# LOW VOLTAGE POWER CABLE XPLE, PVC, LSHF


prysmian

The planet's pathways

# Connecting people and businesses everywhere

**150**
Years of Experience

**+50**
Countries

**33k**
Employees

**+15B**
Sales in Euros

## Sustainability-driven innovation to lead the energy transition and digital transformation

With a legacy spanning over 150 years, Prysmian is a global leader in energy and telecom cable solutions, driving innovation and sustainability. In 2023, we achieved over €15 billion in sales, supported by our 33,000 employees, 82 manufacturing plants, and operations in more than 50 countries worldwide.

We offer the broadest range of cutting-edge products, services, and technologies tailored to meet the evolving needs of our customers. From enabling the energy transition with our pioneering E-Path sustainable cable solution, to supporting critical telecom infrastructure, Prysmian plays a pivotal role in building resilient and efficient systems across the globe.

Our commitment to work closely with our customers ensures that we deliver solutions to help them expand energy and telecom networks, achieving sustainable, profitable growth while addressing the challenges of a rapidly changing world. Together, we're shaping the future of connectivity and electrification.




# Our world-leading cable solutions

### Transmission

- Submarine power and telecom systems
- Marine installation through inhouse fleet
- Underground interconnectors up to 525kV DC
- Complete solutions provider:
  - Turn-key execution approach
  - Continuous monitoring
  - Post-installation maintenance

### Power Grid

- HV/EHV AC systems supply and installation
- MV and HV/EHV Network Components (NWC) up to 500kV
- Power Distribution cables' solutions from LV to MV (and up to 69kV)
- Data-driven permanent monitoring systems for power networks

### Electrification

- Renewables
- Specialties & OEM
  - (Railway, Marine, Crane, Mining, Nuclear, Rolling Stock, Defence, Electro medical, other infrastructure)
- Data Centres
- Energy Storage Systems
- OGP Onshore/Offshore & SURF
- Elevators
- Other Industrial
- Residential, Hospitals & Commercial constructions

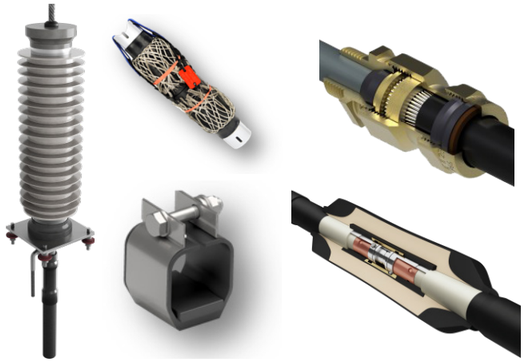
### Digital Solutions

- Commercial Buildings
  - Passive Optical Cabling
  - Structured Cabling System
  - Building Management
- Data Centre
- Mission Critical and Harsh Environment
- Broadcast and Studio
- Marine & Shipboard

# Network components

## Empowering Reliable Grids with Comprehensive Network Components

We go beyond cables to deliver complete solutions for your transmission and distribution needs. Our extensive portfolio of network components and accessories—including joints, terminations, connectors, and glands—ensures seamless integration with power systems, whether for new installations or upgrades to existing grids. Engineered to the highest standards, our components provide reliability, safety, and performance, supporting utilities in building efficient and robust power networks.



We offer tailored solutions across all voltage classes, including innovative designs for optical fiber integration and asset monitoring systems, reflecting our commitment to sustainability and innovation. Our advanced technologies, such as pre-expanded and cold-shrink options, enable faster, easier installations, reducing downtime and ensuring operational excellence.

Backed by Prysmian's global reach and local expertise, we provide dedicated engineering support and customized designs to meet specific project needs. Together, let's build the future of power systems with network components that are as reliable and innovative as our cables.



# Asset monitoring & systems

PRY-CAM

## Advanced Sensing Solutions for Proactive Asset Management

Prysmian's Electronic and Optical Sensing Solutions (EOSS) are at the forefront of system integrity monitoring, offering cutting-edge tools to safeguard your critical assets. Our comprehensive platform integrates partial discharge (PD) detection, distributed temperature sensing (DTS), and distributed acoustic sensing (DAS) to provide real-time insights into your system's health. With Pry-Cam solutions for both portable, spot analysis and permanent installation for continuous monitoring, you hold the power to act proactively, ensuring safety, reliability, and costefficiency.

Our systems deliver precise data on temperature variations, partial discharge activity, and acoustic anomalies, enabling informed decision-making to prevent costly repairs or unplanned downtime. Scalable and flexible, the modular design adapts to your evolving needs, while user-friendly interfaces streamline monitoring and analysis.


With EOSS, Prysmian elevates monitoring from reactive to preventive, helping utilities and industries achieve enhanced operational reliability. Discover how EOSS and Pry-Cam can transform your approach to asset management, ensuring the safety and longevity

# Prysmian in the region

Prysmian operates extensively across the Asia Pacific region, supported by a robust infrastructure that includes 13 manufacturing plants across China, Malaysia, Indonesia, the Philippines, and Thailand. Our regional distribution center in Singapore serves as a strategic hub, ensuring seamless delivery of cutting-edge cable solutions for the energy, infrastructure, and telecom markets.

In Asia Pacific, Prysmian is proud to be a part of landmark projects that showcase our expertise and commitment to innovation. These include addressing the complex cable requirements of iconic developments like Marina Bay Sands in Singapore and supporting the ambitious South Vietnam submarine cable projects, which strengthen regional connectivity. Additionally, Prysmian's advanced solutions have contributed to offshore wind farm developments, highlighting our pivotal role in accelerating the region's transition to renewable energy.

With a clear focus on sustainability and a strong local presence, Prysmian is well-positioned to meet the demands of Asia Pacific's rapidly growing markets. We remain dedicated to delivering innovative technologies that empower our partners and drive the region's progress towards a more connected and



# Our corporate brand

Prysmian has a multi-brand architecture made of three levels: a strong Corporate Brand, Prysmian, which stands for the whole organization. It is the umbrella brand under which all the initiatives regarding the Company worldwide are carried out.

The second level is represented by the three well-known Commercial Brands: Prysmian, Draka and General Cable.

The third level encompasses the wide range of product brands that serve all the markets and applications in which the Company operates.

# Content

Page

# Standards

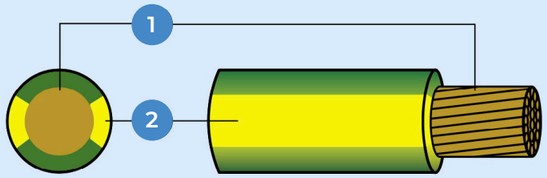
In Prysmian Group, we design and manufacture cables to the following standards:-

| | |
|---|---|
| **British Standards (BS)** | |
| BS EN 50525-2-31 (BS6004) | Electric cables - Low voltage energy cables of rated voltages up to and including 450 / 750 V (U0/U)- for Single core non-sheathed cables with thermoplastic PVC insulation. |
| BS EN 50525-3-41 (BS6004) | Electric cables - Low voltage energy cables of rated voltages up to and including 450/ 750 V (U0/U)- for Single core non-sheathed cables with halogen-free crosslinked insulation, and low emission of smoke. |
| BS 6346 | Electric cables. PVC insulated, armoured cables for voltages up to 600/1000V and 1900/3300V. |
| BS 6360 | Specification for conductors in insulated cables and cords. |
| BS 6500 | Electric cables, Flexible cords rated up to 300/500V, for use with appliances and equipment intended for domestic, office and similar environments. |
| BS 6387 | Specification for performance requirements for cables required to maintain circuit integrity under fire conditions. |
| BS 5467 | Electric cables. Thermosetting insulated, armoured cables for voltages of 600/1000V and 1900/3300V. |
| BS 6724 | Electric cables. Thermosetting insulated, armoured cables for voltages of 600/1000V and 1900/3300V, having low emission of smoke and corrosive gases when affected by fire. |
| BS 7671 | Requirements for Electrical Installations. IEE Wiring Regulations. |
| BS 7211 | Electric cables. Thermosetting insulated, non-armoured cables for voltages up to and including 450/750V, for electric power, lighting and internal wiring, and having low emission of smoke and corrosive gases when affected by fire. |
| **International Electrotechnical Commission (IEC)** | |
| IEC 60227-3 | Polyvinyl Chloride Insulated Cables of Rated Voltages up to and including 450/750V.<br>Part 3: Non-Sheathed Cables for Fixed Wiring. |
| IEC 60228 | Conductors of Insulated Cables. |
| IEC 60331 | Tests for electric cables under fire conditions - Circuit integrity -<br>Part 11: Apparatus - Fire alone at a flame temperature of at least 750°C. |
| IEC 60332-1-2 | Tests on electric and optical fibre cables under fire conditions -<br>Part 1-1: Test for vertical flame propagation for a single insulated wire or cable Procedure for 1 kW pre-mixed flame. |
| IEC 60332-3-22 | Tests on electric and optical fibre cables under fire conditions -<br>Part 3-22: Test for vertical flame spread of vertically-mounted bunched wires or cables - Category A. |
| IEC 60332-3-24 | Tests on electric and optical fibre cables under fire conditions -<br>Part 3-24: Test for vertical flame spread of vertically-mounted bunched wires or cables - Category C. |
| IEC 60502-1 | Power cables with extruded insulation and their accessories for rated voltages from 1kV (Um = 1,2kV) up to 30kV (Um = 36kV) -<br>Part 1: Cables for rated voltages of 1 kV (Um = 1,2kV) and 3kV (Um = 3.6kV). |
| IEC 60754-1 | Test on gases evolved during combustion of materials from cables -<br>Part 1: Determination of the amount of halogen acid gas. |
| IEC 60754-2 | Test on gases evolved during combustion of electric cables -<br>Part 2: Determination of degree of acidity of gases evolved during the combustion of material taken from electric cables by measuring pH and conductivity. |
| IEC 61034-2 | Measurement of smoke density of cables burning under defined conditions. |
| **Malaysia Standards** | |
| MS 136 | PVC-insulated cable (non-armoured) for electric power and lighting. |
| MS 274 | PVC-insulated cables for electricity supply with rated voltage 0.6/1kV |
| **Singapore Standards** | |
| SS 358-3 | PVC-insulated, non-sheathed cables 450/750V. |
| SS 299 | Specification for fire resistant cables<br>Part 1 - Performance requirements for cables required to maintain circuit integrity under fire conditions. |



# Single Core CU/PVC

## PVC Insulated, Non-sheathed 450/750V




**Component**

1. Copper Conductor
2. PVC Insulation

**Standards Applied**

Design Guide: IEC60227-3, BS EN 50525-2-31, SS358-3, MS136
Conductor: IEC60228, BS6360, BS EN 60228
Flame Retardancy: IEC60332-1-2, IEC60332-3-24**

**Electrical Characteristics**

Operating voltage, Uo/U: 450/750V
Max. operating temperature: 70°C
Final short circuit temperature: 160°C
Test voltage: 2.5kV for 15 minutes

**Installation Guide**

Min. bending radius (mm) : 6 x Cable Overall Diameter
Max. pulling tension (kgf) : 7 x No. of Core x Conductor Size

| | |
|---|---|
| **Construction** | |
| Conductor | PVC-insulated cable (non-armoured) for electric power and lighting. |
| Insulation | PVC-insulated cables for electricity supply with rated voltage 0.6/1kV |
| Core Identification | Black, Red, Green/Yellow, Yellow, Blue, White, Grey, Brown or other |

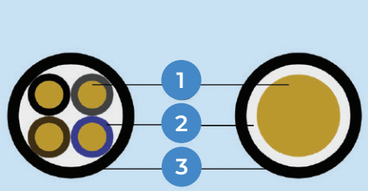
## Dimension & Electrical Data

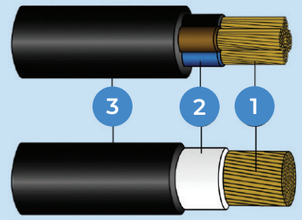
| Product ID | No. of Core | Conductor Size | Nom. Insulation Thickness | Nom. Overall Diameter | Approx. Cable Weight | Max. d.c. Resistance at 20°C |
|---|---|---|---|---|---|---|
| | | mm² | mm | mm | kg/km | Ω/km |
| | 1 | 1.5 | 0.7 | 3.0 | 22 | 12.1 |
| | 1 | 2.5 | 0.8 | 3.6 | 33 | 7.41 |
| | 1 | 4 | 0.8 | 4.2 | 50 | 4.61 |
| | 1 | 6 | 0.8 | 4.7 | 70 | 3.08 |
| | 1 | 10 | 1.0 | 6.1 | 118 | 1.83 |
| | 1 | 16 | 1.0 | 7.1 | 178 | 1.15 |
| | 1 | 25 | 1.2 | 8.8 | 280 | 0.727 |
| | 1 | 35 | 1.2 | 10.1 | 376 | 0.524 |
| | 1 | 50 | 1.4 | 11.7 | 509 | 0.387 |
| | 1 | 70 | 1.4 | 13.5 | 717 | 0.268 |
| | 1 | 95 | 1.6 | 15.8 | 991 | 0.193 |
| | 1 | 120 | 1.6 | 17.4 | 1229 | 0.153 |
| | 1 | 150 | 1.8 | 19.4 | 1512 | 0.124 |
| | 1 | 185 | 2.0 | 21.6 | 1895 | 0.0991 |
| | 1 | 240 | 2.2 | 24.7 | 2471 | 0.0754 |
| | 1 | 300 | 2.4 | 27.5 | 3092 | 0.0601 |
| | 1 | 400 | 2.6 | 30.9 | 3938 | 0.0470 |
| | 1 | 500 | 2.8 | 34.4 | 4945 | 0.0366 |
| | 1 | 630 | 2.8 | 38.4 | 6303 | 0.0283 |



# Single Core, 2-, 3-, 4-, 5-, multicores CU/PVC/PVC

## PVC insulated, PVC sheathed, 0.6/1kV




**Component**

1. Copper Conductor
2. PVC Insulation
3. PVC/PVC-FR** sheath

**Standards Applied**

Design Guide: IEC60502-1, MS274
Conductor: IEC60228, BS6360, BS EN 60228
Flame Retardancy: IEC60332-1-2, IEC60332-3-24**, IEC60332-3-22**

**Electrical Characteristics**

Operating voltage, Uo/U: 600/1000V
Max. operating temperature: 70°C
Final short circuit temperature: 160°C
Test voltage: 3.5kV for 5 minutes

**Installation Guide**

Min. bending radius (mm): 8 x Cable Overall Diameter, (sector shape); 6 x cable overall diameter (circular shape)
Max. pulling tension (kgf): 7 x No. of Core x Conductor Size

| Construction | |
|---|---|
| Conductor | Plain annealed copper wire |
| Insulation | An extruded layer of polyvinyl chloride (PVC) compound |
| Core Identification | Refer to Appendix F for details except single core. Single core will come with black insulation |
| Assembly*** | Cores cabled together, supplied with filler* and covered with polyester (PETP) binder tape* |
| Outer Sheath | An extruded layer of polyvinyl chloride (PVC) compound |
| Outer Sheath Colour | Black except single core. Single core will come with grey outer sheath. |

## Dimension & Electrical Data

| Product ID | No. of Core | Conductor Size | Nom. Insulation Thickness | Nom. Sheath Thickness | Nom. Overall Diameter | Approx. Cable Weight | Max. d.c. Resistance at 20°C |
|---|---|---|---|---|---|---|---|
| | | mm² | mm | mm | mm | kg/km | Ω/km |
| | 1 | 1.5 | 0.8 | 1.4 | 6.0 | 53 | 12.1 |
| | 1 | 2.5 | 0.8 | 1.4 | 6.4 | 66 | 7.41 |
| | 1 | 4 | 1.0 | 1.4 | 7.4 | 93 | 4.61 |
| | 1 | 6 | 1.0 | 1.4 | 7.9 | 118 | 3.08 |
| | 1 | 10 | 1.0 | 1.4 | 8.9 | 167 | 1.83 |
| | 1 | 16 | 1.0 | 1.4 | 9.9 | 234 | 1.15 |
| | 1 | 25 | 1.2 | 1.4 | 11.6 | 347 | 0.727 |
| | 1 | 35 | 1.2 | 1.4 | 12.9 | 451 | 0.524 |
| | 1 | 50 | 1.4 | 1.4 | 14.5 | 595 | 0.387 |
| | 1 | 70 | 1.4 | 1.4 | 16.3 | 815 | 0.268 |
| | 1 | 95 | 1.6 | 1.5 | 18.8 | 1113 | 0.193 |
| | 1 | 120 | 1.6 | 1.6 | 20.6 | 1372 | 0.153 |
| | 1 | 150 | 1.8 | 1.6 | 22.6 | 1670 | 0.124 |
| | 1 | 185 | 2.0 | 1.7 | 25.0 | 2082 | 0.0991 |
| | 1 | 240 | 2.2 | 1.8 | 28.3 | 2686 | 0.0754 |
| | 1 | 300 | 2.4 | 1.9 | 31.3 | 3342 | 0.0601 |
| | 1 | 400 | 2.6 | 2.0 | 34.9 | 4248 | 0.0470 |
| | 1 | 500 | 2.8 | 2.1 | 38.6 | 5307 | 0.0366 |
| | 1 | 630 | 2.8 | 2.2 | 42.8 | 6736 | 0.0283 |
| | 1 | 800 | 2.8 | 2.5 | 47.7 | 8536 | 0.0221 |
| | 1 | 1000 | 3.0 | 2.5 | 52.6 | 10649 | 0.0176 |



## CU/PVC/PVC, PVC Insulated, PVC sheathed Cable, 0.6/1kV

## 2-, 3-, 4-, 5-Cores

## Dimension & Electrical Data

| Product ID | No. of Core | Conductor Size | Nom. Insulation Thickness | Nom. Sheath Thickness | Nom. Overall Diameter | Approx. Cable Weight | Max. d.c. Resistance at 20°C |
|---|---|---|---|---|---|---|---|
| | | mm² | mm | mm | mm | kg/km | Ω/km |
| | 2 | 1.5 | 0.8 | 1.8 | 10.4 | 134 | 12.1 |
| | 2 | 2.5 | 0.8 | 1.8 | 11.3 | 166 | 7.41 |
| | 2 | 4 | 1.0 | 1.8 | 12.4 | 215 | 4.61 |
| | 2 | 6 | 1.0 | 1.8 | 13.5 | 275 | 3.08 |
| | 2 | 10 | 1.0 | 1.8 | 16.3 | 380 | 1.83 |
| | 2 | 16 | 1.0 | 1.8 | 18.7 | 526 | 1.15 |
| | 2 | 25 | 1.2 | 1.8 | 22.2 | 768 | 0.727 |
| | 2 | 35 | 1.2 | 1.8 | 24.8 | 988 | 0.524 |
| | 2 | 50 | 1.4 | 1.8 | 28.1 | 1297 | 0.387 |
| | 2 | 70 | 1.4 | 1.9 | 32.0 | 1775 | 0.268 |
| | 2 | 95 | 1.6 | 2.0 | 37.2 | 2439 | 0.193 |
| | 2 | 120 | 1.6 | 2.1 | 40.7 | 2996 | 0.153 |
| | 2 | 150 | 1.8 | 2.2 | 44.8 | 3664 | 0.124 |
| | 2 | 185 | 2.0 | 2.4 | 49.9 | 4564 | 0.0991 |
| | 2 | 240 | 2.2 | 2.5 | 56.2 | 5894 | 0.0754 |
| | 2 | 300 | 2.4 | 2.7 | 62.4 | 7336 | 0.0601 |
| | 2 | 400 | 2.6 | 3.0 | 69.9 | 9293 | 0.0470 |

## Dimension & Electrical Data

| Product ID | No. of Core | Conductor Size | Nom. Insulation Thickness | Nom. Sheath Thickness | Nom. Overall Diameter | Approx. Cable Weight | Max. d.c. Resistance at 20°C |
|---|---|---|---|---|---|---|---|
| | | mm² | mm | mm | mm | kg/km | Ω/km |
| | 3 | 1.5 | 0.8 | 1.8 | 10.9 | 159 | 12.1 |
| | 3 | 2.5 | 0.8 | 1.8 | 11.9 | 202 | 7.41 |
| | 3 | 4 | 1.0 | 1.8 | 13.0 | 267 | 4.61 |
| | 3 | 6 | 1.0 | 1.8 | 14.3 | 347 | 3.08 |
| | 3 | 10 | 1.0 | 1.8 | 17.4 | 511 | 1.83 |
| | 3 | 16 | 1.0 | 1.8 | 19.9 | 724 | 1.15 |
| | 3 | 25 | 1.2 | 1.8 | 23.7 | 1086 | 0.727 |
| | 3 | 35 | 1.2 | 1.8 | 26.2 | 1396 | 0.524 |
| | 3 | 35 sh | 1.2 | 1.8 | 21.9 | 1340 | 0.524 |
| | 3 | 50 | 1.4 | 1.8 | 29.8 | 1847 | 0.387 |
| | 3 | 50 sh | 1.4 | 1.8 | 24.7 | 1770 | 0.387 |
| | 3 | 70 | 1.4 | 1.9 | 33.9 | 2471 | 0.268 |
| | 3 | 70 sh | 1.4 | 1.9 | 27.9 | 2430 | 0.268 |
| | 3 | 95 | 1.6 | 2.1 | 39.6 | 3411 | 0.193 |
| | 3 | 95 sh | 1.6 | 2.1 | 32.6 | 3278 | 0.193 |
| | 3 | 120 | 1.6 | 2.2 | 43.3 | 4336 | 0.153 |
| | 3 | 120 sh | 1.6 | 2.2 | 35.4 | 4149 | 0.1530 |
| | 3 | 150 | 1.8 | 2.3 | 47.8 | 5310 | 0.124 |
| | 3 | 150 sh | 1.8 | 2.3 | 39.2 | 4948 | 0.124 |
| | 3 | 185 | 2.0 | 2.5 | 53.2 | 6618 | 0.0991 |
| | 3 | 185 sh | 2.0 | 2.5 | 43.7 | 6154 | 0.0991 |
| | 3 | 240 | 2.2 | 2.7 | 60.1 | 8584 | 0.0754 |
| | 3 | 240 sh | 2.2 | 2.7 | 49.2 | 7905 | 0.0754 |
| | 3 | 300 | 2.4 | 2.8 | 66.5 | 10661 | 0.0601 |
| | 3 | 300 sh | 2.4 | 2.9 | 53.6 | 9685 | 0.0601 |
| | 3 | 400 | 2.6 | 3.1 | 74.5 | 13510 | 0.047 |
| | 3 | 400 sh | 2.6 | 3.1 | 66.4 | 12849 | 0.047 |

sh: sector shaped conductor



## Dimension & Electrical Data

| Product ID | No. of Core | Conductor Size | Nom. Insulation Thickness | Nom. Sheath Thickness | Nom. Overall Diameter | Approx. Cable Weight | Max. d.c. Resistance at 20°C |
|---|---|---|---|---|---|---|---|
| | | mm² | mm | mm | mm | kg/km | Ω/km |
| | 4 | 1.5 | 0.8 | 1.8 | 11.8 | 196 | 12.1 |
| | 4 | 2.5 | 0.8 | 1.8 | 12.8 | 255 | 7.41 |
| | 4 | 4 | 1.0 | 1.8 | 15.1 | 371 | 4.61 |
| | 4 | 6 | 1.0 | 1.8 | 16.5 | 483 | 3.08 |
| | 4 | 10 | 1.0 | 1.8 | 19.1 | 667 | 1.83 |
| | 4 | 16 | 1.0 | 1.8 | 21.6 | 946 | 1.15 |
| | 4 | 25 | 1.2 | 1.8 | 25.8 | 1408 | 0.727 |
| | 4 | 35 | 1.2 | 1.8 | 28.8 | 1818 | 0.524 |
| | 4 | 35 sh | 1.2 | 1.8 | 26.2 | 1780 | 0.524 |
| | 4 | 50 | 1.4 | 1.9 | 33.1 | 2467 | 0.387 |
| | 4 | 50 sh | 1.4 | 1.9 | 29.0 | 2352 | 0.387 |
| | 4 | 70 | 1.4 | 2.1 | 37.9 | 3413 | 0.268 |
| | 4 | 70 sh | 1.4 | 2.0 | 33.2 | 3251 | 0.268 |
| | 4 | 95 | 1.6 | 2.2 | 43.4 | 4599 | 0.193 |
| | 4 | 95 sh | 1.6 | 2.2 | 38.6 | 4438 | 0.193 |
| | 4 | 120 | 1.6 | 2.3 | 48.0 | 5623 | 0.153 |
| | 4 | 120 sh | 1.6 | 2.3 | 41.8 | 5516 | 0.1530 |
| | 4 | 150 | 1.8 | 2.5 | 53.1 | 6943 | 0.124 |
| | 4 | 150 sh | 1.8 | 2.5 | 46.9 | 6613 | 0.124 |
| | 4 | 185 | 2.0 | 2.7 | 59.1 | 8687 | 0.0991 |
| | 4 | 185 sh | 2.0 | 2.6 | 51.9 | 8180 | 0.0991 |
| | 4 | 240 | 2.2 | 2.9 | 66.8 | 11185 | 0.0754 |
| | 4 | 240 sh | 2.2 | 2.9 | 58.8 | 10545 | 0.0754 |
| | 4 | 300 | 2.4 | 3.1 | 74.2 | 14008 | 0.0601 |
| | 4 | 300 sh | 2.4 | 3.1 | 65.1 | 12954 | 0.0601 |
| | 4 | 400 | 2.6 | 3.4 | 83.0 | 17664 | 0.047 |
| | 4 | 400 sh | 2.6 | 3.4 | 73.3 | 17018 | 0.047 |

sh: sector shaped conductor

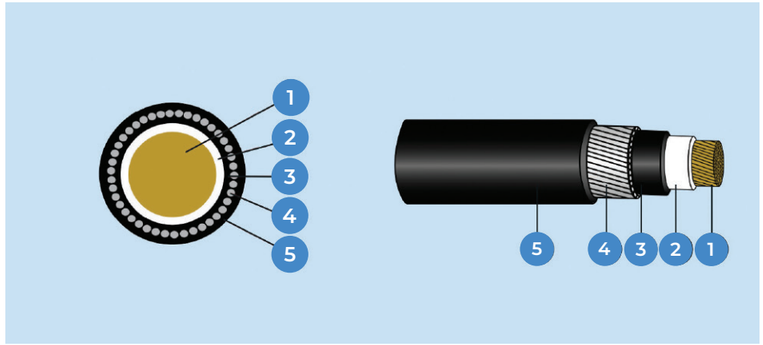
## Dimension & Electrical Data

| Product ID | No. of Core | Conductor Size | Nom. Insulation Thickness | Nom. Sheath Thickness | Nom. Overall Diameter | Approx. Cable Weight | Max. d.c. Resistance at 20°C |
|---|---|---|---|---|---|---|---|
| | | mm² | mm | mm | mm | kg/km | Ω/km |
| | 5 | 1.5 | 0.8 | 1.8 | 12.7 | 214 | 12.1 |
| | 5 | 2.5 | 0.8 | 1.8 | 13.9 | 276 | 7.41 |
| | 5 | 4.0 | 1.0 | 1.8 | 16.0 | 402 | 4.61 |
| | 7 | 1.5 | 0.8 | 1.8 | 13.7 | 266 | 12.1 |
| | 7 | 2.5 | 0.8 | 1.8 | 14.9 | 350 | 7.41 |
| | 7 | 4.0 | 1.0 | 1.8 | 17.4 | 514 | 4.61 |
| | 12 | 1.5 | 0.8 | 1.8 | 17.4 | 420 | 12.1 |
| | 12 | 2.5 | 0.8 | 1.8 | 19.2 | 559 | 7.41 |
| | 12 | 4.0 | 1.0 | 1.8 | 22.7 | 834 | 4.61 |
| | 19 | 1.5 | 0.8 | 1.8 | 20.1 | 611 | 12.1 |
| | 19 | 2.5 | 0.8 | 1.8 | 22.2 | 826 | 7.41 |
| | 19 | 4.0 | 1.0 | 1.8 | 26.5 | 1247 | 4.61 |
| | 27 | 1.5 | 0.8 | 1.8 | 23.6 | 833 | 12.1 |
| | 27 | 2.5 | 0.8 | 1.8 | 26.2 | 1138 | 7.41 |
| | 27 | 4.0 | 1.0 | 1.9 | 32.0 | 1745 | 4.61 |
| | 37 | 1.5 | 0.8 | 1.8 | 26.6 | 1099 | 12.1 |
| | 37 | 2.5 | 0.8 | 1.8 | 29.5 | 1511 | 7.41 |
| | 37 | 4.0 | 1.0 | 2.1 | 36.5 | 2269 | 4.61 |
| | 48 | 1.5 | 0.8 | 1.8 | 30.6 | 1411 | 12.1 |
| | 48 | 2.5 | 0.8 | 1.9 | 34.0 | 1949 | 7.41 |



# Single Core CU/PVC/PVC/AWA/PVC

## PVC Insulated, PVC bedded, AWA armoured, PVC sheathed Cable 0.6/1kV




**Component**

1. Copper Conductor
2. PVC Insulation
3. PVC Bedding
4. Aluminium Wire Armoured
5. PVC/PVC-FR** sheath

**Standards Applied**

Design Guide: BS6346, MS274
Conductor: IEC60228, BS6360, BS EN 60228
Flame Retardancy: IEC60332-1-2, IEC60332-3-24**, IEC60332-3-22**

**Electrical Characteristics**

Operating voltage, Uo/U: 600/1000V
Max. operating temperature: 70°C
Final short circuit temperature: 160°C
Test voltage: 3.5kV for 5 minutes

**Installation Guide**

Min. bending radius (mm) : 10 x Cable Overall Diameter
Max. pulling tension (kgf) : 7 x No. of Core x Conductor Size

| Construction | |
|---|---|
| Conductor | Plain annealed copper wire |
| Insulation | An extruded layer of polyvinyl chloride (PVC) compound |
| Core Identification | Refer to Appendix F for details |
| Bedding | An extruded layer of polyvinyl chloride (PVC) compound |
| Bedding Colour | Black |
| Armour | A single layer of aluminium wire armoured (AWA) |
| Outer Sheath | An extruded layer of polyvinyl chloride (PVC) compound |
| Outer Sheath Colour | Black |

## Dimension & Electrical Data

| Pro-duct ID | No. of Core | Conductor Size | Nom. Insulation Thickness | Nom. Dia. after Bedding | Nom. Armour Wire Size | Nom. Sheath Thickness | Nom. Overall Diameter | Approx. Cable Weight | Max. d.c. Resistance at 20°C |
|---|---|---|---|---|---|---|---|---|---|
| | | mm² | mm | mm | mm | mm | mm | kg/km | Ω/km |
| | 1 | 50 | 1.4 | 13.3 | 1.25 | 1.5 | 19.1 | 804 | 0.387 |
| | 1 | 70 | 1.4 | 15.1 | 1.25 | 1.6 | 21.1 | 1056 | 0.268 |
| | 1 | 95 | 1.6 | 17.4 | 1.25 | 1.6 | 23.4 | 1378 | 0.193 |
| | 1 | 120 | 1.6 | 19.4 | 1.6 | 1.7 | 26.3 | 1738 | 0.153 |
| | 1 | 150 | 1.8 | 21.4 | 1.6 | 1.7 | 28.3 | 2071 | 0.124 |
| | 1 | 185 | 2.0 | 23.6 | 1.6 | 1.8 | 30.8 | 2522 | 0.0991 |
| | 1 | 240 | 2.2 | 26.7 | 1.6 | 1.9 | 34.1 | 3189 | 0.0754 |
| | 1 | 300 | 2.4 | 29.5 | 1.6 | 1.9 | 37.0 | 3878 | 0.0601 |
| | 1 | 400 | 2.6 | 33.3 | 2.0 | 2.1 | 42.0 | 5002 | 0.047 |
| | 1 | 500 | 2.8 | 36.8 | 2.0 | 2.1 | 45.5 | 6112 | 0.0366 |
| | 1 | 630 | 2.8 | 40.8 | 2.0 | 2.2 | 49.7 | 7610 | 0.0283 |
| | 1 | 800 | 2.8 | 45.5 | 2.5 | 2.4 | 55.8 | 9699 | 0.0221 |
| | 1 | 1000 | 3.0 | 50.4 | 2.5 | 2.5 | 60.9 | 11954 | 0.0176 |

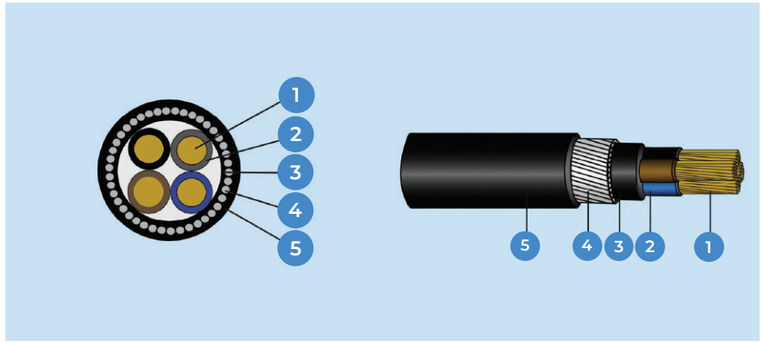
* Optional

** Available upon request



# 2-, 3-, 4-, 5-, multicores CU/PVC/PVC/SWA/PVC

## PVC insulated, PVC bedded, SWA armoured, PVC sheathed Cable 0.6/1kV




**Component**

1. Copper Conductor
2. PVC Insulation
3. PVC Bedding
4. Galvanised Steel Wire Armoured
5. PVC/PVC-FR** sheath

**Standards Applied**

Design Guide: BS6346, MS274
Conductor: IEC60228, BS6360, BS EN 60228
Flame Retardancy: IEC60332-1-2, IEC60332-3-24**, IEC60332-3-22**

**Electrical Characteristics**

Operating voltage, Uo/U: 600/1000V
Max. operating temperature: 70°C
Final short circuit temperature: 160°C
Test voltage: 3.5kV for 5 minutes

**Installation Guide**

Min. bending radius (mm) : 10 x Cable Overall Diameter
Max. pulling tension (kgf) : 7 x No. of Core x Conductor Size

| Construction | |
|---|---|
| Conductor | Plain annealed copper wire |
| Insulation | An extruded layer of polyvinyl chloride (PVC) compound |
| Core Identification | Refer to Appendix F for details |
| Assembly | Cores cabled together, supplied with filler* and covered with polyester (PETP) binder tape* |
| Bedding | An extruded layer of polyvinyl chloride (PVC) compound |
| Bedding Colour | Black |
| Armour | A single layer of galvanised steel wire armour (SWA) |
| Outer Sheath | An extruded layer of polyvinyl chloride (PVC) compound |
| Outer Sheath Colour | Black |

## Dimension & Electrical Data

| Product ID | No. of Core | Conductor Size | Nom. Insulation Thickness | Nom. Dia. after Bedding | Nom. Armour Wire Size | Nom. Sheath Thickness | Nom. Overall Diameter | Approx. Cable Weight | Max. d.c. Resistance at 20°C |
|---|---|---|---|---|---|---|---|---|---|
| | | mm² | mm | mm | mm | mm | mm | kg/km | Ω/km |
| | 2 | 1.5 | 0.6 | 7.3 | 0.9 | 1.4 | 12.2 | 287 | 12.1 |
| | 2 | 2.5 | 0.7 | 8.6 | 0.9 | 1.4 | 13.5 | 353 | 7.41 |
| | 2 | 4 | 0.8 | 10.1 | 0.9 | 1.4 | 15.0 | 447 | 4.61 |
| | 2 | 6 | 0.8 | 11.2 | 0.9 | 1.5 | 16.3 | 542 | 3.08 |
| | 2 | 10 | 1.0 | 14.0 | 1.25 | 1.6 | 20.0 | 783 | 1.83 |
| | 2 | 16 | 1.0 | 16.2 | 1.25 | 1.6 | 21.9 | 992 | 1.15 |
| | 2 | 25 | 1.2 | 20.1 | 1.6 | 1.7 | 26.7 | 1516 | 0.727 |
| | 2 | 35 | 1.2 | 22.7 | 1.6 | 1.8 | 29.5 | 1833 | 0.727 |
| | 2 | 50 | 1.4 | 26.0 | 1.6 | 1.9 | 33.0 | 2261 | 0.387 |
| | 2 | 70 | 1.4 | 30.0 | 1.6 | 1.9 | 37.0 | 2885 | 0.268 |
| | 2 | 95 | 1.6 | 35.1 | 2.0 | 2.1 | 43.3 | 4056 | 0.193 |
| | 2 | 120 | 1.6 | 38.4 | 2.0 | 2.2 | 46.8 | 4717 | 0.153 |
| | 2 | 150 | 1.8 | 42.3 | 2.0 | 2.3 | 50.9 | 5563 | 0.124 |
| | 2 | 185 | 2.0 | 47.4 | 2.5 | 2.4 | 57.2 | 7183 | 0.0991 |
| | 2 | 240 | 2.2 | 53.5 | 2.5 | 2.5 | 63.5 | 8829 | 0.0754 |
| | 2 | 300 | 2.4 | 59.7 | 2.5 | 2.7 | 70.1 | 10607 | 0.0601 |
| | 2 | 400 | 2.6 | 66.6 | 2.5 | 2.9 | 77.4 | 12862 | 0.047 |



# CU/PVC/PVC/SWA/PVC, PVC insulated, PVC bedded, SWA armoured, PVC sheathed Cable 0.6/1kV
2-, 3-, 4-, 5-, multicores

## Dimension & Electrical Data

| Product ID | No. of Core | Conductor Size | Nom. Insulation Thickness | Nom. Dia. after Bedding | Nom. Armour Wire Size | Nom. Sheath Thickness | Nom. Overall Diameter | Approx. Cable Weight | Max. d.c. Resistance at 20°C |
|---|---|---|---|---|---|---|---|---|---|
| | | mm² | mm | mm | mm | mm | mm | kg/km | Ω/km |
| | 3 | 1.5 | 0.6 | 7.7 | 0.9 | 1.4 | 12.6 | 315 | 12.1 |
| | 3 | 2.5 | 0.7 | 9.1 | 0.9 | 1.4 | 14.0 | 390 | 7.41 |
| | 3 | 4 | 0.8 | 10.7 | 0.9 | 1.4 | 15.6 | 499 | 4.61 |
| | 3 | 6 | 0.8 | 12.0 | 1.25 | 1.5 | 17.8 | 707 | 3.08 |
| | 3 | 10 | 1.0 | 15.1 | 1.25 | 1.6 | 21.2 | 974 | 1.83 |
| | 3 | 16 | 1.0 | 17.4 | 1.25 | 1.6 | 23.1 | 1235 | 1.15 |
| | 3 | 25 | 1.2 | 21.6 | 1.6 | 1.7 | 28.2 | 1910 | 0.727 |
| | 3 | 35 | 1.2 | 24.1 | 1.6 | 1.8 | 30.9 | 2320 | 0.524 |
| | 3 | 35 sh | 1.2 | 19.8 | 1.6 | 1.8 | 27.1 | 2149 | 0.524 |
| | 3 | 50 | 1.4 | 27.7 | 1.6 | 1.9 | 34.7 | 2938 | 0.387 |
| | 3 | 50 sh | 1.4 | 22.6 | 1.6 | 1.9 | 30.1 | 2710 | 0.387 |
| | 3 | 70 | 1.4 | 32.3 | 2.0 | 2.0 | 40.3 | 4123 | 0.268 |
| | 3 | 70 sh | 1.4 | 26.3 | 2.0 | 2.0 | 34.8 | 3765 | 0.268 |
| | 3 | 95 | 1.6 | 37.3 | 2.0 | 2.1 | 45.5 | 5308 | 0.193 |
| | 3 | 95 sh | 1.6 | 30.3 | 2.0 | 2.1 | 39.0 | 4794 | 0.193 |
| | 3 | 120 | 1.6 | 40.8 | 2.0 | 2.2 | 49.2 | 6311 | 0.153 |
| | 3 | 120 sh | 1.6 | 32.9 | 2.0 | 2.2 | 41.8 | 5791 | 0.153 |
| | 3 | 150 | 1.8 | 45.5 | 2.5 | 2.4 | 55.3 | 8048 | 0.124 |
| | 3 | 150 sh | 1.8 | 36.9 | 2.5 | 2.4 | 47.2 | 7206 | 0.124 |
| | 3 | 185 | 2.0 | 50.5 | 2.5 | 2.5 | 60.5 | 9622 | 0.0991 |
| | 3 | 185 sh | 2.0 | 41.0 | 2.5 | 2.5 | 51.5 | 8636 | 0.0991 |
| | 3 | 240 | 2.2 | 57.0 | 2.5 | 2.6 | 67.2 | 11956 | 0.0754 |
| | 3 | 240 sh | 2.2 | 46.5 | 2.5 | 2.6 | 57.2 | 10747 | 0.0754 |
| | 3 | 300 | 2.4 | 63.6 | 2.5 | 2.8 | 74.2 | 14513 | 0.0601 |
| | 3 | 300 sh | 2.4 | 50.5 | 2.5 | 2.8 | 62.0 | 12775 | 0.0601 |
| | 3 | 400 | 2.6 | 71.0 | 2.5 | 3.0 | 82.0 | 17773 | 0.047 |
| | 3 | 400 sh | 2.4 | 56.7 | 2.5 | 3.0 | 68.7 | 16042 | 0.047 |

## Dimension & Electrical Data

| Product ID | No. of Core | Conductor Size | Nom. Insulation Thickness | Nom. Dia. after Bedding | Nom. Armour Wire Size | Nom. Sheath Thickness | Nom. Overall Diameter | Approx. Cable Weight | Max. d.c. Resistance at 20°C |
|---|---|---|---|---|---|---|---|---|---|
| | | mm² | mm | mm | mm | mm | mm | kg/km | Ω/km |
| | 4 | 1.5 | 0.6 | 7.7 | 0.9 | 1.4 | 12.6 | 315 | 12.1 |
| | 4 | 2.5 | 0.7 | 9.1 | 0.9 | 1.4 | 14.0 | 390 | 7.41 |
| | 4 | 4 | 0.8 | 10.7 | 0.9 | 1.4 | 15.6 | 499 | 4.61 |
| | 4 | 6 | 0.8 | 12.0 | 1.25 | 1.5 | 17.8 | 707 | 3.08 |
| | 4 | 10 | 1.0 | 15.1 | 1.25 | 1.6 | 21.2 | 974 | 1.83 |
| | 4 | 16 | 1.0 | 17.4 | 1.25 | 1.6 | 23.1 | 1235 | 1.15 |
| | 4 | 25 | 1.2 | 21.6 | 1.6 | 1.7 | 28.2 | 1910 | 0.727 |
| | 4 | 35 | 1.2 | 24.1 | 1.6 | 1.8 | 30.9 | 2320 | 0.524 |
| | 4 | 35 sh | 1.2 | 19.8 | 1.6 | 1.8 | 27.1 | 2149 | 0.524 |
| | 4 | 50 | 1.4 | 27.7 | 1.6 | 1.9 | 34.7 | 2938 | 0.387 |
| | 4 | 50 sh | 1.4 | 22.6 | 1.6 | 1.9 | 30.1 | 2710 | 0.387 |
| | 4 | 70 | 1.4 | 32.3 | 2.0 | 2.0 | 40.3 | 4123 | 0.268 |
| | 4 | 70 sh | 1.4 | 26.3 | 2.0 | 2.0 | 34.8 | 3765 | 0.268 |
| | 4 | 95 | 1.6 | 37.3 | 2.0 | 2.1 | 45.5 | 5308 | 0.193 |
| | 4 | 95 sh | 1.6 | 30.3 | 2.0 | 2.1 | 39.0 | 4794 | 0.193 |
| | 4 | 120 | 1.6 | 40.8 | 2.0 | 2.2 | 49.2 | 6311 | 0.153 |
| | 4 | 120 sh | 1.6 | 32.9 | 2.0 | 2.2 | 41.8 | 5791 | 0.153 |
| | 4 | 150 | 1.8 | 45.5 | 2.5 | 2.4 | 55.3 | 8048 | 0.124 |
| | 4 | 150 sh | 1.8 | 36.9 | 2.5 | 2.4 | 47.2 | 7206 | 0.124 |
| | 4 | 185 | 2.0 | 50.5 | 2.5 | 2.5 | 60.5 | 9622 | 0.0991 |
| | 4 | 185 sh | 2.0 | 41.0 | 2.5 | 2.5 | 51.5 | 8636 | 0.0991 |
| | 4 | 240 | 2.2 | 57.0 | 2.5 | 2.6 | 67.2 | 11956 | 0.0754 |
| | 4 | 240 sh | 2.2 | 46.5 | 2.5 | 2.6 | 57.2 | 10747 | 0.0754 |
| | 4 | 300 | 2.4 | 63.6 | 2.5 | 2.8 | 74.2 | 14513 | 0.0601 |
| | 4 | 300 sh | 2.4 | 50.5 | 2.5 | 2.8 | 62.0 | 12775 | 0.0601 |
| | 4 | 400 | 2.6 | 71.0 | 2.5 | 3.0 | 82.0 | 17773 | 0.047 |
| | 4 | 400 sh | 2.4 | 56.7 | 2.5 | 3.0 | 68.7 | 16042 | 0.047 |

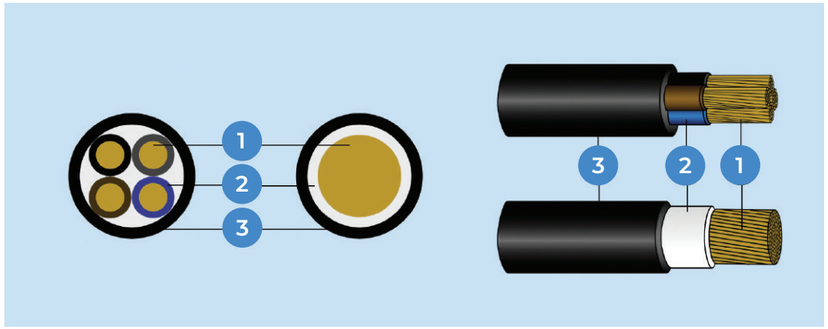


## Dimension & Electrical Data

| Product ID | No. of Core | Conductor Size | Nom. Insulation Thickness | Nom. Dia. after Bedding | Nom. Armour Wire Size | Nom. Sheath Thickness | Nom. Overall Diameter | Approx. Cable Weight | Max. d.c. Resistance at 20°C |
|---|---|---|---|---|---|---|---|---|---|
| | | mm² | mm | mm | mm | mm | mm | kg/km | Ω/km |
| | 5 | 1.5 | 0.6 | 9.3 | 0.9 | 1.4 | 14.2 | 393 | 12.1 |
| | 5 | 2.5 | 0.7 | 11.0 | 0.9 | 1.5 | 16.1 | 512 | 7.41 |
| | 5 | 4.0 | 0.8 | 13.1 | 1.25 | 1.5 | 18.6 | 764 | 4.61 |
| | 7 | 1.5 | 0.6 | 10.2 | 0.9 | 1.4 | 15.0 | 459 | 12.1 |
| | 7 | 2.5 | 0.7 | 12.0 | 1.25 | 1.5 | 17.8 | 695 | 7.41 |
| | 7 | 4.0 | 0.8 | 14.2 | 1.25 | 1.6 | 19.9 | 910 | 4.61 |
| | 12 | 1.5 | 0.6 | 13.5 | 1.25 | 1.5 | 19.3 | 775 | 12.1 |
| | 12 | 2.5 | 0.7 | 16.1 | 1.25 | 1.6 | 22.2 | 1017 | 7.41 |
| | 12 | 4.0 | 0.8 | 19.5 | 1.6 | 1.7 | 26.2 | 1521 | 4.61 |
| | 19 | 1.5 | 0.6 | 15.8 | 1.25 | 1.6 | 21.8 | 1014 | 12.1 |
| | 19 | 2.5 | 0.7 | 19.4 | 1.6 | 1.7 | 26.4 | 1549 | 7.41 |
| | 19 | 4.0 | 0.8 | 23.0 | 1.6 | 1.8 | 29.8 | 2051 | 4.61 |
| | 27 | 1.5 | 0.6 | 19.5 | 1.6 | 1.7 | 26.4 | 1497 | 12.1 |
| | 27 | 2.5 | 0.7 | 23.3 | 1.6 | 1.8 | 30.5 | 2004 | 7.41 |
| | 27 | 4.0 | 0.8 | 28.1 | 2.0 | 2.0 | 36.1 | 2992 | 4.61 |
| | 37 | 1.5 | 0.6 | 21.9 | 1.6 | 1.8 | 29.0 | 1829 | 12.1 |
| | 37 | 2.5 | 0.7 | 26.3 | 1.6 | 1.9 | 33.8 | 2475 | 7.41 |
| | 37 | 4.0 | 0.8 | 31.7 | 2.0 | 2.1 | 39.9 | 3698 | 4.61 |
| | 48 | 1.5 | 0.6 | 25.1 | 1.6 | 1.9 | 32.6 | 2224 | 12.1 |
| | 48 | 2.5 | 0.7 | 30.6 | 2.0 | 2.0 | 39.2 | 3369 | 7.41 |

# Single Core, 2-, 3-, 4-, 5-, multicores CU/XLPE/PVC

## XLPE insulated, PVC sheathed Cable 0.6/1kV




**Component**

1. Copper Conductor
2. XLPE Insulation
3. PVC/PVC-FR** sheath

**Standards Applied**

Design Guide: IEC60502-1
Conductor: IEC60228, BS6360, BS EN 60228
Flame Retardancy: IEC60332-1-2, IEC60332-3-24**,
IEC60332-3-22**

**Electrical Characteristics**

Operating voltage, Uo/U: 600/1000V
Max. operating temperature: 90°C
Final short circuit temperature: 250°C
Test voltage: 3.5kV for 5 minutes

**Installation Guide**

Min. bending radius (mm) : 6 x Cable Overall Diameter (Single Core)
Min. bending radius (mm) : 8 x Cable Overall Diameter (2-, 3-, 4-, 5-, multicores)
Max. pulling tension (kgf) : 7 x No. of Core x Conductor Size

| Construction | |
|---|---|
| Conductor | Plain annealed copper wire |
| Insulation | An extruded layer of cross-linked polyethylene (XLPE) compound |
| Core Identification | Refer to Appendix F for details except single core. Single core will come with natural colour insulation. |
| Assembly*** | Cores cabled together, supplied with filler* and covered with polyester (PETP) binder tape* |
| Outer Sheath | An extruded layer of polyvinyl chloride (PVC) compound |
| Sheath Colour | Black |



## Dimension & Electrical Data

| Product ID | No. of Core | Conductor Size | Nom. Insulation Thickness | Nom. Sheath Thickness | Nom. Overall Diameter | Approx. Cable Weight | Max. d.c. Resistance at 20°C |
|---|---|---|---|---|---|---|---|
| | | mm² | mm | mm | mm | kg/km | Ω/km |
| | 1 | 1.5 | 0.7 | 1.4 | 5.8 | 47 | 12.1 |
| | 1 | 2.5 | 0.7 | 1.4 | 6.2 | 62 | 7.41 |
| | 1 | 4 | 0.7 | 1.4 | 6.8 | 77 | 4.61 |
| | 1 | 6 | 0.7 | 1.4 | 7.3 | 100 | 3.08 |
| | 1 | 10 | 0.7 | 1.4 | 8.5 | 150 | 1.83 |
| | 1 | 16 | 0.7 | 1.4 | 9.5 | 211 | 1.15 |
| | 1 | 25 | 0.9 | 1.4 | 11.2 | 314 | 0.727 |
| | 1 | 35 | 0.9 | 1.4 | 12.5 | 414 | 0.524 |
| | 1 | 50 | 1.0 | 1.4 | 13.7 | 538 | 0.387 |
| | 1 | 70 | 1.1 | 1.4 | 15.7 | 751 | 0.268 |
| | 1 | 95 | 1.1 | 1.5 | 18.0 | 1018 | 0.193 |
| | 1 | 120 | 1.2 | 1.5 | 19.7 | 1267 | 0.153 |
| | 1 | 150 | 1.4 | 1.6 | 21.9 | 1555 | 0.124 |
| | 1 | 185 | 1.6 | 1.6 | 24.2 | 1932 | 0.0991 |
| | 1 | 240 | 1.7 | 1.7 | 27.2 | 2510 | 0.0754 |
| | 1 | 300 | 1.8 | 1.8 | 29.9 | 3125 | 0.0601 |
| | 1 | 400 | 2.0 | 1.9 | 33.6 | 3985 | 0.047 |
| | 1 | 500 | 2.2 | 2.0 | 37.3 | 4978 | 0.0366 |
| | 1 | 630 | 2.4 | 2.2 | 42.0 | 6430 | 0.0283 |
| | 1 | 800 | 2.6 | 2.4 | 47.2 | 8188 | 0.0221 |
| | 1 | 1000 | 2.8 | 2.5 | 52.4 | 10256 | 0.0176 |

## CU/XLPE/PVC, XLPE insulated, PVC sheathed Cable, 0.6/1kV

## 2-, 3-, 4-, 5-, multicores

### Dimension & Electrical Data

| Product ID | No. of Core | Conductor Size | Nom. Insulation Thickness | Nom. Sheath Thickness | Nom. Overall Diameter | Approx. Cable Weight | Max. d.c. Resistance at 20°C |
|---|---|---|---|---|---|---|---|
| | | mm² | mm | mm | mm | kg/km | Ω/km |
| | 2 | 1.5 | 0.7 | 1.8 | 9.6 | 117 | 12.1 |
| | 2 | 2.5 | 0.7 | 1.8 | 10.4 | 147 | 7.41 |
| | 2 | 4 | 0.7 | 1.8 | 11.5 | 193 | 4.61 |
| | 2 | 6 | 0.7 | 1.8 | 12.7 | 249 | 3.08 |
| | 2 | 10 | 0.7 | 1.8 | 15.2 | 339 | 1.83 |
| | 2 | 16 | 0.7 | 1.8 | 17.3 | 476 | 1.15 |
| | 2 | 25 | 0.9 | 1.8 | 20.8 | 697 | 0.727 |
| | 2 | 35 | 0.9 | 1.8 | 23.2 | 910 | 0.524 |
| | 2 | 50 | 1.0 | 1.8 | 25.8 | 1177 | 0.387 |
| | 2 | 70 | 1.1 | 1.8 | 30.1 | 1643 | 0.268 |
| | 2 | 95 | 1.1 | 1.9 | 34.1 | 2220 | 0.193 |
| | 2 | 120 | 1.2 | 2.0 | 38.2 | 2798 | 0.153 |
| | 2 | 150 | 1.4 | 2.2 | 42.4 | 3415 | 0.124 |
| | 2 | 185 | 1.6 | 2.3 | 47.2 | 4249 | 0.0991 |
| | 2 | 240 | 1.7 | 2.5 | 53.2 | 5530 | 0.0754 |
| | 2 | 300 | 1.8 | 2.6 | 58.8 | 6853 | 0.0601 |
| | 2 | 400 | 2.0 | 2.9 | 66.2 | 8714 | 0.047 |



### Dimension & Electrical Data

| Product ID | No. of Core | Conductor Size | Nom. Insulation Thickness | Nom. Sheath Thickness | Nom. Overall Diameter | Approx. Cable Weight | Max. d.c. Resistance at 20°C |
|---|---|---|---|---|---|---|---|
| | | mm² | mm | mm | mm | kg/km | Ω/km |
| | 3 | 1.5 | 0.7 | 1.8 | 10.1 | 138 | 12.1 |
| | 3 | 2.5 | 0.7 | 1.8 | 11.0 | 177 | 7.41 |
| | 3 | 4 | 0.7 | 1.8 | 12.2 | 238 | 4.61 |
| | 3 | 6 | 0.7 | 1.8 | 13.5 | 312 | 3.08 |
| | 3 | 10 | 0.7 | 1.8 | 16.2 | 460 | 1.83 |
| | 3 | 16 | 0.7 | 1.8 | 18.5 | 656 | 1.15 |
| | 3 | 25 | 0.9 | 1.8 | 22.3 | 976 | 0.727 |
| | 3 | 35 | 0.9 | 1.8 | 25.0 | 1286 | 0.524 |
| | 3 | 35 sh | 0.9 | 1.8 | 20.2 | 1210 | 0.524 |
| | 3 | 50 | 1.0 | 1.8 | 27.8 | 1677 | 0.387 |
| | 3 | 50 sh | 1.0 | 1.8 | 22.6 | 1594 | 0.387 |
| | 3 | 70 | 1.1 | 1.9 | 32.7 | 2412 | 0.268 |
| | 3 | 70 sh | 1.1 | 1.9 | 26.4 | 2276 | 0.268 |
| | 3 | 95 | 1.1 | 2.0 | 37.1 | 3259 | 0.193 |
| | 3 | 95 sh | 1.1 | 2.0 | 29.8 | 3000 | 0.193 |
| | 3 | 120 | 1.2 | 2.1 | 41.3 | 4077 | 0.153 |
| | 3 | 120 sh | 1.2 | 2.1 | 33.0 | 3874 | 0.153 |
| | 3 | 150 | 1.4 | 2.3 | 46.0 | 5008 | 0.124 |
| | 3 | 150 sh | 1.4 | 2.3 | 37.1 | 4637 | 0.124 |
| | 3 | 185 | 1.6 | 2.4 | 51.2 | 6265 | 0.0991 |
| | 3 | 185 sh | 1.6 | 2.4 | 41.3 | 5767 | 0.0991 |
| | 3 | 240 | 1.7 | 2.6 | 57.8 | 8142 | 0.0754 |
| | 3 | 240 sh | 1.7 | 2.6 | 46.4 | 7414 | 0.0754 |
| | 3 | 300 | 1.8 | 2.8 | 64.0 | 10119 | 0.0601 |
| | 3 | 300 sh | 1.8 | 2.8 | 50.4 | 9091 | 0.0601 |
| | 3 | 400 | 2.0 | 3.0 | 71.8 | 12853 | 0.047 |
| | 3 | 400 sh | 2.0 | 3.0 | 60.8 | 12097 | 0.047 |

sh: sector shaped conductor

## Dimension & Electrical Data

| Product ID | No. of Core | Conductor Size | Nom. Insulation Thickness | Nom. Sheath Thickness | Nom. Overall Diameter | Approx. Cable Weight | Max. d.c. Resistance at 20°C |
|---|---|---|---|---|---|---|---|
| | | mm² | mm | mm | mm | kg/km | Ω/km |
| | 4 | 1.5 | 0.7 | 1.8 | 11.0 | 172 | 12.1 |
| | 4 | 2.5 | 0.7 | 1.8 | 12.0 | 223 | 7.41 |
| | 4 | 4 | 0.7 | 1.8 | 13.4 | 304 | 4.61 |
| | 4 | 6 | 0.7 | 1.8 | 14.8 | 403 | 3.08 |
| | 4 | 10 | 0.7 | 1.8 | 17.7 | 594 | 1.83 |
| | 4 | 16 | 0.7 | 1.8 | 20.3 | 856 | 1.15 |
| | 4 | 25 | 0.9 | 1.8 | 24.6 | 1278 | 0.727 |
| | 4 | 35 | 0.9 | 1.8 | 27.9 | 1690 | 0.524 |
| | 4 | 35 sh | 0.9 | 1.8 | 24.3 | 1639 | 0.524 |
| | 4 | 50 | 1.0 | 1.9 | 31.2 | 2244 | 0.387 |
| | 4 | 50 sh | 1.0 | 1.9 | 26.7 | 2159 | 0.387 |
| | 4 | 70 | 1.1 | 2.0 | 36.4 | 3173 | 0.268 |
| | 4 | 70 sh | 1.1 | 2.0 | 31.4 | 3080 | 0.268 |
| | 4 | 95 | 1.1 | 2.1 | 41.3 | 4278 | 0.193 |
| | 4 | 95 sh | 1.1 | 2.1 | 35.7 | 4056 | 0.193 |
| | 4 | 120 | 1.2 | 2.3 | 46.1 | 5471 | 0.153 |
| | 4 | 120 sh | 1.2 | 2.3 | 39.7 | 5245 | 0.153 |
| | 4 | 150 | 1.4 | 2.4 | 51.1 | 6690 | 0.124 |
| | 4 | 150 sh | 1.4 | 2.4 | 44.6 | 6262 | 0.124 |
| | 4 | 185 | 1.6 | 2.6 | 57.1 | 8409 | 0.0991 |
| | 4 | 185 sh | 1.6 | 2.6 | 49.7 | 7807 | 0.0991 |
| | 4 | 240 | 1.7 | 2.8 | 64.4 | 10923 | 0.0754 |
| | 4 | 240 sh | 1.7 | 2.8 | 56.0 | 10027 | 0.0754 |
| | 4 | 300 | 1.8 | 3.0 | 71.3 | 13567 | 0.0601 |
| | 4 | 300 sh | 1.8 | 3.0 | 61.8 | 12326 | 0.0601 |
| | 4 | 400 | 2.0 | 3.3 | 80.2 | 17268 | 0.047 |
| | 4 | 400 sh | 2.0 | 3.2 | 69.5 | 16291 | 0.047 |

sh: sector shaped conductor

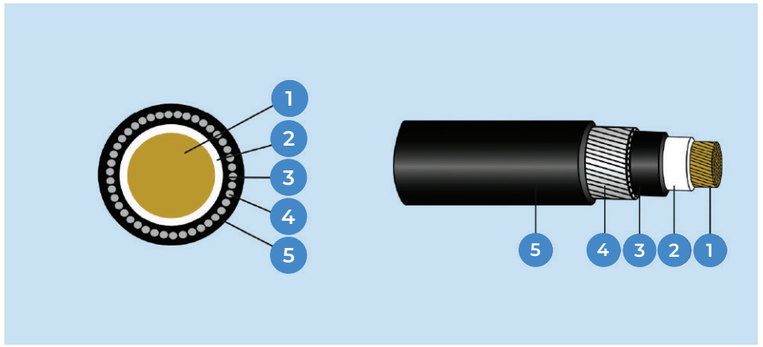


## Dimension & Electrical Data

| Product ID | No. of Core | Conductor Size | Nom. Insulation Thickness | Nom. Sheath Thickness | Nom. Overall Diameter | Approx. Cable Weight | Max. d.c. Resistance at 20°C |
|---|---|---|---|---|---|---|---|
| | | mm² | mm | mm | mm | kg/km | Ω/km |
| | 5 | 1.5 | 0.7 | 1.8 | 11.9 | 183 | 12.1 |
| | 5 | 2.5 | 0.7 | 1.8 | 13.1 | 240 | 7.41 |
| | 5 | 4 | 0.7 | 1.8 | 14.6 | 331 | 4.61 |
| | 5 | 6 | 0.7 | 1.8 | 16.2 | 442 | 3.08 |
| | 5 | 10 | 0.7 | 1.8 | 18.8 | 707 | 1.83 |
| | 5 | 16 | 0.7 | 1.8 | 21.7 | 1028 | 1.15 |
| | 5 | 25 | 0.9 | 1.8 | 26.4 | 1549 | 0.727 |
| | 5 | 35 | 0.9 | 1.8 | 29.8 | 2038 | 0.524 |
| | 5 | 50 | 1.0 | 1.9 | 34.5 | 2774 | 0.387 |
| | 5 | 70 | 1.1 | 2.1 | 40.2 | 3891 | 0.268 |
| | 5 | 95 | 1.1 | 2.2 | 45.4 | 5161 | 0.913 |
| | 7 | 1.5 | 0.7 | 1.8 | 12.8 | 226 | 12.1 |
| | 7 | 2.5 | 0.7 | 1.8 | 14.6 | 302 | 7.41 |
| | 7 | 4.0 | 0.7 | 1.8 | 15.7 | 419 | 4.61 |
| | 12 | 1.5 | 0.7 | 1.8 | 16.2 | 351 | 12.1 |
| | 12 | 2.5 | 0.7 | 1.8 | 18.1 | 478 | 7.41 |
| | 12 | 4.0 | 0.7 | 1.8 | 20.3 | 676 | 4.61 |
| | 19 | 1.5 | 0.7 | 1.8 | 18.8 | 507 | 12.1 |
| | 19 | 2.5 | 0.7 | 1.8 | 20.9 | 704 | 7.41 |
| | 19 | 4.0 | 0.7 | 1.8 | 23.6 | 1006 | 4.61 |
| | 27 | 1.5 | 0.7 | 1.8 | 22.3 | 689 | 12.1 |
| | 27 | 2.5 | 0.7 | 1.8 | 24.9 | 965 | 7.41 |
| | 27 | 4.0 | 0.7 | 1.8 | 28.2 | 1390 | 4.61 |
| | 37 | 1.5 | 0.7 | 1.8 | 24.9 | 901 | 12.1 |
| | 37 | 2.5 | 0.7 | 1.8 | 27.8 | 1274 | 7.41 |
| | 37 | 4.0 | 0.7 | 1.9 | 32.0 | 1881 | 4.61 |
| | 48 | 1.5 | 0.7 | 1.8 | 28.3 | 1139 | 12.1 |
| | 48 | 2.5 | 0.7 | 1.9 | 32.1 | 1634 | 7.41 |

# Single Core CU/XLPE/PVC/AWA/PVC

## XLPE insulated, PVC bedded, AWA armoured, PVC sheathed Cable 0.6/1kV




**Component**

1. Copper Conductor
2. XLPE Insulation
3. PVC Bedding
4. Aluminium Wire Armoured
5. PVC Sheath

**Standards Applied**

Design Guide: BS5467, IEC60502-1
Conductor : IEC60228, BS6360, BS EN 60228
Flame Retardancy: IEC60332-1-2, IEC60332-3-24**,
IEC60332-3-22**

**Electrical Characteristics**

Operating voltage, Uo/U: 600/1000V
Max. operating temperature: 90°C
Final short circuit temperature: 250°C
Test voltage: 3.5kV for 5 minutes

**Installation Guide**

Min. bending radius (mm) : 10 x Cable Overall Diameter
Max. pulling tension (kgf) : 7 x No. of Core x Conductor Size

| Construction | |
|---|---|
| Conductor | Plain annealed copper wire |
| Insulation | An extruded layer of cross-linked polyethylene (XLPE) compound |
| Core Identification | Natural |
| Bedding | An extruded layer of polyvinyl chloride (PVC) compound |
| Bedding Colour | Black |
| Armour | A single layer of aluminium wire armoured (AWA) |
| Outer Sheath | An extruded layer of polyvinyl chloride (PVC) compound |
| Outer Sheath Colour | Black |



## Dimension & Electrical Data

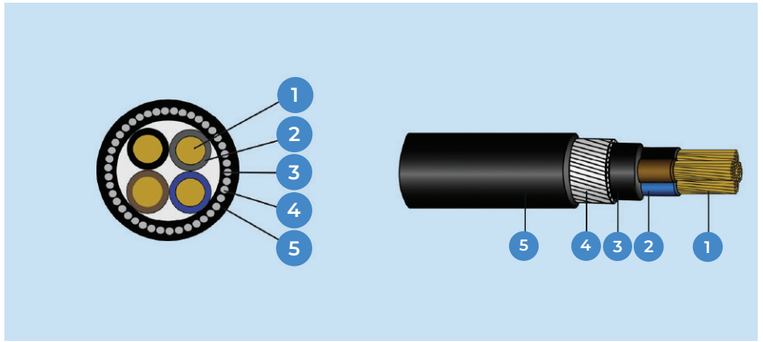
| Pro-duct ID | No. of Core | Conductor Size | Nom. Insulation Thickness | Nom. Dia. after Bedding | Nom. Armour Wire Size | Nom. Sheath Thickness | Nom. Overall Diameter | Approx. Cable Weight | Max. d.c. Resistance at 20°C |
|---|---|---|---|---|---|---|---|---|---|
| | | mm² | mm | mm | mm | mm | mm | kg/km | Ω/km |
| | 1 | 50 | 1.0 | 12.9 | 1.25 | 1.8 | 19.0 | 776 | 0.387 |
| | 1 | 70 | 1.1 | 14.9 | 1.25 | 1.8 | 21.0 | 1020 | 0.268 |
| | 1 | 95 | 1.1 | 16.8 | 1.25 | 1.8 | 22.9 | 1307 | 0.193 |
| | 1 | 120 | 1.2 | 18.6 | 1.6 | 1.8 | 25.4 | 1645 | 0.153 |
| | 1 | 150 | 1.4 | 20.6 | 1.6 | 1.8 | 27.4 | 1951 | 0.124 |
| | 1 | 185 | 1.6 | 22.9 | 1.6 | 1.8 | 29.7 | 2372 | 0.0991 |
| | 1 | 240 | 1.7 | 25.7 | 1.6 | 1.9 | 32.7 | 2999 | 0.0754 |
| | 1 | 300 | 1.8 | 28.3 | 1.6 | 2.0 | 35.5 | 3661 | 0.0601 |
| | 1 | 400 | 2.0 | 32.1 | 2.0 | 2.1 | 40.3 | 4706 | 0.047 |
| | 1 | 500 | 2.2 | 35.6 | 2.0 | 2.2 | 44.0 | 5796 | 0.0366 |
| | 1 | 630 | 2.4 | 40.0 | 2.0 | 2.3 | 48.6 | 7316 | 0.0283 |
| | 1 | 800 | 2.6 | 45.1 | 2.5 | 2.5 | 55.1 | 9696 | 0.0221 |
| | 1 | 1000 | 2.8 | 50.1 | 2.5 | 2.7 | 60.5 | 11600 | 0.0176 |

* Optional

** Available upon request

# 2-, 3-, 4-, 5-, Multicores, CU/XLPE/PVC/SWA/PVC

## XLPE insulated, PVC bedded, SWA armoured, PVC sheathed Cable 0.6/1kV




**Component**

1. Copper Conductor
2. XLPE Insulation
3. PVC Bedding
4. Galvanised Steel Wire Armoured
5. PVC Sheath

**Standards Applied**

Design Guide: BS5467, IEC60502-1
Conductor : IEC60228, BS6360, BS EN 60228
Flame Retardancy: IEC60332-1-2, IEC60332-3-24**,
IEC60332-3-22**

**Electrical Characteristics**

Operating voltage, Uo/U: 600/1000V
Max. operating temperature: 90°C
Final short circuit temperature: 250°C
Test voltage: 3.5kV for 5 minutes

**Installation Guide**

Min. bending radius (mm) : 10 x Cable Overall Diameter
Max. pulling tension (kgf) : 7 x No. of Core x Conductor Size

| Construction | |
|---|---|
| Conductor | Plain annealed copper wire |
| Insulation | An extruded layer of cross-linked polyethylene (XLPE) compound |
| Core Identification | Refer to Appendix F for details |
| Assembly | Cores cabled together, supplied with filler* and covered with polyester (PETP) binder tape* |
| Bedding | An extruded layer of polyvinyl chloride (PVC) compound |
| Bedding Colour | Black |
| Armour | A single layer of steel wire armoured (SWA) |
| Outer Sheath | An extruded layer of polyvinyl chloride (PVC) compound |
| Outer Sheath Colour | Black |



## Dimension & Electrical Data

| Pro-duct ID | No. of Core | Conductor Size | Nom. Insulation Thickness | Nom. Dia. after Bedding | Nom. Armour Wire Size | Nom. Sheath Thickness | Nom. Overall Diameter | Approx. Cable Weight | Max. d.c. Resistance at 20°C |
|---|---|---|---|---|---|---|---|---|---|
| | | $mm^2$ | mm | mm | mm | mm | mm | kg/km | Ω/km |
| | 2 | 1.5 | 0.7 | 8.0 | 0.9 | 1.8 | 13.4 | 332 | 12.1 |
| | 2 | 2.5 | 0.7 | 8.9 | 0.9 | 1.8 | 14.3 | 381 | 7.41 |
| | 2 | 4 | 0.7 | 10.0 | 0.9 | 1.8 | 15.4 | 447 | 4.61 |
| | 2 | 6 | 0.7 | 11.1 | 0.9 | 1.8 | 16.5 | 533 | 3.08 |
| | 2 | 10 | 0.7 | 13.6 | 1.25 | 1.8 | 19.7 | 780 | 1.83 |
| | 2 | 16 | 0.7 | 15.7 | 1.25 | 1.8 | 21.8 | 978 | 1.15 |
| | 2 | 25 | 0.9 | 19.2 | 1.6 | 1.8 | 26.0 | 1457 | 0.727 |
| | 2 | 35 | 0.9 | 21.6 | 1.6 | 1.8 | 28.4 | 1754 | 0.524 |
| | 2 | 50 | 1.0 | 24.2 | 1.6 | 1.8 | 31.0 | 2117 | 0.387 |
| | 2 | 70 | 1.1 | 28.5 | 1.6 | 2.0 | 35.7 | 2770 | 0.268 |
| | 2 | 95 | 1.1 | 32.7 | 2.0 | 2.1 | 40.9 | 3827 | 0.193 |
| | 2 | 120 | 1.2 | 36.4 | 2.0 | 2.2 | 44.8 | 4573 | 0.153 |
| | 2 | 150 | 1.4 | 40.3 | 2.5 | 2.3 | 48.9 | 5351 | 0.124 |
| | 2 | 185 | 1.6 | 45.3 | 2.5 | 2.5 | 55.3 | 7006 | 0.0991 |
| | 2 | 240 | 1.7 | 51.0 | 2.5 | 2.7 | 61.4 | 8588 | 0.0754 |
| | 2 | 300 | 1.8 | 56.8 | 2.5 | 2.8 | 61.4 | 10305 | 0.0601 |
| | 2 | 400 | 2.0 | 63.6 | 2.5 | 3.1 | 74.8 | 12569 | 0.047 |

* Optional

** Available upon request

## Dimension & Electrical Data

| Pro-duct ID | No. of Core | Conductor Size | Nom. Insulation Thickness | Nom. Dia. after Bedding | Nom. Armour Wire Size | Nom. Sheath Thickness | Nom. Overall Diameter | Approx. Cable Weight | Max. d.c. Resistance at 20°C |
|---|---|---|---|---|---|---|---|---|---|
| | | mm² | mm | mm | mm | mm | mm | kg/km | Ω/km |
| | 3 | 1.5 | 0.7 | 8.6 | 0.9 | 1.8 | 14.0 | 365 | 12.1 |
| | 3 | 2.5 | 0.7 | 9.5 | 0.9 | 1. 8 | 14.9 | 425 | 7.41 |
| | 3 | 4 | 0.7 | 10.7 | 0.9 | 1.8 | 16.1 | 515 | 4.61 |
| | 3 | 6 | 0.7 | 12.0 | 0.9 | 1.8 | 17.4 | 616 | 3.08 |
| | 3 | 10 | 0.7 | 14.6 | 1.25 | 1.8 | 20.7 | 936 | 1.83 |
| | 3 | 16 | 0.7 | 16.9 | 1.25 | 1.8 | 23.0 | 1194 | 1.15 |
| | 3 | 25 | 0.9 | 20.7 | 1.6 | 1.8 | 27.5 | 1793 | 0.727 |
| | 3 | 35 | 0.9 | 23.4 | 1.6 | 1.8 | 30.2 | 2198 | 0.524 |
| | 3 | 35 sh | 0.9 | 18.6 | 1.6 | 1.8 | 25.4 | 1950 | 0.524 |
| | 3 | 50 | 1.0 | 26.2 | 1.6 | 1.9 | 33.2 | 2708 | 0.387 |
| | 3 | 50 sh | 1.0 | 20.9 | 1.6 | 1.9 | 27.9 | 2431 | 0.387 |
| | 3 | 70 | 1.1 | 31.3 | 2.0 | 2.0 | 39.3 | 3963 | 0.268 |
| | 3 | 70 sh | 1.1 | 25.0 | 2.0 | 2.1 | 33.2 | 3518 | 0.268 |
| | 3 | 95 | 1.1 | 35.4 | 2.0 | 2.2 | 43.8 | 5019 | 0.193 |
| | 3 | 95 sh | 1.1 | 28.2 | 2.0 | 2.2 | 36.6 | 4398 | 0.193 |
| | 3 | 120 | 1.2 | 39.5 | 2.0 | 2.3 | 48.1 | 6000 | 0.153 |
| | 3 | 120 sh | 1.2 | 31.2 | 2.0 | 2.3 | 39.8 | 5419 | 0.153 |
| | 3 | 150 | 1.4 | 44.2 | 2.5 | 2.5 | 54.2 | 7715 | 0.124 |
| | 3 | 150 sh | 1.4 | 35.2 | 2.5 | 2.5 | 45.2 | 6777 | 0.124 |
| | 3 | 185 | 1.6 | 49.2 | 2.5 | 2.6 | 59.4 | 9264 | 0.0991 |
| | 3 | 185 sh | 1.6 | 39.3 | 2.5 | 2.6 | 49.5 | 8149 | 0.0991 |
| | 3 | 240 | 1.7 | 55.8 | 2.5 | 2.8 | 66.4 | 11544 | 0.0754 |
| | 3 | 240 sh | 1.7 | 44.4 | 2.5 | 2.8 | 55.0 | 10136 | 0.0754 |
| | 3 | 300 | 1.8 | 61.6 | 2.5 | 3.0 | 72.6 | 13870 | 0.0601 |
| | 3 | 300 sh | 1.8 | 48.0 | 2.5 | 3.0 | 59.0 | 12019 | 0.0601 |
| | 3 | 400 | 2.0 | 69.0 | 3.2 | 3.3 | 81.9 | 18039 | 0.047 |
| | 3 | 400 sh | 2.0 | 58.0 | 2.5 | 3.3 | 69.6 | 15650 | 0.047 |

sh: sector shaped conductor



## Dimension & Electrical Data

| Pro-duct ID | No. of Core | Conductor Size | Nom. Insulation Thickness | Nom. Dia. after Bedding | Nom. Armour Wire Size | Nom. Sheath Thickness | Nom. Overall Diameter | Approx. Cable Weight | Max. d.c. Resistance at 20°C |
|---|---|---|---|---|---|---|---|---|---|
| | | mm² | mm | mm | mm | mm | mm | kg/km | Ω/km |
| | 4 | 1.5 | 0.7 | 9.4 | 0.9 | 1.8 | 14.8 | 413 | 12.1 |
| | 4 | 2.5 | 0.7 | 10.4 | 0.9 | 1.8 | 15.8 | 493 | 7.41 |
| | 4 | 4 | 0.7 | 11.8 | 0.9 | 1.8 | 17.2 | 602 | 4.61 |
| | 4 | 6 | 0.7 | 13.2 | 1.25 | 1.8 | 19.3 | 842 | 3.08 |
| | 4 | 10 | 0.7 | 16.1 | 1.25 | 1.8 | 22.2 | 1108 | 1.83 |
| | 4 | 16 | 0.7 | 18.7 | 1.25 | 1.8 | 24.8 | 1453 | 1.15 |
| | 4 | 25 | 0.9 | 23.0 | 1.6 | 1.8 | 29.8 | 2179 | 0.727 |
| | 4 | 35 | 0.9 | 26.2 | 1.6 | 1.9 | 33.2 | 2722 | 0.524 |
| | 4 | 35 sh | 0.9 | 22.7 | 1.6 | 1.9 | 29.7 | 2536 | 0.524 |
| | 4 | 50 | 1.0 | 29.3 | 2.0 | 2.0 | 37.3 | 3651 | 0.387 |
| | 4 | 50 sh | 1.0 | 24.9 | 1.6 | 2.0 | 32.1 | 3136 | 0.387 |
| | 4 | 70 | 1.1 | 34.7 | 2.0 | 2.2 | 43.1 | 4875 | 0.268 |
| | 4 | 70 sh | 1.1 | 29.8 | 2.0 | 2.2 | 38.2 | 4541 | 0.268 |
| | 4 | 95 | 1.1 | 39.4 | 2.0 | 2.3 | 48.0 | 6200 | 0.193 |
| | 4 | 95 sh | 1.1 | 33.8 | 2.0 | 2.3 | 42.4 | 5729 | 0.193 |
| | 4 | 120 | 1.2 | 44.3 | 2.5 | 2.5 | 54.3 | 8179 | 0.153 |
| | 4 | 120 sh | 1.2 | 37.8 | 2.5 | 2.5 | 47.8 | 7529 | 0.153 |
| | 4 | 150 | 1.4 | 49.1 | 2.5 | 2.6 | 59.3 | 9646 | 0.124 |
| | 4 | 150 sh | 1.4 | 42.6 | 2.5 | 2.6 | 52.8 | 8794 | 0.124 |
| | 4 | 185 | 1.6 | 54.7 | 2.5 | 2.8 | 65.3 | 11707 | 0.0991 |
| | 4 | 185 sh | 1.6 | 47.3 | 2.5 | 2.8 | 57.9 | 10632 | 0.0991 |
| | 4 | 240 | 1.7 | 62.0 | 2.5 | 3.0 | 73.0 | 14677 | 0.0754 |
| | 4 | 240 sh | 1.7 | 53.6 | 2.5 | 3.0 | 64.6 | 13251 | 0.0754 |
| | 4 | 300 | 1.8 | 68.5 | 2.5 | 3.2 | 79.9 | 17676 | 0.0601 |
| | 4 | 300 sh | 1.8 | 59.0 | 2.5 | 3.2 | 70.4 | 15896 | 0.0601 |
| | 4 | 400 | 2.0 | 77.2 | 3.2 | 3.5 | 90.5 | 22972 | 0.047 |
| | 4 | 400 sh | 2.0 | 66.9 | 3.2 | 3.5 | 80.2 | 21387 | 0.047 |

sh: sector shaped conductor

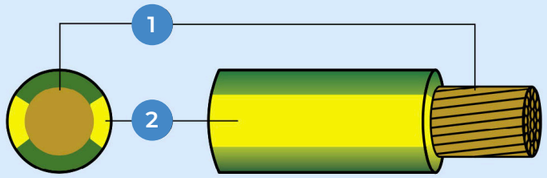
## Dimension & Electrical Data

| Pro-duct ID | No. of Core | Conductor Size | Nom. Insulation Thickness | Nom. Dia. after Bedding | Nom. Armour Wire Size | Nom. Sheath Thickness | Nom. Overall Diameter | Approx. Cable Weight | Max. d.c. Resistance at 20°C |
|---|---|---|---|---|---|---|---|---|---|
| | | $mm^2$ | mm | mm | mm | mm | mm | kg/km | Ω/km |
| | 5 | 1.5 | 0.7 | 10.3 | 0.9 | 1.8 | 15.7 | 444 | 1.15 |
| | 5 | 2.5 | 0.7 | 11.4 | 0.9 | 1.8 | 16.8 | 531 | 0.727 |
| | 5 | 4 | 0.7 | 13.0 | 1.25 | 1.8 | 19.1 | 760 | 0.524 |
| | 5 | 6 | 0.7 | 14.5 | 1.25 | 1.8 | 20.6 | 918 | 0.387 |
| | 5 | 10 | 0.7 | 17.2 | 1.25 | 1.8 | 23.3 | 1256 | 0.268 |
| | 5 | 16 | 0.7 | 20.1 | 1.6 | 1.8 | 26.9 | 1809 | 0.193 |
| | 5 | 25 | 0.9 | 24.8 | 1.6 | 1.8 | 31.6 | 2508 | 0.153 |
| | 5 | 35 | 0.9 | 28.2 | 1.6 | 1.9 | 35.2 | 3130 | 0.124 |
| | 5 | 50 | 1.0 | 32.9 | 2.0 | 2.1 | 41.1 | 4391 | 0.0991 |
| | 5 | 70 | 1.1 | 38.4 | 2.0 | 2.3 | 47.0 | 5780 | 0.0754 |
| | 5 | 95 | 1.1 | 43.3 | 2.5 | 2.4 | 53.6 | 7737 | 0.193 |
| | 7 | 1.5 | 0.7 | 11.2 | 0.9 | 1.8 | 16.6 | 510 | 12.1 |
| | 7 | 2.5 | 0.7 | 12.4 | 1.25 | 1.8 | 18.5 | 718 | 7.41 |
| | 7 | 4 | 0.7 | 14.0 | 1.25 | 1.8 | 20.1 | 875 | 4.61 |
| | 12 | 1.5 | 0.7 | 14.7 | 1.25 | 1.8 | 20.8 | 827 | 12.1 |
| | 12 | 2.5 | 0.7 | 16.5 | 1.25 | 1.8 | 22.6 | 1004 | 7.41 |
| | 12 | 4 | 0.7 | 18.6 | 1.6 | 1.8 | 25.4 | 1417 | 4.61 |
| | 19 | 1.5 | 0.7 | 17.2 | 1.25 | 1.8 | 23.3 | 1056 | 12.1 |
| | 19 | 2.5 | 0.7 | 19.4 | 1.6 | 1.8 | 26.2 | 1464 | 7.41 |
| | 19 | 4 | 0.7 | 21.9 | 1.6 | 1.8 | 28.7 | 1864 | 4.61 |
| | 27 | 1.5 | 0.7 | 20.6 | 1.6 | 1.8 | 27.4 | 1495 | 12.1 |
| | 27 | 2.5 | 0.7 | 23.3 | 1.6 | 1.8 | 30.1 | 1867 | 7.41 |
| | 27 | 4 | 0.7 | 26.5 | 1.6 | 1.9 | 33.5 | 2424 | 4.61 |
| | 37 | 1.5 | 0.7 | 23.2 | 1.6 | 1.8 | 30.0 | 1802 | 12.1 |
| | 37 | 2.5 | 0.7 | 26.2 | 1.6 | 1.9 | 33.2 | 2288 | 7.41 |
| | 37 | 4 | 0.7 | 30.3 | 2.0 | 2.1 | 38.5 | 3351 | 4.61 |
| | 48 | 1.5 | 0.7 | 26.8 | 1.6 | 1.8 | 33.8 | 2173 | 12.1 |
| | 48 | 2.5 | 0.7 | 30.7 | 2.0 | 2.1 | 38.9 | 3122 | 7.41 |



# Single Core CU/LSHF

## Cross-linked polyolefin insulated, Non-sheathed Cable 450/750V




**Component**

1. Copper Conductor
2. LSHF Insulation

**Standards Applied**

Design Guide: BS7211
Conductor: IEC60228, BS6360, BS EN 60228
Flame Retardancy: IEC60332-1-2, IEC60332-3-22
Low Smoke & Reduced Toxidity: IEC60754-1/2, IEC61034-2

**Electrical Characteristics**

Operating voltage, Uo/U: 450/750V
Max. operating temperature: 90°C
Final short circuit temperature: 250°C
Test voltage: 2.5kV for 15 minutes

**Installation Guide**

Min. bending radius (mm) : 6 x Cable Overall Diameter
Max. pulling tension (kgf) : 7 x No. of Core x Conductor Size

| Construction | |
|---|---|
| Conductor | Plain annealed copper wire |
| Insulation | An extruded layer of cross-linked polyolefin , EI5 |
| Core Identification | Black, Red, Green/Yellow, Yellow, Blue, White, Grey, Brown or other |

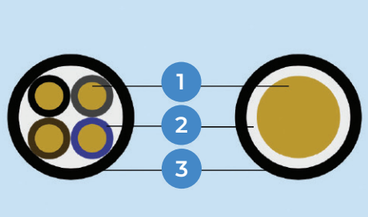
## Dimension & Electrical Data

| Product ID | No. of Core | Conductor Size | Nom. Insulation Thickness | Nom. Overall Diameter | Approx. Cable Weight | Max. d.c. Resistance at 20°C |
|---|---|---|---|---|---|---|
| | | mm² | mm | mm | kg/km | Ω/km |
| | 1 | 1.5 | 0.7 | 3.0 | 22 | 12.1 |
| | 1 | 2.5 | 0.8 | 3.6 | 34 | 7.41 |
| | 1 | 4 | 0.8 | 4.2 | 51 | 4.61 |
| | 1 | 6 | 0.8 | 4.7 | 71 | 3.08 |
| | 1 | 10 | 1.0 | 6.1 | 120 | 1.83 |
| | 1 | 16 | 1.0 | 7.1 | 180 | 1.15 |
| | 1 | 25 | 1.2 | 8.8 | 283 | 0.727 |
| | 1 | 35 | 1.2 | 10.1 | 380 | 0.524 |
| | 1 | 50 | 1.4 | 11.7 | 514 | 0.387 |
| | 1 | 70 | 1.4 | 13.5 | 724 | 0.268 |
| | 1 | 95 | 1.6 | 15.8 | 1000 | 0.193 |
| | 1 | 120 | 1.6 | 17.4 | 1239 | 0.153 |
| | 1 | 150 | 1.8 | 19.4 | 1524 | 0.124 |
| | 1 | 185 | 2.0 | 21.6 | 1910 | 0.0991 |
| | 1 | 240 | 2.2 | 24.7 | 2489 | 0.0754 |
| | 1 | 300 | 2.4 | 27.5 | 3114 | 0.0601 |
| | 1 | 400 | 2.6 | 30.9 | 3965 | 0.0470 |
| | 1 | 500 | 2.8 | 34.4 | 4979 | 0.0366 |
| | 1 | 630 | 2.8 | 38.4 | 6339 | 0.0283 |



# Single Core, 2-, 3-, 4-, 5-, Multicores CU/XLPE/LSHF

## XLPE insulated, LSHF sheathed Cable 0.6/1kV




**Component**

1. Copper Conductor
2. XLPE Insulation
3. LSHF Sheath

**Standards Applied**

Design Guide: IEC60502-1
Conductor: IEC60228, BS6360, BS EN 60228
Flame Retardancy: IEC60332-1-2, IEC60332-3-22
Low Smoke & Reduced Toxidity: IEC60754-1/2, IEC61034-2

**Electrical Characteristics**

Operating voltage, Uo/U: 600/1000V
Max. operating temperature: 90°C
Final short circuit temperature: 250°C
Test voltage: 3.5kV for 5 minutes

**Installation Guide**

Min. bending radius (mm) : 6 x Cable Overall Diameter (Single Core)
Min. bending radius (mm) : 8 x Cable Overall Diameter (2-, 3-, 4-, 5-, multicores)
Max. pulling tension (kgf) : 7 x No. of Core x Conductor Size

| Construction | |
|---|---|
| Conductor | Plain annealed copper wire |
| Insulation | An extruded layer of cross-linked polyethylene (XLPE) compound |
| Core Identification | Refer to Appendix F for details except single core.<br>Single core will come with natural colour insulation. |
| Assembly*** | Cores cabled together, supplied with filler* and covered with polyester (PETP) binder tape* |
| Outer Sheath | A low smoke halogen free (LSHF) compound |
| Outer Sheath Colour | Black |

* Optional
*** Not available for single core cable

## Dimension & Electrical Data

| Product ID | No. of Core | Conductor Size | Nom. Insulation Thickness | Nom. Sheath Thickness | Nom. Overall Diameter | Approx. Cable Weight | Max. d.c. Resistance at 20°C |
|---|---|---|---|---|---|---|---|
| | | mm² | mm | mm | mm | kg/km | Ω/km |
| | 1 | 1.5 | 0.8 | 1.4 | 5.8 | 49 | 12.1 |
| | 1 | 2.5 | 0.7 | 1.4 | 6.2 | 64 | 7.41 |
| | 1 | 4 | 0.7 | 1.4 | 6.8 | 80 | 4.61 |
| | 1 | 6 | 0.7 | 1.4 | 7.3 | 103 | 3.08 |
| | 1 | 10 | 0.7 | 1.4 | 8.5 | 153 | 1.83 |
| | 1 | 16 | 0.7 | 1.4 | 9.5 | 214 | 1.15 |
| | 1 | 25 | 0.9 | 1.4 | 11.2 | 318 | 0.727 |
| | 1 | 35 | 0.9 | 1.4 | 12.5 | 419 | 0.524 |
| | 1 | 50 | 1.0 | 1.4 | 13.7 | 543 | 0.387 |
| | 1 | 70 | 1.1 | 1.4 | 15.7 | 757 | 0.268 |
| | 1 | 95 | 1.1 | 1.5 | 18.0 | 1025 | 0.193 |
| | 1 | 120 | 1.2 | 1.5 | 19.7 | 1275 | 0.153 |
| | 1 | 150 | 1.4 | 1.6 | 21.9 | 1565 | 0.124 |
| | 1 | 185 | 1.6 | 1.6 | 24.2 | 1943 | 0.0991 |
| | 1 | 240 | 1.7 | 1.7 | 27.2 | 2524 | 0.0754 |
| | 1 | 300 | 1.8 | 1.8 | 29.9 | 3140 | 0.0601 |
| | 1 | 400 | 2.0 | 1.9 | 33.6 | 4003 | 0.047 |
| | 1 | 500 | 2.2 | 2.0 | 37.3 | 5000 | 0.0366 |
| | 1 | 630 | 2.4 | 2.2 | 42.0 | 6457 | 0.0283 |
| | 1 | 800 | 2.6 | 2.4 | 47.2 | 8222 | 0.0221 |
| | 1 | 1000 | 2.8 | 2.5 | 52.4 | 10295 | 0.0176 |



## CU/XLPE/PVC, XLPE insulated, PVC sheathed Cable, 0.6/1kV

## 2-, 3-, 4-, 5-, multicores

## Dimension & Electrical Data

| Product ID | No. of Core | Conductor Size | Nom. Insulation Thickness | Nom. Sheath Thickness | Nom. Overall Diameter | Approx. Cable Weight | Max. d.c. Resistance at 20°C |
|---|---|---|---|---|---|---|---|
| | | mm² | mm | mm | mm | kg/km | Ω/km |
| | 2 | 1.5 | 0.7 | 1.8 | 9.6 | 122 | 12.1 |
| | 2 | 2.5 | 0.7 | 1.8 | 10.4 | 152 | 7.41 |
| | 2 | 4 | 0.7 | 1.8 | 11.5 | 198 | 4.61 |
| | 2 | 6 | 0.7 | 1.8 | 12.7 | 255 | 3.08 |
| | 2 | 10 | 0.7 | 1.8 | 15.2 | 347 | 1.83 |
| | 2 | 16 | 0.7 | 1.8 | 17.3 | 484 | 1.15 |
| | 2 | 25 | 0.9 | 1.8 | 20.8 | 708 | 0.727 |
| | 2 | 35 | 0.9 | 1.8 | 23.2 | 922 | 0.524 |
| | 2 | 50 | 1.0 | 1.8 | 25.8 | 1191 | 0.387 |
| | 2 | 70 | 1.1 | 1.8 | 30.1 | 1659 | 0.268 |
| | 2 | 95 | 1.1 | 1.9 | 34.1 | 2240 | 0.193 |
| | 2 | 120 | 1.2 | 2.0 | 38.2 | 2821 | 0.153 |
| | 2 | 150 | 1.4 | 2.2 | 42.4 | 3441 | 0.124 |
| | 2 | 185 | 1.6 | 2.3 | 47.2 | 4281 | 0.0991 |
| | 2 | 240 | 1.7 | 2.5 | 53.2 | 5570 | 0.0754 |
| | 2 | 300 | 1.8 | 2.6 | 58.8 | 6899 | 0.0601 |
| | 2 | 400 | 2.0 | 2.9 | 66.2 | 8771 | 0.047 |

## Dimension & Electrical Data

| Product ID | No. of Core | Conductor Size | Nom. Insulation Thickness | Nom. Sheath Thickness | Nom. Overall Diameter | Approx. Cable Weight | Max. d.c. Resistance at 20°C |
|---|---|---|---|---|---|---|---|
| | | mm² | mm | mm | mm | kg/km | Ω/km |
| | 3 | 1.5 | 0.7 | 1.8 | 10.1 | 143 | 12.1 |
| | 3 | 2.5 | 0.7 | 1.8 | 11.0 | 183 | 7.41 |
| | 3 | 4 | 0.7 | 1.8 | 12.2 | 243 | 4.61 |
| | 3 | 6 | 0.7 | 1.8 | 13.5 | 319 | 3.08 |
| | 3 | 10 | 0.7 | 1.8 | 16.2 | 468 | 1.83 |
| | 3 | 16 | 0.7 | 1.8 | 18.5 | 666 | 1.15 |
| | 3 | 25 | 0.9 | 1.8 | 22.3 | 988 | 0.727 |
| | 3 | 35 | 0.9 | 1.8 | 25.0 | 1299 | 0.524 |
| | 3 | 35 sh | 0.9 | 1.8 | 20.2 | 1220 | 0.524 |
| | 3 | 50 | 1.0 | 1.8 | 27.8 | 1691 | 0.387 |
| | 3 | 50 sh | 1.0 | 1.8 | 22.6 | 1606 | 0.387 |
| | 3 | 70 | 1.1 | 1.9 | 32.7 | 2430 | 0.268 |
| | 3 | 70 sh | 1.1 | 1.9 | 26.4 | 2290 | 0.268 |
| | 3 | 95 | 1.1 | 2.0 | 37.1 | 3281 | 0.193 |
| | 3 | 95 sh | 1.1 | 2.0 | 29.8 | 3017 | 0.193 |
| | 3 | 120 | 1.2 | 2.1 | 41.3 | 4103 | 0.153 |
| | 3 | 120 sh | 1.2 | 2.1 | 33.0 | 3891 | 0.153 |
| | 3 | 150 | 1.4 | 2.3 | 46.0 | 5040 | 0.124 |
| | 3 | 150 sh | 1.4 | 2.3 | 37.1 | 4662 | 0.124 |
| | 3 | 185 | 1.6 | 2.4 | 51.2 | 6302 | 0.0991 |
| | 3 | 185 sh | 1.6 | 2.4 | 41.3 | 5796 | 0.0991 |
| | 3 | 240 | 1.7 | 2.6 | 57.8 | 8187 | 0.0754 |
| | 3 | 240 sh | 1.7 | 2.6 | 46.4 | 7414 | 0.0754 |
| | 3 | 300 | 1.8 | 2.7 | 63.3 | 9852 | 0.0601 |
| | 3 | 300 sh | 1.8 | 2.7 | 52.5 | 9108 | 0.0601 |
| | 3 | 400 | 2.0 | 3 | 71 | 12505 | 0.047 |
| | 3 | 400 sh | 2.0 | 3 | 59.9 | 11635 | 0.047 |



## Dimension & Electrical Data

| Product ID | No. of Core | Conductor Size | Nom. Insulation Thickness | Nom. Sheath Thickness | Nom. Overall Diameter | Approx. Cable Weight | Max. d.c. Resistance at 20°C |
|---|---|---|---|---|---|---|---|
| | | mm² | mm | mm | mm | kg/km | Ω/km |
| | 4 | 1.5 | 0.7 | 1.8 | 11.0 | 178 | 12.1 |
| | 4 | 2.5 | 0.7 | 1.8 | 12.0 | 230 | 7.41 |
| | 4 | 4 | 0.7 | 1.8 | 13.4 | 313 | 4.61 |
| | 4 | 6 | 0.7 | 1.8 | 14.8 | 412 | 3.08 |
| | 4 | 10 | 0.7 | 1.8 | 17.7 | 603 | 1.83 |
| | 4 | 16 | 0.7 | 1.8 | 20.3 | 866 | 1.15 |
| | 4 | 25 | 0.9 | 1.8 | 24.6 | 1291 | 0.727 |
| | 4 | 35 | 0.9 | 1.8 | 27.9 | 1705 | 0.524 |
| | 4 | 35 sh | 0.9 | 1.8 | 24.3 | 1639 | 0.524 |
| | 4 | 50 | 1.0 | 1.9 | 31.2 | 2261 | 0.387 |
| | 4 | 50 sh | 1.0 | 1.9 | 26.7 | 2159 | 0.387 |
| | 4 | 70 | 1.1 | 2.0 | 36.4 | 3195 | 0.268 |
| | 4 | 70 sh | 1.1 | 2.0 | 31.4 | 3080 | 0.268 |
| | 4 | 95 | 1.1 | 2.1 | 41.3 | 4303 | 0.193 |
| | 4 | 95 sh | 1.1 | 2.1 | 35.7 | 4056 | 0.193 |
| | 4 | 120 | 1.2 | 2.3 | 46.1 | 5503 | 0.153 |
| | 4 | 120 sh | 1.2 | 2.3 | 39.7 | 5245 | 0.153 |
| | 4 | 150 | 1.4 | 2.4 | 51.1 | 6727 | 0.124 |
| | 4 | 150 sh | 1.4 | 2.4 | 44.6 | 6262 | 0.124 |
| | 4 | 185 | 1.6 | 2.6 | 57.1 | 8454 | 0.0991 |
| | 4 | 185 sh | 1.6 | 2.6 | 49.7 | 7807 | 0.0991 |
| | 4 | 240 | 1.7 | 2.8 | 64.4 | 10977 | 0.0754 |
| | 4 | 240 sh | 1.7 | 2.8 | 56.0 | 10027 | 0.0754 |
| | 4 | 300 | 1.8 | 3.0 | 71.3 | 13632 | 0.0601 |
| | 4 | 300 sh | 1.8 | 3.0 | 61.8 | 12326 | 0.0601 |
| | 4 | 400 | 2.0 | 3.3 | 80.2 | 17348 | 0.047 |
| | 4 | 400 sh | 2.0 | 3.2 | 69.5 | 16291 | 0.047 |

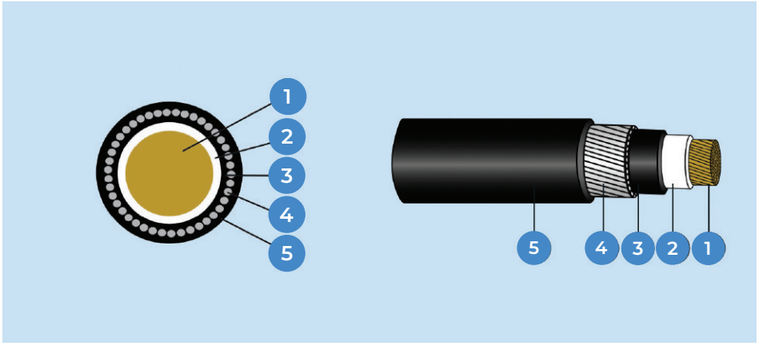
## Dimension & Electrical Data

| Product ID | No. of Core | Conductor Size | Nom. Insulation Thickness | Nom. Sheath Thickness | Nom. Overall Diameter | Approx. Cable Weight | Max. d.c. Resistance at 20°C |
|---|---|---|---|---|---|---|---|
| | | mm² | mm | mm | mm | kg/km | Ω/km |
| | 5 | 1.5 | 0.7 | 1.8 | 11.9 | 189 | 12.1 |
| | 5 | 2.5 | 0.7 | 1.8 | 13.1 | 246 | 7.41 |
| | 5 | 4 | 0.7 | 1.8 | 14.6 | 338 | 4.61 |
| | 5 | 6 | 0.7 | 1.8 | 16.2 | 450 | 3.08 |
| | 5 | 10 | 0.7 | 1.8 | 18.8 | 716 | 1.83 |
| | 5 | 16 | 0.7 | 1.8 | 21.7 | 1040 | 1.15 |
| | 5 | 25 | 0.9 | 1.8 | 26.4 | 1563 | 0.727 |
| | 5 | 35 | 0.9 | 1.8 | 29.8 | 2054 | 0.524 |
| | 5 | 50 | 1.0 | 1.9 | 34.5 | 2795 | 0.387 |
| | 5 | 70 | 1.1 | 2.1 | 40.2 | 3916 | 0.268 |
| | 5 | 95 | 1.1 | 2.2 | 45.2 | 5204 | 0.193 |
| | 7 | 1.5 | 0.7 | 1.8 | 12.8 | 232 | 12.1 |
| | 7 | 2.5 | 0.7 | 1.8 | 14.6 | 309 | 7.41 |
| | 7 | 4.0 | 0.7 | 1.8 | 15.6 | 426 | 4.61 |
| | 12 | 1.5 | 0.7 | 1.8 | 16.2 | 359 | 12.1 |
| | 12 | 2.5 | 0.7 | 1.8 | 18.1 | 488 | 7.41 |
| | 12 | 4.0 | 0.7 | 1.8 | 20.2 | 685 | 4.61 |
| | 19 | 1.5 | 0.7 | 1.8 | 18.8 | 507 | 12.1 |
| | 19 | 2.5 | 0.8 | 1.8 | 22.2 | 715 | 7.41 |
| | 19 | 4.0 | 1.0 | 1.8 | 26.5 | 1247 | 4.61 |
| | 27 | 1.5 | 0.7 | 1.8 | 22.3 | 700 | 12.1 |
| | 27 | 2.5 | 0.7 | 1.8 | 18.1 | 978 | 7.41 |
| | 27 | 4.0 | 0.7 | 1.8 | 28.0 | 1401 | 4.61 |
| | 37 | 1.5 | 0.7 | 1.8 | 24.9 | 913 | 12.1 |
| | 37 | 2.5 | 0.7 | 1.8 | 27.8 | 1288 | 7.41 |
| | 37 | 4.0 | 0.7 | 1.9 | 31.8 | 1895 | 4.61 |
| | 48 | 1.5 | 0.7 | 1.8 | 28.3 | 1155 | 12.1 |
| | 48 | 2.5 | 0.7 | 1.9 | 32.1 | 1652 | 7.41 |



# Single Core CU/XLPE/LSHF/AWA/LSHF

## XLPE insulated, LSHF bedded, AWA armoured, LSHF sheathed Cable 0.6/1kV




**Component**

1. Copper Conductor
2. XLPE Insulation
3. LSHF Bedding
4. Aluminium Wire Armoured
5. LSHF Sheath

**Standards Applied**

Design Guide: BS6724, IEC60502-1
Conductor: IEC60228, BS6360, BS EN 60228
Flame Retardancy: IEC60332-1-2, IEC60332-3-22
Low Smoke & Reduced Toxidity: IEC60754-1/2, IEC61034-2

**Electrical Characteristics**

Operating voltage, Uo/U: 600/1000V
Max. operating temperature: 90°C
Final short circuit temperature: 250°C
Test voltage: 3.5kV for 5 minutes

**Installation Guide**

Min. bending radius (mm): 10 x Cable Overall Diameter
Max. pulling tension (kgf): 7 x No. of Core x Conductor Size

| Construction | |
|---|---|
| Conductor | Plain annealed copper wire |
| Insulation | An extruded layer of cross-linked polyethylene (XLPE) compound |
| Core Identification | Natural |
| Bedding | An extruded layer of low smoke halogen free (LSHF) compound |
| Bedding Colour | Black |
| Armour | A single layer of aluminium wire armoured (AWA) |
| Outer Sheath | An extruded layer of low smoke halogen free (LSHF) compound |
| Outer Sheath Colour | Black |

## Dimension & Electrical Data

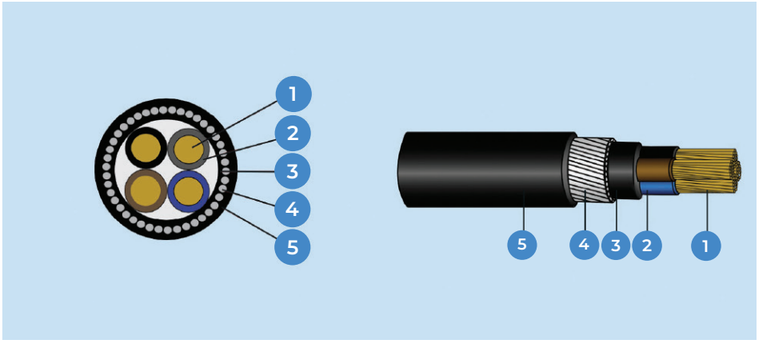
| Pro-duct ID | No. of Core | Conductor Size | Nom. Insulation Thickness | Nom. Dia. after Bedding | Nom. Armour Wire Size | Nom. Sheath Thickness | Nom. Overall Diameter | Approx. Cable Weight | Max. d.c. Resistance at 20°C |
|---|---|---|---|---|---|---|---|---|---|
| | | $mm^2$ | mm | mm | mm | mm | mm | kg/km | Ω/km |
| | 1 | 50 | 1.0 | 12.9 | 1.25 | 1.8 | 19.0 | 745 | 0.387 |
| | 1 | 70 | 1.1 | 14.9 | 1.25 | 1.8 | 21.0 | 986 | 0.268 |
| | 1 | 95 | 1.1 | 16.8 | 1.25 | 1.8 | 22.9 | 1279 | 0.193 |
| | 1 | 120 | 1.2 | 18.6 | 1.6 | 1.8 | 25.4 | 1552 | 0.153 |
| | 1 | 150 | 1.4 | 20.6 | 1.6 | 1.8 | 27.4 | 1959 | 0.124 |
| | 1 | 185 | 1.6 | 22.9 | 1.6 | 1.8 | 29.7 | 2396 | 0.0991 |
| | 1 | 240 | 1.7 | 25.7 | 1.6 | 1.9 | 32.7 | 3010 | 0.0754 |
| | 1 | 300 | 1.8 | 28.3 | 1.6 | 2.0 | 35.5 | 3674 | 0.0601 |
| | 1 | 400 | 2.0 | 32.1 | 2.0 | 2.1 | 40.3 | 4725 | 0.047 |
| | 1 | 500 | 2.2 | 35.6 | 2.0 | 2.2 | 44.0 | 5817 | 0.0366 |
| | 1 | 630 | 2.4 | 40.0 | 2.0 | 2.3 | 48.6 | 7354 | 0.0283 |
| | 1 | 800 | 2.6 | 45.1 | 2.5 | 2.5 | 55.1 | 9432 | 0.0221 |
| | 1 | 1000 | 2.8 | 50.1 | 2.5 | 2.7 | 60.5 | 11613 | 0.0176 |

* Optional



# 2-, 3-, 4-, 5-, Multicores, CU/XLPE/LSHF/SWA/LSHF

## XLPE insulated, LSHF bedded, SWA armoured, LSHF sheathed Cable 0.6/1kV




**Component**

1. Copper Conductor
2. XLPE Insulation
3. LSHF Bedding
4. Galvanised Steel Wire Armoured
5. LSHF Sheath

**Standards Applied**

Design Guide: BS6724, IEC60502-1
Conductor: IEC60228, BS6360, BS EN 60228
Flame Retardancy: IEC60332-1-2, IEC60332-3-22
Low Smoke & Reduced Toxidity : IEC60754-1/2, IEC61034-2

**Electrical Characteristics**

Operating voltage, Uo/U: 600/1000V
Max. operating temperature: 90°C
Final short circuit temperature: 250°C
Test voltage: 3.5kV for 5 minutes

**Installation Guide**

Min. bending radius (mm): 10 x Cable Overall Diameter
Max. pulling tension (kgf): 7 x No. of Core x Conductor Size

| Construction | |
|---|---|
| Conductor | Plain annealed copper wire |
| Insulation | An extruded layer of cross-linked polyethylene (XLPE) compound |
| Core Identification | Refer to Appendix F for details |
| Assembly | Cores cabled together, supplied with filler* and covered with polyester (PETP) binder tape* |
| Bedding | An extruded layer of low smoke halogen free (LSHF) compound |
| Bedding Colour | Black |
| Armour | A single layer of galvanised steel wire armour (SWA) |
| Outer Sheath | An extruded layer of low smoke halogen free (LSHF) compound |
| Outer Sheath Colour | Black |

* Optional

## Dimension & Electrical Data

| Pro-duct ID | No. of Core | Conductor Size | Nom. Insulation Thickness | Nom. Dia. after Bedding | Nom. Armour Wire Size | Nom. Sheath Thickness | Nom. Overall Diameter | Approx. Cable Weight | Max. d.c. Resistance at 20°C |
|---|---|---|---|---|---|---|---|---|---|
| | | mm² | mm | mm | mm | mm | mm | kg/km | Ω/km |
| | 2 | 1.5 | 0.7 | 8.0 | 0.9 | 1.8 | 13.4 | 292 | 12.1 |
| | 2 | 2.5 | 0.7 | 8.9 | 0.9 | 1.8 | 14.3 | 341 | 7.41 |
| | 2 | 4 | 0.7 | 10.0 | 0.9 | 1.8 | 15.4 | 410 | 4.61 |
| | 2 | 6 | 0.7 | 11.1 | 0.9 | 1.8 | 16.5 | 493 | 3.08 |
| | 2 | 10 | 0.7 | 13.6 | 1.25 | 1.8 | 19.7 | 749 | 1.83 |
| | 2 | 16 | 0.7 | 15.7 | 1.25 | 1.8 | 21.8 | 943 | 1.15 |
| | 2 | 25 | 0.9 | 19.2 | 1.6 | 1.8 | 26.0 | 1268 | 0.727 |
| | 2 | 35 | 0.9 | 21.6 | 1.6 | 1.8 | 28.4 | 1761 | 0.524 |
| | 2 | 50 | 1.0 | 24.2 | 1.6 | 1.8 | 31.0 | 2141 | 0.387 |
| | 2 | 70 | 1.1 | 28.5 | 1.6 | 2.0 | 35.7 | 2781 | 0.268 |
| | 2 | 95 | 1.1 | 32.7 | 2.0 | 2.1 | 40.9 | 3868 | 0.193 |
| | 2 | 120 | 1.2 | 36.4 | 2.0 | 2.2 | 44.8 | 4593 | 0.153 |
| | 2 | 150 | 1.4 | 40.3 | 2.0 | 2.3 | 48.9 | 5408 | 0.124 |
| | 2 | 185 | 1.6 | 45.3 | 2.5 | 2.5 | 55.3 | 7039 | 0.0991 |
| | 2 | 240 | 1.7 | 51.0 | 2.5 | 2.7 | 61.4 | 8640 | 0.0754 |
| | 2 | 300 | 1.8 | 56.8 | 2.5 | 2.8 | 67.4 | 10322 | 0.0601 |
| | 2 | 400 | 2.0 | 63.6 | 2.5 | 3.1 | 74.8 | 12599 | 0.047 |

* Optional
** Available upon request



## Dimension & Electrical Data

| Pro-duct ID | No. of Core | Conductor Size | Nom. Insulation Thickness | Nom. Dia. after Bedding | Nom. Armour Wire Size | Nom. Sheath Thickness | Nom. Overall Diameter | Approx. Cable Weight | Max. d.c. Resistance at 20°C |
|---|---|---|---|---|---|---|---|---|---|
| | | mm² | mm | mm | mm | mm | mm | kg/km | Ω/km |
| | 3 | 1.5 | 0.7 | 8.6 | 0.9 | 1.8 | 14.0 | 320 | 12.1 |
| | 3 | 2.5 | 0.7 | 9.5 | 0.9 | 1.8 | 14.9 | 383 | 7.41 |
| | 3 | 4 | 0.7 | 10.7 | 0.9 | 1.8 | 16.1 | 466 | 4.61 |
| | 3 | 6 | 0.7 | 12.0 | 0.9 | 1.8 | 17.4 | 565 | 3.08 |
| | 3 | 10 | 0.7 | 14.6 | 1.25 | 1.8 | 20.7 | 890 | 1.83 |
| | 3 | 16 | 0.7 | 16.9 | 1.25 | 1.8 | 23.0 | 1157 | 1.15 |
| | 3 | 25 | 0.9 | 20.7 | 1.6 | 1.8 | 27.5 | 1797 | 0.727 |
| | 3 | 35 | 0.9 | 23.4 | 1.6 | 1.8 | 30.2 | 2199 | 0.524 |
| | 3 | 35 sh | 0.9 | 18.6 | 1.6 | 1.8 | 25.4 | 2020 | 0.524 |
| | 3 | 50 | 1.0 | 26.2 | 1.6 | 1.9 | 33.2 | 2695 | 0.387 |
| | 3 | 50 sh | 1.0 | 20.9 | 1.6 | 1.9 | 27.9 | 2489 | 0.387 |
| | 3 | 70 | 1.1 | 31.3 | 2.0 | 2.0 | 39.3 | 3549 | 0.268 |
| | 3 | 70 sh | 1.1 | 25.0 | 2.0 | 2.1 | 33.2 | 3321 | 0.268 |
| | 3 | 95 | 1.1 | 35.4 | 2.0 | 2.2 | 43.8 | 4929 | 0.193 |
| | 3 | 95 sh | 1.1 | 28.2 | 2.0 | 2.2 | 36.6 | 4503 | 0.193 |
| | 3 | 120 | 1.2 | 39.5 | 2.0 | 2.3 | 48.1 | 5931 | 0.153 |
| | 3 | 120 sh | 1.2 | 31.2 | 2.0 | 2.3 | 39.8 | 5512 | 0.153 |
| | 3 | 150 | 1.4 | 44.2 | 2.5 | 2.5 | 54.2 | 7618 | 0.124 |
| | 3 | 150 sh | 1.4 | 35.2 | 2.5 | 2.5 | 45.2 | 6905 | 0.124 |
| | 3 | 185 | 1.6 | 49.2 | 2.5 | 2.6 | 59.4 | 9121 | 0.0991 |
| | 3 | 185 sh | 1.6 | 39.3 | 2.5 | 2.6 | 49.5 | 8247 | 0.0991 |
| | 3 | 240 | 1.7 | 55.8 | 2.5 | 2.8 | 66.4 | 11347 | 0.0754 |
| | 3 | 240 sh | 1.7 | 44.4 | 2.5 | 2.8 | 55.0 | 10201 | 0.0754 |
| | 3 | 300 | 1.8 | 61.6 | 2.5 | 3.0 | 72.6 | 13699 | 0.0601 |
| | 3 | 300 sh | 1.8 | 48.0 | 2.5 | 3.0 | 59.0 | 12158 | 0.0601 |
| | 3 | 400 | 2.0 | 69.0 | 3.2 | 3.3 | 81.9 | 16833 | 0.047 |
| | 3 | 400 sh | 2.0 | 58.0 | 2.5 | 3.3 | 69.6 | 15458 | 0.047 |

## Dimension & Electrical Data

| Pro-duct ID | No. of Core | Conductor Size | Nom. Insulation Thickness | Nom. Dia. after Bedding | Nom. Armour Wire Size | Nom. Sheath Thickness | Nom. Overall Diameter | Approx. Cable Weight | Max. d.c. Resistance at 20°C |
|---|---|---|---|---|---|---|---|---|---|
| | | mm² | mm | mm | mm | mm | mm | kg/km | Ω/km |
| | 4 | 1.5 | 0.7 | 9.4 | 0.9 | 1.8 | 14.8 | 371 | 12.1 |
| | 4 | 2.5 | 0.7 | 10.4 | 0.9 | 1.8 | 15.8 | 450 | 7.41 |
| | 4 | 4 | 0.7 | 11.8 | 0.9 | 1.8 | 17.2 | 562 | 4.61 |
| | 4 | 6 | 0.7 | 13.2 | 1.25 | 1.8 | 19.3 | 802 | 3.08 |
| | 4 | 10 | 0.7 | 16.1 | 1.25 | 1.8 | 22.2 | 1087 | 1.83 |
| | 4 | 16 | 0.7 | 18.7 | 1.25 | 1.8 | 24.8 | 1427 | 1.15 |
| | 4 | 25 | 0.9 | 23.0 | 1.6 | 1.8 | 29.8 | 2207 | 0.727 |
| | 4 | 35 | 0.9 | 26.2 | 1.6 | 1.9 | 33.2 | 2759 | 0.524 |
| | 4 | 35 sh | 0.9 | 22.7 | 1.6 | 1.9 | 29.7 | 2530 | 0.524 |
| | 4 | 50 | 1.0 | 29.3 | 2.0 | 2.0 | 37.3 | 3257 | 0.387 |
| | 4 | 50 sh | 1.0 | 24.9 | 1.6 | 2.0 | 32.1 | 3127 | 0.387 |
| | 4 | 70 | 1.1 | 34.7 | 2.0 | 2.2 | 43.1 | 4943 | 0.268 |
| | 4 | 70 sh | 1.1 | 29.8 | 2.0 | 2.2 | 38.2 | 4529 | 0.268 |
| | 4 | 95 | 1.1 | 39.4 | 2.0 | 2.3 | 48.0 | 6287 | 0.193 |
| | 4 | 95 sh | 1.1 | 33.8 | 2.0 | 2.3 | 42.4 | 5711 | 0.193 |
| | 4 | 120 | 1.2 | 44.3 | 2.5 | 2.5 | 54.3 | 8112 | 0.153 |
| | 4 | 120 sh | 1.2 | 37.8 | 2.5 | 2.5 | 47.8 | 7483 | 0.153 |
| | 4 | 150 | 1.4 | 49.1 | 2.5 | 2.6 | 59.3 | 9603 | 0.124 |
| | 4 | 150 sh | 1.4 | 42.6 | 2.5 | 2.6 | 52.8 | 8741 | 0.124 |
| | 4 | 185 | 1.6 | 54.7 | 2.5 | 2.8 | 65.3 | 11620 | 0.0991 |
| | 4 | 185 sh | 1.6 | 47.3 | 2.5 | 2.8 | 57.9 | 10568 | 0.0991 |
| | 4 | 240 | 1.7 | 62.0 | 2.5 | 3.0 | 73.0 | 14524 | 0.0754 |
| | 4 | 240 sh | 1.7 | 53.6 | 2.5 | 3.0 | 64.6 | 13142 | 0.0754 |
| | 4 | 300 | 1.8 | 68.5 | 2.5 | 3.2 | 79.9 | 17609 | 0.0601 |
| | 4 | 300 sh | 1.8 | 59.0 | 2.5 | 3.2 | 70.4 | 15768 | 0.0601 |
| | 4 | 400 | 2.0 | 77.2 | 3.2 | 3.5 | 90.5 | 23072 | 0.047 |
| | 4 | 400 sh | 2.0 | 66.9 | 3.2 | 3.5 | 80.2 | 21145 | 0.047 |

sh: sector shaped conductor



## Dimension & Electrical Data

| Pro-duct ID | No. of Core | Conductor Size | Nom. Insulation Thickness | Nom. Dia. after Bedding | Nom. Armour Wire Size | Nom. Sheath Thickness | Nom. Overall Diameter | Approx. Cable Weight | Max. d.c. Resistance at 20°C |
|---|---|---|---|---|---|---|---|---|---|
| | | mm² | mm | mm | mm | mm | mm | kg/km | Ω/km |
| | 5 | 1.5 | 0.7 | 10.3 | 0.9 | 1.8 | 15.7 | 408 | 1.15 |
| | 5 | 2.5 | 0.7 | 11.4 | 0.9 | 1.8 | 16.8 | 493 | 0.727 |
| | 5 | 4 | 0.7 | 13.0 | 1.25 | 1.8 | 19.1 | 624 | 0.524 |
| | 5 | 6 | 0.7 | 14.5 | 1.25 | 1.8 | 20.6 | 879 | 0.387 |
| | 5 | 10 | 0.7 | 17.2 | 1.25 | 1.8 | 23.3 | 1225 | 0.268 |
| | 5 | 16 | 0.7 | 20.1 | 1.6 | 1.8 | 26.9 | 1840 | 0.193 |
| | 5 | 25 | 0.9 | 24.8 | 1.6 | 1.8 | 31.6 | 2546 | 0.153 |
| | 5 | 35 | 0.9 | 28.2 | 1.6 | 1.9 | 35.2 | 3177 | 0.124 |
| | 5 | 50 | 1.0 | 32.9 | 2.0 | 2.1 | 41.1 | 4430 | 0.0991 |
| | 5 | 70 | 1.1 | 38.4 | 2.0 | 2.3 | 47.0 | 5787 | 0.0754 |
| | 5 | 95 | 1.1 | 43.3 | 2.5 | 2.4 | 54 | 7869 | 0.193 |
| | 7 | 1.5 | 0.7 | 11.2 | 0.9 | 1.8 | 16.6 | 464 | 12.1 |
| | 7 | 2.5 | 0.7 | 12.4 | 1.25 | 1.8 | 18.5 | 566 | 7.41 |
| | 7 | 4 | 0.7 | 14.0 | 1.25 | 1.8 | 20.1 | 830 | 4.61 |
| | 12 | 1.5 | 0.7 | 14.7 | 1.25 | 1.8 | 20.8 | 784 | 12.1 |
| | 12 | 2.5 | 0.7 | 16.5 | 1.25 | 1.8 | 22.6 | 970 | 7.41 |
| | 12 | 4 | 0.7 | 18.6 | 1.6 | 1.8 | 25.4 | 1408 | 4.61 |
| | 19 | 1.5 | 0.7 | 17.2 | 1.25 | 1.8 | 23.3 | 1019 | 12.1 |
| | 19 | 2.5 | 0.7 | 19.4 | 1.6 | 1.8 | 26.2 | 1470 | 7.41 |
| | 19 | 4 | 0.7 | 21.9 | 1.6 | 1.8 | 28.7 | 1866 | 4.61 |
| | 27 | 1.5 | 0.7 | 20.6 | 1.6 | 1.8 | 27.4 | 1500 | 12.1 |
| | 27 | 2.5 | 0.7 | 23.3 | 1.6 | 1.8 | 30.1 | 1889 | 7.41 |
| | 27 | 4 | 0.7 | 26.5 | 1.6 | 1.9 | 33.5 | 2481 | 4.61 |
| | 37 | 1.5 | 0.7 | 23.2 | 1.6 | 1.8 | 30.0 | 1808 | 12.1 |
| | 37 | 2.5 | 0.7 | 26.2 | 1.6 | 1.9 | 33.2 | 2298 | 7.41 |
| | 37 | 4 | 0.7 | 30.3 | 2.0 | 2.1 | 38.5 | 3381 | 4.61 |
| | 48 | 1.5 | 0.7 | 26.8 | 1.6 | 1.8 | 33.8 | 2198 | 12.1 |
| | 48 | 2.5 | 0.7 | 30.7 | 2.0 | 2.1 | 38.9 | 3179 | 7.41 |

# Appendix

Page

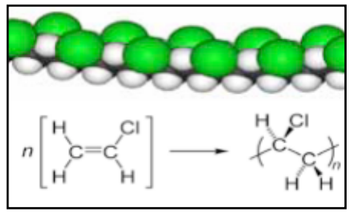
# Appendix A. Materials Introduction

## Insulation

In the manufacture of electric cables, the two most important factors to be considered are safety and reliability. The materials that are selected must be stable, reliable, durable, able to withstand the environment and safe to use. Materials used as insulation for the cables must meet the following;

1. Providing safe insulation of the line conductors with minimum loss in electrical energy.
2. Exhibiting good stable mechanical properties under normal conditions.
3. Possessing consistent electrical and mechanical properties over long period of use and over wide temperature ranges.
4. Exhibiting inert chemical properties which make it resistant to most chemicals.

Extruded insulations used for wire and cable can be classified into two categories, namely Thermoplastic materials and Thermoset materials.



Thermoplastic materials tend to lose their form upon subsequent heating, while thermosetting materials tend to maintain their form. Generally, cables produced with thermoset materials can operate at higher temperature than cables produced with thermoplastic materials. The insulation range includes the beside:

### Thermoplastic

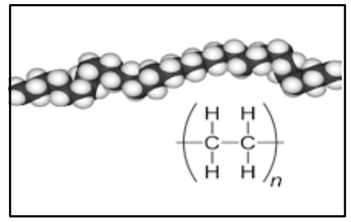
#### a) Polyvinyl Chloride (PVC)

PVC has high electrical strength and good insulation resistance. It is inherently tough and resistant to flame, moisture and abrasion. Resistance to ozone, acids, alkalies, alcohols, and most solvents is also adequate. Compounding can impart resistance to oils and gasoline. Based on the specific formulation, temperature ratings range from 60°C to 105°C. PVC with 70°C temperature rating is most commonly used.

PVC materials are known to emit smoke and form hydrochloride acid (highly toxicated and corrossive chemical) when come in contact with water. Frequently in applications where smoke is a major hazard (notably in tunnels and rapid transit areas) PVC-free cable insulation such as low smoke halogen free (LSHF, XLEVA) is preferred.

#### b) Polyethylene (PE)

Research has shown that PE exhibits excellent electrical insulating properties, stable mechanical characteristic and resistant to chemicals and moisture.



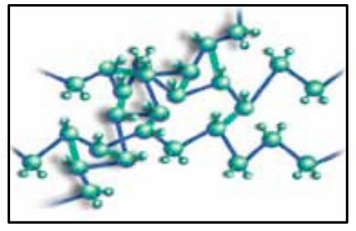
Polyethylene is however not suitable for use under high temperatures. This is mainly due to the molecular structure of the PE polymer which is made up of linear chains of independent PE molecules loosely held together by weak molecular bonds.

These weak molecular bonds break when subjected to temperature above 70°C, causing the individual molecules to slide over one another. The resultant PE polymer starts to change its shape and consistency and become soft plastic-like in nature. For application that required operating temperature higher than 70°C, cross-linked polyethylene (XLPE) is preferred.



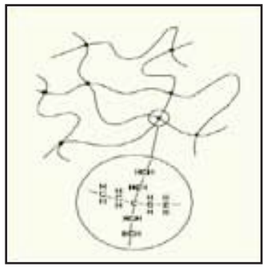
### Thermoset

#### c) Cross-linked Polythylene (XLPE)



The thermoplastic nature of the PE can be converted into a thermally stable thermosetting compound by the process of cross-linking. In the process of cross-linking perpendicular chemical bonds are formed between parallel chains of the PE molecules. The parallel loose two- dimensional molecular structure is converted into a cellular three- dimensional polymeric structure.

The resultant XLPE compound exhibits a durable and excellent insulating material which exhibits the following advantages over the conventional PE material.

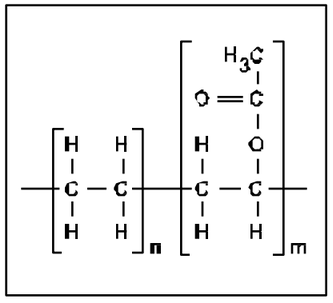


- Suitable for continuous operating temperature up to 90°C.
- High thermal short circuit rating (250°C).
- Excellent electrical properties maintained over the full temperature range.
- Excellent water resistance and low permeability to water.
- Excellent chemical resistance to inorganic salts, oils, alkaline, acids ad organic solvents.
- High durability and long operation life.
- Halogen Free

All these properties have resulted in the rapid growth of preference of XLPE cables in the electrical industry.

#### d) Cross-linked Polyolefin (XLEVA)

EVA compound is a polymer that approaches elastomeric materials in softness and flexibility, yet can be processed like other thermoplastic. The properties is further enhanced to achieve thermal stability by the process of cross-linking to form a cellular three-dimensional polymeric structure.



The resultant XLEVA compound exhibits a more durable and excellent insulating material while maintaining its flexibility. Based on the specific formulation, XLEVA compound can withstand a temperature rating up to 110°C and display an excellent flame retardant capability. It contains no halogen and has a temperature index of more than 250°C which is currently the highest among most insulation materials.

## Table A1
## Comparison for Insulation Materials

| Property | | Unit | Insulation Materials | | | |
|---|---|---|---|---|---|---|
| | | | PVC | PE | XLPE | XLEVA[A] |
| Chemical Name | | | Polyvinyl Chloride | Polyethylene | Cross-linked Polyethylene | Cross-linked Ethylene-vinyl Acetate |
| Max. Rated Temperature | Normal | °C | 70 | 70 | 90 | 110[B] |
| | Short Circuit | °C | 160 | 200 | 250 | 250 |
| Density | | | 1.2 - 1.4 | 0.92 - 0.94 | 0.92 - 0.95 | 1.5 - 1.55 |
| Volume Resistivity | | Ohm-cm | 10E15 | 10E16 | 10E16 | 10E14 |
| Dielectric Constant | | | 3 - 5 | 2.0 - 2.3 | 2.3 - 2.5 | 4 - 6 |
| Tensile Strength | | N/mm2 | 12 - 14 | 12 - 14 | 13 - 18 | 10 - 14 |
| Elongation-at-break | | % | 200 - 450 | 500 - 650 | 200 - 350 | 110 - 200 |
| Flame Retardant Property | | | ++ | + | + | +++ |
| Water resistance | | | ++ | +++ | +++ | +++ |
| Weather resistance | | | ++ | ++ | ++ | ++ |
| Ozone resistance | | | ++ | ++ | ++ | ++ |
| Solvent resistance | | | --- | ++ | + | + |
| Resistance to oil | | | ++ | +++ | +++ | ++ |
| Resistance to heat deformation | | | --- | + | +++ | +++ |

Note:
[A] Named as LSHF for all non-sheathed cables.
[B] Normal type, high temperature rating available upon request.
--- Poor + Fair ++ Good +++ Excellent



**Bedding and Sheathing**

Jacket, also called sheaths, serve several purposes. For examples, they provide mechanical, thermal, chemical, and environmental protection to the insulated conductors they enclose. They may act as electrical insulation when used over shields or armour. They ease installation and routing concerns by enclosing multiple insulated conductors.

Commonly used jacket materials for low voltage power cables include extrusions of Polyvinyl Chloride (PVC), High Density Polyethylene (HDPE), and Low Smoke Halogen Free (LSHF) materials. These materials are applied using plastic extrusion lines that heat the compound to melting point and form it over the core. The material is then cooled in water trough and wound onto a reel.

## Table A2
## Comparison for Bedding/Sheathing Materials

| Property | Unit | Insulation Materials | | |
|---|---|---|---|---|
| | | PVC | HDPE | LSHF |
| Chemical Name | | Polyvinyl Chloride | High Density Polyethylene | Low Smoke Halogen Free |
| Density | | 1.35 - 1.5 | 0.94 - 0.95 | 1.4 - 1.6 |
| Halogen Content | | >20% | <0.5% | <0.5% |
| Halogen Free | | No | Yes | Yes |
| Limiting Oxygen Index (LOI) | | >22 | ≤22 | >30 |
| Smoke Generation | | Dark and dense | Less Smoke | Least Smoke |
| Tensile Strength | N/mm2 | 12 - 14 | 12 - 14 | 13 - 18 |
| Elongation-at-break | % | 200 - 450 | 500 - 650 | 200 - 350 |
| Flame Retardant Property | | ++ | --- | +++ |
| Water resistance | | ++ | +++ | +++ |
| Weather resistance | | ++ | ++ | ++ |
| Ozone resistance | | ++ | ++ | ++ |
| Chemical resistance | | ++ | +++ | ++ |
| Solvent resistance | | ++ | ++ | ++ |
| Resistance to crude oil | | +++ | ++ | +++ |
| Resistance to heat deformation | | --- | + | +++ |

Note: Refer to normal PVC that comply with IEC60332-1-2.
Higher grade PVC available upon request. Higher grade of PVC can achieve higher LOI reading.
--- Poor + Fair ++ Good +++ Excellent

# Appendix B. Selection of Cross-Sectional Area of Conductor

In order to choose the right power cable, one has to consider:

- The current
- The voltage drop
- The short circuit rating
- The installation methods
- The ambient temperature
- The frequency and harmonic current
- Maximum safe length at short circuit

### Current Rating

When electric current flows through the conductor of a cable, the electrical resistance of the conductor generates heat. When a temperature greater than that allowed is reached by the cable due to heat generation, a larger conductor size (with lower electrical resistance) has to be selected. Other important considerations are methods of installation of the cable and ambient temperature. Calculation which takes into account all criteria are described in IEC 60287 and are rather complex. In general, preferences is given to standard current rating tables which are issued by national standardization bureaus.

The current rating given in Table 4 to 14 are based on the following standard conditions of the installation.

1. Maximum operating temperature of conductor = 90°C
2. Ambient air temperature = 30°C
3. Ground temperature = 1°C
4. Soil thermal resistivity = 1.2°C m/w
5. Depth of laying (For cable laid direct in the ground) = 0.5m

### Voltage Drop

Another important factor for the determination of the conductor size is the voltage drop. The voltage drop of the cable at a given current is caused by losses in the cable. In case of a too high voltage drop, it is necessary to choose a bigger conductor size. The voltage drop in a cable demotes the difference in voltage at the beginning and at the end of the cable. It depends on:

- The current carried
- The power factor
- The length of the cable
- The resistance of the cable
- Reactance of the cable

The permissible voltage drop is usually stated as a percentage of the circuit voltage.

According to CP5:1998 regulation 525-01-01, it is stipulated that the total voltage drop for any particular cable run must be such that the voltage drop in the circuit of which the cable forms a part does not exceed 4% of the nominal voltage of the supply.



### Selection of Cable based on Voltage Drop and Current using Tables

Since the actual power factor of the load is usually not known, the most practical approach to the question of the voltage drop is to assume the worst conditions, i.e. power factor equal to one and the conductor is at maximum operating temperature. The voltage drop values given in the tables are based on these assumptions.

The values of the voltage drop (Vd) are tabulated for a current of one Ampere for a 1 metre run, the value of voltage drop needs to be multiplied by the length of the run, in metre, and by the current, in Ampere that the cables are to carry.

$$\mathbf{V = V_{drop} \times I \times L}$$

Where

| | |
|---|---|
| **V** | Voltage (V) |
| $\mathbf{V_{drop}}$ | Approx. Voltage drop (V/Am) |
| **I** | Current (A) |
| **L** | Route Length (m) |

### Example:

Given that the supply voltage is 415V, 3 phase 50Hz and that the cable used is a 4C Cu/mica/XLPE/ SWA/PVC fire resistant cable. Required cable is to be installed in ground and to carry a 250 Amp load per phase over a route length of 100m. Cable installation is to be in compliance with CP5: 1998 Regulation 522.08 regulation.

### Maximum permissible voltage drop

Vmax = 4% of 415V

Vmax = 16.65V

### Voltage drop/ampere/metre

$$V_{drop} = \frac{Vmax.}{I \times L} = \frac{16.6V}{250x100} = \mathbf{0.66mV/Am}$$

Select from Table 10 (pg 43) such that the Vd value is equal to, or less than the calculated 0.66mV, at the same time ensuring that it will carry the current. It will be seen that this value is 0.61 giving a cable size of 70mm2.

# Appendix C. Current Ratings And Voltage Drop Table (Unarmoured Cables)

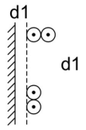
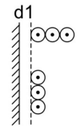
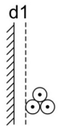
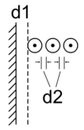
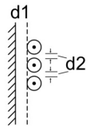
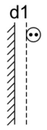
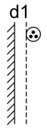
## Cables installed in free air

Plain annealed stranded conductor, mica tape lapping, XLPE insulated, LSF cables, 600/1000V

**Conditions of installation:**

Ambient temperature: 30°C. Maximum Conductor temperature: 90°C

## Table C1

| Nominal area of conductor | Instalation Methods | | | | | | |
|---|---|---|---|---|---|---|---|
| | Single Core Cable | | | | | Multicore Cable | |
| | 2-Single Cores Touching | 2-Single Cores Touching | 3-Single Cores Trefoil | 3-Single Cores Spaced Horizontal | 3-Single Cores Spaced Vertical | 2 Loaded Conductor | 3 Loaded Conductor |
| |  |  |  |  |  |  |  |
| | A | B | C | D | E | F | G |
| (mm²) | (A) | (A) | (A) | (A) | (A) | (A) | (A) |
| 1.5 | 27 | 23 | 22 | 27 | 23 | 26 | 23 |
| 2.5 | 35 | 31 | 30 | 37 | 31 | 36 | 32 |
| 4 | 49 | 42 | 40 | 52 | 44 | 49 | 42 |
| 6 | 63 | 54 | 52 | 67 | 55 | 63 | 54 |
| 10 | 88 | 76 | 73 | 95 | 76 | 86 | 75 |
| 16 | 137 | 100 | 96 | 150 | 112 | 115 | 100 |
| 25 | 161 | 141 | 135 | 182 | 161 | 149 | 127 |
| 35 | 200 | 176 | 169 | 226 | 201 | 185 | 157 |
| 50 | 242 | 215 | 207 | 275 | 246 | 225 | 192 |
| 70 | 310 | 279 | 268 | 353 | 318 | 289 | 246 |
| 95 | 377 | 341 | 328 | 430 | 389 | 352 | 298 |
| 120 | 437 | 399 | 382 | 500 | 454 | 410 | 346 |
| 150 | 504 | 462 | 443 | 577 | 527 | 473 | 399 |
| 185 | 575 | 531 | 509 | 661 | 605 | 542 | 456 |
| 240 | 679 | 631 | 604 | 781 | 719 | 641 | 538 |
| 300 | 783 | 731 | 699 | 902 | 833 | 741 | 620 |
| 400 | 940 | 880 | 839 | 1085 | 1008 | - | - |
| 500 | 1083 | 1006 | 958 | 1253 | 1169 | - | - |
| 630 | 1254 | 1117 | 1077 | 1454 | 1362 | - | - |
| 800 | 1460 | 1262 | 1152 | 1696 | 1595 | - | - |
| 1000 | 1683 | 1432 | 1240 | 1958 | 1847 | - | - |

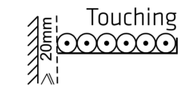
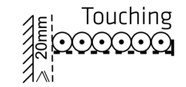
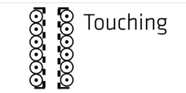
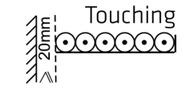
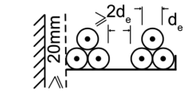
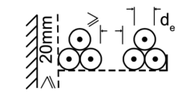
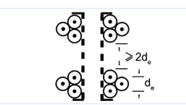
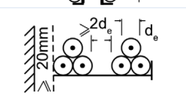
Group installation correction factor for methods A to E, please refer to Table 2
Group installation correction factor for methods F to G, please refer to Table 3
Correction factors for ambient air temperature other than 30 o C, please refer to Table 6
d1: Clearance to wall not less than one cable diameter
d2: Minimum 0.3 times the diameter of cable



## Correction factors for groups of more than one circuit of single core cables

To be used in conjunction with current ratings in Table 4 for single core cables in free air for installation methods A to G.

## Table C2

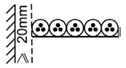
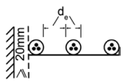
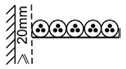
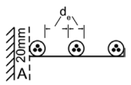
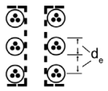
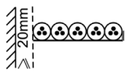
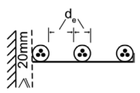
| Installation method (See Note 1) | | | Number of three-phase circuits (Note 4) | | | | Use as a multiplier to rating for |
|---|---|---|---|---|---|---|---|
| | | | Number of trays | 1 | 2 | 3 | |
| Unperforated trays (Note 2) | H |  | 1<br>2<br>3 | 0.95<br>0.92<br>0.90 | 0.90<br>0.85<br>0.80 | 0.85<br>0.80<br>0.75 | Three cables in horizontal formation |
| Perforated trays (Note 2) | J |  | 1<br>2<br>3 | 0.95<br>0.95<br>0.90 | 0.90<br>0.85<br>0.85 | 0.85<br>0.80<br>0.80 | |
| Vertical perforated trays (Note 3) | K |  | 1<br>2 | 0.95<br>0.90 | 0.85<br>0.85 | -<br>- | Three cables in vertical formation |
| Ladder support cleats, etc (Note 2) | L |  | 1<br>2<br>3 | 1.00<br>0.95<br>0.95 | 0.95<br>0.90<br>0.90 | 0.95<br>0.90<br>0.85 | Three cables in horizontal formation |
| Unperforated trays (Note 2) | H |  | 1<br>2<br>3 | 1.00<br>0.95<br>0.95 | 0.95<br>0.90<br>0.90 | 0.95<br>0.85<br>0.85 | Three cables in trefoil formation |
| Perforated trays (Note 2) | J |  | 1<br>2<br>3 | 1.00<br>0.95<br>0.95 | 1.00<br>0.95<br>0.90 | 0.95<br>0.90<br>0.85 | |
| Vertical perforated trays (Note 3) | K |  | 1<br>2 | 1.00<br>1.00 | 0.90<br>0.90 | 0.90<br>0.85 | |
| Ladder supports, cleats, etc (Note 2) | L |  | 1<br>2<br>3 | 1.00<br>0.95<br>0.95 | 1.00<br>0.95<br>0.95 | 1.00<br>0.95<br>0.90 | |

Notes:
1. Factors are given for single layers of cables (for trefoil groups) as shown in the tables and DO NOT apply when cables are installed in more than one layer touching each other. Values for such installations may be significantly lower and must be determined by an appropriate method.
2. Values are given for a vertical spacing between trays of 300mm. For closer spacing the factors should be reduced.
3. Values are given for a horizontal spacing between trays of 225mm with tray mounted back to back. For closer spacing the factors should be reduced.
4. For circuits having more than one cable in parallel per phase, each set of three conductors should be considered as a circuit for the purposes of this table.

## Correction factors for groups of more than one circuit of single core cables

To be used in conjunction with current ratings in Table 4 for single core cables in free air for installation methods A to G.

### Table C3

| Installation Method (See Note 1) | | | Number of Trays | Number of Cables | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | 1 | 2 | 3 | 4 | 6 | 9 |
| Unperforated trays (Note 2) | M |  Touching | 1<br>2<br>3 | 0.95<br>0.95<br>0.95 | 0.85<br>0.85<br>0.85 | 0.80<br>0.75<br>0.75 | 0.75<br>0.75<br>0.70 | 0.70<br>0.70<br>0.65 | 0.70<br>0.65<br>0.60 |
| | |  Spaced | 1<br>2<br>3 | 1.00<br>0.95<br>0.95 | 0.95<br>0.95<br>0.95 | 0.95<br>0.90<br>0.90 | 0.95<br>0.90<br>0.90 | 0.90<br>0.85<br>0.85 | -<br>-<br>- |
| Perforated trays (Note 2) | N |  Touching | 1<br>2<br>3 | 1.00<br>1.00<br>1.00 | 0.90<br>0.85<br>0.85 | 0.80<br>0.80<br>0.80 | 0.80<br>0.75<br>0.75 | 0.75<br>0.75<br>0.70 | 0.75<br>0.70<br>0.65 |
| | |  Spaced | 1<br>2<br>3 | 1.00<br>1.00<br>1.00 | 1.00<br>1.00<br>1.00 | 1.00<br>0.95<br>0.95 | 0.95<br>0.90<br>0.90 | 0.90<br>0.85<br>0.85 | -<br>-<br>- |
| Vertical perforated trays (Note 3) | O |  Touching | 1<br>2 | 1.00<br>1.00 | 0.90<br>0.90 | 0.80<br>0.80 | 0.75<br>0.75 | 0.75<br>0.70 | 0.70<br>0.70 |
| | |  Spaced | 1<br>2 | 1.00<br>1.00 | 0.90<br>0.90 | 0.90<br>0.90 | 0.90<br>0.85 | 0.85<br>0.85 | -<br>- |
| Ladder support cleats, etc (Note 2) | P |  Touching | 1<br>2<br>3 | 1.00<br>1.00<br>1.00 | 0.85<br>0.85<br>0.85 | 0.80<br>0.80<br>0.80 | 0.80<br>0.80<br>0.75 | 0.80<br>0.75<br>0.75 | 0.80<br>0.75<br>0.70 |
| | |  Spaced | 1<br>2<br>3 | 1.00<br>1.00<br>1.00 | 1.00<br>1.00<br>1.00 | 1.00<br>1.00<br>0.95 | 1.00<br>0.95<br>0.95 | 1.00<br>0.95<br>0.95 | -<br>-<br>- |

Notes:
1. Factors apply to single layer groups of cables as shown above and do NOT apply when cables are installed in more than one layer touching each other. Values for such installations may be significantly lower and must be determined by an appropriate method.
2. Values are given for a vertical spacing between trays of 300mm . For closer vertical spacing the factors should be reduced.
3. Values are given for a horizontal spacing between trays of 225mm with trays mounted back to back. For closer spacing the factors should be reduced.



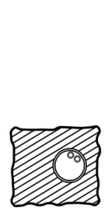
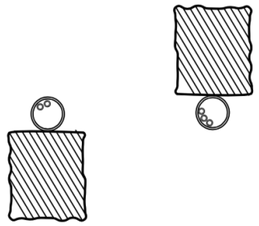
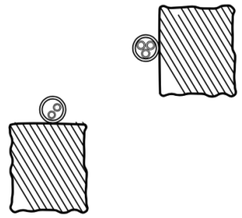
## Cables in conduit and trunking, and bunched cables on a surface

Plain annealed stranded conductor, mica tape lapping, XLPE insulated, LSF cables, 600/1000V

**Conditions of Installation:**

Ambient temperature: 30°C. Maximum conductor temperature: 90°C

### Table C4

| Nominal Area of Conductor | Insulated Conductors in R | | Insulated Conductors in S | | Multicore Cable on a Wall T | |
|---|---|---|---|---|---|---|
| | 2 Loaded Conductor | 3 Loaded Conductor | 2 loaded Conductor | 3 Loaded Conductor | 2 Loaded Conductor | 3 Loaded Conductor |
| |  | |  | |  | |
| (mm²) | Amp | | Amp | | Amp | |
| 1.5 | 19 | 17 | 23 | 20 | 24 | 22 |
| 2.5 | 26 | 23 | 31 | 27 | 33 | 30 |
| 4 | 35 | 31 | 42 | 37 | 45 | 40 |
| 6 | 45 | 40 | 54 | 48 | 58 | 52 |
| 10 | 61 | 54 | 74 | 66 | 80 | 71 |
| 16 | 81 | 73 | 100 | 89 | 107 | 96 |
| 25 | 106 | 95 | 133 | 117 | 138 | 119 |
| 35 | 131 | 117 | 164 | 144 | 171 | 147 |
| 50 | 158 | 141 | 198 | 175 | 210 | 179 |
| 70 | 200 | 179 | 254 | 222 | 269 | 229 |
| 95 | 241 | 216 | 306 | 269 | 328 | 278 |
| 120 | 278 | 249 | 354 | 312 | 382 | 322 |
| 150 | 318 | 285 | - | - | 441 | 371 |
| 185 | 362 | 324 | - | - | 506 | 424 |
| 240 | 424 | 380 | - | - | 599 | 500 |
| 300 | 486 | 435 | - | - | 693 | 576 |
| 400 | 579 | 519 | - | - | 860 | 692 |
| 500 | 664 | 595 | - | - | 994 | 797 |
| 630 | 765 | 685 | - | - | 1155 | 923 |
| 800 | 885 | 792 | - | - | 1349 | 1074 |
| 1000 | 1014 | 908 | - | - | 1560 | 1237 |

For group correction factors, please refer to Table 5
Correction factors for ambient temperatures other than 30°C, refer to Table 6

## Correction Factors for Cables in Conduit and Trunking, and Bunched Cables on a Surface

Correction factors for groups of more than one circuit or more then one multicore cable. To be used in conjunction with ratings for cables in Table C5

## Table C5

| Item | Arrangement of Cables | | Correction factors | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Number of circuits or multicore cables | | | | | | | | | | | | | |
| | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 12 | 14 | 16 | 18 | 20 |
| 1 | Bunched on a surface or enclosed in condult or trunking | | 1.00 | 0.80 | 0.70 | 0.65 | 0.60 | 0.55 | 0.55 | 0.50 | 0.50 | 0.50 | 0.45 | 0.45 | 0.40 | 0.40 | 0.40 |
| 2 | Single-layer wall or floor | Touching | 1.00 | 0.85 | 0.80 | 0.75 | 0.75 | 0.70 | 0.70 | 0.70 | 0.70 | 0.70 | 0.70 | 0.70 | 0.65 | 0.65 | 0.65 |
| 3 | Single-layer wall or floor | Spaced | 1.00 | 0.85 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| 4 | Single-layer under ceiling | Touching | 0.95 | 0.80 | 0.70 | 0.70 | 0.65 | 0.65 | 0.65 | 0.60 | 0.60 | 0.60 | 0.60 | 0.60 | 0.55 | 0.55 | 0.55 |
| 5 | Single-layer under ceiling | Spaced | 0.95 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 |

Notes:

1. These factors are applicable to uniform groups of cables, equally loaded.
2. Where horizontal clearance between adjacent cables exceeds twice their overall diameter, no reduction factor need be applied.
3. “Spaced” cables means a clearance between adjacent surfaces of one cable diameter.
4. The same correction factors are applied to:
   - groups of two or three single-core cables;
   - multicore cables.
5. If a system consists of both two and three core cables, the total number of cables is taken as the number of circuits, and the corresponding correction factor is applied to the tables for two loaded conductors for the two-core cables, and to the tables for three loaded conductors for the three-core cables.
6. If a group consists of n loaded single-core cables it may either be considered as n/2 circcuits of two loaded conductors or n/3 circuits of three loaded conductors.

## Correction Factors for Ambient Air Temperature Other Than 30°C Table C6

| Ambient temperature °C | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 | 55 | 65 | 70 | 75 | 80 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Correction factors | 1.15 | 1.12 | 1.08 | 1.04 | 0.96 | 0.91 | 0.87 | 0.82 | 0.76 | 0.71 | 0.65 | 0.58 | 0.50 | 0.41 |



## Voltage drop table (Unarmoured Cables)

Voltage drop for single core cables per amp per metre

## Table C7

| Nominal area of conductor | For  | | For  | For  | For  |
|---|---|---|---|---|---|
| | AC | DC | | | |
| (mm²) | (mV) | (mV) | (mV) | (mV) | (mV) |
| 1.5 | 30.86 | 30.86 | 26.73 | 26.73 | 26.73 |
| 2.5 | 18.90 | 18.90 | 16.37 | 16.37 | 16.37 |
| 4 | 11.76 | 11.76 | 10.19 | 10.19 | 10.19 |
| 6 | 7.86 | 7.86 | 6.81 | 6.81 | 6.81 |
| 10 | 4.67 | 4.66 | 4.04 | 4.04 | 4.05 |
| 16 | 2.95 | 2.94 | 2.55 | 2.55 | 2.56 |
| 25 | 1.87 | 1.85 | 1.62 | 1.62 | 1.63 |
| 35 | 1.35 | 1.34 | 1.17 | 1.17 | 1.19 |
| 50 | 1.01 | 0.99 | 0.87 | 0.88 | 0.90 |
| 70 | 0.71 | 0.68 | 0.61 | 0.62 | 0.65 |
| 95 | 0.52 | 0.49 | 0.45 | 0.45 | 0.50 |
| 120 | 0.43 | 0.39 | 0.37 | 0.38 | 0.42 |
| 150 | 0.36 | 0.32 | 0.32 | 0.33 | 0.37 |
| 185 | 0.30 | 0.25 | 0.26 | 0.28 | 0.33 |
| 240 | 0.25 | 0.19 | 0.22 | 0.24 | 0.29 |
| 300 | 0.22 | 0.15 | 0.20 | 0.21 | 0.28 |
| 400 | 0.20 | 0.12 | 0.17 | 0.20 | 0.26 |
| 500 | 0.19 | 0.093 | 0.16 | 0.18 | 0.25 |
| 630 | 0.18 | 0.072 | 0.15 | 0.17 | 0.25 |
| 800 | 0.17 | 0.056 | 0.15 | 0.17 | 0.24 |
| 1000 | 0.16 | 0.045 | 0.14 | 0.16 | 0.24 |

## Voltage drop for multi-core cables per amp per metre

### Table C8

| Nominal area of conductor | For Twin-core | | For 3 and 4 cores |
|---|---|---|---|
| | AC | DC | |
| ($mm^2$) | (mV) | (mV) | (mV) |
| 16 | 2.90 | 2.90 | 2.60 |
| 25 | 1.90 | 1.90 | 1.60 |
| 35 | 1.30 | 1.30 | 1.20 |
| 50 | 1.00 | 0.99 | 0.87 |
| 70 | 0.70 | 0.68 | 0.61 |
| 95 | 0.52 | 0.49 | 0.45 |
| 120 | 0.42 | 0.39 | 0.36 |
| 150 | 0.35 | 0.32 | 0.30 |
| 185 | 0.29 | 0.25 | 0.25 |
| 240 | 0.24 | 0.19 | 0.21 |
| 300 | 0.21 | 0.15 | 0.19 |

# Appendix D. Current Ratings And Voltage Drop Table (Armoured Cable)

Cables laid direct in ground

## Single-core cables

Plain annealed stranded copper conductor, mica tape lapping, XLPE insulated, Aluminium or copper wire armoured, LSF cables, 600/1000V

### Table D1

| Nominal Area of Conductor | Single Core (Aluminium wire armoured) | | | | | |
|---|---|---|---|---|---|---|
| | Two cables touching | | | | Three cables trefoil (touching) 3-phase | |
| | Single-phase (AC) | | DC | | | |
| | Current rating | Approx volt drop per Amp per metre | Current rating | Approx volt drop per Amp per metre | Current rating | Approx volt drop per Amp per metre |
| ($mm^2$) | Amp | mV | Amp | mV | Amp | mV |
| 50 | 275 | 0.99 | 275 | 0.99 | 235 | 0.86 |
| 70 | 340 | 0.70 | 340 | 0.68 | 290 | 0.61 |
| 95 | 405 | 0.53 | 410 | 0.49 | 345 | 0.46 |
| 120 | 460 | 0.43 | 470 | 0.39 | 390 | 0.37 |
| 150 | 510 | 0.37 | 530 | 0.32 | 435 | 0.32 |
| 185 | 580 | 0.31 | 600 | 0.25 | 490 | 0.27 |
| 240 | 670 | 0.26 | 690 | 0.19 | 560 | 0.23 |
| 300 | 750 | 0.24 | 790 | 0.15 | 630 | 0.21 |
| 400 | 830 | 0.21 | 910 | 0.12 | 700 | 0.19 |
| 500 | 910 | 0.20 | 1030 | 0.093 | 770 | 0.18 |
| 630 | 1000 | 0.19 | 1200 | 0.072 | 840 | 0.17 |
| 800 | 1117 | 0.18 | 1422 | 0.056 | 931 | 0.16 |
| 1000 | 1254 | 0.17 | 1683 | 0.045 | 1038 | 0.15 |



## Twin and Multi Core

Plain annealed stranded copper conductor, mica tape lapping, XLPE insulated LSF bedded, Galvanised steel wire armoured, LSF sheathed cables, 600/1000V

### Table D2

| Nominal Area of Conductor | Single Core (Aluminium wire armoured) | | | | | |
|---|---|---|---|---|---|---|
| | Two cables touching | | | | Three cables trefoil (touching) 3-phase | |
| | Single-phase (AC) | | DC | | | |
| | Current rating | Approx volt drop per Amp per metre | Current rating | Approx volt drop per Amp per metre | Current rating | Approx volt drop per Amp per metre |
| ($mm^2$) | Amp | mV | Amp | mV | Amp | mV |
| 16 | 140 | 2.90 | 140 | 2.90 | 115 | 2.60 |
| 25 | 180 | 1.90 | 180 | 1.90 | 150 | 1.60 |
| 35 | 215 | 1.30 | 215 | 1.30 | 180 | 1.20 |
| 50 | 255 | 1.00 | 255 | 0.99 | 215 | 0.87 |
| 70 | 315 | 0.70 | 315 | 0.68 | 265 | 0.61 |
| 95 | 380 | 0.52 | 380 | 0.49 | 315 | 0.45 |
| 120 | 430 | 0.42 | 435 | 0.39 | 360 | 0.36 |
| 150 | 480 | 0.35 | 490 | 0.32 | 405 | 0.30 |
| 185 | 540 | 0.29 | 560 | 0.25 | 460 | 0.25 |
| 240 | 630 | 0.24 | 650 | 0.19 | 530 | 0.21 |
| 300 | 700 | 0.21 | 740 | 0.15 | 590 | 0.19 |

For group correction factors, please refer to Table D4. Correction factors for ground temperatures other than 15°C, refer to Table D6

**Conditions of installation (for Table D1 & D2):**

Ground temperature : 15°C

Depth of laying : 0.5m

Soil thermal resistivity : 1.2°C m/w

Maximum conductor operating temperature at rated current : 90°C

Note:

Ratings given are for single circuits installed thermally independent of any other heat source.

## Cables run in single way ducts

Plain annealed stranded copper conductor, mica tape lapping, XLPE insulated, armoured, LSF cables, 600/1000V

### Table D3

| Nominal Area of Conductor | Single Core | | | | Two-Core | | Two-Core | |
|---|---|---|---|---|---|---|---|---|
| | Two cables ducts touching | | Three cables ducts touching, Trefoil | | | | | |
| | Current rating | Approx volt drop per Amp per metre | Current rating | Approx volt drop per Amp per metre | Current rating | Approx volt drop per Amp per metre | Current rating | Approx volt drop per Amp per metre |
| ($mm^2$) | Amp | mV | Amp | mV | Amp | mV | Amp | mV |
| 16 | - | - | - | - | 115 | 2.90 | 94 | 2.6 |
| 25 | - | - | - | - | 145 | 1.90 | 125 | 1.6 |
| 35 | - | - | - | - | 175 | 1.30 | 150 | 1.2 |
| 50 | 255 | 1.10 | 235 | 0.93 | 210 | 1.00 | 175 | 0.87 |
| 70 | 310 | 0.80 | 280 | 0.70 | 260 | 0.70 | 215 | 0.61 |
| 95 | 365 | 0.65 | 330 | 0.56 | 310 | 0.52 | 260 | 0.45 |
| 120 | 410 | 0.55 | 370 | 0.48 | 355 | 0.42 | 300 | 0.36 |
| 150 | 445 | 0.50 | 405 | 0.43 | 400 | 0.35 | 335 | 0.30 |
| 185 | 485 | 0.45 | 440 | 0.39 | 455 | 0.29 | 380 | 0.25 |
| 240 | 550 | 0.40 | 500 | 0.35 | 520 | 0.24 | 440 | 0.21 |
| 300 | 610 | 0.37 | 550 | 0.32 | 590 | 0.21 | 495 | 0.19 |
| 400 | 640 | 0.35 | 580 | 0.30 | - | - | - | - |
| 500 | 690 | 0.33 | 620 | 0.28 | - | - | - | - |
| 630 | 750 | 0.30 | 670 | 0.26 | - | - | - | - |
| 800 | 828 | 0.28 | 735 | 0.24 | - | - | - | - |
| 1000 | 919 | 0.26 | 811 | 0.22 | - | - | - | - |

For group correction factors, please refer to Table D5. Correction factors for ground temperatures other than 15°C, refer to Table D7

**Conditions of installation**

Ground temperature : 15°C
Depth of laying : 0.5m
Soil thermal resistivity : 1.2°C m/w
Maximum conductor operating temperature at rated current : 90°C
Ambient air temperature : 25°C

Note:

* Single core cables are aluminium wire armoured for a.c. systems.

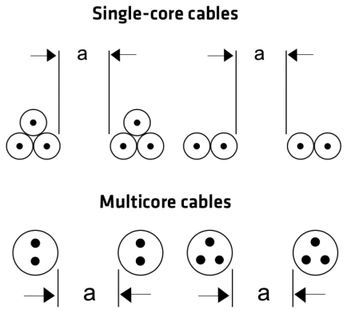
Ratings given are for single circuits installed thermally independent of any other heat source.



## Correction factors for more than one circuit, cables laid directly in the ground

### Table D4

| Number of circuits | Cable to cables clearance (a) | | | | |
|---|---|---|---|---|---|
| | Nil (cables touching) | One cable diameter | 0.215m | 0.25m | 0.5m |
| 2 | 0.75 | 0.80 | 0.85 | 0.90 | 0.90 |
| 3 | 0.65 | 0.70 | 0.15 | 0.80 | 0.85 |
| 4 | 0.60 | 0.60 | 0.70 | 0.75 | 0.80 |
| 5 | 0.55 | 0.55 | 0.65 | 0.70 | 0.80 |
| 6 | 0.50 | 0.55 | 0.60 | 0.70 | 0.80 |

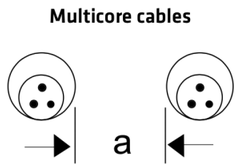



## Correction factors for more than one circuit, cables laid directly in ducts in the ground

### Table D5

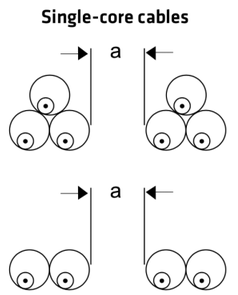
A - Multicore cables in single-way ducts

| Number of cables | Duct to duct clearance (a) | | | |
|---|---|---|---|---|
| | Nil (cables touching) | 0.25m | 0.5m | 1.0m |
| 2 | 0.85 | 0.90 | 0.95 | 0.95 |
| 3 | 0.75 | 0.85 | 0.90 | 0.95 |
| 4 | 0.70 | 0.80 | 0.85 | 0.90 |
| 5 | 0.65 | 0.80 | 0.80 | 0.90 |
| 6 | 0.60 | 0.80 | 0.80 | 0.90 |




B - Single-core cables in single-way ducts

| Number of single-core circuits of two or three cables | Duct to duct clearance (a) | | | |
|---|---|---|---|---|
| | Nil (cables touching) | 0.25m | 0.5m | 1.0m |
| 2 | 0.80 | 0.90 | 0.90 | 0.95 |
| 3 | 0.70 | 0.80 | 0.85 | 0.90 |
| 4 | 0.65 | 0.70 | 0.80 | 0.90 |
| 5 | 0.60 | 0.70 | 0.80 | 0.90 |
| 6 | 0.60 | 0.70 | 0.80 | 0.90 |




## Correction factors for ground temperatures other than 15°C

### Table D6

| Ground Temperature °C | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 |
|---|---|---|---|---|---|---|---|---|---|
| **Correction factor** | 1.03 | 1.00 | 0.97 | 0.93 | 0.89 | 0.86 | 0.82 | 0.76 | 0.72 |

## Maximum Conductor Resistance
## Table D7

| Cross Section Area (S) (mm2) | Conductor for fixed wiring Class 1 (solid) Class 2 (stranded) ohm/km at 20°C |
|---|---|
| 0.50 | 36.0 |
| 0.75 | 24.5 |
| 1.00 | 18.1 |
| 1.50 | 12.1 |
| 2.50 | 7.41 |
| 4 | 4.61 |
| 6 | 3.08 |
| 10 | 1.83 |
| 16 | 1.15 |
| 25 | 0.727 |
| 35 | 0.524 |
| 50 | 0.387 |
| 70 | 0.268 |
| 95 | 0.193 |
| 120 | 0.153 |
| 150 | 0.124 |
| 185 | 0.0991 |
| 240 | 0.0754 |
| 300 | 0.0601 |
| 400 | 0.0470 |
| 500 | 0.0366 |
| 630 | 0.0283 |
| 800 | 0.0221 |
| 1000 | 0.0176 |

## Electrical Characteristics
## Table D8

| Conductor Resistance Temperature Correction Factors | | | |
|---|---|---|---|
| Temp°C | Factor | Temp°C | Factor |
| 10 | 0.961 | 25 | 1.020 |
| 11 | 0.965 | 30 | 1.039 |
| 12 | 0.969 | 35 | 1.059 |
| 13 | 0.972 | 40 | 1.079 |
| 14 | 0.976 | 45 | 1.098 |
| 15 | 0.980 | 50 | 1.118 |
| 16 | 0.984 | 55 | 1.138 |
| 17 | 0.988 | 60 | 1.157 |
| 18 | 0.992 | 65 | 1.177 |
| 19 | 0.996 | 70 | 1.196 |
| 20 | 1.000 | 75 | 1.216 |
| 21 | 1.004 | 80 | 1.236 |
| 22 | 1.008 | 85 | 1.255 |
| 23 | 1.012 | 90 | 1.275 |
| 24 | 1.016 | - | - |

# Appendix E. Short Circuit Ratings

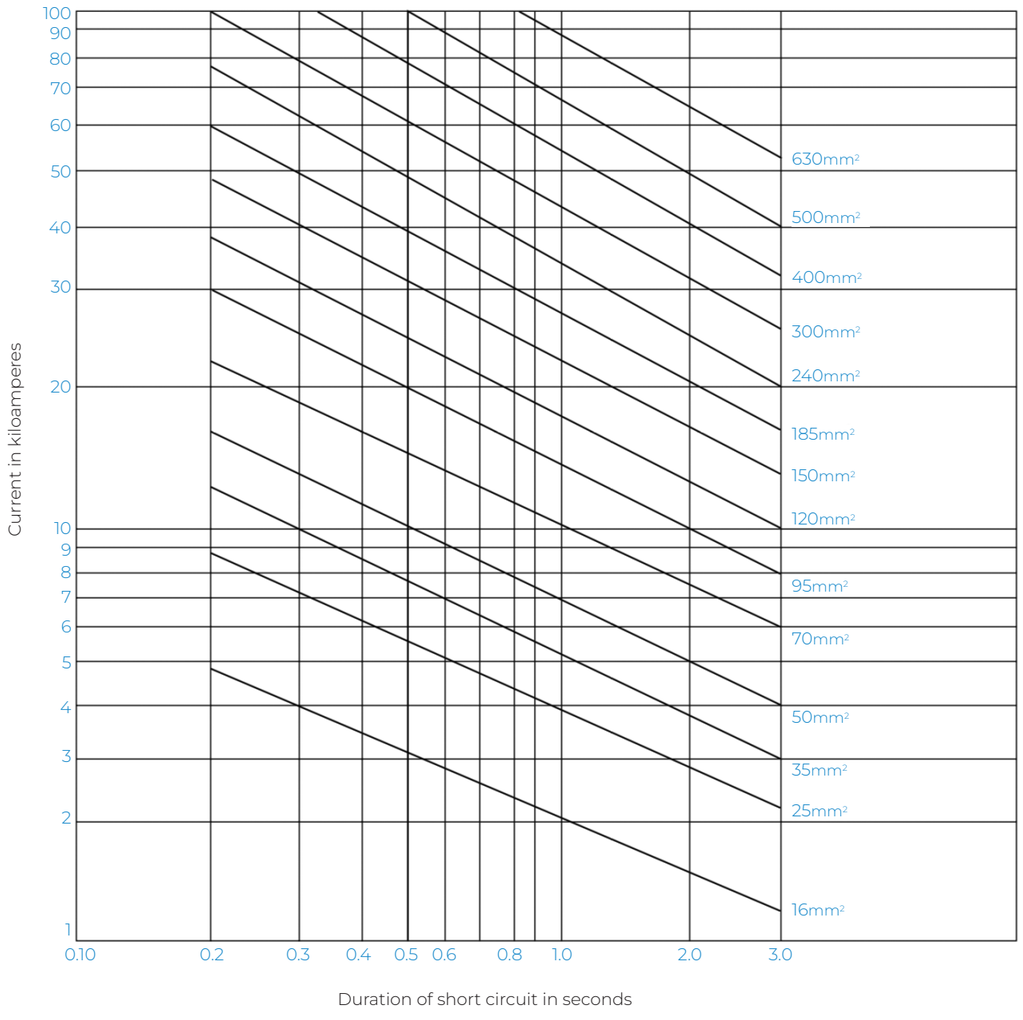
Another important factor for the determination of the conductor size is the maximum allowable current during a short circuit when the maximum allowable conductor temperature is higher than during normal operation.

The maximum permissible short circuit current of XLPE cables up to 1 kV with copper conductors can be calculated with following formula:

$$1k = \frac{S}{\sqrt{t}} \cdot K$$

**1k** Maximum permissible short circuit current
**(A) S** Conductor area (mm2)
**t** Duration of short circuit process (s). Maximum value for t is 5 seconds
**K** Constant of 143 for copper conductors and temperature rising 90°C to 250°C

**Cooper Conductors**






# Appendix F. Cables Drum Handling and Storage Procedure

Minimum bending radius

| Types of cable | Unarmoured | | Environment |
|---|---|---|---|
| Number of cores | Single core | Multicore | |
| 300 / 500V and 600 / 1000V cable | 8ø | 6ø | 10ø |

**Calculating side wall pressure to cable**

Permissible maximum side wall pressure to the cable at bending point during installation is 500kgf/m.

$$\text{Side wall pressure to cable} = \frac{\text{Pulling tension (kgf)}}{\text{Bending radius (m)}} = \frac{T}{R}$$

Permissable maximum pulling tension **T** for copper conductor cables:

T = 7 x (# of cores) x (conductor cross-sectional area)

**Drum handling**

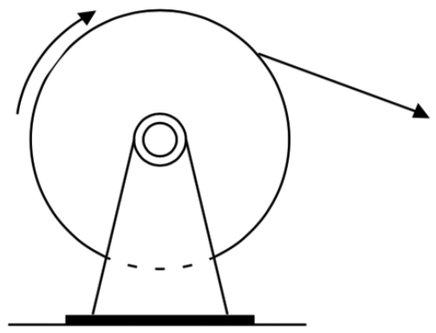
Always handle the drums with care. Here are two points how:

1. Always use a fork-lift truck or crane when removing drums from the vehicle.
2. Always take care to lower the drums into an upright position on their flanges.

**Unwinding Cables**

## DO:

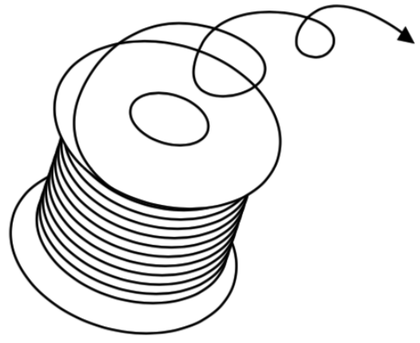
Unwind from the top of the drum.



**Right!**

## DON'T:

Pulling like this causes kinking and possible damage to drum and cable.



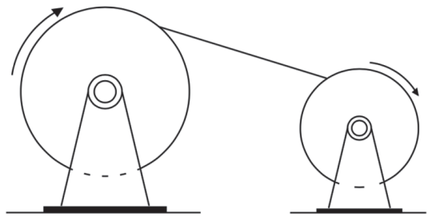
**Wrong!**

## Rewinding Cables/Changing Drums

**Rewinding**

DO:

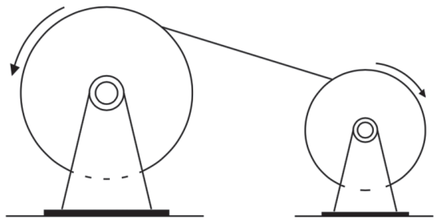
Wind the top part between drums.



**Right!**

DON’T:

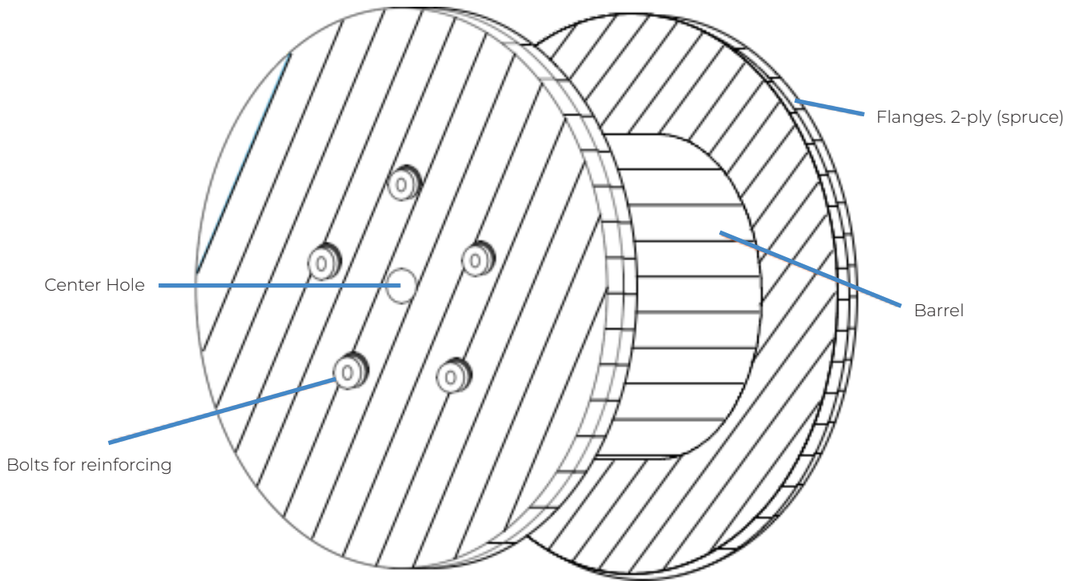
Wind from top to bottom between drums.



**Wrong!**

## Tightening Drum Flanges

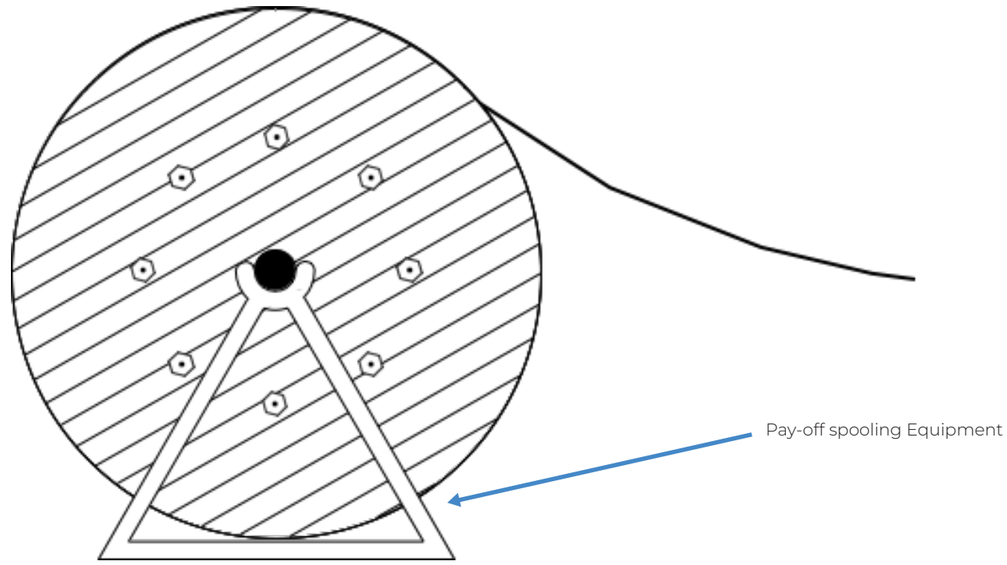
Due to changing weather conditions, wooden drums may slightly shrink or loosen, which requires retightening on the flange bolts, show in diagram.






## Proper Spooling Equipment

Although cables are generally tough, they can still be damaged by impact, pinching or abrasion. Pay-off spooling makes for an easy operation. Through faulty handling, cables may slide or ”crawl”. This can result in pinching or locking, which causes damage.



## Handling with a forklift

### DO:

Face the fork towards the drum front view and across both flanges.

Picture 1a

### DON'T:

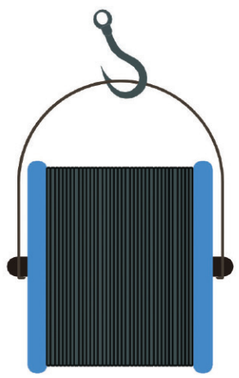
Fork the drum from the side, as it will cause damage to the cables.

Picture 1b

## Handling with a hoist

### DO:

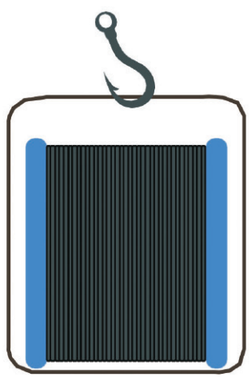
Use a hoist to lift the cable drums, with a steel pipe across the drum centre and a certified sling belt or wire rope.



Picture 2a

### DON'T:

Lay the sling belts over the wood battens, causing damage to both wood battens and cable.



Picture 2b

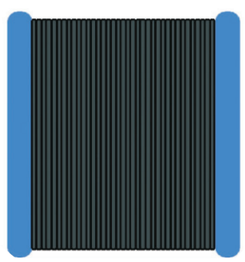


## Storage

1. Cables coiled in the drum must have a minimum 2 inch gap from the flange edge,
2. For open storage, black PVC sheet must be used to wrap and protect the cables.
3. Cable drums must be stored in an upright position.

### DO:

Cable drum in upright position, with 2 inch gap from crum flange edge.



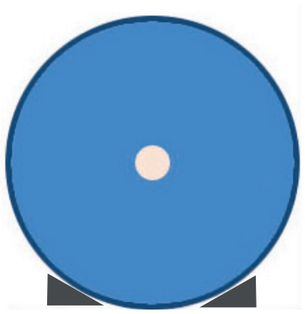
Picture 3a

### DON'T:

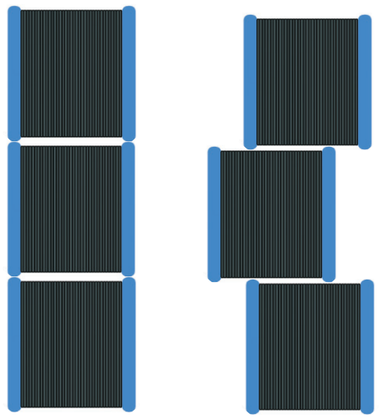
Cable drum laid on one flange side, causing cable sag

Picture 3b

4. Wood chokes should be placed under the flanges to prevent accidental rolling.



5. In vertical storage, drum flanges must be aligned. Misaligned flanges will come into contact with cables, causing damage.

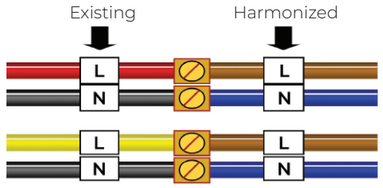


# Appendix G. Identification of Cores in Cables

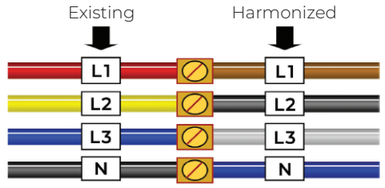
In March 2004, the Amendment No.2: AMD 14905 to BS7671: 2001 (IEE Wiring Rgulations Sixteenth Edition) has been harmonized with the CENELEC Standard HD 384.5.514: Identification including 514.3: Identification of conductor and with CENELEC Harmonization Document HD 308 S2: 2001 Identification of cores in cables and flexible cords.

The change in cable core colours is a major development that will affect the way wiring cable colours are distinguished and installed. Currently, for three phase fixed electrical installations, the wiring cable colours for “line” connections are red, yellow and blue respectively. The new three phase harmonized cable core colours will be brown, black and grey, following that of the new BS 7671: 2008 Requirements for electrical installations, IEE Wiring Regulations, 17th edition. A number of countries in the European Union as well as Hong Kong and Singapore are implementing these harmonized cable core colours.

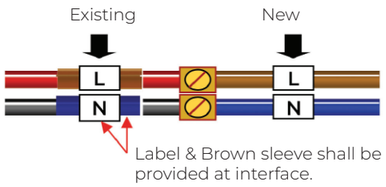
SINGLE-PHASE CIRCUITS




THREE-PHASE CIRCUITS




For any new electrical installation that involved extension from existing wiring system, BS7671 has been modified to align with these cable core colours where suitable marking/ labelling method eg. colour tapes, sleeves, discs, or by alphanumerics (letters and/or numbers) is allowed. See below figure:






## Cable Cores Colour Code

| Function | Alpha-numeric | Existing Core Colour | New Harmonized Core Colour |
|---|---|---|---|
| Protective conductor | | Green / Yellow | Green / Yellow |
| Functional earthing conductor | | Cream | Cream |
| **AC Power Circuit** | | | |
| - Phase | L | Red | Brown |
| - Neutral | N | Black | Blue |
| **Three Phase Circuit** | | | |
| - Phase 1 | L1 | Red | Brown |
| - Phase 2 | L2 | Yellow | Black |
| - Phase 3 | L3 | Blue | Grey |
| - Neutral | N | Black | Blue |
| **DC Two-Wire Unearthed Circuit** | | | |
| - Positive | L+ | Red | Brown |
| - Negative | L- | Black | Grey |
| **DC Two-Wire Earthed Circuit** | | | |
| - Positive (of negative earth) | L+ | Red | Brown |
| - Negative (of negative earth) | M | Black | Blue |
| - Positive (of positive earth) | M | Black | Blue |
| - Negative (of positive earth) | L- | Blue | Grey |
| **DC Three-Wire Circuit** | | | |
| - Positive | L+ | Red | Brown |
| - Mid-wire (may be earthed) | M | Black | Blue |
| - Negative | L- | Blue | Grey |

# Sales & marketing offices

## SINGAPORE

**Prysmian APAC**
**Singapore Cables Manufacturers Pte Ltd**
No 20 Jurong Port Road, Jurong Town
SINGAPORE 619094
Email: sales.asean@prysmian.com
Tel: +65 6265 0707 Fax +65 6265 2226

**Prysmian PowerLink S.R.L.**
**Singapore Branch**
**(Submarine and EHV Systems)**
No 20 Jurong Port Road, Jurong Town
SINGAPORE 619094
Email: sales.asean@prysmian.com
Tel: +65 6461 7800 Fax: +65 6898 3590

## INDONESIA

**PT Prysmian Cables Indonesia**
Perkantoran Hljau Arkadia, Tower F, 7th Floor Suite 701
JI TB 5imatupang Kav 88, Jakarta 12520
INDONESIA
Email: commercial.indonesia@prysmian.com
Tel: +62 21 781 6515 Fax +62 21 781 6504

## MALAYSIA

**Sindutch Cable Manufacturer Sdn Bhd**
Suite 1201-3, Tower 2, Wisma Amfirst Jalan SS7/15 Off,
Jalan Stadium, SS 3, 47301 Petaling Jaya, Selangor
MALAYSIA
Email: scmm@prysmian.com
Tel +60 3 7803 7171 Fax: +60 3 7803 7575

## THAILAND

**MCl-Draka Cable Co Ltd**
2170 Bangkok Tower, Phetchaburi Rd,
Bangkapi, Huai Khwang,
Bangkok 10310
THAILAND
Email: info.th@prysmian.com
Tel: +662 3080 830 Fax: +662 6080 054

## VIETNAM

**Singapore Cables Manufacturers Pte Ltd**
Vietnam Rep Office
Unit 1605, 16th Floor, Havana Tower
132 Ham Nghi Street, Dist 1, HCMC 70000
VIETNAM
Email: sales.asean@prysmian.com
Tel: + 84 28 392 60581 Fax: +84 28 392 60580



# Manufacturing plants

## SINGAPORE

**Singapore Cables Manufacturers Pte Ltd**
**(Warehouse)**
No 20 Jurong Port Road, Jurong Town
SINGAPORE 619094
Email: sales.asean@prysmian.com
Tel: +65 6265 0707 Fax +65 6265 2226

## INDONESIA

**PT Prysmian Cables Indonesia**
Kawasan Industri Indotaisei,. Blok G-1.
Kota Bukit Indah. Cikampek 41373,
Jawa Barat, INDONESIA
Email: commercial.indonesia@prysmian.com
Tel: +62 264 351 222 Fax: +62 264 351 778

## MALAYSIA

**Sindutch Cable Manufacturer Sdn Bhd**
Lot 38. Jalan Industri 11,
Alor Gajah Industrial Estate
78000 Alor Gajah, Melaka
MALAYSIA
Email scmm@prysmian.com
Tel: +60 6 5563 833 Fax. +60 6 5563 282

## THAILAND

**Rayong Factory**
2/7 Ban-bueng Bankhai Road KM 57,
Nongbua Moo 2, Ban Khai, Rayong 21120
THAILAND
Email: info.th@prysmian.com
Tel: +66 38 961 158 Fax: +66 38 961 167

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