ve ekipmanların korunması  
gereken yerlerde kullanılır

## APPLICATION

In places where electro-magnetic interference and influence exists  
In covered places where people are densely found  
-Instrumentation and Control Engineering  
-Energy Stations  
-In machine production as measurement and control cable  
-Production and Assembly Lines  
-In places where medium level mechanical stresses exist  
-In places where human life and valuable materials and equipment need  
to be protected

## KABLO YAPISI

|                       |                                                                              |
|-----------------------|------------------------------------------------------------------------------|
| <b>1-İletken</b>      | IEC 60228; DIN EN 60228; EN 60228 Sınıf 5<br>Bükülü Elektrolitik Tavlı Bakır |
| <b>2-Yalıtkan</b>     | EN 50363-7 HFFR Kompaund                                                     |
| <b>3-Yalıtım Renk</b> | DIN VDE 0293; TS EN 50363-7 veya<br>Siyah yalıtkan, beyaz numara kodlu       |
| <b>4-Büküm</b>        | Uygun adımda katlar halinde                                                  |
| <b>5-İç Kılıf</b>     | EN 50363-8 HFFR Kompaund                                                     |
| <b>6-Ekran</b>        | Kalaylı Bakır Örgü                                                           |
| <b>7-Dış Kılıf</b>    | EN 50363-8 HFFR Kompaund                                                     |
| <b>8-Kılıf Rengi</b>  | RAL 7001 Gri                                                                 |

## CONSTRUCTION

|                        |                                                                                |
|------------------------|--------------------------------------------------------------------------------|
| <b>1-Conductor</b>     | IEC 60228; DIN EN 60228; EN 60228 Class 5<br>Stranded Electrolytic Bare Copper |
| <b>2-Insulation</b>    | EN 50363-7 HFFR Compound                                                       |
| <b>3-Colour Code</b>   | DIN VDE 0293; TS EN 50334 or<br>Black cores with white number Imprinted        |
| <b>4-Stranding</b>     | In layers of optimum pitch                                                     |
| <b>5-Inner Sheath</b>  | EN 50363-8 HFFR Compound                                                       |
| <b>6-Screen</b>        | Tinned Copper Braid                                                            |
| <b>7-Outer Sheath</b>  | EN 50363-8 HFFR Compound                                                       |
| <b>8-Sheath Colour</b> | RAL 7001 Grey                                                                  |

## TEKNİK ÖZELLİKLER TECHNICAL CHARACTERISTICS

| İLETKEN DİRENÇİ<br>CONDUCTOR<br>RESISTANCE     | YALITIM DİRENÇİ<br>INSULATION<br>RESISTANCE                       | AKIM TAŞIMA KAPASİTESİ<br>CURRENT CARRYING<br>CAPACITY | ÇALIŞMA VOLTAJİ<br>OPERATING<br>VOLTAGE              | TEST VOLTAJİ<br>TEST VOLTAGE | BÜKÜLME YARIÇAPI<br>BENDING RADIUS | ÇALIŞMA SICAKLIĞI<br>TEMPERATURE RANGE                                  | ALEV GECİKTİRİCİLİK TESTİ<br>FLAME RETARDANT TEST |
|------------------------------------------------|-------------------------------------------------------------------|--------------------------------------------------------|------------------------------------------------------|------------------------------|------------------------------------|-------------------------------------------------------------------------|---------------------------------------------------|
| mm <sup>2</sup> Ω/km                           | 20MΩkm                                                            | mm <sup>2</sup> A                                      | 300/500V                                             | 2000V                        | 7,5x Cable Ø                       | Hareketli / Mobile<br>-5°C-+70°C Sabit<br>Sabit / Stable<br>-30°C-+70°C | IEC 60332-1-2<br>DIN EN 60332-1-2<br>EN 60332-1-2 |
| 0,5 39                                         |                                                                   | 0,5 6,0                                                |                                                      |                              |                                    |                                                                         |                                                   |
| 0,75 26                                        |                                                                   | 0,75 13                                                |                                                      |                              |                                    |                                                                         |                                                   |
| 1,0 19,5                                       |                                                                   | 1,0 16                                                 |                                                      |                              |                                    |                                                                         |                                                   |
| 1,5 13,3                                       |                                                                   | 1,5 20                                                 |                                                      |                              |                                    |                                                                         |                                                   |
| 2,5 7,98                                       |                                                                   | 2,5 25                                                 |                                                      |                              |                                    |                                                                         |                                                   |
| DUMAN YOĞUNLUĞU<br>TESTİ<br>SMOKE DENSITY TEST | KOROZİF GAZ TESTİ<br>TEST ON CORROSIVENESS<br>OF COMBUSTION GASES | HALOJENSİZLİK TESTİ<br>HALOGEN FREE TEST               | ALEV YAYILIMI TESTİ<br>FLAME PROPAGATION TEST        |                              |                                    |                                                                         |                                                   |
| IEC 61034-2<br>VDE 0482-1034-2<br>EN 61034-2   | IEC 60754-2<br>VDE 0482-754-1/2<br>EN 60754-2                     | IEC 60754-1<br>VDE 0482-754-2<br>EN 60754-2            | IEC 60332-3-24<br>DIN EN 60332-3-24<br>EN 60332-3-24 |                              |                                    |                                                                         |                                                   |

## NOTLAR

\*EMC: Elektromanyetik uyumlu  
Esnek yapıları ile dar alanlarda rahatlıkla uygulanabilirler.  
Bu tip kablolar dış ortamlarda kullanıma uygun değildir.  
**OZ:** Siyah yalıtım+Sarı/Yeşil toprak koruma damarsız  
**JZ:** Siyah yalıtım+Sarı/Yeşil toprak koruma damarı  
**OB:** Renk kodlu yalıtım+Sarı/Yeşil toprak koruma damarsız  
**JB:** Renk kodlu yalıtım +Sarı/Yeşil toprak koruma damarı

## NOTES

\*EMC: Electromagnetic compatibility  
With their flexible design they can easily be used in narrow spaces.  
These cables are not suitable for outdoor use.  
**OZ:** Black insulation+Without Green/Yellow earthing core  
**JZ:** Black insulation+Green/Yellow earthing core  
**OB:** Colour code insulation+Without Green/Yellow earthing core  
**JB:** Colour code insulation+With Green/Yellow earthing core

# ERFLEX 130-CH / HSLCH



İYİ EMC\* ÖZELLİK/ESNEK KABLO YAPISI/İNCELTİLMİŞ DIŞ ÇAP/KÜÇÜK BÜKÜLME YARIÇAPI/ALEV GECİKTİRİCİ ÖZELLİK  
GOOD EMC\* CHARACTERISTIC/FLEXIBLE CABLE DESIGN/REDUCED OUTER DIAMETER/SMALL BENDING RADIUS/  
FLAME RETARDANT CHARACTERISTIC



## KULLANIM ALANLARI

Elektromanyetik karışım ve girişimlerin olduğu  
İnsanların yoğun olarak bulunduğu kapalı ortamlarda  
-Enstrüman ve Kontrol Mühendisliği  
-Enerji İstasyonlarında  
-Ölçme, ve kontrol amaçlı olarak makine üretiminde  
-Montaj ve Üretim Hatlarında  
-Mekanik zorlanmaların orta derecede olduğu yerlerde  
-İnsan hayatının, değerli malzemelerin ve ekipmanların korunması  
gereken yerlerde kullanılır

## APPLICATION

In places where electro-magnetic interference and influence exists  
In covered places where people are densely found  
-Instrumentation and Control Engineering  
-Energy Stations  
-In machine production as measurement and control cable  
-Production and Assembly Lines  
-In places where medium level mechanical stresses exist  
-In places where human life and valuable materials and equipment need  
to be protected

## KABLO YAPISI

|                       |                                                                              |
|-----------------------|------------------------------------------------------------------------------|
| <b>1-İletken</b>      | IEC 60228; DIN EN 60228; EN 60228 Sınıf 5<br>Bükülü Elektrolitik Tavlı Bakır |
| <b>2-Yalıtkan</b>     | EN 50363-7 HFFR Kompaund                                                     |
| <b>3-Yalıtım Renk</b> | DIN VDE 0293; TS EN 50363-7 veya<br>Siyah yalıtkan, beyaz numara kodlu       |
| <b>4-Büküm</b>        | Uygun adımda katlar halinde                                                  |
| <b>5-İç Kılıf</b>     | Ayırıcı bant: PES Bant                                                       |
| <b>6-Ekran</b>        | Kalaylı Bakır Örgü                                                           |
| <b>7-Dış Kılıf</b>    | EN 50363-8 HFFR Kompaund                                                     |
| <b>8-Kılıf Rengi</b>  | RAL 7001 Gri                                                                 |

## CONSTRUCTION

|                        |                                                                                |
|------------------------|--------------------------------------------------------------------------------|
| <b>1-Conductor</b>     | IEC 60228; DIN EN 60228; EN 60228 Class 5<br>Stranded Electrolytic Bare Copper |
| <b>2-Insulation</b>    | EN 50363-7 HFFR Compound                                                       |
| <b>3-Colour Code</b>   | DIN VDE 0293; TS EN 50334 or<br>Black cores with white number Imprinted        |
| <b>4-Stranding</b>     | In layers of optimum pitch                                                     |
| <b>5-Inner Sheath</b>  | Wrapping: PES Tape                                                             |
| <b>6-Screen</b>        | Tinned Copper Braid                                                            |
| <b>7-Outer Sheath</b>  | EN 50363-8 HFFR Compound                                                       |
| <b>8-Sheath Colour</b> | RAL 7001 Grey                                                                  |

## TEKNİK ÖZELLİKLER TECHNICAL CHARACTERISTICS

| İLETKEN DİRENÇİ<br>CONDUCTOR<br>RESISTANCE     | YALITIM DİRENÇİ<br>INSULATION<br>RESISTANCE                       | AKIM TAŞIMA KAPASİTESİ<br>CURRENT CARRYING<br>CAPACITY | ÇALIŞMA VOLTAJİ<br>OPERATING<br>VOLTAGE              | TEST VOLTAJİ<br>TEST VOLTAGE | BÜKÜLME YARIÇAPI<br>BENDING RADIUS | ÇALIŞMA SICAKLIĞI<br>TEMPERATURE RANGE                                  | ALEV GECİKTİRİCİLİK TESTİ<br>FLAME RETARDANT TEST |
|------------------------------------------------|-------------------------------------------------------------------|--------------------------------------------------------|------------------------------------------------------|------------------------------|------------------------------------|-------------------------------------------------------------------------|---------------------------------------------------|
| mm <sup>2</sup> Ω/km                           | 20MΩkm                                                            | mm <sup>2</sup> A                                      | 300/500V                                             | 2000V                        | 7,5x Cable Ø                       | Hareketli / Mobile<br>-5°C-+70°C Sabit<br>Sabit / Stable<br>-30°C-+70°C | IEC 60332-1-2<br>DIN EN 60332-1-2<br>EN 60332-1-2 |
| 0,5 39                                         |                                                                   | 0,5 6,0                                                |                                                      |                              |                                    |                                                                         |                                                   |
| 0,75 26                                        |                                                                   | 0,75 13                                                |                                                      |                              |                                    |                                                                         |                                                   |
| 1,0 19,5                                       |                                                                   | 1,0 16                                                 |                                                      |                              |                                    |                                                                         |                                                   |
| 1,5 13,3                                       |                                                                   | 1,5 20                                                 |                                                      |                              |                                    |                                                                         |                                                   |
| 2,5 7,98                                       |                                                                   | 2,5 25                                                 |                                                      |                              |                                    |                                                                         |                                                   |
| DUMAN YOĞUNLUĞU<br>TESTİ<br>SMOKE DENSITY TEST | KOROZİF GAZ TESTİ<br>TEST ON CORROSIVENESS<br>OF COMBUSTION GASES | HALOJENSİZLİK TESTİ<br>HALOGEN FREE TEST               | ALEV YAYILIMI TESTİ<br>FLAME PROPAGATION TEST        |                              |                                    |                                                                         |                                                   |
| IEC 61034-2<br>VDE 0482-1034-2<br>EN 61034-2   | IEC 60754-2<br>VDE 0482-754-1/2<br>EN 60754-2                     | IEC 60754-1<br>VDE 0482-754-2<br>EN 60754-2            | IEC 60332-3-24<br>DIN EN 60332-3-24<br>EN 60332-3-24 |                              |                                    |                                                                         |                                                   |

## NOTLAR

\*EMC: Elektromanyetik uyumlu  
Esnek yapıları ile dar alanlarda rahatlıkla uygulanabilirler.  
Bu tip kablolar dış ortamlarda kullanıma uygun değildir.  
**OZ:** Siyah yalıtım+Sarı/Yeşil toprak koruma damarsız  
**JZ:** Siyah yalıtım+Sarı/Yeşil toprak koruma damarı  
**OB:** Renk kodlu yalıtım+Sarı/Yeşil toprak koruma damarsız  
**JB:** Renk kodlu yalıtım+Sarı/Yeşil toprak koruma damarı

## NOTES

\*EMC: Electromagnetic compatibility  
With their flexible design they can easily be used in narrow spaces.  
These cables are not suitable for outdoor use.  
**OZ:** Black insulation+Without Green/Yellow earthing core  
**JZ:** Black insulation+Green/Yellow earthing core  
**OB:** Colour code insulation+Without Green/Yellow earthing core  
**JB:** Colour code insulation+With Green/Yellow earthing core

# ERFLEX 120-Y / H05VV5-F (NYSLYö)



ESNEK KABLO YAPISI/KÜÇÜK BÜKÜLME YARIÇAPI/ALEV GECİKTİRİCİ ÖZELLİK  
FLEXIBLE CABLE DESIGN/SMALL BENDING RADIUS/FLAME RETARDANT CHARACTERISTIC



## KULLANIM ALANLARI

- Enstrüman ve Kontrol Mühendisliği
- Endüstriyel Elektronik
- Ölçme ve kontrol amaçlı olarak makine üretiminde
- Montaj ve Üretim Hatlarında
- Islak kuru ve nemli ortamlarda
- Kimyasal dayanım istenen ortamlarda
- Mekanik zorlanmaların düşük olduğu yerlerde kullanılır

## APPLICATION

- Instrumentation and Control Engineering
- Industrial Electronics
- In machine production as measurement and control cable
- Production and Assembly Lines
- Dry, moist and wet places
- In places where low mechanical stresses exist

## KABLO YAPISI

|                       |                                                                              |
|-----------------------|------------------------------------------------------------------------------|
| <b>1-İletken</b>      | IEC 60228; DIN EN 60228; EN 60228 Sınıf 5<br>Bükülü Elektrolitik Tavlı Bakır |
| <b>2-Yalıtkan</b>     | EN 50363-3 PVC Kompaund                                                      |
| <b>3-Yalıtım Renk</b> | DIN VDE 0293; TS EN 50334 veya<br>Siyah yalıtkan, beyaz numara kodlu         |
| <b>4-Büküm</b>        | Uygun adımda katlar halinde                                                  |
| <b>5-Kılıf</b>        | EN 50363-4-1 TM5 yağa dayanıklı PVC Kompaund                                 |
| <b>6-Kılıf Rengi</b>  | RAL 7001 Gri                                                                 |

## CONSTRUCTION

|                        |                                                                                   |
|------------------------|-----------------------------------------------------------------------------------|
| <b>1-Conductor</b>     | IEC 60228; DIN EN 60228; EN 60228 Class 5<br>Stranded Electrolytic Bare Copper    |
| <b>2-Insulation</b>    | EN 50363-3 PVC Compound                                                           |
| <b>3-Colour Code</b>   | DIN VDE 0293; TS EN 50334 or Black insulated cores with<br>white number Imprinted |
| <b>4-Stranding</b>     | In layers of optimum pitch                                                        |
| <b>5-Sheath</b>        | EN 50363-4-1 TM5 oil resistant PVC Compound                                       |
| <b>6-Sheath Colour</b> | RAL 7001 Grey                                                                     |

## TEKNİK ÖZELLİKLER TECHNICAL CHARACTERISTICS

| İLETKEN DİRENCİ<br>CONDUCTOR<br>RESISTANCE | YALITIM DİRENCİ<br>INSULATION<br>RESISTANCE | AKIM TAŞIMA KAPASİTESİ<br>CURRENT CARRYING<br>CAPACITY | ÇALIŞMA VOLTAJI<br>OPERATING<br>VOLTAGE | TEST VOLTAJI<br>TEST VOLTAGE | BÜKÜLME YARIÇAPI<br>BENDING RADIUS | ÇALIŞMA SICAKLIĞI<br>TEMPERATURE RANGE                                  | ALEV GECİKTİRİCİLİK TESTİ<br>FLAME RETARDANT TEST | KİMYASAL DAYANIM<br>CHEMICAL RESISTANCE |
|--------------------------------------------|---------------------------------------------|--------------------------------------------------------|-----------------------------------------|------------------------------|------------------------------------|-------------------------------------------------------------------------|---------------------------------------------------|-----------------------------------------|
| mm <sup>2</sup> Ω/km                       | 20MΩkm                                      | mm <sup>2</sup> A                                      | 300V/500V                               | 2000V                        | 7,5x Cable Ø                       | Hareketli / Mobile<br>-5°C-+70°C Sabit<br>Sabit / Stable<br>-30°C-+70°C | IEC 60332-1-2<br>DIN EN 60332-1-2<br>EN 60332-1-2 | IEC 60811-404                           |
| 0,5 39                                     |                                             | 0,5 6,0                                                |                                         |                              |                                    |                                                                         |                                                   |                                         |
| 0,75 26                                    |                                             | 0,75 13                                                |                                         |                              |                                    |                                                                         |                                                   |                                         |
| 1,0 19,5                                   |                                             | 1,0 16                                                 |                                         |                              |                                    |                                                                         |                                                   |                                         |
| 1,5 13,3                                   |                                             | 1,5 20                                                 |                                         |                              |                                    |                                                                         |                                                   |                                         |
| 2,5 7,98                                   |                                             | 2,5 25                                                 |                                         |                              |                                    |                                                                         |                                                   |                                         |

## NOTLAR

Esnek yapıları ile dar alanlarda rahatlıkla uygulanabilirler.  
Bu tip kablolar dış ortamlarda kullanıma uygun değildir.  
**OZ:** Siyah yalıtım+Sarı/Yeşil toprak koruma damarsız  
**JZ:** Siyah yalıtım+Sarı/Yeşil toprak koruma damarı  
**OB:** Renk kodlu yalıtım+Sarı/Yeşil toprak koruma damarsız  
**JB:** Renk kodlu yalıtım +Sarı/Yeşil toprak koruma damarı

## NOTES

With their flexible design they can easily be used in narrow spaces.  
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**JB:** Colour code insulation+With Green/Yellow earthing core

# ERFLEX 120-Y / H05VV5-F (NYSLYö)

| KOD NO<br>CODE NR. | DAMAR SAYISI VE KESİTİ (mm <sup>2</sup> )<br>NUMBER OF CORE AND CROSS<br>SECTION (mm <sup>2</sup> ) | KABLO ÇAPI (mm)<br>OVERALL DIAMETER<br>(mm) | BAKIR AĞIRLIĞI (kg/km)<br>COPPER WEIGHT<br>(kg/km) | YAKLAŞIK KABLO AĞIRLIĞI (kg/km)<br>APPROX. CABLE WEIGHT<br>(kg/km) | STANDART<br>UZUNLUK (m)<br>STANDARD LENGTH (m) |
|--------------------|-----------------------------------------------------------------------------------------------------|---------------------------------------------|----------------------------------------------------|--------------------------------------------------------------------|------------------------------------------------|
| 330850023          | 2 x 0,50                                                                                            | 5,60                                        | 10                                                 | 45                                                                 | 100/500/1000                                   |
| 330850033          | 3 x 0,50                                                                                            | 6,00                                        | 14                                                 | 51                                                                 | 100/500/1000                                   |
| 330850043          | 4 x 0,50                                                                                            | 6,70                                        | 18                                                 | 62                                                                 | 100/500/1000                                   |
| 330850053          | 5 x 0,50                                                                                            | 7,40                                        | 23                                                 | 74                                                                 | 100/500/1000                                   |
| 330850063          | 6 x 0,50                                                                                            | 8,20                                        | 26                                                 | 102                                                                | 100/500/1000                                   |
| 330850073          | 7 x 0,50                                                                                            | 8,20                                        | 32                                                 | 110                                                                | 100/500/1000                                   |
| 330850083          | 8 x 0,50                                                                                            | 8,60                                        | 37                                                 | 124                                                                | 100/500/1000                                   |
| 330850103          | 10 x 0,50                                                                                           | 10,50                                       | 46                                                 | 165                                                                | 100/500/1000                                   |
| 330850123          | 12 x 0,50                                                                                           | 11,00                                       | 53                                                 | 186                                                                | 100/500/1000                                   |
| 330850143          | 14 x 0,50                                                                                           | 11,50                                       | 63                                                 | 195                                                                | 100/500/1000                                   |
| 330850163          | 16 x 0,50                                                                                           | 12,40                                       | 70                                                 | 221                                                                | 100/500/1000                                   |
| 330850183          | 18 x 0,50                                                                                           | 13,00                                       | 76                                                 | 253                                                                | 100/500/1000                                   |
| 330850193          | 19 x 0,50                                                                                           | 13,00                                       | 80                                                 | 262                                                                | 100/500/1000                                   |
| 330850213          | 21 x 0,50                                                                                           | 13,60                                       | 90                                                 | 287                                                                | 100/500/1000                                   |
| 330850243          | 24 x 0,50                                                                                           | 15,10                                       | 105                                                | 345                                                                | 100/500/1000                                   |
| 330850303          | 30 x 0,50                                                                                           | 16,50                                       | 126                                                | 416                                                                | 100/500/1000                                   |
| 330850363          | 36 x 0,50                                                                                           | 17,80                                       | 154                                                | 490                                                                | 100/500/1000                                   |
| 330875023          | 2 x 0,75                                                                                            | 6,50                                        | 15                                                 | 67                                                                 | 100/500/1000                                   |
| 330875033          | 3 x 0,75                                                                                            | 6,90                                        | 21                                                 | 78                                                                 | 100/500/1000                                   |
| 330875043          | 4 x 0,75                                                                                            | 7,40                                        | 27                                                 | 92                                                                 | 100/500/1000                                   |
| 330875053          | 5 x 0,75                                                                                            | 8,40                                        | 34                                                 | 113                                                                | 100/500/1000                                   |
| 330875063          | 6 x 0,75                                                                                            | 9,30                                        | 41                                                 | 135                                                                | 100/500/1000                                   |
| 330875073          | 7 x 0,75                                                                                            | 9,30                                        | 46                                                 | 142                                                                | 100/500/1000                                   |
| 330875083          | 8 x 0,75                                                                                            | 9,80                                        | 54                                                 | 157                                                                | 100/500/1000                                   |
| 330875103          | 10 x 0,75                                                                                           | 11,30                                       | 65                                                 | 188                                                                | 100/500/1000                                   |
| 330875123          | 12 x 0,75                                                                                           | 11,60                                       | 79                                                 | 222                                                                | 100/500/1000                                   |
| 330875143          | 14 x 0,75                                                                                           | 13,10                                       | 91                                                 | 267                                                                | 100/500/1000                                   |
| 330875163          | 16 x 0,75                                                                                           | 13,80                                       | 105                                                | 301                                                                | 100/500/1000                                   |
| 330875183          | 18 x 0,75                                                                                           | 14,60                                       | 117                                                | 336                                                                | 100/500/1000                                   |
| 330875193          | 19 x 0,75                                                                                           | 14,60                                       | 125                                                | 343                                                                | 100/500/1000                                   |
| 330875213          | 21 x 0,75                                                                                           | 15,70                                       | 136                                                | 396                                                                | 100/500/1000                                   |
| 330875243          | 24 x 0,75                                                                                           | 16,60                                       | 158                                                | 444                                                                | 100/500/1000                                   |
| 330875303          | 30 x 0,75                                                                                           | 18,60                                       | 196                                                | 516                                                                | 100/500/1000                                   |
| 330875363          | 36 x 0,75                                                                                           | 20,10                                       | 230                                                | 595                                                                | 100/500/1000                                   |
| 330801023          | 2 x 1                                                                                               | 6,60                                        | 20                                                 | 64                                                                 | 100/500/1000                                   |
| 330801033          | 3 x 1                                                                                               | 7,10                                        | 27                                                 | 81                                                                 | 100/500/1000                                   |
| 330801043          | 4 x 1                                                                                               | 7,60                                        | 36                                                 | 103                                                                | 100/500/1000                                   |
| 330801053          | 5 x 1                                                                                               | 8,80                                        | 46                                                 | 127                                                                | 100/500/1000                                   |
| 330801063          | 6 x 1                                                                                               | 9,60                                        | 55                                                 | 150                                                                | 100/500/1000                                   |
| 330801073          | 7 x 1                                                                                               | 9,60                                        | 61                                                 | 160                                                                | 100/500/1000                                   |
| 330801083          | 8 x 1                                                                                               | 10,60                                       | 74                                                 | 198                                                                | 100/500/1000                                   |
| 330801103          | 10 x 1                                                                                              | 12,40                                       | 88                                                 | 233                                                                | 100/500/1000                                   |
| 330801123          | 12 x 1                                                                                              | 12,60                                       | 106                                                | 270                                                                | 100/500/1000                                   |
| 330801143          | 14 x 1                                                                                              | 13,80                                       | 123                                                | 308                                                                | 100/500/1000                                   |
| 330801163          | 16 x 1                                                                                              | 14,10                                       | 140                                                | 344                                                                | 100/500/1000                                   |
| 330801183          | 18 x 1                                                                                              | 15,30                                       | 156                                                | 380                                                                | 100/500/1000                                   |
| 330801193          | 19 x 1                                                                                              | 15,30                                       | 166                                                | 390                                                                | 100/500/1000                                   |
| 330801213          | 21 x 1                                                                                              | 16,10                                       | 180                                                | 454                                                                | 100/500/1000                                   |
| 330801243          | 24 x 1                                                                                              | 17,30                                       | 211                                                | 487                                                                | 100/500/1000                                   |
| 330801303          | 30 x 1                                                                                              | 19,30                                       | 260                                                | 650                                                                | 100/500/1000                                   |
| 330801363          | 36 x 1                                                                                              | 21,10                                       | 312                                                | 782                                                                | 100/500/1000                                   |

# ERFLEX 120-Y / H05VV5-F (NYSLYö)

| KOD NO<br>CODE NR. | DAMAR SAYISI VEKESİTİ (mm <sup>2</sup> )<br>NUMBER OF CORE AND CROSS<br>SECTION (mm <sup>2</sup> ) | KABLO ÇAPI (mm)<br>OVERALL DIAMETER<br>(mm) | BAKIR AĞIRLIĞI (kg/km)<br>COPPER WEIGHT<br>(kg/km) | YAKLAŞIK KABLO AĞIRLIĞI (kg/km)<br>APPROX. CABLE WEIGHT<br>(kg/km) | STANDART<br>UZUNLUK (mt)<br>STANDARD LENGTH (m) |
|--------------------|----------------------------------------------------------------------------------------------------|---------------------------------------------|----------------------------------------------------|--------------------------------------------------------------------|-------------------------------------------------|
| 330815023          | 2 x 1,5                                                                                            | 7,30                                        | 26                                                 | 90                                                                 | 100/500/1000                                    |
| 330815033          | 3 x 1,5                                                                                            | 8,00                                        | 39                                                 | 110                                                                | 100/500/1000                                    |
| 330815043          | 4 x 1,5                                                                                            | 8,70                                        | 50                                                 | 134                                                                | 100/500/1000                                    |
| 330815053          | 5 x 1,5                                                                                            | 9,50                                        | 65                                                 | 160                                                                | 100/500/1000                                    |
| 330815063          | 6 x 1,5                                                                                            | 10,70                                       | 76                                                 | 195                                                                | 100/500/1000                                    |
| 330815073          | 7 x 1,5                                                                                            | 10,70                                       | 88                                                 | 207                                                                | 100/500/1000                                    |
| 330815083          | 8 x 1,5                                                                                            | 11,90                                       | 100                                                | 247                                                                | 100/500/1000                                    |
| 330815103          | 10 x 1,5                                                                                           | 12,90                                       | 128                                                | 290                                                                | 100/500/1000                                    |
| 330815123          | 12 x 1,5                                                                                           | 13,70                                       | 150                                                | 317                                                                | 100/500/1000                                    |
| 330815143          | 14 x 1,5                                                                                           | 14,60                                       | 179                                                | 375                                                                | 100/500/1000                                    |
| 330815163          | 16 x 1,5                                                                                           | 16,30                                       | 196                                                | 450                                                                | 100/500/1000                                    |
| 330815183          | 18 x 1,5                                                                                           | 16,90                                       | 222                                                | 485                                                                | 100/500/1000                                    |
| 330815193          | 19 x 1,5                                                                                           | 16,90                                       | 235                                                | 497                                                                | 100/500/1000                                    |
| 330815213          | 21 x 1,5                                                                                           | 17,90                                       | 246                                                | 568                                                                | 100/500/1000                                    |
| 330815243          | 24 x 1,5                                                                                           | 19,10                                       | 297                                                | 622                                                                | 100/500/1000                                    |
| 330815303          | 30 x 1,5                                                                                           | 21,70                                       | 366                                                | 888                                                                | 100/500/1000                                    |
| 330815363          | 36 x 1,5                                                                                           | 23,70                                       | 440                                                | 1020                                                               | 100/500/1000                                    |
| 330825023          | 2 x 2,5                                                                                            | 9,10                                        | 45                                                 | 119                                                                | 100/500/1000                                    |
| 330825033          | 3 x 2,5                                                                                            | 9,70                                        | 65                                                 | 154                                                                | 100/500/1000                                    |
| 330825043          | 4 x 2,5                                                                                            | 10,50                                       | 86                                                 | 201                                                                | 100/500/1000                                    |
| 330825053          | 5 x 2,5                                                                                            | 11,50                                       | 107                                                | 243                                                                | 100/500/1000                                    |
| 330825063          | 6 x 2,5                                                                                            | 13,10                                       | 128                                                | 290                                                                | 100/500/1000                                    |
| 330825073          | 7 x 2,5                                                                                            | 13,10                                       | 145                                                | 319                                                                | 100/500/1000                                    |
| 330825083          | 8 x 2,5                                                                                            | 14,10                                       | 168                                                | 367                                                                | 100/500/1000                                    |
| 330825103          | 10 x 2,5                                                                                           | 16,60                                       | 208                                                | 452                                                                | 100/500/1000                                    |
| 330825123          | 12 x 2,5                                                                                           | 17,10                                       | 247                                                | 513                                                                | 100/500/1000                                    |
| 330825143          | 14 x 2,5                                                                                           | 18,70                                       | 286                                                | 600                                                                | 100/500/1000                                    |
| 330825163          | 16 x 2,5                                                                                           | 19,70                                       | 325                                                | 700                                                                | 100/500/1000                                    |
| 330825183          | 18 x 2,5                                                                                           | 20,60                                       | 368                                                | 751                                                                | 100/500/1000                                    |
| 330825193          | 19 x 2,5                                                                                           | 20,60                                       | 388                                                | 771                                                                | 100/500/1000                                    |
| 330825213          | 21 x 2,5                                                                                           | 22,30                                       | 430                                                | 913                                                                | 100/500/1000                                    |
| 330825243          | 24 x 2,5                                                                                           | 24,10                                       | 490                                                | 983                                                                | 100/500/1000                                    |
| 330825303          | 30 x 2,5                                                                                           | 26,60                                       | 610                                                | 1300                                                               | 100/500/1000                                    |
| 330825363          | 36 x 2,5                                                                                           | 29,30                                       | 732                                                | 1592                                                               | 100/500/1000                                    |

# ERFLEX 120-YCY / H05VVC4V5-K (NYSLYCYö)



İYİ EMC\* ÖZELLİK/ESNEK KABLO YAPISI/KÜÇÜK BÜKÜLME YARIÇAPI/ALEV GECİKTİRİCİ ÖZELLİK/YAĞA DAYANIKLILIK  
GOOD EMC\* CHARACTERISTIC/FLEXIBLE CABLE DESIGN/SMALL BENDING RADIUS/  
FLAME RETARDANT CHARACTERISTIC/OIL RESISTANT



## KULLANIM ALANLARI

- Elektromanyetik karışım ve girişimlerin olduğu
- Enstrüman ve Kontrol Mühendisliğinde
- Akaryakıt Pompalarında
- Ölçme ve kontrol amaçlı olarak makine üretiminde
- Montaj ve Üretim Hatlarında
- Kuru ve nemli ortamlarda
- Kimyasal dayanım istenen ortamlarda
- Mekanik zorlanmaların orta derece olduğu yerlerde kullanılır

## APPLICATION

- In places where electro-magnetic interference and influence exists
- Instrumentation and Control Engineering
- Fuel Oil Pumps
- In machine production as measurement and control cable
- Production and Assembly Lines
- Dry and humid places
- In places where medium level mechanical stresses exist

## KABLO YAPISI

|                       |                                                                              |
|-----------------------|------------------------------------------------------------------------------|
| <b>1-İletken</b>      | IEC 60228; DIN EN 60228; EN 60228 Sınıf 5<br>Bükülü Elektrolitik Tavlı Bakır |
| <b>2-Yalıtkan</b>     | EN 50363-3 PVC Kompaund                                                      |
| <b>3-Yalıtım Renk</b> | DIN VDE 0293; TS EN 50334 veya Siyah damar,<br>beyaz numara kodlu            |
| <b>4-Büküm</b>        | Uygun adımda katlar halinde                                                  |
| <b>5-İç Kılıf</b>     | EN 50363-4-1 PVC Kompaund                                                    |
| <b>6-Ekran</b>        | Kalaylı Bakır Örgü                                                           |
| <b>7-Dış Kılıf</b>    | EN 50363-4-1 TM5 yağa dayanıklı PVC Kompaund                                 |
| <b>8-Kılıf Rengi</b>  | RAL 7001 Gri                                                                 |

## CONSTRUCTION

|                        |                                                                                |
|------------------------|--------------------------------------------------------------------------------|
| <b>1-Conductor</b>     | IEC 60228; DIN EN 60228; EN 60228 Class 5<br>Stranded Electrolytic Bare Copper |
| <b>2-Insulation</b>    | EN 50363-3 PVC Compound                                                        |
| <b>3-Colour Code</b>   | DIN VDE 0293; TS EN 50334 or Black cores with<br>white number Imprinted        |
| <b>4-Stranding</b>     | In layers of optimum pitch                                                     |
| <b>5-Inner Sheath</b>  | EN 50363-4-1 PVC Compound                                                      |
| <b>6-Screen</b>        | Tinned Copper Braid                                                            |
| <b>7-Outer Sheath</b>  | EN 50363-4-1 TM5 oil resistant PVC Compound                                    |
| <b>8-Sheath Colour</b> | RAL 7001 Grey                                                                  |

## TEKNİK ÖZELLİKLER TECHNICAL CHARACTERISTICS

| İLETKEN DİRENCİ<br>CONDUCTOR<br>RESISTANCE | YALITIM DİRENCİ<br>INSULATION<br>RESISTANCE | AKIM TAŞIMA KAPASİTESİ<br>CURRENT CARRYING<br>CAPACITY | ÇALIŞMA VOLTAJİ<br>OPERATING<br>VOLTAGE | TEST VOLTAJİ<br>TEST VOLTAGE | BÜKÜLME YARIÇAPI<br>BENDING RADIUS | ÇALIŞMA SICAKLIĞI<br>TEMPERATURE RANGE                                  | ALEV GECİKTİRİCİLİK<br>TESTİ<br>FLAME RETARDANT TEST | KİMYASAL DAYANIM<br>CHEMICAL RESISTANCE |
|--------------------------------------------|---------------------------------------------|--------------------------------------------------------|-----------------------------------------|------------------------------|------------------------------------|-------------------------------------------------------------------------|------------------------------------------------------|-----------------------------------------|
| mm <sup>2</sup> Ω/km                       | 20MΩkm                                      | mm <sup>2</sup> A                                      | 300V/500V                               | 2000V                        | 10x Cable Ø                        | Hareketli / Mobile<br>-5°C-+70°C Sabit<br>Sabit / Stable<br>-30°C-+70°C | IEC 60332-1-2<br>DIN EN 60332-1-2<br>EN 60332-1-2    | IEC 60811-404                           |
| 0,5 39                                     |                                             | 0,5 6,0                                                |                                         |                              |                                    |                                                                         |                                                      |                                         |
| 0,75 26                                    |                                             | 0,75 13                                                |                                         |                              |                                    |                                                                         |                                                      |                                         |
| 1,0 19,5                                   |                                             | 1,0 16                                                 |                                         |                              |                                    |                                                                         |                                                      |                                         |
| 1,5 13,3                                   |                                             | 1,5 20                                                 |                                         |                              |                                    |                                                                         |                                                      |                                         |
| 2,5 7,98                                   |                                             | 2,5 25                                                 |                                         |                              |                                    |                                                                         |                                                      |                                         |

## NOTLAR

\*EMC: Elektromanyetik uyumlu  
Esnek yapıları ile dar alanlarda rahatlıkla uygulanabilirler.  
Bu tip kablolar dış ortamlarda kullanıma uygun değildir.  
**OZ:** Siyah yalıtım+Sarı/Yeşil toprak koruma damarsız  
**JZ:** Siyah yalıtım+Sarı/Yeşil toprak koruma damarı  
**OB:** Renk kodlu yalıtım+Sarı/Yeşil toprak koruma damarsız  
**JB:** Renk kodlu yalıtım +Sarı/Yeşil toprak koruma damarı

## NOTES

\*EMC: Electromagnetic compatibility  
With their flexible design they can easily be used in narrow spaces.  
These cables are not suitable for outdoor use.  
**OZ:** Black insulation+Without Green/Yellow earthing core  
**JZ:** Black insulation+Green/Yellow earthing core  
**OB:** Colour code insulation+Without Green/Yellow earthing core  
**JB:** Colour code insulation+With Green/Yellow earthing core

# ERFLEX 120-YCY / H05VVC4V5-K (NYSLYCYÖ)

| KOD NO<br>CODE NR. | DAMAR SAYISI VEKESİTİ (mm <sup>2</sup> )<br>NUMBER OF CORE AND CROSS<br>SECTION (mm <sup>2</sup> ) | KABLO ÇAPI (mm)<br>OVERALL DIAMETER<br>(mm) | BAKIR AĞIRLIĞI (kg/km)<br>COPPER WEIGHT<br>(kg/km) | YAKLAŞIK KABLO AĞIRLIĞI (kg/km)<br>APPROX. CABLE WEIGHT<br>(kg/km) | STANDART<br>UZUNLUK (mt)<br>STANDARD LENGTH (m) |
|--------------------|----------------------------------------------------------------------------------------------------|---------------------------------------------|----------------------------------------------------|--------------------------------------------------------------------|-------------------------------------------------|
| 331050023          | 2 x 0,50                                                                                           | 8,50                                        | 30                                                 | 80                                                                 | 100/500/1000                                    |
| 331050033          | 3 x 0,50                                                                                           | 8,80                                        | 36                                                 | 96                                                                 | 100/500/1000                                    |
| 331050043          | 4 x 0,50                                                                                           | 9,60                                        | 43                                                 | 110                                                                | 100/500/1000                                    |
| 331050053          | 5 x 0,50                                                                                           | 10,00                                       | 48                                                 | 130                                                                | 100/500/1000                                    |
| 331050063          | 6 x 0,50                                                                                           | 11,20                                       | 57                                                 | 147                                                                | 100/500/1000                                    |
| 331050073          | 7 x 0,50                                                                                           | 11,20                                       | 62                                                 | 155                                                                | 100/500/1000                                    |
| 331050083          | 8 x 0,50                                                                                           | 12,00                                       | 66                                                 | 171                                                                | 100/500/1000                                    |
| 331050103          | 10 x 0,50                                                                                          | 12,80                                       | 75                                                 | 206                                                                | 100/500/1000                                    |
| 331050123          | 12 x 0,50                                                                                          | 14,20                                       | 90                                                 | 238                                                                | 100/500/1000                                    |
| 331050143          | 14 x 0,50                                                                                          | 14,80                                       | 102                                                | 259                                                                | 100/500/1000                                    |
| 331050163          | 16 x 0,50                                                                                          | 15,20                                       | 125                                                | 283                                                                | 100/500/1000                                    |
| 331050183          | 18 x 0,50                                                                                          | 16,00                                       | 135                                                | 320                                                                | 100/500/1000                                    |
| 331050193          | 19 x 0,50                                                                                          | 16,40                                       | 147                                                | 342                                                                | 100/500/1000                                    |
| 331050213          | 21 x 0,50                                                                                          | 17,00                                       | 154                                                | 365                                                                | 100/500/1000                                    |
| 331050243          | 24 x 0,50                                                                                          | 17,60                                       | 173                                                | 409                                                                | 100/500                                         |
| 331050303          | 30 x 0,50                                                                                          | 19,60                                       | 204                                                | 489                                                                | 100/500                                         |
| 331050363          | 36 x 0,50                                                                                          | 21,00                                       | 235                                                | 563                                                                | 100/500                                         |
| 331075023          | 2 x 0,75                                                                                           | 9,20                                        | 35                                                 | 95                                                                 | 100/500/1000                                    |
| 331075033          | 3 x 0,75                                                                                           | 9,40                                        | 48                                                 | 114                                                                | 100/500/1000                                    |
| 331075043          | 4 x 0,75                                                                                           | 10,40                                       | 55                                                 | 125                                                                | 100/500/1000                                    |
| 331075053          | 5 x 0,75                                                                                           | 11,10                                       | 59                                                 | 150                                                                | 100/500/1000                                    |
| 331075063          | 6 x 0,75                                                                                           | 12,00                                       | 66                                                 | 178                                                                | 100/500/1000                                    |
| 331075073          | 7 x 0,75                                                                                           | 12,00                                       | 75                                                 | 191                                                                | 100/500/1000                                    |
| 331075083          | 8 x 0,75                                                                                           | 13,20                                       | 83                                                 | 216                                                                | 100/500/1000                                    |
| 331075103          | 10 x 0,75                                                                                          | 14,60                                       | 97                                                 | 264                                                                | 100/500/1000                                    |
| 331075123          | 12 x 0,75                                                                                          | 15,40                                       | 119                                                | 303                                                                | 100/500/1000                                    |
| 331075143          | 14 x 0,75                                                                                          | 16,40                                       | 135                                                | 342                                                                | 100/500/1000                                    |
| 331075163          | 16 x 0,75                                                                                          | 17,20                                       | 159                                                | 386                                                                | 100/500/1000                                    |
| 331075183          | 18 x 0,75                                                                                          | 18,20                                       | 169                                                | 408                                                                | 100/500                                         |
| 331075193          | 19 x 0,75                                                                                          | 18,60                                       | 182                                                | 445                                                                | 100/500                                         |
| 331075213          | 21 x 0,75                                                                                          | 19,60                                       | 200                                                | 497                                                                | 100/500                                         |
| 331075243          | 24 x 0,75                                                                                          | 20,60                                       | 223                                                | 567                                                                | 100/500                                         |
| 331075303          | 30 x 0,75                                                                                          | 23,00                                       | 267                                                | 664                                                                | 100/500                                         |
| 331075363          | 36 x 0,75                                                                                          | 24,20                                       | 314                                                | 758                                                                | 100/500                                         |
| 331001023          | 2 x 1                                                                                              | 9,40                                        | 44                                                 | 117                                                                | 100/500/1000                                    |
| 331001033          | 3 x 1                                                                                              | 10,30                                       | 56                                                 | 146                                                                | 100/500/1000                                    |
| 331001043          | 4 x 1                                                                                              | 10,90                                       | 67                                                 | 163                                                                | 100/500/1000                                    |
| 331001053          | 5 x 1                                                                                              | 11,80                                       | 79                                                 | 189                                                                | 100/500/1000                                    |
| 331001063          | 6 x 1                                                                                              | 12,60                                       | 91                                                 | 214                                                                | 100/500/1000                                    |
| 331001073          | 7 x 1                                                                                              | 12,60                                       | 104                                                | 259                                                                | 100/500/1000                                    |
| 331001083          | 8 x 1                                                                                              | 14,80                                       | 115                                                | 286                                                                | 100/500/1000                                    |
| 331001103          | 10 x 1                                                                                             | 16,20                                       | 137                                                | 326                                                                | 100/500                                         |
| 331001123          | 12 x 1                                                                                             | 17,20                                       | 157                                                | 370                                                                | 100/500                                         |
| 331001143          | 14 x 1                                                                                             | 18,00                                       | 185                                                | 424                                                                | 100/500                                         |
| 331001163          | 16 x 1                                                                                             | 19,00                                       | 208                                                | 468                                                                | 100/500                                         |
| 331001183          | 18 x 1                                                                                             | 19,40                                       | 232                                                | 513                                                                | 100/500                                         |
| 331001193          | 19 x 1                                                                                             | 20,40                                       | 239                                                | 539                                                                | 100/500                                         |
| 331001213          | 21 x 1                                                                                             | 21,50                                       | 261                                                | 593                                                                | 100/500                                         |
| 331001243          | 24 x 1                                                                                             | 22,30                                       | 289                                                | 653                                                                | 100/500                                         |
| 331001303          | 30 x 1                                                                                             | 24,70                                       | 320                                                | 750                                                                | 100/500                                         |
| 331001363          | 36 x 1                                                                                             | 26,00                                       | 475                                                | 1030                                                               | 100/500                                         |

# ERFLEX 120-YCY / H05VVC4V5-K (NYSLYCYö)

| KOD NO<br>CODENR. | DAMAR SAYISI VE KESİTİ (mm <sup>2</sup> )<br>NUMBER OF CORE AND CROSS<br>SECTION (mm <sup>2</sup> ) | KABLO ÇAPİ (mm)<br>OVERALL DIAMETER<br>(mm) | BAKIR AĞIRLIĞI (kg/km)<br>COPPER WEIGHT<br>(kg/km) | YAKLAŞIK KABLO AĞIRLIĞI (kg/km)<br>APPROX. CABLE WEIGHT<br>(kg/km) | STANDART<br>UZUNLUK (m)<br>STANDARD LENGTH (m) |
|-------------------|-----------------------------------------------------------------------------------------------------|---------------------------------------------|----------------------------------------------------|--------------------------------------------------------------------|------------------------------------------------|
| 331015023         | 2 x 1,5                                                                                             | 10,20                                       | 57                                                 | 129                                                                | 100/500/1000                                   |
| 331015033         | 3 x 1,5                                                                                             | 11,00                                       | 70                                                 | 160                                                                | 100/500/1000                                   |
| 331015043         | 4 x 1,5                                                                                             | 12,40                                       | 85                                                 | 196                                                                | 100/500/1000                                   |
| 331015053         | 5 x 1,5                                                                                             | 13,00                                       | 106                                                | 209                                                                | 100/500/1000                                   |
| 331015063         | 6 x 1,5                                                                                             | 14,30                                       | 119                                                | 255                                                                | 100/500/1000                                   |
| 331015073         | 7 x 1,5                                                                                             | 14,30                                       | 138                                                | 309                                                                | 100/500/1000                                   |
| 331015083         | 8 x 1,5                                                                                             | 16,20                                       | 152                                                | 337                                                                | 100/500/1000                                   |
| 331015103         | 10 x 1,5                                                                                            | 17,20                                       | 176                                                | 385                                                                | 100/500                                        |
| 331015123         | 12 x 1,5                                                                                            | 18,60                                       | 208                                                | 451                                                                | 100/500                                        |
| 331015143         | 14 x 1,5                                                                                            | 19,40                                       | 257                                                | 509                                                                | 100/500                                        |
| 331015163         | 16 x 1,5                                                                                            | 20,20                                       | 284                                                | 582                                                                | 100/500                                        |
| 331015183         | 18 x 1,5                                                                                            | 21,50                                       | 207                                                | 637                                                                | 100/500                                        |
| 331015193         | 19 x 1,5                                                                                            | 22,60                                       | 316                                                | 665                                                                | 100/500                                        |
| 331015213         | 21 x 1,5                                                                                            | 23,80                                       | 354                                                | 749                                                                | 100/500                                        |
| 331015243         | 24 x 1,5                                                                                            | 25,00                                       | 397                                                | 836                                                                | 100/500                                        |
| 331015303         | 30 x 1,5                                                                                            | 26,00                                       | 580                                                | 1085                                                               | 100/500                                        |
| 331015363         | 36 x 1,5                                                                                            | 27,00                                       | 715                                                | 1255                                                               | 100/500                                        |
| 331025023         | 2 x 2,5                                                                                             | 11,90                                       | 80                                                 | 192                                                                | 100/500/1000                                   |
| 331025033         | 3 x 2,5                                                                                             | 13,20                                       | 98                                                 | 213                                                                | 100/500/1000                                   |
| 331025043         | 4 x 2,5                                                                                             | 14,40                                       | 124                                                | 269                                                                | 100/500/1000                                   |
| 331025053         | 5 x 2,5                                                                                             | 15,60                                       | 150                                                | 328                                                                | 100/500/1000                                   |
| 331025063         | 6 x 2,5                                                                                             | 16,80                                       | 179                                                | 377                                                                | 100/500                                        |
| 331025073         | 7 x 2,5                                                                                             | 16,80                                       | 201                                                | 419                                                                | 100/500                                        |
| 331025083         | 8 x 2,5                                                                                             | 19,00                                       | 236                                                | 473                                                                | 100/500                                        |
| 331025103         | 10 x 2,5                                                                                            | 20,80                                       | 280                                                | 560                                                                | 100/500                                        |
| 331025123         | 12 x 2,5                                                                                            | 22,40                                       | 335                                                | 657                                                                | 100/500                                        |
| 331025143         | 14 x 2,5                                                                                            | 23,60                                       | 379                                                | 750                                                                | 100/500                                        |
| 331025163         | 16 x 2,5                                                                                            | 24,80                                       | 424                                                | 825                                                                | 100/500                                        |
| 331025183         | 18 x 2,5                                                                                            | 25,90                                       | 473                                                | 936                                                                | 100/500                                        |
| 331025193         | 19 x 2,5                                                                                            | 26,70                                       | 500                                                | 975                                                                | 100/500                                        |

# ERFLEX 130-YSY / YSLYQY



ESNEK KABLO YAPISI/KÜÇÜK BÜKÜLME YARIÇAPI/ALEV GECİKTİRİCİ ÖZELLİK  
FLEXIBLE CABLE DESIGN/SMALL BENDING RADIUS/FLAME RETARDANT CHARACTERISTIC



## KULLANIM ALANLARI

- Enstrüman ve Kontrol Mühendisliğinde
- Akaryakıt Pompalarında
- Ölçme ve kontrol amaçlı olarak makine üretiminde
- Montaj ve Üretim Hatlarında
- Kuru ve nemli ortamlarda
- Mekanik zorlanmaların orta derece olduğu yerlerde kullanılır

## APPLICATION

- Instrumentation and Control Engineering
- Fuel Oil Pumps
- In machine production as measurement and control cable
- Production and Assembly Lines
- Dry and humid places
- In places where medium level mechanical stresses exist

## KABLO YAPISI

- 1-İletken** IEC 60228; DIN EN 60228; EN 60228 Sınıf 5  
Bükülü Elektrolitik Tavlı Bakır
- 2-Yalıtkan** EN 50363-3 PVC Kompaund
- 3-Yalıtım Renk** DIN VDE 0293; TS EN 50334 veya Siyah damar,  
beyaz numara kodlu
- 4-Büküm** Uygun adımda katlar halinde
- 5-İçkılıf** EN 50363-4-1 PVC Kompaund
- 6-Ekran** Galvanizli Çelik Tel Örgü
- 7-Dış Kılıf** EN 50363-4-1 PVC Kompaund
- 8-Kılıf Rengi** Şeffaf, Gri ya da Siyah

## CONSTRUCTION

- 1-Conductor** IEC 60228; DIN EN 60228; EN 60228 Class 5  
Stranded Electrolytic Bare Copper
- 2-Insulation** EN 50363-3 PVC Compound
- 3-Colour Code** DIN VDE 0293; EN 50334 or Black insulated  
cores with white number Imprinted
- 4-Stranding** In layers of optimum pitch
- 5-Inner Sheath** EN 50363-4-1 PVC Compound
- 6-Armour** Galvanized Steel Wire Braid
- 7-Outer Sheath** EN 50363-4-1 PVC Compound
- 8-Sheath Colour** Transparent, Grey Or Black

## TEKNİK ÖZELLİKLER TECHNICAL CHARACTERISTICS

| İLETKEN DİRENCİ<br>CONDUCTOR<br>RESISTANCE | YALITIM DİRENCİ<br>INSULATION<br>RESISTANCE | AKIM TAŞIMA KAPASİTESİ<br>CURRENT CARRYING<br>CAPACITY | ÇALIŞMA VOLTAJİ<br>OPERATING<br>VOLTAGE | TEST VOLTAJİ<br>TEST VOLTAGE | BÜKÜLME YARIÇAPI<br>BENDING RADIUS | ÇALIŞMA SICAKLIĞI<br>TEMPERATURE RANGE                                  | ALEV GECİKTİRİCİLİK TESTİ<br>FLAME RETARDANT TEST |
|--------------------------------------------|---------------------------------------------|--------------------------------------------------------|-----------------------------------------|------------------------------|------------------------------------|-------------------------------------------------------------------------|---------------------------------------------------|
| mm <sup>2</sup> Ω/km                       | 20MΩkm                                      | mm <sup>2</sup> A                                      | 300/500V                                | 2000V                        | 10x Cable Ø                        | Hareketli / Mobile<br>-5°C-+70°C Sabit<br>Sabit / Stable<br>-30°C-+70°C | IEC 60332-1-2<br>DIN EN 60332-1-2<br>EN 60332-1-2 |
| 0,5 39                                     |                                             | 0,5 6,0                                                |                                         |                              |                                    |                                                                         |                                                   |
| 0,75 26                                    |                                             | 0,75 13                                                |                                         |                              |                                    |                                                                         |                                                   |
| 1,0 19,5                                   |                                             | 1,0 16                                                 |                                         |                              |                                    |                                                                         |                                                   |
| 1,5 13,3                                   |                                             | 1,5 20                                                 |                                         |                              |                                    |                                                                         |                                                   |
| 2,5 7,98                                   |                                             | 2,5 25                                                 |                                         |                              |                                    |                                                                         |                                                   |

## NOTLAR

Esnek yapıları ile dar alanlarda rahatlıkla uygulanabilirler.  
Bu tip kablolar dış ortamlarda kullanıma uygun değildir.  
**OZ:** Siyah yalıtım+Sarı/Yeşil toprak koruma damarsız  
**JZ:** Siyah yalıtım+Sarı/Yeşil toprak koruma damarı  
**OB:** Renk kodlu yalıtım+Sarı/Yeşil toprak koruma damarsız  
**JB:** Renk kodlu yalıtım +Sarı/Yeşil toprak koruma damarı

## NOTES

With their flexible design they can easily be used in narrow spaces.  
These cables are not suitable for outdoor use.  
**OZ:** Black insulation+Without Green/Yellow earthing core  
**JZ:** Black insulation+Green/Yellow earthing core  
**OB:** Colour code insulation+Without Green/Yellow earthing core  
**JB:** Colour code insulation+With Green/Yellow earthing core

# ERFLEX SERVO 160-CY / 2YSLCY



İYİ EMC\* ÖZELLİK/ESNEK KABLO YAPISI/KÜÇÜK BÜKÜLME YARIÇAPI/ALEV GECİKTİRİCİ ÖZELLİK/  
KABLOLAR 4 DAMARLI VE 240mm<sup>2</sup> KESİTE KADAR

GOOD EMC\* CHARACTERISTIC/FLEXIBLE CABLE DESIGN/SMALL BENDING RADIUS/FLAME RETARDANT CHARACTERISTIC/  
4 CORES AND UP TO 240mm<sup>2</sup> CROSS SECTION



## KULLANIM ALANLARI

Elektromanyetik karışım ve girişimlerin olduğu frekans kontrollü motor beslemelerinde

- Otomobil Endüstrisinde
- Enerji İstasyonlarında
- Ambalaj Endüstrisinde
- Takım Tezgahlarında
- Montaj ve Üretim Hatlarında
- Endüstriyel Pompalarda
- Havalandırma Sistemlerinde
- Taşıma Bantlarında
- Kuru, nemli, asitlik ve yağlı ortamlarda
- Mekanik zorlanmaların orta derece olduğu yerlerde kullanılır

## APPLICATION

At frequency controlled motor supply that intensely populated by people where there is electromagnetic interference

- Automobile Industry
- Energy Stations
- Packaging Industry
- Machine Tools
- In assembly and production lines
- Industrial Pumps
- In Ventilation Systems
- Conveyor Belts
- Dry, humid, oily and acidic places
- In places where medium level mechanical stresses exist

## KABLO YAPISI

- 1-İletken** IEC 60228; DIN EN 60228; EN 60228 Sınıf 5  
Bükülü Elektrolitik Tavlı Bakır
- 2-Yalıtkan** DIN VDE 0207 Bölüm-2 PE Kompaund
- 3-Yalıtım Renk** DIN VDE 0293; TS HD 308 S2
- 4-Büküm** Uygun adımda katlar halinde
- 5-Ekran** Pes Bant + Al-Pes Bant + Kalaylı Bakır Örgü
- 6-Kılıf** EN 50363-4-1 PVC Kompaund
- 7-Kılıf Rengi** Şeffaf

## CONSTRUCTION

- 1-Conductor** IEC 60228; DIN EN 60228; EN 60228 Class 5  
Stranded Electrolytic Bare Copper
- 2-Insulation** DIN VDE 0207 PART-2 PE Compound
- 3-Colour Code** DIN VDE 0293; TS HD 308 S2
- 4-Stranding** In layers of optimum pitch
- 5-Screen** Pes Tape + Al-Pes Tape + Tinned Copper Braid
- 6-Sheath** EN 50363-4-1 PVC Compound
- 7-Sheath Colour** Transparent

## TEKNİK ÖZELLİKLER TECHNICAL CHARACTERISTICS

| İLETKEN DİRENCİ<br>CONDUCTOR<br>RESISTANCE | YALITIM DİRENCİ<br>INSULATION<br>RESISTANCE | AKIM TAŞIMA KAPASİTESİ<br>CURRENT CARRYING<br>CAPACITY | ÇALIŞMA VOLTAJİ<br>OPERATING<br>VOLTAGE               | TEST VOLTAJİ<br>TEST VOLTAGE | EFEKTİF KAPASİTE<br>MUTUAL CAPACITANCE                                                                           | BÜKÜLME YARIÇAPI<br>BENDING RADIUS | ÇALIŞMA SICAKLIĞI<br>TEMPERATURE RANGE                                | ALEV GECİKTİRİCİLİK<br>TESTİ<br>FLAME RETARDANT TEST |
|--------------------------------------------|---------------------------------------------|--------------------------------------------------------|-------------------------------------------------------|------------------------------|------------------------------------------------------------------------------------------------------------------|------------------------------------|-----------------------------------------------------------------------|------------------------------------------------------|
| mm <sup>2</sup><br>Ω/km                    | 200MΩxkm                                    | mm <sup>2</sup><br>A                                   | U <sub>0</sub> /U(U <sub>max</sub> )<br>0,6/1(1,2) kV | 4000V                        | Damar/Damar=70-250 nF/km<br>Damar/Ekran =110-410 nF/km<br>Core/Core = 70-250 nF/km<br>Core/Screen =110-410 nF/km | 10x Cable Ø                        | Hareketli / Mobile<br>+5°C-+70°C<br><br>Sabit / Stable<br>-40°C-+70°C | IEC 60332-1-2<br>DIN EN 60332-1-2<br>EN 60332-1-2    |
| 1,5<br>13,3                                |                                             | 1,5<br>20                                              |                                                       |                              |                                                                                                                  |                                    |                                                                       |                                                      |
| 2,5<br>7,98                                |                                             | 2,5<br>25                                              |                                                       |                              |                                                                                                                  |                                    |                                                                       |                                                      |
| 4,0<br>4,95                                |                                             | 4,0<br>34                                              |                                                       |                              |                                                                                                                  |                                    |                                                                       |                                                      |
| 6,0<br>3,30                                |                                             | 6,0<br>44                                              |                                                       |                              |                                                                                                                  |                                    |                                                                       |                                                      |
| 10<br>1,91                                 |                                             | 10<br>61                                               |                                                       |                              |                                                                                                                  |                                    |                                                                       |                                                      |
| 16<br>1,21                                 |                                             | 16<br>82                                               |                                                       |                              |                                                                                                                  |                                    |                                                                       |                                                      |
| 25<br>0,780                                |                                             | 25<br>108                                              |                                                       |                              |                                                                                                                  |                                    |                                                                       |                                                      |
| 35<br>0,554                                |                                             | 35<br>135                                              |                                                       |                              |                                                                                                                  |                                    |                                                                       |                                                      |
| 50<br>0,386                                |                                             | 50<br>168                                              |                                                       |                              |                                                                                                                  |                                    |                                                                       |                                                      |
| 70<br>0,272                                |                                             | 70<br>207                                              |                                                       |                              |                                                                                                                  |                                    |                                                                       |                                                      |
| 95<br>0,206                                |                                             | 95<br>250                                              |                                                       |                              |                                                                                                                  |                                    |                                                                       |                                                      |

## NOTLAR

- \*EMC: Elektromanyetik uyumlu  
Esnek yapıları ile dar alanlarda rahatlıkla uygulanabilirler.  
Bu tip kablolar dış ortamlarda kullanıma uygun değildir.  
**OZ:** Siyah yalıtım+Sarı/Yeşil toprak koruma damarsız  
**JZ:** Siyah yalıtım+Sarı/Yeşil toprak koruma damarı  
**OB:** Renk kodlu yalıtım+Sarı/Yeşil toprak koruma damarsız  
**JB:** Renk kodlu yalıtım +Sarı/Yeşil toprak koruma damarı

## NOTES

- \*EMC: Electromagnetic compatibility  
With their flexible design they can easily be used in narrow spaces.  
These cables are not suitable for outdoor use.  
**OZ:** Black insulation+Without Green/Yellow earthing core  
**JZ:** Black insulation+Green/Yellow earthing core  
**OB:** Colour code insulation+Without Green/Yellow earthing core  
**JB:** Colour code insulation+With Green/Yellow earthing core

# ERFLEX SERVO 160-CYK / 2YSLCYK



İYİ EMC\* ÖZELLİK/ESNEK KABLO YAPISI/KÜÇÜK BÜKÜLME YARIÇAPI/ALEV GECİKTİRİCİ ÖZELLİK/  
KABLOLAR 4 DAMARLI VE 240mm<sup>2</sup> KESİTE KADAR

GOOD EMC\* CHARACTERISTIC/FLEXIBLE CABLE DESIGN/SMALL BENDING RADIUS/FLAME RETARDANT CHARACTERISTIC/  
4 CORES AND UP TO 240mm<sup>2</sup> CROSS SECTION



## KULLANIM ALANLARI

Elektromanyetik karışım ve girişimlerin olduğu frekans kontrollü motor beslemelerinde

- Otomobil Endüstrisinde
- Enerji İstasyonlarında
- Ambalaj Endüstrisinde
- Takım Tezgahlarında
- Montaj ve Üretim Hatlarında
- Endüstriyel Pompalarda
- Havalandırma Sistemlerinde
- Taşıma Bantlarında
- Kuru, nemli, asitlik ve yağlı ortamlarda
- Mekanik zorlanmaların orta derece olduğu yerlerde kullanılır

## APPLICATION

At frequency controlled motor supply that intensely populated by people where there is electromagnetic interference

- Automobile Industry
- Energy Stations
- Packaging Industry
- Machine Tools
- In assembly and production lines
- Industrial Pumps
- In Ventilation Systems
- Conveyor Belts
- Dry, humid, oily and acidy places
- In places where medium level mechanical stresses exist

## KABLO YAPISI

|                       |                                                                              |
|-----------------------|------------------------------------------------------------------------------|
| <b>1-İletken</b>      | IEC 60228; DIN EN 60228; EN 60228 Sınıf 5<br>Bükülü Elektrolitik Tavlı Bakır |
| <b>2-Yalıtkan</b>     | DIN VDE 0207 Bölüm-2 PE Kompaund                                             |
| <b>3-Yalıtım Renk</b> | DIN VDE 0293; TS HD 308 S2                                                   |
| <b>4-Büküm</b>        | Uygun adımda katlar halinde                                                  |
| <b>5-Ekran</b>        | Pes Bant + Al-Pes Bant + Kalaylı Bakır Örgü                                  |
| <b>6-Kılıf</b>        | EN 50363-4-1 PVC Kompaund                                                    |
| <b>7-Kılıf Rengi</b>  | RAL 9005 Siyah                                                               |

## CONSTRUCTION

|                        |                                                                                |
|------------------------|--------------------------------------------------------------------------------|
| <b>1-Conductor</b>     | IEC 60228; DIN EN 60228; EN 60228 Class 5<br>Stranded Electrolytic Bare Copper |
| <b>2-Insulation</b>    | DIN VDE 0207 PART-2 PE Compound                                                |
| <b>3-Colour Code</b>   | DIN VDE 0293; TS HD 308 S2                                                     |
| <b>4-Stranding</b>     | In layers of optimum pitch                                                     |
| <b>5-Screen</b>        | Pes Tape + Al-Pes Tape + Tinned Copper Braid                                   |
| <b>6-Sheath</b>        | EN 50363-4-1 PVC Compound                                                      |
| <b>7-Sheath Colour</b> | RAL 9005 Black                                                                 |

## TEKNİK ÖZELLİKLER TECHNICAL CHARACTERISTICS

| İLETKEN DİRENCİ<br>CONDUCTOR<br>RESISTANCE | YALITIM DİRENCİ<br>INSULATION<br>RESISTANCE | AKIM TAŞIMA KAPASİTESİ<br>CURRENT CARRYING<br>CAPACITY | ÇALIŞMA VOLTAJİ<br>OPERATING<br>VOLTAGE | TEST VOLTAJİ<br>TEST VOLTAGE | EFEKTİF KAPASİTE<br>MUTUAL CAPACITANCE | BÜKÜLME YARIÇAPI<br>BENDING RADIUS | ÇALIŞMA SICAKLIĞI<br>TEMPERATURE RANGE                                                                          | ALEV GECİKTİRİCİLİK<br>TESTİ<br>FLAME RETARDANT TEST |                                                                   |                                                   |
|--------------------------------------------|---------------------------------------------|--------------------------------------------------------|-----------------------------------------|------------------------------|----------------------------------------|------------------------------------|-----------------------------------------------------------------------------------------------------------------|------------------------------------------------------|-------------------------------------------------------------------|---------------------------------------------------|
| mm <sup>2</sup>                            | Ω/km                                        | 200MΩxkm                                               | mm <sup>2</sup>                         | A                            | U <sub>0</sub> /U(U <sub>max</sub> )   | 4000V                              | Damar/Damar=70-250 nF/km<br>Damar/Ekran =110-410 nF/km<br>Core/Core = 70-250 nF/km<br>Core/Screen=110-410 nF/km | 10x Cable Ø                                          | Hareketli / Mobile<br>+5°C-+70°C<br>Sabit / Stable<br>-40°C-+70°C | IEC 60332-1-2<br>DIN EN 60332-1-2<br>EN 60332-1-2 |
| 1,5                                        | 13,3                                        |                                                        | 1,5                                     | 20                           | 0,6/1(1,2) kV                          |                                    |                                                                                                                 |                                                      |                                                                   |                                                   |
| 2,5                                        | 7,98                                        |                                                        | 2,5                                     | 25                           |                                        |                                    |                                                                                                                 |                                                      |                                                                   |                                                   |
| 4,0                                        | 4,95                                        |                                                        | 4,0                                     | 34                           |                                        |                                    |                                                                                                                 |                                                      |                                                                   |                                                   |
| 6,0                                        | 3,30                                        |                                                        | 6,0                                     | 44                           |                                        |                                    |                                                                                                                 |                                                      |                                                                   |                                                   |
| 10                                         | 1,91                                        |                                                        | 10                                      | 61                           |                                        |                                    |                                                                                                                 |                                                      |                                                                   |                                                   |
| 16                                         | 1,21                                        |                                                        | 16                                      | 82                           |                                        |                                    |                                                                                                                 |                                                      |                                                                   |                                                   |
| 25                                         | 0,780                                       |                                                        | 25                                      | 108                          |                                        |                                    |                                                                                                                 |                                                      |                                                                   |                                                   |
| 35                                         | 0,554                                       |                                                        | 35                                      | 135                          |                                        |                                    |                                                                                                                 |                                                      |                                                                   |                                                   |
| 50                                         | 0,386                                       |                                                        | 50                                      | 168                          |                                        |                                    |                                                                                                                 |                                                      |                                                                   |                                                   |
| 70                                         | 0,272                                       |                                                        | 70                                      | 207                          |                                        |                                    |                                                                                                                 |                                                      |                                                                   |                                                   |
| 95                                         | 0,206                                       |                                                        | 95                                      | 250                          |                                        |                                    |                                                                                                                 |                                                      |                                                                   |                                                   |

## NOTLAR

\*EMC: Elektromanyetik uyumlu

Esnek yapıları ile dar alanlarda rahatlıkla uygulanabilirler.  
Bu tip kablolar dış ortamlarda kullanıma uygun değildir.

**OZ:** Siyah yalıtım+Sarı/Yeşil toprak koruma damarsız

**JZ:** Siyah yalıtım+Sarı/Yeşil toprak koruma damarı

**OB:** Renk kodlu yalıtım+Sarı/Yeşil toprak koruma damarsız

**JB:** Renk kodlu yalıtım +Sarı/Yeşil toprak koruma damarı

## NOTES

\*EMC: Electromagnetic compatibility

With their flexible design they can easily be used in narrow spaces.  
These cables are not suitable for outdoor use.

**OZ:** Black insulation+Without Green/Yellow earthing core

**JZ:** Black insulation+Green/Yellow earthing core

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**JB:** Colour code insulation+With Green/Yellow earthing core

# ERFLEX SERVO 160-CY (3+) / 2YSLCY (3+)



İYİ EMC\* ÖZELLİK/ESNEK KABLO YAPISI/KÜÇÜK BÜKÜLME YARIÇAPI/ALEV GECİKTİRİCİ ÖZELLİK/  
KABLOLAR 3+3 DAMARLI VE 240mm<sup>2</sup> KESİTE KADAR

GOOD EMC\* CHARACTERISTIC/FLEXIBLE CABLE DESIGN/SMALL BENDING RADIUS/FLAME RETARDANT CHARACTERISTIC/  
3+3 CORES AND UP TO 240mm<sup>2</sup> CROSS SECTION



## KULLANIM ALANLARI

Elektromanyetik karışım ve girişimlerin olduğu frekans kontrollü motor beslemelerinde

- Otomobil Endüstrisinde
- Enerji İstasyonlarında
- Ambalaj Endüstrisinde
- Takım Tezgahlarında
- Montaj ve Üretim Hatlarında
- Endüstriyel Pompalarda
- Havalandırma Sistemlerinde
- Taşıma Bantlarında
- Kuru, nemli, asitlik ve yağlı ortamlarda
- Mekanik zorlanmaların orta derece olduğu yerlerde kullanılır

## APPLICATION

At frequency controlled motor supply that intensely populated by people where there is electromagnetic interference

- Automobile Industry
- Energy Stations
- Packaging Industry
- Machine Tools
- In assembly and production lines
- Industrial Pumps
- In Ventilation Systems
- Conveyor Belts
- Dry, humid, oily and acidic places
- In places where medium level mechanical stresses exist

## KABLO YAPISI

|                       |                                                                              |
|-----------------------|------------------------------------------------------------------------------|
| <b>1-İletken</b>      | IEC 60228; DIN EN 60228; EN 60228 Sınıf 5<br>Bükülü Elektrolitik Tavlı Bakır |
| <b>2-Yalıtkan</b>     | DIN VDE 0207 Bölüm-2 PE Kompaund                                             |
| <b>3-Yalıtım Renk</b> | DIN VDE 0293; TS HD 308 S2                                                   |
| <b>4-Büküm</b>        | Uygun adımda katlar halinde                                                  |
| <b>5-Ekran</b>        | Pes Bant + Al-Pes Bant + Kalaylı Bakır Örgü                                  |
| <b>6-Kılıf</b>        | EN 50363-4-1 PVC Kompaund                                                    |
| <b>7-Kılıf Rengi</b>  | Şeffaf                                                                       |

## CONSTRUCTION

|                        |                                                                                |
|------------------------|--------------------------------------------------------------------------------|
| <b>1-Conductor</b>     | IEC 60228; DIN EN 60228; EN 60228 Class 5<br>Stranded Electrolytic Bare Copper |
| <b>2-Insulation</b>    | DIN VDE 0207 PART-2 PE Compound                                                |
| <b>3-Colour Code</b>   | DIN VDE 0293; TS HD 308 S2                                                     |
| <b>4-Stranding</b>     | In layers of optimum pitch                                                     |
| <b>5-Screen</b>        | Pes Tape + Al-Pes Tape + Tinned Copper Braid                                   |
| <b>6-Sheath</b>        | EN 50363-4-1 PVC Compound                                                      |
| <b>7-Sheath Colour</b> | Transparent                                                                    |

## TEKNİK ÖZELLİKLER TECHNICAL CHARACTERISTICS

| İLETKEN DİRENCİ<br>CONDUCTOR<br>RESISTANCE | YALITIM DİRENCİ<br>INSULATION<br>RESISTANCE | AKIM TAŞIMA KAPASİTESİ<br>CURRENT CARRYING<br>CAPACITY | ÇALIŞMA VOLTAJİ<br>OPERATING<br>VOLTAGE | TEST VOLTAJİ<br>TEST VOLTAGE | EFEKTİF KAPASİTE<br>MUTUAL CAPACITANCE                                                                       | BÜKÜLME YARIÇAPI<br>BENDING RADIUS | ÇALIŞMA SICAKLIĞI<br>TEMPERATURE RANGE                            | ALEV GECİKTİRİCİLİK<br>TESTİ<br>FLAME RETARDANT TEST |
|--------------------------------------------|---------------------------------------------|--------------------------------------------------------|-----------------------------------------|------------------------------|--------------------------------------------------------------------------------------------------------------|------------------------------------|-------------------------------------------------------------------|------------------------------------------------------|
| mm <sup>2</sup> Ω/km                       | 200MΩxkm                                    | mm <sup>2</sup> A                                      | U <sub>0</sub> /U <sub>m</sub> (Max)    | 4000V                        | Damar/Damar=70-250 nF/km<br>Damar/Ekran=110-410 nF/km<br>Core/Core=70-250 nF/km<br>Core/Screen=110-410 nF/km | 10x Cable Ø                        | Hareketli / Mobile<br>+5°C-+70°C<br>Sabit / Stable<br>-40°C-+70°C | IEC 60332-1-2<br>DIN EN 60332-1-2<br>EN 60332-1-2    |
| 1,5 13,3                                   |                                             | 1,5 20                                                 | 0,6/1(1,2) kV                           |                              |                                                                                                              |                                    |                                                                   |                                                      |
| 2,5 7,98                                   |                                             | 2,5 25                                                 |                                         |                              |                                                                                                              |                                    |                                                                   |                                                      |
| 4,0 4,95                                   |                                             | 4,0 34                                                 |                                         |                              |                                                                                                              |                                    |                                                                   |                                                      |
| 6,0 3,30                                   |                                             | 6,0 44                                                 |                                         |                              |                                                                                                              |                                    |                                                                   |                                                      |
| 10 1,91                                    |                                             | 10 61                                                  |                                         |                              |                                                                                                              |                                    |                                                                   |                                                      |
| 16 1,21                                    |                                             | 16 82                                                  |                                         |                              |                                                                                                              |                                    |                                                                   |                                                      |
| 25 0,780                                   |                                             | 25 108                                                 |                                         |                              |                                                                                                              |                                    |                                                                   |                                                      |
| 35 0,554                                   |                                             | 35 135                                                 |                                         |                              |                                                                                                              |                                    |                                                                   |                                                      |
| 50 0,386                                   |                                             | 50 168                                                 |                                         |                              |                                                                                                              |                                    |                                                                   |                                                      |
| 70 0,272                                   |                                             | 70 207                                                 |                                         |                              |                                                                                                              |                                    |                                                                   |                                                      |
| 95 0,206                                   |                                             | 95 250                                                 |                                         |                              |                                                                                                              |                                    |                                                                   |                                                      |

## NOTLAR

\*EMC: Elektromanyetik uyumlu

Esnek yapıları ile dar alanlarda rahatlıkla uygulanabilirler.  
Bu tip kablolar dış ortamlarda kullanıma uygun değildir.

**OZ:** Siyah yalıtım+Sarı/Yeşil toprak koruma damarsız

**JZ:** Siyah yalıtım+Sarı/Yeşil toprak koruma damarı

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**JB:** Renk kodlu yalıtım +Sarı/Yeşil toprak koruma damarı

## NOTES

\*EMC: Electromagnetic compatibility

With their flexible design they can easily be used in narrow spaces.  
These cables are not suitable for outdoor use.

**OZ:** Black insulation+Without Green/Yellow earthing core

**JZ:** Black insulation+Green/Yellow earthing core

**OB:** Colour code insulation+Without Green/Yellow earthing core

**JB:** Colour code insulation+With Green/Yellow earthing core

# ERFLEX SERVO 160-CYK (3+) / 2YSLCYK (3+)



İYİ EMC\* ÖZELLİK/ESNEK KABLO YAPISI/KÜÇÜK BÜKÜLME YARIÇAPI/ALEV GECİKTİRİCİ ÖZELLİK/  
KABLOLAR 3+3 DAMARLI VE 240mm<sup>2</sup> KESİTE KADAR

GOOD EMC\* CHARACTERISTIC/FLEXIBLE CABLE DESIGN/SMALL BENDING RADIUS/FLAME RETARDANT CHARACTERISTIC/  
3+3 CORES AND UP TO 240mm<sup>2</sup> CROSS SECTION



## KULLANIM ALANLARI

Elektromanyetik karışım ve girişimlerin olduğu frekans kontrollü motor beslemelerinde

- Otomobil Endüstrisinde
- Enerji İstasyonlarında
- Ambalaj Endüstrisinde
- Takım Tezgahlarında
- Montaj ve Üretim Hatlarında
- Endüstriyel Pompalarda
- Havalandırma Sistemlerinde
- Taşıma Bantlarında
- Kuru, nemli, asitlik ve yağlı ortamlarda
- Mekanik zorlanmaların orta derece olduğu yerlerde kullanılır

## APPLICATION

At frequency controlled motor supply that intensely populated by people where there is electromagnetic interference

- Automobile Industry
- Energy Stations
- Packaging Industry
- Machine Tools
- In assembly and production lines
- Industrial Pumps
- In Ventilation Systems
- Conveyor Belts
- Dry, humid, oily and acidic places
- In places where medium level mechanical stresses exist

## KABLO YAPISI

|                       |                                                                              |
|-----------------------|------------------------------------------------------------------------------|
| <b>1-İletken</b>      | IEC 60228; DIN EN 60228; EN 60228 Sınıf 5<br>Bükülü Elektrolitik Tavlı Bakır |
| <b>2-Yalıtkan</b>     | DIN VDE 0207 Bölüm-2 PE Kompaund                                             |
| <b>3-Yalıtım Renk</b> | DIN VDE 0293; TS HD 308 S2                                                   |
| <b>4-Büküm</b>        | Uygun adımda katlar halinde                                                  |
| <b>5-Ekran</b>        | Pes Bant + Al-Pes Bant + Kalaylı Bakır Örgü                                  |
| <b>6-Kılıf</b>        | EN 50363-4-1 PVC Kompaund                                                    |
| <b>7-Kılıf Rengi</b>  | RAL 9005 Siyah                                                               |

## CONSTRUCTION

|                        |                                                                                |
|------------------------|--------------------------------------------------------------------------------|
| <b>1-Conductor</b>     | IEC 60228; DIN EN 60228; EN 60228 Class 5<br>Stranded Electrolytic Bare Copper |
| <b>2-Insulation</b>    | DIN VDE 0207 PART-2 PE Compound                                                |
| <b>3-Colour Code</b>   | DIN VDE 0293; TS HD 308 S2                                                     |
| <b>4-Stranding</b>     | In layers of optimum pitch                                                     |
| <b>5-Screen</b>        | Pes Tape + Al-Pes Tape + Tinned Copper Braid                                   |
| <b>6-Sheath</b>        | EN 50363-4-1 PVC Compound                                                      |
| <b>7-Sheath Colour</b> | RAL 9005 Black                                                                 |

## TEKNİK ÖZELLİKLER TECHNICAL CHARACTERISTICS

| İLETKEN DİRENCİ<br>CONDUCTOR<br>RESISTANCE | YALITIM DİRENCİ<br>INSULATION<br>RESISTANCE | AKIM TAŞIMA KAPASİTESİ<br>CURRENT CARRYING<br>CAPACITY | ÇALIŞMA VOLTAJİ<br>OPERATING<br>VOLTAGE               | TEST VOLTAJİ<br>TEST VOLTAGE | EFEKTİF KAPASİTE<br>MUTUAL CAPACITANCE                                                                           | BÜKÜLME YARIÇAPI<br>BENDING RADIUS | ÇALIŞMA SICAKLIĞI<br>TEMPERATURE RANGE                            | ALEV GECİKTİRİCİLİK<br>TESTİ<br>FLAME RETARDANT TEST |
|--------------------------------------------|---------------------------------------------|--------------------------------------------------------|-------------------------------------------------------|------------------------------|------------------------------------------------------------------------------------------------------------------|------------------------------------|-------------------------------------------------------------------|------------------------------------------------------|
| mm <sup>2</sup><br>Ω/km                    | 200MΩxkm                                    | mm <sup>2</sup><br>A                                   | U <sub>0</sub> /U(U <sub>max</sub> )<br>0,6/1(1,2) kV | 4000V                        | Damar/Damar=70-250 nF/km<br>Damar/Ekran =110-410 nF/km<br>Core/Core = 70-250 nF/km<br>Core/Screen =110-410 nF/km | 10x Cable Ø                        | Hareketli / Mobile<br>+5°C-+70°C<br>Sabit / Stable<br>-40°C-+70°C | IEC 60332-1-2<br>DIN EN 60332-1-2<br>EN 60332-1-2    |
| 1,5<br>13,3                                |                                             | 1,5<br>20                                              |                                                       |                              |                                                                                                                  |                                    |                                                                   |                                                      |
| 2,5<br>7,98                                |                                             | 2,5<br>25                                              |                                                       |                              |                                                                                                                  |                                    |                                                                   |                                                      |
| 4,0<br>4,95                                |                                             | 4,0<br>34                                              |                                                       |                              |                                                                                                                  |                                    |                                                                   |                                                      |
| 6,0<br>3,30                                |                                             | 6,0<br>44                                              |                                                       |                              |                                                                                                                  |                                    |                                                                   |                                                      |
| 10<br>1,91                                 |                                             | 10<br>61                                               |                                                       |                              |                                                                                                                  |                                    |                                                                   |                                                      |
| 16<br>1,21                                 |                                             | 16<br>82                                               |                                                       |                              |                                                                                                                  |                                    |                                                                   |                                                      |
| 25<br>0,780                                |                                             | 25<br>108                                              |                                                       |                              |                                                                                                                  |                                    |                                                                   |                                                      |
| 35<br>0,554                                |                                             | 35<br>135                                              |                                                       |                              |                                                                                                                  |                                    |                                                                   |                                                      |
| 50<br>0,386                                |                                             | 50<br>168                                              |                                                       |                              |                                                                                                                  |                                    |                                                                   |                                                      |
| 70<br>0,272                                |                                             | 70<br>207                                              |                                                       |                              |                                                                                                                  |                                    |                                                                   |                                                      |
| 95<br>0,206                                |                                             | 95<br>250                                              |                                                       |                              |                                                                                                                  |                                    |                                                                   |                                                      |

## NOTLAR

\*EMC: Elektromanyetik uyumlu

Esnek yapıları ile dar alanlarda rahatlıkla uygulanabilirler.  
Bu tip kablolar dış ortamlarda kullanıma uygun değildir.

**OZ:** Siyah yalıtım+Sarı/Yeşil toprak koruma damarsız

**JZ:** Siyah yalıtım+Sarı/Yeşil toprak koruma damarı

**OB:** Renk kodlu yalıtım+Sarı/Yeşil toprak koruma damarsız

**JB:** Renk kodlu yalıtım +Sarı/Yeşil toprak koruma damarı

## NOTES

\*EMC: Electromagnetic compatibility

With their flexible design they can easily be used in narrow spaces.  
These cables are not suitable for outdoor use.

**OZ:** Black insulation+Without Green/Yellow earthing core

**JZ:** Black insulation+Green/Yellow earthing core

**OB:** Colour code insulation+Without Green/Yellow earthing core

**JB:** Colour code insulation+With Green/Yellow earthing core





## **YANGINA DAYANIKLI SİNYAL KONTROL KABLOLARI** **FIRE RESISTANT SIGNAL CONTROL CABLES**



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# ERVITAL JE-H(St)H...Bd FE180/PH120

VDE 0815



ALEV GECİKTİRİCİ ÖZELLİK/DÜŞÜK DUMAN YOĞUNLUĞU/ZEHİRLİ VE KOROZİF GAZLARDAN ARINDIRILMIŞ/  
DEVRE BÜTÜNLÜĞÜ MİNİMUM 180 DAKİKA/MEKANİK ŞOKLU DEVRE BÜTÜNLÜĞÜ PH120  
FLAME RETARDANT CHARACTERISTIC/LOW SMOKE EMISSION/WITHOUT POISONED AND CORROSIVE GASES  
CIRCUIT INTEGRITY 180 MINUTES/CIRCUIT INTEGRITY WITH MECHANICAL SHOCK PH120



## KULLANIM ALANLARI

- İnsanların yoğun olarak bulunduğu kapalı ortamlarda
- Elektromanyetik karışım ve girişimlerin olduğu yerlerde
- Enstrüman ve kontrol mühendisliğinde
- Endüstriyel elektronikte
- Sinyal iletiminde
- Bina içi haberleşme sistemlerinde
- Güvenlik ve yangın ihbar sistemlerinde
- İnsan hayatının, değerli malzemelerin ve ekipmanların korunması gereken yerlerde

## KABLO YAPISI

|                       |                                                                  |
|-----------------------|------------------------------------------------------------------|
| <b>1-İletken</b>      | IEC 60228; VDE 0295; EN 60228 Sınıf 1<br>Elektrolitik Mono Bakır |
| <b>2-Yalıtkan</b>     | Çapraz Bağlı Seramik Formunda Polimer Kompaund                   |
| <b>3-Yalıtım Renk</b> | VDE 0815                                                         |
| <b>4-Büküm</b>        | 2 çift yıldız dördü düzeninde, 2 çift üzeri katlar halinde       |
| <b>5-Ayırıcı Bant</b> | Pes Bant + Cam Elyaf Bant                                        |
| <b>6-Ekran</b>        | Kalaylı Bakır Toprak Teli + Al-Pes Bant                          |
| <b>7-Kılıf</b>        | EN 50290-2-27 HFFR Kompaund                                      |
| <b>8-Kılıf Rengi</b>  | RAL 3000 Kırmızı ya da RAL 2003 Turuncu                          |

## TEKNİK ÖZELLİKLER

### TECHNICAL CHARACTERISTICS

| ÇEVİRİM DİRENCİ<br>LOOP<br>RESISTANCE | YALITIM DİRENCİ (min)<br>INSULATION<br>RESISTANCE (min)                   | EFEKTİF KAPASİTE<br>MUTUAL<br>CAPACITANCE | ÇALIŞMA VOLTAJİ<br>OPERATING<br>VOLTAGE |
|---------------------------------------|---------------------------------------------------------------------------|-------------------------------------------|-----------------------------------------|
| mm <sup>2</sup> Ω/km                  | 100MΩxkm                                                                  | 120nF/km                                  | 225V                                    |
| 0,6    130                            |                                                                           |                                           |                                         |
| 0,8    73,2                           |                                                                           |                                           |                                         |
| 1,0    44,6                           |                                                                           |                                           |                                         |
| 1,5    24,6                           |                                                                           |                                           |                                         |
| 2,5    15,1                           |                                                                           |                                           |                                         |
| BÜKÜLME YARIÇAPI<br>BENDING RADIUS    | TEST VOLTAJİ (50 Hz 1 Dk) DMR/DMR<br>TEST VOLTAGE (50 Hz 1 Min) CORE/CORE | ÇALIŞMA SICAKLIĞI<br>TEMPERATURE RANGE    |                                         |
| 10x Cable Ø                           | 0,6/0,8mm: 500V<br>≥1 0mm: 1000V                                          | - 40°C - +70°C                            |                                         |

## NOTLAR NOTES

\*Bu kablo PH180 testlerinde VDE tarafından onaylanmış ve sertifikalandırılmıştır.

\*This cable has been approved and certified by VDE on PH180 tests.

## APPLICATION

- Indoors where people are densely populated
- In places where there is electromagnetic interference
- Instrumentation and control engineering
- Industrial electronics
- For signal transmission
- Indoor communication systems
- In safety and fire alarm systems
- In places where human life and valuable materials and equipment need to be protected

## CONSTRUCTION

|                        |                                                              |
|------------------------|--------------------------------------------------------------|
| <b>1-Conductor</b>     | IEC 60228; VDE 0295; EN 60228 Class 1<br>Electrolytic Copper |
| <b>2-Insulation</b>    | Cross-linked Ceramic Forming Polymer Compound                |
| <b>3-Colour Code</b>   | VDE 0815                                                     |
| <b>4-Stranding</b>     | 2 pair star quad, more than 2 pairs groups in layers         |
| <b>5-Wrapping</b>      | Pes Tape + Glass Fibre Tape                                  |
| <b>6-Screen</b>        | Tinned Copper Drain Wire + Al-Pes Tape                       |
| <b>7-Sheath</b>        | EN 50290-2-27 HFFR Compound                                  |
| <b>8-Sheath Colour</b> | RAL 3000 Red or RAL 2003 Orange                              |

## YANGIN PERFORMANS TESTLERİ

### FLAME PERFORMANCE TESTS

|                                                                                     |                                                                                      |                                                                                             |                                                                                       |
|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
|  |  |        |  |
| ALEV GECİKTİRİCİLİK<br>TESTİ<br>FLAME RETARDANT TEST                                | ALEV YAYILIMI TESTİ<br>FLAME PROPAGATION TEST                                        | DUMAN YOĞUNLUĞU<br>TESTİ<br>SMOKE DENSITY TEST                                              | KOROZİF GAZ TESTİ<br>TEST ON CORROSIVENESS<br>COMBUSTION GASES                        |
| IEC 60332-1-2<br>VDE 0482-332-1-2<br>EN 60332-1-2<br>BS EN 60332-1-2                | IEC 60332-3-24<br>VDE 0482-332-3-24<br>EN 60332-3-24<br>EN 60332-3-24                | IEC 61034-2<br>VDE 0482-1034-2<br>EN 61034-2<br>BS EN 61034-2                               | IEC 60754-2<br>VDE 0482-754-2<br>EN 60754-2<br>BS EN 60754-2                          |
|  |  |        |                                                                                       |
| HALOJENSİZLİK<br>TESTİ<br>HALOGEN FREE TEST                                         | DEVRE BÜTÜNLÜĞÜ TESTİ(FE180)<br>CIRCUIT INTEGRITY TEST (FE180)                       | MEKANİK ŞOKLU<br>DEVRE BÜTÜNLÜĞÜ TESTİ (PH120)<br>CIRCUIT INTEGRITY WITH SHOCK TEST (PH120) |                                                                                       |
| IEC 60754-1<br>VDE 0482-754-1<br>EN 60754-1<br>BS EN 60754-1                        | IEC 60331-23                                                                         | EN 50200<br>VDE 0482-200<br>BS EN 50200                                                     |                                                                                       |

# ERVITAL JE-H(St)H...Bd FE180/E30

VDE 0815



ALEV GECİKTİRİCİ ÖZELLİK/DÜŞÜK DUMAN YOĞUNLUĞU/ZEHİRLİ VE KOROZİF GAZLARDAN ARINDIRILMIŞ DEVRE BÜTÜNLÜĞÜ 180 DAKİKA/KABLO SİSTEMİNİN DEVRE BÜTÜNLÜĞÜ E30

FLAME RETARDANT CHARACTERISTIC/LOW SMOKE EMISSION/WITHOUT POISONED AND CORROSIVE GASES CIRCUIT INTEGRITY FOR MINIMUM 180 MINUTES/CABLE SYSTEM CIRCUIT INTEGRITY E30



## KULLANIM ALANLARI

Elektromanyetik karışma ve girişimlerin olduğu  
İnsanların yoğun olarak bulunduğu kapalı ortamlarda

- Enstrüman ve kontrol mühendisliğinde
- Endüstriyel elektronikte
- Bilgisayar ve ofis makinelerinde
- Bina içi haberleşme sistemlerinde
- Bina içi ses sistemlerinde
- İnsan hayatının ve önemli malzemelerin korunması gereken yerlerde

## APPLICATION

In places where electro-magnetic interference and influence exists  
Indoors where people are densely populated

- Instrumentation and control engineering
- Industrial electronics
- Computers and office machines
- Indoor communication systems
- Indoor sound systems
- In places where human life and valuable materials and equipment need to be protected

## KABLO YAPISI

|                       |                                                                 |
|-----------------------|-----------------------------------------------------------------|
| <b>1-İletken</b>      | IEC 60228, DIN VDE 0295, EN 60228 Sınıf 1<br>Elektrolitik Bakır |
| <b>2-Yalıtkan</b>     | Çapraz Bağlı Seramik Formunda Polimer Kompaund                  |
| <b>3-Yalıtım Renk</b> | VDE 0815                                                        |
| <b>4-Büküm</b>        | 2 Çift yıldız dörtlü düzeninde, 2 çift üzeri katlar halinde     |
| <b>5-Ayırıcı Bant</b> | Pes Bant + Cam Elyaf Bant                                       |
| <b>6-Ekran</b>        | Kalaylı Bakır Toprak Teli + Al-Pes Bant                         |
| <b>7-Kılıf</b>        | EN 50290-2-27 HFFR Kompaund                                     |
| <b>8-Kılıf Rengi</b>  | RAL 3000 Kırmızı ve RAL 2003 Turuncu                            |

## CONSTRUCTION

|                        |                                                              |
|------------------------|--------------------------------------------------------------|
| <b>1-Conductor</b>     | IEC 60228; VDE 0295; EN 60228 Class 1<br>Electrolytic Copper |
| <b>2-Insulation</b>    | Cross-linked Ceramic Forming Polymer Compound                |
| <b>3-Colour Code</b>   | VDE 0815                                                     |
| <b>4-Stranding</b>     | 2 pair star quad, more than 2 pairs groups in layers         |
| <b>5-Wrapping</b>      | Pes Tape + Glass Fibre Tape                                  |
| <b>6-Screen</b>        | Tinned Copper Drain Wire + Al-Pes Tape                       |
| <b>7-Sheath</b>        | EN 50290-2-27 HFFR Compound                                  |
| <b>8-Sheath Colour</b> | RAL 3000 Red or RAL 2003 Orange                              |

## TEKNİK ÖZELLİKLER

### TECHNICAL CHARACTERISTICS

| ÇEVİRİM DİRENCİ<br>LOOP RESISTANCE | YALITIM DİRENCİ (min)<br>INSULATION RESISTANCE (min) | EFEKTİF KAPASİTE<br>MUTUAL CAPACITANCE | ÇALIŞMA VOLTAJİ<br>OPERATING VOLTAGE |
|------------------------------------|------------------------------------------------------|----------------------------------------|--------------------------------------|
| mm <sup>2</sup> Ω/km               | 100MΩxkm                                             | 120nF/km                               | 225V                                 |
| 0,6    130                         |                                                      |                                        |                                      |
| 0,8    73,2                        |                                                      |                                        |                                      |
| 1,0    44,6                        |                                                      |                                        |                                      |
| 1,5    24,6                        |                                                      |                                        |                                      |
| 2,5    15,1                        |                                                      |                                        |                                      |
| BÜKÜLME YARIÇAPİ<br>BENDING RADIUS | TEST VOLTAJİ<br>TEST VOLTAGE                         | ÇALIŞMA SICAKLIĞI<br>TEMPERATURE RANGE |                                      |
| 10x Cable Ø                        | 0,6/0,8mm: 500V<br>>1,0mm: 1000V                     | - 40°C - +70°C                         |                                      |

## YANGIN PERFORMANS TESTLERİ

### FLAME PERFORMANCE TESTS

| ALEV GECİKTİRİCİLİK<br>TESTİ<br>FLAME RETARDANT TEST                 | ALEV YAYILIMI TESTİ<br>FLAME PROPAGATION TEST                            | DUMAN YOĞUNLUĞU<br>TESTİ<br>SMOKE DENSITY TEST                                                | KOROZİF GAZ TESTİ<br>TEST ON CORROSIVENESS<br>COMBUSTION GASES                            |
|----------------------------------------------------------------------|--------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|
| IEC 60332-1-2<br>VDE 0482-332-1-2<br>EN 60332-1-2<br>BS EN 60332-1-2 | IEC 60332-3-24<br>VDE 0482-332-3-24<br>EN 60332-3-24<br>BS EN 60332-3-24 | IEC 61034-2<br>VDE 0482-1034-2<br>EN 61034-2<br>BS EN 61034-2                                 | IEC 60754-2<br>VDE 0482-754-2<br>EN 60754-2<br>BS EN 60754-2                              |
| HALOJENSİZLİK<br>TESTİ<br>HALOGEN FREE TEST                          | DEVRE BÜTÜNLÜĞÜ TESTİ<br>(FE180)<br>CIRCUIT INTEGRITY TEST<br>(FE180)    | MEKANİK SOKLU AKIM DEVRE BÜTÜNLÜĞÜ TESTİ (PHI20)<br>CIRCUIT INTEGRITY WITH SHOCK TEST (PHI20) | KABLO SİSTEMİNİN DEVRE BÜTÜNLÜĞÜ TESTİ (E30)<br>CABLE SYSTEM CIRCUIT INTEGRITY TEST (E30) |
| IEC 60754-1<br>VDE 0482-754-1<br>EN 60754-1<br>BS EN 60754-1         | IEC 60331-23                                                             | EN 50200<br>VDE 0482-200<br>BS EN 50200                                                       | DIN 4102-12                                                                               |

# ERVITAL JE-H(St)H...Bd FE180/E90

VDE 0815



ALEV GECİKTİRİCİ ÖZELLİK/DÜŞÜK DUMAN YOĞUNLUĞU/ZEHİRLİ VE KOROZİF GAZLARDAN ARINDIRILMIŞ DEVRE BÜTÜNLÜĞÜ 180 DAKİKA/KABLO SİSTEMİNİN DEVRE BÜTÜNLÜĞÜ E90

FLAME RETARDANT CHARACTERISTIC/LOW SMOKE EMISSION/WITHOUT POISONED AND CORROSIVE GASES CIRCUIT INTEGRITY FOR MINIMUM 180 MINUTES/CABLE SYSTEM CIRCUIT INTEGRITY E90



## KULLANIM ALANLARI

Elektromanyetik karışma ve girişimlerin olduğu  
İnsanların yoğun olarak bulunduğu kapalı ortamlarda

- Enstrüman ve kontrol mühendisliğinde
- Endüstriyel elektronikte
- Bilgisayar ve ofis makinelerinde
- Bina içi haberleşme sistemlerinde
- Bina içi ses sistemlerinde
- İnsan hayatının ve önemli malzemelerin korunması gereken yerlerde

## APPLICATION

In places where electro-magnetic interference and influence exists  
Indoors where people are densely populated

- Instrumentation and control engineering
- Industrial electronics
- Computers and office machines
- Indoor communication systems
- Indoor sound systems
- In places where human life and valuable materials and equipment need to be protected

## KABLO YAPISI

|                       |                                                                 |
|-----------------------|-----------------------------------------------------------------|
| <b>1-İletken</b>      | IEC 60228, DIN VDE 0295, EN 60228 Sınıf 1<br>Elektrolitik Bakır |
| <b>2-Yalıtkan</b>     | Çapraz Bağlı Seramik Formunda Polimer Kompaund                  |
| <b>3-Yalıtım Renk</b> | VDE 0815                                                        |
| <b>4-Büküm</b>        | 2 Çift yıldız dördü düzeninde, 2 çift üzeri katlar halinde      |
| <b>5-Ayırıcı Bant</b> | Pes Bant + Cam Elyaf Bant                                       |
| <b>6-Ekran</b>        | Kalaylı Bakır Toprak Teli + Al-Pes Bant                         |
| <b>7-Kılıf</b>        | EN 50290-2-27 HFFR Kompaund                                     |
| <b>8-Kılıf Rengi</b>  | RAL 3000 Kırmızı ve RAL 2003 Turuncu                            |

## CONSTRUCTION

|                        |                                                              |
|------------------------|--------------------------------------------------------------|
| <b>1-Conductor</b>     | IEC 60228; VDE 0295; EN 60228 Class 1<br>Electrolytic Copper |
| <b>2-Insulation</b>    | Cross-linked Ceramic Forming Polymer Compound                |
| <b>3-Colour Code</b>   | VDE 0815                                                     |
| <b>4-Stranding</b>     | 2 pair star quad, more than 2 pairs groups in layers         |
| <b>5-Wrapping</b>      | Pes Tape + Glass Fibre Tape                                  |
| <b>6-Screen</b>        | Tinned Copper Drain Wire + Al-Pes Tape                       |
| <b>7-Sheath</b>        | EN 50290-2-27 HFFR Compound                                  |
| <b>8-Sheath Colour</b> | RAL 3000 Red or RAL 2003 Orange                              |

## TEKNİK ÖZELLİKLER

### TECHNICAL CHARACTERISTICS

| ÇEVİRİM DİRENCİ<br>LOOP<br>RESISTANCE | YALITIM DİRENCİ (min)<br>INSULATION<br>RESISTANCE (min) | EFEKTİF KAPASİTE<br>MUTUAL<br>CAPACITANCE | ÇALIŞMA VOLTAJİ<br>OPERATING<br>VOLTAGE |
|---------------------------------------|---------------------------------------------------------|-------------------------------------------|-----------------------------------------|
| mm <sup>2</sup> Ω/km                  | 100MΩxkm                                                | 120nF/km                                  | 225V                                    |
| 0,6    130                            |                                                         |                                           |                                         |
| 0,8    73,2                           |                                                         |                                           |                                         |
| 1,0    44,6                           |                                                         |                                           |                                         |
| 1,5    24,6                           |                                                         |                                           |                                         |
| 2,5    15,1                           |                                                         |                                           |                                         |
| BÜKÜLMÜ YARIÇAPI<br>BENDING RADIUS    | TEST VOLTAJİ<br>TEST VOLTAGE                            | ÇALIŞMA SICAKLIĞI<br>TEMPERATURE RANGE    |                                         |
| 10x Cable Ø                           | 0,6/0,8mm: 500V<br>>1,0mm: 1000V                        | - 40°C - +70°C                            |                                         |

## YANGIN PERFORMANS TESTLERİ

### FLAME PERFORMANCE TESTS

| ALEV GECİKTİRİCİLİK<br>TESTİ<br>FLAME RETARDANT TEST                 | ALEV YAYILIMI TESTİ<br>FLAME PROPAGATION TEST                            | DUMAN YOĞUNLUĞU<br>TESTİ<br>SMOKE DENSITY TEST                                                   | KOROZİF GAZ TESTİ<br>TEST ON CORROSIVENESS<br>COMBUSTION GASES                                  |
|----------------------------------------------------------------------|--------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|
| IEC 60332-1-2<br>VDE 0482-332-1-2<br>EN 60332-1-2<br>BS EN 60332-1-2 | IEC 60332-3-24<br>VDE 0482-332-3-24<br>EN 60332-3-24<br>BS EN 60332-3-24 | IEC 61034-2<br>VDE 0482-1034-2<br>EN 61034-2<br>BS EN 61034-2                                    | IEC 60754-2<br>VDE 0482-754-2<br>EN 60754-2<br>BS EN 60754-2                                    |
| HALOJENSİZLİK<br>TESTİ<br>HALOGEN FREE TEST                          | DEVRE BÜTÜNLÜĞÜ TESTİ<br>(FE180)<br>CIRCUIT INTEGRITY TEST<br>(FE180)    | MEKANİK SOKLU AKIM DEVRE BÜTÜNLÜĞÜ TESTİ (PHI20)<br>CIRCUIT INTEGRITY WITH<br>SHOCK TEST (PHI20) | KABLO SİSTEMİNİN DEVRE<br>BÜTÜNLÜĞÜ TESTİ (E90)<br>CABLE SYSTEM CIRCUIT<br>INTEGRITY TEST (E90) |
| IEC 60754-1<br>VDE 0482-754-1<br>EN 60754-1<br>BS EN 60754-1         | IEC 60331-23                                                             | EN 50200<br>VDE 0482-200<br>BS EN 50200                                                          | DIN 4102-12                                                                                     |

# ERVITAL JE-H(St)HRH FE180/PH120

**VDE 0815**

ALEV GECİKTİRİCİ ÖZELLİK/DÜŞÜK DUMAN YOĞUNLUĞU/ZEHİRLİ VE KOROZİF GAZLARDAN ARINDIRILMIŞ/  
DEVRE BÜTÜNLÜĞÜ MİNİMUM 180 DAKİKA/MEKANİK ŞOKLU DEVRE BÜTÜNLÜĞÜ PH120  
FLAME RETARDANT CHARACTERISTIC/LOW SMOKE EMISSION/WITHOUT POISONED AND CORROSIVE GASES  
CIRCUIT INTEGRITY 180 MINUTES/CIRCUIT INTEGRITY WITH MECHANICAL SHOCK PH120



## KULLANIM ALANLARI

- İnsanların yoğun olarak bulunduğu kapalı ortamlarda  
Elektromanyetik karışım ve girişimlerin olduğu yerlerde  
- Enstrüman ve kontrol mühendisliğinde  
- Endüstriyel elektronikte  
- Sinyal iletiminde  
- Bina içi haberleşme sistemlerinde  
- Güvenlik ve yangın ihbar sistemlerinde  
- İnsan hayatının, değerli malzemelerin ve ekipmanların korunması  
gereken yerlerde  
- Çelik örgü sayesinde mekanik dayanıklılık gerektiren yerlerde

## KABLO YAPISI

|                       |                                                             |
|-----------------------|-------------------------------------------------------------|
| <b>1-İletken</b>      | IEC 60228; VDE 0295; EN 60228 Sınıf 1<br>Elektrolitik Bakır |
| <b>2-Yalıtkan</b>     | Çapraz Bağlı Seramik Formunda Polimer Kompaund              |
| <b>3-Yalıtım Renk</b> | VDE 0815                                                    |
| <b>4-Büküm</b>        | 4 çiftli gruplar, katlar halinde                            |
| <b>5-Ayırıcı Bant</b> | Pes Bant + Cam Elyaf Bant                                   |
| <b>6-Ekran</b>        | Kalaylı Bakır Toprak Teli + Al-Pes Bant                     |
| <b>7-İç Kılıf</b>     | EN 50290-2-27 HFFR Kompaund                                 |
| <b>8-Armür</b>        | Galvanizli Çelik Tel Örgü                                   |
| <b>9-Dış Kılıf</b>    | EN 50290-2-27 HFFR Kompaund                                 |
| <b>10-Kılıf Rengi</b> | RAL 3000 Kırmızı ya da RAL 2003 Turuncu                     |

## TEKNİK ÖZELLİKLER TECHNICAL CHARACTERISTICS

| ÇEVİRİM DİRENCİ<br>LOOP<br>RESISTANCE | YALITIM DİRENCİ (min)<br>INSULATION<br>RESISTANCE (min)                    | EFEKTİF KAPASİTE<br>MUTUAL<br>CAPACITANCE | ÇALIŞMA VOLTAJI<br>OPERATING<br>VOLTAGE |
|---------------------------------------|----------------------------------------------------------------------------|-------------------------------------------|-----------------------------------------|
| mm <sup>2</sup> Ω/km                  |                                                                            |                                           |                                         |
| 0,6 130                               | 100MΩxkm                                                                   | 120nF/km                                  | 225V                                    |
| 0,8 73,2                              |                                                                            |                                           |                                         |
| 1,0 44,6                              |                                                                            |                                           |                                         |
| 1,5 24,6                              |                                                                            |                                           |                                         |
| 2,5 15,1                              |                                                                            |                                           |                                         |
| BÜKÜLME YARIÇAPI<br>BENDING RADIUS    | TEST VOLTAJI (50 Hz 1 Dak) DMR/DMR<br>TEST VOLTAGE (50 Hz 1 Min) CORE/CORE | ÇALIŞMA SICAKLIĞI<br>TEMPERATURE RANGE    |                                         |
| 10x Cable Ø                           | 0,6/0,8mm: 500V<br>>1,0mm: 1000V                                           | -40°C - +70°C                             |                                         |

## APPLICATION

- Indoors where people are densely populated  
In places where there is electromagnetic interference  
- Instrumentation and control engineering  
- Industrial electronics  
- For signal transmission  
- Indoor communication systems  
- In safety and fire alarm systems  
- In places where human life and valuable materials and equipment  
need to be protected  
- In places where mechanical strength is required

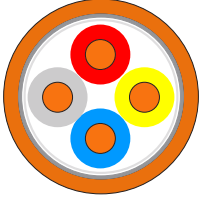
## CONSTRUCTION

|                         |                                                              |
|-------------------------|--------------------------------------------------------------|
| <b>1-Conductor</b>      | IEC 60228; VDE 0295; EN 60228 Class 1<br>Electrolytic Copper |
| <b>2-Insulation</b>     | Cross-linked Ceramic Forming Polymer Compound                |
| <b>3-Colour Code</b>    | VDE 0815                                                     |
| <b>4-Stranding</b>      | 4 pair groups in layers                                      |
| <b>5-Wrapping</b>       | Pes Tape + Glass Fibre Tape                                  |
| <b>6-Screen</b>         | Tinned Copper Drain Wire + Al-Pes Tape                       |
| <b>7-Inner Sheath</b>   | EN 50290-2-27 HFFR Compound                                  |
| <b>8-Armour</b>         | Galvanized Steel Wire Braid                                  |
| <b>9-Outer Sheath</b>   | EN 50290-2-27 HFFR Compound                                  |
| <b>10-Sheath Colour</b> | RAL 3000 Red or RAL 2003 Orange                              |

## YANGIN PERFORMANS TESTLERİ FLAME PERFORMANCE TESTS

| ALEV GECİKTİRİCİLİK<br>TESTİ<br>FLAME RETARDANT TEST                 | ALEV YAYILIMI TESTİ<br>FLAME PROPAGATION TEST                            | DUMAN YOĞUNLUĞU<br>TESTİ<br>SMOKE DENSITY TEST                                              | KOROZİF GAZ TESTİ<br>TEST ON CORROSIVENESS<br>COMBUSTION GASES |
|----------------------------------------------------------------------|--------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|----------------------------------------------------------------|
| IEC 60332-1-2<br>VDE 0482-332-1-2<br>EN 60332-1-2<br>BS EN 60332-1-2 | IEC 60332-3-24<br>VDE 0482-332-3-24<br>EN 60332-3-24<br>BS EN 60332-3-24 | IEC 61034-2<br>VDE 0482-1034-2<br>EN 61034-2<br>BS EN 61034-2                               | IEC 60754-2<br>VDE 0482-754-2<br>EN 60754-2<br>BS EN 60754-2   |
| HALOJENSİZLİK TESTİ<br>HALOGEN FREE TEST                             | DEVRE BÜTÜNLÜĞÜ TESTİ (FE180)<br>CIRCUIT INTEGRITY TEST (FE180)          | MEKANİK ŞOKLU<br>DEVRE BÜTÜNLÜĞÜ TESTİ (PH120)<br>CIRCUIT INTEGRITY WITH SHOCK TEST (PH120) |                                                                |
| IEC 60754-1<br>VDE 0482-754-1<br>EN 60754-1<br>BS EN 60754-1         | IEC 60331-23                                                             | EN 50200<br>VDE 0482-200<br>BS EN 50200                                                     |                                                                |

# ERVITAL JE-HH FE180/PH120

**VDE 0815**

ALEV GECİKTİRİCİ ÖZELLİK/DÜŞÜK DUMAN YOĞUNLUĞU/ZEHİRLİ VE KOROZİF GAZLARDAN ARINDIRILMIŞ  
DEVRE BÜTÜNLÜĞÜ MİNİMUM 180 DAKİKA/MEKANİK ŞOKLU DEVRE BÜTÜNLÜĞÜ PH120  
FLAME RETARDANT CHARACTERISTIC/LOW SMOKE EMISSION/WITHOUT POISONED AND CORROSIVE GASES  
CIRCUIT INTEGRITY 180 MINUTES/CIRCUIT INTEGRITY WITH MECHANICAL SHOCK PH120



## KULLANIM ALANLARI

İnsanların yoğun olarak bulunduğu kapalı ortamlarda  
-Enstrüman ve kontrol mühendisliğinde  
-Endüstriyel elektronikte  
-Bilgisayar ve ofis makinelerinde  
-Bina içi haberleşme sistemlerinde  
-Bina içi ses sistemlerinde  
-İnsan hayatının ve önemli malzemelerin korunması gereken yerlerde

## APPLICATION

Indoors where people are densely populated  
-Instrumentation and control engineering  
-Industrial electronics  
-Computers and office machines  
-Indoor communication systems  
-Indoor sound systems  
-In places where human life and valuable materials and equipment need to be protected

## KABLO YAPISI

|                       |                                                                 |
|-----------------------|-----------------------------------------------------------------|
| <b>1-İletken</b>      | IEC 60228; DIN VDE 0295; EN 60228 Sınıf 1<br>Elektrolitik Bakır |
| <b>2-Yalıtkan</b>     | Çapraz Bağlı Seramik Formunda Polimer<br>Kompaund               |
| <b>3-Yalıtım Renk</b> | VDE 0815                                                        |
| <b>4-Büküm</b>        | 4 çiftli gruplar                                                |
| <b>5-Ayırıcı Bant</b> | Pes Bant + Cam Elyaf Bant                                       |
| <b>6-Kılıf</b>        | EN 50290-2-27 HFFR Kompaund                                     |

## CONSTRUCTION

|                      |                                                                  |
|----------------------|------------------------------------------------------------------|
| <b>1-Conductor</b>   | IEC-60228; DIN VDE 0295; EN 60228 Class 1<br>Electrolytic Copper |
| <b>2-Insulation</b>  | Cross-linked Ceramic Forming Polymer<br>Compound                 |
| <b>3-Colour Code</b> | VDE 0815                                                         |
| <b>4-Stranding</b>   | 4 pair groups                                                    |
| <b>5-Wrapping</b>    | Pes Tape + Glass Fibre Tape                                      |
| <b>6-Sheath</b>      | EN 50290-2-27 HFFR Kompound                                      |

## TEKNİK ÖZELLİKLER TECHNICAL CHARACTERISTICS

| ÇEVİRİM DİRENCİ<br>LOOP<br>RESISTANCE | YALITIM DİRENCİ (min)<br>INSULATION<br>RESISTANCE (min) | EFEKTİF KAPASİTE<br>MUTUAL<br>CAPACITANCE | ÇALIŞMA VOLTAJI<br>OPERATING VOLTAGE |
|---------------------------------------|---------------------------------------------------------|-------------------------------------------|--------------------------------------|
| mm <sup>2</sup> Ω/km                  |                                                         |                                           |                                      |
| 0,6    130                            | 100MΩxkm                                                | 120nF/km                                  | 225V                                 |
| 0,8    73,2                           |                                                         |                                           |                                      |
| 1,0    44,6                           |                                                         |                                           |                                      |
| 1,5    24,6                           |                                                         |                                           |                                      |
| 2,5    15,1                           |                                                         |                                           |                                      |
| BÜKÜLME YARIÇAPI<br>BENDING RADIUS    | TEST VOLTAJI<br>TEST VOLTAGE                            | ÇALIŞMA SICAKLIĞI<br>TEMPERATURE RANGE    |                                      |
| 10x Cable Ø                           | 0,60/0,80 mm : 800V<br>≥1,00mm : 1000V                  | - 40°C - +70°C                            |                                      |

## YANGIN PERFORMANS TESTLERİ FLAME PERFORMANCE TESTS

|                                                                      |                                                                          |                                                                                             |                                                                |
|----------------------------------------------------------------------|--------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|----------------------------------------------------------------|
|                                                                      |                                                                          |                                                                                             |                                                                |
| ALEV GECİKTİRİCİLİK<br>TESTİ<br>FLAME RETARDANT TEST                 | ALEV YAYILIMI TESTİ<br>FLAME PROPAGATION TEST                            | DUMAN YOĞUNLUĞU<br>TESTİ<br>SMOKE DENSITY TEST                                              | KOROZİF GAZ TESTİ<br>TEST ON CORROSIVENESS<br>COMBUSTION GASES |
| IEC 60332-1-2<br>VDE 0482-332-1-2<br>EN 60332-1-2<br>BS EN 60332-1-2 | IEC 60332-3-24<br>VDE 0482-332-3-24<br>EN 60332-3-24<br>BS EN 60332-3-24 | IEC 61034-2<br>VDE 0482-1034-2<br>EN 61034-2<br>BS EN 61034-2                               | IEC 60754-2<br>VDE 0482-754-2<br>EN 60754-2<br>BS EN 60754-2   |
|                                                                      |                                                                          |                                                                                             |                                                                |
| HALOJENSİZLİK<br>TESTİ<br>HALOGEN FREE TEST                          | DEVRE BÜTÜNLÜĞÜ TESTİ (FE180)<br>CIRCUIT INTEGRITY TEST (FE180)          | MEKANİK ŞOKLU DEVRE<br>BÜTÜNLÜĞÜ TESTİ (PH120)<br>CIRCUIT INTEGRITY WITH SHOCK TEST (PH120) |                                                                |
| IEC 60754-1<br>VDE 0482-754-1<br>EN 60754-1<br>BS EN 60754-1         | IEC 60331-23                                                             | EN 50200<br>VDE 0482-200<br>BS EN 50200                                                     |                                                                |

# ERVITAL LIHH FE180/PH120

VDE 0812



ALEV GECİKTİRİCİ ÖZELLİK/DÜŞÜK DUMAN YOĞUNLUĞU/ZEHİRLİ VE KOROZİF GAZLARDAN ARINDIRILMIŞ/  
DEVRE BÜTÜNLÜĞÜ MİNİMUM 180 DAKİKA/MEKANİK ŞOKLU DEVRE BÜTÜNLÜĞÜ PH120  
FLAME RETARDANT CHARACTERISTIC/LOW SMOKE EMISSION/WITHOUT POISONED AND CORROSIVE GASES  
CIRCUIT INTEGRITY 180 MINUTES/CIRCUIT INTEGRITY WITH MECHANICAL SHOCK PH120



## KULLANIM ALANLARI

İnsanların yoğun olarak bulunduğu kapalı ortamlarda  
- Enstrüman ve kontrol mühendisliğinde  
- Endüstriyel elektronikte  
- Sinyal iletiminde  
- Bina içi haberleşme sistemlerinde  
- Güvenlik ve yangın ihbar sistemlerinde  
- İnsan hayatının, değerli malzemelerin ve ekipmanların korunması gereken yerlerde

## APPLICATION

Indoors where people are densely populated  
- Instrumentation and control engineering  
- Industrial electronics  
- For signal transmission  
- Indoor communication systems  
- In safety and fire alarm systems  
- In places where human life and valuable materials and equipment need to be protected

## KABLO YAPISI

|                       |                                                                          |
|-----------------------|--------------------------------------------------------------------------|
| <b>1-İletken</b>      | IEC 60228; VDE 0295; EN 60228 Sınıf 5<br>Bükülü Elektrolitik Tavlı Bakır |
| <b>2-Yalıtkan</b>     | Çapraz Bağlı Seramik Formunda Polimer Kompaund                           |
| <b>3-Yalıtım Renk</b> | DIN 47100                                                                |
| <b>4-Büküm</b>        | Uygun adımda katlar halinde                                              |
| <b>5-Ayırıcı Bant</b> | Pes Bant + Cam Elyaf Bant                                                |
| <b>6-Kılıf</b>        | EN 50290-2-27 HFFR Kompaund                                              |
| <b>7-Kılıf Rengi</b>  | RAL 2003 Turuncu                                                         |

## CONSTRUCTION

|                        |                                                                            |
|------------------------|----------------------------------------------------------------------------|
| <b>1-Conductor</b>     | IEC 60228; VDE 0295; EN 60228 Class 5<br>Stranded Electrolytic Bare Copper |
| <b>2-Insulation</b>    | Cross-linked Ceramic Forming Polymer Compound                              |
| <b>3-Colour Code</b>   | DIN 47100                                                                  |
| <b>4-Stranding</b>     | In layers of optimum pitch                                                 |
| <b>5-Wrapping</b>      | Pes Tape + Glass Fibre Tape                                                |
| <b>6-Sheath</b>        | EN 50290-2-27 HFFR Compound                                                |
| <b>7-Sheath Colour</b> | RAL 2003 Orange                                                            |

## TEKNİK ÖZELLİKLER

### TECHNICAL CHARACTERISTICS

| İLETKEN DİRENCİ<br>CONDUCTOR<br>RESISTANCE | YALITIM DİRENCİ (min)<br>INSULATION<br>RESISTANCE (min) | EFEKTİF KAPASİTE<br>MUTUAL<br>CAPACITANCE      | ÇALIŞMA VOLTAJİ<br>OPERATING<br>VOLTAGE            | AKIM TAŞIMA<br>KAPASİTESİ<br>CURRENT CARRYING<br>CAPACITY |
|--------------------------------------------|---------------------------------------------------------|------------------------------------------------|----------------------------------------------------|-----------------------------------------------------------|
| mm <sup>2</sup>                            | Ω/km                                                    | MΩxkm                                          | mm <sup>2</sup>                                    | A                                                         |
| 0,22                                       | 79                                                      | 0,22mm <sup>2</sup> /0,34mm <sup>2</sup> = 200 | 0,22mm <sup>2</sup> /0,34mm <sup>2</sup> :<br>250V | 0,22 2,5                                                  |
| 0,34                                       | 56                                                      | ≥0,50mm <sup>2</sup> = 20                      | ≥0,50mm <sup>2</sup> :<br>300/500V                 | 0,34 4,5                                                  |
| 0,50                                       | 39                                                      |                                                |                                                    | 0,50 6,0                                                  |
| 0,75                                       | 26                                                      |                                                |                                                    | 0,75 13                                                   |
| 1,0                                        | 19,5                                                    |                                                |                                                    | 1,0 16                                                    |
| 1,5                                        | 13,3                                                    |                                                |                                                    | 1,5 20                                                    |
| 2,5                                        | 7,98                                                    |                                                |                                                    | 2,5 25                                                    |

| BÜKÜLME YARIÇAPI<br>BENDING RADIUS | TEST VOLTAJİ (50 Hz 1 Dk) DMR/DMR<br>TEST VOLTAGE (50 Hz 1 Min) CORE/CORE        | ÇALIŞMA SICAKLIĞI<br>TEMPERATURE RANGE |
|------------------------------------|----------------------------------------------------------------------------------|----------------------------------------|
| 7,5x Cable Ø                       | 0,22mm <sup>2</sup> /0,34mm <sup>2</sup> = 1200V<br>≥0,50mm <sup>2</sup> = 2000V | - 40°C - +70°C                         |

## YANGIN PERFORMANS TESTLERİ

### FLAME PERFORMANCE TESTS

| ALEV GECİKTİRİCİLİK<br>TESTİ<br>FLAME RETARDANT TEST                 | ALEV YAYILIMI TESTİ<br>FLAME PROPAGATION TEST                            | DUMAN YOĞUNLUĞU<br>TESTİ<br>SMOKE DENSITY TEST                                              | KOROZİF GAZ TESTİ<br>TEST ON CORROSIVENESS<br>COMBUSTION GASES |
|----------------------------------------------------------------------|--------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|----------------------------------------------------------------|
| IEC 60332-1-2<br>VDE 0482-332-1-2<br>EN 60332-1-2<br>BS EN 60332-1-2 | IEC 60332-3-24<br>VDE 0482-332-3-24<br>EN 60332-3-24<br>BS EN 60332-3-24 | IEC 61034-2<br>VDE 0482-1034-2<br>EN 61034-2<br>BS EN 61034-2                               | IEC 60754-2<br>VDE 0482-754-2<br>EN 60754-2<br>BS EN 60754-2   |
| HALOJENSİZLİK TESTİ<br>HALOGEN FREE TEST                             | DEVRE BÜTÜNLÜĞÜ TESTİ (FE180)<br>CIRCUIT INTEGRITY TEST (FE180)          | MEKANİK ŞOKLU DEVRE<br>BÜTÜNLÜĞÜ TESTİ (PH120)<br>CIRCUIT INTEGRITY WITH SHOCK TEST (PH120) |                                                                |
| IEC 60754-1<br>VDE 0482-754-1<br>EN 60754-1<br>BS EN 60754-1         | IEC 60331-23                                                             | EN 50200<br>VDE 0482-200<br>BS EN 50200                                                     |                                                                |

# ERVITAL LIHCH FE180/PH120

VDE 0812



ALEV GECİKTİRİCİ ÖZELLİK/DÜŞÜK DUMAN YOĞUNLUĞU/ZEHİRLİ VE KOROZİF GAZLARDAN ARINDIRILMIŞ  
DEVRE BÜTÜNLÜĞÜ MİNİMUM 180 DAKİKA/MEKANİK ŞOKLU DEVRE BÜTÜNLÜĞÜ PH120  
FLAME RETARDANT CHARACTERISTIC/LOW SMOKE EMISSION/WITHOUT POISONED AND CORROSIVE GASES  
CIRCUIT INTEGRITY 180 MINUTES/CIRCUIT INTEGRITY WITH MECHANICAL SHOCK PH120



## KULLANIM ALANLARI

İnsanların yoğun olarak bulunduğu kapalı ortamlarda Elektromanyetik karışım ve girişimlerin olduğu yerlerde

- Enstrüman ve kontrol mühendisliğinde
- Endüstriyel elektronikte
- Sinyal iletiminde
- Bina içi haberleşme sistemlerinde
- Güvenlik ve yangın ihbar sistemlerinde
- İnsan hayatının, değerli malzemelerin ve ekipmanların korunması gereken yerlerde

## APPLICATION

- Indoors where people are densely populated
- In places where there is electromagnetic interference
- Instrumentation and control engineering
- Industrial electronics
- For signal transmission
- Indoor communication systems
- In safety and fire alarm systems
- In places where human life and valuable materials and equipment need to be protected

## KABLO YAPISI

|                       |                                                                          |
|-----------------------|--------------------------------------------------------------------------|
| <b>1-İletken</b>      | IEC 60228; VDE 0295; EN 60228 Sınıf 5<br>Bükülü Elektrolitik Tavlı Bakır |
| <b>2-Yalıtkan</b>     | Çapraz Bağlı Seramik Formunda Polimer Kompaund                           |
| <b>3-Yalıtım Renk</b> | DIN 47100                                                                |
| <b>4-Büküm</b>        | Uygun adımda, katlar halinde                                             |
| <b>5-Ayırıcı Bant</b> | Pes Bant + Cam Elyaf Bant                                                |
| <b>6-Ekran</b>        | Kalaylı Bakır Örgü                                                       |
| <b>7-Kılıf</b>        | EN 50290-2-27 HFFR Kompaund                                              |
| <b>8-Kılıf Rengi</b>  | RAL 2003 Turuncu                                                         |

## CONSTRUCTION

|                        |                                                                             |
|------------------------|-----------------------------------------------------------------------------|
| <b>1-Conductor</b>     | IEC 60228; DIN VDE 0295; HD383 Class 5<br>Stranded Electrolytic Bare Copper |
| <b>2-Insulation</b>    | Cross-linked Ceramic Forming Polymer Compound                               |
| <b>3-Colour Code</b>   | DIN 47100                                                                   |
| <b>4-Stranding</b>     | In layers of optimum pitch                                                  |
| <b>5-Wrapping</b>      | Pes Tape + Glass Fibre Tape                                                 |
| <b>6-Screen</b>        | Tinned Copper Braid                                                         |
| <b>7-Sheath</b>        | EN 50290-2-27 HFFR Compound                                                 |
| <b>8-Sheath Colour</b> | RAL 2003 Orange                                                             |

## TEKNİK ÖZELLİKLER TECHNICAL CHARACTERISTICS

| İLETKEN DİRENCİ<br>CONDUCTOR<br>RESISTANCE | YALITIM DİRENCİ (min)<br>INSULATION<br>RESISTANCE (min)                          | EFEKTİF KAPASİTE<br>MUTUAL<br>CAPACITANCE                                          | AKIM TAŞIMA<br>KAPASİTESİ<br>CURRENT CARRYING<br>CAPACITY |     |
|--------------------------------------------|----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-----------------------------------------------------------|-----|
| mm <sup>2</sup>                            | Ω/km                                                                             | MΩxkm                                                                              | mm <sup>2</sup>                                           | A   |
| 0,22                                       | 79                                                                               | 0,22mm <sup>2</sup> /0,34mm <sup>2</sup>                                           | 0,22                                                      | 2,5 |
| 0,34                                       | 56                                                                               | = 200                                                                              | 0,34                                                      | 4,5 |
| 0,50                                       | 39                                                                               | ≥0,50mm <sup>2</sup> = 20                                                          | 0,50                                                      | 6,0 |
| 0,75                                       | 26                                                                               |                                                                                    | 0,75                                                      | 13  |
| 1,0                                        | 19,5                                                                             |                                                                                    | 1,0                                                       | 16  |
| 1,5                                        | 13,3                                                                             |                                                                                    | 1,5                                                       | 20  |
| 2,5                                        | 7,98                                                                             |                                                                                    | 2,5                                                       | 25  |
| BÖKÜLME YARIÇAPI<br>BENDING RADIUS         | TEST VOLTAJİ (50 Hz 1 Dk) DMR/DMR<br>TEST VOLTAGE (50 Hz 1 Min) CORE/CORE        | ÇALIŞMA VOLTAJİ<br>OPERATING VOLTAGE                                               | ÇALIŞMA SICAKLIĞI<br>TEMPERATURE RANGE                    |     |
| 7,5x Cable Ø                               | 0.22mm <sup>2</sup> /0.34mm <sup>2</sup> = 1200V<br>≥0,50mm <sup>2</sup> = 2000V | 0.22mm <sup>2</sup> /0.34mm <sup>2</sup> = 250V<br>≥0,50mm <sup>2</sup> = 300/500V | - 40°C - +70°C                                            |     |

## YANGIN PERFORMANS TESTLERİ FLAME PERFORMANCE TESTS

| ALEV GECİKTİRİCİLİK<br>TESTİ<br>FLAME RETARDANT TEST                 | ALEV YAYILI MI TESTİ<br>FLAME PROPAGATION TEST                           | DUMAN YOĞUNLUĞU<br>TESTİ<br>SMOKE DENSITY TEST                                              | KOROZİF GAZ TESTİ<br>TEST ON CORROSIVENESS<br>COMBUSTION GASES |
|----------------------------------------------------------------------|--------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|----------------------------------------------------------------|
| IEC 60332-1-2<br>VDE 0482-332-1-2<br>EN 60332-1-2<br>BS EN 60332-1-2 | IEC 60332-3-24<br>VDE 0482-332-3-24<br>EN 60332-3-24<br>BS EN 60332-3-24 | IEC 61034-2<br>VDE 0482-1034-2<br>EN 61034-2<br>BS EN 61034-2                               | IEC 60754-2<br>VDE 0482-754-2<br>EN 60754-2<br>BS EN 60754-2   |
| HALOJENSİZLİK TESTİ<br>HALOGEN FREE TEST                             | DEVRE BÜTÜNLÜĞÜ TESTİ (FE180)<br>CIRCUIT INTEGRITY TEST (FE180)          | MEKANİK ŞOKLU DEVRE<br>BÜTÜNLÜĞÜ TESTİ (PH120)<br>CIRCUIT INTEGRITY WITH SHOCK TEST (PH120) |                                                                |
| IEC 60754-1<br>VDE 0482-754-1<br>EN 60754-1<br>BS EN 60754-1         | IEC 60331-23                                                             | EN 50200<br>VDE 0482-200<br>BS EN 50200                                                     |                                                                |

## NOTLAR NOTES

\* Bu kablo PH180 testlerinde VDE tarafından onaylanmış ve sertifikalandırılmıştır.

\* This cable has been approved and certified by VDE on PH180 tests

# ERVITAL LIHCH FE180/E30-E60

VDE 0812



ALEV GECİKTİRİCİ ÖZELLİK/DÜŞÜK DUMAN YOĞUNLUĞU/ZEHİRLİ VE KOROZİF GAZLARDAN ARINDIRILMIŞ DEVRE BÜTÜNLÜĞÜ 180 DAKIKA/KABLO SİSTEMİNİN DEVRE BÜTÜNLÜĞÜ E30-E60

FLAME RETARDANT CHARACTERISTIC/LOW SMOKE EMISSION/WITHOUT POISONED AND CORROSIVE GASES CIRCUIT INTEGRITY FOR MINIMUM 180 MINUTES/CABLE SYSTEM CIRCUIT INTEGRITY E30-E60



## KULLANIM ALANLARI

Elektromanyetik karışma ve girişimlerin olduğu insanların yoğun olarak bulunduğu kapalı ortamlarda

- Enstrüman ve kontrol mühendisliğinde
- Endüstriyel elektronikte
- Bilgisayar ve ofis makinelerinde
- Bina içi haberleşme sistemlerinde
- Bina içi ses sistemlerinde
- İnsan hayatının ve önemli malzemelerin korunması gereken yerlerde

## KABLO YAPISI

|                       |                                                                       |
|-----------------------|-----------------------------------------------------------------------|
| <b>1-İletken</b>      | IEC 60228; DIN VDE 0295; EN 60228 Sınıf 5<br>Elektrolitik Tavlı Bakır |
| <b>2-Yalıtkan</b>     | Çapraz Bağlı Seramik Formunda Polimer Kompaund                        |
| <b>3-Yalıtım Renk</b> | DIN 47100                                                             |
| <b>4-Büküm</b>        | Uygun adımda, katlar halinde                                          |
| <b>5-Ayırıcı Bant</b> | Pes Bant + Cam Elyaf Bant                                             |
| <b>6-Ekran</b>        | Kalaylı Bakır Örgü                                                    |
| <b>7-Kılıf</b>        | EN 50290-2-27 HFFR Kompaund                                           |
| <b>8-Kılıf Rengi</b>  | RAL 2003 Turuncu                                                      |

## APPLICATION

In places where electro-magnetic interference and influence exists  
Indoors where people are densely populated

- Instrumentation and control engineering
- Industrial electronics
- Computers and office machines
- Indoor communication systems
- Indoor sound systems
- In places where human life and valuable materials and equipment need to be protected

## CONSTRUCTION

|                        |                                                                                |
|------------------------|--------------------------------------------------------------------------------|
| <b>1-Conductor</b>     | IEC 60228; DIN VDE 0295; EN 60228 Class 5<br>Stranded Electrolytic Bare Copper |
| <b>2-Insulation</b>    | Cross-linked Ceramic Forming Polymer Compound                                  |
| <b>3-Colour Code</b>   | DIN 47100                                                                      |
| <b>4-Stranding</b>     | In layers of optimum pitch                                                     |
| <b>5-Wrapping</b>      | Pes Tape + Glass Fibre Tape                                                    |
| <b>6-Screen</b>        | Tinned Copper Braid                                                            |
| <b>7-Sheath</b>        | EN 50290-2-27 HFFR Compaund                                                    |
| <b>8-Sheath Colour</b> | RAL 2003 Orange                                                                |

## TEKNİK ÖZELLİKLER TECHNICAL CHARACTERISTICS

| İLETKEN DİRENCİ<br>CONDUCTOR<br>RESISTANCE | YALITIM DİRENCİ (min)<br>INSULATION<br>RESISTANCE (min)                          | EFEKTİF KAPASİTE<br>MUTUAL<br>CAPACITANCE                                          | AKIM TAŞIMA<br>KAPASİTESİ<br>CURRENT CARRYING<br>CAPACITY |
|--------------------------------------------|----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-----------------------------------------------------------|
| mm <sup>2</sup> Ω/km                       | MΩxkm                                                                            | 120nF/km                                                                           | mm <sup>2</sup> A                                         |
| 0,22    79                                 | 0,22mm <sup>2</sup> /0,34mm <sup>2</sup>                                         |                                                                                    | 0,22    2,5                                               |
| 0,34    56                                 | = 200                                                                            |                                                                                    | 0,34    4,5                                               |
| 0,5    39                                  | ≥0,50mm <sup>2</sup> = 20                                                        |                                                                                    | 0,5    6                                                  |
| 0,75    26                                 |                                                                                  |                                                                                    | 0,75    13                                                |
| 1    19,5                                  |                                                                                  |                                                                                    | 1    16                                                   |
| 1,5    13,3                                |                                                                                  |                                                                                    | 1,5    20                                                 |
| 2,5    7,98                                |                                                                                  |                                                                                    | 2,5    25                                                 |
| BÜKÜLME YARIÇAPI<br>BENDING RADIUS         | TEST VOLTAJİ<br>TEST VOLTAGE                                                     | ÇALIŞMA VOLTAJİ<br>OPERATING VOLTAGE                                               | ÇALIŞMA SICAKLIĞI<br>TEMPERATURE RANGE                    |
| 7,5x Cable Ø                               | 0,22mm <sup>2</sup> /0,34mm <sup>2</sup> = 1200V<br>≥0,50mm <sup>2</sup> = 2000V | 0,22mm <sup>2</sup> /0,34mm <sup>2</sup> = 250V<br>≥0,50mm <sup>2</sup> = 300/500V | - 40°C - +70°C                                            |

## YANGIN PERFORMANS TESTLERİ FLAME PERFORMANCE TESTS



ALEV GECİKTİRİCİLİK  
TESTİ  
FLAME RETARDANT TEST

IEC 60332-1-2  
VDE 0482-332-1-2  
EN 60332-1-2  
BS EN 60332-1-2



ALEV YAYILIMI TESTİ  
FLAME PROPAGATION  
TEST

IEC 60332-3-24  
VDE 0482-332-3-24  
EN 60332-3-24  
BS EN 60332-3-24



DUMAN YOĞUNLUĞU  
TESTİ  
SMOKE DENSITY TEST

IEC 61034-2  
VDE 0482-1034-2  
EN 61034-2  
BS EN 61034-2



KOROZYF GAZ TESTİ  
TEST ON CORROSIVENESS  
COMBUSTION GASES

IEC 60754-2  
VDE 0482-754-2  
EN 60754-2  
BS EN 60754-2



HALOJENSİZLİK TESTİ  
HALOGEN FREE TEST

IEC 60754-1  
VDE 0482-754-1  
EN 60754-1  
BS EN 60754-1



DEVRE BÜTÜNLÜĞÜ TESTİ  
(FE180)  
CIRCUIT INTEGRITY TEST  
(FE180)

IEC 60331-23



MEKANİK SOKLU DEVRE  
BÜTÜNLÜĞÜ TESTİ (PHI20)  
CIRCUIT INTEGRITY WITH  
SHOCK TEST (PHI20)

EN 50200  
VDE 0482-200  
BS EN 50200



KABLO SİSTEMİNİN DEVRE  
BÜTÜNLÜĞÜ TESTİ (E30-E60)  
CABLE SYSTEM CIRCUIT  
INTEGRITY TEST (E30-E60)

DIN 4102-12 E30-E60

# ERVITAL LIHCH FE180/E90

VDE 0812



ALEV GECİKTİRİCİ ÖZELLİK/DÜŞÜK DUMAN YOĞUNLUĞU/ZEHİRLİ VE KOROZİF GAZLARDAN ARINDIRILMIŞ DEVRE BÜTÜNLÜĞÜ 180 DAKIKA/KABLO SİSTEMİNİN DEVRE BÜTÜNLÜĞÜ E90

FLAME RETARDANT CHARACTERISTIC/LOW SMOKE EMISSION/WITHOUT POISONED AND CORROSIVE GASES CIRCUIT INTEGRITY FOR MINIMUM 180 MINUTES/CABLE SYSTEM CIRCUIT INTEGRITY E90



## KULLANIM ALANLARI

Elektromanyetik karışma ve girişimlerin olduğu insanların yoğun olarak bulunduğu kapalı ortamlarda

- Enstrüman ve kontrol mühendisliğinde
- Endüstriyel elektronikte
- Bilgisayar ve ofis makinelerinde
- Bina içi haberleşme sistemlerinde
- Bina içi ses sistemlerinde
- İnsan hayatının ve önemli malzemelerin korunması gereken yerlerde

## KABLO YAPISI

|                       |                                                                       |
|-----------------------|-----------------------------------------------------------------------|
| <b>1-İletken</b>      | IEC 60228; DIN VDE 0295; EN 60228 Sınıf 5<br>Elektrolitik Tavlı Bakır |
| <b>2-Yalıtkan</b>     | Çapraz Bağlı Seramik Formunda Polimer Kompaund                        |
| <b>3-Yalıtım Renk</b> | DIN 47100                                                             |
| <b>4-Büküm</b>        | Uygun adımda, katlar halinde                                          |
| <b>5-Ayırıcı Bant</b> | Pes Bant + Cam Elyaf Bant                                             |
| <b>6-Ekran</b>        | Kalaylı Bakır Örgü                                                    |
| <b>7-Kılıf</b>        | EN 50290-2-27 HFFR Kompaund                                           |
| <b>8-Kılıf Rengi</b>  | RAL 2003 Turuncu                                                      |

## APPLICATION

In places where electro-magnetic interference and influence exists  
Indoors where people are densely populated

- Instrumentation and control engineering
- Industrial electronics
- Computers and office machines
- Indoor communication systems
- Indoor sound systems
- In places where human life and valuable materials and equipment need to be protected

## CONSTRUCTION

|                        |                                                                                |
|------------------------|--------------------------------------------------------------------------------|
| <b>1-Conductor</b>     | IEC 60228; DIN VDE 0295; EN 60228 Class 5<br>Stranded Electrolytic Bare Copper |
| <b>2-Insulation</b>    | Cross-linked Ceramic Forming Polymer Compound                                  |
| <b>3-Colour Code</b>   | DIN 47100                                                                      |
| <b>4-Stranding</b>     | In layers of optimum pitch                                                     |
| <b>5-Wrapping</b>      | Pes Tape + Glass Fibre Tape                                                    |
| <b>6-Screen</b>        | Tinned Copper Braid                                                            |
| <b>7-Sheath</b>        | EN 50290-2-27 HFFR Compaund                                                    |
| <b>8-Sheath Colour</b> | RAL 2003 Orange                                                                |

## TEKNİK ÖZELLİKLER TECHNICAL CHARACTERISTICS

| İLETKEN DİRENCİ<br>CONDUCTOR<br>RESISTANCE | YALITIM DİRENCİ (min)<br>INSULATION<br>RESISTANCE (min) | EFEKTİF KAPASİTE<br>MUTUAL<br>CAPACITANCE | AKIM TAŞIMA<br>KAPASİTESİ<br>CURRENT CARRYING<br>CAPACITY |
|--------------------------------------------|---------------------------------------------------------|-------------------------------------------|-----------------------------------------------------------|
| mm <sup>2</sup> Ω/km                       | MΩxkm                                                   | 120nF/km                                  | mm <sup>2</sup> A                                         |
| 0,22    79                                 | 0,22mm <sup>2</sup> /0,34mm <sup>2</sup>                |                                           | 0,22    2,5                                               |
| 0,34    56                                 | = 200                                                   |                                           | 0,34    4,5                                               |
| 0,5    39                                  | ≥0,50mm <sup>2</sup> = 20                               |                                           | 0,5    6                                                  |
| 0,75    26                                 |                                                         |                                           | 0,75    13                                                |
| 1    19,5                                  |                                                         |                                           | 1    16                                                   |
| 1,5    13,3                                |                                                         |                                           | 1,5    20                                                 |
| 2,5    7,98                                |                                                         |                                           | 2,5    25                                                 |

| BÜKÜLME YARIÇAPI<br>BENDING RADIUS | TEST VOLTAJİ<br>TEST VOLTAGE                                                     | ÇALIŞMA VOLTAJİ<br>OPERATING VOLTAGE                                               | ÇALIŞMA SICAKLIĞI<br>TEMPERATURE RANGE |
|------------------------------------|----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|----------------------------------------|
| 7,5x Cable Ø                       | 0,22mm <sup>2</sup> /0,34mm <sup>2</sup> = 1200V<br>≥0,50mm <sup>2</sup> = 2000V | 0,22mm <sup>2</sup> /0,34mm <sup>2</sup> = 250V<br>≥0,50mm <sup>2</sup> = 300/500V | - 40°C - +70°C                         |

## YANGIN PERFORMANS TESTLERİ FLAME PERFORMANCE TESTS

|                                                                      |                                                                                 |                                                                                                          |                                                                                                           |
|----------------------------------------------------------------------|---------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|
|                                                                      |                                                                                 |                                                                                                          |                                                                                                           |
| <b>ALEV GECİKTİRİCİLİK<br/>TESTİ<br/>FLAME RETARDANT TEST</b>        | <b>ALEV YAYILIMI TESTİ<br/>TESTİ<br/>FLAME PROPAGATION<br/>TEST</b>             | <b>DUMAN YOĞUNLUĞU<br/>TESTİ<br/>SMOKE DENSITY TEST</b>                                                  | <b>KOROZİF GAZ TESTİ<br/>TEST ON CORROSIVENESS<br/>COMBUSTION GASES</b>                                   |
| IEC 60332-1-2<br>VDE 0482-332-1-2<br>EN 60332-1-2<br>BS EN 60332-1-2 | IEC 60332-3-24<br>VDE 0482-332-3-24<br>EN 60332-3-24<br>BS EN 60332-3-24        | IEC 61034-2<br>VDE 0482-1034-2<br>EN 61034-2<br>BS EN 61034-2                                            | IEC 60754-2<br>VDE 0482-754-2<br>EN 60754-2<br>BS EN 60754-2                                              |
|                                                                      |                                                                                 |                                                                                                          |                                                                                                           |
| <b>HALOJENSİZLİK TESTİ<br/>HALOGEN FREE TEST</b>                     | <b>DEVRE BÜTÜNLÜĞÜ TESTİ<br/>(FE180)<br/>CIRCUIT INTEGRITY TEST<br/>(FE180)</b> | <b>MEKANİK SOKLU DEVRE<br/>BÜTÜNLÜĞÜ TESTİ (PHI20)<br/>CIRCUIT INTEGRITY WITH<br/>SHOCK TEST (PHI20)</b> | <b>KABLO SİSTEMİNİN DEVRE<br/>BÜTÜNLÜĞÜ TESTİ (E90)<br/>CABLE SYSTEM CIRCUIT<br/>INTEGRITY TEST (E90)</b> |
| IEC 60754-1<br>VDE 0482-754-1<br>EN 60754-1<br>BS EN 60754-1         | IEC 60331-23                                                                    | EN 50200<br>VDE 0482-200<br>BS EN 50200                                                                  | DIN 4102-12 E90                                                                                           |

# ERVITAL LIH(St)H FE180/PH120

VDE 0812



ALEV GECİKTİRİCİ ÖZELLİK/DÜŞÜK DUMAN YOĞUNLUĞU/ZEHİRLİ VE KOROZİF GAZLARDAN ARINDIRILMIŞ/  
DEVRE BÜTÜNLÜĞÜ MİNİMUM 180 DAKİKA/MEKANİK ŞOKLU DEVRE BÜTÜNLÜĞÜ PH120  
FLAME RETARDANT CHARACTERISTIC/LOW SMOKE EMISSION/WITHOUT POISONED AND CORROSIVE GASES  
CIRCUIT INTEGRITY 180 MINUTES/CIRCUIT INTEGRITY WITH MECHANICAL SHOCK PH120



## KULLANIM ALANLARI

İnsanların yoğun olarak bulunduğu kapalı ortamlarda Elektromanyetik karışım ve girişimlerin olduğu yerlerde

- Enstrüman ve kontrol mühendisliğinde
- Endüstriyel elektronikte
- Sinyal iletiminde
- Bina içi haberleşme sistemlerinde
- Güvenlik ve yangın ihbar sistemlerinde
- İnsan hayatının, değerli malzemelerin ve ekipmanların korunması gereken yerlerde

## KABLO YAPISI

|                       |                                                                          |
|-----------------------|--------------------------------------------------------------------------|
| <b>1-İletken</b>      | IEC 60228; VDE 0295; EN 60228 Sınıf 5<br>Bükülü Elektrolitik Tavlı Bakır |
| <b>2-Yalıtkan</b>     | Çapraz Bağlı Seramik Formunda Polimer Kompaund                           |
| <b>3-Yalıtım Renk</b> | DIN 47100                                                                |
| <b>4-Büküm</b>        | Uygun adımda, katlar halinde                                             |
| <b>5-Ayırıcı Bant</b> | Pes Bant + Cam Elyaf Bant                                                |
| <b>6-Ekran</b>        | Kalaylı Bakır Toprak Teli + Al-Pes Bant                                  |
| <b>7-Kılıf</b>        | EN 50290-2-27 HFFR Kompaund                                              |
| <b>8-Kılıf Rengi</b>  | RAL 2003 Turuncu                                                         |

## APPLICATION

- Indoors where people are densely populated  
In places where there is electromagnetic interference
- Instrumentation and control engineering
  - Industrial electronics
  - For signal transmission
  - Indoor communication systems
  - In safety and fire alarm systems
  - In places where human life and valuable materials and equipment need to be protected

## CONSTRUCTION

|                        |                                                                                |
|------------------------|--------------------------------------------------------------------------------|
| <b>1-Conductor</b>     | IEC 60228; DIN VDE 0295; EN 60228 Class 5<br>Stranded Electrolytic Bare Copper |
| <b>2-Insulation</b>    | Cross-linked Ceramic Forming Polymer Compound                                  |
| <b>3-Colour Code</b>   | DIN 47100                                                                      |
| <b>4-Stranding</b>     | In layers of optimum pitch                                                     |
| <b>5-Wrapping</b>      | Pes Tape + Glass Fibre Tape                                                    |
| <b>6-Screen</b>        | Tinned Copper Drain Wire + Al-Pes-Tape                                         |
| <b>7-Sheath</b>        | EN 50290-2-27 HFFR Compound                                                    |
| <b>8-Sheath Colour</b> | RAL 2003 Orange                                                                |

## TEKNİK ÖZELLİKLER TECHNICAL CHARACTERISTICS

| İLETKEN DİRENCİ<br>CONDUCTOR<br>RESISTANCE | YALITIM DİRENCİ (min)<br>INSULATION<br>RESISTANCE (min) | EFEKTİF KAPASİTE<br>MUTUAL<br>CAPACITANCE | AKIM TAŞIMA<br>KAPASİTESİ<br>CURRENT CARRYING<br>CAPACITY |
|--------------------------------------------|---------------------------------------------------------|-------------------------------------------|-----------------------------------------------------------|
| mm <sup>2</sup> Ω/km                       | MΩxkm                                                   | 120nF/km                                  | mm <sup>2</sup> A                                         |
| 0,22    79                                 | 0,22mm <sup>2</sup> /0,34mm <sup>2</sup>                |                                           | 0,22    2,5                                               |
| 0,34    56                                 | = 200                                                   |                                           | 0,34    4,5                                               |
| 0,50    39                                 | ≥0,50mm <sup>2</sup> = 20                               |                                           | 0,50    6,0                                               |
| 0,75    26                                 |                                                         |                                           | 0,75    13                                                |
| 1,0    19,5                                |                                                         |                                           | 1,0    16                                                 |
| 1,5    13,3                                |                                                         |                                           | 1,5    20                                                 |
| 2,5    7,98                                |                                                         |                                           | 2,5    25                                                 |

| BÜKÜLME YARIÇAP<br>BENDING RADIUS | TEST VOLTAJİ (50 Hz 1 Dk) DMR/DMR<br>TEST VOLTAGE (50 Hz 1 Min) CORE/CORE        | ÇALIŞMA VOLTAJİ<br>OPERATING VOLTAGE                                               | ÇALIŞMA SICAKLIĞI<br>TEMPERATURE RANGE |
|-----------------------------------|----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|----------------------------------------|
| 7,5x Cable Ø                      | 0,22mm <sup>2</sup> /0,34mm <sup>2</sup> = 1200V<br>≥0,50mm <sup>2</sup> = 2000V | 0,22mm <sup>2</sup> /0,34mm <sup>2</sup> = 250V<br>≥0,50mm <sup>2</sup> = 300/500V | - 40°C - +70°C                         |

## YANGIN PERFORMANS TESTLERİ FLAME PERFORMANCE TESTS

|                                                                      |                                                                          |                                                                                                      |                                                                         |
|----------------------------------------------------------------------|--------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------|
|                                                                      |                                                                          |                                                                                                      |                                                                         |
| <b>ALEV GECİKTİRİCİLİK<br/>TESTİ<br/>FLAME RETARDANT TEST</b>        | <b>ALEV YAYILIMI TESTİ<br/>FLAME PROPAGATION<br/>TEST</b>                | <b>DUMAN YOĞUNLUĞU<br/>TESTİ<br/>SMOKE DENSITY TEST</b>                                              | <b>KOROZİF GAZ TESTİ<br/>TEST ON CORROSIVENESS<br/>COMBUSTION GASES</b> |
| IEC 60332-1-2<br>VDE 0482-332-1-2<br>EN 60332-1-2<br>BS EN 60332-1-2 | IEC 60332-3-24<br>VDE 0482-332-3-24<br>EN 60332-3-24<br>BS EN 60332-3-24 | IEC 61034-2<br>VDE 0482-1034-2<br>EN 61034-2<br>BS EN 61034-2                                        | IEC 60754-2<br>VDE 0482-754-2<br>EN 60754-2<br>BS EN 60754-2            |
|                                                                      |                                                                          |                                                                                                      |                                                                         |
| <b>HALOJENSİZLİK TESTİ<br/>HALOGEN FREE TEST</b>                     | <b>DEVRE BÜTÜNLÜĞÜ TESTİ (FE180)<br/>CIRCUIT INTEGRITY TEST (FE180)</b>  | <b>MEKANİK ŞOKLU DEVRE<br/>BÜTÜNLÜĞÜ TESTİ (PH120)<br/>CIRCUIT INTEGRITY WITH SHOCK TEST (PH120)</b> |                                                                         |
| IEC 60754-1<br>VDE 0482-754-1<br>EN 60754-1<br>BS EN 60754-1         | IEC 60331-23                                                             | EN 50200<br>VDE 0482-200<br>BS EN 50200                                                              |                                                                         |

# ERVITAL LIH(St)CH FE180/PH120

VDE 0812



ALEV GECİKTİRİCİ ÖZELLİK/DÜŞÜK DUMAN YOĞUNLUĞU/ZEHİRLİ VE KOROZİF GAZLARDAN ARINDIRILMIŞ/  
DEVRE BÜTÜNLÜĞÜ MİNİMUM 180 DAKİKA/MEKANİK ŞOKLU DEVRE BÜTÜNLÜĞÜ PH120  
FLAME RETARDANT CHARACTERISTIC/LOW SMOKE EMISSION/WITHOUT POISONED AND CORROSIVE GASES  
CIRCUIT INTEGRITY 180 MINUTES/CIRCUIT INTEGRITY WITH MECHANICAL SHOCK PH120



## KULLANIM ALANLARI

İnsanların yoğun olarak bulunduğu kapalı ortamlarda Elektromanyetik karışım ve girişimlerin olduğu yerlerde

- Enstrüman ve kontrol mühendisliğinde
- Endüstriyel elektronikte
- Sinyal iletiminde
- Bina içi haberleşme sistemlerinde
- Güvenlik ve yangın ihbar sistemlerinde
- İnsan hayatının, değerli malzemelerin ve ekipmanların korunması gereken yerlerde

## APPLICATION

- Indoors where people are densely populated
- In places where there is electromagnetic interference
- Instrumentation and control engineering
- Industrial electronics
- For signal transmission
- Indoor communication systems
- In safety and fire alarm systems
- In places where human life and valuable materials and equipment need to be protected

## KABLO YAPISI

|                       |                                                                          |
|-----------------------|--------------------------------------------------------------------------|
| <b>1-İletken</b>      | IEC 60228; VDE 0295; EN 60228 Sınıf 5<br>Bükülü Elektrolitik Tavlı Bakır |
| <b>2-Yalıtkan</b>     | Çapraz Bağlı Seramik Formunda Polimer Kompaund                           |
| <b>3-Yalıtım Renk</b> | DIN 47100                                                                |
| <b>4-Büküm</b>        | Uygun adımda, katlar halinde                                             |
| <b>5-Ayırıcı Bant</b> | Pes Bant + Cam Elyaf Bant                                                |
| <b>6-Ekran</b>        | Al-Pes Bant + Kalaylı Bakır Örgü                                         |
| <b>7-Kılıf</b>        | EN 50290-2-27 HFFR Kompaund                                              |
| <b>8-Kılıf Rengi</b>  | RAL 2003 Turuncu                                                         |

## CONSTRUCTION

|                       |                                                                            |
|-----------------------|----------------------------------------------------------------------------|
| <b>1-Conductor</b>    | IEC 60228; VDE 0295; EN 60228 Class 5<br>Stranded Electrolytic Bare Copper |
| <b>2-Insulation</b>   | Cross-linked Ceramic Forming Polymer Compound                              |
| <b>3-Colour Code</b>  | DIN 47100                                                                  |
| <b>4-Stranding</b>    | In layers of optimum pitch                                                 |
| <b>5-Wrapping</b>     | Pes Tape + Glass Fibre Tape                                                |
| <b>6-Screen</b>       | Al-Pes Tape + Tinned Copper Braid                                          |
| <b>7-Sheath</b>       | EN 50290-2-27 HFFR Compound                                                |
| <b>8-Sheath Color</b> | RAL 2003 Orange                                                            |

## TEKNİK ÖZELLİKLER TECHNICAL CHARACTERISTICS

| İLETKEN DİRENCİ<br>CONDUCTOR RESISTANCE | YALITIM DİRENCİ (min)<br>INSULATION RESISTANCE (min) | EFEKTİF KAPASİTE<br>MUTUAL CAPACITANCE | AKIM TAŞIMA KAPASİTESİ<br>CURRENT CARRYING CAPACITY |
|-----------------------------------------|------------------------------------------------------|----------------------------------------|-----------------------------------------------------|
| mm <sup>2</sup> Ω/km                    | MΩxkm                                                | 120nF/km                               | mm <sup>2</sup> A                                   |
| 0,22    79                              | 0,22mm <sup>2</sup> /0,34mm <sup>2</sup>             |                                        | 0,22    2,5                                         |
| 0,34    56                              | = 200                                                |                                        | 0,34    4,5                                         |
| 0,50    39                              | ≥0,50mm <sup>2</sup> = 20                            |                                        | 0,50    6,0                                         |
| 0,75    26                              |                                                      |                                        | 0,75    13                                          |
| 1,0    19,5                             |                                                      |                                        | 1,0    16                                           |
| 1,5    13,3                             |                                                      |                                        | 1,5    20                                           |
| 2,5    7,98                             |                                                      |                                        | 2,5    25                                           |

| BÜKÜLM YARIÇAPI<br>BENDING RADIUS | TEST VOLTAJ (50 Hz 1 Dk) DMR/DMR<br>TEST VOLTAGE (50 Hz 1 Min) CORE/CORE         | ÇALIŞMA VOLTAJ<br>OPERATING VOLTAGE                                                | ÇALIŞMA SICAKLIĞI<br>TEMPERATURE RANGE |
|-----------------------------------|----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|----------------------------------------|
| 7,5x Cable Ø                      | 0,22mm <sup>2</sup> /0,34mm <sup>2</sup> = 1200V<br>≥0,50mm <sup>2</sup> = 2000V | 0,22mm <sup>2</sup> /0,34mm <sup>2</sup> = 250V<br>≥0,50mm <sup>2</sup> = 300/500V | - 40°C - +70°C                         |

## YANGIN PERFORMANS TESTLERİ FLAME PERFORMANCE TESTS

|                                                                      |                                                                          |                                                                                          |                                                              |
|----------------------------------------------------------------------|--------------------------------------------------------------------------|------------------------------------------------------------------------------------------|--------------------------------------------------------------|
|                                                                      |                                                                          |                                                                                          |                                                              |
| ALEV GECİKTİRİCİLİK TESTİ<br>FLAME RETARDANT TEST                    | ALEV YAYILIMI TESTİ<br>FLAME PROPAGATION TEST                            | DUMAN YOĞUNLUĞU TESTİ<br>SMOKE DENSITY TEST                                              | KOROZİF GAZ TESTİ<br>TEST ON CORROSIVENESS COMBUSTION GASES  |
| IEC 60332-1-2<br>VDE 0482-332-1-2<br>EN 60332-1-2<br>BS EN 60332-1-2 | IEC 60332-3-24<br>VDE 0482-332-3-24<br>EN 60332-3-24<br>BS EN 60332-3-24 | IEC 61034-2<br>VDE 0482-1034-2<br>EN 61034-2<br>BS EN 61034-2                            | IEC 60754-2<br>VDE 0482-754-2<br>EN 60754-2<br>BS EN 60754-2 |
|                                                                      |                                                                          |                                                                                          |                                                              |
| HALOJENSİZLİK TESTİ<br>HALOGEN FREE TEST                             | DEVRE BÜTÜNLÜĞÜ TESTİ (FE180)<br>CIRCUIT INTEGRITY TEST (FE180)          | MEKANİK ŞOKLU DEVRE BÜTÜNLÜĞÜ TESTİ (PH120)<br>CIRCUIT INTEGRITY WITH SHOCK TEST (PH120) |                                                              |
| IEC 60754-1<br>VDE 0482-754-1<br>EN 60754-1<br>BS EN 60754-1         | IEC 60331-23                                                             | EN 50200<br>VDE 0482-200<br>BS EN 50200                                                  |                                                              |

# ERVITAL LIHH-TP FE180/PH120

**VDE 0812**

ALEV GECİKTİRİCİ ÖZELLİK/DÜŞÜK DUMAN YOĞUNLUĞU/ZEHİRLİ VE KOROZİF GAZLARDAN ARINDIRILMIŞ  
DEVRE BÜTÜNLÜĞÜ MİNİMUM 180 DAKİKA/MEKANİK ŞOKLU DEVRE BÜTÜNLÜĞÜ PH120  
FLAME RETARDANT CHARACTERISTIC/LOW SMOKE EMISSION/WITHOUT POISONED AND CORROSIVE GASES  
CIRCUIT INTEGRITY 180 MINUTES/CIRCUIT INTEGRITY WITH MECHANICAL SHOCK PH120



## KULLANIM ALANLARI

İnsanların yoğun olarak bulunduğu kapalı ortamlarda  
-Enstrüman ve kontrol mühendisliğinde  
-Endüstriyel elektronikte  
-Bilgisayar ve ofis makinelerinde  
-Bina içi haberleşme sistemlerinde  
-Bina içi ses sistemlerinde  
-İnsan hayatının ve önemli malzemelerin korunması gereken yerlerde

## APPLICATION

Indoors where people are densely populated  
-Instrumentation and control engineering  
-Industrial electronics  
-Computers and office machines  
-Indoor communication systems  
-Indoor sound systems  
-In places where human life and valuable materials and equipment need to be protected

## KABLO YAPISI

|                       |                                                                              |
|-----------------------|------------------------------------------------------------------------------|
| <b>1-İletken</b>      | IEC 60228; DIN VDE 0295; EN 60228 Sınıf 5<br>Bükülü Elektrolitik Tavlı Bakır |
| <b>2-Yalıtkan</b>     | Çapraz Bağlı Seramik Formunda Polimer<br>Kompaund                            |
| <b>3-Yalıtım Renk</b> | DIN 47100                                                                    |
| <b>4-Büküm</b>        | Çift büküm, katlar halinde                                                   |
| <b>5-Ayırıcı Bant</b> | Pes Bant + Cam Elyaf Bant                                                    |
| <b>6-Kılıf</b>        | EN 50290-2-27 HFFR Kompaund                                                  |

## CONSTRUCTION

|                      |                                                                                |
|----------------------|--------------------------------------------------------------------------------|
| <b>1-Conductor</b>   | IEC-60228; DIN VDE 0295; EN 60228 Class 5<br>Stranded Electrolytic Bare Copper |
| <b>2-Insulation</b>  | Cross-linked Ceramic Forming Polymer<br>Compound                               |
| <b>3-Colour Code</b> | DIN 47100                                                                      |
| <b>4-Stranding</b>   | Pairs in layers                                                                |
| <b>5-Wrapping</b>    | Pes Tape + Glass Fibre Tape                                                    |
| <b>6-Sheath</b>      | EN 50290-2-27 HFFR Compound                                                    |

## TEKNİK ÖZELLİKLER TECHNICAL CHARACTERISTICS

| İLETKEN DİRENCİ<br>CONDUCTOR<br>RESISTANCE | YALITIM DİRENCİ (min)<br>INSULATION<br>RESISTANCE (min)                          | EFEKTİF KAPASİTE<br>MUTUAL<br>CAPACITANCE                                          | AKIM TAŞIMA KAPASİTESİ<br>CURRENT CARRYING<br>CAPACITY |
|--------------------------------------------|----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|--------------------------------------------------------|
| mm <sup>2</sup> Ω/km                       | MΩxkm                                                                            | 120nF/km                                                                           | mm <sup>2</sup> A                                      |
| 0,22 79                                    | 0,22mm <sup>2</sup> /0,34mm <sup>2</sup>                                         |                                                                                    | 0,22 2,5                                               |
| 0,34 56                                    | = 200                                                                            |                                                                                    | 0,34 4,5                                               |
| 0,50 39                                    | ≥0,50mm <sup>2</sup> = 20                                                        |                                                                                    | 0,50 6,0                                               |
| 0,75 26                                    |                                                                                  |                                                                                    | 0,75 13                                                |
| 1,0 19,5                                   |                                                                                  |                                                                                    | 1,0 16                                                 |
| 1,5 13,3                                   |                                                                                  |                                                                                    | 1,5 20                                                 |
| 2,5 7,98                                   |                                                                                  |                                                                                    | 2,5 25                                                 |
| BÜKÜLME YARIÇAP<br>BENDING RADIUS          | TEST VOLTAJ<br>TEST VOLTAGE                                                      | ÇALIŞMA VOLTAJ<br>OPERATING VOLTAGE                                                | ÇALIŞMA SICAKLIĞI<br>TEMPERATURE RANGE                 |
| 7,5x Cable Ø                               | 0,22mm <sup>2</sup> /0,34mm <sup>2</sup> = 1200V<br>≥0,50mm <sup>2</sup> = 2000V | 0,22mm <sup>2</sup> /0,34mm <sup>2</sup> = 250V<br>≥0,50mm <sup>2</sup> = 300/500V | - 40°C - +70°C                                         |

## YANGIN PERFORMANS TESTLERİ FLAME PERFORMANCE TESTS

|                                                                      |                                                                          |                                                                                             |                                                                |
|----------------------------------------------------------------------|--------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|----------------------------------------------------------------|
|                                                                      |                                                                          |                                                                                             |                                                                |
| ALEV GECİKTİRİCİLİK<br>TESTİ<br>FLAME RETARDANT TEST                 | ALEV YAYILIMI TESTİ<br>FLAME PROPAGATION<br>TEST                         | DUMAN YOĞUNLUĞU<br>TESTİ<br>SMOKE DENSITY TEST                                              | KOROZİF GAZ TESTİ<br>TEST ON CORROSIVENESS<br>COMBUSTION GASES |
| IEC 60332-1-2<br>VDE 0482-332-1-2<br>EN 60332-1-2<br>BS EN 60332-1-2 | IEC 60332-3-24<br>VDE 0482-332-3-24<br>EN 60332-3-24<br>BS EN 60332-3-24 | IEC 61034-2<br>VDE 0482-1034-2<br>EN 61034-2<br>BS EN 61034-2                               | IEC 60754-2<br>VDE 0482-754-2<br>EN 60754-2<br>BS EN 60754-2   |
|                                                                      |                                                                          |                                                                                             |                                                                |
| HALOJENSİZLİK TESTİ<br>HALOGEN FREE TEST                             | DEVRE BÜTÜNLÜĞÜ TESTİ (FE180)<br>CIRCUIT INTEGRITY TEST (FE180)          | MEKANİK ŞOKLU DEVRE BÜTÜNLÜĞÜ<br>TESTİ (PH120)<br>CIRCUIT INTEGRITY WITH SHOCK TEST (PH120) |                                                                |
| IEC 60754-1<br>VDE 0482-754-1<br>EN 60754-1<br>BS EN 60754-1         | IEC 60331-23                                                             | EN 50200<br>VDE 0482-200<br>BS EN 50200                                                     |                                                                |

# ERVITAL LIHCH-TP FE180/PH120

VDE 0812



ALEV GECİKTİRİCİ ÖZELLİK/DÜŞÜK DUMAN YOĞUNLUĞU/ZEHİRLİ VE KOROZİF GAZLARDAN ARINDIRILMIŞ  
DEVRE BÜTÜNLÜĞÜ MİNİMUM 180 DAKİKA/MEKANİK ŞOKLU DEVRE BÜTÜNLÜĞÜ PH120  
FLAME RETARDANT CHARACTERISTIC/LOW SMOKE EMISSION/WITHOUT POISONED AND CORROSIVE GASES  
CIRCUIT INTEGRITY 180 MINUTES/CIRCUIT INTEGRITY WITH MECHANICAL SHOCK PH120



## KULLANIM ALANLARI

Elektromanyetik karışım ve girişimlerin olduğu  
İnsanların yoğun olarak bulunduğu kapalı ortamlarda  
-Enstrüman ve kontrol mühendisliğinde  
-Endüstriyel elektronikte  
-Bilgisayar ve ofis makinelerinde  
-Bina içi haberleşme sistemlerinde  
-Bina içi ses sistemlerinde  
-İnsan hayatının ve önemli malzemelerin korunması gereken yerlerde

## APPLICATION

In places where electro-magnetic interference and influence exists  
Indoors where people are densely populated  
-Instrumentation and control engineering  
-Industrial electronics  
-Computers and office machines  
-Indoor communication systems  
-Indoor sound systems  
-In places where human life and valuable materials and equipment need to be protected

## KABLO YAPISI

|                       |                                                                              |
|-----------------------|------------------------------------------------------------------------------|
| <b>1-İletken</b>      | IEC 60228; DIN VDE 0295; EN 60228 Sınıf 5<br>Bükülü Elektrolitik Tavlı Bakır |
| <b>2-Yalıtkan</b>     | Çapraz Bağlı Seramik Formunda Polimer<br>Kompaund                            |
| <b>3-Yalıtım Renk</b> | DIN 47100                                                                    |
| <b>4-Büküm</b>        | Çift büküm, katlar halinde                                                   |
| <b>5-Ayırıcı Bant</b> | Pes Bant + Cam Elyaf Bant                                                    |
| <b>6-Ekran</b>        | Kalaylı Bakır Örgü                                                           |
| <b>7-Kılıf</b>        | EN 50290-2-27 HFFR Kompaund                                                  |

## CONSTRUCTION

|                      |                                                                                |
|----------------------|--------------------------------------------------------------------------------|
| <b>1-Conductor</b>   | IEC 60228; DIN VDE 0295; EN 60228 Class 5<br>Stranded Electrolytic Bare Copper |
| <b>2-Insulation</b>  | Cross-linked Ceramic Forming Polymer<br>Compound                               |
| <b>3-Colour Code</b> | DIN 47100                                                                      |
| <b>4-Stranding</b>   | Pairs in layers                                                                |
| <b>5-Wrapping</b>    | Pes Tape + Glass Fibre Tape                                                    |
| <b>6-Screen</b>      | Tinned Copper Braid                                                            |
| <b>7-Sheath</b>      | EN 50290-2-27 HFFR Compound                                                    |

## TEKNİK ÖZELLİKLER TECHNICAL CHARACTERISTICS

| İLETKEN DİRENCİ<br>CONDUCTOR<br>RESISTANCE | YALITIM DİRENCİ (min)<br>INSULATION<br>RESISTANCE (min)                          | EFEKTİF KAPASİTE<br>MUTUAL<br>CAPACITANCE                                          | AKIM TAŞIMA KAPASİTESİ<br>CURRENT CARRYING<br>CAPACITY |
|--------------------------------------------|----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|--------------------------------------------------------|
| mm <sup>2</sup> Ω/km                       | MΩxkm                                                                            | 120nF/km                                                                           | mm <sup>2</sup> A                                      |
| 0,22 79                                    | 0,22mm <sup>2</sup> /0,34mm <sup>2</sup>                                         |                                                                                    | 0,22 2,5                                               |
| 0,34 56                                    | = 200                                                                            |                                                                                    | 0,34 4,5                                               |
| 0,50 39                                    | ≥0,50mm <sup>2</sup> = 20                                                        |                                                                                    | 0,50 6,0                                               |
| 0,75 26                                    |                                                                                  |                                                                                    | 0,75 13                                                |
| 1,0 19,5                                   |                                                                                  |                                                                                    | 1,0 16                                                 |
| 1,5 13,3                                   |                                                                                  |                                                                                    | 1,5 20                                                 |
| 2,5 7,98                                   |                                                                                  |                                                                                    | 2,5 25                                                 |
| BÜKÜLME YARIÇAPI<br>BENDING RADIUS         | TEST VOLTAJ<br>TEST VOLTAGE                                                      | ÇALIŞMA VOLTAJ<br>OPERATING VOLTAGE                                                | ÇALIŞMA SICAKLIĞI<br>TEMPERATURE RANGE                 |
| 7,5x Cable Ø                               | 0,22mm <sup>2</sup> /0,34mm <sup>2</sup> = 1200V<br>≥0,50mm <sup>2</sup> = 2000V | 0,22mm <sup>2</sup> /0,34mm <sup>2</sup> = 250V<br>≥0,50mm <sup>2</sup> = 300/500V | - 40°C - +70°C                                         |

## YANGIN PERFORMANS TESTLERİ FLAME PERFORMANCE TESTS

|                                                                      |                                                                          |                                                                                             |                                                                |
|----------------------------------------------------------------------|--------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|----------------------------------------------------------------|
|                                                                      |                                                                          |                                                                                             |                                                                |
| ALEV GECİKTİRİCİLİK TESTİ<br>FLAME RETARDANT TEST                    | ALEV YAYILIMI TESTİ<br>FLAME PROPAGATION<br>TEST                         | DUMAN YOĞUNLUĞU<br>TESTİ<br>SMOKE DENSITY TEST                                              | KOROZİF GAZ TESTİ<br>TEST ON CORROSIVENESS<br>COMBUSTION GASES |
| IEC 60332-1-2<br>VDE 0482-332-1-2<br>EN 60332-1-2<br>BS EN 60332-1-2 | IEC 60332-3-24<br>VDE 0482-332-3-24<br>EN 60332-3-24<br>BS EN 60332-3-24 | IEC 61034-2<br>VDE 0482-1034-2<br>EN 61034-2<br>BS EN 61034-2                               | IEC 60754-2<br>VDE 0482-754-2<br>EN 60754-2<br>BS EN 60754-2   |
|                                                                      |                                                                          |                                                                                             |                                                                |
| HALOJENSİZLİK TESTİ<br>HALOGEN FREE TEST                             | DEVRE BÜTÜNLÜĞÜ TESTİ (FE180)<br>CIRCUIT INTEGRITY TEST (FE180)          | MEKANİK ŞOKLU DEVRE<br>BÜTÜNLÜĞÜ TESTİ (PH120)<br>CIRCUIT INTEGRITY WITH SHOCK TEST (PH120) |                                                                |
| IEC 60754-1<br>VDE 0482-754-1<br>EN 60754-1<br>BS EN 60754-1         | IEC 60331-23                                                             | EN 50200<br>VDE 0482-200<br>BS EN 50200                                                     |                                                                |

## NOTLAR NOTES

\* Bu kablo PH180 testlerinde VDE tarafından onaylanmış ve sertifikalandırılmıştır.

\* This cable has been approved and certified by VDE on PH 180 tests

# ERVITAL LIHCH-TP FE180/E30-E60

**VDE 0812**

ALEV GECİKTİRİCİ ÖZELLİK/DÜŞÜK DUMAN YOĞUNLUĞU/ZEHİRLİ VE KOROZİF GAZLARDAN ARINDIRILMIŞ DEVRE BÜTÜNLÜĞÜ 180 DAKIKA/KABLO SİSTEMİNİN DEVRE BÜTÜNLÜĞÜ E30-E60

FLAME RETARDANT CHARACTERISTIC/LOW SMOKE EMISSION/WITHOUT POISONED AND CORROSIVE GASES CIRCUIT INTEGRITY FOR MINIMUM 180 MINUTES/CABLE SYSTEM CIRCUIT INTEGRITY E30-E60



## KULLANIM ALANLARI

Elektromanyetik karışma ve girişimlerin olduğu insanların yoğun olarak bulunduğu kapalı ortamlarda

- Enstrüman ve kontrol mühendisliğinde
- Endüstriyel elektronikte
- Bilgisayar ve ofis makinelerinde
- Bina içi haberleşme sistemlerinde
- Bina içi ses sistemlerinde
- İnsan hayatının ve önemli malzemelerin korunması gereken yerlerde

## APPLICATION

In places where electro-magnetic interference and influence exists indoors where people are densely populated

- Instrumentation and control engineering
- Industrial electronics
- Computers and office machines
- Indoor communication systems
- Indoor sound systems
- In places where human life and valuable materials and equipment need to be protected

## KABLO YAPISI

|                       |                                                                       |
|-----------------------|-----------------------------------------------------------------------|
| <b>1-İletken</b>      | IEC 60228; DIN VDE 0295; EN 60228 Sınıf 5<br>Elektrolitik Tavlı Bakır |
| <b>2-Yalıtkan</b>     | Çapraz Bağlı Seramik Formunda Polimer<br>Kompaund                     |
| <b>3-Yalıtım Renk</b> | DIN 47100                                                             |
| <b>4-Büküm</b>        | Çift büküm katlar halinde                                             |
| <b>5-Ayırıcı Bant</b> | Pes Bant + Cam Elyaf Bant                                             |
| <b>6-Ekran</b>        | Kalaylı Bakır Örgü                                                    |
| <b>7-Kılıf</b>        | EN 50290-2-27 HFFR Kompaund                                           |
| <b>8-Kılıf Rengi</b>  | RAL 2003 Turuncu                                                      |

## CONSTRUCTION

|                        |                                                                                |
|------------------------|--------------------------------------------------------------------------------|
| <b>1-Conductor</b>     | IEC-60228; DIN VDE 0295; EN 60228 Class 5<br>Stranded Electrolytic Bare Copper |
| <b>2-Insulation</b>    | Cross-linked Ceramic Forming Polymer<br>Compound                               |
| <b>3-Colour Code</b>   | DIN 47100                                                                      |
| <b>4-Stranding</b>     | Pairs in layers                                                                |
| <b>5-Wrapping</b>      | Pes Tape + Glass Fibre Tape                                                    |
| <b>6-Screen</b>        | Tinned Copper Braid                                                            |
| <b>7-Sheath</b>        | EN 50290-2-27 HFFR Compaund                                                    |
| <b>8-Sheath Colour</b> | RAL 2003 Orange                                                                |

## TEKNİK ÖZELLİKLER TECHNICAL CHARACTERISTICS

| İLETKEN DİRENCİ<br>CONDUCTOR<br>RESISTANCE | YALITIM DİRENCİ (min)<br>INSULATION<br>RESISTANCE (min)                          | EFEKTİF KAPASİTE<br>MUTUAL<br>CAPACITANCE                                          | AKIM TAŞIMA KAPASİTESİ<br>CURRENT CARRYING<br>CAPACITY |
|--------------------------------------------|----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|--------------------------------------------------------|
| mm <sup>2</sup> Ω/km                       | MΩxkm                                                                            | 120nF/km                                                                           | mm <sup>2</sup> A                                      |
| 0,22    79                                 | 0,22mm <sup>2</sup> /0,34mm <sup>2</sup>                                         |                                                                                    | 0,22    2,5                                            |
| 0,34    56                                 | = 200                                                                            |                                                                                    | 0,34    4,5                                            |
| 0,5    39                                  | ≥0,50mm <sup>2</sup> = 20                                                        |                                                                                    | 0,5    6,0                                             |
| 0,75    26                                 |                                                                                  |                                                                                    | 0,75    13                                             |
| 1    19,5                                  |                                                                                  |                                                                                    | 1    16                                                |
| 1,5    13,3                                |                                                                                  |                                                                                    | 1,5    20                                              |
| 2,5    7,98                                |                                                                                  |                                                                                    | 2,5    25                                              |
| BÜKÜLME YARIÇAPI<br>BENDING RADIUS         | TEST VOLTAJ<br>TEST VOLTAGE                                                      | ÇALIŞMA VOLTAJ<br>OPERATING VOLTAGE                                                | ÇALIŞMA SICAKLIĞI<br>TEMPERATURE RANGE                 |
| 7,5x Cable Ø                               | 0,22mm <sup>2</sup> /0,34mm <sup>2</sup> = 1200V<br>≥0,50mm <sup>2</sup> = 2000V | 0,22mm <sup>2</sup> /0,34mm <sup>2</sup> = 250V<br>≥0,50mm <sup>2</sup> = 300/500V | - 40°C - +70°C                                         |

## YANGIN PERFORMANS TESTLERİ FLAME PERFORMANCE TESTS

|                                                                      |                                                                          |                                                                                                |                                                                                                         |
|----------------------------------------------------------------------|--------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|
|                                                                      |                                                                          |                                                                                                |                                                                                                         |
| ALEV GECİKTİRİCİLİK TESTİ<br>FLAME RETARDANT TEST                    | ALEV YAYILIMI TESTİ<br>FLAME PROPAGATION<br>TEST                         | DUMAN YOĞUNLUĞU<br>TESTİ<br>SMOKE DENSITY TEST                                                 | KOROZİF GAZ TESTİ<br>TEST ON CORROSIVENESS<br>COMBUSTION GASES                                          |
| IEC 60332-1-2<br>VDE 0482-332-1-2<br>EN 60332-1-2<br>BS EN 60332-1-2 | IEC 60332-3-24<br>VDE 0482-332-3-24<br>EN 60332-3-24<br>BS EN 60332-3-24 | IEC 61034-2<br>VDE 0482-1034-2<br>EN 61034-2<br>BS EN 61034-2                                  | IEC 60754-2<br>VDE 0482-754-2<br>EN 60754-2<br>BS EN 60754-2                                            |
|                                                                      |                                                                          |                                                                                                |                                                                                                         |
| HALOJENSİZLİK TESTİ<br>HALOGEN FREE TEST                             | DEVRE BÜTÜNLÜĞÜ TESTİ<br>(FE180)<br>CIRCUIT INTEGRITY TEST<br>(FE180)    | MEKANİK ŞOKLU DEVRE<br>BÜTÜNLÜĞÜ TESTİ (PHI20)<br>CIRCUIT INTEGRITY WITH<br>SHOCK TEST (PHI20) | KABLO SİSTEMİNİN DEVRE<br>BÜTÜNLÜĞÜ TESTİ (E30-E60)<br>CABLE SYSTEM CIRCUIT<br>INTEGRITY TEST (E30-E60) |
| IEC 60754-1<br>VDE 0482-754-1<br>EN 60754-1<br>BS EN 60754-1         | IEC 60331-23<br>VDE 0482-200<br>BS EN 50200                              | EN 50200<br>VDE 0482-200<br>BS EN 50200                                                        | DIN 4102-12                                                                                             |

# ERVITAL LIHCH-TP FE180/E90

VDE 0812



ALEV GECİKTİRİCİ ÖZELLİK/DÜŞÜK DUMAN YOĞUNLUĞU/ZEHİRLİ VE KOROZİF GAZLARDAN ARINDIRILMIŞ DEVRE BÜTÜNLÜĞÜ 180 DAKIKA/KABLO SİSTEMİNİN DEVRE BÜTÜNLÜĞÜ E90

FLAME RETARDANT CHARACTERISTIC/LOW SMOKE EMISSION/WITHOUT POISONED AND CORROSIVE GASES CIRCUIT INTEGRITY FOR MINIMUM 180 MINUTES/CABLE SYSTEM CIRCUIT INTEGRITY E90



## KULLANIM ALANLARI

Elektromanyetik karışma ve girişimlerin olduğu insanların yoğun olarak bulunduğu kapalı ortamlarda

- Enstrüman ve kontrol mühendisliğinde
- Endüstriyel elektronikte
- Bilgisayar ve ofis makinelerinde
- Bina içi haberleşme sistemlerinde
- Bina içi ses sistemlerinde
- İnsan hayatının ve önemli malzemelerin korunması gereken yerlerde

## KABLO YAPISI

|                       |                                                                       |
|-----------------------|-----------------------------------------------------------------------|
| <b>1-İletken</b>      | IEC 60228; DIN VDE 0295; EN 60228 Sınıf 5<br>Elektrolitik Tavlı Bakır |
| <b>2-Yalıtkan</b>     | Çapraz Bağlı Seramik Formunda Polimer<br>Kompaund                     |
| <b>3-Yalıtım Renk</b> | DIN 47100                                                             |
| <b>4-Büküm</b>        | Çift büküm katlar halinde                                             |
| <b>5-Ayırıcı Bant</b> | Pes Bant + Cam Elyaf Bant                                             |
| <b>6-Ekran</b>        | Kalaylı Bakır Örgü                                                    |
| <b>7-Kılıf</b>        | EN 50290-2-27 HFFR Kompaund                                           |
| <b>8-Kılıf Rengi</b>  | RAL 2003 Turuncu                                                      |

## TEKNİK ÖZELLİKLER TECHNICAL CHARACTERISTICS

| İLETKEN DİRENCİ<br>CONDUCTOR<br>RESISTANCE | YALITIM DİRENCİ (min)<br>INSULATION<br>RESISTANCE (min)                          | EFEKTİF KAPASİTE<br>MUTUAL<br>CAPACITANCE                                          | AKIM TAŞIMA KAPASİTESİ<br>CURRENT CARRYING<br>CAPACITY |
|--------------------------------------------|----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|--------------------------------------------------------|
| mm <sup>2</sup>                            | Ω/km                                                                             | MΩxkm                                                                              | mm <sup>2</sup> A                                      |
| 0,22                                       | 79                                                                               | 0,22mm <sup>2</sup> /0,34mm <sup>2</sup>                                           | 0,22 2,5                                               |
| 0,34                                       | 56                                                                               | = 200                                                                              | 0,34 4,5                                               |
| 0,5                                        | 39                                                                               | ≥0,50mm <sup>2</sup> = 20                                                          | 0,5 6,0                                                |
| 0,75                                       | 26                                                                               |                                                                                    | 0,75 13                                                |
| 1                                          | 19,5                                                                             |                                                                                    | 1 16                                                   |
| 1,5                                        | 13,3                                                                             |                                                                                    | 1,5 20                                                 |
| 2,5                                        | 7,98                                                                             |                                                                                    | 2,5 25                                                 |
| BÜKÜLME YARIÇAPI<br>BENDING RADIUS         | TEST VOLTAJİ<br>TEST VOLTAGE                                                     | ÇALIŞMA VOLTAJİ<br>OPERATING VOLTAGE                                               | ÇALIŞMA SICAKLIĞI<br>TEMPERATURE RANGE                 |
| 7,5x Cable Ø                               | 0,22mm <sup>2</sup> /0,34mm <sup>2</sup> = 1200V<br>≥0,50mm <sup>2</sup> = 2000V | 0,22mm <sup>2</sup> /0,34mm <sup>2</sup> = 250V<br>≥0,50mm <sup>2</sup> = 300/500V | - 40°C - +70°C                                         |

## APPLICATION

In places where electro-magnetic interference and influence exists  
Indoors where people are densely populated

- Instrumentation and control engineering
- Industrial electronics
- Computers and office machines
- Indoor communication systems
- Indoor sound systems
- In places where human life and valuable materials and equipment need to be protected

## CONSTRUCTION

|                        |                                                                                |
|------------------------|--------------------------------------------------------------------------------|
| <b>1-Conductor</b>     | IEC-60228; DIN VDE 0295; EN 60228 Class 5<br>Stranded Electrolytic Bare Copper |
| <b>2-Insulation</b>    | Cross-linked Ceramic Forming Polymer<br>Compound                               |
| <b>3-Colour Code</b>   | DIN 47100                                                                      |
| <b>4-Stranding</b>     | Pairs in layers                                                                |
| <b>5-Wrapping</b>      | Pes Tape + Glass Fibre Tape                                                    |
| <b>6-Screen</b>        | Tinned Copper Braid                                                            |
| <b>7-Sheath</b>        | EN 50290-2-27 HFFR Compaund                                                    |
| <b>8-Sheath Colour</b> | RAL 2003 Orange                                                                |

## YANGIN PERFORMANS TESTLERİ FLAME PERFORMANCE TESTS

|                                                                      |                                                                         |                                                                                                |                                                                                                 |
|----------------------------------------------------------------------|-------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|
|                                                                      |                                                                         |                                                                                                |                                                                                                 |
| ALEV GECİKTİRİCİLİK TESTİ<br>FLAME RETARDANT TEST                    | ALEV YAYILIMI TESTİ<br>FLAME PROPAGATION<br>TEST                        | DUMAN YOĞUNLUĞU<br>TESTİ<br>SMOKE DENSITY TEST                                                 | KOROZİF GAZ TESTİ<br>TEST ON CORROSIVENESS<br>COMBUSTION GASES                                  |
| IEC 60332-1-2<br>VDE 0482-332-1-2<br>EN 60332-1-2<br>BS EN 60332-1-2 | IEC 60332-3-24<br>DE 0482-332-3-24<br>EN 60332-3-24<br>BS EN 60332-3-24 | IEC 61034-2<br>VDE 0482-1034-2<br>EN 61034-2<br>BS EN 61034-2                                  | IEC 60754-2<br>VDE 0482-754-2<br>EN 60754-2<br>BS EN 60754-2                                    |
|                                                                      |                                                                         |                                                                                                |                                                                                                 |
| HALOJENSİZLİK TESTİ<br>HALOGEN FREE TEST                             | DEVRE BÜTÜNLÜĞÜ TESTİ<br>(FE180)<br>CIRCUIT INTEGRITY TEST<br>(FE180)   | MEKANİK ŞOKLU DEVRE<br>BÜTÜNLÜĞÜ TESTİ (PHI20)<br>CIRCUIT INTEGRITY WITH<br>SHOCK TEST (PHI20) | KABLO SİSTEMİNİN DEVRE<br>BÜTÜNLÜĞÜ TESTİ (E90)<br>CABLE SYSTEM CIRCUIT<br>INTEGRITY TEST (E90) |
| IEC 60754-1<br>VDE 0482-754-1<br>EN 60754-1<br>BS EN 60754-1         | IEC 60331-23                                                            | EN 50200<br>VDE 0482-200<br>BS EN 50200                                                        | DIN 4102-12                                                                                     |

# ERVITAL LIH(St)H-TP FE180/PH120

**VDE 0812**

ALEV GECİKTİRİCİ ÖZELLİK/DÜŞÜK DUMAN YOĞUNLUĞU/ZEHİRLİ VE KOROZİF GAZLARDAN ARINDIRILMIŞ  
DEVRE BÜTÜNLÜĞÜ MİNİMUM 180 DAKIKA/MEKANİK ŞOKLU DEVRE BÜTÜNLÜĞÜ PH120  
FLAME RETARDANT CHARACTERISTIC/LOW SMOKE EMISSION/WITHOUT POISONED AND CORROSIVE GASES  
CIRCUIT INTEGRITY 180 MINUTES/CIRCUIT INTEGRITY WITH MECHANICAL SHOCK PH120



## KULLANIM ALANLARI

Elektromanyetik karışım ve girişimlerin olduğu  
İnsanların yoğun olarak bulunduğu kapalı ortamlarda  
-Enstrüman ve kontrol mühendisliğinde  
-Endüstriyel elektronikte  
-Bilgisayar ve ofis makinelerinde  
-Bina içi haberleşme sistemlerinde  
-Bina içi ses sistemlerinde  
-İnsan hayatının ve önemli malzemelerin korunması gereken yerlerde

## APPLICATION

In places where electro-magnetic interference and influence exists  
Indoors where people are densely populated  
-Instrumentation and control engineering  
-Industrial electronics  
-Computers and office machines  
-Indoor communication systems  
-Indoor sound systems  
-In places where human life and valuable materials and equipment need to be protected

## KABLO YAPISI

|                       |                                                                              |
|-----------------------|------------------------------------------------------------------------------|
| <b>1-İletken</b>      | IEC 60228; DIN VDE 0295; EN 60228 Sınıf 5<br>Bükülü Elektrolitik Tavlı Bakır |
| <b>2-Yalıtkan</b>     | Çapraz Bağlı Seramik Formunda Polimer<br>Kompaund                            |
| <b>3-Yalıtım Renk</b> | DIN 47100                                                                    |
| <b>4-Büküm</b>        | Çift büküm, katlar halinde                                                   |
| <b>5-Ayırıcı Bant</b> | Pes Bant + Cam Elyaf Bant                                                    |
| <b>6-Ekran</b>        | Kalaylı Bakır Toprak Teli + Al-Pes Bant                                      |
| <b>7-Kılıf</b>        | EN 50290-2-27 HFFR Kompaund                                                  |

## CONSTRUCTION

|                      |                                                                                |
|----------------------|--------------------------------------------------------------------------------|
| <b>1-Conductor</b>   | IEC-60228; DIN VDE 0295; EN 60228 Class 5<br>Stranded Electrolytic Bare Copper |
| <b>2-Insulation</b>  | Cross-linked Ceramic Forming Polymer<br>Compound                               |
| <b>3-Colour Code</b> | DIN 47100                                                                      |
| <b>4-Stranding</b>   | Pairs in layers                                                                |
| <b>5-Wrapping</b>    | Pes Tape + Glass Fibre Tape                                                    |
| <b>6-Screen</b>      | Tinned Copper Drain Wire + Al-Pes Tape                                         |
| <b>7-Sheath</b>      | EN 50290-2-27 HFFR Compound                                                    |

## TEKNİK ÖZELLİKLER TECHNICAL CHARACTERISTICS

| İLETKEN DİRENCİ<br>CONDUCTOR<br>RESISTANCE | YALITIM DİRENCİ (min)<br>INSULATION<br>RESISTANCE (min)                          | EFEKTİF KAPASİTE<br>MUTUAL<br>CAPACITANCE                                          | AKIM TAŞIMA KAPASİTESİ<br>CURRENT CARRYING<br>CAPACITY |
|--------------------------------------------|----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|--------------------------------------------------------|
| mm <sup>2</sup> Ω/km                       | MΩxkm                                                                            | 120nF/km                                                                           | mm <sup>2</sup> A                                      |
| 0,22 79                                    | 0,22mm <sup>2</sup> /0,34mm <sup>2</sup>                                         |                                                                                    | 0,22 2,5                                               |
| 0,34 56                                    | = 200                                                                            |                                                                                    | 0,34 4,5                                               |
| 0,50 39                                    | ≥0,50mm <sup>2</sup> = 20                                                        |                                                                                    | 0,50 6,0                                               |
| 0,75 26                                    |                                                                                  |                                                                                    | 0,75 13                                                |
| 1,0 19,5                                   |                                                                                  |                                                                                    | 1,0 16                                                 |
| 1,5 13,3                                   |                                                                                  |                                                                                    | 1,5 20                                                 |
| 2,5 7,98                                   |                                                                                  |                                                                                    | 2,5 25                                                 |
| BÜKÜLME YARIÇAPI<br>BENDING RADIUS         | TEST VOLTAJI<br>TEST VOLTAGE                                                     | ÇALIŞMA VOLTAJI<br>OPERATING VOLTAGE                                               | ÇALIŞMA SICAKLIĞI<br>TEMPERATURE RANGE                 |
| 7,5x Cable Ø                               | 0,22mm <sup>2</sup> /0,34mm <sup>2</sup> = 1200V<br>≥0,50mm <sup>2</sup> = 2000V | 0,22mm <sup>2</sup> /0,34mm <sup>2</sup> = 250V<br>≥0,50mm <sup>2</sup> = 300/500V | - 40°C - +70°C                                         |

## YANGIN PERFORMANS TESTLERİ FLAME PERFORMANCE TESTS



ALEV GECİKTİRİCİLİK  
TESTİ  
FLAME RETARDANT TEST

IEC 60332-1-2  
VDE 0482-332-1-2  
EN 60332-1-2  
BS EN 60332-1-2



ALEV YAYILIMI TESTİ  
FLAME PROPAGATION  
TEST

IEC 60332-3-24  
VDE 0482-332-3-24  
EN 60332-3-24  
BS EN 60332-3-24



DUMAN YOĞUNLUĞU  
TESTİ  
SMOKE DENSITY TEST

IEC 61034-2  
VDE 0482-1034-2  
EN 61034-2  
BS EN 61034-2



KOROZİF GAZ TESTİ  
TEST ON CORROSIVENESS  
COMBUSTION GASES

IEC 60754-2  
VDE 0482-754-2  
EN 60754-2  
BS EN 60754-2



HALOJENSİZLİK TESTİ  
HALOGEN FREE TEST

IEC 60754-1  
VDE 0482-754-1  
EN 60754-1  
BS EN 60754-1



DEVRE BÜTÜNLÜĞÜ TESTİ (FE180)  
CIRCUIT INTEGRITY TEST (FE180)

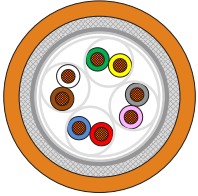
IEC 60331-23



MEKANİK ŞOKLU DEVRE  
BÜTÜNLÜĞÜ TESTİ (PH120)  
CIRCUIT INTEGRITY WITH SHOCK TEST (PH120)

EN 50200  
VDE 0482-200  
BS EN 50200

# ERVITAL LIH(St)CH-TP FE180/PH120

**VDE 0812**

ALEV GECİKTİRİCİ ÖZELLİK/DÜŞÜK DUMAN YOĞUNLUĞU/ZEHİRLİ VE KOROZİF GAZLARDAN ARINDIRILMIŞ  
DEVRE BÜTÜNLÜĞÜ MİNİMUM 180 DAKIKA/MEKANİK ŞOKLU DEVRE BÜTÜNLÜĞÜ PH120  
FLAME RETARDANT CHARACTERISTIC/LOW SMOKE EMISSION/WITHOUT POISONED AND CORROSIVE GASES  
CIRCUIT INTEGRITY 180 MINUTES/CIRCUIT INTEGRITY WITH MECHANICAL SHOCK PH120



## KULLANIM ALANLARI

Elektromanyetik karışım ve girişimlerin olduğu  
İnsanların yoğun olarak bulunduğu kapalı ortamlarda

- Enstrüman ve kontrol mühendisliğinde
- Endüstriyel elektronikte
- Bilgisayar ve ofis makinelerinde
- Bina içi haberleşme sistemlerinde
- Bina içi ses sistemlerinde
- İnsan hayatının ve önemli malzemelerin korunması gereken yerlerde

## APPLICATION

- In places where electro-magnetic interference and influence exists  
Indoors where people are densely populated
- Instrumentation and control engineering
  - Industrial electronics
  - Computers and office machines
  - Indoor communication systems
  - Indoor sound systems
  - In places where human life and valuable materials and equipment need to be protected

## KABLO YAPISI

|                       |                                                                              |
|-----------------------|------------------------------------------------------------------------------|
| <b>1-İletken</b>      | IEC 60228; DIN VDE 0295; EN 60228 Sınıf 5<br>Bükülü Elektrolitik Tavlı Bakır |
| <b>2-Yalıtkan</b>     | Çapraz Bağlı Seramik Formunda Polimer<br>Kompaund                            |
| <b>3-Yalıtım Renk</b> | DIN 47100                                                                    |
| <b>4-Büküm</b>        | Çift büküm, katlar halinde                                                   |
| <b>5-Ayırıcı Bant</b> | Pes Bant + Cam Elyaf Bant                                                    |
| <b>6-Ekran</b>        | Al-Pes Bant + Kalaylı Bakır Örgü                                             |
| <b>7-Kılıf</b>        | EN 50290-2-27 HFFR Kompaund                                                  |

## CONSTRUCTION

|                      |                                                                                |
|----------------------|--------------------------------------------------------------------------------|
| <b>1-Conductor</b>   | IEC 60228; DIN VDE 0295; EN 60228 Class 5<br>Stranded Electrolytic Bare Copper |
| <b>2-Insulation</b>  | Cross-linked Ceramic Forming Polymer<br>Compound                               |
| <b>3-Colour Code</b> | DIN 47100                                                                      |
| <b>4-Stranding</b>   | Pairs in layers                                                                |
| <b>5-Wrapping</b>    | Pes Tape + Glass Fibre Tape                                                    |
| <b>6-Screen</b>      | Al-Pes Tape + Tinned Copper Braid                                              |
| <b>7-Sheath</b>      | EN 50290-2-27 HFFR Compound                                                    |

## TEKNİK ÖZELLİKLER TECHNICAL CHARACTERISTICS

| İLETKEN DİRENCİ<br>CONDUCTOR<br>RESISTANCE | YALITIM DİRENCİ (min)<br>INSULATION<br>RESISTANCE (min)                            | EFEKTİF KAPASİTE<br>MUTUAL<br>CAPACITANCE                                          | AKIM TAŞIMA KAPASİTESİ<br>CURRENT CARRYING<br>CAPACITY |
|--------------------------------------------|------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|--------------------------------------------------------|
| mm <sup>2</sup> Ω/km                       | MΩxkm                                                                              | 120nF/km                                                                           | mm <sup>2</sup> A                                      |
| 0,22    79                                 | 0,22mm <sup>2</sup> ve 0,34mm <sup>2</sup> = 200                                   |                                                                                    | 0,22    2,5                                            |
| 0,34    56                                 | ≥0,50mm <sup>2</sup> = 20                                                          |                                                                                    | 0,34    4,5                                            |
| 0,50    39                                 |                                                                                    |                                                                                    | 0,50    6,0                                            |
| 0,75    26                                 |                                                                                    |                                                                                    | 0,75    13                                             |
| 1,0    19,5                                |                                                                                    |                                                                                    | 1,0    16                                              |
| 1,5    13,3                                |                                                                                    |                                                                                    | 1,5    20                                              |
| 2,5    7,98                                |                                                                                    |                                                                                    | 2,5    25                                              |
| BÜKÜLME YARIÇAP<br>BENDING RADIUS          | TEST VOLTAJI<br>TEST VOLTAGE                                                       | ÇALIŞMA VOLTAJI<br>OPERATING VOLTAGE                                               | ÇALIŞMA SICAKLIĞI<br>TEMPERATURE RANGE                 |
| 7,5x Cable Ø                               | 0,22mm <sup>2</sup> ve 0,34mm <sup>2</sup> = 1200V<br>≥0,50mm <sup>2</sup> = 2000V | 0,22mm <sup>2</sup> /0,34mm <sup>2</sup> = 250V<br>≥0,50mm <sup>2</sup> = 300/500V | -40°C - +70°C                                          |

## YANGIN PERFORMANS TESTLERİ FLAME PERFORMANCE TESTS



ALEV GECİKTİRİCİLİK TESTİ  
FLAME RETARDANT TEST

IEC 60332-1-2  
VDE 0482-332-1-2  
EN 60332-1-2  
BS EN 60332-1-2



ALEV YAYILIMI TESTİ  
FLAME PROPAGATION  
TEST

IEC 60332-3-24  
VDE 0482-332-3-24  
EN 60332-3-24  
BS EN 60332-3-24



DUMAN YOĞUNLUĞU  
TESTİ  
SMOKE DENSITY TEST

IEC 61034-2  
VDE 0482-1034-2  
EN 61034-2  
BS EN 61034-2



KOROZİF GAZ TESTİ  
TEST ON CORROSIVENESS  
COMBUSTION GASES

IEC 60754-2  
VDE 0482-754-2  
EN 60754-2  
BS EN 60754-2



HALOJENSİZLİK TESTİ  
HALOGEN FREE TEST

IEC 60754-1  
VDE 0482-754-1  
EN 60754-1  
BS EN 60754-1



DEVRE BÜTÜNLÜĞÜ TESTİ (FE180)  
CIRCUIT INTEGRITY TEST (FE180)

IEC 60331-23



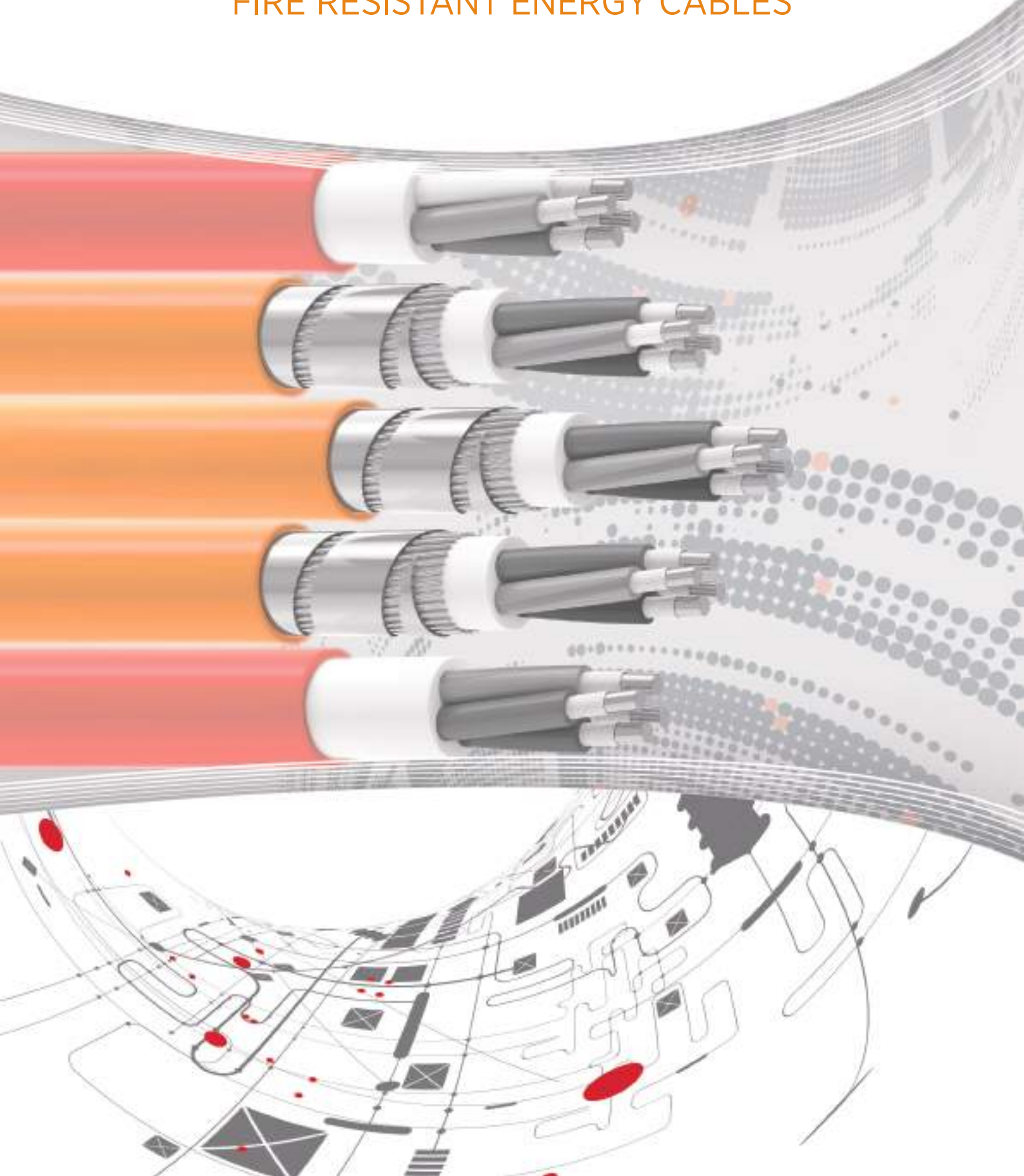
MEKANİK ŞOKLU DEVRE  
BÜTÜNLÜĞÜ TESTİ (PH120)  
CIRCUIT INTEGRITY WITH SHOCK TEST (PH120)

EN 50200  
VDE 0482-200  
BS EN 50200





## **YANGINA DAYANIKLI ENERJİ KABLOLARI** **FIRE RESISTANT ENERGY CABLES**





|                             |     |
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# NHXMH FE180/PH120



ALEV GECİKTİRİCİ ÖZELLİK/DÜŞÜK DUMAN YOĞUNLUĞU/ZEHİRLİ VE KOROZİF GAZLARDAN ARINDIRILMIŞ  
DEVRE BÜTÜNLÜĞÜ FE180/MEKANİK ŞOKLU DEVRE BÜTÜNLÜĞÜ PH120  
FLAME RETARDANT CHARACTERISTIC/LOW SMOKE EMISSION/WITHOUT POISONED AND CORROSIVE GASSES  
CIRCUIT INTEGRITY FE180/CIRCUIT INTEGRITY WITH MECHANICAL SHOCK PH120



## KULLANIM ALANLARI

Yangın anında işlevini devam ettiren bu kablolar, acil durum ve aydınlatma sistemlerinde güç ve kontrol kablosu olarak;

- Havaalanları, hastaneler, alışveriş merkezleri
- Tüneller, metro istasyonları
- Yüksek katlı binalar, oteller
- Endüstriyel tesisler
- İnsan hayatının, değerli malzemelerin ve ekipmanların korunması gereken yerlerde kullanılırlar.

## KABLO YAPISI

|                       |                                                                                  |
|-----------------------|----------------------------------------------------------------------------------|
| <b>1-İletken</b>      | IEC 60228; DIN VDE 0295; EN 60228 Sınıf 1 ya da Sınıf 2 Elektrolitik Tavlı Bakır |
| <b>2-Yalıtkan</b>     | Çapraz Bağlı Özel polimer Kompaund                                               |
| <b>3-Yalıtım Renk</b> | HD 308 S2, VDE 0293                                                              |
| <b>4-Büküm</b>        | Uygun adımda katlar halinde                                                      |
| <b>5-İç Kılıf</b>     | HFFR Kompaund                                                                    |
| <b>6-Dış Kılıf</b>    | HD 604 S1'e göre HFFR kompaund                                                   |
| <b>7-Kılıf Rengi</b>  | RAL 2003 Turuncu                                                                 |

## TEKNİK ÖZELLİKLER TECHNICAL CHARACTERISTICS

| İLETKEN DİRENCİ<br>CONDUCTOR RESISTANCE | YALITIM DİRENCİ (MİN)<br>INSULATION RESISTANCE (MIN) | ÇALIŞMA VOLTAJI<br>OPERATING VOLTAGE   | AKIM TAŞIMA KAPASİTESİ<br>CURRENT CARRYING CAPACITY |
|-----------------------------------------|------------------------------------------------------|----------------------------------------|-----------------------------------------------------|
| mm <sup>2</sup> Ω/km                    | 100MΩxkm                                             | 300/500V                               | mm <sup>2</sup> A                                   |
| 1,5    12,1                             |                                                      |                                        | 1,5    20                                           |
| 2,5    7,41                             |                                                      |                                        | 2,5    25                                           |
| 4    4,61                               |                                                      |                                        | 4    34                                             |
| 6    3,08                               |                                                      |                                        | 6    44                                             |
| 10    1,83                              |                                                      |                                        | 10    61                                            |
| 16    1,15                              |                                                      |                                        | 16    82                                            |
| 25    0,727                             |                                                      |                                        | 25    108                                           |
| BÜKÜLMÜ YARIÇAP<br>BENDING RADIUS       | TEST VOLTAJI<br>TEST VOLTAGE                         | ÇALIŞMA SICAKLIĞI<br>TEMPERATURE RANGE |                                                     |
| 7,5x Cable Ø                            | 2000V                                                | - 40°C - +90°C                         |                                                     |

## APPLICATION

These cables which are able to continue its function during a fire are used as power and control cables at emergency and lighting systems in;

- Airports, hospitals, shopping centers
- Tunnels, subway stations
- Highrises, hotels
- Industrial facilities
- In places where human life and valuable materials and equipment need to be protected.

## CONSTRUCTION

|                        |                                                                               |
|------------------------|-------------------------------------------------------------------------------|
| <b>1-Conductor</b>     | IEC-60228; DIN VDE 0295; EN 60228 Class 1 or Class 2 Electrolytic Bare Copper |
| <b>2-Insulation</b>    | Cross-linked Special polymer Compound                                         |
| <b>3-Colour Code</b>   | HD 308 S2, VDE 0293                                                           |
| <b>4-Stranding</b>     | In layers of optimum pitch                                                    |
| <b>5-Inner Sheath</b>  | HFFR Compound                                                                 |
| <b>6-Outer Sheath</b>  | HFFR compound acc. to HD 604 S1                                               |
| <b>7-Sheath Colour</b> | RAL 2003 Orange                                                               |

## YANGIN PERFORMANS TESTLERİ FLAME PERFORMANCE TESTS

| ALEV GECİKTİRİCİLİK<br>TESTİ<br>FLAME RETARDANT TEST                 | ALEV YAYILIMI TESTİ<br>FLAME PROPAGATION TEST                            | DUMAN YOĞUNLUĞU<br>TESTİ<br>SMOKE DENSITY TEST                                              | KOROZİF GAZ TESTİ<br>TEST ON CORROSIVENESS<br>COMBUSTION GASES |
|----------------------------------------------------------------------|--------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|----------------------------------------------------------------|
| IEC 60332-1-2<br>VDE 0482-332-1-2<br>EN 60332-1-2<br>BS EN 60332-1-2 | IEC 60332-3-24<br>VDE 0482-332-3-24<br>EN 60332-3-24<br>BS EN 60332-3-24 | IEC 61034-2<br>VDE 0482-1034-2<br>EN 61034-2<br>BS EN 61034-2                               | IEC 60754-2<br>VDE 0482-754-2<br>EN 60754-2<br>BS EN 60754-2   |
| HALOJENSİZLİK TESTİ<br>HALOGEN FREE TEST                             | DEVRE BÜTÜNLÜĞÜ TESTİ (FE180)<br>CIRCUIT INTEGRITY TEST (FE180)          | MEKANİK ŞOKLU DEVRE<br>BÜTÜNLÜĞÜ TESTİ (PH120)<br>CIRCUIT INTEGRITY WITH SHOCK TEST (PH120) |                                                                |
| IEC 60754-1<br>VDE 0482-754-1<br>EN 60754-1<br>BS EN 60754-1         | IEC 60331-21                                                             | EN 50200<br>VDE 0482-200<br>BS EN 50200                                                     |                                                                |

# NHXXH FE180/E90

VDE 0266



ALEV GECİKTİRİCİ ÖZELLİK/DÜŞÜK DUMAN YOĞUNLUĞU/ZEHİRLİ VE KOROZİF GAZLARDAN ARINDIRILMIŞ/DEVRE BÜTÜNLÜĞÜ FE180/MEKANİK ŞOKLU DEVRE BÜTÜNLÜĞÜ PH120/KABLO SİSTEMİNİN DEVRE BÜTÜNLÜĞÜ E90  
FLAME RETARDANT CHARACTERISTIC/LOW SMOKE EMISSION/WITHOUT POISONED AND CORROSIVE GASSES  
CIRCUIT INTEGRITY FE180/CIRCUIT INTEGRITY WITH MECHANICAL SHOCK PH120/CABLE SYSTEM CIRCUIT INTEGRITY E90



## KULLANIM ALANLARI

Güç ve kontrol kablosu olarak;

- Yangın sırasında çalışması gereken cihaz ve makinelerde (acil durum asansörleri, yangın suyu sistemleri vs.)
- Yangın alarm sistemine bağlı çalışan havalandırma sistemlerinde
- Yangın kaçış yollarının aydınlatılmasında
- Acil durum güç kaynaklarında
- İnsan hayatının, değerli malzemelerin ve ekipmanların korunması gereken yerlerde

## KABLO YAPISI

|                       |                                                                          |
|-----------------------|--------------------------------------------------------------------------|
| <b>1-İletken</b>      | IEC 60228; BS EN 60228 Sınıf 1 ya da Sınıf 2<br>Elektrolitik Tavlı Bakır |
| <b>2-Yalıtkan</b>     | Mika Bant + VDE 0266 HX11 Çapraz Bağlı<br>HFFR Kompaund                  |
| <b>3-Yalıtım Renk</b> | VDE 0293; HD 308 S2                                                      |
| <b>4-Büküm</b>        | Uygun adımda katlar halinde                                              |
| <b>5-İç Kılıf</b>     | HFFR Kampound                                                            |
| <b>6-Dış Kılıf</b>    | HD 604 S1'e göre HFFR kompaund                                           |
| <b>7-Kılıf Rengi</b>  | RAL 2003 Turuncu                                                         |

## APPLICATION

As a power and control cable;

- Machine and equipment that are required to continue its function during a fire (emergency elevators, fire water pumps etc.)
- Ventilation systems are which are connected to fire alarm system
- In emergency lighting at fire escape exits
- Emergency power supplies
- In places where human life and valuable materials and equipment need to be protected

## CONSTRUCTION

|                        |                                                                       |
|------------------------|-----------------------------------------------------------------------|
| <b>1-Conductor</b>     | IEC 60228; BS EN 60228 Class 1 or Class 2<br>Electrolytic Bare Copper |
| <b>2-Insulation</b>    | Mica Tape + VDE 0266 HX11 Cross-linked<br>HFFR Compound               |
| <b>3-Colour Code</b>   | VDE 0293; HD 308 S2                                                   |
| <b>4-Stranding</b>     | In layers of optimum pitch                                            |
| <b>5-Inner Sheath</b>  | HFFR Compound                                                         |
| <b>6-Outer Sheath</b>  | HFFR compound acc. to HD 604 S1                                       |
| <b>7-Sheath Colour</b> | RAL 2003 Orange                                                       |

## TEKNİK ÖZELLİKLER TECHNICAL CHARACTERISTICS

ÇALIŞMA VOLTAJI  
OPERATING  
VOLTAGE (25°C)

0,6/1kV

TEST VOLTAJI (50 Hz 1Dk) DMR/DMR  
TEST VOLTAGE (50 Hz 1 Min) CORE/CORE

4000V

BÜKÜLME YARIÇAPI  
BENDING RADIUS

12x Cable Ø

ÇALIŞMA SICAKLIĞI  
TEMPERATURE RANGE

- 40°C - +90°C

## YANGIN PERFORMANS TESTLERİ FLAME PERFORMANCE TESTS

|                                                                      |                                                                          |                                                                                                |                                                                                                 |
|----------------------------------------------------------------------|--------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|
|                                                                      |                                                                          |                                                                                                |                                                                                                 |
| ALEV GECİKTİRİCİLİK<br>TESTİ<br>FLAME RETARDANT TEST                 | ALEV YAYILIMI TESTİ<br>FLAME PROPAGATION TEST                            | DUMAN YOĞUNLUĞU<br>TESTİ<br>SMOKE DENSITY TEST                                                 | KOROZİF GAZ TESTİ<br>TEST ON CORROSIVENESS<br>COMBUSTION GASES                                  |
| IEC 60332-1-2<br>VDE 0482-332-1-2<br>EN 60332-1-2<br>BS EN 60332-1-2 | IEC 60332-3-24<br>VDE 0482-332-3-24<br>EN 60332-3-24<br>BS EN 60332-3-24 | IEC 61034-2<br>VDE 0482-1034-2<br>EN 61034-2<br>BS EN 61034-2                                  | IEC 60754-2<br>VDE 0482-754-2<br>EN 60754-2<br>BS EN 60754-2                                    |
|                                                                      |                                                                          |                                                                                                |                                                                                                 |
| HALOJENSİZLİK TESTİ<br>HALOGEN FREE TEST                             | DEVRE BÜTÜNLÜĞÜ TESTİ<br>(FE180)<br>CIRCUIT INTEGRITY TEST<br>(FE180)    | MEKANİK ŞOKLU DEVRE<br>BÜTÜNLÜĞÜ TESTİ (PH120)<br>CIRCUIT INTEGRITY WITH<br>SHOCK TEST (PH120) | KABLO SİSTEMİNİN DEVRE<br>BÜTÜNLÜĞÜ TESTİ (E90)<br>CABLE SYSTEM CIRCUIT<br>INTEGRITY TEST (E90) |
| IEC 60754-1<br>VDE 0482-754-1<br>EN 60754-1<br>BS EN 60754-1         | IEC 60331-21                                                             | EN 50200<br>VDE 0482-200<br>BS EN 50200                                                        | DIN 4102-12                                                                                     |

# NHXCH FE180/E90

VDE 0266



ALEV GECİKTİRİCİ ÖZELLİK/DÜŞÜK DUMAN YOĞUNLUĞU/ZEHİRLİ VE KOROZİF GAZLARDAN ARINDIRILMIŞ/  
DEVRE BÜTÜNLÜĞÜ FE180/MEKANİK ŞOKLU DEVRE BÜTÜNLÜĞÜ PH120/KABLO SİSTEMİNİN DEVRE BÜTÜNLÜĞÜ E90  
FLAME RETARDANT CHARACTERISTIC/LOW SMOKE EMISSION/WITHOUT POISONED AND CORROSIVE GASSES  
CIRCUIT INTEGRITY FE180/CIRCUIT INTEGRITY WITH MECHANICAL SHOCK PH120/CABLE SYSTEM CIRCUIT INTEGRITY E90



## KULLANIM ALANLARI

Güç ve kontrol kablosu olarak;

- Yangın sırasında çalışması gereken cihaz ve makinelerde (acil durum asansörleri, yangın suyu sistemleri vs.)
- Yangın alarm sistemine bağlı çalışan havalandırma sistemlerinde
- Yangın kaçış yollarının aydınlatılmasında
- Acil durum güç kaynaklarında
- İnsan hayatının, değerli malzemelerin ve ekipmanların korunması gereken yerlerde
- Elektromanyetik karışma ve girişimlerin olduğu yerlerde

## KABLO YAPISI

|                       |                                                                          |
|-----------------------|--------------------------------------------------------------------------|
| <b>1-İletken</b>      | IEC 60228; BS EN 60228 Sınıf 1 ya da Sınıf 2<br>Elektrolitik Tavlı Bakır |
| <b>2-Yalıtkan</b>     | Mika Bant + VDE 0266 HX11 Çapraz Bağlı<br>HFFR Kompaund                  |
| <b>3-Yalıtım Renk</b> | VDE 0293; HD 308 S2                                                      |
| <b>4-Büküm</b>        | Uygun adımda katlar halinde                                              |
| <b>5-İç Kılıf</b>     | HFFR Kompaund                                                            |
| <b>6-Ekran</b>        | Konsantrik İletken Formunda<br>Tavlı Bakır ve Bakır Bant                 |
| <b>7-Dış Kılıf</b>    | HD 604 S1'e göre HFFR kompaund                                           |
| <b>8-Kılıf Rengi</b>  | RAL 2003 Turuncu                                                         |

## TEKNİK ÖZELLİKLER TECHNICAL CHARACTERISTICS

|                                                |                                                                          |
|------------------------------------------------|--------------------------------------------------------------------------|
| ÇALIŞMA VOLTAJİ<br>OPERATING<br>VOLTAGE (25°C) | TEST VOLTAJİ (50 Hz 1Dk) DMR/DMR<br>TEST VOLTAGE (50 Hz 1 Min) CORE/CORE |
|------------------------------------------------|--------------------------------------------------------------------------|

0,6/1kV

4000V

|                                    |                                        |
|------------------------------------|----------------------------------------|
| BÜKÜLME YARIÇAPİ<br>BENDING RADIUS | ÇALIŞMA SICAKLIĞI<br>TEMPERATURE RANGE |
|------------------------------------|----------------------------------------|

12x Cable Ø

-40°C - +90°C

## APPLICATION

As a power and control cable;

- Machine and equipment that are required to continue its function during a fire (emergency elevators, fire water pumps etc.)
- Ventilation systems are which are connected to fire alarm system
- In emergency lighting at fire escape exits
- Emergency power supplies
- In places where human life and valuable materials and equipment need to be protected
- In places where there is electromagnetic interference

## CONSTRUCTION

|                        |                                                                       |
|------------------------|-----------------------------------------------------------------------|
| <b>1-Conductor</b>     | IEC 60228; BS EN 60228 Class 1 or Class 2<br>Electrolytic Bare Copper |
| <b>2-Insulation</b>    | Mica Tape + VDE 0266 HX11 Cross-linked<br>HFFR Compound               |
| <b>3-Colour Code</b>   | VDE 0293; HD 308 S2                                                   |
| <b>4-Stranding</b>     | In layers of optimum pitch                                            |
| <b>5-Inner Sheath</b>  | HFFR Compound                                                         |
| <b>6-Screen</b>        | Concentric Conductor Formed by Bare Copper<br>and Copper Tape         |
| <b>7-Outer Sheath</b>  | HFFR compound acc. to HD 604 S1                                       |
| <b>8-Sheath Colour</b> | RAL 2003 Orange                                                       |

## YANGIN PERFORMANS TESTLERİ FLAME PERFORMANCE TESTS

|                                                                      |                                                                          |                                                                                                |                                                                                                 |
|----------------------------------------------------------------------|--------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|
|                                                                      |                                                                          |                                                                                                |                                                                                                 |
| ALEV GECİKTİRİCİLİK<br>TESTİ<br>FLAME RETARDANT TEST                 | ALEV YAYILIMI TESTİ<br>FLAME PROPAGATION TEST                            | DUMAN YOĞUNLUĞU<br>TESTİ<br>SMOKE DENSITY TEST                                                 | KOROZİF GAZ TESTİ<br>TEST ON CORROSIVENESS<br>COMBUSTION GASES                                  |
| IEC 60332-1-2<br>VDE 0482-332-1-2<br>EN 60332-1-2<br>BS EN 60332-1-2 | IEC 60332-3-24<br>VDE 0482-332-3-24<br>EN 60332-3-24<br>BS EN 60332-3-24 | IEC 61034-2<br>VDE 0482-1034-2<br>EN 61034-2<br>BS EN 61034-2                                  | IEC 60754-2<br>VDE 0482-754-2<br>EN 60754-2<br>BS EN 60754-2                                    |
|                                                                      |                                                                          |                                                                                                |                                                                                                 |
| HALOJENSİZLİK TESTİ<br>HALOGEN FREE TEST                             | DEVRE BÜTÜNLÜĞÜ TESTİ<br>(FE180)<br>CIRCUIT INTEGRITY TEST<br>(FE180)    | MEKANİK ŞOKLU DEVRE<br>BÜTÜNLÜĞÜ TESTİ (PH120)<br>CIRCUIT INTEGRITY<br>WITH SHOCK TEST (PH120) | KABLO SİSTEMİNİN DEVRE<br>BÜTÜNLÜĞÜ TESTİ (E90)<br>CABLE SYSTEM CIRCUIT<br>INTEGRITY TEST (E90) |
| IEC 60754-1<br>VDE 0482-754-1<br>EN 60754-1<br>BS EN 60754-1         | IEC 60331-21<br>VDE 0482-200<br>EN 60331-21<br>BS EN 60331-21            | EN 50200<br>VDE 0482-200<br>BS EN 50200                                                        | DIN 4102-12                                                                                     |

# (N)HXH FE180/E30-E60

**HD 604 S1**

ALEV GECİKTİRİCİ ÖZELLİK/DÜŞÜK DUMAN YOĞUNLUĞU/ZEHİRLİ VE KOROZİF GAZLARDAN ARINDIRILMIŞ/  
DEVRE BÜTÜNLÜĞÜ FE180/MEKANİK ŞOKLU DEVRE BÜTÜNLÜĞÜ PH120/KABLO SİSTEMİNİN DEVRE BÜTÜNLÜĞÜ E30-E60  
FLAME RETARDANT CHARACTERISTIC/LOW SMOKE EMISSION/WITHOUT POISONED AND CORROSIVE GASSES  
CIRCUIT INTEGRITY FE180/CIRCUIT INTEGRITY WITH MECHANICAL SHOCK PH120/CABLE SYSTEM CIRCUIT  
INTEGRITY E30-E60



## KULLANIM ALANLARI

Güç ve kontrol kablosu olarak;

- Yangın sırasında çalışması gereken cihaz ve makinelerde (acil durum asansörleri, yangın suyu sistemleri vs.)
- Yangın alarm sistemine bağlı çalışan havalandırma sistemlerinde
- Yangın kaçış yollarının aydınlatılmasında
- Acil durum güç kaynaklarında
- İnsan hayatının, değerli malzemelerin ve ekipmanların korunması gereken yerlerde

## KABLO YAPISI

|                       |                                                                       |
|-----------------------|-----------------------------------------------------------------------|
| <b>1-İletken</b>      | IEC 60228; BS EN 60228 Sınıf 1 ya da Sınıf 2 Elektrolitik Tavlı Bakır |
| <b>2-Yalıtkan</b>     | Çapraz Bağlı Özel Polimer Kompaund                                    |
| <b>3-Yalıtım Renk</b> | VDE 0293; HD 308 S2                                                   |
| <b>4-Büküm</b>        | Uygun adımda katlar halinde                                           |
| <b>5-İç Kılıf</b>     | HFFR Kompaund                                                         |
| <b>6-Dış Kılıf</b>    | HD 604 S1'e göre HFFR compound                                        |
| <b>7-Kılıf Rengi</b>  | RAL 2003 Turuncu                                                      |

## TEKNİK ÖZELLİKLER TECHNICAL CHARACTERISTICS

|                                                    |                                                                                  |
|----------------------------------------------------|----------------------------------------------------------------------------------|
| <b>ÇALIŞMA VOLTAJİ</b><br>OPERATING VOLTAGE (25°C) | <b>TEST VOLTAJİ</b> (50 Hz 1 Dk) DMR/DMR<br>TEST VOLTAGE (50 Hz 1 Min) CORE/CORE |
| 0,6/1kV                                            | 4000V                                                                            |
| <b>BÜKÜLME YARIÇAPİ</b><br>BENDING RADIUS          | <b>ÇALIŞMA SICAKLIĞI</b><br>TEMPERATURE RANGE                                    |
| 12x Cable Ø                                        | - 40°C - +90°C                                                                   |

## APPLICATION

As a power and control cable;

- Machine and equipment that are required to continue its function during a fire (emergency elevators, fire water pumps etc.)
- Ventilation systems which are connected to fire alarm system
- In emergency lighting at fire escape exits
- Emergency power supplies
- In places where human life and valuable materials and equipment need to be protected

## CONSTRUCTION

|                        |                                                                           |
|------------------------|---------------------------------------------------------------------------|
| <b>1-Conductor</b>     | IEC 60228; VDE 0295; EN 60228 Class 1 or Class 2 Electrolytic Bare Copper |
| <b>2-Insulation</b>    | Cross-linked Special Polymer Compound                                     |
| <b>3-Colour Code</b>   | VDE 0293; HD 308 S2                                                       |
| <b>4-Stranding</b>     | In layers of optimum pitch                                                |
| <b>5-Inner Sheath</b>  | HFFR Compound                                                             |
| <b>6-Outer Sheath</b>  | HFFR compound acc. to HD 604 S1                                           |
| <b>7-Sheath Colour</b> | RAL 2003 Orange                                                           |

## YANGIN PERFORMANS TESTLERİ FLAME PERFORMANCE TESTS

|                                                                      |                                                                          |                                                                                                 |                                                                                                     |
|----------------------------------------------------------------------|--------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|
|                                                                      |                                                                          |                                                                                                 |                                                                                                     |
| <b>ALEV GECİKTİRİCİLİK TESTİ</b><br>FLAME RETARDANT TEST             | <b>ALEV YAYILIMI TESTİ</b><br>FLAME PROPAGATION TEST                     | <b>DUMAN YOĞUNLUĞU TESTİ</b><br>SMOKE DENSITY TEST                                              | <b>KOROZİF GAZ TESTİ</b><br>TEST ON CORROSIVENESS COMBUSTION GASES                                  |
| IEC 60332-1-2<br>VDE 0482-332-1-2<br>EN 60332-1-2<br>BS EN 60332-1-2 | IEC 60332-3-24<br>VDE 0482-332-3-24<br>EN 60332-3-24<br>BS EN 60332-3-24 | IEC 61034-2<br>VDE 0482-1034-2<br>EN 61034-2<br>BS EN 61034-2                                   | IEC 60754-2<br>VDE 0482-754-2<br>EN 60754-2<br>BS EN 60754-2                                        |
|                                                                      |                                                                          |                                                                                                 |                                                                                                     |
| <b>HALOJENSİZLİK TESTİ</b><br>HALOGEN FREE TEST                      | <b>DEVRE BÜTÜNLÜĞÜ TESTİ (FE180)</b><br>CIRCUIT INTEGRITY TEST (FE180)   | <b>MEKANİK ŞOKLU DEVRE BÜTÜNLÜĞÜ TESTİ (PH120)</b><br>CIRCUIT INTEGRITY WITH SHOCK TEST (PH120) | <b>KABLO SİSTEMİNİN DEVRE BÜTÜNLÜĞÜ TESTİ (E30-E60)</b><br>CABLE SYSTEM CIRCUIT INTEGRITY (E30-E60) |
| IEC 60754-1<br>VDE 0482-754-1<br>EN 60754-1<br>BS EN 60754-1         | IEC 60331-21                                                             | EN 50200<br>VDE 0482-200<br>BS EN 50200                                                         | DIN 4102-12                                                                                         |

**(N)HXH FE180/E90****HD 604 S1**

ALEV GECİKTİRİCİ ÖZELLİK/DÜŞÜK DUMAN YOĞUNLUĞU/ZEHİRLİ VE KOROZİF GAZLARDAN ARINDIRILMIŞ/  
DEVRE BÜTÜNLÜĞÜ FE180/MEKANİK ŞOKLU DEVRE BÜTÜNLÜĞÜ PH120/KABLO SİSTEMİNİN DEVRE BÜTÜNLÜĞÜ E30-E60  
FLAME RETARDANT CHARACTERISTIC/LOW SMOKE EMISSION/WITHOUT POISONED AND CORROSIVE GASSES  
CIRCUIT INTEGRITY FE180/CIRCUIT INTEGRITY WITH MECHANICAL SHOCK PH120/CABLE SYSTEM CIRCUIT  
INTEGRITY E30-E60

**KULLANIM ALANLARI**

Güç ve kontrol kablosu olarak;

- Yangın sırasında çalışması gereken cihaz ve makinelerde (acil durum asansörleri, yangın suyu sistemleri vs.)
- Yangın alarm sistemine bağlı çalışan havalandırma sistemlerinde
- Yangın kaçış yollarının aydınlatılmasında
- Acil durum güç kaynaklarında
- İnsan hayatının, değerli malzemelerin ve ekipmanların korunması gereken yerlerde

**KABLO YAPISI**

|                       |                                                                       |
|-----------------------|-----------------------------------------------------------------------|
| <b>1-İletken</b>      | IEC 60228; BS EN 60228 Sınıf 1 ya da Sınıf 2 Elektrolitik Tavlı Bakır |
| <b>2-Yalıtkan</b>     | Çapraz Bağlı Özel Polimer Kompaund                                    |
| <b>3-Yalıtım Renk</b> | VDE 0293; HD 308 S2                                                   |
| <b>4-Büküm</b>        | Uygun adımda katlar halinde                                           |
| <b>5-İç Kılıf</b>     | HFFR Kompaund                                                         |
| <b>6-Dış Kılıf</b>    | HD 604 S1'e göre HFFR compound                                        |
| <b>7-Kılıf Rengi</b>  | RAL 2003 Turuncu                                                      |

**TEKNİK ÖZELLİKLER  
TECHNICAL CHARACTERISTICS**

|                                                    |                                                                                  |
|----------------------------------------------------|----------------------------------------------------------------------------------|
| <b>ÇALIŞMA VOLTAJİ</b><br>OPERATING VOLTAGE (25°C) | <b>TEST VOLTAJİ</b> (50 Hz 1 Dk) DMR/DMR<br>TEST VOLTAGE (50 Hz 1 Min) CORE/CORE |
| 0,6/1kV                                            | 4000V                                                                            |
| <b>BÜKÜLME YARIÇAPİ</b><br>BENDING RADIUS          | <b>ÇALIŞMA SICAKLIĞI</b><br>TEMPERATURE RANGE                                    |
| 12x Cable Ø                                        | - 40°C - +90°C                                                                   |

**APPLICATION**

As a power and control cable;

- Machine and equipment that are required to continue its function during a fire (emergency elevators, fire water pumps etc.)
- Ventilation systems which are connected to fire alarm system
- In emergency lighting at fire escape exits
- Emergency power supplies
- In places where human life and valuable materials and equipment need to be protected

**CONSTRUCTION**

|                        |                                                                           |
|------------------------|---------------------------------------------------------------------------|
| <b>1-Conductor</b>     | IEC 60228; VDE 0295; EN 60228 Class 1 or Class 2 Electrolytic Bare Copper |
| <b>2-Insulation</b>    | Cross-linked Special Polymer Compound                                     |
| <b>3-Colour Code</b>   | VDE 0293; HD 308 S2                                                       |
| <b>4-Stranding</b>     | In layers of optimum pitch                                                |
| <b>5-Inner Sheath</b>  | HFFR Compound                                                             |
| <b>6-Outer Sheath</b>  | HFFR compound acc. to HD 604 S1                                           |
| <b>7-Sheath Colour</b> | RAL 2003 Orange                                                           |

**YANGIN PERFORMANS TESTLERİ  
FLAME PERFORMANCE TESTS**

|                                                                      |                                                                          |                                                                                                 |                                                                                             |
|----------------------------------------------------------------------|--------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|
|                                                                      |                                                                          |                                                                                                 |                                                                                             |
| <b>ALEV GECİKTİRİCİLİK TESTİ</b><br>FLAME RETARDANT TEST             | <b>ALEV YAYILIMI TESTİ</b><br>FLAME PROPAGATION TEST                     | <b>DUMAN YOĞUNLUĞU TESTİ</b><br>SMOKE DENSITY TEST                                              | <b>KOROZİF GAZ TESTİ</b><br>TEST ON CORROSIVENESS COMBUSTION GASES                          |
| IEC 60332-1-2<br>VDE 0482-332-1-2<br>EN 60332-1-2<br>BS EN 60332-1-2 | IEC 60332-3-24<br>VDE 0482-332-3-24<br>EN 60332-3-24<br>BS EN 60332-3-24 | IEC 61034-2<br>VDE 0482-1034-2<br>EN 61034-2<br>BS EN 61034-2                                   | IEC 60754-2<br>VDE 0482-754-2<br>EN 60754-2<br>BS EN 60754-2                                |
|                                                                      |                                                                          |                                                                                                 |                                                                                             |
| <b>HALOJENSİZLİK TESTİ</b><br>HALOGEN FREE TEST                      | <b>DEVRE BÜTÜNLÜĞÜ TESTİ (FE180)</b><br>CIRCUIT INTEGRITY TEST (FE180)   | <b>MEKANİK ŞOKLU DEVRE BÜTÜNLÜĞÜ TESTİ (PH120)</b><br>CIRCUIT INTEGRITY WITH SHOCK TEST (PH120) | <b>KABLO SİSTEMİNİN DEVRE BÜTÜNLÜĞÜ TESTİ (E90)</b><br>CABLE SYSTEM CIRCUIT INTEGRITY (E90) |
| IEC 60754-1<br>VDE 0482-754-1<br>EN 60754-1<br>BS EN 60754-1         | IEC 60331-21<br>VDE 0482-200<br>EN 60331-21<br>BS EN 60331-21            | EN 50200<br>VDE 0482-200<br>BS EN 50200                                                         | DIN 4102-12                                                                                 |

# (N)HXCH FE180/E30-E60

**HD 604 S1**

ALEV GECİKTİRİCİ ÖZELLİK/DÜŞÜK DUMAN YOĞUNLUĞU/ZEHİRLİ VE KOROZİF GAZLARDAN ARINDIRILMIŞ/  
DEVRE BÜTÜNLÜĞÜ FE180/MEKANİK ŞOKLU DEVRE BÜTÜNLÜĞÜ PH120/KABLO SİSTEMİNİN DEVRE BÜTÜNLÜĞÜ E30-E60  
FLAME RETARDANT CHARACTERISTIC/LOW SMOKE EMISSION/WITHOUT POISONED AND CORROSIVE GASSES  
CIRCUIT INTEGRITY FE180/CIRCUIT INTEGRITY WITH MECHANICAL SHOCK PH120/CABLE SYSTEM CIRCUIT INTEGRITY E30-E60



## KULLANIM ALANLARI

Güç ve kontrol kablosu olarak;

- Yangın sırasında çalışması gereken cihaz ve makinelerde (acil durum asansörleri, yangın suyu sistemleri vs.)
- Yangın alarm sistemine bağlı çalışan havalandırma sistemlerinde
- Yangın kaçış yollarının aydınlatılmasında
- Acil durum güç kaynaklarında
- İnsan hayatının, değerli malzemelerin ve ekipmanların korunması gereken yerlerde
- Elektromanyetik karışma ve girişimlerin olduğu yerlerde

## APPLICATION

As a power and control cable;

- Machine and equipment that are required to continue its function during a fire (emergency elevators, fire water pumps etc.)
- Ventilation systems are which are connected to fire alarm system
- In emergency lighting at fire escape exits
- Emergency power supplies
- In places where human life and valuable materials and equipment need to be protected
- In places where there is electromagnetic interference

## KABLO YAPISI

|                       |                                                                          |
|-----------------------|--------------------------------------------------------------------------|
| <b>1-İletken</b>      | IEC 60228; BS EN 60228 Sınıf 1 ya da Sınıf 2<br>Elektrolitik Tavlı Bakır |
| <b>2-Yalıtkan</b>     | Çapraz Bağlı Özel Polimer Kompaund                                       |
| <b>3-Yalıtım Renk</b> | VDE 0293; HD 308 S2                                                      |
| <b>4-Büküm</b>        | Uygun adımda katlar halinde                                              |
| <b>5-İç Kılıf</b>     | HFFR Kompaund                                                            |
| <b>6-Ekran</b>        | Konsantrik İletken Formunda<br>Tavlı Bakır ve Bakır Bant                 |
| <b>7-Dış Kılıf</b>    | HD 604 S1'e göre HFFR kompaund                                           |
| <b>8-Kılıf Rengi</b>  | RAL 2003 Turuncu                                                         |

## CONSTRUCTION

|                        |                                                                       |
|------------------------|-----------------------------------------------------------------------|
| <b>1-Conductor</b>     | IEC 60228; BS EN 60228 Class 1 or Class 2<br>Electrolytic Bare Copper |
| <b>2-Insulation</b>    | Cross-linked Special Polymer Compound                                 |
| <b>3-Colour Code</b>   | VDE 0293; HD 308 S2                                                   |
| <b>4-Stranding</b>     | In layers of optimum pitch                                            |
| <b>5-Inner Sheath</b>  | HFFR Compound                                                         |
| <b>6-Screen</b>        | Concentric Conductor Formed by Bare Copper<br>and Copper Tape         |
| <b>7-Outer Sheath</b>  | HFFR compound acc. to HD 604 S1                                       |
| <b>8-Sheath Colour</b> | RAL 2003 Orange                                                       |

## TEKNİK ÖZELLİKLER TECHNICAL CHARACTERISTICS

|                                                |                                                                          |
|------------------------------------------------|--------------------------------------------------------------------------|
| ÇALIŞMA VOLTAJİ<br>OPERATING<br>VOLTAGE (25°C) | TEST VOLTAJİ (50 Hz 1Dk) DMR/DMR<br>TEST VOLTAGE (50 Hz 1 Min) CORE/CORE |
|------------------------------------------------|--------------------------------------------------------------------------|

0,6/1kV

4000V

|                                    |                                        |
|------------------------------------|----------------------------------------|
| BÜKÜLME YARIÇAPI<br>BENDING RADIUS | ÇALIŞMA SICAKLIĞI<br>TEMPERATURE RANGE |
|------------------------------------|----------------------------------------|

12x Cable Ø

-40°C - +90°C

## YANGIN PERFORMANS TESTLERİ FLAME PERFORMANCE TESTS

|                                                                      |                                                                          |                                                                                                |                                                                                                         |
|----------------------------------------------------------------------|--------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|
| ALEV GECİKTİRİCİLİK<br>TESTİ<br>FLAME RETARDANT TEST                 | ALEV YAYILIMI TESTİ<br>FLAME PROPAGATION TEST                            | DUMAN YOĞUNLUĞU<br>TESTİ<br>SMOKE DENSITY TEST                                                 | KOROZİF GAZ TESTİ<br>TEST ON CORROSIVENESS<br>COMBUSTION GASES                                          |
| IEC 60332-1-2<br>VDE 0482-332-1-2<br>EN 60332-1-2<br>BS EN 60332-1-2 | IEC 60332-3-24<br>VDE 0482-332-3-24<br>EN 60332-3-24<br>BS EN 60332-3-24 | IEC 61034-2<br>VDE 0482-1034-2<br>EN 61034-2<br>BS EN 61034-2                                  | IEC 60754-2<br>VDE 0482-754-2<br>EN 60754-2<br>BS EN 60754-2                                            |
| HALOJENSİZLİK TESTİ<br>HALOGEN FREE TEST                             | DEVRE BÜTÜNLÜĞÜ TESTİ<br>(FE180)<br>CIRCUIT INTEGRITY TEST<br>(FE180)    | MEKANİK ŞOKLU DEVRE<br>BÜTÜNLÜĞÜ TESTİ (PH120)<br>CIRCUIT INTEGRITY<br>WITH SHOCK TEST (PH120) | KABLO SİSTEMİNİN DEVRE<br>BÜTÜNLÜĞÜ TESTİ (E30-E60)<br>CABLE SYSTEM CIRCUIT<br>INTEGRITY TEST (E30-E60) |
| IEC 60754-1<br>VDE 0482-754-1<br>EN 60754-1<br>BS EN 60754-1         | IEC 60331-21                                                             | EN 50200<br>VDE 0482-200<br>BS EN 50200                                                        | DIN 4102-12                                                                                             |

# (N)HXCH FE180/E90

**HD 604 S1**

ALEV GECİKTİRİCİ ÖZELLİK/DÜŞÜK DUMAN YOĞUNLUĞU/ZEHİRLİ VE KOROZİF GAZLARDAN ARINDIRILMIŞ/  
DEVRE BÜTÜNLÜĞÜ FE180/MEKANİK ŞOKLU DEVRE BÜTÜNLÜĞÜ PH120/KABLO SİSTEMİNİN DEVRE BÜTÜNLÜĞÜ E90  
FLAME RETARDANT CHARACTERISTIC/LOW SMOKE EMISSION/WITHOUT POISONED AND CORROSIVE GASSES  
CIRCUIT INTEGRITY FE180/CIRCUIT INTEGRITY WITH MECHANICAL SHOCK PH120/CABLE SYSTEM CIRCUIT INTEGRITY E90



## KULLANIM ALANLARI

Güç ve kontrol kablosu olarak;

- Yangın sırasında çalışması gereken cihaz ve makinelerde (acil durum asansörleri, yangın suyu sistemleri vs.)
- Yangın alarm sistemine bağlı çalışan havalandırma sistemlerinde
- Yangın kaçış yollarının aydınlatılmasında
- Acil durum güç kaynaklarında
- İnsan hayatının, değerli malzemelerin ve ekipmanların korunması gereken yerlerde
- Elektromanyetik karışma ve girişimlerin olduğu yerlerde

## APPLICATION

As a power and control cable;

- Machine and equipment that are required to continue its function during a fire (emergency elevators, fire water pumps etc.)
- Ventilation systems are which are connected to fire alarm system
- In emergency lighting at fire escape exits
- Emergency power supplies
- In places where human life and valuable materials and equipment need to be protected
- In places where there is electromagnetic interference

## KABLO YAPISI

|                       |                                                                          |
|-----------------------|--------------------------------------------------------------------------|
| <b>1-İletken</b>      | IEC 60228; BS EN 60228 Sınıf 1 ya da Sınıf 2<br>Elektrolitik Tavlı Bakır |
| <b>2-Yalıtkan</b>     | Çapraz Bağlı Özel Polimer Kompaund                                       |
| <b>3-Yalıtım Renk</b> | VDE 0293; HD 308 S2                                                      |
| <b>4-Büküm</b>        | Uygun adımda katlar halinde                                              |
| <b>5-İç Kılıf</b>     | HFFR Kompaund                                                            |
| <b>6-Ekran</b>        | Konsantrik İletken Formunda<br>Tavlı Bakır ve Bakır Bant                 |
| <b>7-Dış Kılıf</b>    | HD 604 S1'e göre HFFR kompaund                                           |
| <b>8-Kılıf Rengi</b>  | RAL 2003 Turuncu                                                         |

## CONSTRUCTION

|                        |                                                                       |
|------------------------|-----------------------------------------------------------------------|
| <b>1-Conductor</b>     | IEC 60228; BS EN 60228 Class 1 or Class 2<br>Electrolytic Bare Copper |
| <b>2-Insulation</b>    | Cross-linked Special Polymer Compound                                 |
| <b>3-Colour Code</b>   | VDE 0293; HD 308 S2                                                   |
| <b>4-Stranding</b>     | In layers of optimum pitch                                            |
| <b>5-Inner Sheath</b>  | HFFR Compound                                                         |
| <b>6-Screen</b>        | Concentric Conductor Formed by Bare Copper<br>and Copper Tape         |
| <b>7-Outer Sheath</b>  | HFFR compound acc. to HD 604 S1                                       |
| <b>8-Sheath Colour</b> | RAL 2003 Orange                                                       |

## TEKNİK ÖZELLİKLER TECHNICAL CHARACTERISTICS

ÇALIŞMA VOLTAJİ  
OPERATING  
VOLTAGE (25°C)

0,6/1kV

TEST VOLTAJİ (50 Hz 1Dk) DMR/DMR  
TEST VOLTAGE (50 Hz 1 Min) CORE/CORE

4000V

BÜKÜLME YARIÇAPI  
BENDING RADIUS

12x Cable Ø

ÇALIŞMA SICAKLIĞI  
TEMPERATURE RANGE

-40°C - +90°C

## YANGIN PERFORMANS TESTLERİ FLAME PERFORMANCE TESTS



ALEV GECİKTİRİCİLİK  
TESTİ  
FLAME RETARDANT TEST

IEC 60332-1-2  
VDE 0482-332-1-2  
EN 60332-1-2  
BS EN 60332-1-2



ALEV YAYILI MI TESTİ  
FLAME PROPAGATION TEST

IEC 60332-3-24  
VDE 0482-332-3-24  
EN 60332-3-24  
BS EN 60332-3-24



DUMAN YOĞUNLUĞU  
TESTİ  
SMOKE DENSITY TEST

IEC 61034-2  
VDE 0482-1034-2  
EN 61034-2  
BS EN 61034-2



KOROZİF GAZ TESTİ  
TEST ON CORROSIVENESS  
COMBUSTION GASES

IEC 60754-2  
VDE 0482-754-2  
EN 60754-2  
BS EN 60754-2



HALOJENSİZLİK TESTİ  
HALOGEN FREE TEST

IEC 60754-1  
VDE 0482-754-1  
EN 60754-1  
BS EN 60754-1



DEVRE BÜTÜNLÜĞÜ TESTİ  
(FE180)  
CIRCUIT INTEGRITY TEST  
(FE180)

IEC 60331-21  
VDE 0482-200  
EN 60331-21  
BS EN 60331-21



MEKANİK ŞOKLU DEVRE  
BÜTÜNLÜĞÜ TESTİ (PH120)  
CIRCUIT INTEGRITY  
WITH SHOCK TEST (PH120)

EN 50200  
VDE 0482-200  
BS EN 50200



KABLO SİSTEMİNİN DEVRE  
BÜTÜNLÜĞÜ TESTİ (E90)  
CABLE SYSTEM CIRCUIT  
INTEGRITY TEST (E90)

DIN 4102-12





# HABERLEŐME KABLOLARI TELECOMMUNICATION CABLES





|                       |     |
|-----------------------|-----|
| PDV & PDV-K .....     | 160 |
| VBV & VBV-K .....     | 161 |
| HBH & HBH-K .....     | 162 |
| VBAPV & VBAPV-K ..... | 163 |
| HBAPH & HBAPH-K ..... | 164 |
| J-YY...Lg .....       | 165 |
| J-HH...Lg .....       | 167 |
| J-Y(St)Y...Lg .....   | 169 |
| KPD-PAP .....         | 171 |

# PDV & PDV-K



ALEV GECİKTİRİCİ ÖZELLİK/İNCELTİLMİŞ DIŞ ÇAP/KÜÇÜK BÜKÜLME YARIÇAPI  
FLAME RETARDANT CHARACTERISTIC/REDUCED OUTER DIAMETER/SMALL BENDING RADIUS



## KULLANIM ALANLARI

- Bina içi tesisatlarda;  
- Telefon santralleri ve abone dağıtımlarında  
- Sinyal ve data iletiminde

## KABLO YAPISI

- 1-İletken** IEC 60228; DIN VDE 0295; EN 60228 Sınıf 1  
Elektrolitik Bakır  
**2-Yalıtım** Solid PE Kompaund  
**3-Yalıtım Renk** TS EN 60708  
**4-Büküm** 10 çiftte kadar yıldız dörtlü büküm.  
10 çiftten sonra 5 yıldız dörtlü bükümü bir grup.  
Ve 5 veya 10 grup bükümü bir paket;  
her grup polipropilen tanımta şeridi ile sarılır  
**5-Ayırıcı Bant** Pes Bant (10 çift üstü)  
**6-Kılıf** PVC Kompaund  
**7-Kılıf Rengi** RAL 7001 Gri

## APPLICATION

- At indoor installations;  
- Telephone exchanges and subscriber distributions  
- Signal and data transmission

## CONSTRUCTION

- 1-Conductor** IEC 60228; DIN VDE 0295; EN 60228 Class 1  
Electrolytic Copper  
**2-Insulation** Solid PE Compound  
**3-Colour Code** TS EN 60708  
**4-Stranding** Up to 10 pairs laid up as star-quads. After 10 pairs,  
5 star quads laid up to a group. And 5 or 10 groups  
laid up to a unit; each group is wrapped by  
polypropylene identification tape  
**5-Wrapping** Pes Tape (more than 10 pairs)  
**6-Sheath** PVC Compound  
**7-Sheath Colour** RAL 7001 Grey

## TEKNİK ÖZELLİKLER TECHNICAL CHARACTERISTICS

| İLETKEN DİRENCİ<br>CONDUCTOR<br>RESISTANCE | YALITIM DİRENCİ<br>INSULATION<br>RESISTANCE | EFEKTİF KAPASİTE<br>MUTUAL<br>CAPACITANCE | ÇALIŞMA SICAKLIĞI<br>TEMPERATURE RANGE            |
|--------------------------------------------|---------------------------------------------|-------------------------------------------|---------------------------------------------------|
| mm Ω/km<br>0,5 97,8                        | 5000MΩxkm                                   | 56nF/km                                   | - 30°C - +70°C                                    |
| TEST VOLTAJİ (DC)<br>TEST VOLTAGE(DC)      | ÇALIŞMA VOLTAJİ<br>OPERATING VOLTAGE        | BÜKÜLME YARIÇAPI<br>BENDING RADIUS        | ALEV GECİKTİRİCİLİK TESTİ<br>FLAME RETARDANT TEST |
| 1000V                                      | 250V                                        | 7,5 x Cable Ø                             | IEC 60332-1-2<br>VDE 0482-332-1-2<br>EN 60332-1-2 |

## NOTLAR NOTES

PDV: Elektrolitik Bakır İletken/PDV-K: Kalaylı Bakır İletken  
Esas alınan standartlar VDE 0816/TS EN 60708  
PDV: Electrolytic Copper Conductor  
PDV-K: Tinned Copper Conductor  
Based on VDE 0816/TS EN 60708 standards

| KOD NO<br>CODE NR. | ÇİFT SAYISI VE<br>İLETKEN ÇAPI (mm)<br>NUMBER OF PAIRS AND<br>WIRE DIAMETER (mm) | KABLO ÇAPI (mm)<br>OVERALL DIAMETER<br>(mm) | BAKIR AĞIRLIĞI (kg/km)<br>COPPER WEIGHT<br>(kg/km) | YAKLAŞIK KABLO<br>AĞIRLIĞI (kg/km)<br>APPROX. CABLE WEIGHT<br>(kg/km) | STANDART<br>UZUNLUK (mt)<br>STANDARD LENGTH (m) |              |
|--------------------|----------------------------------------------------------------------------------|---------------------------------------------|----------------------------------------------------|-----------------------------------------------------------------------|-------------------------------------------------|--------------|
| PDV                | PDV-K                                                                            |                                             |                                                    |                                                                       |                                                 |              |
| 342805012          | 342905012                                                                        | 1 x 2 x 0,50                                | 3,20                                               | 6                                                                     | 12                                              | 100/500/1000 |
| 342805022          | 342905022                                                                        | 2 x 2 x 0,50                                | 3,90                                               | 10                                                                    | 20                                              | 100/500/1000 |
| 342805032          | 342905032                                                                        | 3 x 2 x 0,50                                | 4,50                                               | 13                                                                    | 25                                              | 100/500/1000 |
| 342805042          | 342905042                                                                        | 4 x 2 x 0,50                                | 4,70                                               | 17                                                                    | 31                                              | 100/500/1000 |
| 342805052          | 342905052                                                                        | 5 x 2 x 0,50                                | 5,10                                               | 20                                                                    | 38                                              | 100/500/1000 |
| 342805062          | 342905062                                                                        | 6 x 2 x 0,50                                | 5,50                                               | 24                                                                    | 43                                              | 100/500/1000 |
| 342805102          | 342905102                                                                        | 10 x 2 x 0,50                               | 7,30                                               | 39                                                                    | 75                                              | 100/500/1000 |
| 342805152          | 342905152                                                                        | 15 x 2 x 0,50                               | 8,10                                               | 59                                                                    | 105                                             | 100/500/1000 |
| 342805202          | 342905202                                                                        | 20 x 2 x 0,50                               | 9,10                                               | 77                                                                    | 135                                             | 100/500/1000 |
| 342805302          | 342905302                                                                        | 30 x 2 x 0,50                               | 10,60                                              | 110                                                                   | 183                                             | 100/500/1000 |
| 342805502          | 342905502                                                                        | 50 x 2 x 0,50                               | 13,20                                              | 180                                                                   | 300                                             | 100/500/1000 |
| 342805112          | 342905112                                                                        | 100 x 2 x 0,50                              | 18,80                                              | 368                                                                   | 556                                             | 100/500/1000 |
| 342805222          | 342905222                                                                        | 200 x 2 x 0,50                              | 25,80                                              | 726                                                                   | 1061                                            | 100/500      |

# VBV & VBV-K



ALEV GECİKTİRİCİ ÖZELLİK/KÜÇÜK BÜKÜLME YARIÇAPI  
FLAME RETARDANT CHARACTERISTIC/SMALL BENDING RADIUS



## KULLANIM ALANLARI

Bina içi tesisatlarda;  
- Telefon santralleri ve abone dağıtımlarında  
- Sinyal ve data iletiminde

## KABLO YAPISI

|                       |                                                                                                                                                    |
|-----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>1-İletken</b>      | IEC 60228; DIN VDE 0295; EN 60228 Sınıf 1<br>Elektrolitik Bakır                                                                                    |
| <b>2-Yalıtım</b>      | PVC Kompaund                                                                                                                                       |
| <b>3-Yalıtım Renk</b> | TS IEC 60189-2                                                                                                                                     |
| <b>4-Büküm</b>        | 10 çift kadar katlar halinde<br>20 çift - 100 çift: 10 çiftli alt grupların birlikte<br>bükümü; her grup polipropilen tanıma şeridi<br>ile sarılır |
| <b>5-Ayırıcı Bant</b> | Pes Bant (10 çift üstü)                                                                                                                            |
| <b>6-Kılıf</b>        | PVC Kompaund                                                                                                                                       |
| <b>7-Kılıf Rengi</b>  | RAL 7001 Gri                                                                                                                                       |

## APPLICATION

At indoor installations;  
- Telephone exchanges and subscriber distributions  
- Signal and data transmission

## CONSTRUCTION

|                        |                                                                                                                                                     |
|------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>1-Conductor</b>     | IEC 60228; DIN VDE 0295; EN 60228 Class 1<br>Electrolytic Copper                                                                                    |
| <b>2-Insulation</b>    | PVC Compound                                                                                                                                        |
| <b>3-Colour Code</b>   | TS IEC 60189-2                                                                                                                                      |
| <b>4-Stranding</b>     | In layers up to 10 pairs<br>20 pairs - 100 pairs: 10 pair groups twisted<br>together; each group is wrapped by polypropylene<br>identification tape |
| <b>5-Wrapping</b>      | Pes Tape (more than 10 pairs)                                                                                                                       |
| <b>6-Sheath</b>        | PVC Compound                                                                                                                                        |
| <b>7-Sheath Colour</b> | RAL 7001 Grey                                                                                                                                       |

## TEKNİK ÖZELLİKLER TECHNICAL CHARACTERISTICS

| DC İLETKEN DİRENCİ<br>DC CONDUCTOR<br>RESISTANCE | YALITIM DİRENCİ<br>INSULATION<br>RESISTANCE | EFEKTİF KAPASİTE<br>MUTUAL<br>CAPACITANCE | ÇALIŞMA SICAKLIĞI<br>TEMPERATURE RANGE            |
|--------------------------------------------------|---------------------------------------------|-------------------------------------------|---------------------------------------------------|
| mm Ω/km<br>0,5 97,8                              | 5000MΩxkm                                   | 120nF/km                                  | -30°C - +70°C                                     |
| TEST VOLTAJİ (A.C.)<br>TEST VOLTAGE (A.C.)       | ÇALIŞMA VOLTAJİ<br>OPERATING VOLTAGE        | BÜKÜLME YARIÇAPI<br>BENDING RADIUS        | ALEV GECİKTİRİCİLİK TESTİ<br>FLAME RETARDANT TEST |
| 1000V                                            | 250V                                        | 8 x Cable Ø                               | IEC 60332-1-2<br>VDE 0482-332-1-2<br>EN 60332-1-2 |

## NOTLAR NOTES

VBV: Elektrolitik Bakır İletken  
VBV-K: Kalaylı Bakır İletken  
Esas alınan standartlar TS IEC 60189-2  
VBV: Electrolytic Copper Conductor  
VBV-K: Tinned Copper Conductor  
Based on TS IEC 60189-2 standard

| KOD NO<br>CODE NR. |           | ÇİFT SAYISI VE<br>İLETKEN ÇAPI (mm)<br>NUMBER OF PAIRS AND<br>WIRE DIAMETER (mm) | KABLO ÇAPI (mm)<br>OVERALL DIAMETER<br>(mm) | BAKIR AĞIRLIĞI (kg/km)<br>COPPER WEIGHT<br>(kg/km) | YAKLAŞIK KABLO<br>AĞIRLIĞI (kg/km)<br>APPROX. CABLE WEIGHT<br>(kg/km) | STANDART<br>UZUNLUK (mt)<br>STANDARD LENGTH (m) |
|--------------------|-----------|----------------------------------------------------------------------------------|---------------------------------------------|----------------------------------------------------|-----------------------------------------------------------------------|-------------------------------------------------|
| VBV                | VBV-K     |                                                                                  |                                             |                                                    |                                                                       |                                                 |
| 342005012          | 342205012 | 1 x 2 x 0,50                                                                     | 3,20                                        | 6                                                  | 15                                                                    | 100/500/1000                                    |
| 342005022          | 342205022 | 2 x 2 x 0,50                                                                     | 3,90                                        | 10                                                 | 24                                                                    | 100/500/1000                                    |
| 342005032          | 342205032 | 3 x 2 x 0,50                                                                     | 4,50                                        | 13                                                 | 31                                                                    | 100/500/1000                                    |
| 342005042          | 342205042 | 4 x 2 x 0,50                                                                     | 4,60                                        | 17                                                 | 38                                                                    | 100/500/1000                                    |
| 342005052          | 342205052 | 5 x 2 x 0,50                                                                     | 5,00                                        | 20                                                 | 47                                                                    | 100/500/1000                                    |
| 342005062          | 342205062 | 6 x 2 x 0,50                                                                     | 5,40                                        | 24                                                 | 53                                                                    | 100/500/1000                                    |
| 342005102          | 342205102 | 10 x 2 x 0,50                                                                    | 7,20                                        | 39                                                 | 87                                                                    | 100/500/1000                                    |
| 342005202          | 342205202 | 20 x 2 x 0,50                                                                    | 9,00                                        | 77                                                 | 140                                                                   | 100/500/1000                                    |
| 342005302          | 342205302 | 30 x 2 x 0,50                                                                    | 10,50                                       | 110                                                | 201                                                                   | 100/500/1000                                    |
| 342005502          | 342205502 | 50 x 2 x 0,50                                                                    | 13,20                                       | 180                                                | 310                                                                   | 100/500/1000                                    |
| 342005112          | 342205112 | 100 x 2 x 0,50                                                                   | 18,80                                       | 376                                                | 601                                                                   | 100/500/1000                                    |
| 342005222          | 342205222 | 200 x 2 x 0,50                                                                   | 25,90                                       | 690                                                | 1090                                                                  | 100/500                                         |

# HBH & HBH-K



ALEV GECİKTİRİCİ ÖZELLİK/DÜŞÜK DUMAN YOĞUNLUĞU/ZEHİRLİ VE KOROZİF GAZLARDAN ARINDIRILMIŞ  
FLAME RETARDANT CHARACTERISTIC/LOW SMOKE EMISSION/WITHOUT POISONED AND CORROSIVE GASES



## KULLANIM ALANLARI

- Bina içi tesisatlarda;  
- Telefon santralleri ve abone dağıtımlarında  
- Sinyal ve data iletiminde  
- İnsan hayatının, değerli malzemelerin ve ekipmanların korunması gereken yerlerde

## KABLO YAPISI

- 1-İletken** IEC 60228; DIN VDE 0295; EN 60228 Sınıf 1  
Elektrolitik Bakır  
**2-Yalıtım** Solid PE Kompaund  
**3-Yalıtım Renk** TS IEC 60189-2  
**4-Büküm** 10 çift kadar katlar halinde  
20 çift - 100 çift: 10 çiftli alt grupların birlikte bükümü; her grup polipropilen tanıma şeridi ile sarılır  
**5-Ayırıcı Bant** Pes Bant (10 çift üstü)  
**6-Kılıf** HFFR Kompaund  
**7-Kılıf Rengi** RAL 7001 Gri

## APPLICATION

- At indoor installations;  
- Telephone exchanges and subscriber distributions  
- Signal and data transmission  
- In places where human life and valuable materials and equipment need to be protected

## CONSTRUCTION

- 1-Conductor** IEC 60228; DIN VDE 0295; EN 60228 Class 1  
Electrolytic Copper  
**2-Insulation** Solid PE Compound  
**3-Colour Code** TS IEC 60189-2  
**4-Stranding** In layers up to 10 pairs  
20 pairs - 100 pairs: 10 pair groups twisted together; each group is wrapped by polypropylene identification tape  
**5-Wrapping** Pes Tape (more than 10 pairs)  
**6-Sheath** HFFR Compound  
**7-Sheath Colour** RAL 7001 Grey

## TEKNİK ÖZELLİKLER TECHNICAL CHARACTERISTICS

| İLETKEN DİRENCİ<br>CONDUCTOR RES.            | YALITIM DİRENCİ<br>INSULATION RES.                                | EFEKTİF KAPASİTE<br>MUTUAL CAPACITANCE               | ÇALIŞMA SICAKLIĞI<br>TEMPERATURE RANGE      | TEST VOLTAJİ (AC)<br>TEST VOLTAGE(AC) | ÇALIŞMA VOLTAJİ<br>OPERATING VOLTAGE | BÜKÜLME YARIÇAPI<br>BENDING RADIUS | ALEV GECİKTİRİCİLİK TESTİ<br>FLAME RETARDANT TEST |
|----------------------------------------------|-------------------------------------------------------------------|------------------------------------------------------|---------------------------------------------|---------------------------------------|--------------------------------------|------------------------------------|---------------------------------------------------|
| mm Ω/km<br>0,5 97,8                          | 500MΩxkm                                                          | 120nF/km                                             | - 30°C - +70°C                              | 1000V                                 | 250V                                 | 10x Cable Ø                        | IEC 60332-1-2<br>VDE 0482-332-1-2<br>EN 60332-1-2 |
| DUMAN YOĞUNLUĞU TESTİ<br>SMOKE DENSITY TEST  | KOROZİF GAZ TESTİ<br>TEST ON CORROSIVENESS<br>OF COMBUSTION GASES | ALEV YAYILIMI TESTİ<br>FLAME PROPAGATION TEST        | HALOJENSİZLİK TESTİ<br>HALOGEN FREE TEST    |                                       |                                      |                                    |                                                   |
| IEC 61034-2<br>VDE 0482-1034-2<br>EN 61034-2 | IEC 60754-2<br>VDE 0482-754-2<br>EN 60754-2                       | IEC 60332-3-24<br>VDE 0482-332-3-24<br>EN 60332-2-24 | IEC 60754-1<br>VDE 0482-754-1<br>EN 60754-1 |                                       |                                      |                                    |                                                   |

## NOTLAR NOTES

HBH:Elektrolitik Bakır İletken/HBH-K: Kalaylı Bakır İletken  
Esas alınan standartlar TS IEC 60189  
HBH: Electrolytic Copper Conductor  
HBH-K: Tinned Copper Conductor  
Based on TS IEC 60189-2 standard

| KOD NO<br>CODE NR. |                   | ÇİFT SAYISI VE<br>İLETKEN ÇAPI (mm)<br>NUMBER OF PAIRS AND<br>WIRE DIAMETER (mm) | KABLO ÇAPI (mm)<br>OVERALL DIAMETER<br>(mm) | BAKIR AĞIRLIĞI (kg/km)<br>COPPER WEIGHT<br>(kg/km) | YAKLAŞIK KABLO<br>AĞIRLIĞI (kg/km)<br>APPROX. CABLE WEIGHT<br>(kg/km) | STANDART<br>UZUNLUK (mt)<br>STANDARD LENGTH (m) |
|--------------------|-------------------|----------------------------------------------------------------------------------|---------------------------------------------|----------------------------------------------------|-----------------------------------------------------------------------|-------------------------------------------------|
| HBH                | HBH-K             |                                                                                  |                                             |                                                    |                                                                       |                                                 |
| 3 4 2 1 0 5 0 1 3  | 3 4 2 3 0 5 0 1 3 | 1 x 2 x 0,50                                                                     | 3,10                                        | 6                                                  | 16                                                                    | 100/500/1000                                    |
| 3 4 2 1 0 5 0 2 3  | 3 4 2 3 0 5 0 2 3 | 2 x 2 x 0,50                                                                     | 3,80                                        | 10                                                 | 25                                                                    | 100/500/1000                                    |
| 3 4 2 1 0 5 0 3 3  | 3 4 2 3 0 5 0 3 3 | 3 x 2 x 0,50                                                                     | 4,40                                        | 13                                                 | 32                                                                    | 100/500/1000                                    |
| 3 4 2 1 0 5 0 4 3  | 3 4 2 3 0 5 0 4 3 | 4 x 2 x 0,50                                                                     | 4,60                                        | 17                                                 | 40                                                                    | 100/500/1000                                    |
| 3 4 2 1 0 5 0 5 3  | 3 4 2 3 0 5 0 5 3 | 5 x 2 x 0,50                                                                     | 5,00                                        | 20                                                 | 49                                                                    | 100/500/1000                                    |
| 3 4 2 1 0 5 0 6 3  | 3 4 2 3 0 5 0 6 3 | 6 x 2 x 0,50                                                                     | 5,40                                        | 24                                                 | 56                                                                    | 100/500/1000                                    |
| 3 4 2 1 0 5 1 0 3  | 3 4 2 3 0 5 1 0 3 | 10 x 2 x 0,50                                                                    | 7,20                                        | 39                                                 | 90                                                                    | 100/500/1000                                    |
| 3 4 2 1 0 5 2 0 3  | 3 4 2 3 0 5 2 0 3 | 20 x 2 x 0,50                                                                    | 9,00                                        | 77                                                 | 140                                                                   | 100/500/1000                                    |
| 3 4 2 1 0 5 3 0 3  | 3 4 2 3 0 5 3 0 3 | 30 x 2 x 0,50                                                                    | 10,50                                       | 110                                                | 198                                                                   | 100/500/1000                                    |
| 3 4 2 1 0 5 5 0 3  | 3 4 2 3 0 5 5 0 3 | 50 x 2 x 0,50                                                                    | 13,20                                       | 180                                                | 302                                                                   | 100/500/1000                                    |
| 3 4 2 1 0 5 1 1 3  | 3 4 2 3 0 5 1 1 3 | 100 x 2 x 0,50                                                                   | 18,80                                       | 376                                                | 573                                                                   | 100/500/1000                                    |
| 3 4 2 1 0 5 2 2 3  | 3 4 2 3 0 5 2 2 3 | 200 x 2 x 0,50                                                                   | 25,80                                       | 725                                                | 1204                                                                  | 100/500                                         |

# VBAPV & VBAPV-K



ALEV GECİKTİRİCİ ÖZELLİK/KÜÇÜK BÜKÜLME YARIÇAPI  
FLAME RETARDANT CHARACTERISTIC/SMALL BENDING RADIUS



## KULLANIM ALANLARI

- Bina içi tesisatlarda;  
- Telefon santralleri ve abone dağıtımlarında  
- Sinyal ve data iletiminde

## KABLO YAPISI

|                          |                                                                                                                                                       |
|--------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>1-İletken</b>         | IEC 60228; DIN VDE 0295; EN 60228 Sınıf 1<br>Elektrolitik Bakır                                                                                       |
| <b>2-Yalıtım Direnci</b> | PVC Kompaund                                                                                                                                          |
| <b>3-Yalıtım Renk</b>    | TS IEC 60189-2                                                                                                                                        |
| <b>4-Büküm</b>           | 10 çiftte kadar katlar halinde<br>20 çift ~ 100 çift: 10 çiftli alt grupların<br>birlikte bükümü; her grup polipropilen<br>tanıtma şeridi ile sarılır |
| <b>5-Ayırıcı Bant</b>    | Pes Bant (10 çift ve üstü)                                                                                                                            |
| <b>6-Ekran</b>           | Kalaylı Bakır Toprak Teli + Pes Bant                                                                                                                  |
| <b>7-Kılıf</b>           | PVC Kompaund                                                                                                                                          |
| <b>8-Kılıf Rengi</b>     | RAL 7001 Gri                                                                                                                                          |

## APPLICATION

- At indoor installations;  
- Telephone exchanges and subscriber distributions  
- Signal and data transmission

## CONSTRUCTION

|                        |                                                                                                                                                     |
|------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>1-Conductor</b>     | IEC 60228; DIN VDE 0295; EN 60228 Class 1<br>Electrolytic Copper                                                                                    |
| <b>2-Insulation</b>    | PVC Compound                                                                                                                                        |
| <b>3-Colour Code</b>   | TS IEC 60189-2                                                                                                                                      |
| <b>4-Stranding</b>     | In layers up to 10 pairs<br>20 pairs - 100 pairs: 10 pair groups twisted<br>together; each group is wrapped by<br>polypropylene identification tape |
| <b>5-Wrapping</b>      | Pes Tape (more than 10 pairs)                                                                                                                       |
| <b>6-Screen</b>        | Tinned Copper Drain Wire + Pes Tape                                                                                                                 |
| <b>7-Sheath</b>        | PVC Compound                                                                                                                                        |
| <b>8-Sheath Colour</b> | RAL 7001 Grey                                                                                                                                       |

## TEKNİK ÖZELLİKLER TECHNICAL CHARACTERISTICS

| İLETKEN DİRENCİ<br>CONDUCTOR RES.     | YALITIM DİRENCİ<br>INSULATION<br>RESISTANCE | EFEKTİF KAPASİTE<br>MUTUAL<br>CAPACITANCE | ÇALIŞMA SICAKLIĞI<br>TEMPERATURE RANGE            |
|---------------------------------------|---------------------------------------------|-------------------------------------------|---------------------------------------------------|
| mm $\Omega/km$<br>0,5 97,8            | 500M $\Omega \times km$                     | 120nF/km                                  | -30°C - +70°C                                     |
| TEST VOLTAJ (AC)<br>TEST VOLTAGE (AC) | ÇALIŞMA VOLTAJ<br>OPERATING VOLTAGE         | BÜKÜLME YARIÇAPI<br>BENDING RADIUS        | ALEV GECİKTİRİCİLİK TESTİ<br>FLAME RETARDANT TEST |
| 1000V                                 | 250V                                        | 8 x Cable Ø                               | IEC 60332-1-2<br>VDE 0482-332-1-2<br>EN 60332-1-2 |

## NOTLAR NOTES

VBV: Elektrolitik Bakır İletken  
VBV-K: Kalaylı Bakır İletken  
Esas alınan standartlar TS IEC 60189-2  
VBAPV: Electrolytic Copper Conductor  
VBAPV-K: Tinned Copper Conductor  
Based on TS IEC 60189-2 standard

| KOD NO<br>CODE NR. |           | ÇİFT SAYISI VE<br>İLETKEN ÇAPI (mm)<br>NUMBER OF PAIRS AND<br>WIRE DIAMETER (mm) | KABLO ÇAPI (mm)<br>OVERALL DIAMETER<br>(mm) | BAKIR AĞIRLIĞI (kg/km)<br>COPPER WEIGHT<br>(kg/km) | YAKLAŞIK KABLO<br>AĞIRLIĞI (kg/km)<br>APPROX. CABLE WEIGHT<br>(kg/km) | STANDART<br>UZUNLUK (mt)<br>STANDARD LENGTH (m) |
|--------------------|-----------|----------------------------------------------------------------------------------|---------------------------------------------|----------------------------------------------------|-----------------------------------------------------------------------|-------------------------------------------------|
| VBAPV              | VBAPV-K   |                                                                                  |                                             |                                                    |                                                                       |                                                 |
| 342405012          | 342505012 | 1 x 2 x 0,50                                                                     | 3,30                                        | 7                                                  | 23                                                                    | 100/500/1000                                    |
| 342405022          | 342505022 | 2 x 2 x 0,50                                                                     | 4,30                                        | 13                                                 | 29                                                                    | 100/500/1000                                    |
| 342405032          | 342505032 | 3 x 2 x 0,50                                                                     | 4,60                                        | 15                                                 | 39                                                                    | 100/500/1000                                    |
| 342405042          | 342505042 | 4 x 2 x 0,50                                                                     | 4,80                                        | 19                                                 | 44                                                                    | 100/500/1000                                    |
| 342405052          | 342505052 | 5 x 2 x 0,50                                                                     | 5,20                                        | 22                                                 | 52                                                                    | 100/500/1000                                    |
| 342405062          | 342505062 | 6 x 2 x 0,50                                                                     | 5,60                                        | 26                                                 | 59                                                                    | 100/500/1000                                    |
| 342405102          | 342505102 | 10 x 2 x 0,50                                                                    | 7,40                                        | 40                                                 | 93                                                                    | 100/500/1000                                    |
| 342405202          | 342505202 | 20 x 2 x 0,50                                                                    | 9,20                                        | 77                                                 | 147                                                                   | 100/500/1000                                    |
| 342405302          | 342505302 | 30 x 2 x 0,50                                                                    | 10,70                                       | 110                                                | 205                                                                   | 100/500/1000                                    |
| 342405502          | 342505502 | 50 x 2 x 0,50                                                                    | 13,40                                       | 180                                                | 314                                                                   | 100/500/1000                                    |
| 342405112          | 342505112 | 100 x 2 x 0,50                                                                   | 19,00                                       | 365                                                | 600                                                                   | 100/500/1000                                    |
| 342405222          | 342505222 | 200 x 2 x 0,50                                                                   | 26,00                                       | 725                                                | 1140                                                                  | 100/500                                         |

# HBAPH & HBAPH-K



ALEV GECİKTİRİCİ ÖZELLİK/DÜŞÜK DUMAN YOĞUNLUĞU/ZEHİRLİ VE KOROZİF GAZLARDAN ARINDIRILMIŞ  
FLAME RETARDANT CHARACTERISTIC/LOW SMOKE EMISSION/WITHOUT POISONED AND CORROSIVE GASES



## KULLANIM ALANLARI

Bina içi tesisatlarda;  
- Telefon santralleri ve abone dağıtımlarında  
- Sinyal ve data iletiminde  
- İnsan hayatının, değerli malzemelerin ve ekipmanların korunması gereken yerlerde

## KABLO YAPISI

|                       |                                                                                                                                               |
|-----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| <b>1-İletken</b>      | IEC 60228; DIN VDE 0295; EN 60228 Sınıf 1<br>Elektrolitik Bakır                                                                               |
| <b>2-Yalıtım</b>      | Solid PE Kompaund                                                                                                                             |
| <b>3-Yalıtım Renk</b> | TS IEC 60189-2                                                                                                                                |
| <b>4-Büküm</b>        | 10 çifte kadar katlar halinde<br>20 çift - 100 çift: 10 çiftli alt grupların birlikte bükümü; her grup polipropilen tanıma şeridi ile sarılır |
| <b>5-Ayırıcı Bant</b> | Pes Bant                                                                                                                                      |
| <b>6-Ekran</b>        | Kalaylı Bakır Toprak Teli + Al Pes Bant                                                                                                       |
| <b>7-Kılıf</b>        | HFFR Kompaund                                                                                                                                 |
| <b>8-Kılıf Rengi</b>  | RAL 7001 Gri                                                                                                                                  |

## APPLICATION

At indoor installations;  
- Telephone exchanges and subscriber distributions  
- Signal and data transmission  
- In places where human life and valuable materials and equipment need to be protected

## CONSTRUCTION

|                        |                                                                                                                                               |
|------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| <b>1-Conductor</b>     | IEC 60228; DIN VDE 0295; EN 60228 Class 1<br>Electrolytic Copper                                                                              |
| <b>2-Insulation</b>    | Solid PE Compound                                                                                                                             |
| <b>3-Colour Code</b>   | TS IEC 60189-2                                                                                                                                |
| <b>4-Stranding</b>     | In layers up to 10 pairs<br>20 pairs - 100 pairs: 10 pair groups twisted together; each group is wrapped by polypropylene identification tape |
| <b>5-Wrapping</b>      | Pes Tape                                                                                                                                      |
| <b>6-Screen</b>        | Tinned Copper Drain Wire + Pes Tape                                                                                                           |
| <b>7-Sheath</b>        | HFFR Compound                                                                                                                                 |
| <b>8-Sheath Colour</b> | RAL 7001 Grey                                                                                                                                 |

## TEKNİK ÖZELLİKLER TECHNICAL CHARACTERISTICS

| İLETKEN DİRENCİ<br>CONDUCTOR RES.    | YALITIM DİRENCİ<br>INSULATION RES.                                | EFEKTİF KAPASİTE<br>MUTUAL CAPACITANCE               | ÇALIŞMA SICAKLIĞI<br>TEMPERATURE RANGE      | TEST VOLTAJI (AC)<br>TEST VOLTAGE(AC) | BÜKÜLME YARIÇAPI<br>BENDING RADIUS | ALEV GECİKTİRİCİLİK TESTİ<br>FLAME RETARDANT TEST | DUMAN YOĞUNLUĞU TESTİ<br>SMOKE DENSITY TEST  |
|--------------------------------------|-------------------------------------------------------------------|------------------------------------------------------|---------------------------------------------|---------------------------------------|------------------------------------|---------------------------------------------------|----------------------------------------------|
| mm Ω/km<br>0,5 97,8                  | 500MΩxkm                                                          | 120nF/km                                             | - 30°C - +70°C                              | 1000V                                 | 10 x Cable Ø                       | IEC 60332-1-2<br>VDE 0482-332-1-2<br>EN 60332-1-2 | IEC 61034-2<br>VDE 0482-1034-2<br>EN 61034-2 |
| ÇALIŞMA VOLTAJI<br>OPERATING VOLTAGE | KOROZİF GAZ TESTİ<br>TEST ON CORROSIVENESS<br>OF COMBUSTION GASES | ALEV YAYILIMI TESTİ<br>FLAME PROPAGATION TEST        | HALOJENSİZLİK TESTİ<br>HALOGEN FREE TEST    |                                       |                                    |                                                   |                                              |
| 250V                                 | IEC 60754-2<br>VDE 0482-754-1/2<br>EN 60754-2                     | IEC 60332-3-24<br>VDE 0482-332-3-24<br>EN 60332-2-24 | IEC 60754-1<br>VDE 0482-754-2<br>EN 60754-2 |                                       |                                    |                                                   |                                              |

## NOTLAR NOTES

HBAPH:Elektrolitik Bakır İletken/HBAPH-K: Kalaylı Bakır İletken  
Esas alınan standartlar TS IEC 60189-2  
HBAPH: Electrolytic Copper Conductor  
HBAPH-K: Tinned Copper Conductor  
Based on TS IEC 60189-2 standard

| KOD NO<br>CODE NR. |           | ÇİFT SAYISI VE<br>İLETKEN ÇAPI (mm)<br>NUMBER OF PAIRS AND<br>WIRE DIAMETER (mm) | KABLO ÇAPI (mm)<br>OVERALL DIAMETER<br>(mm) | BAKIR AĞIRLIĞI (kg/km)<br>COPPER WEIGHT<br>(kg/km) | YAKLAŞIK KABLO<br>AĞIRLIĞI (kg/km)<br>APPROX. CABLE WEIGHT<br>(kg/km) | STANDART<br>UZUNLUK (mt)<br>STANDARD LENGTH (m) |
|--------------------|-----------|----------------------------------------------------------------------------------|---------------------------------------------|----------------------------------------------------|-----------------------------------------------------------------------|-------------------------------------------------|
| HBAPH              | HBAPH-K   |                                                                                  |                                             |                                                    |                                                                       |                                                 |
| 342605013          | 342705013 | 1 x 2 x 0,50                                                                     | 3,30                                        | 7                                                  | 24                                                                    | 100/500/1000                                    |
| 342605023          | 342705023 | 2 x 2 x 0,50                                                                     | 4,00                                        | 13                                                 | 28                                                                    | 100/500/1000                                    |
| 342605033          | 342705033 | 3 x 2 x 0,50                                                                     | 4,60                                        | 15                                                 | 40                                                                    | 100/500/1000                                    |
| 342605043          | 342705043 | 4 x 2 x 0,50                                                                     | 4,80                                        | 19                                                 | 46                                                                    | 100/500/1000                                    |
| 342605053          | 342705053 | 5 x 2 x 0,50                                                                     | 5,20                                        | 23                                                 | 54                                                                    | 100/500/1000                                    |
| 342605063          | 342705063 | 6 x 2 x 0,50                                                                     | 5,60                                        | 26                                                 | 61                                                                    | 100/500/1000                                    |
| 342605103          | 342705103 | 10 x 2 x 0,50                                                                    | 7,40                                        | 40                                                 | 96                                                                    | 100/500/1000                                    |
| 342605203          | 342705203 | 20 x 2 x 0,50                                                                    | 9,20                                        | 77                                                 | 150                                                                   | 100/500/1000                                    |
| 342605303          | 342705303 | 30 x 2 x 0,50                                                                    | 10,70                                       | 110                                                | 200                                                                   | 100/500/1000                                    |
| 342605503          | 342705503 | 50 x 2 x 0,50                                                                    | 13,40                                       | 180                                                | 311                                                                   | 100/500/1000                                    |
| 342605113          | 342705113 | 100 x 2 x 0,50                                                                   | 19,00                                       | 368                                                | 584                                                                   | 100/500/1000                                    |
| 342605223          | 342705223 | 200 x 2 x 0,50                                                                   | 26,00                                       | 725                                                | 1120                                                                  | 100/500                                         |

# J-YY...Lg



ALEV GECİKTİRİCİ ÖZELLİK/KÜÇÜK BÜKÜLME YARIÇAPI  
FLAME RETARDANT CHARACTERISTIC/SMALL BENDING RADIUS



## KULLANIM ALANLARI

Bina içi tesisatlarda

- Santral ve abone dağıtımlarında
- Sinyal ve data iletiminde

## APPLICATION

At indoor installation;

- Telephone exchanges and subscriber distributions
- Signal and data transmission

## KABLO YAPISI

|                       |                                                                 |
|-----------------------|-----------------------------------------------------------------|
| <b>1-İletken</b>      | IEC 60228; DIN VDE 0295; EN 60228 Sınıf 1<br>Elektrolitik Bakır |
| <b>2-Yalıtım</b>      | EN 50290-2-21 PVC Kompaund                                      |
| <b>3-Yalıtım Renk</b> | VDE 0815                                                        |
| <b>4-Büküm</b>        | Çift büküm, katlar halinde                                      |
| <b>5-Ayırıcı Bant</b> | Pes Bant                                                        |
| <b>6-Kılıf</b>        | EN 50290-2-22 PVC Kompaund                                      |
| <b>7-Kılıf Rengi</b>  | RAL 7032 Gri ya da RAL 3000 Kırmızı                             |

## CONSTRUCTION

|                        |                                                                  |
|------------------------|------------------------------------------------------------------|
| <b>1-Conductor</b>     | IEC 60228; DIN VDE 0295; EN 60228 Class 1<br>Electrolytic Copper |
| <b>2-Insulation</b>    | EN 50290-2-21 PVC Compound                                       |
| <b>3-Colour Code</b>   | VDE 0815                                                         |
| <b>4-Stranding</b>     | Pairwise, pairs in layers                                        |
| <b>5-Wrapping</b>      | Pes Tape                                                         |
| <b>6-Sheath</b>        | EN 50290-2-22 PVC Compound                                       |
| <b>7-Sheath Colour</b> | RAL 7032 Grey or RAL 3000 Red                                    |

## TEKNİK ÖZELLİKLER TECHNICAL CHARACTERISTICS

| ÇEVİRİM DİRENCİ<br>LOOP RESISTANCE | YALITIM DİRENCİ<br>INSULATION<br>RESISTANCE | EFEKTİF KAPASİTE<br>MUTUAL<br>CAPACITANCE | ÇALIŞMA SICAKLIĞI<br>TEMPERATURE RANGE | TEST VOLTAJİ (AC)<br>TEST VOLTAGE(AC) | ÇALIŞMA VOLTAJİ<br>OPERATING VOLTAGE | BÜKÜLME YARIÇAPI<br>BENDING RADIUS | ALEV GECİKTİRİCİLİK TESTİ<br>FLAME RETARDANT TEST |
|------------------------------------|---------------------------------------------|-------------------------------------------|----------------------------------------|---------------------------------------|--------------------------------------|------------------------------------|---------------------------------------------------|
| $\Omega/\text{km}$                 | 100M $\Omega \times \text{km}$              | 100nF/km                                  | - 30°C - +70°C                         | <1,00mm: 800V<br>≥1,0mm: 1000V        | 250V                                 | 7,5 x Cable Ø                      | IEC 60332-1-2<br>VDE 0482-332-1-2<br>EN 60332-1-2 |
| 0,6 mm 130                         |                                             |                                           |                                        |                                       |                                      |                                    |                                                   |
| 0,8 mm 73,2                        |                                             |                                           |                                        |                                       |                                      |                                    |                                                   |
| 1,0 mm 44,6                        |                                             |                                           |                                        |                                       |                                      |                                    |                                                   |
| 1,5 mm <sup>2</sup> 24,6           |                                             |                                           |                                        |                                       |                                      |                                    |                                                   |
| 2,5 mm <sup>2</sup> 15,1           |                                             |                                           |                                        |                                       |                                      |                                    |                                                   |

## J-YY...Lg

| KOD NO<br>CODE NR. | ÇİFT SAYISI VE<br>İLETKEN ÇAPI (mm)<br>NUMBER OF PAIRS AND<br>WIRE DIAMETER (mm) | KABLO ÇAPI (mm)<br>OVERALL DIAMETER<br>(mm) | BAKIR AĞIRLIĞI (kg/km)<br>COPPER WEIGHT<br>(kg/km) | YAKLAŞIK KABLO<br>AĞIRLIĞI (kg/km)<br>APPROX. CABLE WEIGHT<br>(kg/km) | STANDART<br>UZUNLUK (mt)<br>STANDARD LENGTH (m) |
|--------------------|----------------------------------------------------------------------------------|---------------------------------------------|----------------------------------------------------|-----------------------------------------------------------------------|-------------------------------------------------|
| 340006015          | 1 x 2 x 0,60                                                                     | 4,80                                        | 6                                                  | 28                                                                    | 500/1000/2000                                   |
| 340006025          | 2 x 2 x 0,60                                                                     | 5,20                                        | 12                                                 | 47                                                                    | 500/1000/2000                                   |
| 340006035          | 3 x 2 x 0,60                                                                     | 6,00                                        | 17                                                 | 49                                                                    | 500/1000/2000                                   |
| 340006045          | 4 x 2 x 0,60                                                                     | 6,50                                        | 22                                                 | 57                                                                    | 500/1000/2000                                   |
| 340006055          | 5 x 2 x 0,60                                                                     | 7,20                                        | 33                                                 | 80                                                                    | 500/1000/2000                                   |
| 340006065          | 6 x 2 x 0,60                                                                     | 7,70                                        | 45                                                 | 91                                                                    | 500/1000/2000                                   |
| 340006105          | 10 x 2 x 0,60                                                                    | 8,70                                        | 55                                                 | 110                                                                   | 500/1000/2000                                   |
| 340008015          | 1 x 2 x 0,80                                                                     | 5,80                                        | 12                                                 | 37                                                                    | 500/1000/2000                                   |
| 340008025          | 2 x 2 x 0,80                                                                     | 6,70                                        | 21                                                 | 57                                                                    | 500/1000/2000                                   |
| 340008035          | 3 x 2 x 0,80                                                                     | 8,20                                        | 31                                                 | 77                                                                    | 500/1000/2000                                   |
| 340008045          | 4 x 2 x 0,80                                                                     | 8,70                                        | 41                                                 | 97                                                                    | 500/1000/2000                                   |
| 340008065          | 6 x 2 x 0,80                                                                     | 10,20                                       | 61                                                 | 137                                                                   | 500/1000/2000                                   |
| 340008085          | 8 x 2 x 0,80                                                                     | 10,90                                       | 81                                                 | 167                                                                   | 500/1000/2000                                   |
| 340008105          | 10 x 2 x 0,80                                                                    | 12,70                                       | 101                                                | 217                                                                   | 500/1000/2000                                   |
| 340001015          | 1 x 2 x 1                                                                        | 6,70                                        | 16                                                 | 41                                                                    | 500/1000/2000                                   |
| 340001025          | 2 x 2 x 1                                                                        | 8,30                                        | 29                                                 | 60                                                                    | 500/1000/2000                                   |
| 340001035          | 3 x 2 x 1                                                                        | 9,90                                        | 45                                                 | 117                                                                   | 500/1000/2000                                   |
| 340001045          | 4 x 2 x 1                                                                        | 11,10                                       | 61                                                 | 133                                                                   | 500/1000/2000                                   |
| 340001065          | 6 x 2 x 1                                                                        | 13,00                                       | 89                                                 | 191                                                                   | 500/1000/2000                                   |
| 340001085          | 8 x 2 x 1                                                                        | 14,50                                       | 119                                                | 246                                                                   | 500/1000                                        |
| 340001105          | 10 x 2 x 1                                                                       | 16,00                                       | 148                                                | 302                                                                   | 500/1000                                        |

| KOD NO<br>CODE NR. | ÇİFT SAYISI VE<br>KESİT (mm <sup>2</sup> )<br>NUMBER OF PAIRS AND<br>CROSS-SECTION(mm <sup>2</sup> ) | KABLO ÇAPI (mm)<br>OVERALL DIAMETER<br>(mm) | BAKIR AĞIRLIĞI (kg/km)<br>COPPER WEIGHT<br>(kg/km) | YAKLAŞIK KABLO<br>AĞIRLIĞI (kg/km)<br>APPROX. CABLE WEIGHT<br>(kg/km) | STANDART<br>UZUNLUK (mt)<br>STANDARD LENGTH (m) |
|--------------------|------------------------------------------------------------------------------------------------------|---------------------------------------------|----------------------------------------------------|-----------------------------------------------------------------------|-------------------------------------------------|
| 340015015          | 1 x 2 x 1,5                                                                                          | 7,80                                        | 29                                                 | 62                                                                    | 500/1000/2000                                   |
| 340015025          | 2 x 2 x 1,5                                                                                          | 9,10                                        | 54                                                 | 109                                                                   | 500/1000/2000                                   |
| 340015035          | 3 x 2 x 1,5                                                                                          | 11,90                                       | 80                                                 | 166                                                                   | 500/1000/2000                                   |
| 340015045          | 4 x 2 x 1,5                                                                                          | 13,20                                       | 107                                                | 206                                                                   | 500/1000/2000                                   |
| 340015065          | 6 x 2 x 1,5                                                                                          | 16,00                                       | 159                                                | 302                                                                   | 500/1000                                        |
| 340015085          | 8 x 2 x 1,5                                                                                          | 18,20                                       | 211                                                | 397                                                                   | 500/1000                                        |
| 340015105          | 10 x 2 x 1,5                                                                                         | 19,40                                       | 263                                                | 476                                                                   | 500/1000                                        |

# J-HH...Lg



ALEV GECİKTİRİCİ ÖZELLİK/KÜÇÜK BÜKÜLME YARIÇAPI/DÜŞÜK DUMAN YOĞUNLUĞU/  
ZEHİRLİ VE KOROZİF GAZLARDAN ARINDIRILMIŞ  
FLAME RETARDANT CHARACTERISTIC/SMALL BENDING RADIUS/LOW SMOKE EMISSION/  
WITHOUT POISONED AND CORROSIVE GASES



## KULLANIM ALANLARI

İnsanların yoğun olarak bulunduğu kapalı ortamlarda  
- Santral ve abone dağıtımlarında  
- Sinyal ve data iletiminde

## APPLICATION

In covered places where people are densely found  
- Telephone exchanges and subscriber distributions  
- Signal and data transmission

## KABLO YAPISI

|                       |                                                                 |
|-----------------------|-----------------------------------------------------------------|
| <b>1-İletken</b>      | IEC 60228; DIN VDE 0295; EN 60228 Sınıf 1<br>Elektrolitik Bakır |
| <b>2-Yalıtkan</b>     | EN 50290-2-26 HFFR Kompaund                                     |
| <b>3-Yalıtım Renk</b> | VDE 0815                                                        |
| <b>4-Büküm</b>        | Çift büküm, katlar halinde                                      |
| <b>5-Ayırıcı Bant</b> | Pes Bant                                                        |
| <b>6-Kılıf</b>        | EN 50290-2-27 HFFR Kompaund                                     |
| <b>7-Kılıf Rengi</b>  | RAL 7001 Gri ya da RAL 3000 Kırmızı                             |

## CONSTRUCTION

|                        |                                                                  |
|------------------------|------------------------------------------------------------------|
| <b>1-Conductor</b>     | IEC 60228; DIN VDE 0295; EN 60228 Class 1<br>Electrolytic Copper |
| <b>2-Insulation</b>    | EN 50290-2-26 HFFR Compound                                      |
| <b>3-Colour Code</b>   | VDE 0815                                                         |
| <b>4-Stranding</b>     | Pairwise, pairs in layers                                        |
| <b>5-Wrapping</b>      | Pes Tape                                                         |
| <b>6-Sheath</b>        | EN 50290-2-27 HFFR Compound                                      |
| <b>7-Sheath Colour</b> | RAL 7001 Grey or RAL 3000 Red                                    |

## TEKNİK ÖZELLİKLER TECHNICAL CHARACTERISTICS

| ÇEVİRİM DİRENCİ<br>LOOP RESISTANCE           | YALITIM DİRENCİ<br>INSULATION<br>RESISTANCE                       | EFEKTİF KAPASİTE<br>MUTUAL<br>CAPACITANCE            | ÇALIŞMA SICAKLIĞI<br>TEMPERATURE RANGE      | TEST VOLTAJİ (AC)<br>TEST VOLTAGE(AC) | ÇALIŞMA VOLTAJİ<br>OPERATING VOLTAGE | BÜKÜLME YARIÇAPI<br>BENDING RADIUS | ALEV GECİKTİRİCİLİK TESTİ<br>FLAME RETARDANT TEST |
|----------------------------------------------|-------------------------------------------------------------------|------------------------------------------------------|---------------------------------------------|---------------------------------------|--------------------------------------|------------------------------------|---------------------------------------------------|
| $\Omega/\text{km}$                           | 100M $\Omega \times \text{km}$                                    | 100nF/km                                             | - 30°C - +70°C                              | <1,00mm: 800V<br>≥1,0mm: 1000V        | 250V                                 | 7,5 x Cable Ø                      | IEC 60332-1-2<br>VDE 0482-332-1-2<br>EN 60332-1-2 |
| 0,6 mm 130                                   |                                                                   |                                                      |                                             |                                       |                                      |                                    |                                                   |
| 0,8 mm 73,2                                  |                                                                   |                                                      |                                             |                                       |                                      |                                    |                                                   |
| 1,0 mm 44,6                                  |                                                                   |                                                      |                                             |                                       |                                      |                                    |                                                   |
| 1,5 mm <sup>2</sup> 24,6                     |                                                                   |                                                      |                                             |                                       |                                      |                                    |                                                   |
| 2,5 mm <sup>2</sup> 15,1                     |                                                                   |                                                      |                                             |                                       |                                      |                                    |                                                   |
| DUMAN YOĞUNLUĞU TESTİ<br>SMOKE DENSITY TEST  | KOROZİF GAZ TESTİ<br>TEST ON CORROSIVENESS<br>OF COMBUSTION GASES | ALEV YAYILIMI TESTİ<br>FLAME PROPAGATION TEST        | HALOJENSİZLİK TESTİ<br>HALOGEN FREE TEST    |                                       |                                      |                                    |                                                   |
| IEC 61034-2<br>VDE 0482-1034-2<br>EN 61034-2 | IEC 60754-2<br>VDE 0482-754-1/2<br>EN 60754-2                     | IEC 60332-3-24<br>VDE 0482-332-3-24<br>EN 60332-2-24 | IEC 60754-1<br>VDE 0482-754-2<br>EN 60754-2 |                                       |                                      |                                    |                                                   |

# J-HH...Lg

| KOD NO<br>CODE NR. | ÇİFT SAYISI VE<br>KESİT (mm)<br>NUMBER OF PAIRS AND<br>CROSS-SECTION (mm) | KABLO ÇAPI (mm)<br>OVERALL DIAMETER<br>(mm) | BAKIR AĞIRLIĞI (kg/km)<br>COPPER WEIGHT<br>(kg/km) | YAKLAŞIK KABLO<br>AĞIRLIĞI (kg/km)<br>APPROX. CABLE WEIGHT<br>(kg/km) | STANDART<br>UZUNLUK (m)<br>STANDARD LENGTH (m) |
|--------------------|---------------------------------------------------------------------------|---------------------------------------------|----------------------------------------------------|-----------------------------------------------------------------------|------------------------------------------------|
| 340106015          | 1 x 2 x 0,60                                                              | 4,80                                        | 6                                                  | 31                                                                    | 100/500/1000                                   |
| 340106025          | 2 x 2 x 0,60                                                              | 5,20                                        | 12                                                 | 51                                                                    | 100/500/1000                                   |
| 340106035          | 3 x 2 x 0,60                                                              | 6,00                                        | 17                                                 | 54                                                                    | 100/500/1000                                   |
| 340106045          | 4 x 2 x 0,60                                                              | 6,50                                        | 22                                                 | 61                                                                    | 100/500/1000                                   |
| 340106065          | 6 x 2 x 0,60                                                              | 7,20                                        | 33                                                 | 85                                                                    | 100/500/1000                                   |
| 340106085          | 8 x 2 x 0,60                                                              | 7,70                                        | 45                                                 | 100                                                                   | 100/500/1000                                   |
| 340106105          | 10 x 2 x 0,60                                                             | 8,70                                        | 55                                                 | 120                                                                   | 100/500/1000                                   |
| 340108015          | 1 x 2 x 0,80                                                              | 5,80                                        | 12                                                 | 40                                                                    | 500/1000/2000                                  |
| 340108025          | 2 x 2 x 0,80                                                              | 6,70                                        | 22                                                 | 61                                                                    | 500/1000/2000                                  |
| 340108035          | 3 x 2 x 0,80                                                              | 8,20                                        | 31                                                 | 83                                                                    | 500/1000/2000                                  |
| 340108045          | 4 x 2 x 0,80                                                              | 8,70                                        | 41                                                 | 105                                                                   | 500/1000/2000                                  |
| 340108065          | 6 x 2 x 0,80                                                              | 10,20                                       | 61                                                 | 145                                                                   | 500/1000/2000                                  |
| 340108085          | 8 x 2 x 0,80                                                              | 10,90                                       | 81                                                 | 177                                                                   | 500/1000/2000                                  |
| 340108105          | 10 x 2 x 0,80                                                             | 12,70                                       | 101                                                | 270                                                                   | 500/1000/2000                                  |
| 340101015          | 1 x 2 x 1                                                                 | 6,70                                        | 16                                                 | 44                                                                    | 500/1000/2000                                  |
| 340101025          | 2 x 2 x 1                                                                 | 8,30                                        | 30                                                 | 65                                                                    | 500/1000/2000                                  |
| 340101035          | 3 x 2 x 1                                                                 | 9,90                                        | 45                                                 | 124                                                                   | 500/1000/2000                                  |
| 340101045          | 4 x 2 x 1                                                                 | 11,10                                       | 61                                                 | 140                                                                   | 500/1000/2000                                  |
| 340101065          | 6 x 2 x 1                                                                 | 13,00                                       | 89                                                 | 200                                                                   | 500/1000/2000                                  |
| 340101085          | 8 x 2 x 1                                                                 | 14,50                                       | 119                                                | 357                                                                   | 500/1000/2000                                  |
| 340101105          | 10 x 2 x 1                                                                | 16,00                                       | 149                                                | 320                                                                   | 500/1000/2000                                  |

| KOD NO<br>CODE NR. | ÇİFT SAYISI VE<br>KESİT (mm <sup>2</sup> )<br>NUMBER OF PAIRS AND<br>CROSS-SECTION (mm <sup>2</sup> ) | KABLO ÇAPI (mm)<br>OVERALL DIAMETER<br>(mm) | BAKIR AĞIRLIĞI (kg/km)<br>COPPER WEIGHT<br>(kg/km) | YAKLAŞIK KABLO<br>AĞIRLIĞI (kg/km)<br>APPROX. CABLE WEIGHT<br>(kg/km) | STANDART<br>UZUNLUK (m)<br>STANDARD LENGTH (m) |
|--------------------|-------------------------------------------------------------------------------------------------------|---------------------------------------------|----------------------------------------------------|-----------------------------------------------------------------------|------------------------------------------------|
| 340115015          | 1 x 2 x 1,5                                                                                           | 7,80                                        | 29                                                 | 67                                                                    | 500/1000/2000                                  |
| 340115025          | 2 x 2 x 1,5                                                                                           | 9,10                                        | 54                                                 | 118                                                                   | 500/1000/2000                                  |
| 340115035          | 3 x 2 x 1,5                                                                                           | 11,90                                       | 80                                                 | 175                                                                   | 500/1000/2000                                  |
| 340115045          | 4 x 2 x 1,5                                                                                           | 13,20                                       | 107                                                | 218                                                                   | 500/1000/2000                                  |
| 340115065          | 6 x 2 x 1,5                                                                                           | 16,00                                       | 159                                                | 321                                                                   | 500/1000/2000                                  |
| 340115085          | 8 x 2 x 1,5                                                                                           | 18,20                                       | 211                                                | 419                                                                   | 500/1000/2000                                  |
| 340115105          | 10 x 2 x 1,5                                                                                          | 19,40                                       | 263                                                | 502                                                                   | 500/1000/2000                                  |

# J-Y(St)Y...Lg



ALEV GECİKTİRİCİ ÖZELLİK/KÜÇÜK BÜKÜLME YARIÇAPI  
FLAME RETARDANT CHARACTERISTIC/SMALL BENDING RADIUS



## KULLANIM ALANLARI

- Elektromanyetik karışım ve girişimlerin olduğu yerlerde
- Enstrüman ve kontrol mühendisliğinde
  - Endüstriyel elektronikte
  - Bilgisayar ve ofis makinelerinde
  - Bina içi haberleşme sistemlerinde
  - Bina içi ses sistemlerinde
  - Güvenlik sistemlerinde

## APPLICATION

- In places where there is electromagnetic interference
- Instrumentation and control engineering
  - Industrial electronics
  - Computers and office machines
  - Indoor communication systems
  - Indoor sound systems
  - Security systems

## KABLO YAPISI

- 1-İletken** IEC 60228; DIN VDE 0295; EN 60228 Sınıf 1  
Elektrolitik Bakır
- 2-Yalıtım** EN 50290-2-21 PVC Kompaund
- 3-Yalıtım Renk** VDE 0815
- 4-Büküm** Çift büküm, katlar halinde
- 5-Ayırıcı Bant** Pes Bant
- 6-Ekran** Kalaylı Bakır Toprak Teli+Pes Bant
- 7-Kılıf** EN 50290-2-22 PVC Kompaund
- 8-Kılıf Rengi** RAL 7032 Gri veya RAL 3000 Kırmızı

## CONSTRUCTION

- 1-Conductor** IEC 60228; DIN VDE 0295; EN 60228 Class 1  
Electrolytic Copper
- 2-Insulation** EN 50290-2-21 PVC Compound
- 3-Colour Code** VDE 0815
- 4-Stranding** Pairwise, pairs in layers
- 5-Wrapping** Pes Tape
- 6-Screen** Tinned Copper Drain Wire+Pes Tape
- 6-Sheath** EN 50290-2-22 PVC Compound
- 7-Sheath Colour** RAL 7032 Grey or RAL 3000 Red

## TEKNİK ÖZELLİKLER

### TECHNICAL CHARACTERISTICS

| ÇEVİRİM DİRENCİ<br>LOOP RESISTANCE | YALITIM DİRENCİ<br>INSULATION<br>RESISTANCE | EFEKTİF KAPASİTE<br>MUTUAL<br>CAPACITANCE | ÇALIŞMA SICAKLIĞI<br>TEMPERATURE RANGE | TEST VOLTAJİ (AC)<br>TEST VOLTAGE(AC) | ÇALIŞMA VOLTAJİ<br>OPERATING VOLTAGE | BÜKÜLME YARIÇAPI<br>BENDING RADIUS | ALEV GECİKTİRİCİLİK TESTİ<br>FLAME RETARDANT TEST |
|------------------------------------|---------------------------------------------|-------------------------------------------|----------------------------------------|---------------------------------------|--------------------------------------|------------------------------------|---------------------------------------------------|
| <b>Ω/km</b>                        | 100MΩxkm                                    | 100nF/km                                  | - 30°C - +70°C                         | <1,00mm: 800V<br>≥1,0mm: 1000V        | 300V                                 | 10 x Cable Ø                       | IEC 60332-1-2<br>VDE 0482-332-1-2<br>EN 60332-1-2 |
| 0,6 mm                             | 130                                         |                                           |                                        |                                       |                                      |                                    |                                                   |
| 0,8 mm                             | 73,2                                        |                                           |                                        |                                       |                                      |                                    |                                                   |
| 1,0 mm                             | 44,6                                        |                                           |                                        |                                       |                                      |                                    |                                                   |
| 1,5 mm <sup>2</sup>                | 24,6                                        |                                           |                                        |                                       |                                      |                                    |                                                   |
| 2,5 mm <sup>2</sup>                | 15,1                                        |                                           |                                        |                                       |                                      |                                    |                                                   |

## NOTLAR NOTES

Bu tip kablolar besleme kablosu olarak ve yer altı tesisatlarında kullanılmak için uygun değildir  
This type of cables are not suitable to be used as feeder cables or used for underground installations

# J-Y(St)Y...Lg

| KOD NO<br>CODE NR. | ÇİFT SAYISI VE<br>İLETKEN ÇAPİ (mm)<br>NUMBER OF PAIRS AND<br>WIRE DIAMETER (mm) | KABLO ÇAPİ (mm)<br>OVERALL DIAMETER<br>(mm) | BAKIR AĞIRLIĞI (kg/km)<br>COPPER WEIGHT<br>(kg/km) | YAKLAŞIK KABLO AĞIRLIĞI<br>(KG/KM)<br>APPROX. CABLE WEIGHT<br>(kg/km) | STANDART<br>UZUNLUK (m)<br>STANDARD LENGTH (m) |
|--------------------|----------------------------------------------------------------------------------|---------------------------------------------|----------------------------------------------------|-----------------------------------------------------------------------|------------------------------------------------|
| 340706015          | 1 x 2 x 0,60                                                                     | 4,70                                        | 8                                                  | 31                                                                    | 100/500/1000                                   |
| 340706025          | 2 x 2 x 0,60                                                                     | 5,20                                        | 13                                                 | 40                                                                    | 100/500/1000                                   |
| 340706035          | 3 x 2 x 0,60                                                                     | 6,20                                        | 18                                                 | 52                                                                    | 100/500/1000                                   |
| 340706045          | 4 x 2 x 0,60                                                                     | 6,90                                        | 23                                                 | 60                                                                    | 100/500/1000                                   |
| 340706065          | 6 x 2 x 0,60                                                                     | 7,90                                        | 34                                                 | 83                                                                    | 100/500/1000                                   |
| 340706085          | 8 x 2 x 0,60                                                                     | 8,80                                        | 46                                                 | 105                                                                   | 100/500/1000                                   |
| 340706105          | 10 x 2 x 0,60                                                                    | 9,70                                        | 56                                                 | 126                                                                   | 100/500/1000                                   |
| 340708015          | 1 x 2 x 0,80                                                                     | 5,50                                        | 13                                                 | 40                                                                    | 100/500/1000                                   |
| 340708025          | 2 x 2 x 0,80                                                                     | 6,10                                        | 23                                                 | 60                                                                    | 100/500/1000                                   |
| 340708035          | 3 x 2 x 0,80                                                                     | 7,60                                        | 32                                                 | 80                                                                    | 100/500/1000                                   |
| 340708045          | 4 x 2 x 0,80                                                                     | 8,50                                        | 38                                                 | 100                                                                   | 100/500/1000                                   |
| 340708065          | 6 x 2 x 0,80                                                                     | 9,80                                        | 60                                                 | 130                                                                   | 100/500/1000                                   |
| 340708085          | 8 x 2 x 0,80                                                                     | 11,00                                       | 76                                                 | 170                                                                   | 100/500/1000                                   |
| 340708105          | 10 x 2 x 0,80                                                                    | 12,10                                       | 96                                                 | 201                                                                   | 100/500/1000                                   |
| 340701015          | 1 x 2 x 1                                                                        | 5,90                                        | 21                                                 | 48                                                                    | 100/500/1000                                   |
| 340701025          | 2 x 2 x 1                                                                        | 6,60                                        | 33                                                 | 67                                                                    | 100/500/1000                                   |
| 340701035          | 3 x 2 x 1                                                                        | 8,30                                        | 49                                                 | 109                                                                   | 100/500/1000                                   |
| 340701045          | 4 x 2 x 1                                                                        | 9,30                                        | 65                                                 | 132                                                                   | 100/500/1000                                   |
| 340701065          | 6 x 2 x 1                                                                        | 10,90                                       | 94                                                 | 180                                                                   | 100/500/1000                                   |
| 340701085          | 8 x 2 x 1                                                                        | 12,70                                       | 120                                                | 237                                                                   | 100/500/1000                                   |
| 340701105          | 10 x 2 x 1                                                                       | 13,70                                       | 150                                                | 281                                                                   | 100/500/1000                                   |

| KOD NO<br>CODE NR. | ÇİFT SAYISI VE<br>KESİT (mm <sup>2</sup> )<br>NUMBER OF PAIRS AND<br>CROSS-SECTION (mm <sup>2</sup> ) | KABLO ÇAPİ (mm)<br>OVERALL DIAMETER<br>(mm) | BAKIR AĞIRLIĞI (kg/km)<br>COPPER WEIGHT<br>(kg/km) | YAKLAŞIK KABLO<br>AĞIRLIĞI (kg/km)<br>APPROX. CABLE WEIGHT<br>(kg/km) | STANDART<br>UZUNLUK (m)<br>STANDARD LENGTH (m) |
|--------------------|-------------------------------------------------------------------------------------------------------|---------------------------------------------|----------------------------------------------------|-----------------------------------------------------------------------|------------------------------------------------|
| 340215015          | 1 x 2 x 1,5                                                                                           | 7,50                                        | 34                                                 | 84                                                                    | 100/500/1000                                   |
| 340215025          | 2 x 2 x 1,5                                                                                           | 8,50                                        | 59                                                 | 127                                                                   | 100/500/1000                                   |
| 340215035          | 3 x 2 x 1,5                                                                                           | 11,00                                       | 85                                                 | 173                                                                   | 100/500/1000                                   |
| 340215045          | 4 x 2 x 1,5                                                                                           | 12,80                                       | 112                                                | 233                                                                   | 100/500/1000                                   |
| 340215065          | 6 x 2 x 1,5                                                                                           | 15,10                                       | 164                                                | 321                                                                   | 100/500/1000                                   |
| 340215085          | 8 x 2 x 1,5                                                                                           | 17,00                                       | 218                                                | 404                                                                   | 100/500/1000                                   |
| 340215105          | 10 x 2 x 1,5                                                                                          | 19,10                                       | 275                                                | 511                                                                   | 100/500/1000                                   |

# KPD-PAP



## KULLANIM ALANLARI

Bina dışı tesisatlarda;

- Telefon santralleri ve abone dağıtımlarında
- Sinyal ve data iletiminde

## KABLO YAPISI

|                       |                                           |
|-----------------------|-------------------------------------------|
| <b>1-İletken</b>      | IEC 60228; DIN VDE 0295; EN 60228 Sınıf 1 |
| <b>2-Yalıtkan</b>     | Foam PE Kompaund                          |
| <b>3-Yalıtım Renk</b> | TS EN 60708                               |
| <b>4-Ayırıcı Bant</b> | Pes Bant                                  |
| <b>5-İç Kılıf</b>     | Polietilen                                |
| <b>6-Ekran</b>        | Polietilen Kaplı Alüminyum Folyo          |
| <b>7-Dış Kılıf</b>    | PE Kompaund                               |
| <b>8-Kılıf Rengi</b>  | RAL 9005 Siyah                            |

## APPLICATION

At outdoor installations;

- Telephone exchanges and subscriber distributions
- Signal and data transmission

## CONSTRUCTION

|                        |                                           |
|------------------------|-------------------------------------------|
| <b>1-Conductor</b>     | IEC 60228; DIN VDE 0295; EN 60228 Class 1 |
| <b>2-Insulation</b>    | Foam PE Compound                          |
| <b>3-Colour Code</b>   | TS EN 60708                               |
| <b>4-Wrapping</b>      | Pes Tape                                  |
| <b>5-Inner Sheath</b>  | Polythlene                                |
| <b>6-Screen</b>        | Pe-coated Aluminium Foil                  |
| <b>7-Outer Sheath</b>  | PE Compound                               |
| <b>8-Sheath Colour</b> | RAL 9005 Black                            |

## TEKNİK ÖZELLİKLER TECHNICAL CHARACTERISTICS

| ÇEVİRİM DİRENCİ<br>LOOP RESISTANCE | YALITIM DİRENCİ<br>INSULATION<br>RESISTANCE | EFEKTİF KAPASİTE<br>MUTUAL<br>CAPACITANCE | ÇALIŞMA SICAKLIĞI<br>TEMPERATURE RANGE |
|------------------------------------|---------------------------------------------|-------------------------------------------|----------------------------------------|
| mm                                 | Ω/km                                        | nF/km (Max.)                              |                                        |
| 0,4                                | 299                                         | 0,4 50                                    | - 30°C - +70°C                         |
| 0,5                                | 189,7                                       | 0,5 50                                    |                                        |
| 0,6                                | 131,8                                       | 0,6 45                                    |                                        |
| 0,9                                | 58,6                                        | 0,9 45                                    |                                        |

## NOTLAR NOTES

Esas alınan standartlar VDE 0816/TS EN 60708  
Based on VDE 0816/TS EN 60708 standards

| TEST VOLTAJ (DC)<br>TEST VOLTAGE(DC) | BÜKÜLME YARICAPI<br>BENDING RADIUS | ÇALIŞMA GELİRİMİ<br>OPERATING VOLTAGE | KAPASİTE DENGESİZLİĞİ<br>CAPACITY UNBALANCE | TOPRAK DENGESİZLİĞİ<br>EARTHING UNBALANCE |
|--------------------------------------|------------------------------------|---------------------------------------|---------------------------------------------|-------------------------------------------|
| 1000V                                | 15 x Cable Ø                       | 300V                                  | 0,4 125<br>0,5 125<br>0,6 60<br>0,9 60      | 0,4 500<br>0,5 500<br>0,6 325<br>0,9 325  |



**ERLINE**

**VERİ İLETİŞİM KABLOLARI**  
**DATA TRANSMISSION CABLES**





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# ERLINE CAT-3 U/UTP



## KULLANIM ALANLARI

- Bina içi tesisatlarda; telefon santralleri ve abone dağıtımlarında, sinyal ve data iletiminde
- 16 MHz bant genişliğine sahip, güvenilir bir şekilde 10 Mbit / s veri taşımada

## APPLICATION

- At indoor installations; telephone exchanges and subscriber distributions, signal and data transmission
- Reliable way to 10 Mbit / s data transport with 16 MHz bandwidth

## KABLO YAPISI

- 1-İletken** Elektrolitik Bakır İletken (24 AWG)
- 2-Yalıtkan** Solid PE İzolasyon
- 3-Büküm** 10 çiftte kadar katlar halinde, 20 çift - 100 çift; 10 çiftli alt grupların birlikte bükümü; her grup polipropilen tanıtmaya şeridi ile sarılır.
- 4-Ayırıcı Bant** Pes Bant
- 5-Kılıf** PVC Kompaund
- 6-Kılıf Rengi** RAL 7001 Gri

## CONSTRUCTION

- 1-Conductor** Electrolytic Copper Conductor (24 AWG)
- 2-Insulation** Solid PE Insulation
- 3-Stranding** In layers up to 10 pairs; 20 pairs-100 pairs; 10-pair groups twisted together; each group is wrapped by polypropylene identification tape
- 4-Wrapping** Pes Tape
- 5-Sheath** PVC Compound
- 6-Sheath Colour** RAL 7001 Grey

## TEKNİK ÖZELLİKLER TECHNICAL CHARACTERISTICS

| İLETKEN DİRENCİ<br>CONDUCTOR RESISTANCE            | YALITIM DİRENCİ (500V)<br>INSULATION RESISTANCE (500V) | DİRENC DENGESİZLİĞİ<br>RESISTANCE UNBALANCED      |
|----------------------------------------------------|--------------------------------------------------------|---------------------------------------------------|
| 97,8Ω/km                                           | 5000MΩxkm                                              | 3%                                                |
| KARAKTERİSTİK EMPEDANS<br>CHARACTERISTIC IMPEDANCE | ÇALIŞMA SICAKLIĞI<br>TEMPERATURE RANGE                 | ALEV GEÇİKTİRİCİLİK TESTİ<br>FLAME RETARDANT TEST |
| 100 ± 15Ω                                          | -20°C - +70°C                                          | IEC 60332-1-2<br>VDE 0482-332-1-2<br>EN 60332-1-2 |

### 10 ÇİFTLİ BİRİMLERİN YALITIM RENKLERİ 10 PAIRS UNIT INSULATION COLOUR

| ÇİFT PAIR | RENK COLOUR                | ÇİFT PAIR | RENK COLOUR                |
|-----------|----------------------------|-----------|----------------------------|
| 1         | Mavi/Beyaz Blue/White      | 6         | Mavi/Kırmızı Blue/Red      |
| 2         | Turuncu/Beyaz Orange/White | 7         | Turuncu/Kırmızı Orange/Red |
| 3         | Yeşil/Beyaz Green/White    | 8         | Yeşil/Kırmızı Green/Red    |
| 4         | Kahve/Beyaz Brown/White    | 9         | Kahve/Kırmızı Brown/Red    |
| 5         | Gri/Beyaz Grey/White       | 10        | Gri/Kırmızı Grey/Red       |

| ÇALIŞMA VOLTAJİ(25°C)<br>OPERATING VOLTAGE (25°C)    | TEST VOLTAJİ (DAMAR/DAMAR)<br>TEST VOLTAGE (CORE/CORE) | BÜKÜLM YARIÇAPI<br>BENDING RADIUS |
|------------------------------------------------------|--------------------------------------------------------|-----------------------------------|
| 250V                                                 | 1200V                                                  | 8x Cable Ø                        |
| EFEKTİF KAPASİTE (1KHz)<br>MUTUAL CAPACITANCE (1KHz) | YAYILMA HIZI<br>VELOCITY OF PROPAGATION                |                                   |
| 52pF/m                                               | 67%                                                    |                                   |

### BİRİM TANIMLAMASI UNIT IDENTIFICATION IEC 60708

| BİRİM UNIT | RENK COLOUR    | ÇİFT PAIR | RENK COLOUR |
|------------|----------------|-----------|-------------|
| 1          | Mavi Blue      | 6         | Beyaz White |
| 2          | Turuncu Orange | 7         | Kırmızı Red |
| 3          | Yeşil Green    | 8         | Siyah Black |
| 4          | Kahve Brown    | 9         | Sarı Yellow |
| 5          | Gri Grey       | 10        | Mor Violet  |

### ELEKTRİKSEL ÖZELLİKLERİ

| FREKANS<br>FREQUENCY<br>(MHz) | ZAYIFLAMA<br>ATTENUATION<br>(dB/100m) (Max) | YAKIN UÇ DİAFONİSİ<br>NEAR END CROSSTALK (NEXT)<br>(dB) (min) | GERİ DÖNÜŞ KAYBI<br>RETURN LOSS<br>(dB) (min) |
|-------------------------------|---------------------------------------------|---------------------------------------------------------------|-----------------------------------------------|
| 0,772                         | 2,2                                         | 43                                                            | 40                                            |
| 1                             | 2,6                                         | 41                                                            | 38                                            |
| 4                             | 5,6                                         | 32                                                            | 26                                            |
| 8                             | 8,5                                         | 28                                                            | 19                                            |
| 10                            | 9,8                                         | 26                                                            | 16                                            |
| 16                            | 13,1                                        | 23                                                            | 10                                            |

## NOTLAR NOTES

Harici uygulamalar için dışkılıf polietilen yapılmaktadır. Yapısal kablolamada omurga kablo olarak kullanılır. 25/50 ve 100 çift olarak üretilmektedir. 16Mbps hıza kadar analog ve dijital sinyallerin iletimine uygundur. Outer sheath is made of polyethylene for outdoor applications. It used as main distribution cable in structural cabling. It is produced 25/50 and 100 pairs. It is suitable for analog and digital signal transmission up to 16Mbps.

## ERLINE CAT-3 F/UTP



## KULLANIM ALANLARI

- Elektromanyetik karışım ve girişimlerin olduğu
- Bina içi tesisatlarda; telefon santralleri ve abone dağıtımlarında, sinyal ve data iletiminde
- 16 MHz bant genişliğine sahip, güvenilir bir şekilde 10 Mbit / s veri taşımada

## APPLICATION

- In places where there is electromagnetic interference
- At indoor installations; telephone exchanges and subscriber distributions, signal and data transmission
- Reliable way to 10 Mbit / s data transport with 16 MHz bandwidth

## KABLO YAPISI

- 1-İletken** Elektrolitik Bakır İletken (24 AWG)
- 2-Yalıtkan** Solid PE İzolasyon
- 3-Büküm** 10 çiftte kadar katlar halinde, 20 çift - 100 çift; 10 çiftli alt grupların birlikte bükümü; her grup polipropilen tanıma şeridi ile sarılır
- 4-Ekran** Pes Bant + Kalaylı Toprak Teli + Al-Pes Bant
- 5-Kılıf** PVC Kompaund
- 6-Kılıf Rengi** RAL 7001 Gri

## CONSTRUCTION

- 1-Conductor** Electrolytic Copper Conductor (24 AWG)
- 2-Insulation** Solid PE Insulation
- 3-Stranding** In layers up to 10 pairs 20 pairs-100 pairs; 10-pair groups twisted together; each group is wrapped by polypropylene identification tape
- 4-Screen** Pes Tape + Tinned Copper Drain Wire + Al-Pes Tape
- 5-Sheath** PVC Compound
- 6-Sheath Colour** RAL 7001 Grey

## TEKNİK ÖZELLİKLER TECHNICAL CHARACTERISTICS

| İLETKEN DİRENCİ<br>CONDUCTOR RESISTANCE            | YALITIM DİRENCİ (500V)<br>INSULATION RESISTANCE (500V) | DİRENC DENGESİZLİĞİ<br>RESISTANCE UNBALANCED      |
|----------------------------------------------------|--------------------------------------------------------|---------------------------------------------------|
| 97,8Ω/km                                           | 5000MΩxkm                                              | 3%                                                |
| KARAKTERİSTİK EMPEDANS<br>CHARACTERISTIC IMPEDANCE | ÇALIŞMA SICAKLIĞI<br>TEMPERATURE RANGE                 | ALEV GECİKİRİCİLİK TESTİ<br>FLAME RETARDANT TEST  |
| 100 ± 15Ω                                          | -20°C - +60°C                                          | IEC 60332-1-2<br>VDE 0482-332-1-2<br>EN 60332-1-2 |

10 ÇİFTLİ BİRİMLERİN YALITIM RENKLERİ  
10 PAIRS UNIT INSULATION COLOUR

| ÇİFT<br>PAIR | RENK<br>COLOUR                | ÇİFT<br>PAIR | RENK<br>COLOUR                |
|--------------|-------------------------------|--------------|-------------------------------|
| 1            | Mavi/Beyaz<br>Blue/White      | 6            | Mavi/Kırmızı<br>Blue/Red      |
| 2            | Turuncu/Beyaz<br>Orange/White | 7            | Turuncu/Kırmızı<br>Orange/Red |
| 3            | Yeşil/Beyaz<br>Green/White    | 8            | Yeşil/Kırmızı<br>Green/Red    |
| 4            | Kahve/Beyaz<br>Brown/White    | 9            | Kahve/Kırmızı<br>Brown/Red    |
| 5            | Gri/Beyaz<br>Grey/White       | 10           | Gri/Kırmızı<br>Grey/Red       |

| ÇALIŞMA VOLTAJİ (25°C)<br>OPERATING VOLTAGE (25°C)   | TEST VOLTAJİ (DAMAR/DAMAR)<br>TEST VOLTAGE (CORE/CORE) | BÜKÜLME YARIÇAPI<br>BENDING RADIUS |
|------------------------------------------------------|--------------------------------------------------------|------------------------------------|
| 250V                                                 | 1200V                                                  | 8x Cable Ø                         |
| EFEKTİF KAPASİTE (1KHz)<br>MUTUAL CAPACITANCE (1KHz) | YAYILMA HIZI<br>VELOCITY OF PROPAGATION                |                                    |
| 59pF/m                                               | 67%                                                    |                                    |

BİRİM TANIMLAMASI  
UNIT IDENTIFICATION IEC 60708

| BİRİM<br>UNIT | RENK<br>COLOUR    | ÇİFT<br>PAIR | RENK<br>COLOUR |
|---------------|-------------------|--------------|----------------|
| 1             | Mavi<br>Blue      | 6            | Beyaz<br>White |
| 2             | Turuncu<br>Orange | 7            | Kırmızı<br>Red |
| 3             | Yeşil<br>Green    | 8            | Siyah<br>Black |
| 4             | Kahve<br>Brown    | 9            | Sarı<br>Yellow |
| 5             | Gri<br>Grey       | 10           | Mor<br>Violet  |

NOTLAR  
NOTES

Harici uygulamalar için dışkılıf polietilen yapılmaktadır. Yapısal kablolamada ana dağıtım kablosu olarak kullanılır. 25/50 ve 100 çift olarak üretilmektedir. 155Mbps hıza kadar analog ve dijital sinyallerin iletimine uygundur. Outer sheath is made of polyethylene for outdoor applications. it used as main distribution cable in structural cabling. It is produced 25/50 and 100 pairs. It is suitable for analog and digital signal transmission up to 16Mbps.

## ELEKTRİKSEL ÖZELLİKLERİ

| FREKANS<br>FREQUENCY<br>(MHz) | ZAYIFLAMA<br>ATTENUATION<br>(dB/100m) (Max) | YAKIN UÇ DİAFONİSİ<br>NEAR END CROSSTALK (NEXT)<br>(dB) (min) | GERİ DÖNÜŞ KAYBI<br>RETURN LOSS<br>(dB) (min) |
|-------------------------------|---------------------------------------------|---------------------------------------------------------------|-----------------------------------------------|
| 0,772                         | 2,2                                         | 43                                                            | 40                                            |
| 1                             | 2,6                                         | 41                                                            | 38                                            |
| 4                             | 5,6                                         | 32                                                            | 26                                            |
| 8                             | 8,5                                         | 28                                                            | 19                                            |
| 10                            | 9,8                                         | 26                                                            | 16                                            |
| 16                            | 13,1                                        | 23                                                            | 10                                            |

# ERLINE CAT-5e U/UTP



## KULLANIM ALANLARI

- 155 Mbit/Sn hıza kadar çalışan bilgi iletişim sistemlerinde
- Bükülü çiftler üzerinden çalışan Ethernet gibi bilgisayar ağları için yapısal kablolama sistemlerinde
- Aynı zamanda telefon ve video gibi diğer sinyalleri taşımada
- 100 MHz 'e kadar performans sağlar ve 10BASE-T, 100BASE-TX (Hızlı internet), ve 1000BASE-T (Gigabit internet) için uygun

## APPLICATION

- Data transmission systems which reaches up to the speed of 155 Mbit/Sec
- Structured cabling for computer networks such as Ethernet over twisted pair
- Carry other signals such as telephony and video
- Performance of up to 100 MHz and is suitable for 10BASE-T, 100BASE-TX (Fast Ethernet), and 1000BASE-T (Gigabit Ethernet)

## KABLO YAPISI

|               |                                     |
|---------------|-------------------------------------|
| 1-İletken     | Elektrolitik Bakır İletken (24 AWG) |
| 2-Yalıtkan    | Solid PE İzolasyon                  |
| 3-Büküm       | 4 çiftin ortak bükümü               |
| 4-Kılıf       | PVC Kompaund 5.6mm Ø                |
| 5-Kılıf Rengi | RAL 7001 Gri                        |

## CONSTRUCTION

|                 |                                        |
|-----------------|----------------------------------------|
| 1-Conductor     | Electrolytic Copper Conductor (24 AWG) |
| 2-Insulation    | Solid PE Insulation                    |
| 3-Stranding     | 4-pair common twist                    |
| 4-Sheath        | PVC Compound 5.6mm Ø                   |
| 5-Sheath Colour | RAL 7001 Grey                          |

## TEKNİK ÖZELLİKLER TECHNICAL CHARACTERISTICS

| İLETKEN DİRENCİ<br>CONDUCTOR RESISTANCE            | YALITIM DİRENCİ (500V)<br>INSULATION RESISTANCE (500V) | DİRENC DENGESİZLİĞİ<br>RESISTANCE UNBALANCED      |
|----------------------------------------------------|--------------------------------------------------------|---------------------------------------------------|
| 94Ω/km                                             | 5000MΩxkm                                              | 2%                                                |
| KARAKTERİSTİK EMPEDANS<br>CHARACTERISTIC IMPEDANCE | ÇALIŞMA SICAKLIĞI<br>TEMPERATURE RANGE                 | ALEV GECİKTİRİCİLİK TESTİ<br>FLAME RETARDANT TEST |
| 100 ± 15Ω                                          | -20°C - +60°C                                          | IEC 60332-1-2<br>VDE 0482-332-1-2<br>EN 60332-1-2 |

| ÇALIŞMA VOLTAJİ (25°C)<br>OPERATING VOLTAGE (25°C)   | TEST VOLTAJİ (DAMAR/DAMAR)<br>TEST VOLTAGE (CORE/CORE) | BÜKÜLME YARIÇAP<br>BENDING RADIUS |
|------------------------------------------------------|--------------------------------------------------------|-----------------------------------|
| 250V                                                 | 1200V                                                  | 8x Cable Ø                        |
| EFEKTİF KAPASİTE (1KHz)<br>MUTUAL CAPACITANCE (1KHz) | YAYILMA HIZI<br>VELOCITY OF PROPAGATION                |                                   |
| 52pF/m                                               | 67%                                                    |                                   |

## DAMAR TANITIM RENKLERİ CORE IDENTIFICATION

| RENK NO<br>COLOUR NUMBER | A TELİ<br>A WIRE | B TELİ<br>B WIRE |
|--------------------------|------------------|------------------|
| 1 Mavi Blue              | Beyaz/Mavi       | White/Blue       |
| 2 Turuncu Orange         | Beyaz/Turuncu    | White/Orange     |
| 3 Yeşil Green            | Beyaz/Yeşil      | White/Green      |
| 4 Kahve Brown            | Beyaz/Kahve      | White/Brown      |

## ELEKTRİKSEL ÖZELLİKLERİ

| FREKANS<br>FREQUENCY<br>(MHz) | ZAYIFLAMA<br>ATTENUATION<br>(dB/100m) (Max) | YAKIN UÇ DİAFONİSİ<br>NEAR END CROSSTALK (NEXT)<br>(dB) (min) | GERİ DÖNÜŞ KAYBI<br>RETURN LOSS<br>(dB) (min) |
|-------------------------------|---------------------------------------------|---------------------------------------------------------------|-----------------------------------------------|
| 1                             | 2,1                                         | 65,3                                                          | 20                                            |
| 4                             | 4,1                                         | 56,3                                                          | 23                                            |
| 10                            | 6,5                                         | 50,3                                                          | 25                                            |
| 16                            | 8,3                                         | 47,2                                                          | 25                                            |
| 20                            | 9,3                                         | 45,8                                                          | 25                                            |
| 31,2                          | 11,7                                        | 42,9                                                          | 23,6                                          |
| 62,5                          | 17                                          | 38,4                                                          | 21,5                                          |
| 100                           | 22                                          | 85,3                                                          | 20,1                                          |
| 125                           | 24,9                                        | 33,8                                                          | 19,4                                          |

## NOTLAR NOTES

155Mbps hıza kadar analog ve dijital sinyallerin iletimine uygundur.  
It is suitable for analog and digital signal transmission up to 155Mbps.

# ERLINE CAT-5e U/UTP LSZH



ALEV GECİKTİRİCİ ÖZELLİK/DÜŞÜK DUMAN YOĞUNLUĞU/ZEHİRLİ VE KOROZİF GAZLARDAN ARINDIRILMIŞ  
FLAME RETARDANT CHARACTERISTIC/LOW SMOKE EMISSION/WITHOUT POISONED AND CORROSIVE GASES



## KULLANIM ALANLARI

- 155 Mbit/Sn hıza kadar çalışan bilgi iletişim sistemlerinde
- Bükülü çiftler üzerinden çalışan Ethernet gibi bilgisayar ağları için yapısal kablolama sistemlerinde
- Aynı zamanda telefon ve video gibi diğer sinyalleri taşımada
- 100 MHz 'e kadar performans sağlar ve 10BASE-T, 100BASE-TX (Hızlı internet), ve 1000BASE-T (Gigabit internet) için uygun
- İnsan hayatının, değerli malzemelerin ve ekipmanların korunması gereken yerlerde

## KABLO YAPISI

- 1-İletken** Elektrolitik Bakır İletken (24 AWG)
- 2-Yalıtkan** Solid PE İzolasyon
- 3-Büküm** 4 çiftin ortak bükümü
- 4-Kılıf** HFFR Kompound 5.6mm Ø
- 5-Kılıf Rengi** RAL 7001 Gri

## APPLICATION

- Data transmission systems which reaches up to the speed of 155 Mbit/Sec
- Structured cabling for computer networks such as Ethernet over twisted pair
- Carry other signals such as telephony and video
- Performance of up to 100 MHz and is suitable for 10BASE-T, 100BASE-TX (Fast Ethernet), and 1000BASE-T (Gigabit Ethernet)
- In places where human life and valuable materials and equipment need to be protected

## CONSTRUCTION

- 1-Conductor** Electrolytic Copper Conductor (24 AWG)
- 2-Insulation** Solid PE Insulation
- 3-Stranding** 4-pair common twist
- 4-Sheath** HFFR Compound 5.6mm Ø
- 5-Sheath Colour** RAL 7001 Grey

## TEKNİK ÖZELLİKLER TECHNICAL CHARACTERISTICS

| İLETKEN DİRENCİ<br>CONDUCTOR RESISTANCE | YALITIM DİRENCİ (500V)<br>INSULATION RESISTANCE (500V) | DİRENC DENGESİZLİĞİ<br>RESISTANCE UNBALANCED | ÇALIŞMA VOLTAJI (25°C)<br>OPERATING VOLTAGE (25°C) |
|-----------------------------------------|--------------------------------------------------------|----------------------------------------------|----------------------------------------------------|
| 94Ω/km                                  | 5000MΩxkm                                              | 2%                                           | 250V                                               |

| EFEKTİF KAPASİTE (1KHz)<br>MUTUAL CAPACITANCE (1KHz) | ÇALIŞMA SICAKLIĞI<br>TEMPERATURE RANGE | YAYILMA HIZI<br>VELOCITY OF PROPAGATION | ALEV GECİKTİRİCİLİK TESTİ<br>FLAME RETARDANT TEST |
|------------------------------------------------------|----------------------------------------|-----------------------------------------|---------------------------------------------------|
| 52pF/m                                               | -20°C - +60°C                          | 67%                                     | IEC 60332-1-2<br>VDE 0482-332-1-2<br>EN 60332-1-2 |

| TEST VOLTAJI (DAMAR/DAMAR)<br>TEST VOLTAGE (CORE/CORE) | BÜKÜLM YARIÇAPI<br>BENDING RADIUS | KARAKTERİSTİK EMPEDANS<br>CHARACTERISTIC IMPEDANCE |
|--------------------------------------------------------|-----------------------------------|----------------------------------------------------|
| 1200V                                                  | 8x Cable Ø                        | 100 ± 15Ω                                          |

| DUMAN YOĞUNLUĞU TESTİ<br>SMOKE DENSITY TEST  | KOROZİF GAZ TESTİ<br>TEST ON CORROSIVENESS<br>OF COMBUSTION GASES | HALOJENSİZLİK TESTİ<br>HALOGEN FREE TEST                     | ALEV YAYILIMI TESTİ<br>FLAME PROPAGATION TEST        |
|----------------------------------------------|-------------------------------------------------------------------|--------------------------------------------------------------|------------------------------------------------------|
| IEC 61034-2<br>VDE 0482-1034-2<br>EN 61034-2 | IEC 60754-2<br>VDE 0482-754-2<br>EN 60754-2                       | IEC 60754-1<br>VDE 0482-754-1<br>EN 60754-1<br>BS EN 60754-1 | IEC 60332-3-25<br>VDE 0482-332-3-25<br>EN 60332-2-25 |

### DAMAR TANITIM RENKLERİ CORE IDENTIFICATION

| RENK NO<br>COLOUR NUMBER | A TELİ<br>A WIRE | B TELİ<br>B WIRE |
|--------------------------|------------------|------------------|
| 1 Mavi Blue              | Beyaz/Mavi       | White/Blue       |
| 2 Turuncu Orange         | Beyaz/Turuncu    | White/Orange     |
| 3 Yeşil Green            | Beyaz/Yeşil      | White/Green      |
| 4 Kahve Brown            | Beyaz/Kahve      | White/Brown      |

### ELEKTRİKSEL ÖZELLİKLERİ

| FREKANS<br>FREQUENCY<br>(MHz) | ZAYIFLAMA<br>ATTENUATION<br>(dB/100m) (Max) | YAKIN UÇ DİAFONİSİ<br>NEAR END CROSSTALK (NEXT)<br>(dB) (min) | GERİ DÖNÜŞ KAYBI<br>RETURN LOSS<br>(dB) (min) |
|-------------------------------|---------------------------------------------|---------------------------------------------------------------|-----------------------------------------------|
| 1                             | 2,1                                         | 65,3                                                          | 20                                            |
| 4                             | 4,1                                         | 56,3                                                          | 23                                            |
| 10                            | 6,5                                         | 50,3                                                          | 25                                            |
| 16                            | 8,3                                         | 47,2                                                          | 25                                            |
| 20                            | 9,3                                         | 45,8                                                          | 25                                            |
| 31,2                          | 11,7                                        | 42,9                                                          | 23,6                                          |
| 62,5                          | 17                                          | 38,4                                                          | 21,5                                          |
| 100                           | 22                                          | 85,3                                                          | 20,1                                          |
| 125                           | 24,9                                        | 33,8                                                          | 19,4                                          |

## NOTLAR NOTES

155Mbps hıza kadar analog ve dijital sinyallerin iletimine uygundur.  
It is suitable for analog and digital signal transmission up to 155Mbps.

## ERLINE CAT-6 U/UTP



## KULLANIM ALANLARI

- 250 Mbit/Sn hıza kadar çalışan bilgi iletişim sistemlerinde
- Bükülü çiftler üzerinden çalışan Ethernet gibi bilgisayar ağları için yapısal kablolama sistemlerinde
- Aynı zamanda telefon ve video gibi diğer sinyalleri taşımada
- 250 MHz 'e kadar performans sağlar ve 10BASE-T, 100BASE-TX (Hızlı internet), 1000BASE-T (Gigabit internet) ve 10GBASE-T (10-Gigabit internet) için uygun

## KABLO YAPISI

- 1- İletken** Elektrolitik Bakır İletken (23 AWG)
- 2-Yalıtkan** Solid PE İzolasyon
- 3-Büküm** 4 çift ve merkez elemanın birlikte bükümü
- 4-Kılıf** PVC Kompaund 6.20mm Ø
- 5-Kılıf Rengi** RAL 7001 Gri

## APPLICATION

- Data transmission systems which reaches up to the speed of 250 Mbit/Sec
- Structured cabling for computer networks such as Ethernet over twisted pair
- Carry other signals such as telephony and video
- Performance of up to 250 MHz and is suitable for 10BASE-T, 100BASE-TX (Fast Ethernet), 1000BASE-T (Gigabit Ethernet) and 10GBASE-T (10-Gigabit Ethernet)

## CONSTRUCTION

- 1- Conductor** Electrolytic Copper Conductor (24 AWG/23 AWG)
- 2-Insulation** Solid PE Insulation
- 3-Stranding** 4-pair common twist with central element
- 4-Sheath** PVC Compound 6.20mm Ø
- 5-Sheath Colour** RAL 7001 Grey

TEKNİK ÖZELLİKLER  
TECHNICAL CHARACTERISTICS

| İLETKEN DİRENCİ<br>CONDUCTOR RESISTANCE            | YALITIM DİRENCİ (500V)<br>INSULATION RESISTANCE (500V) | ÇALIŞMA VOLTAJI (25°C)<br>OPERATING VOLTAGE (25°C) |
|----------------------------------------------------|--------------------------------------------------------|----------------------------------------------------|
| 94Ω/km                                             | 5000MΩxkm                                              | 250V                                               |
| KARAKTERİSTİK EMPEDANS<br>CHARACTERISTIC IMPEDANCE | ÇALIŞMA SICAKLIĞI<br>TEMPERATURE RANGE                 | ALEV GEÇİKTİRİCİLİK TESTİ<br>FLAME RETARDANT TEST  |
| 100 ± 15Ω                                          | -20°C - +60°C                                          | IEC 60332-1-2<br>VDE 0482-332-1-2<br>EN 60332-1-2  |

| TEST VOLTAJI (DAMAR/DAMAR)<br>TEST VOLTAGE (CORE/CORE) | BÜKÜLME YARIÇAPI<br>BENDING RADIUS      |
|--------------------------------------------------------|-----------------------------------------|
| 1200V                                                  | 8x Cable Ø                              |
| EFEKTİF KAPASİTE (1KHz)<br>MUTUAL CAPACITANCE (1KHz)   | YAYILMA HIZI<br>VELOCITY OF PROPAGATION |
| 48pF/m                                                 | 67%                                     |

DAMAR TANITIM RENKLERİ  
CORE IDENTIFICATION

| RENK NO<br>COLOUR NUMBER | A TELİ<br>A WIRE | B TELİ<br>B WIRE |
|--------------------------|------------------|------------------|
| 1 Mavi Blue              | Beyaz/Mavi       | White/Blue       |
| 2 Turuncu Orange         | Beyaz/Turuncu    | White/Orange     |
| 3 Yeşil Green            | Beyaz/Yeşil      | White/Green      |
| 4 Kahve Brown            | Beyaz/Kahve      | White/Brown      |

## ELEKTRİKSEL ÖZELLİKLERİ ELECTRICAL CHARACTERISTICS

| FREKANS<br>FREQUENCY<br>(MHz) | ZAYIFLAMA<br>ATTENUATION<br>(dB/100m) (Max) | YAKIN UÇ DİAFONİSİ<br>NEAR END CROSSTALK (NEXT)<br>(dB) (min) | GERİ DÖNÜŞ KAYBI<br>RETURN LOSS<br>(dB) (min) |
|-------------------------------|---------------------------------------------|---------------------------------------------------------------|-----------------------------------------------|
| 1                             | 2,1                                         | 74                                                            | 20                                            |
| 10                            | 6                                           | 59                                                            | 25                                            |
| 16                            | 7,6                                         | 56                                                            | 25                                            |
| 20                            | 8,5                                         | 55                                                            | 25                                            |
| 62,5                          | 15,5                                        | 47                                                            | 21,5                                          |
| 100                           | 19,9                                        | 44                                                            | 20,1                                          |
| 125                           | 22,5                                        | 43                                                            | 19,5                                          |
| 155,5                         | 25,3                                        | 42                                                            | 18,8                                          |
| 200                           | 29,1                                        | 40                                                            | 18,0                                          |
| 250                           | 33                                          | 38                                                            | 17,3                                          |

NOTLAR  
NOTES

250Mbps hıza kadar analog ve dijital sinyallerin iletimine uygundur.  
It is suitable for analog and digital signal transmission up to 250Mbps.

# ERLINE CAT-6 U/UTP LSZH



ALEV GECİKTİRİCİ ÖZELLİK/DÜŞÜK DUMAN YOĞUNLUĞU/ZEHİRLİ VE KOROZİF GAZLARDAN ARINDIRILMIŞ  
FLAME RETARDANT CHARACTERISTIC/LOW SMOKE EMISSION/WITHOUT POISONED AND CORROSIVE GASES



## KULLANIM ALANLARI

- 250 Mbit/Sn hıza kadar çalışan bilgi iletişim sistemlerinde
- Bükülü çiftler üzerinden çalışan Ethernet gibi bilgisayar ağları için yapısal kablolama sistemlerinde
- Aynı zamanda telefon ve video gibi diğer sinyalleri taşımada
- 250 MHz 'e kadar performans sağlar ve 10BASE-T, 100BASE-TX (Hızlı internet), 1000BASE-T (Gigabit internet) ve 10GBASE-T (10-Gigabit internet) için uygun
- İnsan hayatının, değerli malzemelerin ve ekipmanların korunması gereken yerlerde

## KABLO YAPISI

|                       |                                           |
|-----------------------|-------------------------------------------|
| <b>1-İletken</b>      | Elektrolitik Bakır İletken (23 AWG)       |
| <b>2-Yalıtkan</b>     | Solid PE İzolasyon                        |
| <b>3-Büküm</b>        | 4 çift ve merkez elemanın birlikte bükümü |
| <b>4-Kılıf</b>        | HFFR Kompaund 6.20mm Ø                    |
| <b>5 -Kılıf Rengi</b> | RAL 7001 Gri                              |

## APPLICATION

- Data transmission systems which reaches up to the speed of 250 Mbit/Sec
- Structured cabling for computer networks such as Ethernet over twisted pair
- Carry other signals such as telephony and video
- Performance of up to 250 MHz and is suitable for 10BASE-T, 100BASE-TX (Fast Ethernet), 1000BASE-T (Gigabit Ethernet) and 10GBASE-T (10-Gigabit Ethernet)
- In places where human life and valuable materials and equipment need to be protected

## CONSTRUCTION

|                        |                                               |
|------------------------|-----------------------------------------------|
| <b>1-Conductor</b>     | Electrolytic Copper Conductor (24 AWG/23 AWG) |
| <b>2-Insulation</b>    | Solid PE Insulation                           |
| <b>3-Stranding</b>     | 4 pair common twist with central element      |
| <b>4-Sheath</b>        | HFFR Compound 6.20mm Ø                        |
| <b>5-Sheath Colour</b> | RAL 7001 Grey                                 |

## TEKNİK ÖZELLİKLER TECHNICAL CHARACTERISTICS

| İLETKEN DİRENCİ<br>CONDUCTOR RESISTANCE              | YALITIM DİRENCİ (500V)<br>INSULATION RESISTANCE (500V) | ÇALIŞMA VOLTAJİ (25°C)<br>OPERATING VOLTAGE (25°C) | TEST VOLTAJİ (DAMAR/DAMAR)<br>TEST VOLTAGE (CORE/CORE) | BÜKÜLME YARIÇAPI<br>BENDING RADIUS                             | KARAKTERİSTİK EMPEDANS<br>CHARACTERISTIC IMPEDANCE |                                                              |                                                      |
|------------------------------------------------------|--------------------------------------------------------|----------------------------------------------------|--------------------------------------------------------|----------------------------------------------------------------|----------------------------------------------------|--------------------------------------------------------------|------------------------------------------------------|
| 94Ω/km                                               | 5000MΩxkm                                              | 250V                                               | 1200V                                                  | 8x Cable Ø                                                     | 100 ± 15Ω                                          |                                                              |                                                      |
| EFEKTİF KAPASİTE (1KHz)<br>MUTUAL CAPACITANCE (1KHz) | ÇALIŞMA SICAKLIĞI<br>TEMPERATURE RANGE                 | ALEV GECİKTİRİCİLİK TESTİ<br>FLAME RETARDANT TEST  | DUMAN YOĞUNLUĞU TESTİ<br>SMOKE DENSITY TEST            | KOROZİF GAZ TESTİ<br>TEST ON CORROSIVENESS OF COMBUSTION GASES | YAYILMA HIZI<br>VELOCITY OF PROPAGATION            | HALOJENSİZLİK TESTİ<br>HALOGEN FREE TEST                     | ALEV YAYILIMI TESTİ<br>FLAME PROPAGATION TEST        |
| 48pF/m                                               | -20°C - +70°C                                          | IEC 60332-1-2<br>VDE 0482-332-1-2<br>EN 60332-1-2  | IEC 61034-2<br>VDE 0482-1034-2<br>EN 61034-2           | IEC 60754-2<br>VDE 0482-754-2<br>EN 60754-2                    | 67%                                                | IEC 60754-1<br>VDE 0482-754-1<br>EN 60754-1<br>BS EN 60754-1 | IEC 60332-3-25<br>VDE 0482-332-3-25<br>EN 60332-2-25 |

### DAMAR TANITIM RENKLERİ CORE IDENTIFICATION

| RENK NO<br>COLOUR NUMBER | A TELİ<br>A WIRE | B TELİ<br>B WIRE |
|--------------------------|------------------|------------------|
| 1 Mavi Blue              | Beyaz/Mavi       | White/Blue       |
| 2 Turuncu Orange         | Beyaz/Turuncu    | White/Orange     |
| 3 Yeşil Green            | Beyaz/Yeşil      | White/Green      |
| 4 Kahve Brown            | Beyaz/Kahve      | White/Brown      |

### ELEKTRİKSEL ÖZELLİKLERİ

| FREKANS<br>FREQUENCY (MHz) | ZAYILAMA<br>ATTENUATION (dB/100m) (Max) | YAKIN UÇ DİAFONİSİ<br>NEAR END CROSSTALK (NEXT) (dB) (min) | GERİ DÖNÜŞ KAYBI<br>RETURN LOSS (dB) (min) |
|----------------------------|-----------------------------------------|------------------------------------------------------------|--------------------------------------------|
| 1                          | 2,1                                     | 74                                                         | 20                                         |
| 10                         | 6                                       | 59                                                         | 25                                         |
| 16                         | 7,6                                     | 56                                                         | 25                                         |
| 20                         | 8,5                                     | 55                                                         | 25                                         |
| 62,5                       | 15,5                                    | 47                                                         | 21,5                                       |
| 100                        | 19,9                                    | 44                                                         | 20,1                                       |
| 125                        | 22,5                                    | 43                                                         | 19,5                                       |
| 155,5                      | 25,3                                    | 42                                                         | 18,8                                       |
| 200                        | 29,1                                    | 40                                                         | 18,0                                       |
| 250                        | 33                                      | 38                                                         | 17,3                                       |

## NOTLAR NOTES

250Mbps hıza kadar analog ve dijital sinyallerin iletimine uygundur.  
It is suitable for analog and digital signal transmission up to 250Mbps.

# ERLINE CAT-6 F/UTP



## KULLANIM ALANLARI

- 250 Mbit/Sn hıza kadar çalışan bilgi iletişim sistemlerinde
- Bükülü çiftler üzerinden çalışan Ethernet gibi bilgisayar ağları için yapısal kablolama sistemlerinde
- Aynı zamanda telefon ve video gibi diğer sinyalleri taşımada
- 250 MHz 'e kadar performans sağlar ve 10BASE-T, 100BASE-TX (Hızlı internet), 1000BASE-T (Gigabit internet) ve 10GBASE-T (10-Gigabit internet) için uygun

## KABLO YAPISI

|                      |                                              |
|----------------------|----------------------------------------------|
| <b>1- İletken</b>    | Elektrolitik Bakır İletken (23 AWG)          |
| <b>2-Yalıtkan</b>    | Solid PE İzolasyon                           |
| <b>3-Büküm</b>       | 4 çift ve merkez elemanın birlikte bükümü    |
| <b>4-Ekran</b>       | Pes Bant + Kalaylı Toprak Teli + Al-Pes Bant |
| <b>5-Kılıf</b>       | PVC Kompaund 6.20mm Ø                        |
| <b>6-Kılıf Rengi</b> | RAL 7001 Gri                                 |

## TEKNİK ÖZELLİKLER TECHNICAL CHARACTERISTICS

| İLETKEN DİRENCİ<br>CONDUCTOR RESISTANCE            | YALITIM DİRENCİ (500V)<br>INSULATION RESISTANCE (500V) | ÇALIŞMA VOLTAJI (25°C)<br>OPERATING VOLTAGE (25°C) |
|----------------------------------------------------|--------------------------------------------------------|----------------------------------------------------|
| 94Ω/km                                             | 5000MΩxkm                                              | 250V                                               |
| KARAKTERİSTİK EMPEDANS<br>CHARACTERISTIC IMPEDANCE | ÇALIŞMA SICAKLIĞI<br>TEMPERATURE RANGE                 | ALEV GEÇİKTİRİCİLİK TESTİ<br>FLAME RETARDANT TEST  |
| 100 ± 15Ω                                          | -20°C - +60°C                                          | IEC 60332-1-2<br>VDE 0482-332-1-2<br>EN 60332-1-2  |

### DAMAR TANITIM RENKLERİ CORE IDENTIFICATION

| RENK NO<br>COLOUR NUMBER | A TELİ<br>A WIRE | B TELİ<br>B WIRE |
|--------------------------|------------------|------------------|
| 1 Mavi Blue              | Beyaz/Mavi       | White/Blue       |
| 2 Turuncu Orange         | Beyaz/Turuncu    | White/Orange     |
| 3 Yeşil Green            | Beyaz/Yeşil      | White/Green      |
| 4 Kahve Brown            | Beyaz/Kahve      | White/Brown      |

## NOTLAR NOTES

250Mbps hıza kadar analog ve dijital sinyallerin iletimine uygundur.  
It is suitable for analog and digital signal transmission up to 250Mbps.

## APPLICATION

- Data transmission systems which reaches up to the speed of 250 Mbit/Sec
- Structured cabling for computer networks such as Ethernet over twisted pair
- Carry other signals such as telephony and video
- Performance of up to 250 MHz and is suitable for 10BASE-T, 100BASE-TX (Fast Ethernet), 1000BASE-T (Gigabit Ethernet) and 10GBASE-T (10-Gigabit Ethernet)

## CONSTRUCTION

|                        |                                                   |
|------------------------|---------------------------------------------------|
| <b>1- Conductor</b>    | Electrolytic Copper Conductor (24 AWG/23 AWG)     |
| <b>2-Insulation</b>    | Solid PE Insulation                               |
| <b>3-Stranding</b>     | 4-pair common twist with central element          |
| <b>4-Screen</b>        | Pes Tape + Tinned Copper Drain Wire + Al-Pes Tape |
| <b>5-Sheath</b>        | PVC Compound 6.20mm Ø                             |
| <b>6-Sheath Colour</b> | RAL 7001 Grey                                     |

| TEST VOLTAJI (DAMAR/DAMAR)<br>TEST VOLTAGE (CORE/CORE) | BÜKÜLME YARIÇAPI<br>BENDING RADIUS      |
|--------------------------------------------------------|-----------------------------------------|
| 1200V                                                  | 8x Cable Ø                              |
| EFEKTİF KAPASİTE (1KHz)<br>MUTUAL CAPACITANCE (1KHz)   | YAYILMA HIZI<br>VELOCITY OF PROPAGATION |
| 48pF/m                                                 | 67%                                     |

### ELEKTRİKSEL ÖZELLİKLERİ ELECTRICAL CHARACTERISTICS

| FREKANS<br>FREQUENCY<br>(MHz) | ZAYIFLAMA<br>ATTENUATION<br>(dB/100m) (Max) | YAKIN UÇ DİAFONİSİ<br>NEAR END CROSSTALK (NEXT)<br>(dB) (min) | GERİ DÖNÜŞ KAYBI<br>RETURN LOSS<br>(dB) (min) |
|-------------------------------|---------------------------------------------|---------------------------------------------------------------|-----------------------------------------------|
| 1                             | 2,1                                         | 74                                                            | 20                                            |
| 10                            | 6                                           | 59                                                            | 25                                            |
| 16                            | 7,6                                         | 56                                                            | 25                                            |
| 20                            | 8,5                                         | 55                                                            | 25                                            |
| 62,5                          | 15,5                                        | 47                                                            | 21,5                                          |
| 100                           | 19,9                                        | 44                                                            | 20,1                                          |
| 125                           | 22,5                                        | 43                                                            | 19,5                                          |
| 155,5                         | 25,3                                        | 42                                                            | 18,8                                          |
| 200                           | 29,1                                        | 40                                                            | 18,0                                          |
| 250                           | 33                                          | 38                                                            | 17,3                                          |

# ERLINE CAT-6 F/UTP LSZH



ALEV GECİKTİRİCİ ÖZELLİK/DÜŞÜK DUMAN YOĞUNLUĞU/ZEHİRLİ VE KOROZİF GAZLARDAN ARINDIRILMIŞ  
FLAME RETARDANT CHARACTERISTIC/LOW SMOKE EMISSION/WITHOUT POISONED AND CORROSIVE GASES



## KULLANIM ALANLARI

- 250 Mbit/Sn hıza kadar çalışan bilgi iletişim sistemlerinde
- Bükülü çiftler üzerinden çalışan Ethernet gibi bilgisayar ağları için yapısal kablolama sistemlerinde
- Aynı zamanda telefon ve video gibi diğer sinyalleri taşımada
- 250 MHz 'e kadar performans sağlar ve 10BASE-T, 100BASE-TX (Hızlı internet), 1000BASE-T (Gigabit internet) ve 10GBASE-T (10-Gigabit internet) için uygun
- İnsan hayatının, değerli malzemelerin ve ekipmanların korunması gereken yerlerde

## KABLO YAPISI

|                       |                                              |
|-----------------------|----------------------------------------------|
| <b>1-İletken</b>      | Elektrolitik Bakır İletken (23 AWG)          |
| <b>2-Yalıtkan</b>     | Solid PE İzolasyon                           |
| <b>3-Büküm</b>        | 4 çift ve merkez elemanın birlikte bükümü    |
| <b>4-Ekran</b>        | Pes Bant + Kalaylı Toprak Teli + Al-Pes Bant |
| <b>5-Kılıf</b>        | HFFR Kompaund 6.20mm Ø                       |
| <b>6 -Kılıf Rengi</b> | RAL 7001 Gri                                 |

## APPLICATION

- Data transmission systems which reaches up to the speed of 250 Mbit/Sec
- Structured cabling for computer networks such as Ethernet over twisted pair
- Carry other signals such as telephony and video
- Performance of up to 250 MHz and is suitable for 10BASE-T, 100BASE-TX (Fast Ethernet), 1000BASE-T (Gigabit Ethernet) and 10GBASE-T (10-Gigabit Ethernet)
- In places where human life and valuable materials and equipment need to be protected

## CONSTRUCTION

|                        |                                                   |
|------------------------|---------------------------------------------------|
| <b>1-Conductor</b>     | Electrolytic Copper Conductor (24 AWG/23 AWG)     |
| <b>2-Insulation</b>    | Solid PE Insulation                               |
| <b>3-Stranding</b>     | 4 pair common twist with central element          |
| <b>4-Screen</b>        | Pes Tape + Tinned Copper Drain Wire + Al-Pes Tape |
| <b>5-Sheath</b>        | HFFR Compound 6.20mm Ø                            |
| <b>6-Sheath Colour</b> | RAL 7001 Grey                                     |

## TEKNİK ÖZELLİKLER TECHNICAL CHARACTERISTICS

| İLETKEN DİRENCİ<br>CONDUCTOR RESISTANCE | YALITIM DİRENCİ (500V)<br>INSULATION RESISTANCE (500V) | ÇALIŞMA VOLTAJİ (25°C)<br>OPERATING VOLTAGE (25°C) |
|-----------------------------------------|--------------------------------------------------------|----------------------------------------------------|
| 94Ω/km                                  | 5000MΩxkm                                              | 250V                                               |

| EFEKTİF KAPASİTE (1KHz)<br>MUTUAL CAPACITANCE (1KHz) | ÇALIŞMA SICAKLIĞI<br>TEMPERATURE RANGE | ALEV GECİKTİRİCİLİK TESTİ<br>FLAME RETARDANT TEST | DUMAN YOĞUNLUĞU TESTİ<br>SMOKE DENSITY TEST  |
|------------------------------------------------------|----------------------------------------|---------------------------------------------------|----------------------------------------------|
| 48pF/m                                               | -20°C - +70°C                          | IEC 60332-1-2<br>VDE 0482-332-1-2<br>EN 60332-1-2 | IEC 61034-2<br>VDE 0482-1034-2<br>EN 61034-2 |

### DAMAR TANITIM RENKLERİ CORE IDENTIFICATION

| RENK NO<br>COLOUR NUMBER | A TELİ<br>A WIRE | B TELİ<br>B WIRE |
|--------------------------|------------------|------------------|
| 1 Mavi Blue              | Beyaz/Mavi       | White/Blue       |
| 2 Turuncu Orange         | Beyaz/Turuncu    | White/Orange     |
| 3 Yeşil Green            | Beyaz/Yeşil      | White/Green      |
| 4 Kahve Brown            | Beyaz/Kahve      | White/Brown      |

## NOTLAR NOTES

250Mbps hıza kadar analog ve dijital sinyallerin iletimine uygundur.  
It is suitable for analog and digital signal transmission up to 250Mbps.

| TEST VOLTAJİ (DAMAR/DAMAR)<br>TEST VOLTAGE (CORE/CORE) | BÜKÜLME YARIÇAPI<br>BENDING RADIUS | KARAKTERİSTİK EMPEDANS<br>CHARACTERISTIC IMPEDANCE |
|--------------------------------------------------------|------------------------------------|----------------------------------------------------|
| 1200V                                                  | 8x Cable Ø                         | 100 ± 15Ω                                          |

| KOROZİF GAZ TESTİ<br>TEST ON CORROSIVENESS OF<br>COMBUSTION GASES | YAYILMA HIZI<br>VELOCITY OF<br>PROPAGATION | HALOJENSİZLİK TESTİ<br>HALOGEN FREE TEST                     | ALEV YAYILIMI TESTİ<br>FLAME PROPAGATION TEST        |
|-------------------------------------------------------------------|--------------------------------------------|--------------------------------------------------------------|------------------------------------------------------|
| IEC 60754-2<br>VDE 0482-754-2<br>EN 60754-2                       | 67%                                        | IEC 60754-1<br>VDE 0482-754-1<br>EN 60754-1<br>BS EN 60754-1 | IEC 60332-3-25<br>VDE 0482-332-3-25<br>EN 60332-2-25 |

### ELEKTRİKSEL ÖZELLİKLERİ

| FREKANS<br>FREQUENCY<br>(MHz) | ZAYILAMA<br>ATTENUATION<br>(dB/100m) (Max) | YAKIN UÇ DİAFONİSİ<br>NEAR END CROSSTALK (NEXT)<br>(dB) (min) | GERİ DÖNÜŞ KAYBI<br>RETURN LOSS<br>(dB) (min) |
|-------------------------------|--------------------------------------------|---------------------------------------------------------------|-----------------------------------------------|
| 1                             | 2,1                                        | 74                                                            | 20                                            |
| 10                            | 6                                          | 59                                                            | 25                                            |
| 16                            | 7,6                                        | 56                                                            | 25                                            |
| 20                            | 8,5                                        | 55                                                            | 25                                            |
| 62,5                          | 15,5                                       | 47                                                            | 21,5                                          |
| 100                           | 19,9                                       | 44                                                            | 20,1                                          |
| 125                           | 22,5                                       | 43                                                            | 19,5                                          |
| 155,5                         | 25,3                                       | 42                                                            | 18,8                                          |
| 200                           | 29,1                                       | 40                                                            | 18,0                                          |
| 250                           | 33                                         | 38                                                            | 17,3                                          |

## LIY(St)Y PIMF



İYİ EMC\* ÖZELLİK/ESNEK KABLO YAPISI/İNCELTİLMİŞ DIŞ ÇAP/  
KÜÇÜK BÜKÜLME YARIÇAPI/ALEV GECİKTİRİCİ ÖZELLİK  
GOOD EMC\* CHARACTERISTIC/FLEXIBLE CABLE DESIGN/REDUCED OUTER DIAMETER/  
SMALL BENDING RADIUS/FLAME RETARDANT CHARACTERISTIC



## KULLANIM ALANLARI

Elektromanyetik karışım ve girişimlerin olduğu

- Enstrüman ve Kontrol Mühendisliğinde
- Endüstriyel Elektronikte
- Bilgisayar ve Ofis Makinelerinde
- Bina İçi Haberleşme Sistemlerinde
- Bina İçi Ses Sistemlerinde
- Güvenlik Sistemlerinde

## KABLO YAPISI

|                         |                                                                                                   |
|-------------------------|---------------------------------------------------------------------------------------------------|
| <b>1-İletken</b>        | IEC 60228; DIN VDE 0295; EN 60228 Sınıf 2 ya da Sınıf 5<br>Elektrolitik Tavlı ya da Kalaylı Bakır |
| <b>2-Yalıtkan</b>       | EN 50290-2-21 PVC Kompaund                                                                        |
| <b>3-Yalıtım Renk</b>   | DIN 47100                                                                                         |
| <b>4-Bireysel Ekran</b> | Pes Bant+Kalaylı Bakır Toprak Teli+Pes Bant                                                       |
| <b>5-Büküm</b>          | Ekranlanmış çiftlerin katlar halinde bükümü                                                       |
| <b>6-Ayırıcı Bant</b>   | Pes Bant                                                                                          |
| <b>7-Ekran</b>          | Kalaylı Toprak Teli + Al-Pes Bant                                                                 |
| <b>8-Kılıf</b>          | EN 50290-2-22 PVC Kompaund                                                                        |
| <b>9-Kılıf Rengi</b>    | RAL 7001 Gri                                                                                      |

## APPLICATION

In places where electro-magnetic interference and influence exists

- Instrumentation and Control Engineering
- Industrial Electronics
- Computers and Office Machines
- Indoor Communication Systems
- Indoor Voice Systems
- Security Systems

## CONSTRUCTION

|                            |                                                                                            |
|----------------------------|--------------------------------------------------------------------------------------------|
| <b>1-Conductor</b>         | IEC 60228; DIN VDE 0295; EN 60228 Class 2 or Class 5<br>Electrolytic Bare or Tinned Copper |
| <b>2-Insulation</b>        | EN 50290-2-21 PVC Compound                                                                 |
| <b>3-Colour Code</b>       | DIN 47100                                                                                  |
| <b>4-Individual Screen</b> | Pes Tape + Tinned Copper Drain Wire + Pes Tape                                             |
| <b>5-Stranding</b>         | Screened pairs in layers                                                                   |
| <b>6-Wrapping</b>          | Pes Tape                                                                                   |
| <b>7-Screen</b>            | Tinned Copper Drain Wire + Al-Pes Tape                                                     |
| <b>8-Sheath</b>            | EN 50290-2-22 PVC Compound                                                                 |
| <b>9-Sheath Colour</b>     | RAL 7001 Grey                                                                              |

TEKNİK ÖZELLİKLER  
TECHNICAL CHARACTERISTICS

| İLETKEN DİRENCİ<br>CONDUCTOR RESISTANCE | YALITIM DİRENCİ (500V)<br>INSULATION RESISTANCE (500V)                | EFEKTİF KAPASİTE (MAX)<br>MUTUAL CAPACITANCE (MAX) | AKIM TAŞIMA KAPASİTESİ (25°C)<br>CURRENT CARRYING CAPACITY (25°C) | ÇALIŞMA VOLTAJI<br>OPERATING VOLTAGE                               | TEST VOLTAJI<br>TEST VOLTAGE                                    |
|-----------------------------------------|-----------------------------------------------------------------------|----------------------------------------------------|-------------------------------------------------------------------|--------------------------------------------------------------------|-----------------------------------------------------------------|
| mm <sup>2</sup> Ω/km                    | 0,22/0,34mm <sup>2</sup> = 200MΩxkm<br>>0,50mm <sup>2</sup> = 20MΩxkm | mm <sup>2</sup> pF/m                               | mm <sup>2</sup> A                                                 | 0,22/0,34mm <sup>2</sup> = 250V<br>>0,50mm <sup>2</sup> = 300/500V | 0,22/0,34mm <sup>2</sup> = 1500V<br>0,50mm <sup>2</sup> = 2000V |
| 0,22 79                                 |                                                                       | 0,22 210                                           | 0,22 2,5                                                          |                                                                    |                                                                 |
| 0,34 56                                 |                                                                       | 0,34 210                                           | 0,34 4,5                                                          |                                                                    |                                                                 |
| 0,50 39                                 |                                                                       | 0,50 220                                           | 0,50 6,0                                                          |                                                                    |                                                                 |
| 0,75 26                                 |                                                                       | 0,75 220                                           | 0,75 13                                                           |                                                                    |                                                                 |
| 1,0 19,5                                |                                                                       | 1,0 230                                            | 1,0 16                                                            |                                                                    |                                                                 |
| 1,5 13,3                                |                                                                       | 1,5 240                                            | 1,5 20                                                            |                                                                    |                                                                 |
| 2,5 7,98                                |                                                                       | 2,5 250                                            | 2,5 25                                                            |                                                                    |                                                                 |
| BÜKÜLME YARIÇAPI<br>BENDING RADIUS      | ÇALIŞMA SICAKLIĞI<br>TEMPERATURE RANGE                                | ALEV GECİKTİRİCİLİK TESTİ<br>FLAME RETARDANT TEST  | EMPEDANS (YAKLAŞIK)<br>IMPEDANCE (APPROX.)                        | İNDÜKTANS<br>INDUCTANCE (APPROX.)                                  |                                                                 |
| 10x Cable Ø                             | -30°C - +70°C                                                         | IEC 60332-1-2<br>VDE 0482-322-1-2<br>EN 60332-1-2  | 78Ω                                                               | 0,67mH/km                                                          |                                                                 |

NOTLAR  
NOTES

Esnek yapıları ile dar alanlarda rahatlıkla uygulanabilirler.

Bu tip kablolar dış ortamlarda kullanılmaz.

\*EMC: Elektromanyetik uyumlu

With their flexible design they can be easily used in narrow spaces.

These cables are not suitable for outdoor installations.

\*EMC: Electromagnetic compatibility

# LIY(ST)CY PIMF



İYİ EMC\* ÖZELLİK/ESNEK KABLO YAPISI/İNCELTİLMİŞ DIŞ ÇAP/  
KÜÇÜK BÜKÜLME YARIÇAPI/ALEV GECİKTİRİCİ ÖZELLİK  
GOOD EMC\* CHARACTERISTIC/FLEXIBLE CABLE DESIGN/REDUCED OUTER DIAMETER/  
SMALL BENDING RADIUS/FLAME RETARDANT CHARACTERISTIC



## KULLANIM ALANLARI

Elektromanyetik karışım ve girişimlerin olduğu

- Enstrüman ve Kontrol Mühendisliğinde
- Endüstriyel Elektronikte
- Bilgisayar ve Ofis Makinelerinde
- Bina İçi Haberleşme Sistemlerinde
- Bina İçi Ses Düzenlerinde
- Güvenlik Sistemlerinde

## KABLO YAPISI

|                         |                                                                                                   |
|-------------------------|---------------------------------------------------------------------------------------------------|
| <b>1-İletken</b>        | IEC 60228; DIN VDE 0295; EN 60228 Sınıf 2 ya da Sınıf 5<br>Elektrolitik Tavlı ya da Kalaylı Bakır |
| <b>2-Yalıtkan</b>       | EN 50290-2-21 PVC Kompaund                                                                        |
| <b>3-Yalıtım Renk</b>   | DIN 47100                                                                                         |
| <b>4-Bireysel Ekran</b> | Pes Bant + Kalaylı Bakır Toprak Teli + Pes Bant                                                   |
| <b>5-Büküm</b>          | Ekranlanmış çiftlerin katlar halinde bükümü                                                       |
| <b>6-Ayırıcı Bant</b>   | Pes Bant                                                                                          |
| <b>7-Genel Ekran</b>    | Kalaylı Toprak Teli + Al-Pes Bant + Kalaylı Bakır Tel Örgü                                        |
| <b>8-Kılıf</b>          | EN 50290-2-22 PVC Kompaund                                                                        |
| <b>9-Kılıf Rengi</b>    | RAL 7001 Gri                                                                                      |

## APPLICATION

In places where electro-magnetic interference and influence exists

- Instrumentation and Control Engineering
- Industrial Electronics
- Computers and Office Machines
- Indoor Communication Systems
- Indoor Voice Systems
- Security Systems

## CONSTRUCTION

|                            |                                                                                            |
|----------------------------|--------------------------------------------------------------------------------------------|
| <b>1-Conductor</b>         | IEC 60228; DIN VDE 0295; EN 60228 Class 2 or Class 5<br>Electrolytic Bare or Tinned Copper |
| <b>2-Insulation</b>        | EN 50290-2-21 PVC Compound                                                                 |
| <b>3-Colour Code</b>       | DIN 47100                                                                                  |
| <b>4-Individual Screen</b> | Pes Tape + Tinned Copper Drain Wire + Pes Tape                                             |
| <b>5-Stranding</b>         | Screened pairs in layers                                                                   |
| <b>6-Wrapping</b>          | Pes Bant                                                                                   |
| <b>7-Overall Screen</b>    | Tinned Copper Drain Wire + Pes Tape + Tinned Copper Braid                                  |
| <b>8-Sheath</b>            | EN 50290-2-22 PVC Compound                                                                 |
| <b>9-Sheath Colour</b>     | RAL 7001 Grey                                                                              |

## TEKNİK ÖZELLİKLER TECHNICAL CHARACTERISTICS

| İLETKEN DİRENÇİ<br>CONDUCTOR RESISTANCE | YALITIM DİRENÇİ (500V)<br>INSULATION RESISTANCE (500V)                | EFEKTİF KAPASİTE (MAX)<br>MUTUAL CAPACITANCE (MAX) | AKIM TAŞIMA KAPASİTESİ (25°C)<br>CURRENT CARRYING CAPACITY (25°C) | ÇALIŞMA VOLTAJI<br>OPERATING VOLTAGE                               | TEST VOLTAJI<br>TEST VOLTAGE                                    |
|-----------------------------------------|-----------------------------------------------------------------------|----------------------------------------------------|-------------------------------------------------------------------|--------------------------------------------------------------------|-----------------------------------------------------------------|
| mm <sup>2</sup> Ω/km                    | 0,22/0,34mm <sup>2</sup> = 200MΩxkm<br>>0,50mm <sup>2</sup> = 20MΩxkm | mm <sup>2</sup> Ω/kmpF/m                           | mm <sup>2</sup> A                                                 | 0,22/0,34mm <sup>2</sup> = 250V<br>>0,50mm <sup>2</sup> = 300/500V | 0,22/0,34mm <sup>2</sup> = 1500V<br>0,50mm <sup>2</sup> = 2000V |
| 0,22 79                                 |                                                                       | 0,22 210                                           | 0,22 2,5                                                          |                                                                    |                                                                 |
| 0,34 56                                 |                                                                       | 0,34 210                                           | 0,34 4,5                                                          |                                                                    |                                                                 |
| 0,50 39                                 |                                                                       | 0,50 220                                           | 0,50 6,0                                                          |                                                                    |                                                                 |
| 0,75 26                                 |                                                                       | 0,75 220                                           | 0,75 13                                                           |                                                                    |                                                                 |
| 1,0 19,5                                |                                                                       | 1,0 230                                            | 1,0 16                                                            |                                                                    |                                                                 |
| 1,5 13,3                                |                                                                       | 1,5 240                                            | 1,5 20                                                            |                                                                    |                                                                 |
| 2,5 7,98                                |                                                                       | 2,5 250                                            | 2,5 25                                                            |                                                                    |                                                                 |
| BÜKÜLME YARIÇAPI<br>BENDING RADIUS      | ÇALIŞMA SICAKLIĞI<br>TEMPERATURE RANGE                                | ALEV GECİKTİRİCİLİK TESTİ<br>FLAME RETARDANT TEST  | EMPEDANS (YAKLAŞIK)<br>IMPEDANCE (APPROX.)                        | İNDÜKTANS (YAKLAŞIK)<br>INDUCTANCE (APPROX.)                       |                                                                 |
| 10x Cable Ø                             | -30°C - +70°C                                                         | IEC 60332-1-2<br>VDE 0482-322-1-2<br>EN 60332-1-2  | 78Ω                                                               | 0,67mH/km                                                          |                                                                 |

## NOTLAR NOTES

Esnek yapıları ile dar alanlarda rahatlıkla uygulanabilirler.

Bu tip kablolar dış ortamlarda kullanılmaz.

\*EMC: Elektromanyetik uyumlu

With their flexible design they can be easily used in narrow spaces.

These cables are not suitable for outdoor installations.

\*EMC: Electromagnetic compatibility

# LI2Y(St)Y PIMF



İYİ EMC\* ÖZELLİK/ESNEK KABLO YAPISI/İNCELTİLMİŞ DIŞ ÇAP/  
KÜÇÜK BÜKÜLME YARIÇAP/İLEV GECİKTİRİCİ ÖZELLİK  
GOOD EMC\* CHARACTERISTIC/FLEXIBLE CABLE DESIGN/REDUCED OUTER DIAMETER/  
SMALL BENDING RADIUS/FLAME RETARDANT CHARACTERISTIC



## KULLANIM ALANLARI

Elektromanyetik karışım ve girişimlerin olduğu

- Enstrüman ve Kontrol Mühendisliğinde
- Endüstriyel Elektronikte
- Bilgisayar ve Ofis Makinelerinde
- Otomasyon Sistemlerinde
- Yüksek Hızlı Data Sistemlerinde

## APPLICATION

In places where electro-magnetic interference and influence exists

- Instrumentation and Control Engineering
- Industrial Electronics
- Computers and Office Machines
- Automation Systems
- High Transmission Rates In Data Systems

## KABLO YAPISI

|                         |                                                                                                   |
|-------------------------|---------------------------------------------------------------------------------------------------|
| <b>1-İletken</b>        | IEC 60228; DIN VDE 0295; EN 60228 Sınıf 2 ya da Sınıf 5<br>Elektrolitik Tavlı ya da Kalaylı Bakır |
| <b>2-Yalıtkan</b>       | EN 50290-2-23 PE Kompaund                                                                         |
| <b>3-Yalıtım Renk</b>   | DIN 47100                                                                                         |
| <b>4-Bireysel Ekran</b> | Pes Bant + Kalaylı Bakır Toprak Teli + Pes Bant                                                   |
| <b>5-Büküm</b>          | Ekranlanmış çiftlerin katlar halinde bükümü                                                       |
| <b>6-Ayırıcı Bant</b>   | Pes Bant                                                                                          |
| <b>7-Ekran</b>          | Kalaylı Toprak Teli + Al-Pes Bant                                                                 |
| <b>8-Kılıf</b>          | EN 50290-2-22 PVC Kompaund                                                                        |
| <b>9-Kılıf Rengi</b>    | RAL 7001 Gri                                                                                      |

## CONSTRUCTION

|                            |                                                                                            |
|----------------------------|--------------------------------------------------------------------------------------------|
| <b>1-Conductor</b>         | IEC 60228; DIN VDE 0295; EN 60228 Class 2 or Class 5<br>Electrolytic Bare or Tinned Copper |
| <b>2-Insulation</b>        | EN 50290-2-23 PE Compound                                                                  |
| <b>3-Colour Code</b>       | DIN 47100                                                                                  |
| <b>4-Individual Screen</b> | Pes Tape + Tinned Copper Drain Wire + Pes Tape                                             |
| <b>5-Stranding</b>         | Screened pairs in layers                                                                   |
| <b>6-Wrapping</b>          | Pes Tape                                                                                   |
| <b>7-Screen</b>            | Tinned Copper Drain Wire + Al-Pes Tape                                                     |
| <b>8-Sheath</b>            | EN 50290-2-22 PVC Compound                                                                 |
| <b>9-Sheath Colour</b>     | RAL 7001 Grey                                                                              |

## TEKNİK ÖZELLİKLER TECHNICAL CHARACTERISTICS

| İLETKEN DİRENCİ<br>CONDUCTOR RESISTANCE                            | YALITIM DİRENCİ (500V)<br>INSULATION RESISTANCE (500V)          | EFEKTİF KAPASİTE (MAX)<br>MUTUAL CAPACITANCE (MAX) | EMPEDANS (YAKLAŞIK)<br>IMPEDANCE (APPROX.) | İNDÜKTANS (YAKLAŞIK)<br>INDUCTANCE (APPROX.)      | AKIM TAŞIMA KAPASİTESİ (25°C)<br>CURRENT CARRYING CAPACITY (25°C) |
|--------------------------------------------------------------------|-----------------------------------------------------------------|----------------------------------------------------|--------------------------------------------|---------------------------------------------------|-------------------------------------------------------------------|
| mm <sup>2</sup> Ω/km                                               | 5000MΩxkm                                                       | mm <sup>2</sup> Ω/kmpF/m                           | 78Ω                                        | 0,67mH/km                                         | mm <sup>2</sup> A                                                 |
| 0,22 79                                                            |                                                                 | 0,22 70                                            |                                            |                                                   | 0,22 2,5                                                          |
| 0,34 56                                                            |                                                                 | 0,34 80                                            |                                            |                                                   | 0,34 4,5                                                          |
| 0,50 39                                                            |                                                                 | 0,50 90                                            |                                            |                                                   | 0,50 6,0                                                          |
| 0,75 26                                                            |                                                                 | 0,75 90                                            |                                            |                                                   | 0,75 13                                                           |
| 1,5 13,3                                                           |                                                                 | 1,0 90                                             |                                            |                                                   | 1,0 16                                                            |
| 2,5 7,98                                                           |                                                                 | 1,5 100                                            |                                            |                                                   | 1,5 20                                                            |
|                                                                    |                                                                 | 2,5 120                                            |                                            |                                                   | 2,5 25                                                            |
| ÇALIŞMA VOLTAJI<br>OPERATING VOLTAGE                               | TEST VOLTAJI<br>TEST VOLTAGE                                    | BÜKÜLME YARIÇAP<br>BENDING RADIUS                  | ÇALIŞMA SICAKLIĞI<br>TEMPERATURE RANGE     | ALEV GECİKTİRİCİLİK TESTİ<br>FLAME RETARDANT TEST |                                                                   |
| 0,22/0,34mm <sup>2</sup> = 250V<br>>0,50mm <sup>2</sup> = 300/500V | 0,22/0,34mm <sup>2</sup> = 1500V<br>0,50mm <sup>2</sup> = 2000V | 10x Cable Ø                                        | -30°C - +70°C                              | IEC 60332-1-2<br>VDE 0482-322-1-2<br>EN 60332-1-2 |                                                                   |

## NOTLAR NOTES

Esnek yapıları ile dar alanlarda rahatlıkla uygulanabilirler.

Bu tip kablolar dış ortamlarda kullanılmaz.

\*EMC: Elektromanyetik uyumlu

With their flexible design they can be easily used in narrow spaces.

These cables are not suitable for outdoor installation.

\*EMC: Electromagnetic compatibility

# LI2Y(ST)CY PIMF



EMC\* ÖZELLİK/ESNEK KABLO YAPISI/İNCELTİLMİŞ DIŞ ÇAP/  
KÜÇÜK BÜKÜLME YARIÇAPI/ALEV GECİKTİRİCİ ÖZELLİK  
GOOD EMC\* CHARACTERISTIC/FLEXIBLE CABLE DESIGN/REDUCED OUTER DIAMETER/  
SMALL BENDING RADIUS/FLAME RETARDANT CHARACTERISTIC



## KULLANIM ALANLARI

- Elektromanyetik karışım ve girişimlerin olduğu
- Enstrüman ve Kontrol Mühendisliğinde
  - Endüstriyel Elektronikte
  - Bilgisayar ve Ofis Makinelerinde
  - Otomasyon Sistemleri
  - Yüksek Hızlı Data Sistemleri

## KABLO YAPISI

|                         |                                                                                                   |
|-------------------------|---------------------------------------------------------------------------------------------------|
| <b>1-İletken</b>        | IEC 60228; DIN VDE 0295; EN 60228 Sınıf 2 ya da Sınıf 5<br>Elektrolitik Tavlı ya da Kalaylı Bakır |
| <b>2-Yalıtkan</b>       | EN 50290-2-23 PE Kompaund                                                                         |
| <b>3-Yalıtım Renk</b>   | DIN 47100                                                                                         |
| <b>4-Bireysel Ekran</b> | Pes Bant + Kalaylı Bakır Toprak Teli + Pes Bant                                                   |
| <b>5-Büküm</b>          | Bireysel ekranlanmış çiftlerin katlar halinde bükümü                                              |
| <b>6-Ayırıcı Bant</b>   | Pes Bant                                                                                          |
| <b>7-Genel Ekran</b>    | Kalaylı Toprak Teli + Al-Pes Bant + Kalaylı Bakır Tel Örgü                                        |
| <b>8-Kılıf</b>          | EN 50290-2-22 PVC Kompaund                                                                        |
| <b>9-Kılıf Rengi</b>    | RAL 7001 Gri                                                                                      |

## TEKNİK ÖZELLİKLER TECHNICAL CHARACTERISTICS

| İLETKEN DİRENCİ<br>CONDUCTOR RESISTANCE                            | YALITIM DİRENCİ (500V)<br>INSULATION RESISTANCE (500V)          | EFEKTİF KAPASİTE (MAX)<br>MUTUAL CAPACITANCE (MAX) | EMPEDANS (YAKLAŞIK)<br>IMPEDANCE (APPROX.) | İNDÜKTANS (YAKLAŞIK)<br>INDUCTANCE (APPROX.)      | AKIM TAŞIMA KAPASİTESİ (25°C)<br>CURRENT CARRYING CAPACITY (25°C) |
|--------------------------------------------------------------------|-----------------------------------------------------------------|----------------------------------------------------|--------------------------------------------|---------------------------------------------------|-------------------------------------------------------------------|
| mm <sup>2</sup> Ω/km                                               | 5000MΩxkm xkm                                                   | mm <sup>2</sup> pF/m                               | 78Ω                                        | 0,67mH/km                                         | mm <sup>2</sup> A                                                 |
| 0,22 79                                                            |                                                                 | 0,22 70                                            |                                            |                                                   | 0,22 2,5                                                          |
| 0,34 56                                                            |                                                                 | 0,34 80                                            |                                            |                                                   | 0,34 4,5                                                          |
| 0,50 39                                                            |                                                                 | 0,50 90                                            |                                            |                                                   | 0,50 6,0                                                          |
| 0,75 26                                                            |                                                                 | 0,75 90                                            |                                            |                                                   | 0,75 13                                                           |
| 1,5 13,3                                                           |                                                                 | 1,0 90                                             |                                            |                                                   | 1,0 16                                                            |
| 2,5 7,98                                                           |                                                                 | 1,5 100                                            |                                            |                                                   | 1,5 20                                                            |
|                                                                    |                                                                 | 2,5 120                                            |                                            |                                                   | 2,5 25                                                            |
| ÇALIŞMA VOLTAJI<br>OPERATING VOLTAGE                               | TEST VOLTAJI<br>TEST VOLTAGE                                    | BÜKÜLME YARIÇAPI<br>BENDING RADIUS                 | ÇALIŞMA SICAKLIĞI<br>TEMPERATURE RANGE     | ALEV GECİKTİRİCİLİK TESTİ<br>FLAME RETARDANT TEST |                                                                   |
| 0,22/0,34mm <sup>2</sup> = 250V<br>>0,50mm <sup>2</sup> = 300/500V | 0,22/0,34mm <sup>2</sup> = 1000V<br>0,50mm <sup>2</sup> = 2000V | 10x Cable Ø                                        | -30°C - +70°C                              | IEC 60332-1-2<br>VDE 0482-322-1-2<br>EN 60332-1-2 |                                                                   |

## NOTLAR NOTES

Esnek yapıları ile dar alanlarda rahatlıkla uygulanabilirler.  
Bu tip kablolar dış ortamlarda kullanılmaz.  
\*EMC: Elektromanyetik uyumlu  
With their flexible design they can be easily used in narrow spaces.  
These cables are not suitable for outdoor installations.  
\*EMC: Electromagnetic compatibility

# LI2Y(St)H PIMF



İYİ EMC\* ÖZELLİK/ESNEK KABLO YAPISI/İNCELTİLMİŞ DIŞ ÇAP/KÜÇÜK BÜKÜLME YARIÇAPI/  
ALEV GECİKTİRİCİ/ÖZELLİK/DÜŞÜK DUMAN YOĞUNLUĞU/ZEHİRLİ VE KOROZİF GAZLARDAN ARINDIRILMIŞ  
GOOD EMC\* CHARACTERISTIC/FLEXIBLE CABLE DESIGN/REDUCED OUTER DIAMETER/SMALL BENDING RADIUS/  
FLAME RETARDANT CHARACTERISTIC/LOW SMOKE EMISSION/WITHOUT POISONED AND CORROSIVE GASES



## KULLANIM ALANLARI

Elektromanyetik karışım ve girişimlerin olduğu insanların yoğun olarak bulunduğu kapalı ortamlarda

- Enstrüman ve Kontrol Mühendisliğinde
- Endüstriyel Elektronikte
- Bilgisayar ve Ofis Makinelerinde
- Otomasyon Sistemleri
- Yüksek Hızlı Data Sistemleri

## KABLO YAPISI

|                         |                                                                                                   |
|-------------------------|---------------------------------------------------------------------------------------------------|
| <b>1-İletken</b>        | IEC 60228; DIN VDE 0295; EN 60228 Sınıf 2 ya da Sınıf 5<br>Elektrolitik Tavlı ya da Kalaylı Bakır |
| <b>2-Yalıtkan</b>       | EN 50290-2-23 PE Kompaund                                                                         |
| <b>3-Yalıtım Renk</b>   | DIN 47100                                                                                         |
| <b>4-Bireysel Ekran</b> | Pes Bant + Kalaylı Bakır Toprak Teli + Pes Bant                                                   |
| <b>5-Büküm</b>          | Ekranlanmış çiftlerin katlar halinde bükümü                                                       |
| <b>6-Ayırıcı Bant</b>   | Pes Bant                                                                                          |
| <b>7-Genel Ekran</b>    | Kalaylı Toprak Teli + Al-Pes Bant                                                                 |
| <b>8-Kılıf</b>          | EN 50290-2-27 HFFR Kompaund                                                                       |
| <b>9-Kılıf Rengi</b>    | RAL 7001 Gri                                                                                      |

## APPLICATION

In places where electro-magnetic interference and influence exists  
Indoors where people are intensely populated

- Instrumentation and Control Engineering
- Industrial Electronics
- Computers and Office Machines
- Automation Systems
- High Transmission Rates In Data Processing Systems

## CONSTRUCTION

|                            |                                                                                            |
|----------------------------|--------------------------------------------------------------------------------------------|
| <b>1-Conductor</b>         | IEC 60228; DIN VDE 0295; EN 60228 Class 2 or Class 5<br>Electrolytic Bare or Tinned Copper |
| <b>2-Insulation</b>        | EN 50290-2-23 PE Compound                                                                  |
| <b>3-Colour Code</b>       | DIN 47100                                                                                  |
| <b>4-Individual Screen</b> | Pes Tape + Tinned Copper Drain Wire + Pes Tape                                             |
| <b>5-Stranding</b>         | Screened pairs in layers                                                                   |
| <b>6-Wrapping</b>          | Pes Tape                                                                                   |
| <b>7-Overall Screen</b>    | Tinned Copper Drain Wire + Al-Pes Tape                                                     |
| <b>8-Sheath</b>            | EN 50290-2-27 HFFR Compound                                                                |
| <b>9-Sheath Colour</b>     | RAL 7001 Grey                                                                              |

## TEKNİK ÖZELLİKLER

### TECHNICAL CHARACTERISTICS

| İLETKEN DİRENCİ<br>CONDUCTOR RESISTANCE | YALITIM DİRENCİ (500V)<br>INSULATION RESISTANCE (500V) | EFEKTİF KAPASİTE (MAX)<br>MUTUAL CAPACITANCE (MAX) |
|-----------------------------------------|--------------------------------------------------------|----------------------------------------------------|
| mm <sup>2</sup> Ω/km                    | 5000MΩxkm                                              | mm <sup>2</sup> pF/m                               |
| 0,22 79                                 |                                                        | 0,22 70                                            |
| 0,34 56                                 |                                                        | 0,34 80                                            |
| 0,50 39                                 |                                                        | 0,50 90                                            |
| 0,75 26                                 |                                                        | 0,75 90                                            |
| 1,0 19,5                                |                                                        | 1,0 90                                             |
| 1,5 13,3                                |                                                        | 1,5 100                                            |
| 2,5 7,98                                |                                                        | 2,5 120                                            |

| BÜKÜLME YARIÇAPI<br>BENDING RADIUS | ÇALIŞMA SICAKLIĞI<br>TEMPERATURE RANGE | EMPEDANS (YAKLAŞIK)<br>IMPEDANCE (APPROX.) | İNDÜKTANS (YAKLAŞIK)<br>INDUCTANCE (APPROX.) |
|------------------------------------|----------------------------------------|--------------------------------------------|----------------------------------------------|
| 7,5x Cable Ø                       | -30°C - +70°C                          | 78Ω                                        | 0,67mH/km                                    |

| AKIM TAŞIMA KAPASİTESİ (25°C)<br>CURRENT CARRYING CAPACITY(25°C) | ÇALIŞMA VOLTAJI<br>OPERATING VOLTAGE                               | TEST VOLTAJI<br>TEST VOLTAGE                                    |
|------------------------------------------------------------------|--------------------------------------------------------------------|-----------------------------------------------------------------|
| mm <sup>2</sup> A                                                | 0,22/0,34mm <sup>2</sup> = 250V<br>>0,50mm <sup>2</sup> = 300/500V | 0,22/0,34mm <sup>2</sup> = 1500V<br>0,50mm <sup>2</sup> = 2000V |
| 0,22 2,5                                                         |                                                                    |                                                                 |
| 0,34 4,5                                                         |                                                                    |                                                                 |
| 0,50 6,0                                                         |                                                                    |                                                                 |
| 0,75 13                                                          |                                                                    |                                                                 |
| 1,0 16                                                           |                                                                    |                                                                 |
| 1,5 20                                                           |                                                                    |                                                                 |
| 2,5 25                                                           |                                                                    |                                                                 |

| ALEV GECİKTİRİCİLİK TESTİ<br>FLAME RETARDANT TEST | DUMAN YOĞUNLUĞU TESTİ<br>SMOKE DENSITY TEST  | KOROZİF GAZ TESTİ<br>TEST ON CORROSIVENESS<br>OF COMBUSTION | ALEV YAYILIMI TESTİ<br>FLAME PROPAGATION<br>TEST     |
|---------------------------------------------------|----------------------------------------------|-------------------------------------------------------------|------------------------------------------------------|
| IEC 60332-1-2<br>VDE 0482-332-1-2<br>EN 60332-1-2 | IEC 61034-2<br>VDE 0482-1034-2<br>EN 61034-2 | IEC 60754-2<br>VDE 0482-754-1/2<br>EN 60754-2               | IEC 60332-3-25<br>VDE 0482-332-3-25<br>EN 60332-2-25 |

## NOTLAR NOTES

Esnek yapıları ile dar alanlarda rahatlıkla uygulanabilirler.

Bu tip kablolar dış ortamlarda kullanılmaz.

\*EMC: Elektromanyetik uyumlu

With their flexible design they can be easily used in narrow spaces.

These cables are not suitable for outdoor installations.

\*EMC: Electromagnetic compatibility

HALOJENSİZLİK TESTİ  
HALOGEN FREE TEST

IEC 60754-1

VDE 0482-754-2

EN 60754-2

# LI2Y(St)CH PIMF



İYİ EMC\* ÖZELLİK/ESNEK KABLO YAPISI/İNCELTİLMİŞ DIŞ ÇAP/KÜÇÜK BÜKÜLME YARIÇAPI/  
ALEV GECİKTİRİCİ/ÖZELLİK/DÜŞÜK DUMAN YOĞUNLUĞU/ZEHİRLİ VE KOROZİF GAZLARDAN ARINDIRILMIŞ  
GOOD EMC\* CHARACTERISTIC/FLEXIBLE CABLE DESIGN/REDUCED OUTER DIAMETER/SMALL BENDING RADIUS/  
FLAME RETARDANT CHARACTERISTIC/LOW SMOKE EMISSION/WITHOUT POISONED AND CORROSIVE GASES



## KULLANIM ALANLARI

Elektromanyetik karışım ve girişimlerin olduğu insanların yoğun olarak bulunduğu kapalı ortamlarda

- Enstrüman ve Kontrol Mühendisliğinde
- Endüstriyel Elektronikte
- Bilgisayar ve Ofis Makinelerinde
- Otomasyon Sistemleri
- Yüksek Hızlı Data Sistemleri

## KABLO YAPISI

|                         |                                                                                                  |
|-------------------------|--------------------------------------------------------------------------------------------------|
| <b>1-İletken</b>        | IEC 60228; DIN VDE 0295; EN 60228 Sınıf 2 ya da Sınıf 5<br>Elektrolitik Tavlı Veya Kalaylı Bakır |
| <b>2-Yalıtkan</b>       | EN 50290-2-23 PE Kompound                                                                        |
| <b>3-Yalıtım Renk</b>   | DIN 47100                                                                                        |
| <b>4-Bireysel Ekran</b> | Pes Bant + Kalaylı Bakır Toprak Teli + Pes Bant                                                  |
| <b>5-Büküm</b>          | Ekranlanmış çiftlerin katlar halinde bükümü                                                      |
| <b>6-Ayırıcı Bant</b>   | Pes Bant                                                                                         |
| <b>7-Genel Ekran</b>    | Kalaylı Toprak Teli + Al-Pes Bant +<br>Kalaylı Bakır Tel Örgü                                    |
| <b>8-Kılıf</b>          | EN 50290-2-27 HFFR Kompound                                                                      |
| <b>9-Kılıf Rengi</b>    | RAL 7001 Gri                                                                                     |

## APPLICATION

In places where electro-magnetic interference and influence exists  
Indoors where people are intensely populated

- Instrumentation and Control Engineering
- Industrial Electronics
- Computers and Office Machines
- Automation Systems
- High Transmission Rates In Data Processing Systems

## CONSTRUCTION

|                            |                                                                                            |
|----------------------------|--------------------------------------------------------------------------------------------|
| <b>1-Conductor</b>         | IEC 60228; DIN VDE 0295; EN 60228 Class 2 or Class 5<br>Electrolytic Bare Or Tinned Copper |
| <b>2-Insulation</b>        | EN 50290-2-23 PE Compound                                                                  |
| <b>3-Colour Code</b>       | DIN 47100                                                                                  |
| <b>4-Individual Screen</b> | Pes Tape + Tinned Copper Drain Wire + Pes Tape                                             |
| <b>5-Stranding</b>         | Screened pairs in layers                                                                   |
| <b>6-Wrapping</b>          | Pes Tape                                                                                   |
| <b>7-Overall Screen</b>    | Tinned Copper Drain Wire + Al-Pes Tape +<br>Tinned Copper Braid                            |
| <b>8-Sheath</b>            | EN 50290-2-27 HFFR Compound                                                                |
| <b>9-Sheath Colour</b>     | RAL 7001 Grey                                                                              |

## TEKNİK ÖZELLİKLER TECHNICAL CHARACTERISTICS

| İLETKEN DİRENCİ<br>CONDUCTOR RESISTANCE | YALITIM DİRENCİ (500V)<br>INSULATION RESISTANCE (500V) | EFEKTİF KAPASİTE (MAX)<br>MUTUAL CAPACITANCE (MAX) |
|-----------------------------------------|--------------------------------------------------------|----------------------------------------------------|
| mm <sup>2</sup> Ω/km                    | 5000MΩxkm                                              | mm <sup>2</sup> pF/m                               |
| 0,22 79                                 |                                                        | 0,22 70                                            |
| 0,34 56                                 |                                                        | 0,34 80                                            |
| 0,50 39                                 |                                                        | 0,50 90                                            |
| 0,75 26                                 |                                                        | 0,75 90                                            |
| 1,0 19,5                                |                                                        | 1,0 90                                             |
| 1,5 13,3                                |                                                        | 1,5 100                                            |
| 2,5 7,98                                |                                                        | 2,5 120                                            |

| BÜKÜLME YARIÇAPI<br>BENDING RADIUS | ÇALIŞMA SICAKLIĞI<br>TEMPERATURE RANGE | EMPEDANS (YAKLAŞIK)<br>IMPEDANCE (APPROX.) | İNDÜKTANS (YAKLAŞIK)<br>INDUCTANCE (APPROX.) |
|------------------------------------|----------------------------------------|--------------------------------------------|----------------------------------------------|
| 7,5x Cable Ø                       | -30°C - +70°C                          | 78Ω                                        | 0,67mH/km                                    |

| AKIM TAŞIMA KAPASİTESİ (25°C)<br>CURRENT CARRYING CAPACITY(25°C) | ÇALIŞMA VOLTAJI<br>OPERATING VOLTAGE                               | TEST VOLTAJI<br>TEST VOLTAGE                                    |
|------------------------------------------------------------------|--------------------------------------------------------------------|-----------------------------------------------------------------|
| mm <sup>2</sup> A                                                | 0,22/0,34mm <sup>2</sup> = 250V<br>>0,50mm <sup>2</sup> = 300/500V | 0,22/0,34mm <sup>2</sup> = 1500V<br>0,50mm <sup>2</sup> = 2000V |
| 0,22 2,5                                                         |                                                                    |                                                                 |
| 0,34 4,5                                                         |                                                                    |                                                                 |
| 0,50 6,0                                                         |                                                                    |                                                                 |
| 0,75 13                                                          |                                                                    |                                                                 |
| 1,0 16                                                           |                                                                    |                                                                 |
| 1,5 20                                                           |                                                                    |                                                                 |
| 2,5 25                                                           |                                                                    |                                                                 |

| ALEV GECİKTİRİCİLİK TESTİ<br>FLAME RETARDANT TEST | DUMAN YOĞUNLUĞU TESTİ<br>SMOKE DENSITY TEST  | KOROZİF GAZ TESTİ<br>TEST ON CORROSIVENESS<br>OF COMBUSTION | ALEV YAYILIMI TESTİ<br>FLAME PROPAGATION<br>TEST     |
|---------------------------------------------------|----------------------------------------------|-------------------------------------------------------------|------------------------------------------------------|
| IEC 60332-1-2<br>VDE 0482-332-1-2<br>EN 60332-1-2 | IEC 61034-2<br>VDE 0482-1034-2<br>EN 61034-2 | IEC 60754-2<br>VDE 0482-754-1/2<br>EN 60754-2               | IEC 60332-3-25<br>VDE 0482-332-3-25<br>EN 60332-2-25 |

HALOJENSİZLİK TESTİ  
HALOGEN FREE TEST  
IEC 60754-1  
VDE 0482-754-2  
EN 60754-2

## NOTLAR NOTES

Esnek yapıları ile dar alanlarda rahatlıkla uygulanabilirler.

Bu tip kablolar dış ortamlarda kullanılmaz.

\*EMC: Elektromanyetik uyumlu

With their flexible design they can be easily used in narrow spaces.

These cables are not suitable for outdoor installations.

\*EMC: Electromagnetic compatibility

# LIH(St)H PIMF



İYİ EMC\* ÖZELLİK/ESNEK KABLO YAPISI/İNCELTİLMİŞ DIŞ ÇAP/KÜÇÜK BÜKÜLME YARIÇAPI/  
ALEV GECİKTİRİCİ/ÖZELLİK DÜŞÜK DUMAN YOĞUNLUĞU/ZEHİRLİ VE KOROZİF GAZLARDAN ARINDIRILMIŞ  
GOOD EMC\* CHARACTERISTIC/FLEXIBLE CABLE DESIGN/REDUCED OUTER DIAMETER/SMALL BENDING RADIUS/  
FLAME RETARDANT CHARACTERISTIC/LOW SMOKE EMISSION/WITHOUT POISONED AND CORROSIVE GASES



## KULLANIM ALANLARI

Elektromanyetik karışım ve girişimlerin olduğu  
İnsanların yoğun olarak bulunduğu kapalı ortamlarda  
- Enstrüman ve Kontrol Mühendisliğinde  
- Endüstriyel Elektronikte  
- Bilgisayar ve Ofis Makinelerinde  
- Bina İçi Haberleşme Sistemleri  
- Bina İçi Ses Düzenleri

## APPLICATION

In places where electro-magnetic interference and influence exists  
Indoors where people are intensely populated  
- Instrumentation and Control Engineering  
- Industrial Electronics  
- Computers and Office Machines  
- Indoor Communication Systems  
- Indoor Voice Systems

## KABLO YAPISI

|                           |                                                                                                   |
|---------------------------|---------------------------------------------------------------------------------------------------|
| <b>1 - İletken</b>        | IEC 60228; DIN VDE 0295; EN 60228 Sınıf 2 ya da Sınıf 5<br>Elektrolitik Tavlı ya da Kalaylı Bakır |
| <b>2 - Yalıtkan</b>       | EN 50290-2-26 HFFR Kompaund                                                                       |
| <b>3 - Yalıtım Renk</b>   | DIN 47100                                                                                         |
| <b>4 - Bireysel Ekran</b> | Pes Bant + Kalaylı Bakır Toprak Teli + Pes Bant                                                   |
| <b>5 - Büküm</b>          | Bireysel ekranlanmış çiftlerin katlar halinde bükümü                                              |
| <b>6 - Ayırıcı Bant</b>   | Pes Bant                                                                                          |
| <b>7 - Genel Ekran</b>    | Kalaylı Toprak Teli + Al-Pes Bant                                                                 |
| <b>8 - Kılıf</b>          | EN 50290-2-27 HFFR Kompaund                                                                       |
| <b>9 - Kılıf Rengi</b>    | RAL 7001 Gri                                                                                      |

## CONSTRUCTION

|                              |                                                      |
|------------------------------|------------------------------------------------------|
| <b>1 - Conductor</b>         | IEC 60228; DIN VDE 0295; EN 60228 Class 2 or Class 5 |
| <b>2 - Insulation</b>        | Electrolytic Bare or Tinned Copper                   |
| <b>3 - Colour Code</b>       | EN 50290-2-26 HFFR Compound                          |
| <b>4 - Individual Screen</b> | DIN 47100                                            |
| <b>5 - Stranding</b>         | Pes Tape + Tinned Copper Drain Wire + Pes Tape       |
| <b>6 - Wrapping</b>          | Individually screened pairs in layers                |
| <b>7 - Overall Screen</b>    | Pes Tape                                             |
| <b>8 - Sheath</b>            | Tinned Copper Drain Wire + Al-Pes Tape               |
| <b>9 - Sheath Colour</b>     | EN 50290-2-27 HFFR Compound<br>RAL 7001 Grey         |

## TEKNİK ÖZELLİKLER TECHNICAL CHARACTERISTICS

| İLETKEN DİRENCİ<br>CONDUCTOR RESISTANCE |      | YALITIM DİRENCİ (500V)<br>INSULATION RESISTANCE (500V)                | EFEKTİF KAPASİTE (MAX)<br>MUTUAL CAPACITANCE (MAX) |      | AKIM TAŞIMA KAPASİTESİ (25°C)<br>CURRENT CARRYING CAPACITY (25°C) | ÇALIŞMA VOLTAJI<br>OPERATING VOLTAGE | TEST VOLTAJI<br>TEST VOLTAGE                                       |                                                                 |                                                             |                                                      |
|-----------------------------------------|------|-----------------------------------------------------------------------|----------------------------------------------------|------|-------------------------------------------------------------------|--------------------------------------|--------------------------------------------------------------------|-----------------------------------------------------------------|-------------------------------------------------------------|------------------------------------------------------|
| mm <sup>2</sup>                         | Ω/km | 0,22/0,34mm <sup>2</sup> = 200MΩxkm<br>>0,50mm <sup>2</sup> = 20MΩxkm | mm <sup>2</sup>                                    | pF/m | mm <sup>2</sup>                                                   | A                                    | 0,22/0,34mm <sup>2</sup> = 250V<br>>0,50mm <sup>2</sup> = 300/500V | 0,22/0,34mm <sup>2</sup> = 1500V<br>0,50mm <sup>2</sup> = 2000V |                                                             |                                                      |
| 0,22                                    | 79   |                                                                       | 0,22                                               | 210  | 0,22                                                              | 2,5                                  |                                                                    |                                                                 |                                                             |                                                      |
| 0,34                                    | 56   |                                                                       | 0,34                                               | 210  | 0,34                                                              | 4,5                                  |                                                                    |                                                                 |                                                             |                                                      |
| 0,50                                    | 39   |                                                                       | 0,50                                               | 220  | 0,50                                                              | 6,0                                  |                                                                    |                                                                 |                                                             |                                                      |
| 0,75                                    | 26   |                                                                       | 0,75                                               | 220  | 0,75                                                              | 13                                   |                                                                    |                                                                 |                                                             |                                                      |
| 1,0                                     | 19,5 |                                                                       | 1,0                                                | 230  | 1,0                                                               | 16                                   |                                                                    |                                                                 |                                                             |                                                      |
| 1,5                                     | 13,3 |                                                                       | 1,5                                                | 240  | 1,5                                                               | 20                                   |                                                                    |                                                                 |                                                             |                                                      |
| 2,5                                     | 7,98 |                                                                       | 2,5                                                | 250  | 2,5                                                               | 25                                   |                                                                    |                                                                 |                                                             |                                                      |
| BÜKÜLME YARIÇAPI<br>BENDING RADIUS      |      | ÇALIŞMA SICAKLIĞI<br>TEMPERATURE RANGE                                | EMPEDANS (YAKLAŞIK)<br>IMPEDANCE (APPROX.)         |      | İNDÜKTANS (YAKLAŞIK)<br>INDUCTANCE (APPROX.)                      |                                      | ALEV GECİKTİRİCİLİK TESTİ<br>FLAME RETARDANT TEST                  | DUMAN YOĞUNLUĞU TESTİ<br>SMOKE DENSITY TEST                     | KOROZİF GAZ TESTİ<br>TEST ON CORROSIVENESS<br>OF COMBUSTION | ALEV YAYILIMI TESTİ<br>FLAME PROPAGATION<br>TEST     |
| 7,5x Cable Ø                            |      | -30°C - +70°C                                                         | 78Ω                                                |      | 0,67mH/km                                                         |                                      | IEC 60332-1-2<br>VDE 0482-332-1-2<br>EN 60332-1-2                  | IEC 61034-2<br>VDE 0482-1034-2<br>EN 61034-2                    | IEC 60754-2<br>VDE 0482-754-1/2<br>EN 60754-2               | IEC 60332-3-24<br>VDE 0482-332-3-24<br>EN 60332-2-24 |

## NOTLAR NOTES

Esnek yapıları ile dar alanlarda rahatlıkla uygulanabilirler.  
Bu tip kablolar dış ortamlarda kullanılmaz.

\*EMC: Elektromanyetik uyumlu

With their flexible design they can be easily used in narrow spaces.  
These cables are not suitable for outdoor installation.

\*EMC: Electromagnetic compatibility

HALOJENSİZLİK TESTİ  
HALOGEN FREE TEST

IEC 60754-1  
VDE 0482-754-2  
EN 60754-2

## LIH(ST)CH PIMF



İYİ EMC\* ÖZELLİK/ESNEK KABLO YAPISI/İNCELTİLMİŞ DIŞ ÇAP/KÜÇÜK BÜKÜLME YARIÇAPI/  
ALEV GECİKTİRİCİ/ÖZELLİK DÜŞÜK DUMAN YOĞUNLUĞU/ZEHİRLİ VE KOROZİF GAZLARDAN ARINDIRILMIŞ  
GOOD EMC\* CHARACTERISTIC/FLEXIBLE CABLE DESIGN/REDUCED OUTER DIAMETER/SMALL BENDING RADIUS/  
FLAME RETARDANT CHARACTERISTIC/LOW SMOKE EMISSION/WITHOUT POISONED AND CORROSIVE GASES



## KULLANIM ALANLARI

Elektromanyetik karışım ve girişimlerin olduğu  
İnsanların yoğun olarak bulunduğu kapalı ortamlarda:

- Enstrüman ve Kontrol Mühendisliğinde
- Endüstriyel Elektronikte
- Bilgisayar ve Ofis Makinelerinde
- Bina İçi Haberleşme Sistemleri
- Bina İçi Ses Düzenleri

## KABLO YAPISI

- 1 - İletken** IEC 60228; DIN VDE 0295; EN 60228 Sınıf 2 ya da Sınıf 5  
Elektrolitik Tavlı ya da Kalaylı Bakır
- 2 - Yalıtkan** EN 50290-2-26 HFFR Kompaund
- 3 - Yalıtım Renk** DIN 47100
- 4 - Bireysel Ekran** Pes Bant + Kalaylı Bakır Toprak Teli + Pes Bant
- 5 - Büküm** Bireysel ekranlanmış çiftlerin katlar halinde bükümü
- 6 - Ayırıcı Bant** Pes Bant
- 7 - Genel Ekran** Kalaylı Toprak Teli + Al-Pes Bant +  
Kalaylı Bakır Tel Örgü
- 8 - Kılıf** EN 50290-2-27 HFFR Kompaund
- 9 - Kılıf Rengi** RAL 7001 Gri

## TEKNİK ÖZELLİKLER

## TECHNICAL CHARACTERISTICS

| İLETKEN DİRENCİ<br>CONDUCTOR RESISTANCE | YALITIM DİRENCİ (500V)<br>INSULATION RESISTANCE (500V)                | EFEKTİF KAPASİTE (MAX)<br>MUTUAL CAPACITANCE (MAX) |
|-----------------------------------------|-----------------------------------------------------------------------|----------------------------------------------------|
| mm <sup>2</sup> Ω/km                    | 0,22/0,34mm <sup>2</sup> = 200MΩxkm<br>>0,50mm <sup>2</sup> = 20MΩxkm | mm <sup>2</sup> pF/m                               |
| 0,22 79                                 |                                                                       | 0,22 210                                           |
| 0,34 56                                 |                                                                       | 0,34 210                                           |
| 0,50 39                                 |                                                                       | 0,50 220                                           |
| 0,75 26                                 |                                                                       | 0,75 220                                           |
| 1,0 19,5                                |                                                                       | 1,0 230                                            |
| 1,5 13,3                                |                                                                       | 1,5 240                                            |
| 2,5 7,98                                |                                                                       | 2,5 250                                            |
| BÜKÜLME YARIÇAPI<br>BENDING RADIUS      | ÇALIŞMA SICAKLIĞI<br>TEMPERATURE RANGE                                | EMPEDANS (YAKLAŞIK)<br>IMPEDANCE (APPROX.)         |
| 7,5x Cable Ø                            | -30°C - +70°C                                                         | 78Ω                                                |
|                                         |                                                                       | İNDÜKTANS (YAKLAŞIK)<br>INDUCTANCE (APPROX.)       |
|                                         |                                                                       | 0,67mH/km                                          |

## APPLICATION

- In places where electro-magnetic interference and influence exists  
Indoors where people are intensely populated
- Instrumentation and Control Engineering
  - Industrial Electronics
  - Computers and Office Machines
  - Indoor Communication Systems
  - Indoor Voice Systems

## CONSTRUCTION

- 1 - Conductor** IEC 60228; DIN VDE 0295; EN 60228 Class 2 or Class 5  
Electrolytic Bare or Tinned Copper
- 2 - Insulation** EN 50290-2-26 HFFR Compound
- 3 - Colour Code** DIN 47100
- 4 - Individual Screen** Pes Tape + Tinned Copper Drain Wire + Pes Tape
- 5 - Stranding** Individually screened pairs in layers
- 6 - Wrapping** Pes Tape
- 7 - Overall Screen** Tinned Copper Drain Wire + Al-Pes Tape +  
Tinned Copper Braid
- 8 - Sheath** EN 50290-2-27 HFFR Compound
- 9 - Sheath Colour** RAL 7001 Grey

| AKIM TAŞIMA KAPASİTESİ (25°C)<br>CURRENT CARRYING CAPACITY (25°C) |                                              | ÇALIŞMA VOLTAJİ<br>OPERATING VOLTAGE                               | TEST VOLTAJİ<br>TEST VOLTAGE                                    |
|-------------------------------------------------------------------|----------------------------------------------|--------------------------------------------------------------------|-----------------------------------------------------------------|
| mm <sup>2</sup>                                                   | A                                            | 0,22/0,34mm <sup>2</sup> = 250V<br>>0,50mm <sup>2</sup> = 300/500V | 0,22/0,34mm <sup>2</sup> = 1500V<br>0,50mm <sup>2</sup> = 2000V |
| 0,22                                                              | 2,5                                          |                                                                    |                                                                 |
| 0,34                                                              | 4,5                                          |                                                                    |                                                                 |
| 0,50                                                              | 6,0                                          |                                                                    |                                                                 |
| 0,75                                                              | 13                                           |                                                                    |                                                                 |
| 1,0                                                               | 16                                           |                                                                    |                                                                 |
| 1,5                                                               | 20                                           |                                                                    |                                                                 |
| 2,5                                                               | 25                                           |                                                                    |                                                                 |
| ALEV GECİKTİRİCİLİK TESTİ<br>FLAME RETARDANT TEST                 | DUMAN YOĞUNLUĞU TESTİ<br>SMOKE DENSITY TEST  | KOROZİF GAZ TESTİ<br>TEST ON CORROSIVENESS<br>OF COMBUSTION        | ALEV YAYILIMI TESTİ<br>FLAME PROPAGATION<br>TEST                |
| IEC 60332-1-2<br>VDE 0482-332-1-2<br>EN 60332-1-2                 | IEC 61034-2<br>VDE 0482-1034-2<br>EN 61034-2 | IEC 60754-2<br>VDE 0482-754-1/2<br>EN 60754-2                      | IEC 60332-3-24<br>VDE 0482-332-3-24<br>EN 60332-2-24            |

HALOJENSİZLİK TESTİ  
HALOGEN FREE TEST  
IEC 60754-1  
VDE 0482-754-2  
EN 60754-2

NOTLAR  
NOTES

Esnek yapıları ile dar alanlarda rahatlıkla uygulanabilirler

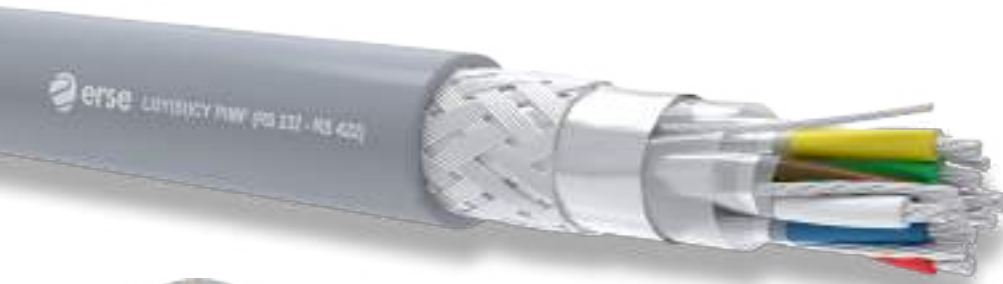
Bu tip kablolar dış ortamlarda kullanılmaz

\*EMC: Elektromanyetik uyumlu

With their flexible design they can be easily used in narrow spaces  
These cables are not suitable for outdoor installations

\*EMC: Electromagnetic compatibility

# LI2Y(St)CY PIMF (RS 232 - RS 422)



İYİ EMC\* ÖZELLİK/ESNEK KABLO YAPISI/İNCELTİLMİŞ DIŞ ÇAP/KÜÇÜK BÜKÜLME YARIÇAPI/  
ALEV GECİKTİRİCİ/ÖZELLİK/2 ÇİFTTEN 12 ÇİFTE KADAR ÜRETİLMEKTEDİR

GOOD EMC\* CHARACTERISTIC/FLEXIBLE CABLE DESIGN/REDUCED OUTER DIAMETER/SMALL BENDING RADIUS/  
FLAME RETARDANT CHARACTERISTIC/PRODUCED AT LEAST 2 PAIRS UP TO 12 PAIRS



## KULLANIM ALANLARI

- Enstrüman ve Kontrol Mühendisliğinde
- Endüstriyel Elektronik
- Bilgisayar ve Ofis Makineleri

## KABLO YAPISI

|                  |                                                               |
|------------------|---------------------------------------------------------------|
| 1-İletken        | Kalaylı Bakır                                                 |
| 2-Yalıtkan       | PE kompaund                                                   |
| 3-Bireysel Ekran | Pes Bant+Kalaylı Bakır Toprak Teli+Pes Bant                   |
| 4-Büküm          | Ekranlanmış çiftlerin katlar halinde bükümü                   |
| 5-Ayrıcı Bant    | Pes Bant                                                      |
| 6-Ekran          | Kalaylı Toprak Teli + Al-Pes Bant +<br>Kalaylı Bakır Tel Örgü |
| 7-Kılıf          | PVC Kompaund                                                  |
| 8-Kılıf Rengi    | RAL 7001 Gri                                                  |

## APPLICATION

- Instrumentation and Control Engineering
- Industrial Electronics
- Computers and Office Machines

## CONSTRUCTION

|                     |                                                                 |
|---------------------|-----------------------------------------------------------------|
| 1-Conductor         | Tinned Copper                                                   |
| 2-Insulation        | PE compound                                                     |
| 3-Individual Screen | Pes Tape+Tinned Copper Drain Wire+Pes Tape                      |
| 4-Stranding         | Screened, pairs in layers                                       |
| 5-Wrapping          | Pes Tape                                                        |
| 6-Screen            | Tinned Copper Drain Wire + Al-Pes Tape +<br>Tinned Copper Braid |
| 7-Sheath            | PVC Compound                                                    |
| 8-Sheath Colour     | RAL 7001 Grey                                                   |

## TEKNİK ÖZELLİKLER TECHNICAL CHARACTERISTICS

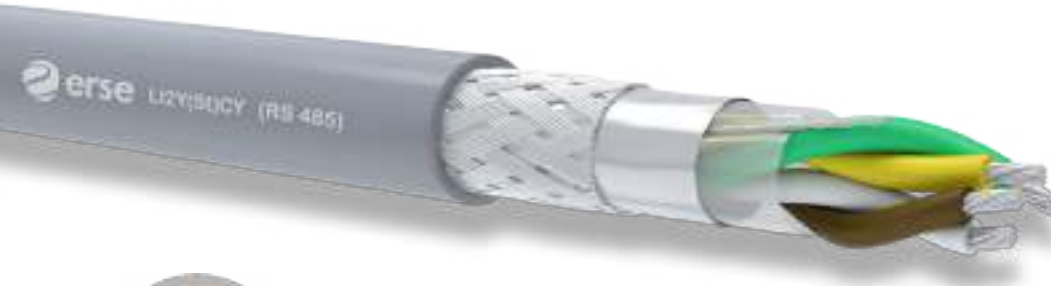
| İLETKEN DİRENCİ<br>CONDUCTOR RESISTANCE    | YALITIM DİRENCİ (500V)<br>INSULATION RESISTANCE (500V) | ÇALIŞMA VOLTAJİ<br>OPERATING VOLTAGE                 |
|--------------------------------------------|--------------------------------------------------------|------------------------------------------------------|
| mm <sup>2</sup> Ω/km<br>0,22 79<br>0,34 56 | 500MΩxkm                                               | 300V                                                 |
| TEST VOLTAJİ<br>TEST VOLTAGE               | BÜKÜLME YARIÇAPI<br>BENDING RADIUS                     | KARAKTERİSTİK EMPEDANS<br>CHARACTERISTIC IMPEDANCE   |
| 1200V                                      | 10x Cable Ø                                            | 100±15%                                              |
| ÇALIŞMA SICAKLIĞI<br>TEMPERATURE RANGE     | ALEV GECİKTİRİCİLİK TESTİ<br>FLAME RETARDANT TEST      | EFEKTİF KAPASİTE (1KHz)<br>MUTUAL CAPACITANCE (1KHz) |
| -20°C - +70°C                              | IEC 60332-1-2<br>VDE 0482-332-1-2<br>EN 60332-1-2      | mm <sup>2</sup> pF/m<br>0,22 52                      |
| YAYILMA HIZI<br>VELOCITY OF PROPAGATION    | AKIM TAŞIMA KAPASİTESİ<br>CURRENT CARRYING CAPACITY    |                                                      |
| 76%                                        | 0,22mm <sup>2</sup> = 2,5 A                            |                                                      |

## NOTLAR NOTES

RS-232: Çok bilinen arabirim standartıdır. İki cihaz arasında seri bilgi alışverişi için tasarlanmıştır. Uygun kablo ile 15-31 metre uzaklığa bilgi gönderilebilir. 20Kbps'ye kadar bilgi iletimine izin verir  
RS-422: İki serili bir haberleşme standardıdır. RS 422'e dayalı haberleşme sistemleri vericiyle alıcı arasındaki çiftlenmiş damarlar üzerindeki dijital bilgiyle haberleşmektedir. Cihazlar 1220 metre uzağa bir tekrarlayıcı gerekmeden yerleştirilebilirler ve RS 422 sürücüler 10 alıcıya kadar (1 sürücü 10 alıcı) kablo uzunluğuna bağlı olarak 100Kbps (1200 mt de) ile 10Mbps (12 mt de) hızla haberleşebilirler. Bu sistemler dengeli çıkış ve diferansiyel giriş yaparak RS 232 gibi tek uçlu sistemlere göre daha iyi bir gürültü bağışıklığı sağlarlar. Böylece RS 422 kullanan bağlantılar RS 232 kullanan bağlantılara kıyasla daha uzağa daha yüksek bit hızlarında veri gönderirler. RS 422 noktadan çoklu noktaya bağlantılar da oluşturabilmesine de olanak sağlar. Ama yine de ana birimin bağımlı birimden bilgi alabilmesi için RS-485 cihazları gerekir.

RS-232: it is a well-known interface standard. It is designed for serial data exchange between two devices. Data can be transmitted 15 - 31 meters by a suitable cable. It allows data transmission up to 20Kbps  
RS 422: It is as a two serial communication standard and more correctly named as EIA/TIA-422. Communication systems based on RS-422 communicate digital information over twisted pair wire from transmitters to receivers. Devices can be apart from each other up to 1220 meter without any repeaters and RS 422 drivers can transmit to up to 10 receivers (1 driver 10 receivers) and RS 422 systems can communicate at rate from 100Kbps (at 1200 m) up to 10Mbps (at 12 m) varying by cable length. This systems utilize balanced outputs and differential inputs. As a result, they provide better noise immunity than single-ended systems such as RS 232. Thus links using RS 422 operate over longer distance at higher speed than links using RS 232. RS 422 also makes it possible to create point-to-multipoint connections but RS-485 devices are required for master to receive data back from each slave.

# LI2Y(St)CY (RS 485)



İYİ EMC\* ÖZELLİK/ESNEK KABLO YAPISI/İNCELTİLMİŞ DIŞ ÇAP/KÜÇÜK BÜKÜLME YARIÇAPI/  
ALEV GECİKTİRİCİ ÖZELLİK/1 ÇİFTTEN 4 ÇİFTE KADAR ÜRETİLMEKTEDİR  
GOOD EMC\* CHARACTERISTIC/FLEXIBLE CABLE DESIGN/SMALL BENDING RADIUS/  
FLAME RETARDANT CHARACTERISTIC/PRODUCED AT LEAST 1 PAIR UP TO 4 PAIRS



## KULLANIM ALANLARI

- Kontrol Mühendisliğinde
- Endüstriyel Elektronik
- Bilgisayar ve Ofis Makineleri

## APPLICATION

- Control Engineering
- Industrial Electronics
- Computers and Office Machines

## KABLO YAPISI

|                |                                                               |
|----------------|---------------------------------------------------------------|
| 1-İletken      | Kalaylı Bakır (7X0,20=0,22mm <sup>2</sup> , 24 AWG)           |
| 2-Yalıtkan     | PE Kompaund                                                   |
| 3-Büküm        | Çift büküm katlar halinde                                     |
| 4-Ayırıcı Bant | Pes Bant                                                      |
| 5-Genel Ekran  | Kalaylı Toprak Teli + Al-Pes Bant +<br>Kalaylı Bakır Tel Örgü |
| 6-Kılıf        | PVC Kompaund                                                  |
| 7-Kılıf Rengi  | RAL 7001 Gri                                                  |

## CONSTRUCTION

|                 |                                                                                |
|-----------------|--------------------------------------------------------------------------------|
| 1-Conductor     | Tinned Copper (7X0,20=0,22mm <sup>2</sup> , 24 AWG)                            |
| 2-Insulation    | PE Compound                                                                    |
| 3-Stranding     | Pairwise, pairs in layers                                                      |
| 4-Wrapping      | Pes Tape                                                                       |
| 5-Screen        | Tinned Copper Drain Wire + Al-Pes Tape +<br>Tinned Copper Braid (65% Coverage) |
| 6-Sheath        | PVC Compound                                                                   |
| 7-Sheath Colour | RAL 7001 Grey                                                                  |

## TEKNİK ÖZELLİKLER TECHNICAL CHARACTERISTICS

| İLETKEN DİRENCİ<br>CONDUCTOR RESISTANCE    | YALITIM DİRENCİ (500V)<br>INSULATION RESISTANCE (500V)               | EFEKTİF KAPASİTE (1KHz)<br>MUTUAL CAPACITANCE (1KHz) |
|--------------------------------------------|----------------------------------------------------------------------|------------------------------------------------------|
| mm <sup>2</sup> Ω/km<br>0,22 79            | 500MΩxkm                                                             | 42,1pF/m                                             |
| EMPEDANS (YAKLAŞIK)<br>IMPEDANCE (APPROX.) | YAYILMA HIZI YAKLAŞIK (YAKLAŞIK)<br>VELOCITY OF PROPAGATION (APPROX) | AKIM TAŞIMA KAPASİTESİ<br>CURRENT CARRYING CAPACITY  |
| 120 Ω ±10%                                 | 67%                                                                  | mm <sup>2</sup> A<br>0,22 2,5                        |
| ÇALIŞMA VOLTAJI<br>OPERATING VOLTAGE       | TEST VOLTAJI<br>TEST VOLTAGE                                         | BÜKÜLME YARIÇAPI<br>BENDING RADIUS                   |
| 300V                                       | 1200V                                                                | 10x Cable Ø                                          |
| ÇALIŞMA SICAKLIĞI<br>TEMPERATURE RANGE     | ALEV GECİKTİRİCİLİK TESTİ<br>FLAME RETARDANT TEST                    |                                                      |
| -40°C - +70°C                              | IEC 60332-1-2<br>VDE 0482-332-1-2<br>EN 60332-1-2                    |                                                      |

## NOTLAR NOTES

RS-485: EIA (ABD Elektronik Endüstrisi Birliği) tarafından EIA/TIA-485 olarak tanımlanmış iki serili bir haberleşme standardıdır. RS-485'e dayalı haberleşme sistemleri vericiyle alıcı arasındaki çiftlenmiş damarlar üzerindeki dijital bilgiyle haberleşmektedir. Cihazlar 1220 mt uzağa bir tekrarlayıcı gerekmeden yerleştirilebilirler, 32 RS-485 verici-alıcı veri taşıtı (32 sürücü 32 alıcı) oluşturulabilir ve kablo uzunluğuna bağlı olarak 100Kbps (1200 mt de) ile 10Mbps (12 mt de) hızla haberleşebilirler. Bu sistemler dengeli çıkış ve diferansiyel giriş yaparak RS 232 gibi tek uçlu sistemlere göre daha iyi bir gürültü bağımsızlığı sağlarlar. Böylece daha uzağa daha yüksek bit hızlarında veri gönderirler. RS485 iki veya dört telli network sistemlerinde kullanılabilirler. RS-485 lerin üç fazlılık kabiliyeti sayesinde çoklu verici-alıcı çiftlerinin iki kablolu çoklu bağlantı hattına bağlantısını yapabilmektedir. Ayrıca, dört telli sistemler ana bağlantı sürücüsünden tüm bağımlı alıcı birimlere ve tüm bağımlı sürücülerden ana bağlantı alıcısına bağlantı sağlamakta kullanılabilirler. RS-485: It is defined by EIA (USA Electronic Industry Association) as a two serial communication standard and more correctly named as EIA/TIA-485. Communication systems based on RS-485 communicate digital information over twisted pair wire from transmitters to receivers. Devices can be apart from each other up to 1220 meter without any repeaters and 32 RS-485 transceivers (32 drivers 32 receivers) can occupy a bus and communicate at rate from 100Kbps (at 1200 m) up to 10Mbps (at 12 m) varying by cable length. This systems utilize balanced outputs and differential inputs. As a result, they provide better noise immunity than single-ended systems such as RS 232. Thus links using RS-485 operate over longer distance at higher speed than links using RS 232. RS-485 can be used in two and four-wire networked systems and tri-state capabilities of RS-485 transmitters enable multiple transceivers to be connected to a two-wire multidrop bus. Also fourwire systems can be used master node driver to be connected to all slave receivers and all slave drivers to be connected to master receiver.

# PROFIBUS-DP



İYİ EMC\* ÖZELLİK / HIZLI VERİ ALIŞ-VERİŞİ / DAHA HIZLI VE KOLAY KULLANIM VE KURULUM

GOOD EMC\* CHARACTERISTIC / HIGH SPEED DATA TRANSMISSION / QUICKER AND EASIER HARNESSING AND INSTALLATION



## KULLANIM ALANLARI

- Scada sistemlerinde
- Su ve Doğalgaz Dağıtım Şebekelerinde
- Elektrik Üretim ve Dağıtımında
- Akaryakıt Dolum Tesislerinde
- Elektrik Santrallerinde
- Üretim Bantlarında

## APPLICATION

- In scada systems
- Water and Natural Gas Distribution Networks
- Electric Generation and Distribution
- Fueling Stations
- Power Stations
- Production Lines

## KABLO YAPISI

- 1 - İletken Elektrolitik Bakır (0,64 mm, 22 AWG)
- 2 - Yalıtkan Köpük PE
- 3 - Yalıtım Renk A Teli Yeşil - B Teli Kırmızı
- 4 - 1.Ekran Pes Bant + Al-Pes Bant
- 5 - 2.Ekran Kalaylı Bakır Örgü (Min 85% Kapama)
- 6 - Kılıf PVC Kompaund
- 7 - Kılıf Rengi RAL 4001 Mor

## CONSTRUCTION

- 1 - Conductor Electrolytic Copper (0,64 mm, 22 AWG)
- 2 - Insulation Foam PE
- 3 - Stranding A Wire Green- B Wire Red
- 4 - 1.Screen Pes Tape + Al-Pes Tape
- 5 - 2.Screen Tinned Copper Braid (Min 85% Coverage)
- 6 - Sheath PVC Compound
- 7 - Sheath Colour RAL 4001 Violet

## TEKNİK ÖZELLİKLER TECHNICAL CHARACTERISTICS

| ÇEVİRİM DİRENCİ<br>LOOP RESISTANCE | YALITIM DİRENCİ (500V)<br>INSULATION RESISTANCE (500V) | ÇALIŞMA VOLTAJİ<br>OPERATING VOLTAGE | TEST VOLTAJİ (DAMAR/DAMAR)<br>TEST VOLTAGE (CORE/CORE) | BÜKÜLME YARIÇAPI<br>BENDING RADIUS | KARAKTERİSTİK<br>EMPEDANS<br>CHARACTERISTIC<br>IMPEDANCE | EFEKTİF KAPASİTE<br>MUTUAL<br>CAPACITANCE | ÇALIŞMA SICAKLIĞI<br>TEMPERATURE RANGE | ALEV GECİKTİRİCİLİK<br>TESTİ<br>FLAME RETARDANT TEST |
|------------------------------------|--------------------------------------------------------|--------------------------------------|--------------------------------------------------------|------------------------------------|----------------------------------------------------------|-------------------------------------------|----------------------------------------|------------------------------------------------------|
| 110Ωxkm                            | 1000MΩxkm                                              | 300V                                 | 1200V                                                  | 12x Cable Ø                        | 150Ω ± 15%                                               | 30nF/km                                   | -40°C - +70°C                          | IEC 60332-1-2<br>VDE 0482-332-1-2<br>EN 60332-1-2    |

## NOTLAR NOTES

Profibus: Scada sisteminde yer alan ana bilgisayar ile diğer bilgisayarlar, sensörler, motorlar, termokupullar otomatik vanalar gibi cihazların bağlantısını tek bir hat üzerinden yapma sistemi.

Scada: Coğrafik olarak geniş bir alana yayılmış cihazların bir merkezden bilgisayar aracılığıyla denetlenmesini, izlenmesini ve bir mantık içinde işletilmesini sağlayan sistemlere verilen genel isim.

Profibus: A connection system of host computer and other computers, sensors, motors, thermocouples, automatic valves which are parts of scada system on a single line.

Scada: A generic name for systems that allow inspection, monitoring and operating under a logic of devices sprawling over a wide geographical area from a center by means of computers.

\* EMC: compatible for electromagnetic compatibility

| BİLGİ İLETİM HIZI<br>DATA TRANSFER RATE<br>(Kbps) | MAX HAT UZUNLUĞU<br>MAX SEGMENT LENGTH<br>(m) |
|---------------------------------------------------|-----------------------------------------------|
| 9,6                                               | 1200                                          |
| 93,75                                             | 1200                                          |
| 187,5                                             | 1000                                          |
| 500                                               | 400                                           |
| 1200                                              | 200                                           |
| 12000                                             | 100                                           |

## ZAYIFLAMALAR ATTENUATIONS

| BİLGİ İLETİM HIZI<br>DATA TRANSFER RATE<br>(Kbps) | ZAYIFLAMA<br>ATTENUATION |
|---------------------------------------------------|--------------------------|
| 9,6kHz                                            | 2,5dB/km                 |
| 38,4kHz                                           | 4dB/km                   |
| 4MHz                                              | 22dB/km                  |
| 16MHz                                             | 42dB/km                  |

# PROFIBUS-PA



İYİ EMC\* ÖZELLİK / HIZLI VERİ ALIŞ-VERİŞİ / DAHA HIZLI VE KOLAY KULLANIM VE KURULUM

GOOD EMC\* CHARACTERISTIC / HIGH SPEED DATA TRANSMISSION / QUICKER AND EASIER HARNESSING AND INSTALLATION



## KULLANIM ALANLARI

- Scada sistemlerinde
- Su ve Doğalgaz Dağıtım Şebekelerinde
- Elektrik Üretim ve Dağıtımında
- Akaryakıt Dolum Tesislerinde
- Elektrik Santrallerinde
- Üretim Bantlarında

## APPLICATION

- In scada systems
- Water and Natural Gas Distribution Networks
- Electric Generation and Distribution
- Fueling Stations
- Power Stations
- Production Lines

## KABLO YAPISI

|                       |                                       |
|-----------------------|---------------------------------------|
| <b>1-İletken</b>      | Solid bakır (1 mm, 18 AWG)            |
| <b>2-Yalıtkan</b>     | Köpük PE                              |
| <b>3-Yalıtım Renk</b> | A Teli Yeşil - B Teli Kırmızı         |
| <b>4-1.Ekran</b>      | Pes Bant + Al-Pes Bant                |
| <b>5-2.Ekran</b>      | Kalaylı Bakır Örgü (85% Kapama)       |
| <b>6-Kılıf</b>        | PVC Kompaund                          |
| <b>7-Kılıf Rengi</b>  | RAL 5015* Mavi ya da RAL 9005** Siyah |

## CONSTRUCTION

|                        |                                     |
|------------------------|-------------------------------------|
| <b>1-Conductor</b>     | Solid Copper (1 mm, 18 AWG)         |
| <b>2-Insulation</b>    | Foam PE                             |
| <b>3-Stranding</b>     | A Wire Green- B Wire Red            |
| <b>4-1.Screen</b>      | Pes Tape + Al Pes Tape              |
| <b>5-2.Screen</b>      | Tinned Copper Braid ( 85% Coverage) |
| <b>6-Sheath</b>        | PVC Compound                        |
| <b>7-Sheath Colour</b> | Ral 5015 Blue* or Ral 9005 Black**  |

## TEKNİK ÖZELLİKLER TECHNICAL CHARACTERISTICS

| ÇEVİRİM DİRENCİ<br>LOOP RESISTANCE                 | YALITIM DİRENCİ<br>INSULATION RESISTANCE | ÇALIŞMA VOLTAJI<br>OPERATING VOLTAGE   | TEST VOLTAJI (DAMAR/DAMAR)<br>TEST VOLTAGE (CORE/CORE) | BÜKÜLME YARIÇAPI<br>BENDING RADIUS | KARAKTERİSTİK EMPEDANS<br>CHARACTERISTIC IMPEDANCE |
|----------------------------------------------------|------------------------------------------|----------------------------------------|--------------------------------------------------------|------------------------------------|----------------------------------------------------|
| 46Ωxkm                                             | 1000MΩxkm                                | 300V                                   | 1200V                                                  | 10x Cable Ø                        | 100Ω ± 20%                                         |
| EFEKTİF KAPASİTE (MAX)<br>MUTUAL CAPACITANCE (MAX) | ZAYIFLAMA<br>ATTENUATION                 | ÇALIŞMA SICAKLIĞI<br>TEMPERATURE RANGE | ALEV GECİKTİRİCİLİK TESTİ<br>FLAME RETARDANT TEST      |                                    |                                                    |
| 54nF/km                                            | <3dB/km @ 39KHz                          | -40°C - +70°C                          | IEC 60332-1-2<br>VDE 0482-332-1-2<br>EN 60332-1-2      |                                    |                                                    |

## NOTLAR NOTES

Profibus: Scada sisteminde yer alan ana bilgisayar ile diğer bilgisayarlar, sensörler, motorlar, termokupullar otomatik vanalar gibi cihazların bağlantısını tek bir hat üzerinden yapma sistemi.

Scada: Coğrafik olarak geniş bir alana yayılmış cihazların bir merkezden bilgisayar aracılığıyla denetlenmesini, izlenmesini ve bir mantık içinde işletilmesini sağlayan sistemlere verilen genel isim.

\*RAL 5015 Mavi: Patlayıcı ve parlayıcı ortamlarda ex-proof bağlantılarda

\*\*RAL9005 Siyah: UV dayanıklılık gereken yerlerde

Profibus: A connection system of host computer and other computers, sensors, motors, thermocouples, automatic valves which are parts of scada system on a single line.

Scada: A generic name for systems that allow inspection, monitoring and operating under a logic of devices sprawling over a wide geographical area from a center by means of computers.

\*RAL 5015 Blue: In explosive and flare up places as ex-proof connection

\*\*RAL 9005 Black: In places where UV resistant is required

# EIB-2Y(St)Y



KÜÇÜK BÜKÜLME YARIÇAPI/ALEV GECİKTİRİCİ ÖZELLİK  
SMALL BENDING RADIUS/FLAME RETARDANT CHARACTERISTIC



## KULLANIM ALANLARI

- Akıllı binalarda
- Aydınlatma Sisteminin Otomasyonunda
  - Güvenlik Sistemlerinin Otomasyonunda
  - Isıtma, Soğutma ve Havalandırma Otomasyonunda
  - Ses ve Görüntü Sistemleri Otomasyonunda
  - Elektrik, Su ve Doğalgaz Sistemleri Otomasyonunda

## APPLICATION

- At the smart buildings
- Automation of Lighting Systems
  - Automation of Security Systems
  - Automation of Heating, Cooling, and Ventilation Systems
  - Automation of Voice and Image Systems
  - Automation of Electric, Water and Natural Gas Systems

## KABLO YAPISI

|                       |                                                                 |
|-----------------------|-----------------------------------------------------------------|
| <b>1-İletken</b>      | IEC 60228; DIN VDE 0295; EN 60228 Sınıf 1<br>Elektrolitik Bakır |
| <b>2-Yalıtkan</b>     | PE Kompaund                                                     |
| <b>3-Yalıtım Renk</b> | VDE 0815                                                        |
| <b>4-Büküm</b>        | Yıldız dörtlü                                                   |
| <b>5-Ekran</b>        | Pes Bant + Kalaylı Bakır Toprak Teli + Al-Pes Bant              |
| <b>6-Kılıf</b>        | DIN VDE 0207 bölüm-5 YM1 PVC Kompaund                           |
| <b>7-Kılıf Rengi</b>  | RAL 6018 Yeşil                                                  |

## CONSTRUCTION

|                        |                                                                  |
|------------------------|------------------------------------------------------------------|
| <b>1-Conductor</b>     | IEC 60228; DIN VDE 0295; EN 60228 Class 1<br>Electrolytic Copper |
| <b>2-Insulation</b>    | PE Compound                                                      |
| <b>3-Colour Code</b>   | VDE 0815                                                         |
| <b>4-Stranding</b>     | Star quad                                                        |
| <b>5-Screen</b>        | Pes Tape + Tinned Copper Drain Wire + Al-Pes Tape                |
| <b>6-Sheath</b>        | DIN VDE 0207 part-5 YM1 PVC Compound                             |
| <b>7-Sheath Colour</b> | RAL 6018 Green                                                   |

## TEKNİK ÖZELLİKLER TECHNICAL CHARACTERISTICS

| ÇEVİRİM DİRENCİ<br>LOOP RESISTANCE | YALITIM DİRENCİ<br>INSULATION RESISTANCE | EFEKTİF KAPASİTE (MAX)<br>MUTUAL CAPACITANCE (MAX) | ÇALIŞMA VOLTAJİ<br>OPERATING VOLTAGE | TEST VOLTAJİ (50 Hz)<br>TEST VOLTAGE (50 Hz) | BÜKÜLME YARIÇAPI<br>BENDING RADIUS |
|------------------------------------|------------------------------------------|----------------------------------------------------|--------------------------------------|----------------------------------------------|------------------------------------|
| mm Ω/km<br>0,8 73,2                | 100MΩxkm                                 | 100 nF/(1KHz)                                      | 300V                                 | 1000V                                        | 10x Cable Ø                        |

## NOTLAR NOTES

Bu tip kablolar besleme kablosu olarak ve yer altı tesisatlarında kullanılmak için uygun değildir.

This type of cables are not suitable to be used as feeder cables or for underground installations.

| ÇALIŞMA SICAKLIĞI<br>TEMPERATURE RANGE | ALEV GECİKTİRİCİLİK TESTİ<br>FLAME RETARDANT TEST |
|----------------------------------------|---------------------------------------------------|
| -30°C - +70°C                          | IEC 60332-1-2<br>VDE 0482-332-1-2<br>EN 60332-1-2 |

# EIB-H(St)H



KÜÇÜK BÜKÜLME YARIÇAPI/ALEV GECİKTİRİCİ ÖZELLİK/DÜŞÜK DUMAN YOĞUNLUĞU  
ZEHİRLİ VE KOROZİF GAZLARDAN ARINDIRILMIŞ  
SMALL BENDING RADIUS/FLAME RETARDANT CHARACTERISTIC/LOW SMOKE EMISSION/  
WITHOUT POISONED AND CORROSIVE GASES



## KULLANIM ALANLARI

- Aydınlatma Sisteminin Otomasyonunda
- Güvenlik Sistemlerinin Otomasyonunda
- Isıtma, Soğutma Ve Havalandırma Otomasyonunda
- Ses Ve Görüntü Sistemleri Otomasyonunda
- Elektrik, Su Ve Doğalgaz Sistemleri Otomasyonunda
- İnsan hayatının, değerli malzemelerin ve ekipmanların korunması gereken yerlerde

## APPLICATION

- Automation Of Lighting Systems
- Automation Of Security Systems
- Automation Of Heating,Cooling,And Ventilation Systems
- Automation Of Voice And Image Systems
- Automation Of Electric, Water And Natural Gas Systems
- In places where human life and valuable materials and equipment need to be protected

## KABLO YAPISI

|                       |                                                               |
|-----------------------|---------------------------------------------------------------|
| <b>1-İletken</b>      | IEC 60228;DIN VDE 0295;EN 60228 Sınıf 1<br>Elektrolitik Bakır |
| <b>2-Yalıtkan</b>     | PE Kompaund                                                   |
| <b>3-Yalıtım Renk</b> | VDE 0815                                                      |
| <b>4-Büküm</b>        | Yıldız dörtlü                                                 |
| <b>5-Ekran</b>        | Pes Bant + Kalaylı Bakır Toprak Teli + Al-Pes Bant            |
| <b>6-Kılıf</b>        | HFFR Kompaund                                                 |
| <b>7-Kılıf Rengi</b>  | RAL 6018 Yeşil                                                |

## CONSTRUCTION

|                        |                                                                |
|------------------------|----------------------------------------------------------------|
| <b>1-Conductor</b>     | IEC 60228;DIN VDE 0295;EN 60228 Class 1<br>Electrolytic Copper |
| <b>2-Insulation</b>    | PE Compound                                                    |
| <b>3-Colour Code</b>   | VDE 0815                                                       |
| <b>4-Stranding</b>     | Star quad                                                      |
| <b>5-Screen</b>        | Pes Tape + Tinned Copper Drain Wire + Al-Pes Tape              |
| <b>6-Sheath</b>        | HFFR Compound                                                  |
| <b>7-Sheath Colour</b> | RAL 6018 Green                                                 |

## TEKNİK ÖZELLİKLER TECHNICAL CHARACTERISTICS

| ÇEVİRİM DİRENCİ<br>LOOP RESISTANCE | YALITIM DİRENCİ<br>INSULATION RESISTANCE | EFEKTİF KAPASİTE (MAX)<br>MUTUAL CAPACITANCE (MAX) |
|------------------------------------|------------------------------------------|----------------------------------------------------|
| mm Ω/km<br>0,8 73,2                | 100MΩxkm                                 | nF/(1KHz)                                          |

| ÇALIŞMA VOLTAJİ<br>OPERATING VOLTAGE | TEST VOLTAJİ (50 Hz)<br>TEST VOLTAGE (50 Hz) | BÜKÜLME YARIÇAPI<br>BENDING RADIUS | ÇALIŞMA SICAKLIĞI<br>TEMPERATURE RANGE |
|--------------------------------------|----------------------------------------------|------------------------------------|----------------------------------------|
| 300V                                 | 1000V                                        | 10x Cable Ø                        | -30°C - +70°C                          |

## NOTLAR NOTES

Bu tip kablolar besleme kablosu olarak ve yer altı tesisatlarında kullanılmak için uygun değildir.

This type of cables are not suitable to be used as feeder cables or for underground installations.

| ALEV GECİKTİRİCİLİK TESTİ<br>FLAME RETARDANT TEST | DUMAN YOĞUNLUĞU TESTİ<br>SMOKE DENSITY TEST  | KOROZİF GAZ TESTİ<br>TEST ON CORROSIVENESS<br>OF COMBUSTION | ALEV YAYILIMI TESTİ<br>FLAME PROPAGATION<br>TEST     |
|---------------------------------------------------|----------------------------------------------|-------------------------------------------------------------|------------------------------------------------------|
| IEC 60332-1-2<br>VDE 0482-332-1-2<br>EN 60332-1-2 | IEC 61034-2<br>VDE 0482-1034-2<br>EN 61034-2 | IEC 60754-2<br>VDE 0482-754-2<br>EN 60754-2                 | IEC 60332-3-25<br>VDE 0482-332-3-25<br>EN 60332-2-25 |

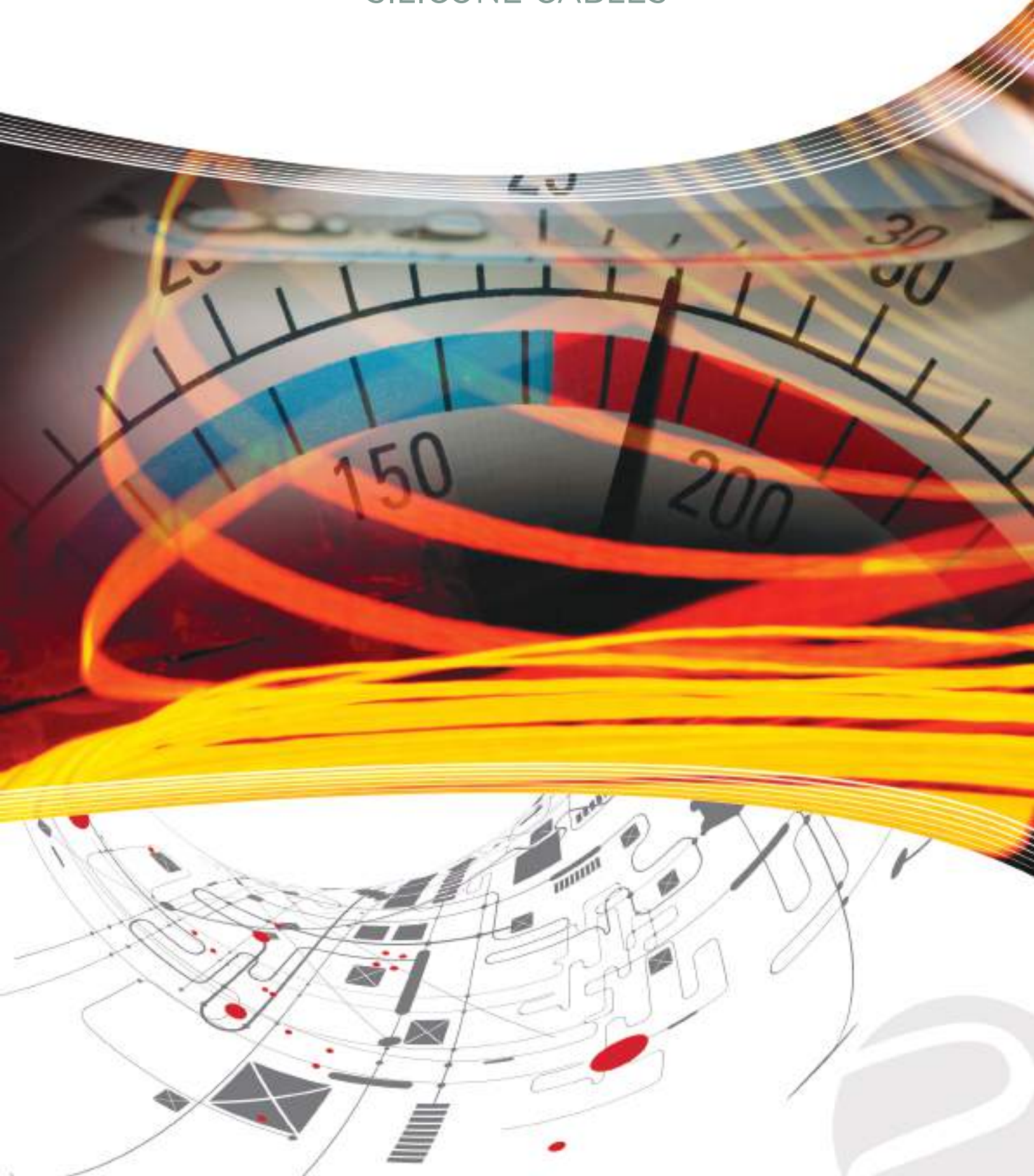
HALOJENSİZLİK TESTİ  
HALOGEN FREE TEST

IEC 60754-1  
VDE 0482-754-1  
EN 60754-1  
BS EN 60754-1



***SIMH VITAL***

**SİLİKON KABLOLAR**  
SILICONE CABLES



|                   |     |
|-------------------|-----|
| SIA .....         | 201 |
| SI AF .....       | 202 |
| N2GF AF .....     | 203 |
| SIMH (SIHF) ..... | 204 |
| SIMH-PLUS .....   | 205 |
| SIMH-C1 .....     | 206 |
| SIMH-C2 .....     | 207 |

# SIA H05S-U & H07S-U



ALEV GECİKTİRİCİ ÖZELLİK/DÜŞÜK DUMAN YOĞUNLUĞU/ZEHİRLİ VE KOROZİF GAZLARDAN ARINDIRILMIŞ/  
YÜKSEK ISIYA DAYANIKLI/DÜŞÜK ISIYA DAYANIKLI  
FLAME RETARDANT CHARACTERISTIC/LOW SMOKE EMISSION/WITHOUT POISONED AND CORROSIVE GASES  
HIGH TEMPERATURE RESISTANT/LOW TEMPERATURE RESISTANT



## KULLANIM ALANLARI

- Yüksek ısı bulunan makina ve ortamlarda
- Düşük ısı bulunan ortamlarda
- Demir Çelik Endüstrisinde
- Cam Sanayisinde
- Brülörlerde
- Isıtma ve Aydınlatma Sistemlerinde
- Beyaz Eşya Sektöründe
- İnsan hayatının, değerli malzemelerin ve ekipmanların korunması gereken yerlerde

## APPLICATION

- High-temperature machines and environments
- Low-temperature environments
- Iron and Steel Industries
- Glass Industries
- Burners
- Heating and Lighting Systems
- White Goods Sector
- In places where human life and valuable materials and equipment need to be protected

## KABLO YAPISI

- 1-İletken** IEC 60228; DIN VDE 0295; EN 60228  
Sınıf 1 Elektrolitik Tavlı Bakır
- 2-Yalıtkan** Silikon Kompaund EN 50363-1 EI2

## CONSTRUCTION

- 1-Conductor** IEC 60228; DIN VDE 0295; EN 60228  
Class 1 Electrolytic Bare Copper
- 2-Insulation** Silicone Compound EN 50363-1 EI2

## TEKNİK ÖZELLİKLER

### TECHNICAL CHARACTERISTICS

| İLETKEN DİRENCİ<br>CONDUCTOR<br>RESISTANCE |      | YALITIM DİRENCİ<br>INSULATION<br>RESISTANCE | AKIM TAŞIMA<br>KAPASİTESİ<br>CURRENT CARRYING<br>CAPACITY |    | ÇALIŞMA VOLTAJII<br>OPERATING<br>VOLTAGE      | TEST VOLTAJII<br>TEST VOLTAGE                                 | BÜKÜLME YARIÇAPI<br>BENDING RADIUS                           | ÇALIŞMA SICAKLIĞII<br>TEMPERATURE RANGE                      | ALEV GECİKTİRİCİLİK TESTİ<br>FLAME RETARDANT TEST    |
|--------------------------------------------|------|---------------------------------------------|-----------------------------------------------------------|----|-----------------------------------------------|---------------------------------------------------------------|--------------------------------------------------------------|--------------------------------------------------------------|------------------------------------------------------|
| mm <sup>2</sup>                            | Ω/km | 20MΩxkm                                     | mm <sup>2</sup>                                           | A  | 300/500V (H05S-U & SIA)<br>450/750V (H07S-U ) | 2000V                                                         | 10x Cable Ø                                                  | - 60°C - +180°C                                              | IEC 60332-1-2<br>VDE 0482-332-1-2<br>EN 60332-1-2    |
| 0,75                                       | 24,5 |                                             | 0,75                                                      | 13 |                                               |                                                               |                                                              |                                                              |                                                      |
| 1,0                                        | 18,1 |                                             | 1,0                                                       | 16 |                                               |                                                               |                                                              |                                                              |                                                      |
| 1,5                                        | 12,1 |                                             | 1,5                                                       | 20 |                                               |                                                               |                                                              |                                                              |                                                      |
| 2,5                                        | 7,41 |                                             | 2,5                                                       | 25 |                                               |                                                               |                                                              |                                                              |                                                      |
| 4,0                                        | 4,61 |                                             | 4,0                                                       | 34 |                                               |                                                               |                                                              |                                                              |                                                      |
| 6,0                                        | 3,08 |                                             | 6,0                                                       | 44 |                                               |                                                               |                                                              |                                                              |                                                      |
| 10                                         | 1,83 |                                             | 10                                                        | 61 |                                               |                                                               |                                                              |                                                              |                                                      |
| 16                                         | 1,15 |                                             | 16                                                        | 82 |                                               |                                                               |                                                              |                                                              |                                                      |
|                                            |      |                                             |                                                           |    |                                               |                                                               |                                                              |                                                              |                                                      |
|                                            |      |                                             |                                                           |    |                                               | IEC 61034-2<br>VDE 0482-1034-2<br>EN 61034-2<br>BS EN 61034-2 | IEC 60754-2<br>VDE 0482-754-2<br>EN 60754-2<br>BS EN 60754-2 | IEC 60754-1<br>VDE 0482-754-1<br>EN 60754-1<br>BS EN 60754-1 | IEC 60332-3-24<br>VDE 0482-332-3-24<br>EN 60332-2-24 |

# SIAF

## H05S-K & H07S-K



KÜÇÜK BÜKÜLME YARIÇAPI/ALEV GECİKTİRİCİ ÖZELLİK/DÜŞÜK DUMAN YOĞUNLUĞU/ZEHİRLİ VE KOROZİF GAZLARDAN ARINDIRILMIŞ/YÜKSEK ISIYA DAYANIKLI/DÜŞÜK ISIYA DAYANIKLI  
SMALL BENDING RADIUS/FLAME RETARDANT CHARACTERISTIC/LOW SMOKE EMISSION/WITHOUT POISONED AND CORROSIVE GASES/HIGH TEMPERATURE RESISTANT/LOW TEMPERATURE RESISTANT



### KULLANIM ALANLARI

- Yüksek ısı bulunan makina ve ortamlarda
- Düşük ısı bulunan ortamlarda
- Demir Çelik Endüstrisinde
- Cam Sanayisinde
- Brülörlerde
- Isıtma ve Aydınlatma Sistemlerinde
- Beyaz Eşya Sektöründe
- İnsan hayatının, değerli malzemelerin ve ekipmanların korunması gereken yerlerde

### KABLO YAPISI

- 1-İletken** IEC 60228; DIN VDE 0295; EN 60228  
Sınıf 5 Bükülü Elektrolitik Tavlı Bakır
- 2-Yalıtkan** Silikon Kompaund EN 50363-1 EI2

### APPLICATION

- High-temperature machines and environments
- Low-temperature environments
- Iron and Steel Industries
- Glass Industries
- Burners
- Heating and Lighting Systems
- White Goods Sector
- In places where human life and valuable materials and equipment need to be protected

### CONSTRUCTION

- 1-Conductor** IEC 60228; DIN VDE 0295; EN 60228  
Class 5 Stranded Electrolytic Bare Copper
- 2-Insulation** Silicone Compound EN 50363-1 EI2

### TEKNİK ÖZELLİKLER TECHNICAL CHARACTERISTICS

| İLETKEN DİRENCİ<br>CONDUCTOR RESISTANCE | YALITIM DİRENCİ<br>INSULATION RESISTANCE | AKIM TAŞIMA<br>KAPASİTESİ<br>CURRENT CARRYING CAPACITY | ÇALIŞMA VOLTAJI<br>OPERATING VOLTAGE        | TEST VOLTAJI<br>TEST VOLTAGE                                  | BÜKÜLME YARIÇAPI<br>BENDING RADIUS                                | ÇALIŞMA SICAKLIĞI<br>TEMPERATURE RANGE                       | ALEV GECİKTİRİCİLİK TESTİ<br>FLAME RETARDANT TEST    |
|-----------------------------------------|------------------------------------------|--------------------------------------------------------|---------------------------------------------|---------------------------------------------------------------|-------------------------------------------------------------------|--------------------------------------------------------------|------------------------------------------------------|
| mm <sup>2</sup> Ω/km                    | 20MΩxkm                                  | mm <sup>2</sup> A                                      | 300/500V (H05S-K&SIAF)<br>450/750V (H07S-K) | 2000V                                                         | 6x Cable Ø                                                        | - 60°C - +180°C                                              | IEC 60332-1-2<br>VDE 0482-332-1-2<br>EN 60332-1-2    |
| 0,5 39                                  |                                          | 0,5 6                                                  |                                             |                                                               |                                                                   |                                                              |                                                      |
| 0,75 26                                 |                                          | 0,75 13                                                |                                             |                                                               |                                                                   |                                                              |                                                      |
| 1,0 19,5                                |                                          | 1,0 16                                                 |                                             |                                                               |                                                                   |                                                              |                                                      |
| 1,5 13,3                                |                                          | 1,5 20                                                 |                                             |                                                               |                                                                   |                                                              |                                                      |
| 2,5 7,98                                |                                          | 2,5 25                                                 |                                             |                                                               |                                                                   |                                                              |                                                      |
| 4,0 4,95                                |                                          | 4,0 34                                                 |                                             |                                                               |                                                                   |                                                              |                                                      |
| 6,0 3,30                                |                                          | 6,0 44                                                 |                                             |                                                               |                                                                   |                                                              |                                                      |
| 10 1,91                                 |                                          | 10 61                                                  |                                             |                                                               |                                                                   |                                                              |                                                      |
| 16 1,21                                 |                                          | 16 82                                                  |                                             |                                                               |                                                                   |                                                              |                                                      |
| 25 0,780                                |                                          | 25 108                                                 |                                             |                                                               |                                                                   |                                                              |                                                      |
| 35 0,554                                |                                          | 35 135                                                 |                                             |                                                               |                                                                   |                                                              |                                                      |
| 50 0,386                                |                                          | 70 207                                                 |                                             |                                                               |                                                                   |                                                              |                                                      |
| 70 0,272                                |                                          | 95 250                                                 |                                             |                                                               |                                                                   |                                                              |                                                      |
| 95 0,206                                |                                          | 120 344                                                |                                             |                                                               |                                                                   |                                                              |                                                      |
| 120 0,161                               |                                          | 150 420                                                |                                             |                                                               |                                                                   |                                                              |                                                      |
| 150 0,129                               |                                          | 185 490                                                |                                             |                                                               |                                                                   |                                                              |                                                      |
| 185 0,106                               |                                          | 240 580                                                |                                             |                                                               |                                                                   |                                                              |                                                      |
| 240 0,0801                              |                                          |                                                        |                                             |                                                               |                                                                   |                                                              |                                                      |
|                                         |                                          |                                                        |                                             | DUMAN YOĞUNLUĞU<br>TESTİ<br>SMOKE DENSITY TEST                | KOROZİF GAZ TESTİ<br>TEST ON CORROSIVENESS<br>OF COMBUSTION GASES | HALOJENSİZLİK TESTİ<br>HALOGEN-FREE TEST                     | ALEV YAYILIMI TESTİ<br>FLAME PROPAGATION<br>TEST     |
|                                         |                                          |                                                        |                                             | IEC 61034-2<br>VDE 0482-1034-2<br>EN 61034-2<br>BS EN 61034-2 | IEC 60754-2<br>VDE 0482-754-2<br>EN 60754-2<br>BS EN 60754-2      | IEC 60754-1<br>VDE 0482-754-1<br>EN 60754-1<br>BS EN 60754-1 | IEC 60332-3-24<br>VDE 0482-332-3-24<br>EN 60332-2-24 |

# N2GFAF



KÜÇÜK BÜKÜLME YARIÇAPI/ALEV GECİKTİRİCİ ÖZELLİK/DÜŞÜK DUMAN YOĞUNLUĞU/ZEHİRLİ VE KOROZİF GAZLARDAN ARINDIRILMIŞ/YÜKSEK ISIYA DAYANIKLI/DÜŞÜK ISIYA DAYANIKLI  
SMALL BENDING RADIUS/FLAME RETARDANT CHARACTERISTIC/LOW SMOKE EMISSION/WITHOUT POISONED AND CORROSIVE GASES/HIGH TEMPERATURE RESISTANT/LOW TEMPERATURE RESISTANT



## KULLANIM ALANLARI

- Yüksek ısı bulunan makina ve ortamlarda
- Düşük ısı bulunan ortamlarda
- Demir Çelik Endüstrisinde
- Cam Sanayisinde
- Brülörlerde
- Isıtma ve Aydınlatma Sistemlerinde
- Beyaz Eşya Sektöründe
- İnsan hayatının, değerli malzemelerin ve ekipmanların korunması gereken yerlerde

## KABLO YAPISI

- 1-İletken** IEC 60228; DIN VDE 0295; EN 60228  
Sınıf 5 Bükülü Elektrolitik Kalaylı Bakır
- 2-Yalıtkan** Silikon Kompaund EN 50363-1 EI2

## APPLICATION

- High-temperature machines and environments
- Low-temperature environments
- Iron and Steel Industries
- Glass Industries
- Burners
- Heating and Lighting Systems
- White Goods Sector
- In places where human life and valuable materials and equipment need to be protected

## CONSTRUCTION

- 1-Conductor** IEC 60228; DIN VDE 0295; EN 60228  
Class 5 Stranded Electrolytic Tinned Copper
- 2-Insulation** Silicone Compound EN 50363-1 EI2

## TEKNİK ÖZELLİKLER TECHNICAL CHARACTERISTICS

| İLETKEN DİRENCİ<br>CONDUCTOR<br>RESISTANCE | YALITIM DİRENCİ<br>INSULATION<br>RESISTANCE | AKIM TAŞIMA<br>KAPASİTESİ<br>CURRENT CARRYING<br>CAPACITY | ÇALIŞMA VOLTAJİ<br>OPERATING<br>VOLTAGE | TEST VOLTAJİ<br>TEST VOLTAGE                                  | BÜKÜLME YARIÇAPI<br>BENDING RADIUS                                | ÇALIŞMA SICAKLIĞI<br>TEMPERATURE RANGE                       | ALEV GECİKTİRİCİLİK TESTİ<br>FLAME RETARDANT TEST    |
|--------------------------------------------|---------------------------------------------|-----------------------------------------------------------|-----------------------------------------|---------------------------------------------------------------|-------------------------------------------------------------------|--------------------------------------------------------------|------------------------------------------------------|
| mm <sup>2</sup> Ω/km                       | 20MΩxkm                                     | mm <sup>2</sup> A                                         | 300/500V                                | 2000V                                                         | 6x Cable Ø                                                        | - 60°C - +180°C                                              | IEC 60332-1-2<br>VDE 0482-332-1-2<br>EN 60332-1-2    |
| 0,5 40,1                                   |                                             | 0,5 6                                                     |                                         |                                                               |                                                                   |                                                              |                                                      |
| 0,75 26,7                                  |                                             | 0,75 13                                                   |                                         |                                                               |                                                                   |                                                              |                                                      |
| 1,0 20                                     |                                             | 1,0 16                                                    |                                         |                                                               |                                                                   |                                                              |                                                      |
| 1,5 13,7                                   |                                             | 1,5 20                                                    |                                         |                                                               |                                                                   |                                                              |                                                      |
| 2,5 8,21                                   |                                             | 2,5 25                                                    |                                         |                                                               |                                                                   |                                                              |                                                      |
| 4,0 5,09                                   |                                             | 4,0 34                                                    |                                         |                                                               |                                                                   |                                                              |                                                      |
| 6,0 3,39                                   |                                             | 6,0 44                                                    |                                         |                                                               |                                                                   |                                                              |                                                      |
| 10 1,95                                    |                                             | 10 61                                                     |                                         |                                                               |                                                                   |                                                              |                                                      |
| 16 1,24                                    |                                             | 16 82                                                     |                                         |                                                               |                                                                   |                                                              |                                                      |
| 25 0,795                                   |                                             | 25 108                                                    |                                         |                                                               |                                                                   |                                                              |                                                      |
| 35 0,565                                   |                                             | 35 135                                                    |                                         |                                                               |                                                                   |                                                              |                                                      |
| 50 0,393                                   |                                             | 70 207                                                    |                                         |                                                               |                                                                   |                                                              |                                                      |
| 70 0,277                                   |                                             | 95 250                                                    |                                         |                                                               |                                                                   |                                                              |                                                      |
| 95 0,210                                   |                                             | 120 344                                                   |                                         |                                                               |                                                                   |                                                              |                                                      |
| 120 0,164                                  |                                             | 150 420                                                   |                                         |                                                               |                                                                   |                                                              |                                                      |
| 150 0,132                                  |                                             | 185 490                                                   |                                         |                                                               |                                                                   |                                                              |                                                      |
| 185 0,108                                  |                                             | 240 580                                                   |                                         |                                                               |                                                                   |                                                              |                                                      |
| 240 0,0817                                 |                                             |                                                           |                                         |                                                               |                                                                   |                                                              |                                                      |
|                                            |                                             |                                                           |                                         | DUMAN YOĞUNLUĞU<br>TESTİ<br>SMOKE DENSITY TEST                | KOROZİF GAZ TESTİ<br>TEST ON CORROSIVENESS<br>OF COMBUSTION GASES | HALOJENSİZLİK TESTİ<br>HALOGEN-FREE TEST                     | ALEV YAYILIMI TESTİ<br>FLAME PROPAGATION<br>TEST     |
|                                            |                                             |                                                           |                                         | IEC 61034-2<br>VDE 0482-1034-2<br>EN 61034-2<br>BS EN 61034-2 | IEC 60754-2<br>VDE 0482-754-2<br>EN 60754-2<br>BS EN 60754-2      | IEC 60754-1<br>VDE 0482-754-1<br>EN 60754-1<br>BS EN 60754-1 | IEC 60332-3-24<br>VDE 0482-332-3-24<br>EN 60332-2-24 |

## SIMH (SIHF)



KÜÇÜK BÜKÜLME YARIÇAPI/ALEV GECİKTİRİCİ ÖZELLİK/DÜŞÜK DUMAN YOĞUNLUĞU/ZEHİRLİ VE KOROZİF GAZLARDAN ARINDIRILMIŞ/YÜKSEK ISIYA DAYANIKLI/DÜŞÜK ISIYA DAYANIKLI/DEVRE BÜTÜNLÜĞÜ IEC 60331 180 DAKİKA (min.)  
SMALL BENDING RADIUS/FLAME RETARDANT CHARACTERISTIC/LOW SMOKE EMISSION/WITHOUT POISONED AND CORROSIVE GASES/HIGH TEMPERATURE RESISTANT /LOW TEMPERATURE RESISTANT/CIRCUIT INTEGRITY FOR MINIMUM 180 MINUTES IEC 60331



## KULLANIM ALANLARI

Besleme ve kontrol kablosu olarak

- Yüksek ısı bulunan makina ve ortamlarda
- Düşük ısı bulunan ortamlarda
- Demir Çelik Endüstrisinde
- Cam Sanayisinde
- Brülörlerde
- Isıtma ve Aydınlatma Sistemlerinde
- İnsan hayatının, değerli malzemelerin ve ekipmanların korunması gereken yerlerde

## KABLO YAPISI

|                       |                                                                                            |
|-----------------------|--------------------------------------------------------------------------------------------|
| <b>1-İletken</b>      | IEC 60228; DIN VDE 0295; EN 60228<br>Sınıf 5 Bükülü Elektrolitik Tavlı ya da Kalaylı Bakır |
| <b>2-Yalıtkan</b>     | Silikon Kompaund EN 50363-1 EI2                                                            |
| <b>3-Yalıtım Renk</b> | VDE 0293; TS HD 308 S2                                                                     |
| <b>4-Büküm</b>        | Uygun adımda katlar halinde                                                                |
| <b>5-Kılıf</b>        | Silikon Kompaund EN 50363-2-1 EM9                                                          |

## APPLICATION

As power and control cable

- High-temperature machines and environments
- Low-temperature environments
- Iron and Steel Industries
- Glass Industries
- Burners
- Heating and Lighting Systems
- In places where human life and valuable materials and equipment need to be protected

## CONSTRUCTION

|                      |                                                                                          |
|----------------------|------------------------------------------------------------------------------------------|
| <b>1-Conductor</b>   | IEC 60228; DIN VDE 0295; EN 60228<br>Class 5 Stranded Electrolytic Bare or Tinned Copper |
| <b>2-Insulation</b>  | Silicone Compound EN 50363-1 EI2                                                         |
| <b>3-Colour Code</b> | VDE 0293; TS HD 308 S2                                                                   |
| <b>4-Stranding</b>   | In layers of optimum pitch                                                               |
| <b>5-Sheath</b>      | Silicone Compound EN 50363-2-1 EM9                                                       |

## TEKNİK ÖZELLİKLER

## TECHNICAL CHARACTERISTICS

| İLETKEN DİRENCİ<br>CONDUCTOR<br>RESISTANCE                    | YALITIM DİRENCİ<br>INSULATION<br>RESISTANCE                       | AKIM TAŞIMA<br>KAPASİTESİ<br>CURRENT CARRYING<br>CAPACITY    | ÇALIŞMA VOLTAJI<br>OPERATING<br>VOLTAGE                           | TEST VOLTAJI<br>TEST VOLTAGE                         | BÜKÜLME YARIÇAPI<br>BENDING RADIUS | ÇALIŞMA SICAKLIĞI<br>TEMPERATURE RANGE | ALEV GECİKTİRİCİLİK TESTİ<br>FLAME RETARDANT TEST |
|---------------------------------------------------------------|-------------------------------------------------------------------|--------------------------------------------------------------|-------------------------------------------------------------------|------------------------------------------------------|------------------------------------|----------------------------------------|---------------------------------------------------|
| mm <sup>2</sup> Ω/km                                          | 20MΩxkm                                                           | mm <sup>2</sup> A                                            | 300/500V                                                          | 2000V                                                | 6x Cable Ø                         | - 60°C - +180°C                        | IEC 60332-1-2<br>VDE 0482-332-1-2<br>EN 60332-1-2 |
| 0,75    26                                                    |                                                                   | 0,75    13                                                   |                                                                   |                                                      |                                    |                                        |                                                   |
| 1,0    19,5                                                   |                                                                   | 1,0    16                                                    |                                                                   |                                                      |                                    |                                        |                                                   |
| 1,5    13,3                                                   |                                                                   | 1,5    20                                                    |                                                                   |                                                      |                                    |                                        |                                                   |
| 2,5    7,98                                                   |                                                                   | 2,5    25                                                    |                                                                   |                                                      |                                    |                                        |                                                   |
| 4,0    4,95                                                   |                                                                   | 4,0    34                                                    |                                                                   |                                                      |                                    |                                        |                                                   |
| DUMAN YOĞUNLUĞU TESTİ<br>SMOKE DENSITY TEST                   | KOROZİF GAZ TESTİ<br>TEST ON CORROSIVENESS<br>OF COMBUSTION GASES | HALOJENSİZLİK TESTİ<br>HALOGEN-FREE TEST                     | DEVRE BÜTÜNLÜĞÜ TESTİ (FE 180)<br>CIRCUIT INTEGRITY TEST (FE 180) | ALEV YAYILIMI TESTİ<br>FLAME PROPAGATION TEST        |                                    |                                        |                                                   |
| IEC 61034-2<br>VDE 0482-1034-2<br>EN 61034-2<br>BS EN 61034-2 | IEC 60754-2<br>VDE 0482-754-2<br>EN 60754-2<br>BS EN 60754-2      | IEC 60754-1<br>VDE 0482-754-1<br>EN 60754-1<br>BS EN 60754-1 | IEC 60331-21                                                      | IEC 60332-3-24<br>VDE 0482-332-3-24<br>EN 60332-2-24 |                                    |                                        |                                                   |

## SIMH-PLUS



KÜÇÜK BÜKÜLME YARIÇAPI/ALEV GECİKTİRİCİ ÖZELLİK/DÜŞÜK DUMAN YOĞUNLUĞU/ZEHİRLİ VE KOROZİF GAZLARDAN ARINDIRILMIŞ/YÜKSEK ISIYA DAYANIKLI/DÜŞÜK ISIYA DAYANIKLI/DEVRE BÜTÜNLÜĞÜ IEC 60331 180 DAKİKA (min.)  
SMALL BENDING RADIUS/FLAME RETARDANT CHARACTERISTIC/LOW SMOKE EMISSION/WITHOUT POISONED AND CORROSIVE GASES/HIGH TEMPERATURE RESISTANT/LOW TEMPERATURE RESISTANT/CIRCUIT INTEGRITY FOR MINIMUM 180 MINUTES IEC 60331



## KULLANIM ALANLARI

Besleme ve kontrol kablosu olarak

- Yüksek ısı bulunan makina ve ortamlarda
- Düşük ısı bulunan ortamlarda
- Demir Çelik Endüstrisinde
- Cam Sanayisinde
- Brülörlerde
- Isıtma ve Aydınlatma Sistemlerinde
- İnsan hayatının, değerli malzemelerin ve ekipmanların korunması gereken yerlerde

## KABLO YAPISI

- 1-İletken** IEC 60228; DIN VDE 0295; EN 60228 Sınıf 5  
Bükülü Elektrolitik Tavlı ya da Kalaylı Bakır
- 2-Yalıtkan** Özel Silikon Kompaund
- 3-Yalıtım Renk** VDE 0293; TS HD 308 S2
- 4-Büküm** Uygun adımda katlar halinde
- 5-Kılıf** Özel Silikon Kompaund

## APPLICATION

As power and control cable

- High-temperature machines and environments
- Low-temperature environments
- Iron and Steel Industries
- Glass Industries
- Burners
- Heating and Lighting Systems
- In places where human life and valuable materials and equipment need to be protected

## CONSTRUCTION

- 1-Conductor** IEC 60228; DIN VDE 0295; EN 60228 Class 5  
Stranded Electrolytic Bare or Tinned Copper
- 2-Insulation** Special Silicone Compound
- 3-Colour Code** VDE 0293; TS HD 308 S2
- 4-Stranding** In layers of optimum pitch
- 5-Sheath** Special Silicone Compound

## TEKNİK ÖZELLİKLER

## TECHNICAL CHARACTERISTICS

| İLETKEN DİRENCİ (TAVLIBAKIR)<br>CONDUCTOR RESISTANCE<br>(BARE COPPER) | YALITIM DİRENCİ<br>INSULATION RESISTANCE                          | AKIM TAŞIMA<br>KAPASİTESİ<br>CURRENT CARRYING<br>CAPACITY    | ÇALIŞMA VOLTAJİ<br>OPERATING<br>VOLTAGE                           | TEST VOLTAJİ<br>TEST VOLTAGE                         | BÜKÜLME YARIÇAPI<br>BENDING RADIUS | ÇALIŞMA SICAKLIĞI<br>TEMPERATURE RANGE | ALEV GECİKTİRİCİLİK TESTİ<br>FLAME RETARDANT TEST |
|-----------------------------------------------------------------------|-------------------------------------------------------------------|--------------------------------------------------------------|-------------------------------------------------------------------|------------------------------------------------------|------------------------------------|----------------------------------------|---------------------------------------------------|
| mm <sup>2</sup> Ω/km                                                  | 100MΩxkm                                                          | mm <sup>2</sup> A                                            | 0,6/1kV                                                           | 3500V                                                | 6x Cable Ø                         | - 60°C - +300°C                        | IEC 60332-1-2<br>VDE 0482-332-1-2<br>EN 60332-1-2 |
| 0,75    26                                                            |                                                                   | 0,75    13                                                   |                                                                   |                                                      |                                    |                                        |                                                   |
| 1,0    19,5                                                           |                                                                   | 1,0    16                                                    |                                                                   |                                                      |                                    |                                        |                                                   |
| 1,5    13,3                                                           |                                                                   | 1,5    20                                                    |                                                                   |                                                      |                                    |                                        |                                                   |
| 2,5    7,98                                                           |                                                                   | 2,5    25                                                    |                                                                   |                                                      |                                    |                                        |                                                   |
| 4,0    4,95                                                           |                                                                   | 4,0    34                                                    |                                                                   |                                                      |                                    |                                        |                                                   |
| DUMAN YOĞUNLUĞU TESTİ<br>SMOKE DENSITY TEST                           | KOROZİF GAZ TESTİ<br>TEST ON CORROSIVENESS<br>OF COMBUSTION GASES | HALOJENSİZLİK TESTİ<br>HALOGEN-FREE TEST                     | DEVRE BÜTÜNLÜĞÜ TESTİ (FE 180)<br>CIRCUIT INTEGRITY TEST (FE 180) | ALEV YAYILIMI TESTİ<br>FLAME PROPAGATION TEST        |                                    |                                        |                                                   |
| IEC 61034-2<br>VDE 0482-1034-2<br>EN 61034-2<br>BS EN 61034-2         | IEC 60754-2<br>VDE 0482-754-2<br>EN 60754-2<br>BS EN 60754-2      | IEC 60754-1<br>VDE 0482-754-1<br>EN 60754-1<br>BS EN 60754-1 | IEC 60331-21                                                      | IEC 60332-3-24<br>VDE 0482-332-3-24<br>EN 60332-2-24 |                                    |                                        |                                                   |

## SIMH-C1



KÜÇÜK BÜKÜLME YARIÇAPI/ALEV GECİKTİRİCİ ÖZELLİK/DÜŞÜK DUMAN YOĞUNLUĞU/ZEHİRLİ VE KOROZİF GAZLARDAN ARINDIRILMIŞ/YÜKSEK ISIYA DAYANIKLI/DÜŞÜK ISIYA DAYANIKLI/DEVRE BÜTÜNLÜĞÜ IEC 60331 180 DAKİKA (min.)  
SMALL BENDING RADIUS/FLAME RETARDANT CHARACTERISTIC/LOW SMOKE EMISSION/WITHOUT POISONED AND CORROSIVE GASES/HIGH TEMPERATURE RESISTANT/LOW TEMPERATURE RESISTANT/CIRCUIT INTEGRITY FOR MINIMUM 180 MINUTES IEC 60331



## KULLANIM ALANLARI

Besleme ve kontrol kablosu olarak

- Yüksek ısı bulunan makina ve ortamlarda
- Düşük ısı bulunan ortamlarda
- Demir Çelik Endüstrisinde
- Cam Sanayisinde
- Brülörlerde
- Isıtma ve Aydınlatma Sistemlerinde
- İnsan hayatının, değerli malzemelerin ve ekipmanların korunması gereken yerlerde

## KABLO YAPISI

|                       |                                                                              |
|-----------------------|------------------------------------------------------------------------------|
| <b>1-İletken</b>      | IEC 60228; DIN VDE 0295; EN 60228 Sınıf 5<br>Bükülü Elektrolitik Tavlı Bakır |
| <b>2-Yalıtkan</b>     | Silikon Kompaund EN 50363-1 EI2                                              |
| <b>3-Yalıtım Renk</b> | VDE 0293; TS HD 308 S2                                                       |
| <b>4-Büküm</b>        | Uygun adımda katlar halinde                                                  |
| <b>5-Ayırıcı Bant</b> | Pes Bant                                                                     |
| <b>6-Ekran</b>        | Kalaylı Bakır Örgü (85% Kapama)                                              |
| <b>7-Kılıf</b>        | Silikon Kompaund EN 50363-2-1 EM9                                            |

## APPLICATION

As a power and control cable

- High-temperature machines and environments
- Low-temperature environments
- Iron and Steel Industries
- Glass Industries
- Burners
- Heating and Lighting Systems
- In places where human life and valuable materials and equipment need to be protected

## CONSTRUCTION

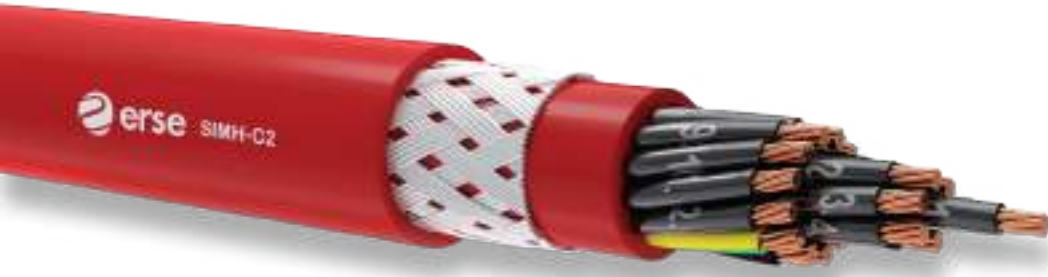
|                      |                                                                                |
|----------------------|--------------------------------------------------------------------------------|
| <b>1-Conductor</b>   | IEC 60228; DIN VDE 0295; EN 60228 Class 5<br>Stranded Electrolytic Bare Copper |
| <b>2-Insulation</b>  | Silicone Compound EN 50363-1 EI2                                               |
| <b>3-Colour Code</b> | VDE 0293; TS HD 308 S2                                                         |
| <b>4-Stranding</b>   | In layers of optimum pitch                                                     |
| <b>5-Wrapping</b>    | Pes Tape                                                                       |
| <b>6-Screen</b>      | Tinned Copper Braid (85% Coverage)                                             |
| <b>7-Sheath</b>      | Silicone Compound EN 50363-2-1 EM9                                             |

## TEKNİK ÖZELLİKLER

## TECHNICAL CHARACTERISTICS

| İLETKEN DİRENCİ<br>CONDUCTOR RESISTANCE                       | YALITIM DİRENCİ<br>INSULATION RESISTANCE                          | AKIM TAŞIMA<br>KAPASİTESİ<br>CURRENT CARRYING CAPACITY       | ÇALIŞMA VOLTAJİ<br>OPERATING VOLTAGE                              | TEST VOLTAJİ<br>TEST VOLTAGE                         | BÜKÜLME YARIÇAPI<br>BENDING RADIUS | ÇALIŞMA SICAKLIĞI<br>TEMPERATURE RANGE | ALEV GECİKTİRİCİLİK TESTİ<br>FLAME RETARDANT TEST |
|---------------------------------------------------------------|-------------------------------------------------------------------|--------------------------------------------------------------|-------------------------------------------------------------------|------------------------------------------------------|------------------------------------|----------------------------------------|---------------------------------------------------|
| mm <sup>2</sup> Ω/km                                          | 20MΩxkm                                                           | mm <sup>2</sup> A                                            | 300/500V                                                          | 2000V                                                | 6x Cable Ø                         | - 60°C - +180°C                        | IEC 60332-1-2<br>VDE 0482-332-1-2<br>EN 60332-1-2 |
| 0,75    26                                                    |                                                                   | 0,75    13                                                   |                                                                   |                                                      |                                    |                                        |                                                   |
| 1,0    19,5                                                   |                                                                   | 1,0    16                                                    |                                                                   |                                                      |                                    |                                        |                                                   |
| 1,5    13,3                                                   |                                                                   | 1,5    20                                                    |                                                                   |                                                      |                                    |                                        |                                                   |
| 2,5    7,98                                                   |                                                                   | 2,5    25                                                    |                                                                   |                                                      |                                    |                                        |                                                   |
| 4,0    4,95                                                   |                                                                   | 4,0    34                                                    |                                                                   |                                                      |                                    |                                        |                                                   |
| DUMAN YOĞUNLUĞU TESTİ<br>SMOKE DENSITY TEST                   | KOROZİF GAZ TESTİ<br>TEST ON CORROSIVENESS<br>OF COMBUSTION GASES | HALOJENSİZLİK TESTİ<br>HALOGEN-FREE TEST                     | DEVRE BÜTÜNLÜĞÜ TESTİ (FE 180)<br>CIRCUIT INTEGRITY TEST (FE 180) | ALEV YAYILIMI TESTİ<br>FLAME PROPAGATION TEST        |                                    |                                        |                                                   |
| IEC 61034-2<br>VDE 0482-1034-2<br>EN 61034-2<br>BS EN 61034-2 | IEC 60754-2<br>VDE 0482-754-2<br>EN 60754-2<br>BS EN 60754-2      | IEC 60754-1<br>VDE 0482-754-1<br>EN 60754-1<br>BS EN 60754-1 | IEC 60331-21                                                      | IEC 60332-3-24<br>VDE 0482-332-3-24<br>EN 60332-2-24 |                                    |                                        |                                                   |

## SIMH-C2



KÜÇÜK BÜKÜLME YARIÇAPI/ALEV GECİKTİRİCİ ÖZELLİK/DÜŞÜK DUMAN YOĞUNLUĞU/ZEHİRLİ VE KOROZİF GAZLARDAN ARINDIRILMIŞ/YÜKSEK ISIYA DAYANIKLI/DÜŞÜK ISIYA DAYANIKLI/DEVRE BÜTÜNLÜĞÜ IEC 60331 180 DAKİKA (min.)  
SMALL BENDING RADIUS/FLAME RETARDANT CHARACTERISTIC/LOW SMOKE EMISSION/WITHOUT POISONED AND CORROSIVE GASES/HIGH TEMPERATURE RESISTANT/LOW TEMPERATURE RESISTANT/CIRCUIT INTEGRITY FOR MINIMUM 180 MINUTES IEC 60331



## KULLANIM ALANLARI

Besleme ve kontrol kablosu olarak

- Yüksek ısı bulunan makina ve ortamlarda
- Düşük ısı bulunan ortamlarda
- Demir Çelik Endüstrisinde
- Cam Sanayisinde
- Brülörlerde
- Isıtma ve Aydınlatma Sistemlerinde
- İnsan hayatının, değerli malzemelerin ve ekipmanların korunması gereken yerlerde

## KABLO YAPISI

|                       |                                                                              |
|-----------------------|------------------------------------------------------------------------------|
| <b>1-İletken</b>      | IEC 60228; DIN VDE 0295; EN 60228 Sınıf 5<br>Bükülü Elektrolitik Tavlı Bakır |
| <b>2-Yalıtkan</b>     | Silikon Kompaund EN 50363-2 EI2                                              |
| <b>3-Yalıtım Renk</b> | VDE 0293; TS HD 308 S2                                                       |
| <b>4-Büküm</b>        | Uygun adımda katlar halinde                                                  |
| <b>5-İç Kılıf</b>     | Silikon Kompaund                                                             |
| <b>6-Ekran</b>        | Kalaylı Bakır Örgü (85% Kapama)                                              |
| <b>7-Dış Kılıf</b>    | Silikon Kompaund EN 50363-2-1 EM9                                            |

## APPLICATION

As a power and control cable

- High-temperature machines and environments
- Low-temperature environments
- Iron and Steel Industries
- Glass Industries
- Burners
- Heating and Lighting Systems
- In places where human life and valuable materials and equipment need to be protected

## CONSTRUCTION

|                       |                                                                                |
|-----------------------|--------------------------------------------------------------------------------|
| <b>1-Conductor</b>    | IEC 60228; DIN VDE 0295; EN 60228<br>Class 5 Stranded Electrolytic Bare Copper |
| <b>2-Insulation</b>   | Silicone Compound EN 50363-2 EI2                                               |
| <b>3-Colour Code</b>  | VDE 0293; TS HD 308 S2                                                         |
| <b>4-Stranding</b>    | In layers of optimum pitch                                                     |
| <b>5-Inner Sheath</b> | Silicone Compound                                                              |
| <b>6-Screen</b>       | Tinned Copper Braid (85% Coverage)                                             |
| <b>7-Outer sheath</b> | Silicone Compound EN 50363-2-1 EM9                                             |

## TEKNİK ÖZELLİKLER

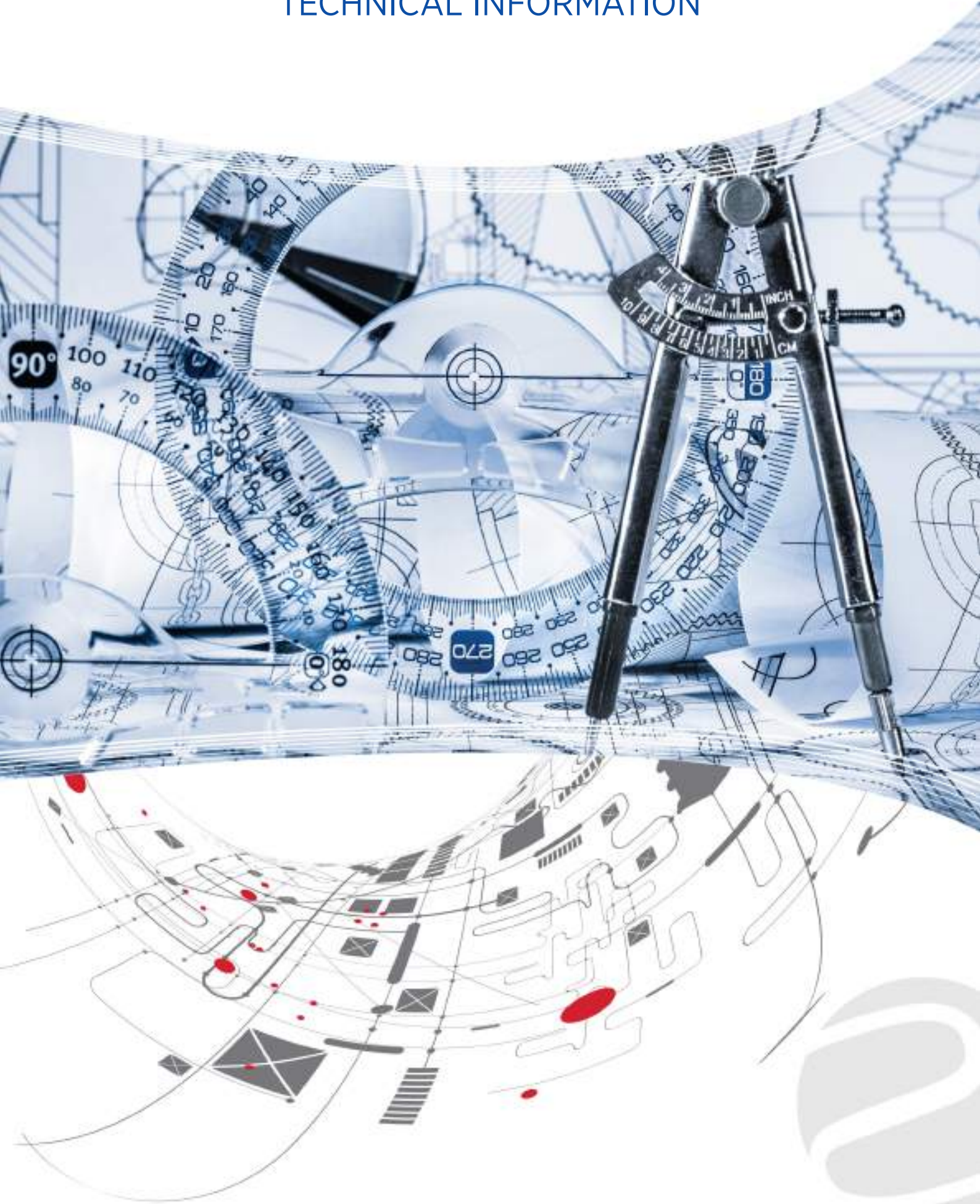
## TECHNICAL CHARACTERISTICS

| İLETKEN DİRENCİ<br>CONDUCTOR<br>RESISTANCE                    | YALITIM DİRENCİ<br>INSULATION<br>RESISTANCE                       | AKIM TAŞIMA KAPASİTESİ<br>CURRENT CARRYING<br>CAPACITY       | ÇALIŞMA VOLTAJI<br>OPERATING<br>VOLTAGE                           | TEST VOLTAJI<br>TEST VOLTAGE                         | BÜKÜLME YARIÇAPI<br>BENDING RADIUS | ÇALIŞMA SICAKLIĞI<br>TEMPERATURE RANGE | ALEV GECİKTİRİCİLİK TESTİ<br>FLAME RETARDANT TEST |
|---------------------------------------------------------------|-------------------------------------------------------------------|--------------------------------------------------------------|-------------------------------------------------------------------|------------------------------------------------------|------------------------------------|----------------------------------------|---------------------------------------------------|
| mm <sup>2</sup> Ω/km                                          | 20MΩ.xkm                                                          | mm <sup>2</sup> A                                            | 300/500V                                                          | 2000V                                                | 6x Cable Ø                         | - 60°C - +180°C                        | IEC 60332-1-2<br>VDE 0482-332-1-2<br>EN 60332-1-2 |
| 0,75    26                                                    |                                                                   | 0,75    13                                                   |                                                                   |                                                      |                                    |                                        |                                                   |
| 1,0    19,5                                                   |                                                                   | 1,0    16                                                    |                                                                   |                                                      |                                    |                                        |                                                   |
| 1,5    13,3                                                   |                                                                   | 1,5    20                                                    |                                                                   |                                                      |                                    |                                        |                                                   |
| 2,5    7,98                                                   |                                                                   | 2,5    25                                                    |                                                                   |                                                      |                                    |                                        |                                                   |
| 4,0    4,95                                                   |                                                                   | 4,0    34                                                    |                                                                   |                                                      |                                    |                                        |                                                   |
| DUMAN YOĞUNLUĞU TESTİ<br>SMOKE DENSITY TEST                   | KOROZİF GAZ TESTİ<br>TEST ON CORROSIVENESS<br>OF COMBUSTION GASES | HALOJENSİZLİK TESTİ<br>HALOGEN-FREE TEST                     | DEVRE BÜTÜNLÜĞÜ TESTİ (FE 180)<br>CIRCUIT INTEGRITY TEST (FE 180) | ALEV YAYILIMI TESTİ<br>FLAME PROPAGATION TEST        |                                    |                                        |                                                   |
| IEC 61034-2<br>VDE 0482-1034-2<br>EN 61034-2<br>BS EN 61034-2 | IEC 60754-2<br>VDE 0482-754-2<br>EN 60754-2<br>BS EN 60754-2      | IEC 60754-1<br>VDE 0482-754-1<br>EN 60754-1<br>BS EN 60754-1 | IEC 60331-21                                                      | IEC 60332-3-24<br>VDE 0482-332-3-24<br>EN 60332-2-24 |                                    |                                        |                                                   |



# TEKNİK BİLGİLER

## TECHNICAL INFORMATION



## ELEKTROMANYETİK UYUMLULUK VE KABLOLAR

**EMC:** Bir sistem veya cihazın içinde bulunduğu elektromanyetik ortamdan etkilenmeden fonksiyonlarını (giderilemeyecek bir elektromanyetik bozulma olmaksızın) yerine getirebilme yeteneğidir.

Bir cihazın çevresindeki diğer cihazları etkileyecek istenmeyen elektromanyetik dalgalar yaymaması ve aynı zamanda diğer cihazların yaydığı istenmeyen dalgalardan da etkilenmemesi gerekmektedir.

EMC kalitesini belirleyen ana etkenlerden birisi cihazları birbirine bağlayan kablolardır. Çünkü, istenmeyen elektromanyetik dalgaları bir noktadan diğerine ilettikleri gibi (iletkenlik yoluyla girişim), üzerlerinde dolaşan sinyalleri bir anten gibi bulundukları ortama da yayarlar (ışıma yoluyla girişim).

Kablo performansını belirleyen iki temel unsur ekranlama malzemesi kalitesi ve kablo ekran topraklamasıdır.

### 1-EKRANLAMA

Ekranlama etkinliği ekran olmadan alınan sinyalin ekran varken alınan sinyale oranı kullanılarak hesaplanır. Ölçüm prosedürlerinden elde edilen veri aşağıdaki tabloda verilen matematiksel formülasyonlarla kullanılarak farklı frekans aralıklarında ekranlama etkinliği hesaplanır.

| FREKANS ARALIĞI                       | ÖLÇÜM BÜYÜKLÜKLERİ              | BİRİMLER | EKRANLAMA ETKİNLİĞİ                                   |
|---------------------------------------|---------------------------------|----------|-------------------------------------------------------|
| LINEER BİRİMLER                       |                                 |          |                                                       |
| 9 kHz-20 MHz                          | H <sub>1</sub> , H <sub>2</sub> | μA/m,    | $S_H = 20 \log_{10} \frac{H_1}{H_2} \text{ (B.1)}^a$  |
| 50 Hz' e kadar aşağı esnetilebilir    | V <sub>1</sub> , V <sub>2</sub> | μT       | $S_H = 20 \log_{10} \frac{V_1}{V_2} \text{ (B.2)}$    |
| 20-300 MHz                            | E <sub>1</sub> , E <sub>2</sub> | μV/m     | $S_E = 20 \log_{10} \frac{E_1}{E_2} \text{ (B.3)}$    |
| 1.7-18 GHz                            | P <sub>1</sub> , P <sub>2</sub> | watt     | $S_P = 10 \log_{10} \frac{P_1}{P_2} \text{ (B.4)}$    |
| 100 GHz' e kadar yukarı esnetilebilir |                                 |          |                                                       |
| LOGARİTMİK BİRİMLER                   |                                 |          |                                                       |
| Tüm frekanslar                        | Tümü, dB ile ilgili             | dB       | SE = E <sub>1</sub> (dB) - E <sub>2</sub> (dB) (B.5a) |
| (Yukarıda listelendiği gibi)          | değerler                        |          | SE = H <sub>1</sub> (dB) - H <sub>2</sub> (dB) (B.5b) |
|                                       |                                 |          | SE = V <sub>1</sub> (dB) - V <sub>2</sub> (dB) (B.5c) |
|                                       |                                 |          | SE = P <sub>1</sub> (dB) - P <sub>2</sub> (dB) (B.5d) |

H1 ekranlama yokken manyetik alan (referans okuma)

H2 ekranlama varken manyetik alan V1 ekranlama yokken okunan voltaj (referans okuma)

V2 ekranlama varken okunan voltaj E1 ekranlama yokken elektrik alan (referans okuma)

E2 ekranlama varken elektrik alan P1 ekranlama yokken güç (referans okuma)

P2 ekranlama varken güç

Ekranlama amacıyla seçilecek malzemeler üç grupta toplanabilir:

#### 1)Yüksek Performanslı Malzemeler

Çelik, bakır, paslanmaz çelik gibi malzemelerden yapılmış %100 kapama (80-120 dB ekranlama etkinliği)

#### 2)Standart Performanslı Malzemeler

İletken metal tabakalar (20-40 dB ekranlama etkinliği)

#### 3)Zayıf Performanslı Malzemeler

Metalleştirilmiş kumaş yapılar iletkin kağıt malzemeler (iletken polimerler) (15-30 dB ekranlama etkinliği)

Pratikte birçok sorunu 40 dB ekranlama etkinliği çözebilir.

Askeri sistemlerde 100-120 dB ekranlama etkinliği istenebilmektedir.

### 2-TOPRAKLAMA

Bir elektrik devresi ya da cihazın, iletken bir ara bağlantı ile istemli ya da istem dışı olarak, yeryüzü (toprak potansiyeline) ya da toprak yerine geçebilecek büyüklükte referans olan bir yüzeye bağlanmasıdır. Yeryüzü mutlak referans sıfır volt olarak kabul edilir. Gerçek anlamda bir topraklama için tüm cihazların bu mutfak sıfır noktasına getirilmesi zorunludur.

Pratikte toprak yerine geçebilecek yapılardan bazıları:

- Çelik kafes binalar
- Araç gövdesi (otomobil, uçak, gemi)
- Su boruları
- Toprak elektrotlu sistemler
- Topraklama plakası ve kafesi vb.

Kablolar kaynak ile yük arasında sinyal iletiminde kullanıldığından dolayı ekranlamanın hangi tarafta yapılacağı ve topraklama kalitesi büyük önem taşımaktadır. Sadece yük tarafından ekranlanmış bir kabloda istenmeyen elektrik alanlar iyi ekranlanır.

Ancak bu manyetik alanların ekranlanmasına yetmez. Hem yük hem de kaynak tarafında topraklama uygulandığında elektrik alan ekranlanması daha iyi olur ve manyetik ekranlama da sağlanmış olur. (10-20 dB ekranlama etkinliği artar) Bükülü çift iletken kullanılarak (iletkenler arasındaki alanı küçülterek ve büküm sayesinde zıt yönlü akımlar akması sağlanarak) manyetik sızıntı azaltılır. Her iki taraftan da topraklama uygulandığında elektrik ve manyetik ekranlama etkin biçimde sağlanmış olur.

## KOAKSİYEL KABLO ELEKTRİKSEL ÖZELLİKLER

### ELEKTRİKSEL ÖZELLİKLER

#### 1) KARAKTERİSTİK EMPEDANS

Koaksiyel kabloların en genel elektriksel özelliği karakteristik empedanstır. Uzunluğa bağlı değildir. Kablo boyutları ve yalıtkan malzemeye bağlıdır. Ohm olarak ifade edilir. Coaxial kablolar genelde 50 ohm, 75 ohm, 93 ohm olarak yapılandırılır. Coaxial bir kablonun empedansını belirlemenin basit formülü;

$$Z_0: 138 \times V_p \times \log (D/d) \text{ ohm}$$

Z<sub>0</sub>: Karakteristik Empedans

V<sub>p</sub>: Yayılma Hızı

D: Dielektrik (Yalıtım) Çapı

d: İç iletken Çapı

#### 2) KAPASİTE (pF/m)

Yalıtım malzemesinin biriktirdiği elektrik enerjisi olup, iletken, yalıtım ve yalıtım malzemesinin dielektrik sabitine bağlıdır. Yüksek değerli kapasite genelde kötü niteliklidir.

$$C: \frac{2\pi \times 8,85 \times \epsilon_r}{\ln (D/d)} \text{ pF/m}$$

ε<sub>r</sub>: Dielektrik Sabiti

| MALZEME    | ε <sub>r</sub> Dielektrik Sabiti |
|------------|----------------------------------|
| HAVA       | 1                                |
| PE SOLİD   | 2,3                              |
| PE HÜCRELİ | 1,5                              |
| PTFE       | 1,95                             |
| FEP        | 2,15                             |

#### 3) YAYILMA HIZI

Kablonun yayılma hızı; kablo içindeki sinyal hızının ışık hızına oranıdır.

Örneğin Yekpare(solid) PE yalıtımlı kabloda yayılma hızı %66 iken Köpük PE de %87'ye kadar yükselir.

Bu özellik gecikme olarakta gösterilebilir.

$$V_p: \frac{1}{\sqrt{\epsilon_r}} \quad \text{gecikme: } 1,0167164 \times \sqrt{\epsilon_r}$$

#### 4) ZAYIFLAMA (dB/100mt)

Tüm iletim hatları veya koaksiyel kablolar sinyal kayıplarına sebep olurlar. Başka bir deyişle, sinyal şiddetinde kablo içinde, devre içinde veya hava ortamında ilerlemesi esnasında azalma meydana gelir. Zayıflama olarak adlandırılan bu kayıplar iletim hattının verimliliğini azaltacak ve güç kapasite limitlerini düşürecektir. Desibel cinsinden bir oran olarak veya logaritmik bir oran cinsinden ifade edilirler.

Kabloların zayıflama yönünden performansının değerlendirilmesi konusunda zayıflama sabiti değerlendirilir.

Zayıflama sabiti bir kablo veya diğer iletim ortamı için sinyalin gittiği yol doğrultusunda azalan voltaj veya akım oranıdır. Birimi desibel/birim kablo uzunluğudur.

#### 5) GERİ DÖNÜŞ KAYBI (YANSIMA KAYBI)(RL-RETURN LOSS)

Kablo boyutları, yalıtkan malzemenin kalitesi ve kablonun döşenmesi sırasındaki hatalar karakteristik empedansı etkiler. Her düzensizlik ve hata yansımalarla sebep olur.

Geri dönüş kaybı çıkış sinyali ile yansıyan sinyalin arasındaki orandır.

## HARMONİZE KABLO SEMBOLLERİ

### HARMONİZE KABLolar

#### Yapım düzeni

H: Harmonize düzen

A: Onaylanan ulusal yapı

#### Anma gerilimi

01 100/100 V

03 300/300 V

05 300/500 V

07 450/750 V

11 600/1000 V

#### Yalıtım malzemeleri

V Polivinil klorür (PVC)

V2 PVC +90 °C' ye kadar

V3 PVC düşük sıcaklık için

B EPR

E Polietilen

X XLPE PE (çapraz bağlı)

R Kauçuk

S Silikon kauçuk

#### Kılıf yada örgü malzemeleri

V Polivinil klorür (PVC)

V2 PVC, +90 °C" ye kadar

V3 PVC, düşük sıcaklık için

V5 PVC, yağa dayanıklı

R Kauçuk

N Cloroprene kauçuk

Q Poliüretan

C4 Bakır örgü tel ekran

J Cam elyaf örgü

T Tekstil örgü

#### Özel yapım özellikleri

H Yassı ayrılabilir kablolar

H2 Yassı ayrılamayan kablolar

H6 Yassı ayrılamayan kablolar, asansörler için

H8 Spiral kablolar

#### İletken tipi

U Tek telli yuvarlak iletken

R Çok telli yuvarlak iletken

K İnce çok telli (sabit tesisatlarda kullanılan kablolar için)

F İnce çok telli (esnek kablolar için)

H Ekstra ince çok telli

D Ark kaynak kabloları için bükülgen iletken

E Ark kaynak kabloları için ekstra bükülgen iletken

#### Topraklama iletken korumalı

X Toprak koruma damarsız

G Toprak koruma damarlı

## VDE STANDARTLARINA GÖRE KABLO SEMBOLLERİ

### TELEKOMİNİKASYON KABLO VE İLETKENLERİ

|    |                                                     |
|----|-----------------------------------------------------|
| A  | Dış ortam kabloları                                 |
| G  | Maden kablosu                                       |
| J  | Tesisat kablo ve iletkenleri                        |
| L  | Çok damarlı kablolar                                |
| S  | Santral kabloları - Sinyal kabloları                |
| JE | Endüstriyel elektronik tesisat kablo ve iletkenleri |
| Li | Bükülü iletken tel                                  |

#### Yalıtım malzemeleri:

|      |                              |
|------|------------------------------|
| P    | Kağıt yalıtım                |
| Y    | PVC                          |
| 2Y   | Polietilen (PE)              |
| 3Y   | PS, polistiren               |
| 5Y   | PTFE                         |
| 6Y   | FEP                          |
| 7Y   | ETFE                         |
| O2Y  | Köpük PE, hücreli polietilen |
| O2YS | Foam-skin PE                 |

#### Yapısal Özellikler :

|       |                                         |
|-------|-----------------------------------------|
| F     | Dolgulu kablo                           |
| Yv    | Güçlendirilmiş PVC kılıf                |
| 2Yv   | Güçlendirilmiş PE kılıf                 |
| (C)   | Bakır tel örgü ekran                    |
| (L)   | Plastik kaplamalı alüminyum bant ekran  |
| (St)  | Metal Folyo ekran                       |
| D     | Konsantrik bakır teller                 |
| (Z)   | Çelik tel örgü                          |
| M     | Kurşun kılıf                            |
| Mz    | Sertleştirici madde etkili kurşun kılıf |
| L     | Alüminyum kılıf, düzgün                 |
| LD    | Kıvrımlı (oluklu) alüminyum kılıf       |
| W     | Kıvrımlı çelik kılıf                    |
| (L)2Y | Lamineli kılıf                          |
| b     | Zırh                                    |
| c     | Jüt kaplamalı koruma                    |
| E     | PVC bant                                |
| (T)   | Havai kablo için askı telli             |
| STIII | Lokal kablo içinde yıldız dörtlü        |
| STI   | Geniş mesafe için yıldız dörtlü         |
| ST    | Fantom devre için yıldız dörtlü         |
| F     | Demiryolu kullanımı için yıldız dörtlü  |
| PİMF  | Bireysel ekranlı çiftler                |
| TİMF  | Bireysel ekranlı üçler                  |
| VİMF  | Bireysel ekranlı dörtler                |
| Bd    | Gruplar halinde büküm                   |
| Lg    | Katlar halinde büküm                    |

## VDE STANDARTLARINA GÖRE KABLO SEMBOLLERİ

### GÜÇ KABLoları

#### İletken tipi:

- N VDE - standardı  
(N) VDE - standardı esaslı

#### İletken malzemeleri:

- Cu Bakır  
A Alüminyum

#### Yalıtım malzemeleri:

- H Halojensiz (HFFR)  
Y Polivinil klorid (PVC)  
2Y Polietilen (PE)  
2X PE çapraz bağlı (XLPE)

#### Konsantrik iletken, ekran:

- C Konsantrik bakır iletken  
CW Konsantrik bakır iletken, oluklu (kıvrımlı)  
CE Her damar konsantrik bakır iletkenli  
S Bakır ekran  
SE Her damarı bakır ekranlı

#### Zırhlar:

- F Yassı tel zırh  
R Yuvarlak tel zırh  
B Çelik bant zırh

#### Dış kılıf malzemeleri:

- Y PVC  
2Y PE

#### Topraklama iletkeni:

- J Toprak koruma damarlı  
O Toprak koruma damarsız

#### İletken tipi:

- r... Yuvarlak iletken  
s... Daire dilimi biçimli iletken  
o... Oval şekilli iletken  
re Tek tel iletken  
Rm Çok telli iletken  
V Sıkıştırılmış iletken

## YANMA TESTLERİNİN KARŞILAŞTIRILMASI

## EN, IEC, DIN, VDE ve BS ALEV YAYIMI TESTİ

| EN    | BÖLÜM | MADDE | AÇIKLAMA                                                                   | IEC       | BS           | DIN VDE      |
|-------|-------|-------|----------------------------------------------------------------------------|-----------|--------------|--------------|
| 60332 | 1     | 1     | Yalıtılmış tek bir tel veya kablo için düşey alev yayılımı deney teçhizatı | 60332-1-1 | EN 60332-1-1 | 0482-332-1-1 |
|       | 1     | 2     | 1kW ön karışimli deney prosedürü                                           | 1-2       | 1-2          | 332-1-2      |
|       | 2     | 2     | Difüzyon karışimli deney prosedürü                                         | 2-2       | 2-2          | 332-2-2      |

| EN    | BÖLÜM | MADDE | AÇIKLAMA                                                                                          | IEC        | BS            | DIN VDE       |
|-------|-------|-------|---------------------------------------------------------------------------------------------------|------------|---------------|---------------|
| 60332 | 3     | 10    | Düşey olarak monte edilmiş demetlenmiş teller veya kablolarda düşey alev yayılımı deney teçhizatı | 60332-3-10 | EN 60332-3-10 | 0482-332-3-10 |
|       | 3     | 21    | Kategori A F/R                                                                                    | 3-21       | 3-21          | 332-3-21      |
|       | 3     | 22    | Kategori A                                                                                        | 3-22       | 3-22          | 332-3-22      |
|       | 3     | 23    | Kategori B                                                                                        | 3-23       | 3-23          | 332-3-23      |
|       | 3     | 24    | Kategori C                                                                                        | 3-24       | 3-24          | 332-3-24      |
|       | 3     | 25    | Kategori D                                                                                        | 3-25       | 3-25          | 332-3-25      |

## HALOJENSİZ / KOROZİF OLMAYAN YANICI GAZLAR

| EN    | BÖLÜM | MADDE | AÇIKLAMA                                                                                                                | IEC     | BS         | DIN VDE    |
|-------|-------|-------|-------------------------------------------------------------------------------------------------------------------------|---------|------------|------------|
| 50267 | 1     |       | Kablolardan alınan malzemelerin yanması sırasında açığa çıkan gazlara uygulanan deney teçhizatı                         | 60754-1 | EN 50267-1 | 0482-267-1 |
|       | 2     | 1     | Halojen asit gazı miktarının tayini                                                                                     | 1       | 2-1        | 267-2-1    |
|       | 2     | 2     | PH ve iletkenliğin ölçülmesiyle malzemelerin asitlik derecesinin tayini                                                 | 2       | 2-2        | 267-2-2    |
|       | 2     | 3     | PH ve iletkenliğin ağırlıklı ortalamasının belirlenmesi ile kablolardan açığa çıkan gazların asitlik derecesinin tayini | 2       | 2-3        | 267-2-3    |

## DUMAN YOĞUNLUĞU

| EN    | BÖLÜM | MADDE | AÇIKLAMA                                                                          | IEC     | BS         | DIN VDE     |
|-------|-------|-------|-----------------------------------------------------------------------------------|---------|------------|-------------|
| 61034 | 1     |       | Belirtilen şartlarda yanan kabloların duman yoğunluğu tayini için deney teçhizatı | 61034-1 | EN 61034-1 | 0482-1034-1 |
|       | 2     |       | Belirtilen şartlarda yanan kabloların duman yoğunluğu tayini                      | 2       | 2          | 1034-2      |

**ERVİTAL KABLOLARA UYGULANAN YANGIN PERFORMANS TESTLERİ****1) IEC 60332-1, VDE 0482-332-1-2, EN 60332-1-2, BS EN 60332-1-2 YALITILMIŞ TEK İLETKEN VEYA KABLO İÇİN DİKEY ALEV YAYILMASINA KARŞI DAYANIKLILIK DENEYİ. 1KW ÖN KARIŞIMLI ALEV**

600 mm uzunluğundaki kablo numunesi ön tarafı açık metal bir hücrede dikey olarak sabitlenir. Propan beki numune kablo eksenine 45°lik açı yapacak şekilde yerleştirilir. Test süresi kablo çapına bağlıdır. Eğer örnek parça, test süresi sonunda askıdan 50mm ye kadar yanmaz ve alev kendiliğinden sönerse deney başarılıdır.

| KABLO DIŞ ÇAPI<br>mm | ALEV UYGULAMA SÜRESİ<br>mm |
|----------------------|----------------------------|
| D≤25                 | 60 ± 2                     |
| 25<D≤75              | 120 ± 2                    |
| 50<D≤75              | 240 ± 2                    |
| 75<D                 | 480 ± 2                    |

**2) IEC 60332-3-22, VDE 0482-60332-3-22, EN 60332-3-22, BS EN 60332-3-22 (CAT A) DİKEY OLARAK MONTE EDİLMİŞ, DEMETLENMİŞ TELLER VEYA KABLOLARDAKİ DİKEY ALEV YAYILIMI DENEYİ**

Test numuneleri çelik bir merdivene bağlanır. Numune sayısı deney numunesinin her bir metresi başına 7 litrelik metalik olmayan malzemenin toplam anma hacmini sağlamak için gerekli sayı olmalıdır. Çelik merdiven 1 metre genişliğinde, 2 metre derinliğinde ve 4 metre yüksekliğindeki test odasının arka kısmına yerleştirilir. Havalandırma deliği yolu ile test odası havalandırılır. Deney alevi 40 dakika süreyle kablo numuneleri üzerine uygulanır. Eğer numunelerin hiçbirisi 2,5 metrenin üzerinde zarar görmedi ve alevler kendiliğinden söndüyse test başarılıdır.

**3) IEC 61034-2, VDE 0482-1034-2, EN 61034-2, BS EN 61034-2 BELİRLİ ŞARTLAR ALTINDA YANAN KABLOLARIN DUMAN YOĞUNLUĞUNUN ÖLÇÜLMESİ**

3 m<sup>3</sup>'lük bir test odası, ölçme sistemi: bir ışık kaynağı (100W standart halojen lamba) ve bir selenyum ya da silikon fotoselden oluşur. İkisi de 2,1 metrelik yüksekliğe yerleştirilir. Dikdörtgen bir tepsi alkolle doldurulur. Dumanın yayılması bir vantilatör ile sağlanır. Numunenin uzunluğu 1 metredir. Numune sayısı ise kablo çapına göre seçilir. Numuneler alkol dolu tepsi üzerine yatay olarak sabitlenir. Vantilatör çalıştırılır ve alkol yakılır, ışık şiddeti, fotosene bağlı bir plotter tarafından kaydedilir. Test boyunca ışık iletimi aşağıdaki tabloda verilen değerleri aşmadı ise test başarılıdır.



| KABLO DIŞ ÇAPI<br>mm | NUMUNE SAYISI  | IŞIK İLETİMİ |
|----------------------|----------------|--------------|
| 40<D                 | 1              | >60%         |
| 20<D≤40              | 2              | >60%         |
| 10<D≤20              | 3              | >60%         |
| 5<D≤10               | N <sub>1</sub> | >60%         |
| 1<D≤5                | N <sub>2</sub> | >60%         |

$$N_1 = \frac{45}{D}$$

$$N_2 = \frac{45}{3D}$$

#### 4) IEC 60754-1 VE 2, VDE 0482-267-2-1,2 ve 3, EN 50267-2-1,2 ve 3, BS EN 50267-2-1, 2 ve 3 HALOJEN ASİT GAZI TAYİNİ, pH VE İLETKENLİĞİN ÖLÇÜLMESİ

Bu test dolaylı olarak yalıtım ya da dış kılıf bileşiminin korozif gaz yayılımının ölçülmesine olanak verir, PH değeri ve iletkenlik ölçümü sırasında düşük miktarda halojen ölçülebilir. 500-600 mm boyunda bir fırında en az 1 gr, yalıtım ya da dış kılıf bileşiği 935°C'ye kadar ısıtılır. Hava akımı, çıkan gazların arıtılmış su ile dolu şişe içinden geçerek filtreleme yapılmasını sağlar. Filtre suyu üzerinden yapılan ölçüm sonucunda pH değeri 4,3'ten daha az ve elektrik iletkenliği 100  $\mu\text{S}/\text{cm}$ ' i aşmadı ise test başarılıdır.



#### 5) IEC 60331-21/23 YALITIM DAYANIKLILIĞI TESTİ

Bu test yalıtımın alev şartları altındaki dayanıklılığını belirtir. 1,2 m. uzunluğunda dış kılıflı ve iki ucundaki diğer kaplamalar soyulmuş şekilde, elektronik bağlantı için uygun halde hazırlanan numune yakıcı maddenin yaklaşık 75 mm yukarısına yatay olarak yerleştirilir. Numune (her iletken için bir 2 A sigorta) bir voltaj kaynağına bağlanır ve anma gerilimi test edilir. Bütün ekranlar ve diğer metal kılıflar birlikte bağlanır ve topraklanır, iletkenin voltaj kaynağından uzak olan ucu, elektrik kontağı yapmasını engellemek için bir miktar kıvrılır. Alev kaynağı ateşlenerek sıcaklık kablo seviyesinde en az 750°C'ye kadar yükseltilir. Numune 180 dakikalık zaman periyodu içinde test edilir. Eğer test süresi boyunca 2 A sigortalarından hiçbiri patlamaz ise test başarı gerçekleşmiştir.



#### 6) EN 50200, VDE 0482-200, BS EN 50200, BS 8434-1, BS 8434-2, IEC 60331-1 ve 2 MEKANİK ŞOKLU AKIM SÜREKLİLİĞİ

Bu test; alarm, aydınlatma ve haberleşme amaçları için emniyet devrelerinde kullanılması amaçlanan ve yangına karşı kendinden dayanıklılığı olan kablolar için uygulanır. Tek bir kablo minimum bükme yarıçapıyla özel bir fiber glas duvara monte edilir, 840 °C'deki propan bekiyle yakılır, Test sırasında kablonun beyan gerilimi iletgenlerden geçirilir, her 5 dakikada bir 25 kg bir kuvvetle kablonun bağlı olduğu duvara mekanik şok uygulanır. Test sırasında gerilim değerleri korunmalıdır. Kablonun dayanım süresi dakika olarak PH 15, PH 30, PH 60, PH 90, PH 120 arasındadır.



## 7) DIN 4102-12:DEVRE BÜTÜNLÜĞÜNÜ KORUMAK İÇİN GEREKLİ OLAN ELEKTRİK KABLO SİSTEMLERİNİN YANGIN DİRENCİ(FONKSİYON DEVAMLILIĞI) (E30...E90)

Alman standardı DIN VDE 4102-12 'ye göre, kabloların yangın performanslarının yanı sıra kabloların temas halinde olduğu tüm bileşenler (tavalar, kablo kanalları, klipsler vs...) ile birlikte performansının önemi vurgulanmaktadır. Testin amacı komple elektrik sisteminin yangın şartları altında çalıştığını doğrulamaktır. (acil aydınlatma, fanlar, yangın çıkışı, yangın alarmı, asansörler, pompalar ve benzeri sistemler)

Komple bir elektrik sisteminin yangın performansını test etmek için kablolar 3 metre uzunluğundaki fırın içerisine bina içine döşendiği gibi kablo kanalları, kablo merdivenleri ve klipsler kullanılarak döşenmektedir.

Gerçeğe en yakın simülasyonu elde etmek için kablo tava ve merdivenlerine belirli düzeyde ağırlıklar bağlanarak fırın içerisinde sıcaklık artışı DIN 4102-12 standardında tanımlanan ISO 834 sıcaklık eğrisi (ETK) 'e göre 1000 °C uygulanır.



## CPR YAPI MALZEMELERİ YÖNETMELİĞİ (305/2011/AB)

Kablo sektörü için CPR, bina ve altyapı dahil olmak üzere, herhangi bir yapıda bulunan sabit tesisatlarda kullanılan güç, kontrol ve haberleşme kablolarının yangına tepki ve yangına dayanım performansı ile beraber tehlikeli madde açığa çıkması gerekliliklerini içerir. Bununla birlikte, yapılarda kullanılan kabloların yangına karşı performans beyanlarını ve CE işaretlemesini zorunlu kılar.

Kablolar için EN 50575'in 1 Temmuz 2015 tarihinde yayınlanması ve 1 Aralık 2015 ten itibaren CE işaretlemesinin uygulamaya geçmesi, Temmuz 2017'den itibaren zorunlu olmak üzere Avrupa birliği ülkelerinde kablo satışı veya dağıtımını yapacak firmalar üreticilerden ürüne ait performans beyanı (DoP) düzenlemesini ve ürün üzerine CE işaretlemesi yapılmasını yasal olarak talep edebilecektir.

Kablolardan CPR in temel gereklerinden olan

1)Yangın durumunda emniyet gerekliliğine destek olan

a)Yangına tepki performansı (EN 50575,EN 13501-6)

b)Yangına dayanım performansı(P ve PH sınıflandırması)

2)Hijyen,sağlık ve çevre gerekliliğine destek olan

a)Tehlikeli madde açığa çıkması

gibi üç önemli performans beklenmektedir.

EN 50575 standardı aşağıdaki test standartlarına atıf yapar: EN 13501-6, EN ISO 1716, EN 50399, EN 60332-1-2, EN 60754-2, EN 61034-2

## Yangına karşı tepki sınıflandırması Test yöntemleri(EN 50575)

| Yangına Tepki Performans Sınıfı | UYGULANAN TEST STANDARTLARI                                                                 |                       |              |                         |                       |
|---------------------------------|---------------------------------------------------------------------------------------------|-----------------------|--------------|-------------------------|-----------------------|
|                                 | EN ISO 1716                                                                                 | EN 50399 <sup>a</sup> | EN 60332-1-2 | EN 61034-2 <sup>c</sup> | EN 60754 <sup>d</sup> |
| A <sub>ca</sub>                 | X                                                                                           | -                     | -            | -                       | -                     |
| B1 <sub>ca</sub>                | -                                                                                           | X <sup>b</sup>        | X            | II                      | X                     |
| B2 <sub>ca</sub>                | -                                                                                           | II                    | X            | II                      | X                     |
| C <sub>ca</sub>                 | -                                                                                           | II                    | X            | II                      | X                     |
| D <sub>ca</sub>                 | -                                                                                           | II                    | X            | II                      | X                     |
| E <sub>ca</sub>                 | -                                                                                           | -                     | X            | -                       | -                     |
| F <sub>ca</sub>                 | Hiçbir performans belirlenmedi.                                                             |                       |              |                         |                       |
| AÇIKLAMALAR                     |                                                                                             |                       |              |                         |                       |
| a                               | EN 50399, daha önce FIPEC20 Senaryo 1 ve FIPEC20 Senaryo 2'deki tüm bilgileri içermektedir. |                       |              |                         |                       |
| b                               | EN 50399'da B1ca sınıfı testleri için özel koşullar vardır.                                 |                       |              |                         |                       |
| c                               | Ek sınıflandırma testleridir.                                                               |                       |              |                         |                       |
| d                               | EN 60754-2, daha önce EN 50267-2-3'deki tüm bilgileri içermektedir.                         |                       |              |                         |                       |
| FIPEC                           | Fire Performance of Electric Cables                                                         |                       |              |                         |                       |

| Sınıf            | Deney Yöntem(ler)i                      | Sınıflandırma Kriterleri                                                                                        | Ek Sınıflandırma                                                                                                   | AVCP Sistem                                                                                                                                                                                                 |
|------------------|-----------------------------------------|-----------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| A <sub>ca</sub>  | EN ISO 1716                             | PCS ≤ 2,0 MJ/kg <sup>(1)</sup>                                                                                  |                                                                                                                    |                                                                                                                                                                                                             |
| B1 <sub>ca</sub> | EN 50399<br>(30 kW alevkaynağı)<br>Ve   | FS ≤ 1,75 m ve<br>THR <sub>1200s</sub> ≤ 10 MJ ve<br>En Yüksek HRR ≤ 20 kW ve<br>FIGRA ≤ 120 Ws <sup>-1</sup>   | Duman Üretimi <sup>(2,3)</sup><br>ve Alevli damlacıklar/partiküller <sup>(3)</sup><br>ve Asitderesi <sup>(4)</sup> | Sistem 1+<br>* Ürün belgelendirme kuruluşu (3. parti)<br>tarafından numunelerin denetim testi ile<br>başlangıç tip testi ve fabrika denetim ve<br>fabrika üretim kontrolü (FPC)<br>* Üretici tarafından FPC |
|                  | EN 60332-1-2                            | H ≤ 425 mm                                                                                                      |                                                                                                                    |                                                                                                                                                                                                             |
| B2 <sub>ca</sub> | EN 50399<br>(20,5 kW alevkaynağı)<br>Ve | FS ≤ 1,5 m; ve<br>THR <sub>1200s</sub> ≤ 15 MJ; ve<br>En Yüksek HRR ≤ 30 kW; ve<br>FIGRA ≤ 150 Ws <sup>-1</sup> | Duman Üretimi <sup>(2,3)</sup><br>ve Alevli damlacıklar/partiküller <sup>(3)</sup><br>ve Asitderesi <sup>(4)</sup> |                                                                                                                                                                                                             |
|                  | EN 60332-1-2                            | H ≤ 425 mm                                                                                                      |                                                                                                                    |                                                                                                                                                                                                             |
| C <sub>ca</sub>  | EN 50399<br>(20,5 kW alevkaynağı)<br>Ve | FS ≤ 2,0 m; ve<br>THR <sub>1200s</sub> ≤ 30 MJ; ve<br>En Yüksek HRR ≤ 60 kW; ve<br>FIGRA ≤ 300 Ws <sup>-1</sup> | Duman Üretimi <sup>(2,3)</sup><br>ve Alevli damlacıklar/partiküller <sup>(3)</sup><br>ve Asitderesi <sup>(4)</sup> | Sistem 3<br>* 3. kurum tarafından belirlenmiş<br>laboratuvar da başlangıç tip testi<br>* Üretici tarafından FPC                                                                                             |
|                  | EN 60332-1-2                            | H ≤ 425 mm                                                                                                      |                                                                                                                    |                                                                                                                                                                                                             |
| D <sub>ca</sub>  | EN 50399<br>(20,5 kW alevkaynağı)<br>Ve | THR <sub>1200s</sub> ≤ 70 MJ; ve<br>En Yüksek HRR ≤ 400 kW; ve<br>FIGRA ≤ 1 300 Ws <sup>-1</sup>                | Duman Üretimi <sup>(2,3)</sup><br>ve Alevli damlacıklar/partiküller <sup>(3)</sup><br>ve Asitderesi <sup>(4)</sup> |                                                                                                                                                                                                             |
|                  | EN 60332-1-2                            | H ≤ 425 mm                                                                                                      |                                                                                                                    |                                                                                                                                                                                                             |
| E <sub>ca</sub>  | EN 60332-1-2                            | H ≤ 425 mm                                                                                                      |                                                                                                                    | Sistem 4<br>* başlangıç tip testi ve üretici tarafından FPC                                                                                                                                                 |
| F <sub>ca</sub>  |                                         | Hiç bir performans tespit edilmedi                                                                              |                                                                                                                    |                                                                                                                                                                                                             |

(1) Metal malzemeler dışında bir bütün olarak Grün ve Grünün herhangi bir dış bileşeni (örn. kılıf).

(2) EN 61034-2 Duman Üretimi

s1 = TSP<sub>1200s</sub> ≤ 50 m<sup>2</sup> ve En Yüksek SPR ≤ 0,25 m<sup>2</sup>/s

s1a = s1 ve geçirgenlik EN 61034-2 ≥ % 80'e uygun olarak

s1b = s1 ve geçirgenlik EN 61034-2 ≥ % 60 < % 80'e uygun olarak

s2 = TSP<sub>1200s</sub> ≤ 400 m<sup>2</sup> ve En Yüksek SPR ≤ 1,5 m<sup>2</sup>/s

s3 = s1 ya da s2 değil

(3) EN 50399 Yanarak düşen parçacıklar

d0 = 1200 s içerisinde hiçbir alevli damlacık/partikül mevcut değil;

d1 = 1 200 s içerisinde 10 s. den daha uzun süren hiçbir alevli damlacık/partikül mevcut değil; d2 = d0 ya da d1 değil.

(4) EN 60754-2 Asitlik Derecesi

a1 = iletkenlik < 2,5 µS/mm ve pH > 4,3;

a2 = iletkenlik < 10 µS/mm ve pH > 4,3;

a3 = a1 ya da a2 değil.

Hiçbir Açıklama = Hiçbir Performans Tespit Edilmedi.

(5) B1<sub>ca</sub> sınıfı kablolar için beyan edilen duman sınıfı, EN 50399'a (30 kW alevkaynağı) göre deneyden çıkacaktır.

(6) B2<sub>ca</sub>, C<sub>ca</sub>, D<sub>ca</sub> sınıflarında yer alan kablolar için beyan edilen duman sınıfı, EN 50399'a (20,5 kW alevkaynağı) göre deneyden çıkacaktır.

## BEYAN GERİLİMLERİ 450/750 V OLAN TERMOPLASTİK YALITIMLI VE KILIFLI KABLOLARIN GENEL ÖZELLİKLERİ TS EN 50525-1, VDE 0281/1

### YALITIM :

Yalıtım kablonun her bir tipi için belirtilen tipteki termoplastik malzemeden olmalıdır.

En büyük sürekli iletken sıcaklığı 70 °C için ve PVC bileşiği ile yalıtılmış kablolar için, TI 1, TI 2, TI 4, ve TI 5 tipleri uygundur.

En büyük sürekli iletken sıcaklığı 90 °C için ve PVC bileşiği ile yalıtılmış kablolar için TI3 tipi uygundur.

### YALITIM ÖZELLİKLERİ

| DENEY                                      | BİRİM  | BİLEŞİĞİN TİPİ |      |      |      |      |
|--------------------------------------------|--------|----------------|------|------|------|------|
|                                            |        | TI 1           | TI 2 | TI 3 | TI 4 | TI 5 |
| En büyük sürekli iletken sıcaklığı         | °C     | 70             | 70   | 90   | 70   | 70   |
| Kısa devre şartları için en büyük sıcaklık | °C     | 160            | 160  | 160  | 160  | 160  |
| 200°C'de en küçük ısı kararlılık           | dakika | -              | -    | 240  | -    | -    |

### KILIF :

Kılıf her bir kablo tipi için belirtilen tipteki termoplastik malzemeden olmalıdır.

-Sabit tesislerdeki PVC kılıflı kablolar için TM 1 tipi

-PVC Kılıflı bükülgen kablolar için TM 2 tipi

-Isıya dayanıklı beyan edilen iletken sıcaklığı 90 °C yi aşmayan PVC kılıflı bükülgen kablolar için TM 3 tipi

-Yağa dayanıklı PVC kılıflı kablolar için TM 5 tipi (H05VV5-F,H05VVC4V5-K)

-Düşük sıcaklığa dayanıklı PVC örtülü kablolar için TM 6 tipi olmalıdır.

### UYGULAMA :

Kılıf homojen bir tabaka olarak

a-Tek damarlı kablolarda damar üzerine

b-Çok damarlı kablolarda damar topluluğu ve dolgular veya varsa iç örtü üzerine ekstrüde edilir.

| DENEY                            | BİRİM  | BİLEŞİĞİN TİPİ |      |      |      |       |      |
|----------------------------------|--------|----------------|------|------|------|-------|------|
|                                  |        | TM 1           | TM 2 | TM 3 | TM 4 | TM 5  | TM 6 |
| Mineral yağ daldırma             | -      | -              | -    | -    | -    | -     | -    |
| Yağın sıcaklığı                  | °C     | -              | -    | -    | -    | 90±2  | -    |
| Yağ daldırma süresi              | saat   | -              | -    | -    | -    | 70x24 | -    |
| 200°C'de en küçük ısı kararlılık | dakika | -              | -    | 240  | -    | -     | -    |

| DENEY                                                | BİRİM | KABLOLARIN BEYAN GERİLİMLERİ |          |
|------------------------------------------------------|-------|------------------------------|----------|
|                                                      |       | 300/500V                     | 450/750V |
| İmalatı tamamlanmış kabloları uygulanan gerilim (aa) | V     | 2000                         | 2500     |
| Damarlara uygulanan gerilim (aa)                     | V     |                              |          |
| Et kalınlığı 0,60mm'ye kadar (0,60mm dahil)          | V     | 1500                         |          |
| Et kalınlığı 0,60mm'nin üzeri                        | V     | 2000                         | 2000     |
| Yalıtımın doğru akıma uzun süreli dayanımı           |       |                              |          |
| Suyun sıcaklığı                                      | °C    | 60±5                         | 60±5     |
| Uygulanan gerilim                                    |       |                              |          |

## VDE 0293, TS HD 308 S2 ye GÖRE KABLO DAMAR RENKLERİ

### Yeşil ve Sarı Damarı Olan Kablo ve Kordonlar

| Damarların sayısı | DAMARLARIN RENKLERİ <sup>b</sup> |        |            |       |     |
|-------------------|----------------------------------|--------|------------|-------|-----|
|                   | Koruyucu                         | Enerji |            |       |     |
| 3                 | Yeşil ve Sarı                    | Mavi   | Kahverengi |       |     |
| 4                 | Yeşil ve Sarı                    |        | Kahverengi | Siyah | Gri |
| 4 <sub>a</sub>    | Yeşil ve Sarı                    | Mavi   | Kahverengi | Siyah |     |
| 5                 | Yeşil ve Sarı                    | Mavi   | Kahverengi | Siyah | Gri |

a: Sadece belirli uygulamalar için

b: Metalik kılıf, zırh veya ekran telleri gibi yalıtılmamış eşmerkezli iletken, bu çizelgede bir damar olarak dikkate alınmıştır. Bir eşmerkezli iletken kendi konumuyla tanımlanır ve bu nedenle renkle tanıtılmasına gerek yoktur.

### Yeşil ve Sarı Damarı Olmayan Kablo Ve Kordonlar

| Damarların sayısı | DAMARLARIN RENKLERİ <sup>b</sup> |            |       |     |       |
|-------------------|----------------------------------|------------|-------|-----|-------|
|                   | Koruyucu                         | Enerji     |       |     |       |
| 2                 | Mavi                             | Kahverengi |       |     |       |
| 3                 |                                  | Kahverengi | Siyah | Gri |       |
| 3 <sub>a</sub>    | Mavi                             | Kahverengi | Siyah |     |       |
| 4                 | Mavi                             | Kahverengi | Siyah | Gri |       |
| 5                 | Mavi                             | Kahverengi | Siyah | Gri | Siyah |

a: Sadece belirli uygulamalar için

b: Metalik kılıf, zırh veya ekran telleri gibi yalıtılmamış eşmerkezli iletken, bu çizelgede bir damar olarak dikkate alınmıştır. Bir eşmerkezli iletken kendi konumuyla tanımlanır ve bu nedenle renkle tanıtılmasına gerek yoktur.

### Tek Damarlı Kablolar :

Kılıfı tek damarlı kablolar ve yalıtılmış iletkenler için aşağıdaki renkler yalıtım için kullanılmalıdır:

- Koruyucu iletken için yeşil ve sarı birleşimden iki renk,
- Nötr iletken için mavi renk

Faz iletkenleri için kahverengi, siyah veya gri renklerin kullanılması tavsiye edilir.

Diğer renkler belirli uygulamalar için kullanılabilir.

## PAS 5308 BÖLÜM-1 ÇOK ÇİFTLİ RENK KODLARI

## 1- Ekranlı Çiftlerin Tanımlanması

- İki çift bireysel ekranlı ve genel ekranlı kablolar saat yönünde siyah-mavi-yeşil-kahve sırasına göre renk kodlaması yapılır
- Tek üçlü kablo damar renkleri mavi, siyah, yeşil sırasına göre renk kodlaması yapılır.

50 çifte kadar diğer bütün kablolar aşağıdaki tabloya göre kodlanır

| ÇİFT NO | A TELİ  | B TELİ  | ÇİFT NO | A TELİ  | B TELİ  |
|---------|---------|---------|---------|---------|---------|
| 1       | SİYAH   | MAVİ    | 26      | BEYAZ   | SARI    |
| 2       | SİYAH   | YEŞİL   | 27      | KIRMIZI | SARI    |
| 3       | MAVİ    | YEŞİL   | 28      | TURUNCU | SARI    |
| 4       | SİYAH   | KAHVE   | 29      | SİYAH   | GRİ     |
| 5       | MAVİ    | KAHVE   | 30      | MAVİ    | GRİ     |
| 6       | YEŞİL   | KAHVE   | 31      | YEŞİL   | GRİ     |
| 7       | SİYAH   | BEYAZ   | 32      | KAHVE   | GRİ     |
| 8       | MAVİ    | BEYAZ   | 33      | BEYAZ   | GRİ     |
| 9       | YEŞİL   | BEYAZ   | 34      | KIRMIZI | GRİ     |
| 10      | KAHVE   | BEYAZ   | 35      | TURUNCU | GRİ     |
| 11      | SİYAH   | KIRMIZI | 36      | SARI    | GRİ     |
| 12      | MAVİ    | KIRMIZI | 37      | SİYAH   | MOR     |
| 13      | YEŞİL   | KIRMIZI | 38      | MAVİ    | MOR     |
| 14      | KAHVE   | KIRMIZI | 39      | YEŞİL   | MOR     |
| 15      | BEYAZ   | KIRMIZI | 40      | KAHVE   | MOR     |
| 16      | SİYAH   | TURUNCU | 41      | BEYAZ   | MOR     |
| 17      | MAVİ    | TURUNCU | 42      | KIRMIZI | MOR     |
| 18      | YEŞİL   | TURUNCU | 43      | TURUNCU | MOR     |
| 19      | KAHVE   | TURUNCU | 44      | SARI    | MOR     |
| 20      | BEYAZ   | TURUNCU | 45      | GRİ     | MOR     |
| 21      | KIRMIZI | TURUNCU | 46      | SİYAH   | TURKUAZ |
| 22      | SİYAH   | SARI    | 47      | MAVİ    | TURKUAZ |
| 23      | MAVİ    | SARI    | 48      | YEŞİL   | TURKUAZ |
| 24      | YEŞİL   | SARI    | 49      | KAHVE   | TURKUAZ |
| 25      | KAHVE   | SARI    | 50      | BEYAZ   | TURKUAZ |

## 2-Bireysel Ekranlı Çiftlerin Tanımlanması

- Ekranlı çiftler, ayırıcı bandın altındaki numaralı bant tarafından tanımlanır.
- Her çift bir siyah ve bir mavi damara sahiptir.

## PAS 5308 BÖLÜM-2 ÇOK ÇİFTLİ RENK KODLARI

## 1-Ekransız Çiftlerin Tanımlanması

-İki çift bireysel ekransız ve genel ekranlı kablolar  
dörtlü formatında kodlanmalı ve saat yönünde  
siyah-mavi-yeşil-kahve olarak kodlanmalıdır.

50 çifte kadar diğer bütün kablolar aşağıdaki tabloya göre kodlanır.

| ÇİFT NO | A TELİ      | B TELİ     | ÇİFT NO | A TELİ            | B TELİ     |
|---------|-------------|------------|---------|-------------------|------------|
| 1       | BEYAZ       | MAVİ       | 26      | KIRMIZI / MAVİ    | MAVİ       |
| 2       | BEYAZ       | TURUNCU    | 27      | KIRMIZI / MAVİ    | TURUNCU    |
| 3       | BEYAZ       | YEŞİL      | 28      | KIRMIZI / MAVİ    | YEŞİL      |
| 4       | BEYAZ       | KAHVERENGİ | 29      | KIRMIZI / MAVİ    | KAHVERENGİ |
| 5       | BEYAZ       | GRİ        | 30      | KIRMIZI / MAVİ    | GRİ        |
| 6       | KIRMIZI     | MAVİ       | 31      | MAVİ / SİYAH      | MAVİ       |
| 7       | KIRMIZI     | TURUNCU    | 32      | MAVİ / SİYAH      | TURUNCU    |
| 8       | KIRMIZI     | YEŞİL      | 33      | MAVİ / SİYAH      | YEŞİL      |
| 9       | KIRMIZI     | KAHVERENGİ | 34      | MAVİ / SİYAH      | KAHVERENGİ |
| 10      | KIRMIZI     | GRİ        | 35      | MAVİ / SİYAH      | YEŞİL      |
| 11      | SİYAH       | MAVİ       | 36      | SARI / MAVİ       | MAVİ       |
| 12      | SİYAH       | TURUNCU    | 37      | SARI / MAVİ       | TURUNCU    |
| 13      | SİYAH       | YEŞİL      | 38      | SARI / MAVİ       | YEŞİL      |
| 14      | SİYAH       | KAHVERENGİ | 39      | SARI / MAVİ       | KAHVERENGİ |
| 15      | SİYAH       | GRİ        | 40      | SARI / MAVİ       | GRİ        |
| 16      | SARI        | MAVİ       | 41      | BEYAZ/TURUNCU     | MAVİ       |
| 17      | SARI        | TURUNCU    | 42      | BEYAZ/TURUNCU     | TURUNCU    |
| 18      | SARI        | YEŞİL      | 43      | BEYAZ/TURUNCU     | YEŞİL      |
| 19      | SARI        | KAHVERENGİ | 44      | BEYAZ/TURUNCU     | KAHVERENGİ |
| 20      | SARI        | GRİ        | 45      | BEYAZ/TURUNCU     | GRİ        |
| 21      | BEYAZ/ MAVİ | MAVİ       | 46      | TURUNCU / KIRMIZI | MAVİ       |
| 22      | BEYAZ/ MAVİ | TURUNCU    | 47      | TURUNCU / KIRMIZI | TURUNCU    |
| 23      | BEYAZ/ MAVİ | YEŞİL      | 48      | TURUNCU / KIRMIZI | YEŞİL      |
| 24      | BEYAZ/ MAVİ | KAHVERENGİ | 49      | TURUNCU / KIRMIZI | KAHVERENGİ |
| 25      | BEYAZ/ MAVİ | GRİ        | 50      | TURUNCU / KIRMIZI | GRİ        |

## 2-Bireysel Ekranlı Çiftlerin Tanımlanması

- Ekranlı çiftler, çiftleri ayırıcı bandın altındaki  
numaralı bant tarafından tanımlanır.  
- Her çift bir siyah ve bir mavi damara sahiptir.

## 3-Damarın Tanımı

1"den 40"a kadar: Sarı üzerine siyah numara damgalı.  
41"den 80"e kadar: Siyah üzerine beyaz numara damgalı.

## DIN 47100 RENK KODLARI (Renkler tekrarlamasız)

| DAMAR NO | DAMAR RENGİ   | DAMAR NO | DAMAR RENGİ         |
|----------|---------------|----------|---------------------|
| 1        | BEYAZ         | 32       | SARI-MAVİ           |
| 2        | KAHVE         | 33       | YEŞİL-KIRMIZI       |
| 3        | YEŞİL         | 34       | SARI-KIRMIZI        |
| 4        | SARI          | 35       | YEŞİL-SİYAH         |
| 5        | GRI           | 36       | SARI-SİYAH          |
| 6        | PEMBE         | 37       | GRI-MAVİ            |
| 7        | MAVİ          | 38       | PEMBE-MAVİ          |
| 8        | KIRMIZI       | 39       | GRI-KIRMIZI         |
| 9        | SİYAH         | 40       | PEMBE-KIRMIZI       |
| 10       | MOR           | 41       | GRI-SİYAH           |
| 11       | GRI-PEMBE     | 42       | PEMBE-SİYAH         |
| 12       | KIRMIZI-MAVİ  | 43       | MAVİ-SİYAH          |
| 13       | BEYAZ-YEŞİL   | 44       | KIRMIZI-SİYAH       |
| 14       | KAHVE-YEŞİL   | 45       | BEYAZ-KAHVE-SİYAH   |
| 15       | BEYAZ-SARI    | 46       | SARI-YEŞİL-SİYAH    |
| 16       | SARI-KAHVE    | 47       | GRI-PEMBE-SİYAH     |
| 17       | BEYAZ-GRI     | 48       | KIRMIZI-MAVİ-SİYAH  |
| 18       | GRI-KAHVE     | 49       | BEYAZ-YEŞİL-SİYAH   |
| 19       | BEYAZ-PEMBE   | 50       | KAHVE-YEŞİL-SİYAH   |
| 20       | PEMBE-KAHVE   | 51       | BEYAZ-SARI-SİYAH    |
| 21       | BEYAZ-MAVİ    | 52       | SARI-KAHVE-SİYAH    |
| 22       | KAHVE-MAVİ    | 53       | BEYAZ-GRI-SİYAH     |
| 23       | BEYAZ-KIRMIZI | 54       | GRI-KAHVE-SİYAH     |
| 24       | KAHVE-KIRMIZI | 55       | BEYAZ-PEMBE-SİYAH   |
| 25       | BEYAZ-SİYAH   | 56       | PEMBE-KAHVE-SİYAH   |
| 26       | KAHVE-SİYAH   | 57       | BEYAZ-MAVİ-SİYAH    |
| 27       | GRI-YEŞİL     | 58       | KAHVE-MAVİ-SİYAH    |
| 28       | SARI-GRI      | 59       | BEYAZ-KIRMIZI-SİYAH |
| 29       | PEMBE-YEŞİL   | 60       | KAHVE-KIRMIZI-SİYAH |
| 30       | SARI-PEMBE    | 61       | SİYAH-BEYAZ         |
| 31       | YEŞİL-MAVİ    |          |                     |

## DIN 47100 RENK KODLARI (45. Damardan itibaren renk tekrarlamalı)

| DAMAR NO | DAMAR RENGİ   | DAMAR NO | DAMAR RENGİ   |
|----------|---------------|----------|---------------|
| 1        | BEYAZ         | 32       | SARI-MAVİ     |
| 2        | KAHVE         | 33       | YEŞİL-KIRMIZI |
| 3        | YEŞİL         | 34       | SARI-KIRMIZI  |
| 4        | SARI          | 35       | YEŞİL-SİYAH   |
| 5        | GRİ           | 36       | SARI-SİYAH    |
| 6        | PEMBE         | 37       | GRİ-MAVİ      |
| 7        | MAVİ          | 38       | PEMBE-MAVİ    |
| 8        | KIRMIZI       | 39       | GRİ-KIRMIZI   |
| 9        | SİYAH         | 40       | PEMBE-KIRMIZI |
| 10       | MOR           | 41       | GRİ-SİYAH     |
| 11       | GRİ-PEMBE     | 42       | PEMBE-SİYAH   |
| 12       | KIRMIZI-MAVİ  | 43       | MAVİ-SİYAH    |
| 13       | BEYAZ-YEŞİL   | 44       | KIRMIZI-SİYAH |
| 14       | KAHVE-YEŞİL   | 45       | BEYAZ         |
| 15       | BEYAZ-SARI    | 46       | KAHVE         |
| 16       | SARI-KAHVE    | 47       | YEŞİL         |
| 17       | BEYAZ-GRİ     | 48       | SARI          |
| 18       | GRİ-KAHVE     | 49       | GRİ           |
| 19       | BEYAZ-PEMBE   | 50       | PEMBE         |
| 20       | PEMBE-KAHVE   | 51       | MAVİ          |
| 21       | BEYAZ-MAVİ    | 52       | KIRMIZI       |
| 22       | KAHVE-MAVİ    | 53       | SİYAH         |
| 23       | BEYAZ-KIRMIZI | 54       | MOR           |
| 24       | KAHVE-KIRMIZI | 55       | GRİ-PEMBE     |
| 25       | BEYAZ-SİYAH   | 56       | KIRMIZI-MAVİ  |
| 26       | KAHVE-SİYAH   | 57       | BEYAZ-YEŞİL   |
| 27       | GRİ-YEŞİL     | 58       | KAHVE-YEŞİL   |
| 28       | SARI-YEŞİL    | 59       | BEYAZ-SARI    |
| 29       | PEMBE-YEŞİL   | 60       | SARI-KAHVE    |
| 30       | SARI-PEMBE    | 61       | BEYAZ-GRİ     |
| 31       | YEŞİL-MAVİ    |          |               |

## DIN 47100 RENK KODLARI (BÜKÜLÜ ÇİFTLER)

## ÇİFTLERİN RENKLERİ

| ÇİFT NO |    |    | a-Damarı      | b-Damarı      |
|---------|----|----|---------------|---------------|
| 1       | 23 | 45 | BEYAZ         | KAHVE         |
| 2       | 24 | 46 | YEŞİL         | SARI          |
| 3       | 25 | 47 | GRİ           | PEMBE         |
| 4       | 26 | 48 | MAVİ          | KIRMIZI       |
| 5       | 27 | 49 | SİYAH         | MOR           |
| 6       | 28 | 50 | GRİ-PEMBE     | KIRMIZI-MAVİ  |
| 7       | 29 | 51 | BEYAZ-YEŞİL   | KAHVE-YEŞİL   |
| 8       | 30 | 52 | BEYAZ-SARI    | SARI-KAHVE    |
| 9       | 31 | 53 | BEYAZ-GRİ     | GRİ-KAHVE     |
| 10      | 32 | 54 | BEYAZ-PEMBE   | PEMBE-KAHVE   |
| 11      | 33 | 55 | BEYAZ-MAVİ    | KAHVE-MAVİ    |
| 12      | 34 | 56 | BEYAZ-KIRMIZI | KAHVE-KIRMIZI |
| 13      | 35 | 57 | BEYAZ-SİYAH   | KAHVE-SİYAH   |
| 14      | 36 | 58 | GRİ-YEŞİL     | SARI-GRİ      |
| 15      | 37 | 59 | PEMBE-YEŞİL   | SARI-PEMBE    |
| 16      | 38 | 60 | YEŞİL-MAVİ    | SARI-MAVİ     |
| 17      | 39 | 61 | YEŞİL-KIRMIZI | SARI-KIRMIZI  |
| 18      | 40 | 62 | YEŞİL-SİYAH   | SARI-SİYAH    |
| 19      | 41 | 63 | GRİ-MAVİ      | PEMBE-MAVİ    |
| 20      | 42 | 64 | GRİ-KIRMIZI   | PEMBE-KIRMIZI |
| 21      | 43 | 65 | GRİ-SİYAH     | PEMBE-SİYAH   |
| 22      | 44 | 66 | MAVİ-SİYAH    | KIRMIZI-SİYAH |

## J-Y(St)Y...Lg YANGIN ALARM VE HABERLEŞME KABLOLARI DIN VDE 0815'e Göre Renk Kodları

2 perli tesisat kabloları yıldız dörtlü şeklinde bükülür.

1. Çift: a-damarı Kırmızı b-damarı Siyah  
2. Çift: a-damarı Beyaz b-damarı Sarı

4 veya daha fazla telli tesisat kabloları:

Her katta 1. çiftin a-damarı Kırmızı, diğer çiftlerde Beyaz  
b-teli Sarı, Yeşil, Kahve, Siyah renkler devamlı sıra ile takip eder.  
Sıralanışı: Dış kattan içe doğrudur.

| b-teli | ÇİFT NO |    |    |    |    |    |    |    |    |    |
|--------|---------|----|----|----|----|----|----|----|----|----|
| Mavi   | 1       | 6  | 11 | 16 | 21 | 26 | 31 | 36 | 41 | 46 |
| Sarı   | 2       | 7  | 12 | 17 | 22 | 27 | 32 | 37 | 42 | 47 |
| Yeşil  | 3       | 8  | 13 | 18 | 23 | 28 | 33 | 38 | 43 | 48 |
| Kahve  | 4       | 9  | 14 | 19 | 24 | 29 | 34 | 39 | 44 | 49 |
| Siyah  | 5       | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 |

## J-H(St)H...Bd ÖZELLİKLER

### PERLERİN TEMEL RENKLERİ

| Çift No  | 1       | 2    | 3     | 4     |
|----------|---------|------|-------|-------|
| a-damarı | Mavi    | Gri  | Yeşil | Beyaz |
| b-damarı | Kırmızı | Sarı | Kahve | Siyah |

| Çift Sayısı | Alt Birim     | 1. Kat | 2. Kat |
|-------------|---------------|--------|--------|
| 2           | Yıldız dörtlü | 1      | -      |
| 4           | Çift          | 4      | -      |
| 8           | 4 Çiftli grup | 2      | -      |
| 12          | 4 Çiftli grup | 3      | -      |
| 16          | 4 Çiftli grup | 4      | -      |
| 20          | 4 Çiftli grup | 5      | -      |
| 32          | 4 Çiftli grup | 1      | 7      |
| 40          | 4 Çiftli grup | 2      | 8      |
| 52          | 4 Çiftli grup | 3      | 10     |

## DAHİLİ TESİSAT KABLOLARI

(VBV &amp; VBV-K / HBH &amp; HBH-K / VBAPV &amp; VBAPV-K / HBAPH &amp; HBAPH-K)

## ON ÇİFTLİ GRUP YALITIM RENKLERİ

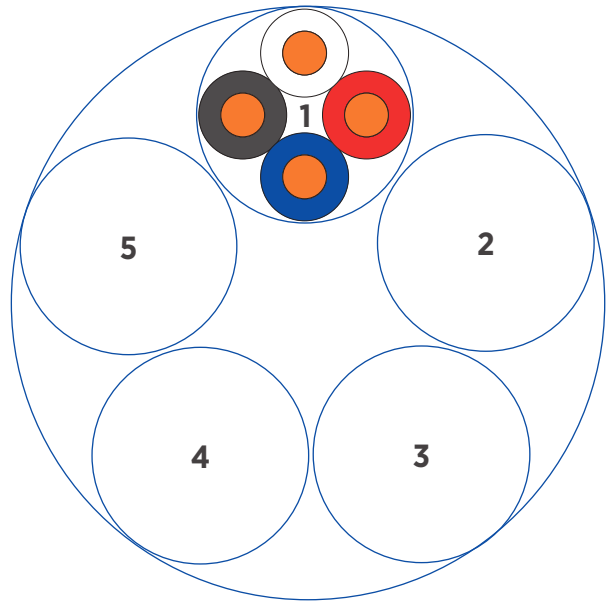
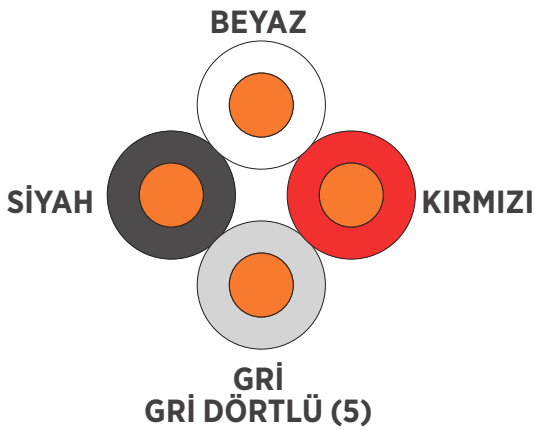
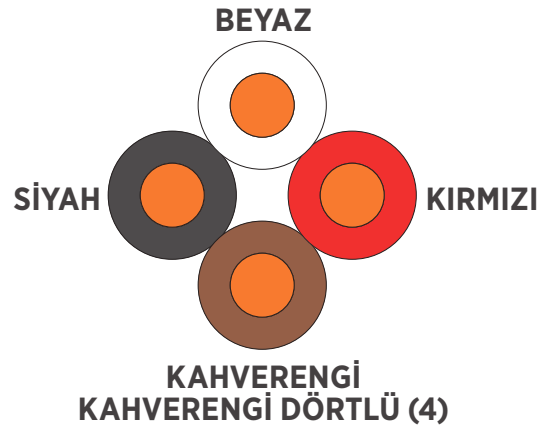
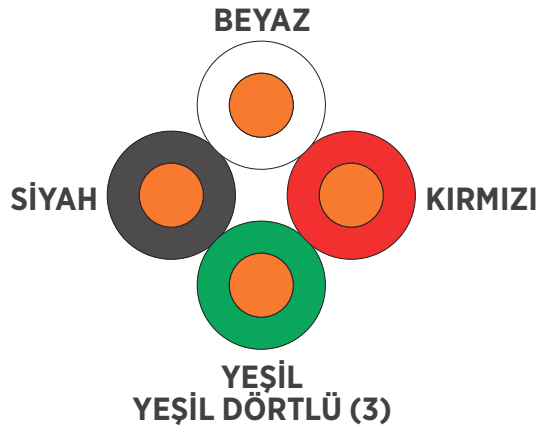
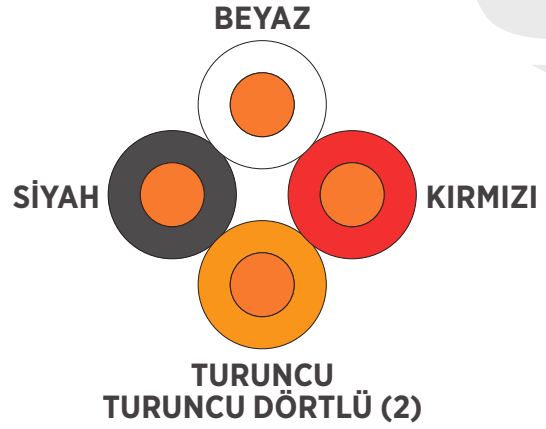
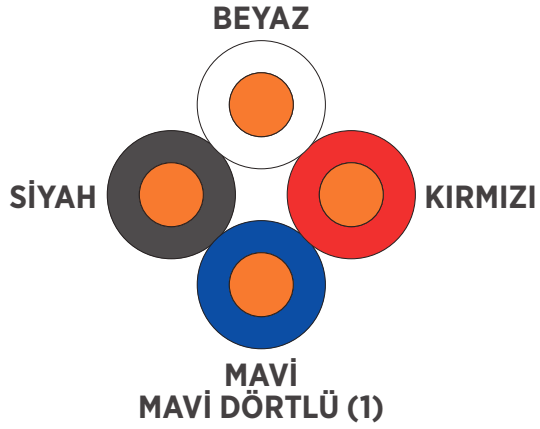
| GRUP NO | YALITKAN RENKLERİ |            |
|---------|-------------------|------------|
|         | A-TELİ            | B-TELİ     |
| 1       | BEYAZ             | MAVİ       |
| 2       | BEYAZ             | TURUNCU    |
| 3       | BEYAZ             | YEŞİL      |
| 4       | BEYAZ             | KAHVERENGİ |
| 5       | BEYAZ             | GRİ        |
| 6       | KIRMIZI           | MAVİ       |
| 7       | KIRMIZI           | TURUNCU    |
| 8       | KIRMIZI           | YEŞİL      |
| 9       | KIRMIZI           | KAHVERENGİ |
| 10      | KIRMIZI           | GRİ        |

| GRUP NO | BAĞ ŞERİDİ RENGİ |
|---------|------------------|
| 1       | MAVİ             |
| 2       | TURUNCU          |
| 3       | YEŞİL            |
| 4       | KAHVERENGİ       |
| 5       | GRİ              |
| 6       | BEYAZ-MAVİ       |
| 7       | BEYAZ-TURUNCU    |
| 8       | BEYAZ-YEŞİL      |
| 9       | BEYAZ-KAHVERENGİ |
| 10      | BEYAZ-GRİ        |

## KABLO ÇEKİRDEK DÜZENİ

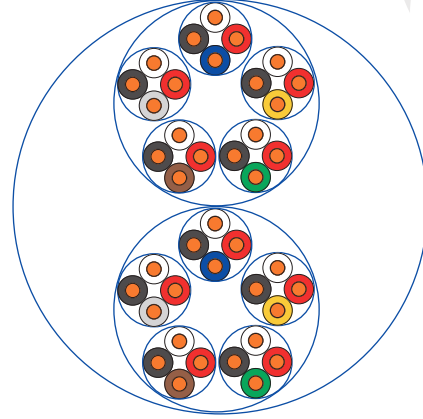
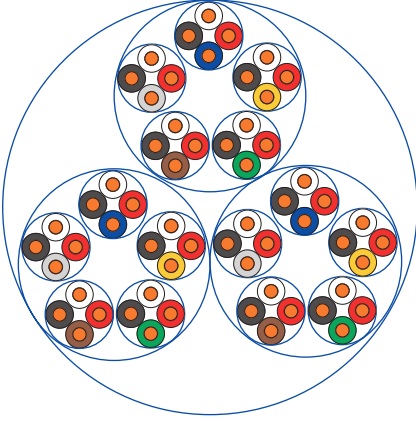
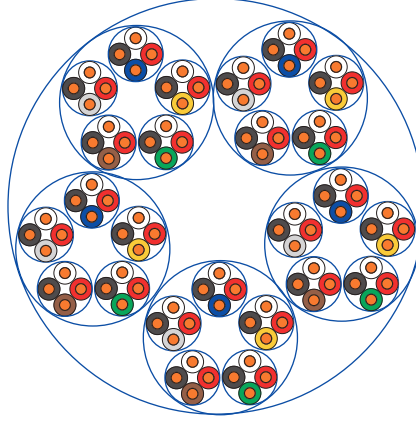
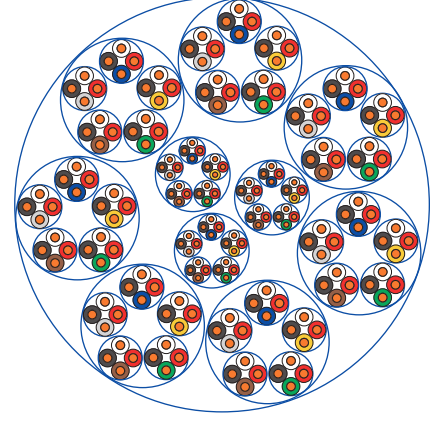
| GRUP NO | ÇEKİRDEK DÜZENİ | 1. Kat | 2. Kat | 2. Kat |
|---------|-----------------|--------|--------|--------|
| 1       | İKİLİ           | -      | -      | -      |
| 2       | İKİLİ           | -      | -      | -      |
| 3       | İKİLİ           | -      | -      | -      |
| 4       | İKİLİ           | -      | -      | -      |
| 6       | İKİLİ           | -      | -      | -      |
| 10      | İKİLİ           | 7      | 7      | -      |
| 20      | 10 ÇİFT GRUP    | -      | -      | -      |
| 30      | 10 ÇİFT GRUP    | -      | -      | -      |
| 50      | 10 ÇİFT GRUP    | -      | -      | -      |
| 100     | 10 ÇİFT GRUP    | 7      | 7      | -      |
| 200     | 50 ÇİFT GRUP    | -      | -      | -      |

## PDV&amp;PDV-K / PD-PAP TELEFON KABLOLARININ GENEL YAPISI (YILDIZ DÖRTLÜ)

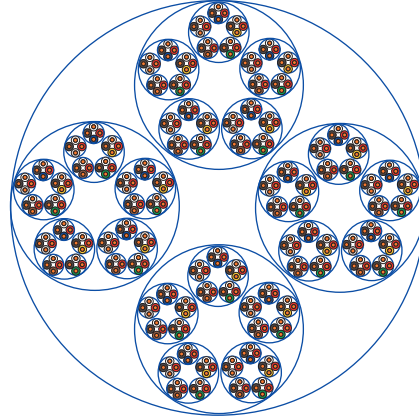


GRUP VE PAKETLERİN  
BAĞ ŞERİDİ RENKLERİ

| GRUP NO | BAĞ ŞERİDİ RENGİ |
|---------|------------------|
| 1       | MAVİ             |
| 2       | TURUNCU          |
| 3       | YEŞİL            |
| 4       | KAHVERENGİ       |
| 5       | GRİ              |
| 6       | BEYAZ-MAVİ       |
| 7       | BEYAZ-TURUNCU    |
| 8       | BEYAZ-YEŞİL      |
| 9       | BEYAZ-KAHVERENGİ |
| 10      | BEYAZ-GRİ        |

20 Çiftli Çekirdek  
(2 gruptan oluşur)30 Çiftli Çekirdek  
(3 gruptan oluşur)50 Çiftli Çekirdek  
(5 gruptan oluşur)100 Çiftli Çekirdek  
(10 gruptan oluşur)50 ÇİFTLİ GRUP VE PAKETLERİN  
BAĞ ŞERİDİ RENKLERİ

| GRUP NO | BAĞ ŞERİDİ RENGİ |
|---------|------------------|
| 1       | MAVİ             |
| 2       | TURUNCU          |
| 3       | YEŞİL            |
| 4       | KAHVERENGİ       |

200 Çiftli Çekirdek  
(4 adet 50 çiftli paketten oluşur)

## STANDART ESNEK İLETKENLERİN METRİK ÖLÇÜLERİ VDE 0295; IEC 60228; EN 60228

| İLETKENİN<br>SINIFI | KESİT<br>ALANI<br>mm <sup>2</sup> | TELİN BÜKÜM<br>SAYISI VE ÖLÇÜSÜ<br>mm | İLETKENİN NOMİNAL<br>ÇAPI<br>mm | NOMİNAL AĞIRLIK<br>kg/km<br>20 °C |
|---------------------|-----------------------------------|---------------------------------------|---------------------------------|-----------------------------------|
|                     | 0,05                              | 7X0.10                                | 0,3                             | 0,5                               |
|                     | 0,22                              | 7X0.20                                | 0,6                             | 2,0                               |
|                     | 0,5                               | 7X0.30                                | 0,9                             | 4,5                               |
| 5                   | 0,5                               | 16X0.20                               | 0,93                            | 4,5                               |
| 6                   | 0,5                               | 28X0.15                               | 0,94                            | 4,5                               |
|                     | 0,5                               | 151X0.065                             | 0,98                            | 4,5                               |
|                     | 0,65                              | 14X0.25                               | 1,1                             | 5,8                               |
| 5                   | 0,75                              | 24X0.20                               | 1,14                            | 6,7                               |
| 6                   | 0,75                              | 42X0.15                               | 1,12                            | 6,7                               |
| 5                   | 1,0                               | 32X0.20                               | 1,34                            | 8,9                               |
| 5                   | 1,25                              | 40X0.20                               | 1,47                            | 11,1                              |
| 5                   | 1,35                              | 19X0.30                               | 1,5                             | 12,0                              |
| 5                   | 1,5                               | 30X0.25                               | 1,6                             | 13,4                              |
|                     | 2,0                               | 28X0.30                               | 1,87                            | 17,8                              |
| 5                   | 2,5                               | 50X0.25                               | 2,09                            | 22,3                              |
|                     | 3,0                               | 44X0.30                               | 2,4                             | 27                                |
| 5                   | 4,0                               | 56X0.30                               | 2,61                            | 36                                |
|                     | 4,5                               | 65X0.30                               | 2,8                             | 40                                |
| 5                   | 6                                 | 84X0.30                               | 3,21                            | 53                                |
|                     | 8                                 | 120X0.30                              | 3,75                            | 71                                |
| 5                   | 10                                | 80X0.40                               | 4,2                             | 89                                |
| 5                   | 16                                | 128X0.40                              | 5,3                             | 142                               |
| 5                   | 25                                | 200X0.40                              | 7,1                             | 223                               |
| 5                   | 35                                | 280X0.40                              | 8,5                             | 312                               |
| 5                   | 50                                | 400X0.40                              | 10,3                            | 445                               |
| 5                   | 70                                | 356X0.50                              | 12,4                            | 623                               |
| 5                   | 95                                | 485X0.50                              | 14,5                            | 846                               |
| 5                   | 120                               | 120X0.30                              | 16,0                            | 1068                              |
| 5                   | 150                               | 765X0.50                              | 18,0                            | 1335                              |
| 5                   | 185                               | 944X0.50                              | 20,0                            | 1647                              |
| 5                   | 240                               | 1225X0.50                             | 23,0                            | 2136                              |
| 5                   | 300                               | 1530X0.50                             | 26,0                            | 2670                              |
| 5                   | 400                               | 2034X0.50                             | 30,0                            | 3560                              |
| 5                   | 500                               | 1768X0.60                             | 33,5                            | 4450                              |

## BAKIR İLETKENİN YAPISI VDE 0295; IEC 60228; EN 60228

| Kesit | Çok Tellî Yuvarlak İletken Sınıf2 Sütun1 | Çok Tellî Bükülü Tellerin Standart Yapısı Sütun 2 | İnce Bükülü Teller Sınıf5 Sütun3 | Extra ince bükülü teller |               |           |          |
|-------|------------------------------------------|---------------------------------------------------|----------------------------------|--------------------------|---------------|-----------|----------|
|       |                                          |                                                   |                                  | Sınıf 6 Sütun 4          | Standart yapı |           |          |
|       |                                          |                                                   |                                  |                          | Sütun 5       | Sütun 6   | Sütun 6  |
| 0,035 | -                                        | 7x0,08                                            | -                                | -                        | -             | -         | -        |
| 0,05  | -                                        | -                                                 | -                                | -                        | -             | 14x0,07   | 26x0,05  |
| 0,08  | -                                        | -                                                 | -                                | -                        | -             | -         | -        |
| 0,09  | -                                        | -                                                 | -                                | -                        | 7x0,124       | 24x0,07   | -        |
| 0,14  | -                                        | -                                                 | 18x0,10                          | 18x0,10                  | 18x0,10       | 36x0,07   | 72x0,05  |
| 0,25  | -                                        | -                                                 | 14x0,15                          | 32x0,10                  | 32x0,10       | 65x0,07   | 128x0,05 |
| 0,34  | -                                        | 7x0,25                                            | 19x0,15                          | 42x0,10                  | 42x0,10       | 88x0,07   | 174x0,05 |
| 0,38  | -                                        | 7x0,27                                            | 12x0,20                          | 21x0,15                  | 48x0,10       | 100x0,07  | 194x0,05 |
| 0,5   | 7x0,30                                   | 7x0,30                                            | 16x0,20                          | 28x0,15                  | 64x0,10       | 131x0,07  | 256x0,05 |
| 0,75  | 7x0,37                                   | 7x0,37                                            | 24x0,20                          | 42x0,15                  | 96x0,10       | 195x0,07  | 384x0,05 |
| 1,0   | 7x0,43                                   | 7x0,43                                            | 32x0,20                          | 56x0,15                  | 128x0,10      | 260x0,07  | 512x0,05 |
| 1,5   | 7x0,52                                   | 7x0,52                                            | 30x0,25                          | 84x0,15                  | 192x0,10      | 392x0,07  | 768x0,05 |
| 2,5   | 7x0,67                                   | 19x0,41                                           | 50x0,25                          | 140x0,15                 | 320x0,10      | 615x0,07  | 128x0,05 |
| 4     | 7x0,85                                   | 19x0,52                                           | 56x0,30                          | 224x0,15                 | 512x0,10      | 1040x0,07 | -        |
| 6     | 7x1,05                                   | 19x0,64                                           | 84x0,30                          | 192x0,20                 | 768x0,10      | 1560x0,07 | -        |
| 10    | 7x1,35                                   | 49x0,51                                           | 80x0,40                          | 320x0,20                 | 128x0,10      | 2600x0,07 | -        |
| 16    | 7x1,70                                   | 49x0,65                                           | 128x0,40                         | 512x0,20                 | 2048x0,10     | 4116x0,07 | -        |
| 25    | 7x2,13                                   | 84x0,62                                           | 200x0,40                         | 800x0,20                 | 3200x0,10     | 6370x0,07 | -        |
| 35    | 7x2,52                                   | 133x0,58                                          | 280x0,40                         | 1120x0,40                | 4410x0,10     | 9100x0,07 | -        |
| 50    | 19x1,83                                  | 113x0,69                                          | 400x0,40                         | 705x0,30                 | -             | -         | -        |
| 70    | 19x2,17                                  | 189x0,69                                          | 356x0,50                         | 990x0,30                 | -             | -         | -        |
| 95    | 19x2,52                                  | 259x0,69                                          | 485x0,50                         | 1340x0,30                | -             | -         | -        |
| 120   | 37x2,03                                  | 336x0,67                                          | 614x0,50                         | 1690x0,30                | -             | -         | -        |
| 150   | 37x2,27                                  | 392x0,69                                          | 765x0,50                         | 2123x0,30                | -             | -         | -        |
| 185   | 37x2,52                                  | 494x0,69                                          | 944x0,50                         | 1470x0,40                | -             | -         | -        |
| 240   | 61x2,24                                  | 627x0,70                                          | 1225x0,50                        | 1905x0,40                | -             | -         | -        |
| 300   | 61x2,50                                  | 790x0,70                                          | 1530x0,70                        | 2385x0,40                | -             | -         | -        |
| 400   | 61x2,89                                  | -                                                 | 2034x0,50                        | -                        | -             | -         | -        |
| 500   | 61x3,23                                  | -                                                 | 1768x0,60                        | -                        | -             | -         | -        |
| 630   | 91x2,97                                  | -                                                 | 2228x0,60                        | -                        | -             | -         | -        |

## TEK VE ÇOK DAMARLI KABLOLAR İÇİN SINIF 2 ÖRGÜLÜ İLETKENLER

| Anma kesit alanı<br>mm <sup>2</sup> | İletkendeki tellerin sayısı |    |                        |    |                  |    | 20 °C de iletken direnci |                         |                                                         |
|-------------------------------------|-----------------------------|----|------------------------|----|------------------|----|--------------------------|-------------------------|---------------------------------------------------------|
|                                     | Dairesel                    |    | Dairesel sıkıştırılmış |    | Biçimlendirilmiş |    | Çıplak Bakır<br>Ω / km   | Kalaylı Bakır<br>Ω / km | Alüminyum ve<br>alüminyum alaşımlı<br>iletkenler Ω / km |
|                                     | Cu                          | Al | Cu                     | Al | Cu               | Al |                          |                         |                                                         |
| 1                                   | 2                           | 3  | 4                      | 5  | 6                | 7  | 8                        | 9                       | 10                                                      |
| 0,5                                 | 7                           | -  | -                      | -  | -                | -  | 36                       | 36,7                    | -                                                       |
| 0,75                                | 7                           | -  | -                      | -  | -                | -  | 24,5                     | 24,8                    | -                                                       |
| 1                                   | 7                           | -  | -                      | -  | -                | -  | 18,1                     | 18,2                    | -                                                       |
| 1,5                                 | 7                           | -  | 6                      | -  | -                | -  | 12,1                     | 12,2                    | -                                                       |
| 2,5                                 | 7                           | -  | 6                      | -  | -                | -  | 7,41                     | 7,56                    | -                                                       |
| 4                                   | 7                           | -  | 6                      | -  | -                | -  | 4,61                     | 4,7                     | -                                                       |
| 6                                   | 7                           | -  | 6                      | 6  | -                | -  | 3,08                     | 3,11                    | 3,08                                                    |
| 10                                  | 7                           | 7  | 6                      | 6  | -                | -  | 1,83                     | 1,84                    | 1,91                                                    |
| 16                                  | 7                           | 7  | 6                      | 6  | 6                | 6  | 1,15                     | 1,16                    | 1,2                                                     |
| 25                                  | 7                           | 7  | 6                      | 6  | 6                | 6  | 0,727                    | 0,754                   | 0,868                                                   |
| 35                                  | 7                           | 7  | 6                      | 6  | 6                | 6  | 0,524                    | 0,529                   | 0,641                                                   |
| 50                                  | 19                          | 19 | 6                      | 6  | 6                | 6  | 0,387                    | 0,391                   | 0,443                                                   |
| 70                                  | 19                          | 19 | 12                     | 12 | 12               | 12 | 0,268                    | 0,27                    | 0,32                                                    |
| 95                                  | 19                          | 19 | 15                     | 15 | 15               | 15 | 0,193                    | 0,195                   | 0,253                                                   |
| 120                                 | 37                          | 37 | 18                     | 15 | 18               | 15 | 0,153                    | 0,154                   | 0,206                                                   |
| 150                                 | 37                          | 37 | 18                     | 15 | 18               | 15 | 0,124                    | 0,126                   | 0,164                                                   |
| 185                                 | 37                          | 37 | 30                     | 30 | 30               | 30 | 0,0991                   | 0,1                     | 0,125                                                   |
| 240                                 | 37                          | 37 | 34                     | 30 | 34               | 30 | 0,0754                   | 0,0762                  | 0,1                                                     |
| 300                                 | 61                          | 61 | 34                     | 30 | 34               | 30 | 0,0601                   | 0,0607                  | 0,0778                                                  |
| 400                                 | 61                          | 61 | 53                     | 53 | 53               | 53 | 0,047                    | 0,0475                  | 0,0605                                                  |
| 500                                 | 61                          | 61 | 53                     | 53 | 53               | 53 | 0,0366                   | 0,0369                  | 0,0469                                                  |
| 630                                 | 91                          | 91 | 53                     | 53 | 53               | 53 | 0,0283                   | 0,0286                  | 0,0367                                                  |
| 800                                 | 91                          | 91 | 53                     | 53 | b                | b  | 0,0221                   | 0,0224                  | 0,0291                                                  |
| 1200                                | b                           | b  | b                      | b  | b                | b  | 0,0151                   | 0,0151                  | 0,0247                                                  |
| 1400 <sup>a</sup>                   | b                           | b  | b                      | b  | b                | b  | 0,0129                   | 0,0129                  | 0,0212                                                  |
| 1600                                | b                           | b  | b                      | b  | b                | b  | 0,0113                   | 0,0113                  | 0,0186                                                  |
| 1800 <sup>a</sup>                   | b                           | b  | b                      | b  | b                | b  | 0,0101                   | 0,0101                  | 0,0165                                                  |
| 2000                                | b                           | b  | b                      | b  | b                | b  | 0,009                    | 0,009                   | 0,0149                                                  |
| 2500                                | b                           | b  | b                      | b  | b                | b  | 0,0072                   | 0,0072                  | 0,0127                                                  |

a - Bu boyutlar tercih edilmez. Tercih edilmeyen diğer boyutlar bazı özel uygulamalar için bilinir, ancak bunlar TS EN 60228 standardının kapsamında değildir.

b- Bu boyutlar için tellerin en az sayısı belirtilmez. Bu boyutlar 4, 5 veya 6 çeşit parçadan (milliken) yapılabilir.

c- Alüminyum iletken gibi aynı anma kesit alanına sahip örgülü alüminyum alaşımlı iletkenler için direnç değeri imalatçı ile alıcı arasındaki anlaşmaya bağlı olmalıdır.

## IEC 60228; EN 60228 VE VDE 0295'E GÖRE İLETKEN DİRENÇ DEĞERİ

| İletken<br>Ölçüleri             | Güç kabloları ve telleri |        |               |        |                      |        | Kaynak Tablosu   |                |
|---------------------------------|--------------------------|--------|---------------|--------|----------------------|--------|------------------|----------------|
|                                 | Bakır İletkenler         |        |               |        | Alüminyum İletkenler |        | Bakır İletkenler |                |
|                                 | Kalaylı Teller           |        | Çıplak Teller |        | Çıplak Teller        |        | Çıplak Teller    | Kalaylı Teller |
|                                 | Sınıf1                   | Sınıf2 | Sınıf1        | Sınıf2 | Sınıf1               | Sınıf2 |                  |                |
| Normal Kesit<br>mm <sup>2</sup> | Ω/km                     | Ω/km   | Ω/km          | Ω/km   | Ω/km                 | Ω/km   | Ω/km             | Ω/km           |
| 0,05                            | -                        | ~380   | -             | ~360   | -                    | -      | -                | -              |
| 0,08                            | -                        | ~240   | -             | ~230   | -                    | -      | -                | -              |
| 0,09                            | -                        | ~230   | -             | ~215   | -                    | -      | -                | -              |
| 0,14                            | -                        | ~140   | -             | ~138   | -                    | -      | -                | -              |
| 0,20                            | -                        | ~96,8  | -             | ~95    | -                    | -      | -                | -              |
| 0,25                            | -                        | ~79,3  | -             | ~78    | -                    | -      | -                | -              |
| 0,34                            | -                        | ~57,1  | -             | ~56    | -                    | -      | -                | -              |
| 0,50                            | 36,70                    | 40,10  | 36,00         | 39,00  | -                    | -      | -                | -              |
| 0,75                            | 24,80                    | 26,70  | 24,50         | 26,00  | -                    | -      | -                | -              |
| 1                               | 18,20                    | 20,00  | 18,10         | 19,50  | -                    | -      | -                | -              |
| 1,50                            | 12,20                    | 13,70  | 12,10         | 13,30  | -                    | -      | -                | -              |
| 2,50                            | 7,56                     | 8,21   | 7,41          | 7,98   | -                    | -      | -                | -              |
| 4                               | 4,70                     | 5,09   | 4,61          | 4,95   | -                    | -      | -                | -              |
| 6                               | 3,11                     | 3,39   | 3,08          | 3,33   | -                    | -      | -                | -              |
| 10                              | 1,84                     | 1,50   | 1,83          | 1,91   | -                    | -      | -                | -              |
| 16                              | 1,16                     | 1,24   | 1,15          | 1,21   | -                    | 1,910  | 1,160            | 1,190          |
| 25                              | 0,734                    | 0,795  | 0,727         | 0,780  | 1,200                | 1,200  | 0,758            | 0,780          |
| 35                              | 0,529                    | 0,565  | 0,524         | 0,554  | 0,868                | 0,868  | 0,536            | 0,552          |
| 50                              | 0,391                    | 0,393  | 0,387         | 0,386  | 0,641                | 0,641  | 0,379            | 0,391          |
| 70                              | 0,270                    | 0,277  | 0,268         | 0,272  | 0,443                | 0,443  | 0,268            | 0,276          |
| 95                              | 0,195                    | 0,210  | 0,193         | 0,206  | 0,320                | 0,320  | 0,198            | 0,204          |
| 120                             | 0,154                    | 0,164  | 0,153         | 0,161  | 0,253                | 0,253  | 0,155            | 0,159          |
| 150                             | 0,126                    | 0,132  | 0,124         | 0,129  | 0,206                | 0,206  | 0,125            | 0,129          |
| 185                             | 0,1260                   | 0,108  | 0,0991        | 0,106  | 0,164                | 0,164  | 0,102            | 0,105          |
| 240                             | 0,0762                   | 0,0817 | 0,0754        | 0,0801 | 0,125                | 0,125  | -                | -              |
| 300                             | 0,0607                   | 0,0654 | 0,0601        | 0,0641 | 0,100                | 0,100  | -                | -              |
| 400                             | 0,0475                   | 0,0495 | 0,0470        | 0,0486 | -                    | 0,0778 | -                | -              |
| 500                             | 0,0369                   | 0,0391 | 0,0366        | 0,0384 | -                    | 0,0605 | -                | -              |
| 630                             | 0,0286                   | 0,0292 | 0,0283        | 0,0287 | -                    | 0,0469 | -                | -              |

## AWG AMERİKAN TEL ÖLÇÜ SİSTEMİ (MONO BAKIR TELLER)

| İLETKENİN<br>SINIFI<br>(AWG) | KESİT<br>ALANI<br>mm <sup>2</sup> | İLETKENİN<br>NOMİNAL ÇAPI<br>mm | NOMİNAL<br>AĞIRLIK<br>kg / km | İLETKENİN DİRENCİ<br>(Ω/km)<br>20 ° C |
|------------------------------|-----------------------------------|---------------------------------|-------------------------------|---------------------------------------|
| 40                           | 0,0049                            | 0,079                           | 0,0433                        | 3540                                  |
| 39                           | 0,0062                            | 0,089                           | 0,0552                        | 2780                                  |
| 38                           | 0,0081                            | 0,102                           | 0,0720                        | 2130                                  |
| 37                           | 0,0103                            | 0,114                           | 0,0912                        | 1680                                  |
| 36                           | 0,0127                            | 0,127                           | 0,113                         | 1360                                  |
| 35                           | 0,0159                            | 0,142                           | 0,141                         | 1080                                  |
| 34                           | 0,0201                            | 0,16                            | 0,179                         | 857                                   |
| 33                           | 0,0255                            | 0,18                            | 0,228                         | 675                                   |
| 32                           | 0,0324                            | 0,203                           | 0,289                         | 532                                   |
| 31                           | 0,0401                            | 0,226                           | 0,357                         | 430                                   |
| 30                           | 0,0507                            | 0,254                           | 0,451                         | 340                                   |
| 29                           | 0,0649                            | 0,287                           | 0,576                         | 266                                   |
| 28                           | 0,0806                            | 0,32                            | 0,716                         | 214                                   |
| 27                           | 0,102                             | 0,361                           | 0,908                         | 169                                   |
| 26                           | 0,128                             | 0,404                           | 1,14                          | 135                                   |
| 25                           | 0,162                             | 0,455                           | 1,44                          | 106                                   |
| 24                           | 0,205                             | 0,511                           | 1,82                          | 84,2                                  |
| 23                           | 0,259                             | 0,574                           | 2,31                          | 66,6                                  |
| 22                           | 0,324                             | 0,643                           | 2,89                          | 53,2                                  |
| 21                           | 0,411                             | 0,724                           | 3,66                          | 41,9                                  |
| 20                           | 0,519                             | 0,813                           | 4,61                          | 33,2                                  |
| 19                           | 0,653                             | 0,912                           | 5,8                           | 26,4                                  |
| 18                           | 0,823                             | 1,02                            | 7,32                          | 21                                    |
| 18                           | 0,897                             | 1,22                            | 8,26                          | 21,2                                  |
| 17                           | 1,04                              | 1,15                            | 9,24                          | 16,6                                  |
| 16                           | 1,31                              | 1,29                            | 11,6                          | 13,6                                  |
| 16                           | 1,31                              | 1,47                            | 11,8                          | 13,6                                  |
| 14                           | 2,08                              | 1,63                            | 18,5                          | 8,28                                  |
| 14                           | 2,08                              | 1,85                            | 18,9                          | 8,56                                  |
| 12                           | 3,31                              | 2,052                           | 29,5                          | 5,21                                  |
| 12                           | 3,3                               | 2,052                           | 30,1                          | 5,38                                  |
| 12                           | 3,08                              | 1,99                            | 28,9                          | 5,59                                  |
| 10                           | 5,26                              | 2,59                            | 46,8                          | 3,28                                  |

## AWG AMERİKAN TEL ÖLÇÜ SİSTEMİ (BÜKÜLÜ BAKIR TELLER)

| ÖLÇÜ<br>(AWG) | BÜKÜM<br>DÜZENİ<br>(NOM. AWG) | YAKLAŞIK ÇAP<br>INCHES<br>mm | KESİT<br>mm² | AĞIRLIK<br>kg/km | İLETKEN DİRENCİ<br>(Ω/km)<br>20 ° C |        |
|---------------|-------------------------------|------------------------------|--------------|------------------|-------------------------------------|--------|
| 36            | 7 x 44                        | 0,006                        | 0,152        | 0,014            | 0,249                               | 1360,6 |
| 34            | 7 x 42                        | 0,075                        | 0,191        | 0,022            | 0,397                               | 856,0  |
| 32            | 7 x 40                        | 0,0093                       | 0,236        | 0,034            | 0,639                               | 538,4  |
| 32            | 19 x 44                       | 0,010                        | 0,254        | 0,035            | 0,639                               | 538,4  |
| 30            | 7 x 38                        | 0,012                        | 0,305        | 0,057            | 0,997                               | 367,4  |
| 30            | 19 x 42                       | 0,012                        | 0,305        | 0,059            | 0,997                               | 367,4  |
| 28            | 7 x 36                        | 0,015                        | 0,381        | 0,089            | 1,588                               | 232,0  |
| 28            | 19 x 40                       | 0,016                        | 0,406        | 0,090            | 1,588                               | 232,0  |
| 27            | 7 x 35                        | 0,017                        | 0,432        | 0,110            | 2,014                               | 182,4  |
| 26            | 7 x 34                        | 0,019                        | 0,483        | 0,141            | 2,526                               | 145,6  |
| 26            | 10 x 36                       | 0,021                        | 0,533        | 0,126            | 2,526                               | 145,6  |
| 26            | 19 x 38                       | 0,020                        | 0,508        | 0,155            | 2,526                               | 145,6  |
| 24            | 7 x 32                        | 0,024                        | 0,610        | 0,227            | 4,032                               | 90,8   |
| 24            | 10 x 34                       | 0,024                        | 0,610        | 0,200            | 4,032                               | 90,8   |
| 24            | 19 x 36                       | 0,024                        | 0,610        | 0,240            | 4,032                               | 90,8   |
| 22            | 42 x 40                       | 0,023                        | 0,584        | 0,205            | 4,032                               | 90,8   |
| 22            | 7 x 30                        | 0,030                        | 0,762        | 0,355            | 6,388                               | 57,4   |
| 22            | 19 x 34                       | 0,031                        | 0,787        | 0,382            | 6,388                               | 57,4   |
| 20            | 26 x 36                       | 0,030                        | 0,762        | 0,330            | 6,388                               | 57,4   |
| 20            | 7 x 28                        | 0,038                        | 0,965        | 0,563            | 10,191                              | 35,7   |
| 20            | 10 x 30                       | 0,037                        | 0,940        | 0,506            | 10,181                              | 35,7   |
| 20            | 19 x 32                       | 0,037                        | 0,940        | 0,614            | 10,181                              | 35,7   |
| 20            | 26 x 34                       | 0,036                        | 0,914        | 0,522            | 10,181                              | 35,7   |
| 18            | 42 x 36                       | 0,038                        | 1,965        | 0,531            | 10,181                              | 35,7   |
| 18            | 7 x 26                        | 0,048                        | 1,220        | 0,897            | 16,175                              | 22,7   |
| 18            | 16 x 30                       | 0,047                        | 1,190        | 0,810            | 16,175                              | 22,7   |
| 18            | 19 x 30                       | 0,049                        | 1,240        | 0,963            | 16,175                              | 22,7   |
| 18            | 42 x 34                       | 0,047                        | 1,190        | 0,844            | 16,175                              | 22,7   |
| 16            | 65 x 36                       | 0,047                        | 1,190        | 0,822            | 16,175                              | 22,7   |
| 16            | 7 x 24                        | 0,060                        | 1,520        | 1,430            | 25,756                              | 14,2   |
| 16            | 19 x 29                       | 0,058                        | 1,470        | 1,228            | 25,756                              | 14,2   |
| 16            | 26 x 30                       | 0,059                        | 1,500        | 1,316            | 25,756                              | 14,2   |
| 16            | 65 x 34                       | 0,059                        | 1,500        | 1,306            | 25,756                              | 14,2   |
| 14            | 105 x 36                      | 0,059                        | 1,500        | 1,329            | 25,756                              | 14,2   |
| 14            | 7 x 22                        | 0,076                        | 1,930        | 2,271            | 41,012                              | 8,95   |
| 14            | 19 x 26                       | 0,071                        | 1,800        | 2,434            | 41,012                              | 8,95   |
| 14            | 42 x 30                       | 0,075                        | 1,910        | 2,127            | 41,012                              | 8,95   |
| 12            | 105 x 34                      | 0,075                        | 1,910        | 2,110            | 61,160                              | 8,95   |
| 12            | 7 x 20                        | 0,096                        | 2,440        | 3,360            | 61,160                              | 5,61   |
| 12            | 19 x 25                       | 0,093                        | 2,360        | 3,087            | 61,160                              | 5,61   |
| 12            | 65 x 30                       | 0,095                        | 2,410        | 3,291            | 103,613                             | 5,61   |
| 10            | 165 x 34                      | 0,095                        | 2,410        | 3,315            | 103,613                             | 3,54   |
| 10            | 37 x 26                       | 0,115                        | 2,920        | 4,740            | 103,613                             | 3,54   |
| 10            | 65 x 28                       | 0,120                        | 3,050        | 5,224            | 103,613                             | 3,54   |
| 10            | 105 x 30                      | 0,118                        | 3,000        | 5,317            | 103,613                             | 3,54   |

## ESNEK KABLOLARIN AKIM TAŞIMA KAPASİTESİ

| Nominal<br>Kesit | GURUP 1<br>Boru içine yerleştirilen bir ya<br>da birden fazla tek damarlı<br>kablolar |                           | GURUP 2<br>Çok damarlı kablolar Plastik<br>kılıflı kablolar, mobil kablolar,<br>bina içi ağ kabloları gibi |                           | GURUP 3<br>Açıkta ve cihazların irtibat-<br>larında kullanılan tek damarlı<br>kablolar |                           |         |
|------------------|---------------------------------------------------------------------------------------|---------------------------|------------------------------------------------------------------------------------------------------------|---------------------------|----------------------------------------------------------------------------------------|---------------------------|---------|
|                  | ÖLÇÜ<br>mm²                                                                           | AKIM TAŞIMA<br>KAPASİTESİ | SİGORTA                                                                                                    | AKIM TAŞIMA<br>KAPASİTESİ | SİGORTA                                                                                | AKIM TAŞIMA<br>KAPASİTESİ | SİGORTA |
|                  |                                                                                       | A                         | A                                                                                                          | A                         | A                                                                                      | A                         | A       |
| 0,08             | 2,5                                                                                   | -                         | 0,5                                                                                                        | -                         | -                                                                                      | -                         |         |
| 0,14             | 6                                                                                     | -                         | 1,5                                                                                                        | -                         | 6                                                                                      | -                         |         |
| 0,25             | 8,5                                                                                   | -                         | 2,5                                                                                                        | -                         | 8,5                                                                                    | -                         |         |
| 0,34             | 9                                                                                     | -                         | 3,5                                                                                                        | -                         | 10                                                                                     | -                         |         |
| 0,5              | 10                                                                                    | -                         | 5                                                                                                          | -                         | 12                                                                                     | -                         |         |
| 0,75             | 11                                                                                    | -                         | 13                                                                                                         | 10                        | 16                                                                                     | 16                        |         |
| 1                | 12                                                                                    | 10                        | 16                                                                                                         | 16                        | 20                                                                                     | 20                        |         |
| 1,5              | 16                                                                                    | 16                        | 20                                                                                                         | 20                        | 25                                                                                     | 25                        |         |
| 2,5              | 21                                                                                    | 20                        | 27                                                                                                         | 25                        | 34                                                                                     | 35                        |         |
| 4                | 27                                                                                    | 25                        | 36                                                                                                         | 35                        | 45                                                                                     | 50                        |         |
| 6                | 35                                                                                    | 35                        | 47                                                                                                         | 50                        | 57                                                                                     | 63                        |         |
| 10               | 48                                                                                    | 50                        | 65                                                                                                         | 63                        | 78                                                                                     | 80                        |         |
| 16               | 65                                                                                    | 63                        | 87                                                                                                         | 80                        | 104                                                                                    | 100                       |         |
| 25               | 88                                                                                    | 80                        | 115                                                                                                        | 100                       | 137                                                                                    | 125                       |         |
| 35               | 110                                                                                   | 100                       | 143                                                                                                        | 125                       | 168                                                                                    | 160                       |         |
| 50               | 140                                                                                   | 125                       | 178                                                                                                        | 160                       | 210                                                                                    | 200                       |         |
| 70               | 175                                                                                   | 160                       | 220                                                                                                        | 224                       | 260                                                                                    | 250                       |         |
| 95               | 210                                                                                   | 200                       | 265                                                                                                        | 250                       | 310                                                                                    | 310                       |         |
| 120              | 250                                                                                   | 250                       | 310                                                                                                        | 300                       | 365                                                                                    | 355                       |         |
| 150              | -                                                                                     | -                         | 355                                                                                                        | 355                       | 415                                                                                    | 425                       |         |
| 185              | -                                                                                     | -                         | 405                                                                                                        | 355                       | 475                                                                                    | 425                       |         |
| 240              | -                                                                                     | -                         | 480                                                                                                        | 425                       | 560                                                                                    | 500                       |         |
| 300              | -                                                                                     | -                         | 555                                                                                                        | 500                       | 645                                                                                    | 600                       |         |
| 400              | -                                                                                     | -                         | -                                                                                                          | -                         | 770                                                                                    | 630                       |         |
| 500              | -                                                                                     | -                         | -                                                                                                          | -                         | 890                                                                                    | 850                       |         |

## D.C VOLTAJ İÇİN GERİLİM DÜŞÜMÜ

$$V_{\text{drop}} = 2 \times I \times L \times R$$

$I$  = Yüz akımı (A)  
 $L$  = Uzunluk (km)  
 $R$  = Maksimum beklenen iletken sıcaklığında direnç değeri ( $\Omega/\text{km}$ )  
 $X$  = Reaktans ( $\Omega/\text{km}$ )  
 $\cos \phi$  = Güç Faktörü  
 $f$  = Frekans (Hz)  
 $Z$  = Empedans ( $\Omega/\text{km}$ )

## A.C VOLTAJ TEK FAZ İÇİN

$$V_{\text{drop}} = 2 \times I \times L (R \cos \phi + X \sin \phi)$$

$d$  = İletken çapı (mm)  
 $l$  = İletken uzunluğu (m)

## A.C VOLTAJ ÜÇ FAZ İÇİN

$$V_{\text{drop}} = \sqrt{3} \times I \times L \times (R \cos \phi + X \sin \phi)$$

### REAKTANS:

$$x = 2 \times \pi \times f \times L \times l$$

### İNDÜKTANS:

$$L = 0,2 \times \left[ \ln \left( \frac{2a}{d} \right) + 0,25 \right] 10^{-6}$$

### EMPEDANS:

$$Z = \sqrt{R^2 + X^2}$$

## GÜÇ FAKTÖRÜ DÖNÜŞÜMÜ

$$\sin \phi = \sqrt{1 - \cos^2 \phi}$$

NOT: Hesaplamalarda Güç Faktörü ( $\cos \phi$ ) 0,8 Yüz Akımı ( $I$ ) 1 A ve Uzunluk ( $L$ ) 1 km olarak alınmıştır.

## ELEKTRİKSEL HESAPLAMALAR VE FORMÜLLER

### KISA DEVRE AKIMI

0,6 / 1 kV + 90 °C gemi tipi kablolar kısa devre akım formülü.

### GENEL FORMÜL:

$$I_k = 226 \frac{S}{\sqrt{t}} \sqrt{\ln \frac{234 + T_k}{234 + T_b}}$$

$I_k$  = Kısa devre akımı (kA)

$S$  = Kesit ( $\text{mm}^2$ )

$T$  = Kısa devre süresi (sec)

$T_k$  = Maksimum beklenen iletken sıcaklığı (kısa devre anında) (°C)

$T_b$  = Maksimum beklenen iletken sıcaklığı (normal şartlarda) (°C)

### FORMÜL 1:

XLPE ve HF90 malzemeleri için standartlarda verilen sıcaklık değerleri  $T_k = 250$  °C &  $T_b = 90$  °C' dir. Bu değerler formülde yerine konulduğunda genel formül XLPE ve HF90 malzemeleri için;

$$I_k = 146 \frac{S}{\sqrt{t}}$$

### FORMÜL 2:

PVC malzemeleri için standartlarda verilen sıcaklık değerleri  $T_k = 150$  °C &  $T_b = 70$  °C' dir. Bu değerler formülde yerine konulduğunda genel formül PVC malzemeleri için;

$$I_k = 31,66 \frac{S}{\sqrt{t}}$$

## KABLO KESİTLERİNE GÖRE MUHTELİF GÜÇLERİN BELİRLİ GERİLİM DÜŞÜMÜNDE TAŞINABİLECEĞİ EN UZUN MESAFELER (3-380V Trifaze)

| Güç Akım |     | Cos Ø | KESİT mm <sup>2</sup> |     |     |     |      |      |      |      |      |     |     |     |     |     |     |
|----------|-----|-------|-----------------------|-----|-----|-----|------|------|------|------|------|-----|-----|-----|-----|-----|-----|
| kW       | A   |       | 1,5                   | 2,5 | 4   | 6   | 10   | 16   | 25   | 35   | 50   | 70  | 95  | 120 | 150 | 185 | 240 |
| 2,5      | 5   |       | 240                   | 400 | 640 |     |      |      |      |      |      |     |     |     |     |     |     |
| 3        | 6   |       | 200                   | 330 | 535 | 800 |      |      |      |      |      |     |     |     |     |     |     |
| 3,5      | 7   |       | 170                   | 285 | 455 | 685 |      |      |      |      |      |     |     |     |     |     |     |
| 4        | 8   |       | 150                   | 250 | 400 | 600 | 1000 |      |      |      |      |     |     |     |     |     |     |
| 4,5      | 9   |       | 135                   | 223 | 353 | 530 | 890  |      |      |      |      |     |     |     |     |     |     |
| 5        | 10  |       | 120                   | 200 | 320 | 480 | 800  |      |      |      |      |     |     |     |     |     |     |
| 6        | 12  |       | 100                   | 166 | 265 | 400 | 670  | 1070 |      |      |      |     |     |     |     |     |     |
| 7        | 14  |       | 85                    | 142 | 225 | 340 | 570  | 920  |      |      |      |     |     |     |     |     |     |
| 8        | 16  |       | 75                    | 125 | 200 | 300 | 500  | 800  |      |      |      |     |     |     |     |     |     |
| 9        | 18  |       | 66                    | 110 | 175 | 265 | 445  | 725  | 1120 |      |      |     |     |     |     |     |     |
| 10       | 19  | 0.82  |                       | 100 | 160 | 240 | 400  | 640  | 1000 |      |      |     |     |     |     |     |     |
| 12       | 23  |       |                       | 82  | 133 | 200 | 335  | 535  | 835  | 1170 |      |     |     |     |     |     |     |
| 14       | 27  |       |                       | 75  | 113 | 170 | 285  | 460  | 720  | 1050 |      |     |     |     |     |     |     |
| 16       | 31  |       |                       |     | 100 | 150 | 250  | 400  | 630  | 880  |      |     |     |     |     |     |     |
| 18       | 35  |       |                       |     | 88  | 130 | 220  | 355  | 560  | 780  |      |     |     |     |     |     |     |
| 20       | 37  |       |                       |     |     | 120 | 200  | 320  | 500  | 700  | 1000 |     |     |     |     |     |     |
| 25       | 46  |       |                       |     |     | 95  | 160  | 255  | 400  | 560  | 800  |     |     |     |     |     |     |
| 30       | 55  |       |                       |     |     |     | 130  | 215  | 335  | 470  | 670  |     |     |     |     |     |     |
| 35       | 65  |       |                       |     |     |     | 115  | 189  | 285  | 400  | 570  | 805 |     |     |     |     |     |
| 40       | 72  |       |                       |     |     |     | 100  | 160  | 250  | 350  | 500  | 705 |     |     |     |     |     |
| 45       | 83  |       |                       |     |     |     |      | 140  | 220  | 310  | 445  | 625 | 850 |     |     |     |     |
| 50       | 93  |       |                       |     |     |     |      |      | 200  | 280  | 400  | 560 | 770 |     |     |     |     |
| 60       | 107 |       |                       |     |     |     |      |      | 160  | 220  | 335  | 470 | 635 | 800 |     |     |     |
| 70       | 125 |       |                       |     |     |     |      |      |      |      | 285  | 400 | 550 | 690 |     |     |     |
| 80       | 143 |       |                       |     |     |     |      |      |      |      | 250  | 350 | 480 | 600 | 755 |     |     |
| 90       | 160 |       |                       |     |     |     |      |      |      |      | 220  | 310 | 425 | 535 | 670 |     |     |
| 100      | 180 |       |                       |     |     |     |      |      |      |      | 200  | 280 | 380 | 480 | 600 | 740 |     |
| 110      | 197 | 0.85  |                       |     |     |     |      |      |      |      |      | 255 | 340 | 440 | 550 | 675 |     |
| 130      | 232 |       |                       |     |     |     |      |      |      |      |      | 228 | 290 | 370 | 465 | 570 |     |
| 150      | 268 |       |                       |     |     |     |      |      |      |      |      |     | 250 | 320 | 400 | 495 | 640 |
| 180      | 320 |       |                       |     |     |     |      |      |      |      |      |     |     | 265 | 335 | 410 | 535 |
| 200      | 350 |       |                       |     |     |     |      |      |      |      |      |     |     |     | 300 | 370 | 480 |
| 250      | 405 |       |                       |     |     |     |      |      |      |      |      |     |     |     |     | 295 | 385 |
| 300      | 500 |       |                       |     |     |     |      |      |      |      |      |     |     |     |     |     | 310 |

## KABLO KESİTLERİNE GÖRE MUHTELİF GÜÇLERİN BELİRLİ GERİLİM DÜŞÜMÜNDE TAŞINABİLECEĞİ EN UZUN MESAFELER (U-220V MONOFAZE)

| Güç | Akım         | KESİT mm <sup>2</sup> |     |    |    |    |    |     |     |
|-----|--------------|-----------------------|-----|----|----|----|----|-----|-----|
| kW  | Şiddeti<br>A | 1,5                   | 2,5 | 4  | 6  | 10 | 16 | 25  | 35  |
| 2   | 9            | 30                    | 50  |    |    |    |    |     |     |
| 2.5 | 11           | 24                    | 40  |    |    |    |    |     |     |
| 3   | 14           | 20                    | 33  | 54 |    |    |    |     |     |
| 3.5 | 16           | 17                    | 29  | 49 | 69 |    |    |     |     |
| 4   | 18           | 15                    | 25  | 40 | 60 |    |    |     |     |
| 4.5 | 21           | 13                    | 22  | 35 | 53 |    |    |     |     |
| 5   | 23           | 12                    | 20  | 32 | 48 | 80 |    |     |     |
| 6   | 27           |                       | 16  | 26 | 40 | 67 |    |     |     |
| 7   | 32           |                       | 15  | 23 | 34 | 57 | 92 |     |     |
| 8   | 36           |                       | 13  | 20 | 30 | 50 | 80 |     |     |
| 9   | 41           |                       |     | 17 | 26 | 45 | 72 |     |     |
| 10  | 46           |                       |     | 16 | 24 | 40 | 64 | 100 |     |
| 12  | 55           |                       |     |    | 20 | 38 | 54 | 83  |     |
| 14  | 64           |                       |     |    | 17 | 28 | 46 | 71  | 100 |
| 16  | 72           |                       |     |    |    | 25 | 40 | 62  | 88  |
| 18  | 82           |                       |     |    |    | 23 | 35 | 55  | 78  |
| 20  | 91           |                       |     |    |    |    | 32 | 50  | 70  |
| 25  | 114          |                       |     |    |    |    | 26 | 40  | 56  |
| 30  | 136          |                       |     |    |    |    |    | 33  | 47  |
| 40  | 180          |                       |     |    |    |    |    |     | 36  |

GERİLİM DÜŞÜMÜ: %AU = 3

## ÖLÇÜ DEĞİŞİM TABLOSU

| UZUNLUK           | cm.   | m.     | Km.   | Parmak (In) | Ayak (ft) | Yarda (yd) | Kara Mili | Deniz Mili |
|-------------------|-------|--------|-------|-------------|-----------|------------|-----------|------------|
| 1 santimetre (cm) | 1     | 0,01   | -     | 0,3937      | 0,0328    | -          | -         | -          |
| 1 metre (m)       | 100   | 1      | 0,001 | 39,37       | 3,281     | 1,094      | -         | -          |
| 1 kilometre (km)  | 105   | 1000   | 1     | 39370       | 3281      | 1094       | 0,6214    | 0,5396     |
| 1 inç (in)        | 2,540 | 0,254  | -     | 1           | 0,833     | 0,0278     | -         | -          |
| 1 ayak            | 30,48 | 0,3048 | -     | 12          | 1         | 0,3333     | -         | -          |
| 1 yarda           | 91,44 | 0,9144 | -     | 36          | 3         | 1          | -         | -          |
| 1 kara mili       | -     | 1069   | 1,609 | 63346       | 5280      | 1760       | 1         | 0,8684     |
| 1 deniz mili      | -     | 1852   | 1,852 | 72913       | 6080      | 2027       | 1152      | -          |

| ALAN                                 | cm <sup>2</sup> | m <sup>2</sup> | a (Ar) | ha    | km <sup>2</sup> | in <sup>2</sup> | ft <sup>2</sup> | Yarda <sup>2</sup> | mil <sup>2</sup> | Acre   |
|--------------------------------------|-----------------|----------------|--------|-------|-----------------|-----------------|-----------------|--------------------|------------------|--------|
| 1 santimetre kare (cm <sup>2</sup> ) | 1               | 0,0001         | -      | -     | -               | 0,155           | -               | -                  | -                | -      |
| 1 metre kar (m <sup>2</sup> )        | 1000            | 1              | 0,01   | -     | -               | 1550            | 10,76           | 1,196              | -                | -      |
| 1 Ar (a)                             | -               | 100            | 1      | 0,01  | -               | -               | 1076            | 119,6              | -                | 0,0247 |
| 1 hektar (ha)                        | -               | 1000           | 100    | 1     | 0,01            | -               | -               | 0,0039             | 2,47             | -      |
| kilometre kare (km <sup>2</sup> )    | -               | -              | 1000   | 100   | 1               | -               | -               | -                  | 0,3861           | 247,1  |
| 1 inç kare                           | 6,452           | -              | -      | -     | -               | 1               | -               | -                  | -                | -      |
| 1 ayak kare(ft <sup>2</sup> )        | 929             | 0,0929         | -      | -     | -               | 144             | 1               | 0,111              | -                | -      |
| 1 yarda kare                         | 8361            | 0,8361         | -      | -     | -               | 1296            | 9               | 1                  | -                | -      |
| 1 mil kare                           | -               | -              | -      | 259   | 2,59            | -               | -               | -                  | -                | 640    |
| 1 acre                               | -               | 4050           | 40,5   | 0,405 | -               | -               | 43640           | 4850               | 0,0016           | 1      |

| AĞIRLIK         | gr.     | kg.   | Metrik ton | ounce  | Libre pound | stone  | Küçük ton | Büyük ton |
|-----------------|---------|-------|------------|--------|-------------|--------|-----------|-----------|
| 1 gram (gr)     | 1       | 0.001 | -          | 0,0332 | -           | -      | -         | -         |
| 1 kilogram (kg) | 1000    | 1     | 0,001      | 35,27  | 2,205       | 0,157  | 0,0011    | 0,00098   |
| 1 ton (metrik)  | -       | 1000  | 1          | 35274  | 2204,6      | 157,47 | 1,1023    | 0,9842    |
| 1 ounce (oz)    | 28,35   | 0,028 | -          | 1      | 0,0625      | 0,004  | -         | -         |
| 1 libre (lb.)   | 453,6   | 0,454 | -          | 16     | 1           | 0,071  | -         | -         |
| 1 stone         | 6530    | 6,35  | 0,0064     | 224    | 14          | 1      | 0,007     | 0,0063    |
| 1 küçük ton     | 907,190 | 907,2 | 0,907      | 32000  | 2000        | 142,9  | 1         | 0,8929    |
| 1 büyük ton     | 1106050 | 1016  | 1,016      | 35,840 | 2240        | 160    | 1,120     | 1         |

| HACİM                               | cm <sup>3</sup> | dm <sup>3</sup> litre | in <sup>3</sup> | ft <sup>3</sup> | Yard <sup>3</sup> | UK ounce | USA ounce | USA gallon | UK gallon | UK pint |
|-------------------------------------|-----------------|-----------------------|-----------------|-----------------|-------------------|----------|-----------|------------|-----------|---------|
| 1 santimetre küp (cm <sup>3</sup> ) | 1               | 0,001                 | 0,061           | -               | -                 | 0,038    | 0,353     | -          | -         | -       |
| 1 desimetre küp (dm <sup>3</sup> )  | 1000            | 1                     | 61,02           | 0,035           | -                 | 33,81    | 35,3      | 0,2462     | 0,22      | 1,76    |
| 1 inç küp (in <sup>3</sup> )        | 16,39           | 0,0164                | 1               | -               | -                 | 0,5541   | 0,5768    | -          | -         | 0,0288  |
| 1 ayak küp ft <sup>3</sup>          | -               | 28,32                 | 1728            | 1               | 0,0370            | 957,5    | 966,6     | 7,481      | 6,232     | 49,83   |
| 1 yarda küp                         | -               | 764,6                 | 46656           | 27              | 1                 | 25853    | 26,909    | 202        | 168,2     | 1345    |
| 1 ounce (USA)                       | 29,57           | 0,02296               | 1,805           | -               | -                 | 1        | 1,041     | -          | -         | 0,0520  |
| 1 ounce (UK)                        | 28,41           | 0,0284                | 1,734           | -               | -                 | 0,9607   | 1         | -          | -         | 0,05    |
| 1 galon (USA)                       | 3785            | 3,785                 | 231             | 0,1337          | -                 | 128      | 133,2     | 1          | 0,8327    | 6,662   |
| 1 galon (UK)                        | 4546            | 4,546                 | 277,4           | 0,1603          | -                 | 153,7    | 160       | 1,201      | 1         | 8       |
| 1 pint (UK)                         | 568,2           | 0,5682                | 34,68           | 0,02            | -                 | 19,21    | 20        | 0,1501     | 0,125     | 1       |

# LOJİSTİK

Erse Kablo lojistik faaliyetlerini, Silivri'deki üretim tesislerindeki, 5.000 m<sup>2</sup> deposunda son teknoloji paketleme, sarım ve kesim makineleriyle, modern ve kaliteli hizmet anlayışıyla gerçekleştirmektedir.

Erse Lojistik Merkezi, profesyonel stok yönetimi, teknolojik raf sistemleri, adresleme ve barkod entegrasyonlu özel yazılımlar aracılığı ile koordine edilmektedir.

Erse lojistik ekibi, ürünün, hizmetin ve bilginin müşteri ihtiyaçları doğrultusunda, hammaddenin temin edilmesinden son kullanıcıya ulaştırılmasına kadar olan süreçte depolama, taşıma, gümrükleme ve sigortalama işlemlerinin uygulanması ve kontrol edilmesi faaliyetlerini yürütmektedir.

Erse Lojistik Merkezi, bütünleşik lojistik sistemine göre; gelen ve giden tüm lojistik faaliyetlerin toplam maliyetinin en aza indirilmesi, koordinasyonun artırılması, kalitenin artırılması ve verimliliğin yükseltilmesi amaçları çerçevesinde bütünsel bakış açısıyla yönetilmektedir.

Erse lojistik faaliyetlerinde, üretim planlarına uygun, iş ortaklarına değer katan, çözüm odaklı ve hızlı hizmetler sunmayı amaçlamıştır. Üretimi yapılan kablolar, ulusal ve uluslararası standartlara ve sevk koşullarına uygun olarak, müşteri talepleri çerçevesinde ambalajlanıp paketlenerek sevkiyata uygun hale getirilir.

Erse tüm organizasyonlarında olduğu gibi, lojistik faaliyetlerini de benimsediği müşteri memnuniyetini gözetken anlayışıyla yöneterek, sevkiyatlarını kaliteli hizmet anlayışıyla planlamaktadır.



## PAKETLEME ÇEŞİTLERİMİZ



■ Tahta Makara



■ Kontrplak Makara



■ Plastik Makara



■ Shrinkli Kangal



■ Karton Kutu



■ Palet



■ Euro Palet



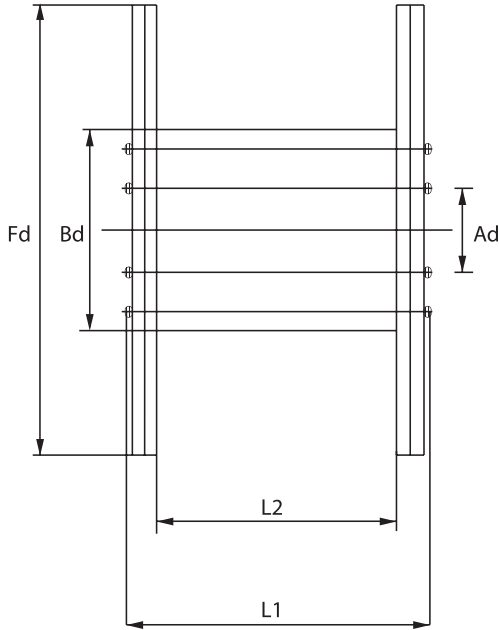
**Isıl İşlem Güvencesi:** İhracat ürünlerimizde sadece ısıtılmış makara ve paletler kullanılır.



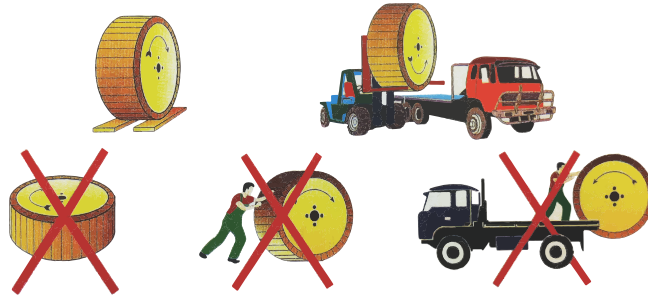
**Incoterms:** Müşterilerle yapılan mutabakat çerçevesinde Incoterms kurallarına uygun sevkiyat yapılmaktadır.

## STANDART MAKARALAR

| MAKARA<br>KOD NO | Fd<br>mm | Bd<br>mm | Ad<br>mm | L1<br>mm | L2<br>mm | MAX. YÜKLEME<br>KAPASİTESİ | MAKARA<br>AĞIRLIĞI |
|------------------|----------|----------|----------|----------|----------|----------------------------|--------------------|
|                  |          |          |          |          |          | kg                         | kg                 |
| MD-40            | 400      | 200      | 40       | 310      | 250      | 100                        | 3                  |
| MD-50            | 500      | 250      | 45       | 350      | 290      | 150                        | 4                  |
| MD-60            | 600      | 300      | 50       | 350      | 300      | 200                        | 5                  |
| 60               | 630      | 315      | 56       | 415      | 315      | 250                        | 17                 |
| 70               | 710      | 355      | 80       | 520      | 400      | 250                        | 25                 |
| 80               | 800      | 400      | 80       | 520      | 400      | 400                        | 31                 |
| 90               | 900      | 450      | 80       | 690      | 560      | 750                        | 47                 |
| 100              | 1000     | 500      | 80       | 710      | 560      | 900                        | 71                 |
| 120              | 1250     | 630      | 80       | 890      | 670      | 1700                       | 144                |
| 140              | 1400     | 710      | 80       | 890      | 670      | 2000                       | 175                |
| 160              | 1600     | 800      | 80       | 1100     | 850      | 3000                       | 280                |
| 180              | 1800     | 1000     | 100      | 1100     | 840      | 4000                       | 380                |
| 200              | 2000     | 1250     | 100      | 1350     | 1045     | 5000                       | 550                |



**Fd:**Flanş Çapı  
**Ad:**Göbek Delik Çapı  
**Bd:**Göbek Çapı  
**L1:**Dış Kanat Açıklığı  
**L2:**İç Kanat Açıklığı



## KABLO DIŞ ÇAPINA BAĞLI OLARAK MAKARALARIN MAX. TAŞIMA KAPASİTELERİ

| KABLO<br>ÇAPI<br>mm | MD<br>40 | MD<br>50 | MD<br>60 | 60   | 70   | 80   | 90   | 100  | 120  | 140  | 160  | 180  | 200  |
|---------------------|----------|----------|----------|------|------|------|------|------|------|------|------|------|------|
| 6                   | 420      | 735      | 1070     | 1110 | 2024 | 2755 |      |      |      |      |      |      |      |
| 7                   | 310      | 540      | 780      | 840  | 1480 | 2340 | 2730 |      |      |      |      |      |      |
| 8                   | 235      | 430      | 590      | 640  | 1064 | 1463 |      |      |      |      |      |      |      |
| 9                   | 185      | 335      | 465      | 470  | 890  | 1152 | 2202 | 2866 |      |      |      |      |      |
| 10                  | 150      | 270      | 385      | 388  | 680  | 980  | 1768 | 2349 |      |      |      |      |      |
| 11                  | 14       | 230      | 330      | 315  | 564  | 760  | 1404 | 1910 |      |      |      |      |      |
| 12                  |          | 195      | 270      | 254  | 470  | 643  | 1206 | 1540 | 2727 |      |      |      |      |
| 13                  | 100      | 165      | 235      | 238  | 385  | 542  | 1032 | 1339 | 2265 | 2967 |      |      |      |
| 14                  |          | 140      | 210      | 190  | 360  | 454  | 880  | 1159 |      |      |      |      |      |
| 15                  |          |          | 185      | 180  | 300  | 430  | 749  | 1000 | 1990 | 2480 |      |      |      |
| 16                  |          | 130      | 160      | 140  | 239  | 358  | 632  | 860  | 1756 | 2205 |      |      |      |
| 17                  |          | 115      | 145      | 134  | 228  | 294  | 603  | 736  | 1545 | 1960 |      |      |      |
| 18                  |          |          | 130      | 102  | 218  | 280  | 505  | 705  | 1355 | 1737 | 2227 |      |      |
| 19                  |          |          | 120      | 96   | 172  | 228  | 485  | 599  | 1184 | 1535 | 2435 | 2830 |      |
| 20                  |          |          |          | 92   | 165  | 220  | 402  | 576  | 1139 | 1352 |      |      |      |
| 21                  |          |          |          | 90   | 159  | 210  | 387  | 485  | 990  | 1304 | 2172 | 2527 |      |
| 22                  |          |          |          | 65   | 122  | 167  | 315  | 468  | 856  | 1145 | 1930 | 2248 | 2954 |
| 23                  |          |          |          | 62   | 117  | 160  | 304  | 389  | 827  | 999  | 1870 | 2172 |      |
| 24                  |          |          |          | 60   | 113  | 156  | 294  | 377  | 709  | 967  | 1657 | 1927 | 2608 |
| 25                  |          |          |          | 58   | 110  | 150  | 285  | 365  | 688  | 839  | 1608 | 1867 | 2522 |
| 26                  |          |          |          | 56   | 80   | 116  | 226  | 299  | 668  | 814  | 1420 | 1650 | 2218 |
| 27                  |          |          |          |      | 78   | 113  | 220  | 290  | 567  | 700  | 1244 | 1450 | 2150 |
| 28                  |          |          |          |      | 76   | 109  | 215  | 282  | 550  | 680  | 1210 | 1410 | 1880 |
| 29                  |          |          |          |      | 73   | 106  | 209  | 226  | 462  | 663  | 1180 | 1370 | 1826 |
| 30                  |          |          |          |      |      | 103  | 162  | 220  | 450  | 564  | 1028 | 1200 | 1583 |
| 31                  |          |          |          |      | 70   | 76   | 157  | 214  | 438  | 550  | 1003 | 1166 | 1540 |
| 32                  |          |          |          |      |      | 74   | 153  | 209  | 428  | 537  | 866  | 1009 | 1500 |
| 33                  |          |          |          |      |      |      | 150  | 204  | 352  | 450  | 846  | 985  | 1289 |
| 34                  |          |          |          |      |      | 72   | 146  | 158  | 344  | 440  | 828  | 962  | 1257 |
| 35                  |          |          |          |      |      |      | 108  | 154  | 336  | 430  | 710  | 824  | 1227 |
| 36                  |          |          |          |      |      |      |      | 150  | 329  | 422  | 692  | 806  | 1040 |
| 37                  |          |          |          |      |      |      | 105  | 148  | 265  | 348  | 678  | 788  | 1017 |
| 38                  |          |          |          |      |      |      | 103  | 144  | 259  | 340  | 664  | 722  | 994  |
| 39                  |          |          |          |      |      |      |      | 110  | 254  | 334  | 560  | 653  | 972  |
| 40                  |          |          |          |      |      |      |      | 105  | 249  | 327  | 549  | 640  | 812  |
| 41                  |          |          |          |      |      |      |      | 102  | 244  | 264  | 539  | 627  | 795  |
| 42                  |          |          |          |      |      |      |      |      | 190  | 259  | 529  | 615  | 779  |
| 43                  |          |          |          |      |      |      |      | 10   | 187  | 254  | 437  | 510  | 763  |
| 44                  |          |          |          |      |      |      |      |      | 183  | 249  | 430  | 502  | 750  |
| 45                  |          |          |          |      |      |      |      |      | 180  | 254  | 422  | 492  | 610  |
| 46                  |          |          |          |      |      |      |      |      | 177  | 240  | 415  | 484  | 600  |
| 47                  |          |          |          |      |      |      |      |      | 174  | 187  | 408  | 475  | 589  |
| 48                  |          |          |          |      |      |      |      |      | 130  | 184  | 330  | 386  | 578  |
| 49                  |          |          |          |      |      |      |      |      | 127  | 180  | 325  | 380  | 568  |
| 50                  |          |          |          |      |      |      |      |      | 125  | 178  | 319  | 373  | 558  |
| 51                  |          |          |          |      |      |      |      |      |      | 175  | 314  | 367  | 442  |
| 52                  |          |          |          |      |      |      |      |      | 123  | 172  | 310  | 360  | 435  |
| 53                  |          |          |          |      |      |      |      |      | 120  | 170  | 305  | 356  | 428  |
| 54                  |          |          |          |      |      |      |      |      |      | 126  | 230  | 280  | 420  |
| 55                  |          |          |          |      |      |      |      |      |      | 124  | 235  | 276  | 414  |
| 56                  |          |          |          |      |      |      |      |      |      | 122  | 232  | 270  | 408  |
| 57                  |          |          |          |      |      |      |      |      |      | 121  | 228  | 267  | 400  |
| 58                  |          |          |          |      |      |      |      |      |      | 119  | 225  | 263  | 304  |
| 59                  |          |          |          |      |      |      |      |      |      | 117  | 222  | 260  | 300  |
| 60                  |          |          |          |      |      |      |      |      |      |      | 220  | 256  | 295  |
| 61                  |          |          |          |      |      |      |      |      |      |      | 216  | 252  | 290  |
| 62                  |          |          |          |      |      |      |      |      |      |      | 160  | 190  | 287  |
| 63                  |          |          |          |      |      |      |      |      |      |      | 158  | 187  | 282  |
| 64                  |          |          |          |      |      |      |      |      |      |      | 156  | 184  | 280  |
| 65                  |          |          |          |      |      |      |      |      |      |      | 154  | 182  | 275  |
| 66                  |          |          |          |      |      |      |      |      |      |      | 152  | 180  | 270  |
| 67                  |          |          |          |      |      |      |      |      |      |      | 150  | 178  | 266  |
| 68                  |          |          |          |      |      |      |      |      |      |      |      | 174  | 264  |

## ÜLKELERE GÖRE STANDART KURULUŞLARININ KISALTMALARI

| KISA ADI | AÇILIMI                                                   | ÜLKESİ  | KISA ADI | AÇILIMI                                          | ÜLKESİ      |
|----------|-----------------------------------------------------------|---------|----------|--------------------------------------------------|-------------|
| AFNOR    | Association Française De Normalisation                    | France  | IEEE     | Institute Of Electrical And Electronic Engineers | Uk          |
| ANSI     | American National Standards Institute                     | Usa     | IMQ      | Istituto Italiano Del Marchio Di Qualità         | Italy       |
| ASTM     | American Standard of Testing Materials                    | Usa     | ISDN     | Integrated Services Digital Network              | Int.        |
| BASEC    | British Approvals Service For Electric Cables             | Uk      | ISO      | International Standard Organisation              | Global      |
| BSI(BS)  | British Standard Institution                              | Uk      | KEMA     | Keuring van Electrotechnische Materialen         | Netherlands |
| BV       | Bureau Veritas                                            | France  | LCIE     | Laboratoire Central des Industries Electriques   | France      |
| CATV     | Community Antenna Television                              | Int.    | LLOYDS   | Lloyds Register Of Shipping                      | Uk          |
| CEBEC    | Comite Electrotechnique Belge                             | Belgium | LPC      | Loss Prevention Council                          | Uk          |
| CEE      | Commission on Rules for the approval Electrical Equipment | Int.    | MESC     | Material And Equipment Standards and Code        | Netherlands |
| CEI      | Comitato Electrotecnico Belge Italiano                    | Italy   | MIL      | United States Military Specification             | Usa         |
| CEN      | European Committee For Standardisation                    | Ecc     | NEC      | National Electrical Code                         | Usa         |
| CENELEC  | Comite Europeen De Normalisation Electrotechnique         | Ecc     | NEN      | Nederlands Normalisatie-Instituut                | Netherlands |
| CNET     | Centre National d'etude de Telecommunication              | France  | NF       | Normes Françaises                                | France      |
| CNOMO    | Comite de Normalisation des Moyens de Production          | France  | NFC      | Normes Françaises Class C                        | France      |
| CMA      | Cable Makers Association                                  | Uk      | NEMA     | National Electrical Manufacturer Association     | Usa         |
| CSA      | Canadian Standards Association                            | Canada  | NEMKO    | Norwegian Electrical Material Control            | Norway      |
| CSTB     | Centre Scientifique et Technique du Bâtiment              | France  | NP       | Portuguese Da Qualidade                          | Portugal    |
| DEMKO    | Denmark's Electrical Material Control                     | Den.    | NSAI     | National Standards Authority of Ireland          | Ireland     |
| DIN      | Deutsches Institut Für Normung                            | Den.    | OCMA     | Oil Companies Materials Association              | Uk          |
| DKE      | Deutsche Elektrotechnische Kommission im DIN und VDE      | Ger.    | ÖVE      | Österreichischer Verband für Electrotechnik      | Austria     |
| ECMC     | Electric Cable Makers Confederation                       | Uk      | SEMKO    | Svenska Elektriska Materialkontrollanstalten     | Sweden      |
| ELOT     | Hellenic Organisation For Standardisation                 | Uk      | SETI     | Elektriska Inspektoratet                         | Finland     |
| EIC      | Energy Industries Council                                 | Greece  | SEV      | Schweizerischer Elektrotechnischer Verein        | Switzerland |
| EN       | European Standards                                        | Ger.    | SNV      | Schweizerischer Normenverband                    | Switzerland |
| ERA      | Electrical Research Association                           | Ger.    | TSE      | Turkish Standard Institute                       | Turkey      |
| ESI      | Electrical Supply Industry                                | Uk      | UKOOA    | Uk Offshore Operators Association                | Uk          |
| FAR      | Federal Air Regulation                                    | Usa     | UL       | Underwriters Laboratories                        | Usa         |
| FTZ      | Federated Technisches Zentralamt                          | Ger.    | UNEL     | Unificazione Electrotecnica                      | Italy       |
| GOST     | USSR Standards                                            | Ussr    | UNI      | Unificazione Nazionale Italiano                  | Italy       |
| HD       | Harmonization of Documents                                | Int.    | USE      | Union Technique de l'electrotechnique (Ute)      | France      |
| HN       | Harmonization des Normes                                  | France  | VDE      | Verband Deutscher Elektrotechniker               | Ger.        |
| ICEA     | Insulated Cable Engineers Association                     | Usa     | VDEW     | Vereinigung Deutscher Elektrizitätswerke e.V.    | Ger.        |
| IEC      | International Electrotechnical Commission                 | Europe  | ZVEH     | Zentralverband der Deutschen Elektrohandwerke    | Ger.        |
| IEE      | Institute Of Electrical Engineers                         | Uk      | ZVEI     | Zentralverband der Electrotechnik-und Electronic | Ger.        |



## ELECTROMAGNETIC COMPATIBILITY AND CABLES

**EMC:** Capability of a system or device to maintain its functions (without irreparable electromagnetic failure) in the electromagnetic environment it is present.

Device should not emit undesired EM signals that affect other devices nearby, and at the same time, it should not be affected by undesired signals emitted by the other devices.

Cables that connect devices to each other are amongst the main factors that determine EMC quality. Because cables not only transmit undesired signals from one point to another (conductivity interference) but also emit signals, which travel through them, to the environment like an aerial (radiation interference). Quality of shielding material and cable shield earthing are two basic elements that determine cable performance.

### 1-SHIELDING

Screening is defined as isolating two medium from each other with respect to electromagnetic aspect. In order to understand if screening applied well, screening effectiveness is calculated or measured. Screening effectiveness is calculated by using the ratio of the signal received without the shield, to signal received inside the shield. Data obtained by the measurement procedures are converted to shielding effectiveness in different frequency range by mathematical relationships defined in table below.

| FREQUENCY RANGE                            | MEASURED QUANTITIES             | UNITS       | SHIELDING EFFECTIVENES (dB)                             |                                                                                           |
|--------------------------------------------|---------------------------------|-------------|---------------------------------------------------------|-------------------------------------------------------------------------------------------|
| LINEAR UNITS                               |                                 |             |                                                         |                                                                                           |
| 9 kHz-20 MHz<br>(extendable down to 50 Hz) | H <sub>1</sub> , H <sub>2</sub> | μA/m,<br>μT | $S_H = 20 \log_{10} \frac{H_1}{H_2}$ (B.1) <sup>a</sup> | H <sub>1</sub> is the magnetic field in the absence of the enclosure (reference reading)  |
| 20-300 MHz                                 | V <sub>1</sub> , V <sub>2</sub> | μV          | $S_H = 20 \log_{10} \frac{V_1}{V_2}$ (B.2)              | H <sub>2</sub> is the magnetic field within the enclosure.                                |
| 1.7-18 GHz<br>(extendable up to 100 GHz)   | E <sub>1</sub> , E <sub>2</sub> | μV/m        | $S_E = 20 \log_{10} \frac{E_1}{E_2}$ (B.3)              | V <sub>1</sub> is the voltage reading in the absence of the enclosure (reference reading) |
|                                            | P <sub>1</sub> , P <sub>2</sub> | watt        | $S_P = 10 \log_{10} \frac{P_1}{P_2}$ (B.4)              | V <sub>2</sub> is the voltage reading within the enclosure.                               |
| LOGARITHMIC UNITS                          |                                 |             |                                                         |                                                                                           |
| Tüm frekanslar<br>(as listed above)        | All, in dB<br>related values    | dB          | SE = E <sub>1</sub> (dB) - E <sub>2</sub> (dB) (B.5a)   | E <sub>1</sub> is the electric field in the absence of the enclosure (reference reading)  |
|                                            |                                 |             | SE = H <sub>1</sub> (dB) - H <sub>2</sub> (dB) (B.5b)   | E <sub>2</sub> is the electric field within the enclosure;                                |
|                                            |                                 |             | SE = V <sub>1</sub> (dB) - V <sub>2</sub> (dB) (B.5c)   | P <sub>1</sub> is the power detected in absence of the enclosure (reference reading)      |
|                                            |                                 |             | SE = P <sub>1</sub> (dB) - P <sub>2</sub> (dB) (B.5d)   | P <sub>2</sub> is the power detected within the enclosure.                                |

Materials to be chosen for screening purposes can be divided into three groups;

#### 1-High-performance materials:

100% covering made of materials like steel, copper and stainless steel  
(Screening effectiveness of 80-120 dB)

#### 2-Standard-performance materials:

Conductive metal tapes (screening effectiveness of 20-40 dB)

#### 3-Low-performance materials:

Metallized fabric structures, conductive paper materials (conductive polymers), (screening effectiveness of 15-30 dB)

In practice, many problems can be solved by screening effectiveness of 40 dB.

Screening effectiveness of 100-120 dB can be required for military systems. The values required in specifications for instrument cables, coaxial cables, data transmission cables are around 80- 100 dB.

### 2-EARTHING

It is defined as either voluntary or involuntary connection of an electric circuit or device to earth or a surface big enough to be a substitute for earth by means of a conductive interconnection.

Earthing is accepted as absolute reference zero volt. For the earthing to be accomplished in a real sense of a word, all devices must be brought to this absolute zero point.

Some structures that can substitute earthing in practice:

- Steel construction buildings
- Vehicle body (car, plane, ship)
- Water pipes
- Earthing electrode systems
- Earthing plate, grid, etc.

Direction of screening and earthing are important since cables are generally used to transmit signals between source and load. Unwanted electric fields are well-screen in a cable which is shielded only on the load side.

However, this is not sufficient for screening the magnetic fields. Electric field shielding is better when earthing is applied on both load and source sides, and by doing so magnetic shielding is obtained as well.

(Screening effectiveness increases by 10-20 dB) Magnetic leak is decreased by using twisted pair conductor (by diminishing the area between the conductors and allowing reverse current flows by means of twists).

When earthing is applied on both sides, effective electric and magnetic screening is obtained.

## COAXIAL CABLE ELECTRICAL CHARACTERISTIC

### ELECTRICAL CHARACTERISTIC

#### 1) CHARACTERISTIC IMPEDANCE

The most general feature of coaxial cables is impedance. It does not depend on length. It depends on cable size and insulation material. It is expressed in Ohms. Coaxial cables are generally produced as 50 ohm, 75 ohm and 93 ohm cables.

A simple formula to determine impedance of a coaxial cable;

$$Z_0 = 183 \times V_p \times \log(D/d) \text{ ohm}$$

$Z_0$  = Characteristic Impedance

$V_p$  = Velocity of propagation

$D$  = Dielectric (Insulation) Diameter

$d$  = Conductor inner diameter

#### 2) CAPACITY (pF/m)

It is electric energy accumulated by insulation material, and depends on conductor, insulation and dielectric constant of the insulation material

$$C: \frac{2\pi \times 8,85 \times \epsilon_r}{\ln(D/d)} \text{ pF/m}$$

$\epsilon_r$ : Dielectric Constant

**MATERIAL** Dielectric Constant

|          |      |
|----------|------|
| AIR      | 1    |
| PE SOLID | 2,3  |
| FOAM PE  | 1,5  |
| PTFE     | 1,95 |
| FEP      | 2,15 |

$$d = \frac{L}{(C \times VOP)}$$

#### 3) VELOCITY OF PROPAGATION

Cable's velocity of diffusion is equal to the ratio of the velocity of a signal inside the cable to the velocity of light.

Example: While the velocity of diffusion in the solid PE insulated cable is 66%, in Foam PE it increases to 87%.

This feature can also be shown as delay.

$$V_p: \frac{1}{\sqrt{\epsilon_r}} \quad \text{delay: } 1,0167164 \times \sqrt{\epsilon_r}$$

#### 4) ATTENUATION (dB/100mt)

All transmission lines, or coaxial cables, experience losses. In other words, there is the decrease in magnitude of a signal as it travels through any transmitting medium, such as a cable, circuitry or free air. These losses, termed attenuation, will decrease where the efficiency of the line, which in turn limits the power capabilities. They are measured as a ratio or as the logarithm of a ratio (decibel). Those losses, termed attenuation,

In order to express cable attenuation performans we need to introduce attenuation constant which is a rating for a cable or other transmitting medium, which is the relative rate of amplitude decrease of voltage or current in the direction of travel. It is measured in decibels per unit length of cable.

#### 5) RETURN LOSS (RL)

Cable sizes, quality of insulation material and mistakes made during cable laying influence the characteristic impedance. Any single disorder or mistake results in reflections.

Return loss is equal to the ratio of output signal to the reflected signal.

## HARMONISED CABLES SYMBOLS

### HARMONISED CABLES

#### Regulation designation

- H: Harmonised regulation  
A: Approved national design

#### Rated Voltage

- 01 100/100 V  
03 300/300 V  
05 300/500 V  
07 450/750 V  
11 600/1000 V

#### Insulation material

- V Polyvinylchloride (PVC)  
V2 PVC, up to +90°C  
V3 PVC for low temperatures  
B Ethylenepropylene (EPR)  
E Polyethylene  
X XLPE (cross-linked PE)  
R Rubber  
S Silicone Rubber

#### Sheath or braiding materials

- V Polyvinylchloride (PVC)  
V2 PVC, up to +90°C  
V3 PVC for low temperatures  
V5 PVC, oil resistance  
R Rubber  
N Chloroprene rubber  
Q Polyurethane  
C4 Screen of copper wire braiding  
J Glass fibre braiding  
T Textile braiding

#### Special construction features

- H Flat divisible cables  
H2 Flat non-divisible cables  
H6 Flat non-divisible cables, for elevators  
H8 Spiral cables

#### Conductor type

- U Single-wire round conductor  
R Multiple-wire round conductor  
K Fine stranded (for cables for fixed installations)  
F Fine strands (for flexible cables)  
H Extra fine strands  
D Fine stranded for welding cables  
E Extra fine strands for wilding cables

#### Protective earthing conductor

- X Without protective earthing conductor  
G With protective earthing conductor

## CABLE SYMBOLS ACCORDING TO VDE STANDARDS

### TELECOMMUNICATIONS CABLES AND WIRES

|    |                                                        |
|----|--------------------------------------------------------|
| A  | Outdoor cable                                          |
| G  | Mining cables                                          |
| J  | Installation cables and wires                          |
| L  | Multicore cables                                       |
| S  | Switchboard cables - Signal cable                      |
| JE | Installation cables and wire for industrial electronic |
| Li | Stranded wire conductor                                |

#### Insulation material:

|      |                                |
|------|--------------------------------|
| P    | Paper insulation               |
| Y    | Polyvinylchloride PVC          |
| 2Y   | Polyethylene (PE)              |
| 3Y   | PS, polystyrene                |
| 5Y   | PTFE                           |
| 6Y   | FEP                            |
| 7Y   | ETFE                           |
| O2Y  | Foam PE, cellular polyethylene |
| O2YS | Foam-skin PE                   |

#### Structral Features:

|       |                                         |
|-------|-----------------------------------------|
| F     | Cable core assembly with filling        |
| Yv    | PVC reinforced sheath                   |
| 2Yv   | PE reinforced sheath                    |
| (C)   | Screen of Copper wire braid             |
| (L)   | Screen of plastic-coated aluminium tape |
| (St)  | Metal foil screen                       |
| D     | Concentric layer of copper wires        |
| (Z)   | Steel wire braid                        |
| M     | Lead sheath                             |
| Mz    | Lead sheath with added hardener         |
| L     | Aluminium sheath, smooth                |
| LD    | Corrugated Aluminium sheath             |
| W     | Corrugated steel sheath                 |
| (L)2Y | Laminated sheath                        |
| b     | Armouring                               |
| c     | Protective covering of jute             |
| E     | PVC tape                                |
| (T)   | Support wire for aerial cable           |
| STIII | Star quads in local cables              |
| STI   | Star quads for larger distances         |
| ST    | Star quads for use of phantom circuits  |
| F     | Star quads for railway use              |
| PiMF  | Pair in metal foil                      |
| TiMF  | Triad in metal foil                     |
| ViMF  | Quad in metal foil                      |
| Bd    | Laid up in bundles                      |
| Lg    | Laid up in layers                       |

## CABLE SYMBOLS ACORDING TO VDE STANDARD

### POWER CABLES

#### Conductor type:

- N VDE - standard
- (N) On the basis of VDE - standard

#### Conductor material:

- Cu Copper
- A Aluminium

#### Insulation material:

- H Halogen Free (HFFR)
- Y Polyvinylchloride (PVC)
- 2Y Polyethylene (PE)
- 2X Cross-linked PE (XLPE)

#### Concentric conductor, screen:

- C Concentric copper conductor
- CW Consentric copper conductor, in wave conal formation
- CE Consentric copper conductor over each core
- S Copper screen
- SE Copper screen and conductive layer

#### Armouring:

- F Armour of flat wires
- R Armour of round wires
- B Steel tape armour

#### Sheath material:

- Y PVC
- 2Y PE

#### Protective earthing conductor:

- J With protective conductor
- O Without protective earthing conductor

#### Conductor type:

- r... Round conductor
- s... Sector-shaped conductor
- o... Oval-shaped conductor
- re Single-wire conductor
- Rm Multiple-wire conductor
- V Compact conductor

## COMPARISON OF FIRE TESTS

## EN, IEC, DIN VDE AND BS FLAME RETARDANCE

| EN    | PART | CLAUSE | TITLE                                                                                                          | IEC        | BS            | DIN VDE       |
|-------|------|--------|----------------------------------------------------------------------------------------------------------------|------------|---------------|---------------|
| 60332 | 1    | 1      | Test for vertical flame propagation for a single insulated wire or cable - Apparatus                           | 60332-1-1  | EN 60332-1-1  | 0482-332-1-1  |
|       | 1    | 2      | Test for vertical flame propagation for a single insulated wire or cable - Procedure for 1 kW pre-mixed flame  | 1-2        | 1-2           | 332-2-1       |
|       | 2    | 2      | Test for vertical flame propagation for a single small insulated wire or cable - Procedure for diffusion flame | 2-2        | 2-2           | 332-2-2       |
| EN    | PART | CLAUSE | TITLE                                                                                                          | IEC        | BS            | DIN VDE       |
| 60332 | 3    | 10     | Test for vertical flame spread of vertical mounted bunched wires or cables - Apparatus                         | 60332-3-10 | EN 60332-3-10 | 0482-332-3-10 |
|       |      | 21     | Category A F/R                                                                                                 | 3-21       | 3-21          | 332-3-21      |
|       | 3    | 22     | Category A                                                                                                     | 3-22       | 3-22          | 332-3-22      |
|       |      | 23     | Category B                                                                                                     | 3-23       | 3-23          | 332-3-23      |
|       | 3    | 24     | Category C                                                                                                     | 3-24       | 3-24          | 332-3-24      |
|       |      | 25     | Category D                                                                                                     | 3-25       | 3-25          | 332-3-25      |

## ZERO HALOGEN / CORROSIVINESS OF COMBUSTION GASES

| EN    | PART | CLAUSE | TITLE                                                                                                                              | IEC     | BS         | DIN VDE    |
|-------|------|--------|------------------------------------------------------------------------------------------------------------------------------------|---------|------------|------------|
| 50267 | 1    |        | Test on gases evolved during combustion of materials from cables - Apparatus                                                       | 60754-1 | EN 50267-1 | 0482-267-1 |
|       | 2    | 1      | Procedures: Determination of the amount of halogen acid gas                                                                        | 1       | 2-1        | 267-2-1    |
|       | 2    | 2      | Procedures: Determination of degree of acidity of gases for materials by measuring pH and conductivity                             | 2       | 2-2        | 267-2-2    |
|       | 2    | 3      | Procedures: Determination of degree of acidity of gases for cables by determination of the weighted average of pH and conductivity | 2       | 2-3        | 267-2-3    |

## SMOKE DENSITY

| EN    | PART | CLAUSE | TITLE                                                                               | IEC     | BS         | DIN VDE     |
|-------|------|--------|-------------------------------------------------------------------------------------|---------|------------|-------------|
| 61034 | 1    |        | Measurement of smoke density of cables burning under defined conditions - Apparatus | 61034-1 | EN 61034-1 | 0482-1034-1 |
|       | 2    |        | Measurement of smoke density of cables burning under defined conditions - Procedure | 2       | 2          | 1034-2      |

## PERFORMANCE TEST OF USED ON TO ERVİTAL® CABLES

### 1- IEC 60332-1, VDE 0482-332-1-2, EN 60332-1-2, BS EN 60332-1-2 TEST FOR RESISTANCE TO VERTICAL FLAME DIFFUSION OF A SINGLE INSULATED CONDUCTOR OR CABLE 1 KW PRE-MIXED FLAME

A sample cable of 600 mm will be fixed vertically in a metal chamber with exposed front side. A propane gas burner will be mounted in order to obtain a 45° angle with axis of the sample cable. The test time is dependent on the cable diameter. If the sample does not burn, or if the flame extinguishes itself, the test shall be deemed as successful.



| OUTER DIAMETER (mm) | FLAME DURATION SEC |
|---------------------|--------------------|
| D≤25                | 60 ± 2             |
| 25<D≤75             | 120 ± 2            |
| 50<D≤75             | 240 ± 2            |
| 75<D                | 480 ± 2            |

### 2- IEC 60332-3-22, VDE 0482-60332-3-22, EN 60332-3-22, BS EN 60332-3-22 (CAT A) TEST FOR VERTICAL FLAME DIFFUSION ON VERTICALLY FIXED WIRE OR CABLE BUNDLES

The test samples are mounted on a steel ladder. The total number of test pieces in the test sample shall be that number required to provide a nominal total volume of non-metallic material of 7 l/m of test sample. The steel ladder is placed on the rear part of a test chamber having a width of 1 m, a depth of 2 m and a height of 4 m. The test chamber should be ventilated by an air vent. The test flame is applied on the sample cable for 40 min. The test is passed if the flames extinguish on their own and no part of the samples is damaged over a length of 2,5 m.



### 3- IEC 61034-2, VDE 0482-1034-2, EN 61034-2, BS EN 61034-2 MEASUREMENT OF SMOKE DENSITY OF CABLES BURNT UNDER CERTAIN CONDITIONS

The volume of test chamber is 3m<sup>3</sup>. The measurement system consists of a light source (a standard 100w halogen lamp) and a selenium or silicon photo-electric cell, both installed at a height of 2,15m. A rectangular tray will be filled with alcohol. A ventilator is used to ensure the distribution of smoke. The length of the test samples is 1m. The number of test samples depends on the outer diameter. The samples should be attached horizontally above the tray which is filled with alcohol. The ventilator is started and the alcohol is ignited. Light intensity is recorded by a plotter which is connected to the photocell. The test is passed if the level of light transmission does not exceed the values given in the following table during the test.



| OUTER DIAMETER (mm) | NUMBER OF SAMPLE | LIGHT TRANSMISSION |
|---------------------|------------------|--------------------|
| 40<D                | 1                | >60%               |
| 20<D≤40             | 2                | >60%               |
| 10<D≤20             | 3                | >60%               |
| 5<D≤10              | N <sub>1</sub>   | >60%               |
| 1<D≤5               | N <sub>2</sub>   | >60%               |

$$N_1 = \frac{45}{D}$$

$$N_2 = \frac{45}{3D}$$

#### 4- IEC 60754-1-2, VDE 0482-267-2-1, 2 and 3, EN 50267-2-1,2 and 3, BS EN 50267-2-1,2 and 3 DETERMINATION OF HALOGEN ACID GAS, MEASUREMENT OF PH AND CONDUCTIVITY

This test indirectly allows measuring emission of corrosive gas by insulation and sheath compounds. It is possible to measure small quantities of halogens during measurement of the pH-value and the conductivity. In a 500-600 mm long furnace, at least 1g of insulation or sheath compound should be heated up to a temperature of 935 °C. Air flow will ensure that combustion gases pass through a bottle filled with purified water. The test is passed if the pH-values is lower than 4,3 and the electrical conductivity does not exceed 100 µS/cm.



#### 5- IEC 60331-21/23 TEST ON INSULATION INTEGRITY

This test determines insulation integrity under fire conditions. Cables which are tested according to these standards are marked as FE 180. 1,2 m long sample cable suitable for electrical connection, having outer sheath and other jackets, which are removed at both ends. The prepared sample will be fixed horizontally about 75mm above the burner. The samples will be connected (one 2 A fuse for each conductor) to a voltage source and will be tested with their rated voltage source, is slightly curled in order to prevent electrical contact. The burner is ignited and heated up to a temperature of at least 750°C by means of a thermocouple. The sample will be connected to electrical supply and placed into the flames. The sample will be tested during a period of 180. If none of the 2A fuses has blown during the test period, the test is passed.



#### 6- IEC 60331-1/2, VDE 0482-200, BS EN 50200, BS 8434-1,2 SPECIFICATION FOR PERFORMANCE REQUIREMENTS FOR CABLES REQUIRED TO MAINTAIN CIRCUIT INTEGRITY UNDER FIRE CONDITIONS

This test is applied to cables having resident fire retardant properties used in emergency circuits such as alarm, lighting and communication. A single piece of cable is attached to a special fibre glass wall with cable at the minimum bending radius. It is burned with the 830°C propane burner. The rated tension values of the cable are applied on the conductors during the test. Every five minutes a mechanical shock of 25 kg is applied to the wall the cable is attached to. The tension values must be preserved during the test.



## 7) DIN 4102-12: FIRE RESISTANCE OF ELECTRIC CABLE SYSTEMS NECESSARY FOR PROTECTION OF CIRCUIT INTEGRITY (FUNCTION CONTINUITY)

According to German DIN VDE 4102-12 Standard, besides the fire performance of the cables, the importance of its performance is highlighted with all the components which the cables are in contact (trays, cable ducts, clips etc...). The aim of the test is to verify that the complete electric system works under fire conditions. (urgent lighting, fans, fire exits, fire alarm, elevators, pumps and such systems)

Like inside the buildings, the cables are laid down in 3-meter-length open using cable ducts, cable ladders and clips, to test the fire performance of complete electric system.

To obtain the nearly exact simulation, by hanging specific leveled weights on cable trays and ladders, the temperature increment in open is applied 1000°C according to ISO 834 temperature graph (ETK) defined in DIN 4102-12 standard.



## CPR CONSTRUCTION PRODUCTS REGULATION (305/2011/AB)

For cable sector, CPR, including building and infrastructure, contains the requirements of emerging dangerous substances as well as reaction to fire and fire resistance performance of power, control and communication cables used in fixed installations in any construction. Besides, it makes the declaration of performance against fire which cables used in constructions and CE marking mandatory.

EN 50575 for cables had been published on 1st of July, 2015 and CE marking had been applied since 1st of December, 2015. From July, 2017, as mandatory, the companies which will sell or distribute cables in EU countries could legally request the Declaration of Performance of the product and CE marking on the product.

Three important performances are expected from cables that are CPR's main necessities.

- 1) Supporting safety necessity in case of fire
  - a) Reaction to fire performance (EN 50575, EN 13501-6)
  - b) Withstand to fire performance (P and PF classification)
- 2) Supporting hygiene, health and environment necessities
  - a) Emission of dangerous substances

EN 50575 standards refer to test standards given below:

EN 13501-6, EN ISO 1716, EN 50399, EN 60332-1, EN 60754-2, EN 61034-2

## Test methods for Reaction to fire classes (EN 50575)

| Reaction To Fire Performance Class | APPLIED TEST STANDARDS                                                                                     |                       |              |                         |                       |
|------------------------------------|------------------------------------------------------------------------------------------------------------|-----------------------|--------------|-------------------------|-----------------------|
|                                    | EN ISO 1716                                                                                                | EN 50399 <sup>a</sup> | EN 60332-1-2 | EN 61034-2 <sup>c</sup> | EN 60754 <sup>d</sup> |
| A <sub>ca</sub>                    | X                                                                                                          | -                     | -            | -                       | -                     |
| B1 <sub>ca</sub>                   | -                                                                                                          | X <sup>b</sup>        | X            | X                       | X                     |
| B2 <sub>ca</sub>                   | -                                                                                                          | II                    | X            | X                       | X                     |
| C <sub>ca</sub>                    | -                                                                                                          | II                    | X            | X                       | X                     |
| D <sub>ca</sub>                    | -                                                                                                          | II                    | X            | X                       | X                     |
| E <sub>ca</sub>                    | -                                                                                                          | -                     | X            | -                       | -                     |
| F <sub>ca</sub>                    | No performance determined                                                                                  |                       |              |                         |                       |
| EXPLANATIONS                       |                                                                                                            |                       |              |                         |                       |
| a                                  | EN 50399 contains all the information previously preferred to as FIPEC20 Scenario 1 and FIPEC20 Scenario 2 |                       |              |                         |                       |
| b                                  | Special conditions of test apply in EN 50399 to Class B1ca                                                 |                       |              |                         |                       |
| c                                  | Additional classification tests.                                                                           |                       |              |                         |                       |
| d                                  | EN 60754-2 contains all the information previously contained in EN 50267-2-3                               |                       |              |                         |                       |
| FIPEC                              | Fire Performance of Electric Cables                                                                        |                       |              |                         |                       |

| Class            | Experiment Method(s)                      | Classification Criteria                                                                                       | Additional Classification                                                                                             | AVCP System                                                                                                                                                                                 |
|------------------|-------------------------------------------|---------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| A <sub>ca</sub>  | EN ISO 1716                               | PCS ≤ 2,0 MJ/kg <sup>(1)</sup>                                                                                |                                                                                                                       |                                                                                                                                                                                             |
| B <sub>ca</sub>  | EN 50399<br>(30 kW - flame source)<br>and | FS ≤ 1,75 m and<br>THR <sub>1200s</sub> ≤ 10 MJ and<br>Peak HRR ≤ 20 kW and<br>FIGRA ≤ 120 Ws <sup>-1</sup>   | Smoke production <sup>(2,3)</sup><br>and burning droplets/particules <sup>(3)</sup><br>and Acid degree <sup>(4)</sup> | System 1+<br>*Sample audit test with beginning type test<br>and factory audit and Factory Production<br>Control (FPC) by Product certification body<br>(3rd party)<br>* FPC By Manufacturer |
|                  | EN 60332-1-2                              | H ≤ 425 mm                                                                                                    |                                                                                                                       |                                                                                                                                                                                             |
| B <sub>2ca</sub> | EN 50399<br>(20,5 kW flame source)<br>and | FS ≤ 1,5 m; and<br>THR <sub>1200s</sub> ≤ 15 MJ; and<br>Peak HRR ≤ 30 kW; and<br>FIGRA ≤ 150 Ws <sup>-1</sup> | Smoke production <sup>(2,3)</sup><br>and burning droplets/particules <sup>(3)</sup><br>and Acid degree <sup>(4)</sup> |                                                                                                                                                                                             |
|                  | EN 60332-1-2                              | H ≤ 425 mm                                                                                                    |                                                                                                                       |                                                                                                                                                                                             |
| C <sub>ca</sub>  | EN 50399<br>(20,5 kW flame source)<br>and | FS ≤ 2,0 m; and<br>THR <sub>1200s</sub> ≤ 30 MJ; and<br>Peak HRR ≤ 60 kW; and<br>FIGRA ≤ 300 Ws <sup>-1</sup> | Smoke production <sup>(2,3)</sup><br>and burning droplets/particules <sup>(3)</sup><br>and Acid degree <sup>(4)</sup> |                                                                                                                                                                                             |
|                  | EN 60332-1-2                              | H ≤ 425 mm                                                                                                    |                                                                                                                       |                                                                                                                                                                                             |
| D <sub>ca</sub>  | EN 50399<br>(20,5 kW flame source)<br>and | THR <sub>1200s</sub> ≤ 70 MJ; and<br>Peak HRR ≤ 400 kW; and<br>FIGRA ≤ 1 300 Ws <sup>-1</sup>                 | Smoke production <sup>(2,3)</sup><br>and burning droplets/particules <sup>(3)</sup><br>and Acid degree <sup>(4)</sup> | System 3<br>* Beginning Type Test in laboratory defined by<br>3 <sup>rd</sup> party<br>*FPC By Manufacturer                                                                                 |
|                  | EN 60332-1-2                              | H ≤ 425 mm                                                                                                    |                                                                                                                       |                                                                                                                                                                                             |
| E <sub>ca</sub>  | EN 60332-1-2                              | H ≤ 425 mm                                                                                                    |                                                                                                                       |                                                                                                                                                                                             |
| F <sub>ca</sub>  |                                           | No performance determined                                                                                     |                                                                                                                       | System 4<br>*Beginning Type Test and FPC by manufacturer                                                                                                                                    |

(1) For the product as a whole, excluding metallic materials, and for any external component (i.e. sheath) of the product

(2) EN 61034-2 Smoke production

s1 = TSP<sub>1200s</sub> ≤ 50 m<sup>2</sup> and Peak SPR ≤ 0,25 m<sup>2</sup>/s

s1a = s1 and transmittance in accordance with EN 61034-2 ≥ % 80

s1b = s1 and transmittance in accordance with EN 61034-2 ≥ % 60 < % 80

s2 = TSP<sub>1200s</sub> ≤ 400 m<sup>2</sup> and Peak SPR ≤ 1,5 m<sup>2</sup>/s

s3 = not s1 or s2

(3) EN 50399 Flaming droplets

d0 = No flaming droplets/particules within 1200s

d1 = No flaming droplets/particules persisting longer than 10 s within 1200 s

d2 = not d0 or d1

(4) EN 60754-2 Acidity

a1 = conductivity < 2,5 µS/mm and pH > 4,3;

a2 = conductivity < 10 µS/mm ve pH > 4,3

a3 = not a1 or a2

No Explanation = No performance determined.

(5) The smoke class declared for class B1<sub>ca</sub> cables shall originate from the test according to EN 50399 (30 kW flame source)

(6) The smoke class declared for class B2<sub>ca</sub>, C<sub>ca</sub>, D<sub>ca</sub> cables shall originate from the test according to EN 50399 (20,5 kW flame source)

## GENERAL FEATURES OF CABLES WITH 450/750/V NOMINAL VOLTAGE AND THERMOPLASTIC INSULATION AND SHEATH TS 9756 HD 21.1 S4 VDE 281/1

### INSULATION :

Insulation should be made up of the thermoplastic material stated for each type of cable TI 1, TI 2, TI 4, and TI 5 types are suitable for maximum continuous temperature 70 °C and PVC insulated cables.

TI3 type is suitable for maximum continuous conductor temperature 90 °C and PVC insulated cables.

### INSULATION FEATURES

| TEST                                          | UNIT   | TYPE OF COMPOSITION |      |      |      |      |
|-----------------------------------------------|--------|---------------------|------|------|------|------|
|                                               |        | TI 1                | TI 2 | TI 3 | TI 4 | TI 5 |
| Max. continuous conductor temperature         | °C     | 70                  | 70   | 90   | 70   | 70   |
| Max. temperature for short circuit conditions | °C     | 160                 | 160  | 160  | 160  | 160  |
| Min. thermal stability at 200°C               | minute | -                   | -    | 240  | -    | -    |

### SHEATH:

Sheathing should be made up of the thermoplastic material stated for each type of cable.

-TM 1 type for PVC sheathed cables in fixed installation.

-TM 2 type for PVC sheathed twistable cables.

-TM 3 type for PVC sheathed heat resistant cables that conductor temperature does exceed 90 °C

-TM 5 type (H05VV5-F,H05VVC4V5-K) PVC sheathed and oil resistant cables.

-TM 6 type for PVC sheathed cables resistant to low temperature.

### APPLICATION:

Sheath is extruded as a homogenous layer;

a-Over the core for single core cables.

b-Over the core groups and filler or (if exists) over the inner sheath.

### FEATURES OF SHEATH

| TEST                            | UNITE  | TYPE OF COMPOSITION |      |      |      |       |      |
|---------------------------------|--------|---------------------|------|------|------|-------|------|
|                                 |        | TM 1                | TM 2 | TM 3 | TM 4 | TM 5  | TM 6 |
| Plunge into mineral oil         | -      | -                   | -    | -    | -    | -     | -    |
| Temperature of oil              | °C     | -                   | -    | -    | -    | 90±2  | -    |
| Plunge time                     | hours  | -                   | -    | -    | -    | 70x24 | -    |
| Min. thermal stability at 200°C | minute | -                   | -    | 240  | -    | -     | -    |

### ELECTRICAL PROPERTIES

| TEST                                                 | UNITE | RATED VOLTAGE OF CABLES |          |          |
|------------------------------------------------------|-------|-------------------------|----------|----------|
|                                                      |       | 300/300V                | 300/500V | 450/750V |
| Voltage applied on semi-finished cables (aa)         | V     | 2000                    | 2000     | 2500     |
| Voltage applied on cores (aa)                        | V     |                         |          |          |
| Wall thickness up to 0,60mm                          | V     | 1500                    | 1500     |          |
| Wall thickness above 0,60mm                          | V     | 2000                    | 2000     | 2000     |
| Long term resistance of insulation to direct current |       |                         |          |          |
| Temperature of water                                 | °C    | 60±5                    | 60±5     | 60±5     |
| Voltage applied                                      | V     | 220                     | 220      | 220      |

## CABLE CORE COLOURS ACCORDING VDE 0293, TS HD 308 S2

### Cables and cordons with green-yellow core

| CORE NUMBER    | CORES COLOURS <sup>b</sup> |        |       |       |      |
|----------------|----------------------------|--------|-------|-------|------|
|                | Protector                  | Energy |       |       |      |
| 3              | Green-Yellow               | Blue   | Brown |       |      |
| 4              | Green-Yellow               |        | Brown | Black | Grey |
| 4 <sub>a</sub> | Green-Yellow               | Blue   | Brown | Black |      |
| 5              | Green-Yellow               | Blue   | Brown | Black | Grey |

a: Only for determined applications

b: Common center conductor that not insulated like metallic sheath, armour or screen wires did not take attention as a core in this table. Common center conductor is described with self position, because of this it is not required to describe with a colour

### Cables and cordons are without green-yellow core

| CORE NUMBER    | CORES COLOURS <sup>b</sup> |        |       |      |       |
|----------------|----------------------------|--------|-------|------|-------|
|                | Protector                  | Energy |       |      |       |
| 2              | Blue                       | Brown  | Black |      |       |
| 3              |                            | Brown  | Black | Grey |       |
| 3 <sub>a</sub> | Blue                       | Brown  | Black |      |       |
| 4              | Blue                       | Brown  | Black | Grey |       |
| 5              | Blue                       | Brown  |       | Grey | Black |

a: Only for determined applications

b: Common center conductor that not insulated like metallic sheath, armour or screen wires did not take attention as a core in this table. Common center conductor is described with self position, because of this it is not required to describe with a colour

### Single core cables:

Following colours should be used for insulation of sheathed single core cables and insulated conductors:

- Two colours from green-yellow compound for protective conductor.
- Blue is for neutral conductor black, brown or grey are recommended for phase conductors. Other colour can use for determined applications.

## PAS 5308 PART-1 MULTIPAIR COLOUR CODE

### 1- Identification of not individually pairs

- Two pair collectively screened cables are in quad formation colour coded in rotation black, blue,green, brown
- Single triple will be blue , black, green

All other cables up to 50 pairs conform to the coding of following table:

| PAIR NO | A WIRE | B WIRE | PAIR NO | A WIRE | B WIRE    |
|---------|--------|--------|---------|--------|-----------|
| 1       | BLACK  | BLUE   | 26      | WHITE  | YELLOW    |
| 2       | BLACK  | GREEN  | 27      | RED    | YELLOW    |
| 3       | BLUE   | GREEN  | 28      | ORANGE | YELLOW    |
| 4       | BLACK  | BROWN  | 29      | BLACK  | GREY      |
| 5       | BLUE   | BROWN  | 30      | BLUE   | GREY      |
| 6       | GREEN  | BROWN  | 31      | GREEN  | GREY      |
| 7       | BLACK  | WHITE  | 32      | BROWN  | GREY      |
| 8       | BLUE   | WHITE  | 33      | WHITE  | GREY      |
| 9       | GREEN  | WHITE  | 34      | RED    | GREY      |
| 10      | BROWN  | WHITE  | 35      | ORANGE | GREY      |
| 11      | BLACK  | RED    | 36      | YELLOW | GREY      |
| 12      | BLUE   | RED    | 37      | BLACK  | VIOLET    |
| 13      | GREEN  | RED    | 38      | BLUE   | VIOLET    |
| 14      | BROWN  | RED    | 39      | GREEN  | VIOLET    |
| 15      | WHITE  | RED    | 40      | BROWN  | VIOLET    |
| 16      | BLACK  | ORANGE | 41      | WHITE  | VIOLET    |
| 17      | BLUE   | ORANGE | 42      | RED    | VIOLET    |
| 18      | GREEN  | ORANGE | 43      | ORANGE | VIOLET    |
| 19      | BROWN  | ORANGE | 44      | YELLOW | VIOLET    |
| 20      | WHITE  | ORANGE | 45      | GREY   | VIOLET    |
| 21      | RED    | ORANGE | 46      | BLACK  | TURQUOISE |
| 22      | BLACK  | YELLOW | 47      | BLUE   | TURQUOISE |
| 23      | BLUE   | YELLOW | 48      | GREEN  | TURQUOISE |
| 24      | GREEN  | YELLOW | 49      | BROWN  | TURQUOISE |
| 25      | BROWN  | YELLOW | 50      | WHITE  | TURQUOISE |

### 2- Individually screened pairs

- Screened pairs are identified by a numbered tape under the separator tapes of the pair screens
- Each pair has one black and one blue core

## PAS 5308 PART-2 MULTIPAIR COLOUR CODE

### 1- Identification of not individually screened pairs

- Two pair collectively screened cables are in quad formation colour coded in rotation: Black, blue, green, brown
- Single triple will be blue, white, orange

All other cables up to 50 pairs conform to the coding of following table:

| PAIR NO | A WIRE     | B WIRE | PAIR NO | A WIRE       | B WIRE |
|---------|------------|--------|---------|--------------|--------|
| 1       | WHITE      | BLUE   | 26      | RED/BLUE     | BLUE   |
| 2       | WHITE      | ORANGE | 27      | RED/BLUE     | ORANGE |
| 3       | WHITE      | GREEN  | 28      | RED/BLUE     | GREEN  |
| 4       | WHITE      | BROWN  | 29      | RED/BLUE     | BROWN  |
| 5       | WHITE      | GREY   | 30      | RED/BLUE     | GREY   |
| 6       | RED        | BLUE   | 31      | BLUE/BLACK   | BLUE   |
| 7       | RED        | ORANGE | 32      | BLUE/BLACK   | ORANGE |
| 8       | RED        | GREEN  | 33      | BLUE/BLACK   | GREEN  |
| 9       | RED        | BROWN  | 34      | BLUE/BLACK   | BROWN  |
| 10      | RED        | GREY   | 35      | BLUE/BLACK   | GREY   |
| 11      | BLACK      | BLUE   | 36      | YELLOW/BLUE  | BLUE   |
| 12      | BLACK      | ORANGE | 37      | YELLOW/BLUE  | ORANGE |
| 13      | BLACK      | GREEN  | 38      | YELLOW/BLUE  | GREEN  |
| 14      | BLACK      | BROWN  | 39      | YELLOW/BLUE  | BROWN  |
| 15      | BLACK      | GREY   | 40      | YELLOW/BLUE  | GREY   |
| 16      | YELLOW     | BLUE   | 41      | WHITE/ORANGE | BLUE   |
| 17      | YELLOW     | ORANGE | 42      | WHITE/ORANGE | ORANGE |
| 18      | YELLOW     | GREEN  | 43      | WHITE/ORANGE | GREEN  |
| 19      | YELLOW     | BROWN  | 44      | WHITE/ORANGE | BROWN  |
| 20      | YELLOW     | GREY   | 45      | WHITE/ORANGE | GREY   |
| 21      | WHITE/BLUE | BLUE   | 46      | ORANGE/RED   | BLUE   |
| 22      | WHITE/BLUE | ORANGE | 47      | ORANGE/RED   | ORANGE |
| 23      | WHITE/BLUE | GREEN  | 48      | ORANGE/RED   | GREEN  |
| 24      | WHITE/BLUE | BROWN  | 49      | ORANGE/RED   | BROWN  |
| 25      | WHITE/BLUE | GREY   | 50      | ORANGE/RED   | GREY   |

### 2- Individually screened pairs

- Screened pairs are identified by a numbered tape under the separator tapes of the pair screens
- Each pair has one black and one blue core

### 3-Identification of cores

Core 1 to 40: Yellow with black printed number  
core 41 to 80: Black with white printed number

## COLOUR CODE BASED ON DIN 47100 (Without colour repetition)

| CORE NO | COLOURS FOR THE CORES | CORE NO | COLOURS FOR THE CORES |
|---------|-----------------------|---------|-----------------------|
| 1       | WHITE                 | 32      | YELLOW-BLUE           |
| 2       | BROWN                 | 33      | GREEN-RED             |
| 3       | GREEN                 | 34      | YELLOW-RED            |
| 4       | YELLOW                | 35      | GREEN-BLACK           |
| 5       | GREY                  | 36      | YELLOW-BLACK          |
| 6       | PINK                  | 37      | GREY-BLUE             |
| 7       | BLUE                  | 38      | PINK-BLUE             |
| 8       | RED                   | 39      | GREY-RED              |
| 9       | BLACK                 | 40      | PINK-RED              |
| 10      | VIOLET                | 41      | GREY-BLACK            |
| 11      | GREY-PINK             | 42      | PINK-BLACK            |
| 12      | RED-BLUE              | 43      | BLUE-BLACK            |
| 13      | WHITE-GREEN           | 44      | RED-BLACK             |
| 14      | BROWN-GREEN           | 45      | WHITE-BROWN-BLACK     |
| 15      | WHITE-YELLOW          | 46      | YELLOW-GREEN-BLACK    |
| 16      | YELLOW-BROWN          | 47      | GREY-PINK-BLACK       |
| 17      | WHITE-GREY            | 48      | RED-BLUE-BLACK        |
| 18      | GREY-BROWN            | 49      | WHITE-GREEN-BLACK     |
| 19      | WHITE-PINK            | 50      | BROWN-GREEN-BLACK     |
| 20      | PINK-BROWN            | 51      | WHITE-YELLOW-BLACK    |
| 21      | WHITE-BLUE            | 52      | YELLOW-BROWN-BLACK    |
| 22      | BROWN-BLUE            | 53      | WHITE-GREY-BLACK      |
| 23      | WHITE-RED             | 54      | GREY-BROWN-BLACK      |
| 24      | BROWN-RED             | 55      | WHITE-PINK-BLACK      |
| 25      | WHITE-BLACK           | 56      | PINK-BROWN-BLACK      |
| 26      | BROWN-BLACK           | 57      | WHITE-BLUE-BLACK      |
| 27      | GREY-GREEN            | 58      | BROWN-BLUE-BLACK      |
| 28      | YELLOW-GREY           | 59      | WHITE-RED-BLACK       |
| 29      | PINK-GREEN            | 60      | BROWN-RED-BLACK       |
| 30      | YELLOW-PINK           | 61      | BLACK-WHITE           |
| 31      | GREEN-BLUE            |         |                       |

## COLOUR CODE ACCORDING TO 47100 (With colour repetition from core no 45 and above )

| CORE NO | COLOURS FOR THE CORES | CORE NO | COLOUR FOR THE CORES |
|---------|-----------------------|---------|----------------------|
| 1       | WHITE                 | 32      | YELLOW-BLUE          |
| 2       | BROWN                 | 33      | GREEN-RED            |
| 3       | GREEN                 | 34      | YELLOW-RED           |
| 4       | YELLOW                | 35      | GREEN-BLACK          |
| 5       | GREY                  | 36      | YELLOW-BLACK         |
| 6       | PINK                  | 37      | GREY-BLUE            |
| 7       | BLUE                  | 38      | PINK-BLUE            |
| 8       | RED                   | 39      | GREY-RED             |
| 9       | BLACK                 | 40      | PINK-RED             |
| 10      | VIOLET                | 41      | GREY-BLACK           |
| 11      | GREY-PINK             | 42      | PINK-BLACK           |
| 12      | RED-BLUE              | 43      | BLUE-BLACK           |
| 13      | WHITE-GREEN           | 44      | RED-BLACK            |
| 14      | BROWN-GREEN           | 45      | WHITE                |
| 15      | WHITE-YELLOW          | 46      | BROWN                |
| 16      | YELLOW-BROWN          | 47      | GREEN                |
| 17      | WHITE-GREY            | 48      | YELLOW               |
| 18      | GREY-BROWN            | 49      | GREY                 |
| 19      | WHITE-PINK            | 50      | PINK                 |
| 20      | PINK-BROWN            | 51      | BLUE                 |
| 21      | WHITE-BLUE            | 52      | RED                  |
| 22      | BROWN-BLUE            | 53      | BLACK                |
| 23      | WHITE-RED             | 54      | VIOLET               |
| 24      | BROWN-RED             | 55      | GREY-PINK            |
| 25      | WHITE-BLACK           | 56      | RED-BLUE             |
| 26      | BROWN-BLACK           | 57      | WHITE-GREEN          |
| 27      | GREY-GREEN            | 58      | BROWN-GREEN          |
| 28      | YELLOW-GREEN          | 59      | WHITE-YELLOW         |
| 29      | PINK-GREEN            | 60      | YELLOW-BROWN         |
| 30      | YELLOW-PINK           | 61      | WHITE-GREY           |
| 31      | GREEN-BLUE            |         |                      |

## COLOUR CODE ACCORDING TO DIN 47100 (Twisted pairs)

## COLOUR OF THE PAIRS

| PAIR NUMBER |    |    | a-Core       | b-Core       |
|-------------|----|----|--------------|--------------|
| 1           | 23 | 45 | WHITE        | BROWN        |
| 2           | 24 | 46 | GREEN        | YELLOW       |
| 3           | 25 | 47 | GREY         | PINK         |
| 4           | 26 | 48 | BLUE         | RED          |
| 5           | 27 | 49 | BLACK        | VIOLET       |
| 6           | 28 | 50 | GREY-PINK    | RED-BLUE     |
| 7           | 29 | 51 | WHITE-GREEN  | BROWN-GREEN  |
| 8           | 30 | 52 | WHITE-YELLOW | YELLOW-BROWN |
| 9           | 31 | 53 | WHITE-GREY   | GREY-BROWN   |
| 10          | 32 | 54 | WHITE-PINK   | PINK-BROWN   |
| 11          | 33 | 55 | WHITE-BLUE   | BROWN-BLUE   |
| 12          | 34 | 56 | WHITE-RED    | BROWN-RED    |
| 13          | 35 | 57 | WHITE-BLACK  | BROWN-BLACK  |
| 14          | 36 | 58 | GREY-GREEN   | YELLOW-GREY  |
| 15          | 37 | 59 | PINK-GREEN   | YELLOW-PINK  |
| 16          | 38 | 60 | GREEN-BLUE   | YELLOW-BLUE  |
| 17          | 39 | 61 | GREEN-RED    | YELLOW-RED   |
| 18          | 40 | 62 | GREEN-BLACK  | YELLOW-BLACK |
| 19          | 41 | 63 | GREY-BLUE    | PINK-BLUE    |
| 20          | 42 | 64 | GREY-RED     | PINK-RED     |
| 21          | 43 | 65 | GREY-BLACK   | PINK-BLACK   |
| 22          | 44 | 66 | BLUE-BLACK   | RED-BLACK    |

## J-Y(St)Y...Lg FIRE ALARM AND COMMUNICATION CABLES

### Colour Code According To DIN VDE 0815

2 paired installation cables are stranded as star quad

1. Pair: a-core Red b-core Black  
2. Pair: a-core White b-core Yellow

4 and multi-paired installation cables:

a-core of first pair in each layer is Red, other pairs are White

b-core: Blue, Yellow, Green, Brown, Black in continuous repetition

In order: From outside to inside

| b-wire | Pair Number |    |    |    |    |    |    |    |    |    |
|--------|-------------|----|----|----|----|----|----|----|----|----|
| Blue   | 1           | 6  | 11 | 16 | 21 | 26 | 31 | 36 | 41 | 46 |
| Yellow | 2           | 7  | 12 | 17 | 22 | 27 | 32 | 37 | 42 | 47 |
| Green  | 3           | 8  | 13 | 18 | 23 | 28 | 33 | 38 | 43 | 48 |
| Brown  | 4           | 9  | 14 | 19 | 24 | 29 | 34 | 39 | 44 | 49 |
| Black  | 5           | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 |

## J-H(St)H...Bd FEATURES

### BASIC COLOURS OF PAIRS

| Pair Number | 1    | 2      | 3     | 4     |
|-------------|------|--------|-------|-------|
| a-core      | Blue | Grey   | Green | White |
| b-core      | Red  | Yellow | Brown | Black |

| Pair Number | Sub-group        | 1. Layer | 2. Layer |
|-------------|------------------|----------|----------|
| 2           | Star quad        | 1        | -        |
| 4           | Pair             | 4        | -        |
| 8           | 4 Pairs Sub-unit | 2        | -        |
| 12          | 4 Pairs Sub-unit | 3        | -        |
| 16          | 4 Pairs Sub-unit | 4        | -        |
| 20          | 4 Pairs Sub-unit | 5        | -        |
| 32          | 4 Pairs Sub-unit | 1        | 7        |
| 40          | 4 Pairs Sub-unit | 2        | 8        |
| 52          | 4 Pairs Sub-unit | 3        | 10       |

## INDOOR TYPE TELEPHONE CABLES

(VBV &amp; VBV-K / HBH &amp; HBH-K / VBAPV &amp; VBAPV-K / HBAPH &amp; HBAPH-K)

## INSULATION COLOURS OF GROUP WITH TEN PAIRS

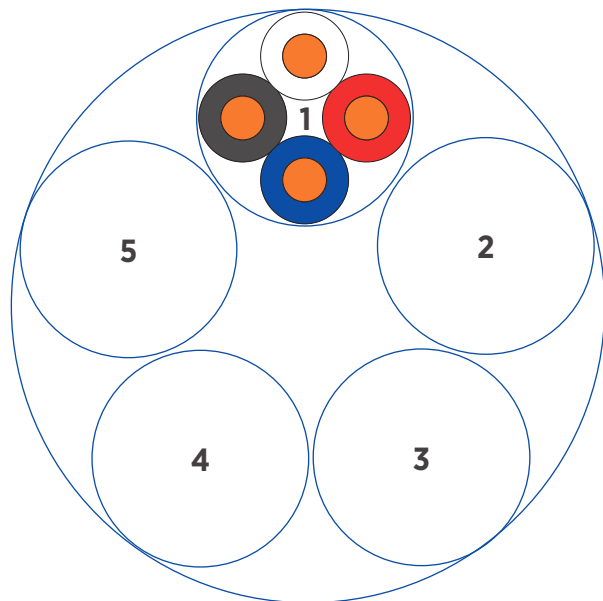
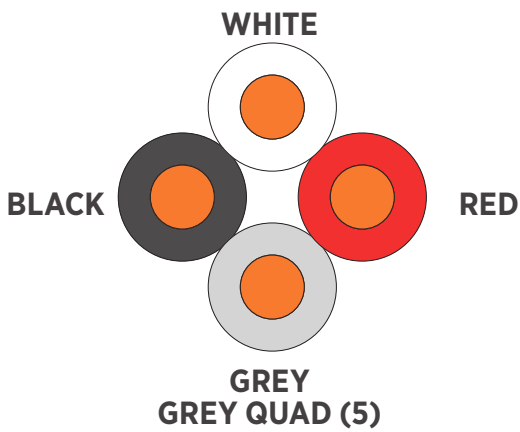
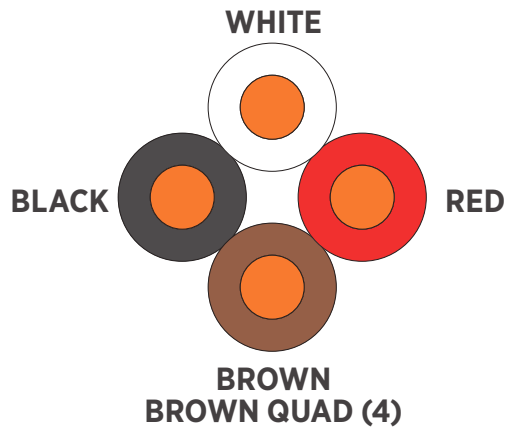
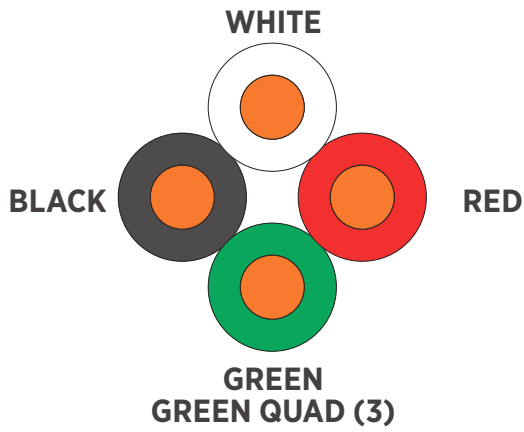
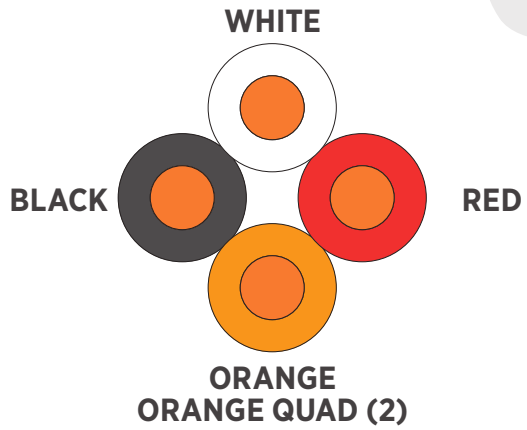
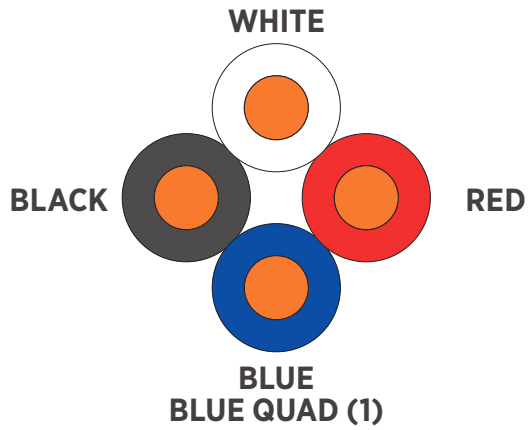
| GROUP NR. | COLOURS OF INSULATION |        |
|-----------|-----------------------|--------|
|           | A-WIRE                | B-WIRE |
| 1         | WHITE                 | BLUE   |
| 2         | WHITE                 | ORANGE |
| 3         | WHITE                 | GREEN  |
| 4         | WHITE                 | BROWN  |
| 5         | WHITE                 | GREY   |
| 6         | RED                   | BLUE   |
| 7         | RED                   | ORANGE |
| 8         | RED                   | GREEN  |
| 9         | RED                   | BROWN  |
| 10        | RED                   | GREY   |

| GROUP NR. | COLOURS OF IDENTIFICATION TABE |  |
|-----------|--------------------------------|--|
|           |                                |  |
| 1         | BLUE                           |  |
| 2         | ORANGE                         |  |
| 3         | GREEN                          |  |
| 4         | BROWN                          |  |
| 5         | GREY                           |  |
| 6         | WHITE-BLUE                     |  |
| 7         | WHITE-ORANGE                   |  |
| 8         | WHITE-GREEN                    |  |
| 9         | WHITE-BROWN                    |  |
| 10        | WHITE-GREY                     |  |

## CORE ARRANGEMENT

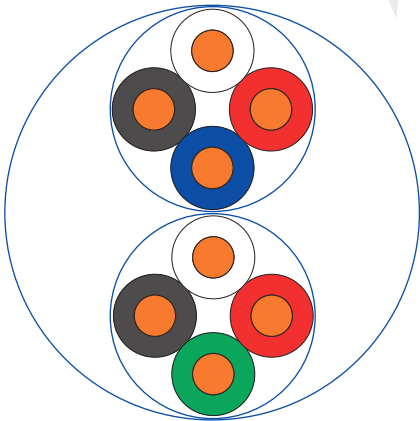
| GROUP NR. | CORE ARRANGEMENT  | 1. Layer | 2. Layer | 2. Layer |
|-----------|-------------------|----------|----------|----------|
| 1         | PAIR              | -        | -        | -        |
| 2         | PAIR              | -        | -        | -        |
| 3         | PAIR              | -        | -        | -        |
| 4         | PAIR              | -        | -        | -        |
| 6         | PAIR              | -        | -        | -        |
| 10        | PAIR              | 7        | 7        | -        |
| 20        | 10 PAIR Sub-group | -        | -        | -        |
| 30        | 10 PAIR Sub-group | -        | -        | -        |
| 50        | 10 PAIR Sub-group | -        | -        | -        |
| 100       | 10 PAIR Sub-group | 7        | 7        | -        |
| 200       | 50 PAIR Sub-group | -        | -        | -        |

## GENERAL STRUCTURE OF PDV&PDV-K / PD-PAP TELEPHONE CABLES (STAR QUAD)

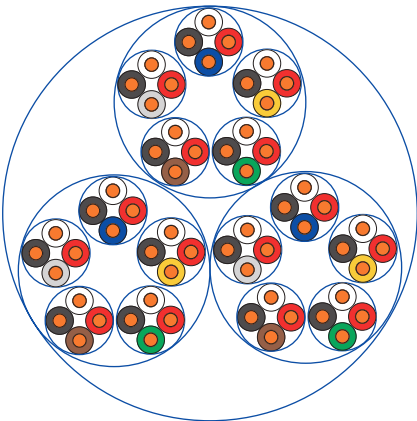


IDENTIFICATION TABE  
OF GROUP AND SUB GROUP

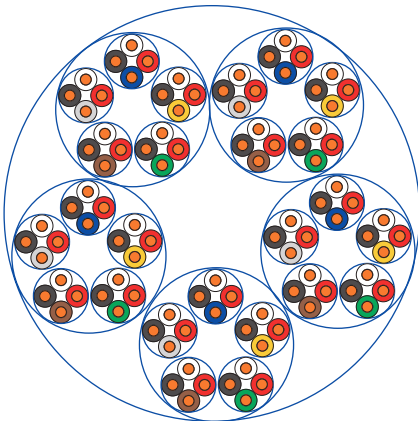
| GROUP NO | COLOURS OF<br>IDENTIFICATION TABE |
|----------|-----------------------------------|
| 1        | BLUE                              |
| 2        | ORANGE                            |
| 3        | GREEN                             |
| 4        | BROWN                             |
| 5        | GREY                              |
| 6        | WHITE-BLUE                        |
| 7        | WHITE-ORANGE                      |
| 8        | WHITE-GREEN                       |
| 9        | WHITE-BROWN                       |
| 10       | WHITE-GREY                        |



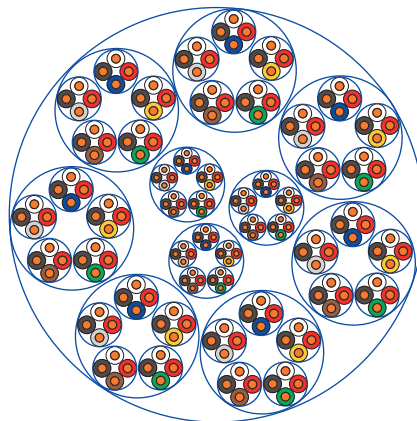
20 Pair core  
(2 Sub-group)



30 Pair core  
(3 Sub-group)



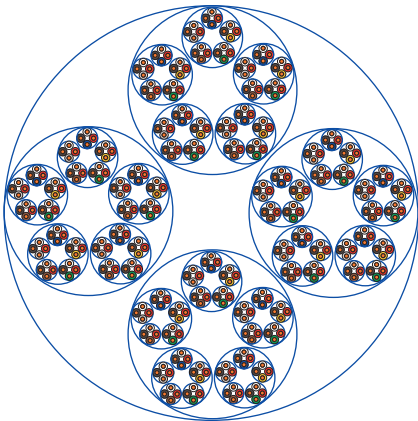
50 Pair core  
(5 Sub-group)



100 Pair core  
(10 Sub-group)

50 PAIRS IDENTIFICATION TABE  
OF UNIT AND SUBGROUP

| GROUP NO | COLOURS OF<br>IDENTIFICATION TABE |
|----------|-----------------------------------|
| 1        | BLUE                              |
| 2        | ORANGE                            |
| 3        | GREEN                             |
| 4        | BROWN                             |



200 Pair core  
(20 Sub-group)  
(4x50 Pair group)

## METRIC SIZES STANDARD FLEXIBLE CONDUCTORS

### VDE 0295; IEC 60228; EN 60228

| CLASS OF CONDUCTOR | CROSS-SECTIONAL AREA<br>mm <sup>2</sup> | STRANDING NO.WIRES-SIZE<br>WIRES<br>mm | NOMINAL DIAMETER<br>OF CONDUCTOR<br>mm | NOMINAL WEIGHT<br>kg/km |
|--------------------|-----------------------------------------|----------------------------------------|----------------------------------------|-------------------------|
|                    | 0,05                                    | 7X0,10                                 | 0,3                                    | 0,5                     |
|                    | 0,22                                    | 7X0,20                                 | 0,6                                    | 2,0                     |
|                    | 0,5                                     | 7X0,30                                 | 0,9                                    | 4,5                     |
| 5                  | 0,5                                     | 16X0,20                                | 0,93                                   | 4,5                     |
| 6                  | 0,5                                     | 28X0,15                                | 0,94                                   | 4,5                     |
|                    | 0,5                                     | 151X0,065                              | 0,98                                   | 4,5                     |
|                    | 0,65                                    | 14X0,25                                | 1,1                                    | 5,8                     |
| 5                  | 0,75                                    | 24X0,20                                | 1,14                                   | 6,7                     |
| 6                  | 0,75                                    | 42X0,15                                | 1,12                                   | 6,7                     |
| 5                  | 1,0                                     | 32X0,20                                | 1,34                                   | 8,9                     |
| 5                  | 1,25                                    | 40X0,20                                | 1,47                                   | 11,1                    |
| 5                  | 1,35                                    | 19X0,30                                | 1,5                                    | 12,0                    |
| 5                  | 1,5                                     | 30X0,25                                | 1,6                                    | 13,4                    |
|                    | 2,0                                     | 28X0,30                                | 1,87                                   | 17,8                    |
| 5                  | 2,5                                     | 50X0,25                                | 2,09                                   | 22,3                    |
|                    | 3,0                                     | 44X0,30                                | 2,4                                    | 27                      |
| 5                  | 4,0                                     | 56X0,30                                | 2,61                                   | 36                      |
|                    | 4,5                                     | 65X0,30                                | 2,8                                    | 40                      |
| 5                  | 6                                       | 84X0,30                                | 3,21                                   | 53                      |
|                    | 8                                       | 120X0,30                               | 3,75                                   | 71                      |
| 5                  | 10                                      | 80X0,40                                | 4,2                                    | 89                      |
| 5                  | 16                                      | 128X0,40                               | 5,3                                    | 142                     |
| 5                  | 25                                      | 200X0,40                               | 7,1                                    | 223                     |
| 5                  | 35                                      | 280X0,40                               | 8,5                                    | 312                     |
| 5                  | 50                                      | 400X0,40                               | 10,3                                   | 445                     |
| 5                  | 70                                      | 356X0,50                               | 12,4                                   | 623                     |
| 5                  | 95                                      | 485X0,50                               | 14,5                                   | 846                     |
| 5                  | 120                                     | 120X0,30                               | 16,0                                   | 1068                    |
| 5                  | 150                                     | 765X0,50                               | 18,0                                   | 1335                    |
| 5                  | 185                                     | 944X0,50                               | 20,0                                   | 1647                    |
| 5                  | 240                                     | 1225X0,50                              | 23,0                                   | 2136                    |
| 5                  | 300                                     | 1530X0,50                              | 26,0                                   | 2670                    |
| 5                  | 400                                     | 2034X0,50                              | 30,0                                   | 3560                    |
| 5                  | 500                                     | 1768X0,60                              | 33,5                                   | 4450                    |

## CONSTRUCTION OF THE CU WIRE CONDUCTOR VDE 0295; IEC 60228; EN 60228

| Cross<br>Section | Multiple Wire<br>Round Conductor<br>Vde 0295<br>Class 2<br>Column1 | Multi Stranded<br>Wires Standard<br>Construction<br>Column 2 | Finely Stranded<br>Wires<br>VDE 0295<br>Class5<br>Column 3 | Extra fine stranded wires      |                       |             |             |
|------------------|--------------------------------------------------------------------|--------------------------------------------------------------|------------------------------------------------------------|--------------------------------|-----------------------|-------------|-------------|
|                  |                                                                    |                                                              |                                                            | VDE 0295<br>Class56<br>Column4 | Standard construction |             |             |
|                  |                                                                    |                                                              |                                                            |                                | Column<br>5           | Column<br>6 | Column<br>6 |
| 0,035            | -                                                                  | 7x0,08                                                       | -                                                          | -                              | -                     | -           | -           |
| 0,05             | -                                                                  | -                                                            | -                                                          | -                              | -                     | 14x0,07     | 26x0,05     |
| 0,08             | -                                                                  | -                                                            | -                                                          | -                              | -                     | -           | -           |
| 0,09             | -                                                                  | -                                                            | -                                                          | -                              | 7x0,124               | 24x0,07     | -           |
| 0,14             | -                                                                  | -                                                            | 18x0,10                                                    | 18x0,10                        | 18x0,10               | 36x0,07     | 72x0,05     |
| 0,25             | -                                                                  | -                                                            | 14x0,15                                                    | 32x0,10                        | 32x0,10               | 65x0,07     | 128x0,05    |
| 0,34             | -                                                                  | 7x0,25                                                       | 19x0,15                                                    | 42x0,10                        | 42x0,10               | 88x0,07     | 174x0,05    |
| 0,38             | -                                                                  | 7x0,27                                                       | 12x0,20                                                    | 21x0,15                        | 48x0,10               | 100x0,07    | 194x0,05    |
| 0,5              | 7x0,30                                                             | 7x0,30                                                       | 16x0,20                                                    | 28x0,15                        | 64x0,10               | 131x0,07    | 256x0,05    |
| 0,75             | 7x0,37                                                             | 7x0,37                                                       | 24x0,20                                                    | 42x0,15                        | 96x0,10               | 195x0,07    | 384x0,05    |
| 1,0              | 7x0,43                                                             | 7x0,43                                                       | 32x0,20                                                    | 56x0,15                        | 128x0,10              | 260x0,07    | 512x0,05    |
| 1,5              | 7x0,52                                                             | 7x0,52                                                       | 30x0,25                                                    | 84x0,15                        | 192x0,10              | 392x0,07    | 768x0,05    |
| 2,5              | 7x0,67                                                             | 19x0,41                                                      | 50x0,25                                                    | 140x0,15                       | 320x0,10              | 615x0,07    | 128x0,05    |
| 4                | 7x0,85                                                             | 19x0,52                                                      | 56x0,30                                                    | 224x0,15                       | 512x0,10              | 1040x0,07   | -           |
| 6                | 7x1,05                                                             | 19x0,64                                                      | 84x0,30                                                    | 192x0,20                       | 768x0,10              | 1560x0,07   | -           |
| 10               | 7x1,35                                                             | 49x0,51                                                      | 80x0,40                                                    | 320x0,20                       | 128x0,10              | 2600x0,07   | -           |
| 16               | 7x1,70                                                             | 49x0,65                                                      | 128x0,40                                                   | 512x0,20                       | 2048x0,10             | 4116x0,07   | -           |
| 25               | 7x2,13                                                             | 84x0,62                                                      | 200x0,40                                                   | 800x0,20                       | 3200x0,10             | 6370x0,07   | -           |
| 35               | 7x2,52                                                             | 133x0,58                                                     | 280x0,40                                                   | 1120x0,40                      | 4410x0,10             | 9100x0,07   | -           |
| 50               | 19x1,83                                                            | 113x0,69                                                     | 400x0,40                                                   | 705x0,30                       | -                     | -           | -           |
| 70               | 19x2,17                                                            | 189x0,69                                                     | 356x0,50                                                   | 990x0,30                       | -                     | -           | -           |
| 95               | 19x2,52                                                            | 259x0,69                                                     | 485x0,50                                                   | 1340x0,30                      | -                     | -           | -           |
| 120              | 37x2,03                                                            | 336x0,67                                                     | 614x0,50                                                   | 1690x0,30                      | -                     | -           | -           |
| 150              | 37x2,27                                                            | 392x0,69                                                     | 765x0,50                                                   | 2123x0,30                      | -                     | -           | -           |
| 185              | 37x2,52                                                            | 494x0,69                                                     | 944x0,50                                                   | 1470x0,40                      | -                     | -           | -           |
| 240              | 61x2,24                                                            | 627x0,70                                                     | 1225x0,50                                                  | 1905x0,40                      | -                     | -           | -           |
| 300              | 61x2,50                                                            | 790x0,70                                                     | 1530x0,70                                                  | 2385x0,40                      | -                     | -           | -           |
| 400              | 61x2,89                                                            | -                                                            | 2034x0,50                                                  | -                              | -                     | -           | -           |
| 500              | 61x3,23                                                            | -                                                            | 1768x0,60                                                  | -                              | -                     | -           | -           |
| 630              | 91x2,97                                                            | -                                                            | 2228x0,60                                                  | -                              | -                     | -           | -           |

## CLASS 2 STRANDED CONDUCTORS FOR SINGLE AND MULTI-CORE CABLES

| Nominal<br>cross-sectional<br>area mm <sup>2</sup> | The number of conductor wires |    |                     |    |           |    | Conductor resistance at 20 ° C |                         |                                                     |
|----------------------------------------------------|-------------------------------|----|---------------------|----|-----------|----|--------------------------------|-------------------------|-----------------------------------------------------|
|                                                    | Circular                      |    | Circular compressed |    | Formatted |    | Bare copper<br>Ω / km          | Tinned copper<br>Ω / km | Aluminum and<br>aluminum alloy<br>conductors Ω / km |
|                                                    | Cu                            | Al | Cu                  | Al | Cu        | Al |                                |                         |                                                     |
| 1                                                  | 2                             | 3  | 4                   | 5  | 6         | 7  | 8                              | 9                       | 10                                                  |
| 0,5                                                | 7                             | -  | -                   | -  | -         | -  | 36                             | 36,7                    | -                                                   |
| 0,75                                               | 7                             | -  | -                   | -  | -         | -  | 24,5                           | 24,8                    | -                                                   |
| 1                                                  | 7                             | -  | -                   | -  | -         | -  | 18,1                           | 18,2                    | -                                                   |
| 1,5                                                | 7                             | -  | 6                   | -  | -         | -  | 12,1                           | 12,2                    | -                                                   |
| 2,5                                                | 7                             | -  | 6                   | -  | -         | -  | 7,41                           | 7,56                    | -                                                   |
| 4                                                  | 7                             | -  | 6                   | -  | -         | -  | 4,61                           | 4,7                     | -                                                   |
| 6                                                  | 7                             | -  | 6                   | 6  | -         | -  | 3,08                           | 3,11                    | 3,08                                                |
| 10                                                 | 7                             | 7  | 6                   | 6  | -         | -  | 1,83                           | 1,84                    | 1,91                                                |
| 16                                                 | 7                             | 7  | 6                   | 6  | 6         | 6  | 1,15                           | 1,16                    | 1,2                                                 |
| 25                                                 | 7                             | 7  | 6                   | 6  | 6         | 6  | 0,727                          | 0,754                   | 0,868                                               |
| 35                                                 | 7                             | 7  | 6                   | 6  | 6         | 6  | 0,524                          | 0,529                   | 0,641                                               |
| 50                                                 | 19                            | 19 | 6                   | 6  | 6         | 6  | 0,387                          | 0,391                   | 0,443                                               |
| 70                                                 | 19                            | 19 | 12                  | 12 | 12        | 12 | 0,268                          | 0,27                    | 0,32                                                |
| 95                                                 | 19                            | 19 | 15                  | 15 | 15        | 15 | 0,193                          | 0,195                   | 0,253                                               |
| 120                                                | 37                            | 37 | 18                  | 15 | 18        | 15 | 0,153                          | 0,154                   | 0,206                                               |
| 150                                                | 37                            | 37 | 18                  | 15 | 18        | 15 | 0,124                          | 0,126                   | 0,164                                               |
| 185                                                | 37                            | 37 | 30                  | 30 | 30        | 30 | 0,0991                         | 0,1                     | 0,125                                               |
| 240                                                | 37                            | 37 | 34                  | 30 | 34        | 30 | 0,0754                         | 0,0762                  | 0,1                                                 |
| 300                                                | 61                            | 61 | 34                  | 30 | 34        | 30 | 0,0601                         | 0,0607                  | 0,0778                                              |
| 400                                                | 61                            | 61 | 53                  | 53 | 53        | 53 | 0,047                          | 0,0475                  | 0,0605                                              |
| 500                                                | 61                            | 61 | 53                  | 53 | 53        | 53 | 0,0366                         | 0,0369                  | 0,0469                                              |
| 630                                                | 91                            | 91 | 53                  | 53 | 53        | 53 | 0,0283                         | 0,0286                  | 0,0367                                              |
| 800                                                | 91                            | 91 | 53                  | 53 | b         | b  | 0,0221                         | 0,0224                  | 0,0291                                              |
| 1200                                               | b                             | b  | b                   | b  | b         | b  | 0,0151                         | 0,0151                  | 0,0247                                              |
| 1400 <sup>a</sup>                                  | b                             | b  | b                   | b  | b         | b  | 0,0129                         | 0,0129                  | 0,0212                                              |
| 1600                                               | b                             | b  | b                   | b  | b         | b  | 0,0113                         | 0,0113                  | 0,0186                                              |
| 1800 <sup>a</sup>                                  | b                             | b  | b                   | b  | b         | b  | 0,0101                         | 0,0101                  | 0,0165                                              |
| 2000                                               | b                             | b  | b                   | b  | b         | b  | 0,009                          | 0,009                   | 0,0149                                              |
| 2500                                               | b                             | b  | b                   | b  | b         | b  | 0,0072                         | 0,0072                  | 0,0127                                              |

a) These sizes are non-preferred. Other non-preferred sizes are recognized for some specialized applications but are not within the scope of this TS EN 60228 standard.

b) The minimum number of wires for these sizes is not specified. These sizes may be constructed from 4, 5 or 6 equal segments (Milliken).

c) For stranded aluminium alloy conductors having the same nominal cross-sectional area as an aluminium conductor the resistance value should be agreed between the manufacturer and the purchaser.

## CONDUCTOR RESISTANCE VALUES ACCORDING TO VDE 0295 EN 60228/IEC 60228

| Conductor<br>Dimension                             | Power cables and wires |                  |                  |                  |                      |        | Welding cables    |              |
|----------------------------------------------------|------------------------|------------------|------------------|------------------|----------------------|--------|-------------------|--------------|
|                                                    | Copper Conductors      |                  |                  |                  | Aluminium Conductors |        | Copper Conductors |              |
|                                                    | Tinned wires           |                  | Bare wires       |                  | Bare wires           |        | Bare Wires        | Tinned Wires |
|                                                    | Class1<br>Class2       | Class5<br>Class6 | Class1<br>Class2 | Class5<br>Class6 | Class1               | Class2 |                   |              |
| Nominal<br>cross-sectional<br>area mm <sup>2</sup> | Ω/km                   | Ω/km             | Ω/km             | Ω/km             | Ω/km                 | Ω/km   | Ω/km              | Ω/km         |
| 0,05                                               | -                      | ~380             | -                | ~360             | -                    | -      | -                 | -            |
| 0,08                                               | -                      | ~240             | -                | ~230             | -                    | -      | -                 | -            |
| 0,09                                               | -                      | ~230             | -                | ~215             | -                    | -      | -                 | -            |
| 0,14                                               | -                      | ~140             | -                | ~138             | -                    | -      | -                 | -            |
| 0,20                                               | -                      | ~96,8            | -                | ~95              | -                    | -      | -                 | -            |
| 0,25                                               | -                      | ~79,3            | -                | ~78              | -                    | -      | -                 | -            |
| 0,34                                               | -                      | ~57,1            | -                | ~56              | -                    | -      | -                 | -            |
| 0,50                                               | 36,70                  | 40,10            | 36,00            | 39,00            | -                    | -      | -                 | -            |
| 0,75                                               | 24,80                  | 26,70            | 24,50            | 26,00            | -                    | -      | -                 | -            |
| 1                                                  | 18,20                  | 20,00            | 18,10            | 19,50            | -                    | -      | -                 | -            |
| 1,50                                               | 12,20                  | 13,70            | 12,10            | 13,30            | -                    | -      | -                 | -            |
| 2,50                                               | 7,56                   | 8,21             | 7,41             | 7,98             | -                    | -      | -                 | -            |
| 4                                                  | 4,70                   | 5,09             | 4,61             | 4,95             | -                    | -      | -                 | -            |
| 6                                                  | 3,11                   | 3,39             | 3,08             | 3,33             | -                    | -      | -                 | -            |
| 10                                                 | 1,84                   | 1,50             | 1,83             | 1,91             | -                    | -      | -                 | -            |
| 16                                                 | 1,16                   | 1,24             | 1,15             | 1,21             | -                    | 1,910  | 1,160             | 1,190        |
| 25                                                 | 0,734                  | 0,795            | 0,727            | 0,780            | 1,200                | 1,200  | 0,758             | 0,780        |
| 35                                                 | 0,529                  | 0,565            | 0,524            | 0,554            | 0,868                | 0,868  | 0,536             | 0,552        |
| 50                                                 | 0,391                  | 0,393            | 0,387            | 0,386            | 0,641                | 0,641  | 0,379             | 0,391        |
| 70                                                 | 0,270                  | 0,277            | 0,268            | 0,272            | 0,443                | 0,443  | 0,268             | 0,276        |
| 95                                                 | 0,195                  | 0,210            | 0,193            | 0,206            | 0,320                | 0,320  | 0,198             | 0,204        |
| 120                                                | 0,154                  | 0,164            | 0,153            | 0,161            | 0,253                | 0,253  | 0,155             | 0,159        |
| 150                                                | 0,126                  | 0,132            | 0,124            | 0,129            | 0,206                | 0,206  | 0,125             | 0,129        |
| 185                                                | 0,1260                 | 0,108            | 0,0991           | 0,106            | 0,164                | 0,164  | 0,102             | 0,105        |
| 240                                                | 0,0762                 | 0,0817           | 0,0754           | 0,0801           | 0,125                | 0,125  | -                 | -            |
| 300                                                | 0,0607                 | 0,0654           | 0,0601           | 0,0641           | 0,100                | 0,100  | -                 | -            |
| 400                                                | 0,0475                 | 0,0495           | 0,0470           | 0,0486           | -                    | 0,0778 | -                 | -            |
| 500                                                | 0,0369                 | 0,0391           | 0,0366           | 0,0384           | -                    | 0,0605 | -                 | -            |
| 630                                                | 0,0286                 | 0,0292           | 0,0283           | 0,0287           | -                    | 0,0469 | -                 | -            |

## CURRENT CARRYING CAPACITY OF FLEXIBLE CABLES

| Nominal<br>Cross<br>Section | GROUP 1<br>One or more single-core cables<br>installed in conduit |                              |      | GROUP 2<br>Multi-core cables e.g. plastic<br>sheathed cables, Building<br>cable, mobile cables |      | GROUP 3<br>Single-core cables freely installed in air, hereby the<br>cables are installed with in intermediate spaces of the<br>cable diameter as a minimum, as well as single-core<br>wiring in switching and distribution systems |      |
|-----------------------------|-------------------------------------------------------------------|------------------------------|------|------------------------------------------------------------------------------------------------|------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|
|                             | MEASURE<br>mm <sup>2</sup>                                        | CURRENT CARRYING<br>CAPACITY | FUSE | CURRENT CARRYING<br>CAPACITY                                                                   | FUSE | CURRENT CARRYING<br>CAPACITY                                                                                                                                                                                                        | FUSE |
|                             |                                                                   | A                            | A    | A                                                                                              | A    | A                                                                                                                                                                                                                                   | A    |
|                             |                                                                   |                              |      |                                                                                                |      |                                                                                                                                                                                                                                     |      |
| 0,08                        |                                                                   | 2,5                          | -    | 0,5                                                                                            | -    | -                                                                                                                                                                                                                                   | -    |
| 0,14                        |                                                                   | 6                            | -    | 1,5                                                                                            | -    | 6                                                                                                                                                                                                                                   | -    |
| 0,25                        |                                                                   | 8,5                          | -    | 2,5                                                                                            | -    | 8,5                                                                                                                                                                                                                                 | -    |
| 0,34                        |                                                                   | 9                            | -    | 3,5                                                                                            | -    | 10                                                                                                                                                                                                                                  | -    |
| 0,5                         |                                                                   | 10                           | -    | 5                                                                                              | -    | 12                                                                                                                                                                                                                                  | -    |
| 0,75                        |                                                                   | 11                           | -    | 13                                                                                             | 10   | 16                                                                                                                                                                                                                                  | 16   |
| 1                           |                                                                   | 12                           | 10   | 16                                                                                             | 16   | 20                                                                                                                                                                                                                                  | 20   |
| 1,5                         |                                                                   | 16                           | 16   | 20                                                                                             | 20   | 25                                                                                                                                                                                                                                  | 25   |
| 2,5                         |                                                                   | 21                           | 20   | 27                                                                                             | 25   | 34                                                                                                                                                                                                                                  | 35   |
| 4                           |                                                                   | 27                           | 25   | 36                                                                                             | 35   | 45                                                                                                                                                                                                                                  | 50   |
| 6                           |                                                                   | 35                           | 35   | 47                                                                                             | 50   | 57                                                                                                                                                                                                                                  | 63   |
| 10                          |                                                                   | 48                           | 50   | 65                                                                                             | 63   | 78                                                                                                                                                                                                                                  | 80   |
| 16                          |                                                                   | 65                           | 63   | 87                                                                                             | 80   | 104                                                                                                                                                                                                                                 | 100  |
| 25                          |                                                                   | 88                           | 80   | 115                                                                                            | 100  | 137                                                                                                                                                                                                                                 | 125  |
| 35                          |                                                                   | 110                          | 100  | 143                                                                                            | 125  | 168                                                                                                                                                                                                                                 | 160  |
| 50                          |                                                                   | 140                          | 125  | 178                                                                                            | 160  | 210                                                                                                                                                                                                                                 | 200  |
| 70                          |                                                                   | 175                          | 160  | 220                                                                                            | 224  | 260                                                                                                                                                                                                                                 | 250  |
| 95                          |                                                                   | 210                          | 200  | 265                                                                                            | 250  | 310                                                                                                                                                                                                                                 | 310  |
| 120                         |                                                                   | 250                          | 250  | 310                                                                                            | 300  | 365                                                                                                                                                                                                                                 | 355  |
| 150                         |                                                                   | -                            | -    | 355                                                                                            | 355  | 415                                                                                                                                                                                                                                 | 425  |
| 185                         |                                                                   | -                            | -    | 405                                                                                            | 355  | 475                                                                                                                                                                                                                                 | 425  |
| 240                         |                                                                   | -                            | -    | 480                                                                                            | 425  | 560                                                                                                                                                                                                                                 | 500  |
| 300                         |                                                                   | -                            | -    | 555                                                                                            | 500  | 645                                                                                                                                                                                                                                 | 600  |
| 400                         |                                                                   | -                            | -    | -                                                                                              | -    | 770                                                                                                                                                                                                                                 | 630  |
| 500                         |                                                                   | -                            | -    | -                                                                                              | -    | 890                                                                                                                                                                                                                                 | 850  |

# LOGISTICS

Erse Kablo carries out its logistics operations in accordance with modern and quality service approach with state-of-art technology packaging, winding and cutting machines in its 5.000 m<sup>2</sup> warehouse in its manufacturing facilities in Silivri/İstanbul.

Professional stock management is coordinated with technological shelf systems, special addressing and barcode-integrated software in Erse Logistics Center.

Erse logistics team conducts the implementation and control processes of storage, transportation, customs clearance and insurance operations for products, services and information from the procurement of raw materials to the delivery to the end user in accordance with the customer needs.

According to the integrated logistics system, Erse Logistics Center is managed with an integrated approach in order to minimize the overall cost of all incoming and outgoing logistics operations, improve coordination and increase quality and productivity.

Erse aims to offer solution-oriented and fast services that comply with the manufacturing plans and add value to business partners in logistics activities. Manufactured cables are packed and shipped upon customer demands in accordance with the national and international standards and the shipping conditions.

Erse manages its logistics activities by taking into consideration of customer satisfaction like in all other organizations and organizes its shipments with quality service approach.



## OUR PACKAGE TYPES



Wooden drums



Plywood drums



Plastic drums



Coils with shrink



Cardboard box



Pallet



Euro Pallet



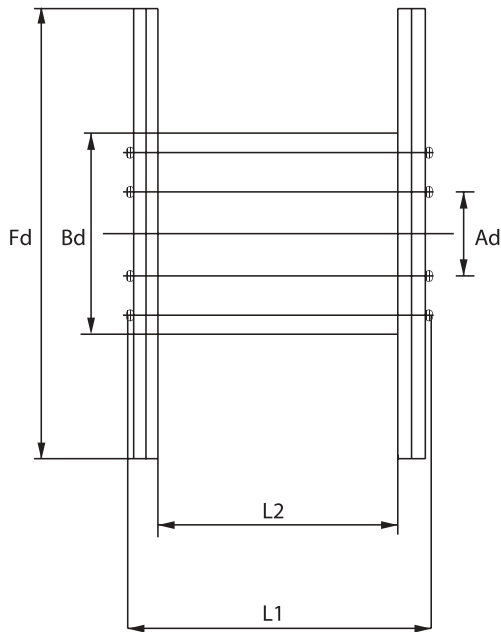
**Heat Treatment Assurance:** Only heat treated drums and pallets are used in our export products.



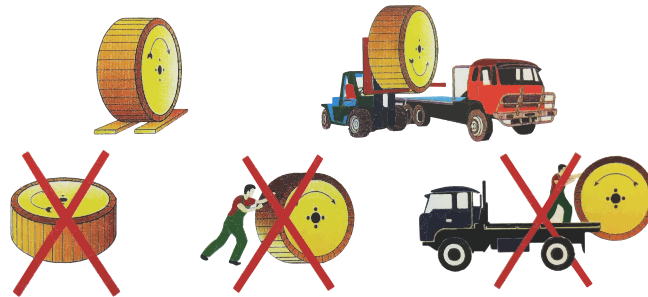
**Incoterms:** The shipping is made in accordance with Incoterms rules within the framework of mutual understanding with our customers.

## WOODEN DRUMS (STANDARD)

| DRUM CODE<br>NUMBER | Fd<br>mm | Bd<br>mm | Ad<br>mm | L1<br>mm | L2<br>mm | MAXIMUM<br>CARRYING<br>CAPACITY<br>kg | DRUM WEIGHT<br>kg |
|---------------------|----------|----------|----------|----------|----------|---------------------------------------|-------------------|
| MD-40               | 400      | 200      | 40       | 310      | 250      | 100                                   | 3                 |
| MD-50               | 500      | 250      | 45       | 350      | 290      | 150                                   | 4                 |
| MD-60               | 600      | 300      | 50       | 350      | 300      | 200                                   | 5                 |
| 60                  | 630      | 315      | 56       | 415      | 315      | 250                                   | 17                |
| 70                  | 710      | 355      | 80       | 520      | 400      | 250                                   | 25                |
| 80                  | 800      | 400      | 80       | 520      | 400      | 400                                   | 31                |
| 90                  | 900      | 450      | 80       | 690      | 560      | 750                                   | 47                |
| 100                 | 1000     | 500      | 80       | 710      | 560      | 900                                   | 71                |
| 120                 | 1250     | 630      | 80       | 890      | 670      | 1700                                  | 144               |
| 140                 | 1400     | 710      | 80       | 890      | 670      | 2000                                  | 175               |
| 160                 | 1600     | 800      | 80       | 1100     | 850      | 3000                                  | 280               |
| 180                 | 1800     | 1000     | 100      | 1100     | 840      | 4000                                  | 380               |
| 200                 | 2000     | 1250     | 100      | 1350     | 1045     | 5000                                  | 550               |



**Fd:** Flange Diameter  
**Ad:** Arbor Hole Diameter  
**Bd:** Barrel Diameter  
**L1:** Overall Winding Width  
**L2:** Inner Winding Width



## MAX. CARRYING CAPACITANCE OF DRUMS DEPEND ON OUTER DIAMETER OF CABLES

| CABLE<br>D<br>mm | MD<br>40 | MD<br>50 | MD<br>60 | 60   | 70   | 80   | 90   | 100  | 120  | 140  | 160  | 180  | 200  |
|------------------|----------|----------|----------|------|------|------|------|------|------|------|------|------|------|
| 6                | 420      | 735      | 1070     | 1110 | 2024 | 2755 |      |      |      |      |      |      |      |
| 7                | 310      | 540      | 780      | 840  | 1480 | 2340 | 2730 |      |      |      |      |      |      |
| 8                | 235      | 430      | 590      | 640  | 1064 | 1463 |      |      |      |      |      |      |      |
| 9                | 185      | 335      | 465      | 470  | 890  | 1152 | 2202 | 2866 |      |      |      |      |      |
| 10               | 150      | 270      | 385      | 388  | 680  | 980  | 1768 | 2349 |      |      |      |      |      |
| 11               | 14       | 230      | 330      | 315  | 564  | 760  | 1404 | 1910 |      |      |      |      |      |
| 12               |          | 195      | 270      | 254  | 470  | 643  | 1206 | 1540 | 2727 |      |      |      |      |
| 13               | 100      | 165      | 235      | 238  | 385  | 542  | 1032 | 1339 | 2265 | 2967 |      |      |      |
| 14               |          | 140      | 210      | 190  | 360  | 454  | 880  | 1159 |      |      |      |      |      |
| 15               |          |          | 185      | 180  | 300  | 430  | 749  | 1000 | 1990 | 2480 |      |      |      |
| 16               |          | 130      | 160      | 140  | 239  | 358  | 632  | 860  | 1756 | 2205 |      |      |      |
| 17               |          | 115      | 145      | 134  | 228  | 294  | 603  | 736  | 1545 | 1960 |      |      |      |
| 18               |          |          |          | 102  | 218  | 280  | 505  | 705  | 1355 | 1737 | 2227 |      |      |
| 19               |          |          | 130      | 96   | 172  | 228  | 485  | 599  | 1184 | 1535 | 2435 | 2830 |      |
| 20               |          |          | 120      | 92   | 165  | 220  | 402  | 576  | 1139 | 1352 |      |      |      |
| 21               |          |          |          | 90   | 159  | 210  | 387  | 485  | 990  | 1304 | 2172 | 2527 |      |
| 22               |          |          |          | 65   | 122  | 167  | 315  | 468  | 856  | 1145 | 1930 | 2248 | 2954 |
| 23               |          |          |          | 62   | 117  | 160  | 304  | 389  | 827  | 999  | 1870 | 2172 |      |
| 24               |          |          |          | 60   | 113  | 156  | 294  | 377  | 709  | 967  | 1657 | 1927 | 2608 |
| 25               |          |          |          | 58   | 110  | 150  | 285  | 365  | 688  | 839  | 1608 | 1867 | 2522 |
| 26               |          |          |          | 56   | 80   | 116  | 226  | 299  | 668  | 814  | 1420 | 1650 | 2218 |
| 27               |          |          |          |      | 78   | 113  | 220  | 290  | 567  | 700  | 1244 | 1450 | 2150 |
| 28               |          |          |          |      | 76   | 109  | 215  | 282  | 550  | 680  | 1210 | 1410 | 1880 |
| 29               |          |          |          |      | 73   | 106  | 209  | 226  | 462  | 663  | 1180 | 1370 | 1826 |
| 30               |          |          |          |      |      | 103  | 162  | 220  | 450  | 564  | 1028 | 1200 | 1583 |
| 31               |          |          |          |      | 70   | 76   | 157  | 214  | 438  | 550  | 1003 | 1166 | 1540 |
| 32               |          |          |          |      |      | 74   | 153  | 209  | 428  | 537  | 866  | 1009 | 1500 |
| 33               |          |          |          |      |      |      | 150  | 204  | 352  | 450  | 846  | 985  | 1289 |
| 34               |          |          |          |      |      | 72   | 146  | 158  | 344  | 440  | 828  | 962  | 1257 |
| 35               |          |          |          |      |      |      | 108  | 154  | 336  | 430  | 710  | 824  | 1227 |
| 36               |          |          |          |      |      |      |      | 150  | 329  | 422  | 692  | 806  | 1040 |
| 37               |          |          |          |      |      |      | 105  | 148  | 265  | 348  | 678  | 788  | 1017 |
| 38               |          |          |          |      |      |      | 103  | 144  | 259  | 340  | 664  | 722  | 994  |
| 39               |          |          |          |      |      |      |      | 110  | 254  | 334  | 560  | 653  | 972  |
| 40               |          |          |          |      |      |      |      | 105  | 249  | 327  | 549  | 640  | 812  |
| 41               |          |          |          |      |      |      |      | 102  | 244  | 264  | 539  | 627  | 795  |
| 42               |          |          |          |      |      |      |      |      | 190  | 259  | 529  | 615  | 779  |
| 43               |          |          |          |      |      |      |      |      | 10   | 187  | 254  | 437  | 763  |
| 44               |          |          |          |      |      |      |      |      |      | 183  | 249  | 430  | 750  |
| 45               |          |          |          |      |      |      |      |      |      | 180  | 254  | 422  | 610  |
| 46               |          |          |          |      |      |      |      |      |      | 177  | 240  | 415  | 600  |
| 47               |          |          |          |      |      |      |      |      |      | 174  | 187  | 408  | 589  |
| 48               |          |          |          |      |      |      |      |      |      | 130  | 184  | 330  | 578  |
| 49               |          |          |          |      |      |      |      |      |      | 127  | 180  | 325  | 568  |
| 50               |          |          |          |      |      |      |      |      |      | 125  | 178  | 319  | 558  |
| 51               |          |          |          |      |      |      |      |      |      | 123  | 175  | 314  | 442  |
| 52               |          |          |          |      |      |      |      |      |      | 120  | 172  | 310  | 435  |
| 53               |          |          |          |      |      |      |      |      |      |      | 170  | 305  | 428  |
| 54               |          |          |          |      |      |      |      |      |      |      | 126  | 230  | 420  |
| 55               |          |          |          |      |      |      |      |      |      |      | 124  | 235  | 414  |
| 56               |          |          |          |      |      |      |      |      |      |      | 122  | 232  | 408  |
| 57               |          |          |          |      |      |      |      |      |      |      | 121  | 228  | 400  |
| 58               |          |          |          |      |      |      |      |      |      |      | 119  | 225  | 304  |
| 59               |          |          |          |      |      |      |      |      |      |      | 117  | 222  | 300  |
| 60               |          |          |          |      |      |      |      |      |      |      |      | 220  | 295  |
| 61               |          |          |          |      |      |      |      |      |      |      |      | 216  | 290  |
| 62               |          |          |          |      |      |      |      |      |      |      |      | 160  | 287  |
| 63               |          |          |          |      |      |      |      |      |      |      |      | 158  | 282  |
| 64               |          |          |          |      |      |      |      |      |      |      |      | 156  | 280  |
| 65               |          |          |          |      |      |      |      |      |      |      |      | 154  | 275  |
| 66               |          |          |          |      |      |      |      |      |      |      |      | 152  | 270  |
| 67               |          |          |          |      |      |      |      |      |      |      |      | 150  | 266  |
| 68               |          |          |          |      |      |      |      |      |      |      |      | 174  | 264  |

## D.C VOLTAGE DROPS

$$V \text{ drop} = 2 \times I \times L \times R$$

$I$  = Face Current (A)  
 $L$  = Length (km)  
 $R$  = Maximum conductor temperature, the resistance value of the expected ( $\Omega/\text{km}$ )  
 $X$  = Reactance ( $\Omega/\text{km}$ )  
 $\cos \phi$  = Power Factor  
 $f$  = Frequency(Hz)  
 $Z$  = Impedance ( $\Omega/\text{km}$ )

## A.C SINGLE PHASE VOLTAGE

$$V \text{ drop} = 2 \times I \times L (R \cos \phi + X \sin \phi)$$

$d$  = Conductor Diameter (mm)  
 $L$  = Conductor Length (m)

## A.C THREE PHASE VOLTAGE

$$V \text{ drop} = \sqrt{3} \times I \times L \times (R \cos \phi + X \sin \phi)$$

### REACTANCE:

$$x = 2 \times \pi \times f \times L \times l$$

### INDUCTANCE:

$$L = 0,2 \times \left[ \ln \left( \frac{2a}{d} \right) + 0,25 \right] 10^6$$

### IMPEDANCE:

$$Z = \sqrt{R^2 + X^2}$$

## POWER CONVERSION FACTOR

$$\sin \phi = \sqrt{1 - \cos^2 \phi}$$

NOTE: Calculations Power Factor ( $\cos \phi$ ) 0.8 Surface Current ( $I$ ) 1 A and Length ( $L$ ) is taken as 1 km.

## ELECTRICAL CALCULATIONS AND FORMULAS

### SHORT CIRCUIT CURRENT

0,6 / 1 kV + 90 °C ship type cables short-circuit current formula.

**GENERAL FORMULA:** 
$$I_k = 226 \frac{S}{\sqrt{t}} \sqrt{\ln \frac{234 + T_k}{234 + T_b}}$$

$I_k$  = Short-circuit current (kA)  
 $S$  = Cross section (mm<sup>2</sup>)  
 $T$  = Short circuit time (sec)  
 $T_k$  = The expected maximum conductor temperature (short time)(°C)  
 $T_b$  = Maximum conductor temperature is expected (normal conditions) (°C)

### FORMULA 1 :

XLPE and the HF90 standards for materials temperature  $T_k$  &  $T_b$  = 90 °C to 250 °C, respectively. These values are placed instead of the formula, the general formula for XLPE and HF90 materials;

$$I_k = 146 \frac{S}{\sqrt{t}}$$

### FORMULA 2 :

The standards for PVC materials temperature  $T_k$  &  $T_b$  = 70 °C to 150 °C, respectively. PVC materials of general formula wherein the values for the orthogonality;

$$I_k = 31,66 \frac{S}{\sqrt{t}}$$

## MAX. CARRYING DISTANCE OF VARIOUS POWER IN DETERMINED VOLTAGE DROP ACCORDING TO CABLE CROSS SECTION (3-380 V THREE PHASES)

| Power Current<br>Power |     |       | CROSS SECTION mm² |     |     |     |      |      |      |      |      |     |     |     |     |     |     |
|------------------------|-----|-------|-------------------|-----|-----|-----|------|------|------|------|------|-----|-----|-----|-----|-----|-----|
| kW                     | A   | Cos Ø | 1,5               | 2,5 | 4   | 6   | 10   | 16   | 25   | 35   | 50   | 70  | 95  | 120 | 150 | 185 | 240 |
| 2,5                    | 5   | 0.82  | 240               | 400 | 640 |     |      |      |      |      |      |     |     |     |     |     |     |
| 3                      | 6   |       | 200               | 330 | 535 | 800 |      |      |      |      |      |     |     |     |     |     |     |
| 3,5                    | 7   |       | 170               | 285 | 455 | 685 |      |      |      |      |      |     |     |     |     |     |     |
| 4                      | 8   |       | 150               | 250 | 400 | 600 | 1000 |      |      |      |      |     |     |     |     |     |     |
| 4,5                    | 9   |       | 135               | 223 | 353 | 530 | 890  |      |      |      |      |     |     |     |     |     |     |
| 5                      | 10  |       | 120               | 200 | 320 | 480 | 800  |      |      |      |      |     |     |     |     |     |     |
| 6                      | 12  |       | 100               | 166 | 265 | 400 | 670  | 1070 |      |      |      |     |     |     |     |     |     |
| 7                      | 14  |       | 85                | 142 | 225 | 340 | 570  | 920  |      |      |      |     |     |     |     |     |     |
| 8                      | 16  |       | 75                | 125 | 200 | 300 | 500  | 800  |      |      |      |     |     |     |     |     |     |
| 9                      | 18  |       | 66                | 110 | 175 | 265 | 445  | 725  | 1120 |      |      |     |     |     |     |     |     |
| 10                     | 19  | 0.85  |                   | 100 | 160 | 240 | 400  | 640  | 1000 |      |      |     |     |     |     |     |     |
| 12                     | 23  |       |                   | 82  | 133 | 200 | 335  | 535  | 835  | 1170 |      |     |     |     |     |     |     |
| 14                     | 27  |       |                   | 75  | 113 | 170 | 285  | 460  | 720  | 1050 |      |     |     |     |     |     |     |
| 16                     | 31  |       |                   |     | 100 | 150 | 250  | 400  | 630  | 880  |      |     |     |     |     |     |     |
| 18                     | 35  |       |                   |     | 88  | 130 | 220  | 355  | 560  | 780  |      |     |     |     |     |     |     |
| 20                     | 37  |       |                   |     |     | 120 | 200  | 320  | 500  | 700  | 1000 |     |     |     |     |     |     |
| 25                     | 46  |       |                   |     |     | 95  | 160  | 255  | 400  | 560  | 800  |     |     |     |     |     |     |
| 30                     | 55  |       |                   |     |     |     | 130  | 215  | 335  | 470  | 670  |     |     |     |     |     |     |
| 35                     | 65  |       |                   |     |     |     | 115  | 189  | 285  | 400  | 570  | 805 |     |     |     |     |     |
| 40                     | 72  |       |                   |     |     |     | 100  | 160  | 250  | 350  | 500  | 705 |     |     |     |     |     |
| 45                     | 83  |       |                   |     |     |     |      | 140  | 220  | 310  | 445  | 625 | 850 |     |     |     |     |
| 50                     | 93  |       |                   |     |     |     |      |      | 200  | 280  | 400  | 560 | 770 |     |     |     |     |
| 60                     | 107 |       |                   |     |     |     |      |      | 160  | 220  | 335  | 470 | 635 | 800 |     |     |     |
| 70                     | 125 |       |                   |     |     |     |      |      |      |      | 285  | 400 | 550 | 690 |     |     |     |
| 80                     | 143 |       |                   |     |     |     |      |      |      |      | 250  | 350 | 480 | 600 | 755 |     |     |
| 90                     | 160 |       |                   |     |     |     |      |      |      |      | 220  | 310 | 425 | 535 | 670 |     |     |
| 100                    | 180 |       |                   |     |     |     |      |      |      |      | 200  | 280 | 380 | 480 | 600 | 740 |     |
| 110                    | 197 | 0.85  |                   |     |     |     |      |      |      |      |      | 255 | 340 | 440 | 550 | 675 |     |
| 130                    | 232 |       |                   |     |     |     |      |      |      |      |      | 228 | 290 | 370 | 465 | 570 |     |
| 150                    | 268 |       |                   |     |     |     |      |      |      |      |      |     | 250 | 320 | 400 | 495 | 640 |
| 180                    | 320 |       |                   |     |     |     |      |      |      |      |      |     |     | 265 | 335 | 410 | 535 |
| 200                    | 350 |       |                   |     |     |     |      |      |      |      |      |     |     |     | 300 | 370 | 480 |
| 250                    | 405 |       |                   |     |     |     |      |      |      |      |      |     |     |     |     | 295 | 385 |
| 300                    | 500 |       |                   |     |     |     |      |      |      |      |      |     |     |     |     |     | 310 |

## MAX. CARRYING DISTANCE OF VARIOUS POWER IN DETERMINED VOLTAGE DROP ACCORDING TO CABLE CROSS SECTION (U-220 V SINGLE PHASE)

| Power<br>kW | Current<br>Power<br>A | Cross Section mm <sup>2</sup> |     |    |    |    |    |     |     |
|-------------|-----------------------|-------------------------------|-----|----|----|----|----|-----|-----|
|             |                       | 1,5                           | 2,5 | 4  | 6  | 10 | 16 | 25  | 35  |
| 2           | 9                     | 30                            | 50  |    |    |    |    |     |     |
| 2.5         | 11                    | 24                            | 40  |    |    |    |    |     |     |
| 3           | 14                    | 20                            | 33  | 54 |    |    |    |     |     |
| 3.5         | 16                    | 17                            | 29  | 49 | 69 |    |    |     |     |
| 4           | 18                    | 15                            | 25  | 40 | 60 |    |    |     |     |
| 4.5         | 21                    | 13                            | 22  | 35 | 53 |    |    |     |     |
| 5           | 23                    | 12                            | 20  | 32 | 48 | 80 |    |     |     |
| 6           | 27                    |                               | 16  | 26 | 40 | 67 |    |     |     |
| 7           | 32                    |                               | 15  | 23 | 34 | 57 | 92 |     |     |
| 8           | 36                    |                               | 13  | 20 | 30 | 50 | 80 |     |     |
| 9           | 41                    |                               |     | 17 | 26 | 45 | 72 |     |     |
| 10          | 46                    |                               |     | 16 | 24 | 40 | 64 | 100 |     |
| 12          | 55                    |                               |     |    | 20 | 38 | 54 | 83  |     |
| 14          | 64                    |                               |     |    | 17 | 28 | 46 | 71  | 100 |
| 16          | 72                    |                               |     |    |    | 25 | 40 | 62  | 88  |
| 18          | 82                    |                               |     |    |    | 23 | 35 | 55  | 78  |
| 20          | 91                    |                               |     |    |    |    | 32 | 50  | 70  |
| 25          | 114                   |                               |     |    |    |    | 26 | 40  | 56  |
| 30          | 136                   |                               |     |    |    |    |    | 33  | 47  |
| 40          | 180                   |                               |     |    |    |    |    |     | 36  |

VOLTAGE DROP: %AU = 3

## CONVERSION TABLES

| Length                    | cm.     | m.           | Km.           | Inch<br>(In) | Foot<br>(ft)   | Yard<br>(yd) | State<br>Mile | Naut<br>Mile  |              |            |
|---------------------------|---------|--------------|---------------|--------------|----------------|--------------|---------------|---------------|--------------|------------|
| 1 centimeter (cm)         | 1       | 0,01         | -             | 0,3937       | 0,0328         | -            | -             | -             |              |            |
| 1 meter (m)               | 100     | 1            | 0,001         | 39,37        | 3,281          | 1,094        | -             | -             |              |            |
| 1 kilometer (km)          | 105     | 1000         | 1             | 39370        | 3281           | 1094         | 0,6214        | 0,5396        |              |            |
| 1 Inch (in)               | 2,540   | 0,254        | -             | 1            | 0,833          | 0,0278       | -             | -             |              |            |
| 1 foot                    | 30,48   | 0,3048       | -             | 12           | 1              | 0,3333       | -             | -             |              |            |
| 1 yard                    | 91,44   | 0,9144       | -             | 36           | 3              | 1            | -             | -             |              |            |
| 1 state mile              | -       | 1069         | 1,609         | 63346        | 5280           | 1760         | 1             | 0,8684        |              |            |
| 1 naut mile               | -       | 1852         | 1,852         | 72913        | 6080           | 2027         | 1152          | -             |              |            |
| AREA                      | cm²     | m²           | a (Ar)        | ha           | km²            | in²          | ft²           | Yard²         | mil²         | Acre       |
| 1 square centimeter (cm²) | 1       | 0,0001       | -             | -            | -              | 0,155        | -             | -             | -            | -          |
| 1 square meter (m²)       | 1000    | 1            | 0,01          | -            | -              | 1550         | 10,76         | 1,196         | -            | -          |
| 1 Ar (a)                  | -       | 100          | 1             | 0,01         | -              | -            | 1076          | 119,6         | -            | 0,0247     |
| 1 hectare (ha)            | -       | 1000         | 100           | 1            | 0,01           | -            | -             | 0,0039        | 2,47         | -          |
| 1 square kilometer (km²)  | -       | -            | 1000          | 100          | 1              | -            | -             | -             | 0,3861       | 247,1      |
| 1 square inch             | 6,452   | -            | -             | -            | -              | 1            | -             | -             | -            | -          |
| 1 square foot (ft²)       | 929     | 0,0929       | -             | -            | -              | 144          | 1             | 0,111         | -            | -          |
| 1 square yard             | 8361    | 0,8361       | -             | -            | -              | 1296         | 9             | 1             | -            | -          |
| 1 square mile             | -       | -            | -             | 259          | 2,59           | -            | -             | -             | -            | 640        |
| 1 acre                    | -       | 4050         | 40,5          | 0,405        | -              | -            | 43640         | 4850          | 0,0016       | 1          |
| WEIGHT                    | gr.     | kg.          | Metric<br>ton | ounce        | Libre<br>pound | stone        | Short<br>ton  | Big<br>ton    |              |            |
| 1 gram (gr)               | 1       | 0.001        | -             | 0,0332       | -              | -            | -             | -             |              |            |
| 1 kilogram (kg)           | 1000    | 1            | 0,001         | 35,27        | 2,205          | 0,157        | 0,0011        | 0,00098       |              |            |
| 1 tone (metric)           | -       | 1000         | 1             | 35274        | 2204,6         | 157,47       | 1,1023        | 0,9842        |              |            |
| 1 ounce (oz)              | 28,35   | 0,028        | -             | 1            | 0,0625         | 0,004        | -             | -             |              |            |
| 1 libre (lb.)             | 453,6   | 0,454        | -             | 16           | 1              | 0,071        | -             | -             |              |            |
| 1 stone                   | 6530    | 6,35         | 0,0064        | 224          | 14             | 1            | 0,007         | 0,0063        |              |            |
| 1 small tone              | 907,190 | 907,2        | 0,907         | 32000        | 2000           | 142,9        | 1             | 0,8929        |              |            |
| 1 big tone                | 1106050 | 1016         | 1,016         | 35,840       | 2240           | 160          | 1,120         | 1             |              |            |
| VOLUME                    | cm³     | dm³<br>liter | in³           | ft³          | Yard³          | UK<br>ounce  | USA<br>ounce  | USA<br>gallon | UK<br>gallon | UK<br>pint |
| 1 cubic centimeter (cm³)  | 1       | 0,001        | 0,061         | -            | -              | 0,038        | 0,353         | -             | -            | -          |
| 1 cubic decimeter (dm³)   | 1000    | 1            | 61,02         | 0,035        | -              | 33,81        | 35,3          | 0,2462        | 0,22         | 1,76       |
| 1 cubic inch (in³)        | 16,39   | 0,0164       | 1             | -            | -              | 0,5541       | 0,5768        | -             | -            | 0,0288     |
| 1 cubic foot ft³          | -       | 28,32        | 1728          | 1            | 0,0370         | 957,5        | 966,6         | 7,481         | 6,232        | 49,83      |
| 1 cubic yard              | -       | 764,6        | 46656         | 27           | 1              | 25853        | 26,909        | 202           | 168,2        | 1345       |
| 1 ounce (USA)             | 29,57   | 0,02296      | 1,805         | -            | -              | 1            | 1,041         | -             | -            | 0,0520     |
| 1 ounce (UK)              | 28,41   | 0,0284       | 1,734         | -            | -              | 0,9607       | 1             | -             | -            | 0,05       |
| 1 galon (USA)             | 3785    | 3,785        | 231           | 0,1337       | -              | 128          | 133,2         | 1             | 0,8327       | 6,662      |
| 1 galon (UK)              | 4546    | 4,546        | 277,4         | 0,1603       | -              | 153,7        | 160           | 1,201         | 1            | 8          |
| 1 pint (UK)               | 568,2   | 0,5682       | 34,68         | 0,02         | -              | 19,21        | 20            | 0,1501        | 0,125        | 1          |

## ABBREVIATIONS OF STANDARDS ASSOCIATED ACCORDING TO COUNTRIES

| SHORT NAME | EXPANSION                                                 | COUNTRY | SHORT NAME | EXPANSION                                        | COUNTRY     |
|------------|-----------------------------------------------------------|---------|------------|--------------------------------------------------|-------------|
| AFNOR      | Association Française De Normalisation                    | France  | IEEE       | Institute Of Electrical And Electronic Engineers | Uk          |
| ANSI       | American National Standards Institute                     | Usa     | IMQ        | Istituto Italiano Del Marchio Di Qualità         | Italy       |
| ASTM       | American Standard of Testing Materials                    | Usa     | ISDN       | Integrated Services Digital Network              | Int.        |
| BASEC      | British Approvals Service For Electric Cables             | Uk      | ISO        | International Standard Organisation              | Global      |
| BSI(BS)    | British Standard Institution                              | Uk      | KEMA       | Keuring van Electrotechnische Materialen         | Netherlands |
| BV         | Bureau Veritas                                            | France  | LCIE       | Laboratoire Central des Industries Electriques   | France      |
| CATV       | Community Antenna Television                              | Int.    | LLOYDS     | Lloyds Register Of Shipping                      | Uk          |
| CEBEC      | Comite Electrotechnique Belge                             | Belgium | LPC        | Loss Prevention Council                          | Uk          |
| CEE        | Commission on Rules for the approval Electrical Equipment | Int.    | MESC       | Material And Equipment Standards and Code        | Netherlands |
| CEI        | Comitato Electrotecnico Belge Italiano                    | Italy   | MIL        | United States Military Specification             | Usa         |
| CEN        | European Committee For Standardisation                    | Ecc     | NEC        | National Electrical Code                         | Usa         |
| CENELEC    | Comite Europeen De Normalisation Electrotechnique         | Ecc     | NEN        | Nederlands Normalisatie-Instituut                | Netherlands |
| CNET       | Centre National d'etude de Telecommunication              | France  | NF         | Normes Françaises                                | France      |
| CNOMO      | Comite de Normalisation des Moyens de Production          | France  | NFC        | Normes Françaises Class C                        | France      |
| CMA        | Cable Makers Association                                  | Uk      | NEMA       | National Electrical Manufacturer Association     | Usa         |
| CSA        | Canadian Standards Association                            | Canada  | NEMKO      | Norske Elektriske Materielle Kontroll            | Norway      |
| CSTB       | Centre Scientifique et Technique du Bâtiment              | France  | NP         | Portuguese Da Qualidade                          | Portugal    |
| DEMKO      | Denmarks Elektriske Materielle Kontroll                   | Den.    | NSAI       | National Standards Authority of Ireland          | Ireland     |
| DIN        | Deutsches Institut Für Normung                            | Den.    | OCMA       | Oil Companies Materials Association              | Uk          |
| DKE        | Deutsche Elektrotechnische Kommission im DIN und VDE      | Ger.    | ÖVE        | Österreichischer Verband für Elektrotechnik      | Austria     |
| ECMC       | Electric Cable Makers Confederation                       | Uk      | SEMKO      | Svenska Elektriska Materielle Kontrollanstalten  | Sweden      |
| ELOT       | Hellenic Organisation For Standardisation                 | Uk      | SETI       | Elektriska Inspektoratet                         | Finland     |
| EIC        | Energy Industries Council                                 | Greece  | SEV        | Schweizerischer Elektrotechnischer Verein        | Switzerland |
| EN         | European Standards                                        | Ger.    | SNV        | Schweizerischer Normenverband                    | Switzerland |
| ERA        | Electrical Research Association                           | Ger.    | TSE        | Turkish Standard Institute                       | Turkey      |
| ESI        | Electrical Supply Industry                                | Uk      | UKOOA      | Uk Offshore Operators Association                | Uk          |
| FAR        | Federal Air Regulation                                    | Usa     | UL         | Underwriters Laboratories                        | Usa         |
| FTZ        | Federated Technisches Zentralamt                          | Ger.    | UNEL       | Unificazione Elettrotecnica                      | Italy       |
| GOST       | USSR-Standards                                            | Ussr    | UNI        | Unificazione Nazionale Italiano                  | Italy       |
| HD         | Harmonisierungs-Dokumente                                 | Int.    | USE        | Union Technique dell'elettrotecnica(UTE)         | France      |
| HN         | Harmonization des Normes                                  | France  | VDE        | Verband Deutscher Elektrotechniker               | Ger.        |
| ICEA       | Insulated Cable Engineers Association                     | Usa     | VDEW       | Vereinigung Deutscher Elektrizitätswerke e.V.    | Ger.        |
| IEC        | International Electrotechnical Commission                 | Europe  | ZVEH       | Zentralverband der Deutschen Elektrohandwerke    | Ger.        |
| IEE        | Institute Of Electrical Engineers                         | Uk      | ZVEI       | Zentralverband der Elektrotechnik-und Electronic | Ger.        |





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