



Connecting globally



FLAME-X

Copper Cable Company Ltd.

is the UK subsidiary of Tele-Fonika Kable S.A., with offices and a warehouse centrally located in Leicestershire.

We are a major supplier of housewiring, low voltage, power and fire resistant cables for use in domestic, commercial offices, public buildings and utilities. In addition, we provide bespoke flexible rubber cable solutions for critical temporary power, submersible pumps and trailing cable applications. For the telecommunications sector we supply copper and fibre data cables.

For your cable requirements we have stock available for immediate despatch from our East Midlands warehouse, for larger quantity shipments we can also deliver directly from our factories where substantial stocks are held.

Factory Approvals

Our Flame-x fire resisting cables are designed for life saving fire fighting and detection systems, so it is critically important these cables are designed and manufactured in internationally approved factories. You can trust Tele-Fonika Kable, our factory management systems are approved to ISO9001 for Quality, to ISO14001 for Environmental and OHSAS18001 for Occupational Health & Safety

BASEC, LPCB Approvals

For your safety and peace of mind, our Flame-x fire resisting cables have been tested, verified and approved by the independent third party laboratories of BASEC and LPCB



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Experience and competence of the TELE-FONIKA Kable Group

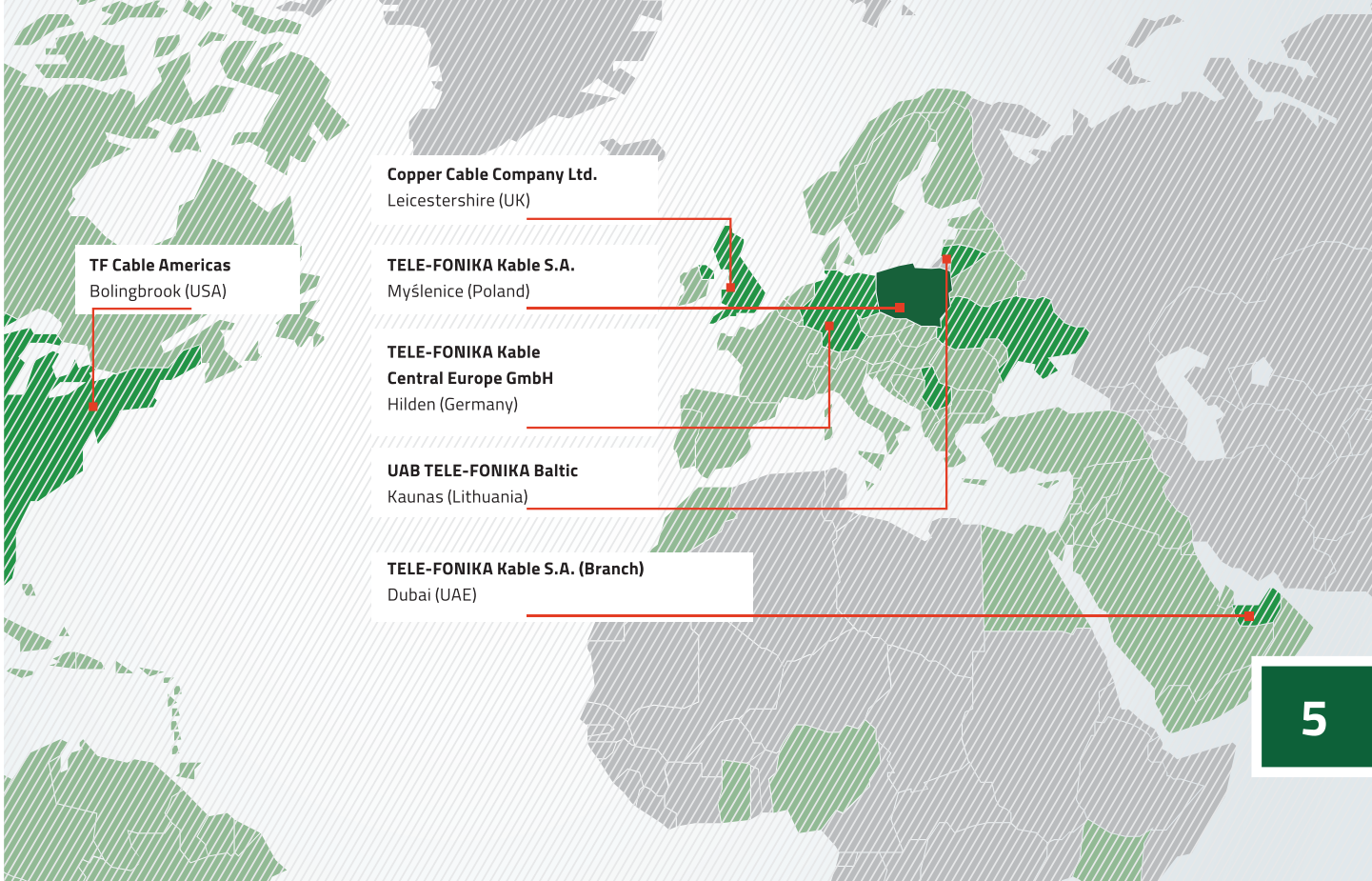
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The Group TELE-FONIKA Kable (TF Kable) is ranked in the forefront of the global cable industry.

The Group is the fourth manufacturer of cables and wires in Europe with significant development potential, based entirely on Polish capital.

TELE-FONIKA Kable Group's considerable investment in research and development centers and multi-skilled work teams, which have included eminent scientists working with our specialists, has been rewarded by the introduction of new-generation products and comprehensive services in the field of cable engineering. Products manufactured in our plants are sold in over 90 countries.

Our product assortment includes 25 thousand cable types. The highest quality of our products is confirmed by over 460 certificates for groups of wares licensed by 34 renowned centres of certifications worldwide. The company combines the good traditions of the cable industry in Poland and innovative technical solutions. TELE-FONIKA Kable Group consists of six plants – four in Poland, one in Ukraine, and one in Serbia. We own over a dozen trade agencies abroad, reaching customers in several dozen countries around the world.



Kraków-Wielicka plant – it produces cables and wires with voltage ranging from 1kV to 30kV, including rubber insulation, used in the extractive industry and wind farms; halogen-free cables and conductors (installed inside buildings); and signaling and control cables for special applications

Kraków-Bieżanów plant – production of overhead lines from alloyed aluminum, silver plated copper conductors for railway traction networks, made on robotic technology lines

Bydgoszcz plant – the largest production center for medium, high and extra high voltage cables in Europe

Myślenice plant – production of copper and fiber optic telecommunication cables, computer cables and car cables

Zajecar plant (Serbia) – production of low and medium voltage cables, signaling and control cables, telecommunication cables, as well as halogen-free cables and wires

Czernihov plant (Ukraine) – production of non-flammable (N)HXH and N2XH cables, self-supporting AsXS_n overhead cables, aluminum and copper wires up to 1kV, including assembly wires

Bukowno-Poland plant (recycling of cable waste)

– it has the recycling capacity of approx. 10 thousand tons of cable waste per year. This allows for the recovery of fractions from individual materials with purity of over 99.5%

Fire Test Laboratory in the Krakow-Wielicka production plant – it is equipped with apparatus that enables to conduct research ranging from basic tests of flame spreading on individual samples to flame spreading tests on bundles.

Furthermore, it is equipped for testing density of emitted fumes and emission of corrosive gases

Laboratory of High and Extreme Voltages in the production plant in Bydgoszcz

– equipped with 4 Faraday cages (three for routine testing and one for cables and cable systems testing) along with a stroke generator and its own research field for qualification tests with 500kV testing systems and 5000A heating transformer sets

FLAME-X 950 SERIES 1

(FLAME-X 950 Single) 600/1000V

Based on EN 50525-3-41 , BS 6387

Single core non-sheathed fire resistant cable having low emission of smoke and corrosive gases when affected by fire

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CONSTRUCTION

| | |
|----------------------------|--|
| Conductors: | Circular or compacted circular, stranded, annealed copper conductor, class 2 acc. to BS EN 60228 |
| Primary insulation: | Fire resistant mica tape with a glass cloth |
| Insulation: | Special thermosetting LSOH compound of EI5 type acc. to BS EN 50363-5 |



CHARACTERISTICS

| | |
|---|---|
| Core identification: | Green/yellow, blue, black, brown, grey, red, yellow. Other colours are available on special request. |
| Maximum conductor operating temperature: | +90°C |
| Lowest installation temperature: | -5°C |
| Maximum short-circuit conductor temperature: | +250°C |
| Minimum bending radius: | 6 × D D – overall diameter of the cable |

FLAME-X 950 SERIES 1

(Flame-X 950 Single) **600/1000V**

Fire performance

| | | |
|---|--|--|
| Fire resistance: | IEC 60331-21 BS 6387 ¹⁾ | Circuit integrity - tested 90 min. at 950°C Category C – resistance to fire: 3 h at 950°C Category W – resistance to fire with water: 15 min at 650°C plus 15 min with water spray Category Z – resistance to fire with mechanical shock: 15 min at 950°C |
| Flame propagation: | BS EN 60332-1-2 | |
| Smoke density: | BS EN 61034-2 | |
| Corrosive and acid gases emission: | BS EN 60754-1 ²⁾ BS EN 60754-2 ²⁾ | HCl content < 0.5% pH ≥ 4.3 & conductivity ≤ 10 μSmm ⁻¹ |

¹⁾ Category C, W, Z for cables up to and including 95 mm². Category C for cables above and including 120 mm².

²⁾ BS EN 60754-1 & BS EN 60754-2 standards replace BS EN 50267-2-1

Applications

For use in fixed installations, where cable is protected by conduit or trunking.
Fire resistant cables intended to provide circuit integrity in case of fire.

| | |
|---------------------------------------|--|
| Standard length cable packing: | 100 m in coils or on spools, or 500 m on drums. Other forms of packing and delivery are available on request. |
|---------------------------------------|--|

Approvals

| | |
|------|--|
| LPCB | 1,5 mm ² to 500 mm ² single-core |
|------|--|

FLAME-X 950 SERIES 1

(Flame-X 950 Single) **600/1000V**

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Technical and Electrical Characteristics

| Nominal cross-sectional area of conductor | Radial thickness of insulation | Approximate overall diameter | Approximate net weight | Maximum resistance of conductor at temperature 20°C |
|---|--------------------------------|------------------------------|------------------------|---|
| mm ² | mm | mm | mm | Ω/km |
| 1.5 | 0.7 | 3.90 | 25.3 | 12.1 |
| 2.5 | 0.8 | 4.60 | 38 | 7.41 |
| 4 | 0.8 | 5.10 | 53 | 4.61 |
| 6 | 0.8 | 5.40 | 71 | 3.08 |
| 10 | 1.0 | 6.70 | 116 | 1.83 |
| 16 | 1.0 | 7.80 | 173 | 1.15 |
| 25 | 1.2 | 9.60 | 270 | 0.727 |
| 35 | 1.2 | 10.60 | 361 | 0.524 |
| 50 | 1.4 | 12.30 | 490 | 0.387 |
| 70 | 1.4 | 13.70 | 683 | 0.268 |
| 95 | 1.6 | 16.10 | 942 | 0.193 |
| 120 | 1.6 | 17.50 | 1171 | 0.153 |
| 150 | 1.8 | 19.50 | 1445 | 0.124 |
| 185 | 2.0 | 21.40 | 1800 | 0.0991 |
| 240 | 2.2 | 24.3 | 2338 | 0.0754 |
| 300 | 2.4 | 26.50 | 2918 | 0.0601 |
| 400 | 2.6 | 29.60 | 3766 | 0.0470 |
| 500 | 2.8 | 33.20 | 4810 | 0.0366 |

FLAME-X 950 SERIES 1

(Flame-X 950 Single) 600/1000V

Current Ratings and Voltage Drop

| Nominal cross-sectional area of conductor | Short circuit current ratings (1 sec) | Current Rating* Two cables, single phase A.C. or D.C. | Current Rating* Three or four cables, three phase A.C. | Voltage Drop** Two cables D.C. | Voltage Drop** Two cables, single phase A.C. | Voltage Drop** Three or four cables, three phase A.C. |
|---|---------------------------------------|--|---|--------------------------------|---|--|
| mm ² | Amps | Amps | Amps | mV/A/m | mV/A/m | mV/A/m |
| 1.5 | 210 | 22 | 19 | 31 | 31 | 27 |
| 2.5 | 350 | 30 | 26 | 19 | 19 | 16 |
| 4 | 570 | 40 | 35 | 12 | 12 | 10 |
| 6 | 850 | 51 | 45 | 7.9 | 7.9 | 6.8 |
| 10 | 1400 | 71 | 63 | 4.7 | 4.7 | 4.0 |
| 16 | 2200 | 95 | 85 | 2.9 | 2.9 | 2.5 |
| 25 | 3600 | 126 | 111 | 1.85 | 1.90 | 1.65 |
| 35 | 5000 | 156 | 138 | 1.35 | 1.35 | 1.15 |
| 50 | 6800 | 189 | 168 | 0.99 | 1.05 | 0.90 |
| 70 | 9800 | 240 | 214 | 0.68 | 0.75 | 0.65 |
| 95 | 13600 | 290 | 259 | 0.49 | 0.58 | 0.50 |
| 120 | 17200 | 336 | 299 | 0.39 | 0.48 | 0.42 |
| 150 | 21100 | 375 | 328 | 0.32 | 0.43 | 0.37 |
| 185 | 26500 | 426 | 370 | 0.25 | 0.37 | 0.32 |
| 240 | 34900 | 500 | 433 | 0.190 | 0.33 | 0.29 |
| 300 | 43700 | 573 | 493 | 0.155 | 0.31 | 0.27 |
| 400 | 55900 | 683 | 584 | 0.120 | 0.29 | 0.25 |
| 500 | 70600 | 783 | 666 | 0.093 | 0.28 | 0.24 |

* Installation reference method 3 (enclosed in conduit on a wall or in trunking etc.) as per BS 7671, Appendix 4, Conductor operating temperature 90°C, Ambient temperature 30°C

** Installation reference methods 3 and 4 (enclosed in conduit, etc., in or on a wall) as per BS 7671, Appendix 4, Conductor operating temperature 90°C, Ambient temperature 30°C

FLAME-X 950 SERIES 1

(Flame-X 950 Single) **600/1000V**

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Correction Factors for Ambient Temperature

| Ambient Temperature, °C | 25 | 30 | 35 | 40 | 45 | 50 | 55 | 60 | 65 | 70 | 75 | 80 | 85 |
|-------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Correction Factor | 1.02 | 1.00 | 0.96 | 0.91 | 0.87 | 0.82 | 0.76 | 0.71 | 0.65 | 0.58 | 0.50 | 0.41 | 0.29 |

Correction Factors for Groups

| Number of Circuits | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 12 | 14 | 16 | 18 |
|--------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Correction Factor | 0.80 | 0.70 | 0.65 | 0.60 | 0.57 | 0.54 | 0.52 | 0.50 | 0.48 | 0.45 | 0.43 | 0.41 | 0.39 |

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BS 7846
Cert No. 814a, 814f



FLAME-X 950 SERIES 2

(Flame-X 950 Standard) **300/500V**

BS 7629-1, BS 6387, BS 5839-1

Fire resistant screened cables having low emission of smoke and corrosive gases when affected by fire

CONSTRUCTION

| | |
|--|---|
| Conductors: | Plain annealed copper solid class 1 (for 1 - 2.5 mm ²) and stranded class 2 (for 4 mm ²) acc. to BS EN 60228 |
| Uninsulated circuit protective conductor: | Tinned annealed copper of the same nominal cross-sectional area and of the same class as the insulated conductors |
| Drain wire: | Tinned annealed copper wires class 2 acc. to BS EN 60228 (for cables with 7, 12, 19 – cores) |
| Insulation: | Special cross-linked heat resistant compound type EI2 acc. to BS EN 50363-1 |
| Optional binder: | Non hygroscopic halogen free tape |
| Screen: | Aluminium/polyester laminated tape and uninsulated circuit protective conductor or drain wire |
| Outer sheath: | Thermoplastic zero halogen low smoke compound type LTS 3 acc. to BS 7655-6.1 |
| Colour of sheath: | Red or white (other colours are permissible when agreed with the manufacturer) |
| Core identification: | 2 core + ECC: brown, blue 3 core + ECC: brown, black, grey 4 core + ECC: blue, brown, black, grey 7, 12, 19 – core + Drain wire: numbering or for identification by colour: in each layer: brown (starting core), black (reference core) |



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CHARACTERISTICS

| | |
|---|-------------------------------------|
| Maximum conductor operating temperature: | +70°C |
| Minimum operating temperature (for fixed application) after installation without movement: | -40°C |
| Lowest installation temperature: | 0°C |
| Maximum short-circuit conductor temperature: | +250°C |
| Minimum bending radius: | 6 × D; (D - overall cable diameter) |

FLAME-X 950 SERIES 2

(Flame-X 950 Standard) 300/500V

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Fire performance

| | |
|---|--|
| Resistance to fire: | BS 6387 Category C – resistance to fire: 3 h at 950°C (IEC 60331) Category W – resistance to fire with water: 15 min at 650°C plus 15 min with water spray Category Z – resistance to fire with mechanical shock: 15 min at 950°C BS EN 50200 Class PH30 (resistance to fire, with mechanical shock and with water: 30 min) BS 5839-1:2002 Clause 26.2d PH 30 Standard fire resistant cable |
| Flame propagation: | BS EN 60332-1-2 (IEC 60332-1-2) and BS EN 50266-2-2 (IEC 60332-3-22) |
| Smoke density: | BS EN 61034-2 (IEC 61034-2) |
| Gases evolved during combustion: | BS EN 50267-2-1 (IEC 61034-2): < 0.5% acid gas BS EN 50267-2-2 (IEC 60754-2): pH ≥ 4.3; conductivity ≤ 10 μSmm ⁻¹ |

Applications

Installations emergency lighting and evacuation systems, fire and smoke detection systems, air-conditioning and alarm systems, automatic elevator doors, computer control rooms, offshore and marine emergency systems, emergency evacuation communicators.

| | |
|---------------------------------------|---|
| Standard length cable packing: | 500 or 1,000 m on drums. Other forms of packing and delivery are available on request. |
|---------------------------------------|---|

Approvals

| | |
|------|---|
| LPCB | 1 mm ² to 4 mm ² 2-core, 3-core, 4-core |
|------|---|

FLAME-X 950 SERIES 2

(Flame-X 950 Standard) 300/500V

Technical and Electrical Characteristics

| Number and cross-sectional area of conductor | Conductor class | Nominal cross-sectional area of protective conductor ECC | Approximate overall diameter | Approximate net weight of cables | Maximum conductor resistance at temperature 20°C | Maximum ECC conductor resistance at 20°C |
|--|-----------------|--|------------------------------|----------------------------------|--|--|
| n × mm ² | | mm ² | mm | kg/km | Ω/km | Ω/km |
| 2 × 1 RE + ECC | 1 | 1 | 6.9 | 65 | 18.1 | 18.2 |
| 2 × 1.5 RE + ECC | 1 | 1.5 | 7.8 | 86 | 12.1 | 12.2 |
| 2 × 1.5 RM + ECC* | 2 | 1.5 | 8.2 | 91 | 12.1 | 12.2 |
| 2 × 2.5 RE + ECC | 1 | 2.5 | 9.2 | 126 | 7.41 | 7.56 |
| 2 × 2.5 RM + ECC* | 2 | 2.5 | 9.7 | 134 | 7.41 | 7.56 |
| 2 × 4 RM + ECC | 2 | 4 | 10.9 | 187 | 4.61 | 4.70 |
| 2 × 6 RM + ECC* | 2 | 6 | 12.0 | 251 | 3.08 | 3.11 |
| 3 × 1 RE + ECC** | 1 | 1 | 7.3 | 81 | 18.1 | 18.2 |
| 3 × 1.5 RE + ECC | 1 | 1.5 | 8.3 | 108 | 12.1 | 12.2 |
| 3 × 2.5 RE + ECC | 1 | 2.5 | 9.7 | 160 | 7.41 | 7.56 |
| 3 × 4 RM + ECC | 2 | 4 | 11.6 | 239 | 4.61 | 4.70 |
| 4 × 1 RE + ECC** | 1 | 1 | 8.2 | 102 | 18.1 | 18.2 |
| 4 × 1.5 RE + ECC | 1 | 1.5 | 9.5 | 138 | 12.1 | 12.2 |
| 4 × 1.5 RM + ECC* | 1 | 1.5 | 10.2 | 147 | 12.1 | 12.2 |
| 4 × 2.5 RE + ECC | 1 | 2.5 | 11.5 | 205 | 7.41 | 7.56 |
| 4 × 4 RM + ECC | 2 | 4 | 14.6 | 310 | 4.61 | 4.70 |

* based on norm. without certificate ** without standards

FLAME-X 950 SERIES 2

(Flame-X 950 Standard) 300/500V

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Technical and Electrical Characteristics

| Number and cross-sectional area of conductor | Conductor class | Nominal cross-sectional area of drain wire | Approximate overall diameter | Approximate net weight of cables | Maximum conductor resistance at 20°C | Maximum drain wire resistance at 20°C |
|--|-----------------|--|------------------------------|----------------------------------|--------------------------------------|---------------------------------------|
| n × mm² | | mm² | mm | kg/km | Ω/km | Ω/km |
| 7 × 1 RE** | 1 | 0.5 | 10.4 | 150 | 18.1 | 36.7 |
| 7 × 1.5 RE | 1 | 0.5 | 12.0 | 207 | 12.1 | 36.7 |
| 7 × 2.5 RE | 1 | 0.5 | 13.9 | 300 | 7.41 | 36.7 |
| 12 × 1 RE** | 1 | 0.5 | 13.6 | 247 | 18.1 | 36.7 |
| 12 × 1.5 RE | 1 | 0.5 | 15.5 | 333 | 12.1 | 36.7 |
| 12 × 2.5 RE | 1 | 0.5 | 18.3 | 496 | 7.41 | 36.7 |
| 19 × 1 RE* | 1 | 0.5 | 15.7 | 356 | 18.1 | 36.7 |
| 19 × 1.5 RE | 1 | 0.5 | 18.1 | 496 | 12.1 | 36.7 |

* based on norm. without certificate ** without standards

Current ratings and voltage drop

Ambient air temperature: 30°C. Conductor operating temperature: 70°C.
Installation as specified in Appendix 4 of BS 7671 IEE Wiring Regulations

FLAME-X 950 SERIES 2

(Flame-X 950 Standard) 300/500V

Reference Method 1

(clipped direct)

| Nominal area of conductor | 1 two core cable* single phase A.C. or D.C. | | 1 three-core or 1 four-core cable*. three-phase A.C. | |
|---------------------------|--|---------------------------------|--|---------------------------------|
| | Current rating | Volts drop per ampere par metre | Current rating | Volts drop per ampere par metre |
| mm ² | A | mV/m | A | mV/m |
| 1.0 | 15 | 44 | 13.5 | 38 |
| 1.5 | 19.5 | 29 | 17.5 | 25 |
| 2.5 | 27 | 18 | 24 | 15 |
| 4.0 | 36 | 11 | 32 | 9.5 |
| 6.0 | 46 | 7.3 | 41 | 6.4 |

Reference Method 3

(enclosed in conduit on a wall or ceiling, or in trunking)

| Nominal area of conductor | 1 two core cable* single phase A.C. or D.C. | | 1 three-core or 1 four-core cable*. three-phase A.C. | |
|---------------------------|--|---------------------------------|--|---------------------------------|
| | Current rating | Volts drop per ampere par metre | Current rating | Volts drop per ampere par metre |
| mm ² | A | mV/m | A | mV/m |
| 1.0 | 13 | 44 | 11.5 | 38 |
| 1.5 | 16.5 | 29 | 15 | 25 |
| 2.5 | 23 | 18 | 20 | 15 |
| 4.0 | 30 | 11 | 27 | 9.5 |
| 6.0 | 38 | 7.3 | 34 | 6.4 |

* with protective conductor

Rating factors for ambient temperature

| Ambient temperature, °C | 25 | 30 | 35 | 40 | 45 | 50 |
|-------------------------|------|------|------|------|------|------|
| Rating factor | 1.03 | 1.00 | 0.94 | 0.87 | 0.79 | 0.71 |

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BS 7846
Cert No. 814b, 814g



FLAME-X 950 SERIES 2e

(Flame-X 950 Enhanced) **300/500V**

BS 7629-1, BS 6387, BS 5839-1

“Enhanced” grade fire resistant electric cables having low emission of smoke and corrosive gases when affected by fire

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CONSTRUCTION

| | |
|--|--|
| Conductors: | Plain annealed copper solid class 1 (for 1 - 2.5 mm ²) and stranded class 2 (for 4 mm ²) acc. to BS EN 60228 and special request |
| Primary insulation: | Fire resistant mica tape with a glass cloth |
| Insulation: | Special cross-linked heat resistant compound type EI2 acc. to BS EN 50363-1 |
| Screen: | Helically applied aluminium / polyester tape and uninsulated circuit protective conductor |
| Uninsulated circuit protective conductor: | Tinned annealed copper conductor of the same nominal cross-sectional area and of the same class as the insulated conductors |
| Outer sheath: | Thermoplastic zero halogen low smoke compound type LTS 3 acc. to BS 7655-6.1 |
| Colour of sheath: | Red or white. Other colours are available on special request. |
| Core identification: | 2 core + ECC: brown, blue 3 core + ECC: brown, black, grey 4 core + ECC: blue, brown, black, grey |



CHARACTERISTICS

| | |
|---|-------------------------------------|
| Maximum conductor operating temperature: | +70°C |
| Minimum operating temperature (for fixed application) after installation without movement: | -40°C |
| Lowest installation temperature: | 0°C |
| Maximum short-circuit conductor temperature: | +250°C |
| Minimum bending radius: | 6 × D; (D - overall cable diameter) |

FLAME-X 950 SERIES 2e

(Flame-X 950 Enhanced) 300/500V

Fire performance

| | |
|---|--|
| Resistance to fire: | Complies with the PH 120 ENHANCED fire resistant cable described in Clause 26.2 of BS 5839-1 BS 6387 Category C – resistance to fire: 3 h at 950°C (IEC 60331) Category W – resistance to fire with water: 15 min at 650°C plus 15 min with water spray Category Z – resistance to fire with mechanical shock: 15 min at 950°C EN 50200 - PH 120 BS 8434-2 - 120 min |
| Flame propagation: | BS EN 60332-1-2 (IEC 60332-1-2) and BS EN 50266-2-2 (IEC 60332-3-22) |
| Smoke density: | BS EN 61034-2 (IEC 61034-2) |
| Gases evolved during combustion: | BS EN 50267-2-1 (IEC 61034-2): < 0.5% acid gas BS EN 50267-2-2 (IEC 60754-2): pH ³ 4.3; conductivity £ 10 mSmm ⁻¹ |

Applications

For use in installations emergency lighting and evacuation systems, fire and smoke detection systems, air-conditioning and alarm systems, automatic elevator doors, computer control rooms, emergency evacuation communicators. Recommended for systems, in particular building types, in which cables might need to operate correctly during a fire for periods in excess of those normally required for single phase evacuation of a building. Cables meeting the enhanced requirement should be used in buildings greater than 30 m in height, or with four or more evacuation zones, or for example hospitals, where there are progressive horizontal evacuation arrangements, or where a risk assessment identifies a possible need.

| | |
|--------------------------------------|---|
| Standard length cable packing | 500 or 1,000 m on drums. Other forms of packing and delivery are available on request. |
|--------------------------------------|---|

Approvals

| | |
|-------------|---|
| LPCB | 1 mm ² to 4 mm ² 2-core, 3-core, 4-core and 1 mm ² to 2,5 mm ² 7-core 1,5 mm ² to 2,5 mm ² 12-core and 1,5 mm ² 19-core |
|-------------|---|

FLAME-X 950 SERIES 2e

(Flame-X 950 Enhanced) 300/500V

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Technical and Electrical Characteristics

| Number and cross-sectional area of conductor | Conductor class | Nominal cross-sectional area of protective conductor ECC | Approximate overall diameter | Approximate net weight of cables | Maximum conductor resistance at 20°C | Maximum ECC conductor resistance at 20°C |
|--|-----------------|--|------------------------------|----------------------------------|--------------------------------------|--|
| n × mm ² | | mm ² | mm | kg/km | Ω/km | Ω/km |
| 2 × 1 RE + ECC | 1 | 1 | 8.1 | 77 | 18.1 | 18.2 |
| 2 × 1.5 RE + ECC | 1 | 1.5 | 9.0 | 99 | 12.1 | 12.2 |
| 2 × 1.5 RM + ECC* | 2 | 1.5 | 9.4 | 104 | 12.1 | 12.2 |
| 2 × 2.5 RE + ECC | 1 | 2.5 | 10.4 | 142 | 7.41 | 7.56 |
| 2 × 2.5 RM + ECC* | 2 | 2.5 | 10.9 | 148 | 7.41 | 7.56 |
| 2 × 4 RM + ECC | 2 | 4 | 12.1 | 202 | 4.61 | 4.70 |
| 3 × 1 RE + ECC** | 1 | 1 | 8.6 | 96 | 18.1 | 18.2 |
| 3 × 1.5 RE + ECC | 1 | 1.5 | 9.6 | 126 | 12.1 | 12.2 |
| 3 × 2.5 RE + ECC | 1 | 2.5 | 11.0 | 180 | 7.41 | 7.56 |
| 3 × 4 RM + ECC | 2 | 4 | 12.9 | 258 | 4.61 | 4.70 |
| 4 × 1 RE + ECC** | 1 | 1 | 9.5 | 121 | 18.1 | 18.2 |
| 4 × 1.5 RE + ECC | 1 | 1.5 | 10.8 | 159 | 12.1 | 12.2 |
| 4 × 2.5 RE + ECC | 1 | 2.5 | 12.8 | 230 | 7.41 | 7.56 |
| 4 × 2.5 RM + ECC* | 2 | 2.5 | 13.7 | 242 | 7.41 | 7.56 |
| 4 × 4 RM + ECC | 2 | 4 | 15.9 | 333 | 4.61 | 4.70 |

* based on norm, without certificate ** without standards

Current ratings and voltage drop

Ambient air temperature: 30°C. Conductor operating temperature: 70°C.
Installation as specified in Appendix 4 of BS 7671 IEE Wiring Regulations

FLAME-X 950 SERIES 2e

(Flame-X 950 Enhanced) 300/500V

Reference Method 1

(clipped direct)

| Nominal area of conductor | 1 two core cable* single phase A.C. or D.C. | | 1 three-core or 1 four-core cable*. three-phase A.C. | |
|---------------------------|---|---------------------------------|--|---------------------------------|
| | Current rating | Volts drop per ampere par metre | Current rating | Volts drop per ampere par metre |
| mm ² | A | mV/m | A | mV/m |
| 1.0 | 15 | 44 | 13.5 | 38 |
| 1.5 | 19.5 | 29 | 17.5 | 25 |
| 2.5 | 27 | 18 | 24 | 15 |
| 4.0 | 36 | 11 | 32 | 9.5 |

Reference Method 3

(enclosed in conduit on a wall or ceiling, or in trunking)

| Nominal area of conductor | 1 two core cable* single phase A.C. or D.C. | | 1 three-core or 1 four-core cable*. three-phase A.C. | |
|---------------------------|---|---------------------------------|--|---------------------------------|
| | Current rating | Volts drop per ampere par metre | Current rating | Volts drop per ampere par metre |
| mm ² | A | mV/m | A | mV/m |
| 1.0 | 13 | 44 | 11.5 | 38 |
| 1.5 | 16.5 | 29 | 15 | 25 |
| 2.5 | 23 | 18 | 20 | 15 |
| 4.0 | 30 | 11 | 27 | 9.5 |

* with protective conductor

Rating factors for ambient temperature

| Ambient temperature, °C | 25 | 30 | 35 | 40 | 45 | 50 |
|-------------------------|------|------|------|------|------|------|
| Rating factor | 1.03 | 1.00 | 0.94 | 0.87 | 0.79 | 0.71 |

Correction factors for groups

| Number of cables in grouping | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|------------------------------|------|------|------|------|------|------|------|------|------|
| Rating factor | 0.80 | 0.70 | 0.65 | 0.60 | 0.57 | 0.54 | 0.52 | 0.50 | 0.48 |

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FLAME-X 950 SERIES 3

600/1000V

Based on BS 7846, BS 6387

Fire resistant security power cable having low emission of smoke and corrosive gases when affected by fire

20

CONSTRUCTION

| | |
|----------------------------|---|
| Conductors: | Circular, circular compacted or shaped, stranded, annealed copper conductor, class 2 acc. to BS EN 60228 |
| Primary insulation: | A suitable wrapping of mica tape with a glass cloth |
| Insulation: | Cable 1 to 16 mm ² - special thermosetting low smoke zero halogen compound type EI5 acc. to BS 50363-5 Cable 25 to 1,000 mm ² - cross-linked polyethylene (XLPE) of GP8 type acc. to BS 7655-1.3 |
| Bedding: | Special low smoke zero halogen filling compound (only 2, 3, 4 cores) |
| Outer sheath: | Thermoplastic LSOH compound of LTS1 type acc. to BS 7655-6.1 |



CHARACTERISTICS

| | | |
|---|---|--------------------------|
| Nominal voltage: | 0.6/1kV | |
| Colour of sheath: | Black. Other colours are available on special request. | |
| Core identification: | with green-yellow | without green-yellow |
| | 1 core: green-yellow | black |
| | 2 core: - | brown, blue |
| | 3 core: green-yellow, blue, brown | brown, black, grey |
| | 4 core: green-yellow, brown, black, grey | blue, brown, black, grey |
| Maximum conductor operating temperature: | +90°C | |
| Lowest installation temperature: | 0°C | |
| Minimum operating temperature after installation without movement: | -40°C | |
| Maximum short-circuit conductor temperature: | +250°C | |
| Minimum bending radius: | 6 × D for cables with circular copper conductors and 8 × D for cables with shaped copper conductors; D – overall diameter of the cable | |

FLAME-X 950 SERIES 3

600/1000V

Fire performance

| | | |
|---|-----------------------------|--|
| Fire resistance: (additional TF test) | BS 7846 p. 17.4.2 | Category F2 |
| | IEC 60331-21 | Circuit integrity - tested 90 min. at 950°C |
| | BS 6387 ¹⁾ | Category C – resistance to fire: 3 h at 950°C |
| | | Category W – resistance to fire with water: 15 min at 650°C plus 15 min with water spray |
| | | Category Z – resistance to fire with mechanical shock: 15 min at 950°C |
| Flame propagation: | BS EN 60332-1-2 | |
| | BS EN 60332-3-24 | |
| Smoke density: | BS EN 61034-2 | |
| Corrosive and acid gases emission: | BS EN 60754-1 ²⁾ | HCl content < 0.5% |
| | BS EN 60754-2 ²⁾ | pH ≥ 4.3 & conductivity ≤ 10 μSmm ⁻¹ |

1) Category C, W, Z for cables up to and including 500 mm².

2) BS EN 60754-1 & BS EN 60754-2 standards replace BS EN 50267-2-1

Applications

Fire resistant cables for use in fixed installations in industrial areas, public buildings (as for example power plants, hospitals, shopping centres, theatres) and similar applications where maintenance of power supply during a fire is required for a defined period of time.

| | |
|--------------------------------------|---|
| Standard length cable packing | 500 or 1,000 m on drums. Other forms of packing and delivery are available on request. |
|--------------------------------------|---|

Approvals

| | |
|------|--|
| LPCB | 1 mm ² to 1,000 mm ² 1-core and 1 mm ² to 16 mm ² 2-core, 3-core, 4-core |
|------|--|

FLAME-X 950 SERIES 3

600/1000V

Technical and Electrical Characteristics

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| Number and CSA of conductor | Nominal thickness of insulation | Nominal thickness of bedding | Nominal thickness of outer sheath | Approx. overall diameter | Approx. net weight of cables | Maximum conductor resistance at 20°C | Current rating single-phase A.C. or D.C.* | | Voltage Drop D.C.* | Voltage Drop single-phase A.C.* | Short circuit rating (1 sec) |
|-----------------------------|---------------------------------|------------------------------|-----------------------------------|--------------------------|------------------------------|--------------------------------------|---|----------|--------------------|---------------------------------|------------------------------|
| | | | | | | | Clipped direct | Free Air | | | |
| n × mm ² | mm | mm | mm | mm | kg/km | Ω/km | Amp | Amp | mV/A/m | mV/A/m | kA |
| 1 × 1 RM | 0.7 | - | 1.4 | 6.4 | 53 | 18.1 | 19 | - | 46 | 46 | 0.14 |
| 1 × 1.5 RM | 0.7 | - | 1.4 | 6.7 | 61 | 12.1 | 25 | - | 31 | 31 | 0.21 |
| 1 × 2.5 RM | 0.7 | - | 1.4 | 7.2 | 74 | 7.41 | 34 | - | 19 | 19 | 0.35 |
| 1 × 4 RM | 0.7 | - | 1.4 | 7.7 | 93 | 4.61 | 46 | - | 12 | 12 | 0.57 |
| 1 × 6 RM | 0.7 | - | 1.4 | 8 | 113 | 3.08 | 59 | - | 7.9 | 7.9 | 0.85 |
| 1 × 10 RM | 0.7 | - | 1.5 | 9.1 | 162 | 1.83 | 81 | - | 4.7 | 4.7 | 1.4 |
| 1 × 16 RM | 0.7 | - | 1.5 | 10.2 | 225 | 1.15 | 109 | - | 2.9 | 2.9 | 2.2 |
| 1 × 25 RM | 0.9 | - | 1.6 | 12.2 | 325 | 0.727 | 143 | 135 | 1.85 | 1.85 | 3.5 |
| 1 × 35 RM | 0.9 | - | 1.7 | 13.4 | 426 | 0.524 | 176 | 169 | 1.35 | 1.35 | 5 |
| 1 × 50 RM | 0.9 | - | 1.8 | 15.1 | 563 | 0.387 | 228 | 207 | 0.99 | 1 | 7.1 |
| 1 × 70 RM | 1.1 | - | 1.9 | 16.9 | 777 | 0.268 | 298 | 268 | 0.68 | 0.71 | 10 |
| 1 × 95 RM | 1.1 | - | 2 | 19.1 | 1042 | 0.193 | 355 | 328 | 0.49 | 0.52 | 13.5 |
| 1 × 120 RM | 1.2 | - | 2.1 | 20.9 | 1294 | 0.153 | 413 | 383 | 0.39 | 0.43 | 17.1 |
| 1 × 150 RM | 1.4 | - | 2.2 | 23.1 | 1586 | 0.124 | 476 | 444 | 0.32 | 0.36 | 21.4 |
| 1 × 185 RM | 1.6 | - | 2.4 | 25.4 | 1971 | 0.099 | 545 | 510 | 0.25 | 0.3 | 26.4 |
| 1 × 240 RM | 1.7 | - | 2.6 | 28.3 | 2527 | 0.075 | 644 | 607 | 0.19 | 0.25 | 34.3 |
| 1 × 300 RM | 1.8 | - | 2.6 | 30.5 | 3120 | 0.060 | 743 | 703 | 0.155 | 0.22 | 42.9 |
| 1 × 400 RM | 2 | - | 2.8 | 34 | 4013 | 0.047 | 868 | 823 | 0.12 | 0.2 | 57.2 |
| 1 × 500 RM | 2.2 | - | 3 | 38 | 5109 | 0.037 | 990 | 946 | 0.093 | 0.185 | 71.5 |
| 1 × 630 RM | 2.4 | - | 3.2 | 43 | 6477 | 0.028 | 1130 | 1088 | 0.072 | 0.175 | 90.1 |
| 1 × 800 RM | 2.6 | - | 3.4 | 48.1 | 8163 | 0.022 | 1288 | 1214 | 0.056 | 0.17 | 114.4 |
| 1 × 1000 RM | 2.8 | - | 3.6 | 52 | 10100 | 0.018 | 1443 | 1349 | 0.045 | 0.165 | 134 |

FLAME-X 950 SERIES 3

600/1000V

Technical and Electrical Characteristics

| Number and CSA of conductor | Nominal thickness of insulation | Nominal thickness of bedding | Nominal thickness of outer sheath | Approx. overall diameter | Approx. net weight of cables | Maximum conductor resistance at 20°C | Current rating single-phase A.C. or D.C.* | | Voltage Drop D.C.* | Voltage Drop single-phase A.C.* | Short circuit rating (1 sec) |
|-----------------------------|---------------------------------|------------------------------|-----------------------------------|--------------------------|------------------------------|--------------------------------------|---|----------|--------------------|---------------------------------|------------------------------|
| | | | | | | | Clipped direct | Free Air | | | |
| n × mm ² | mm | mm | mm | mm | kg/km | Ω/km | Amp | Amp | mV/A/m | mV/A/m | kA |
| 2 × 1 RM | 0.7 | 0.8 | 1.4 | 11.7 | 185 | 18.1 | 19 | 21 | 46 | 46 | 0.14 |
| 2 × 1.5 RM | 0.7 | 0.8 | 1.4 | 12.2 | 208 | 12.1 | 24 | 26 | 31 | 31 | 0.21 |
| 2 × 2.5 RM | 0.7 | 0.8 | 1.4 | 13.1 | 249 | 7.41 | 33 | 36 | 19 | 19 | 0.35 |
| 2 × 4 RM | 0.7 | 0.8 | 1.4 | 14.1 | 304 | 4.61 | 45 | 49 | 12 | 12 | 0.57 |
| 2 × 6 RM | 0.7 | 0.8 | 1.4 | 14.9 | 361 | 3.08 | 58 | 63 | 7-Sep | 7.9 | 0.85 |
| 2 × 10 RM | 0.7 | 0.8 | 1.5 | 16.9 | 497 | 1.83 | 80 | 86 | 4.7 | 4.7 | 1.4 |
| 2 × 16 RM | 0.7 | 0.8 | 1.5 | 18.9 | 670 | 1.15 | 107 | 115 | 2.9 | 2.9 | 2.2 |
| 3 × 1 RM | 0.7 | 0.8 | 1.4 | 12.2 | 203 | 18.1 | 17 | 18 | - | 40 | 0.14 |
| 3 × 1.5 RM | 0.7 | 0.8 | 1.4 | 12.8 | 231 | 12.1 | 22 | 23 | - | 27 | 0.21 |
| 3 × 2.5 RM | 0.7 | 0.8 | 1.4 | 13.8 | 281 | 7.41 | 30 | 32 | - | 16 | 0.35 |
| 3 × 4 RM | 0.7 | 0.8 | 1.4 | 14.9 | 350 | 4.61 | 40 | 42 | - | 10 | 0.57 |
| 3 × 6 RM | 0.7 | 0.8 | 1.4 | 15.7 | 423 | 3.08 | 52 | 54 | - | 6.8 | 0.85 |
| 3 × 10 RM | 0.7 | 0.8 | 1.5 | 17.8 | 593 | 1.83 | 71 | 75 | - | 4 | 1.4 |
| 3 × 16 RM | 0.7 | 0.8 | 1.6 | 20.2 | 826 | 1.15 | 96 | 100 | - | 2.5 | 2.2 |

FLAME-X 950 SERIES 3

600/1000V

24 Technical and Electrical Characteristics

| Number and CSA of conductor | Nominal thickness of insulation | Nominal thickness of bedding | Nominal thickness of outer sheath | Approx. overall diameter | Approx. net weight of cables | Maximum conductor resistance at 20°C | Current rating single-phase A.C. or D.C.* | | Voltage Drop D.C.* | Voltage Drop single-phase A.C.* | Short circuit rating (1 sec) |
|-----------------------------|---------------------------------|------------------------------|-----------------------------------|--------------------------|------------------------------|--------------------------------------|---|------------|--------------------|---------------------------------|------------------------------|
| | | | | | | | Clipped direct | Free Air | | | |
| n × mm² | mm | mm | mm | mm | kg/km | Ω/km | Amp | Amp | mV/A/m | mV/A/m | kA |
| 4 × 1 RM | 0.7 | 0.8 | 1.4 | 13.2 | 233 | 18.1 | 17 | 18 | - | 40 | 0.14 |
| 4 × 1.5 RM | 0.7 | 0.8 | 1.4 | 13.9 | 268 | 12.1 | 22 | 23 | - | 27 | 0.21 |
| 4 × 2.5 RM | 0.7 | 0.8 | 1.4 | 14.9 | 328 | 7.41 | 30 | 32 | - | 16 | 0.35 |
| 4 × 4 RM | 0.7 | 0.8 | 1.4 | 16.2 | 414 | 4.61 | 40 | 42 | - | 10 | 0.57 |
| 4 × 6 RM | 0.7 | 0.8 | 1.5 | 17.2 | 513 | 3.08 | 52 | 54 | - | 6.8 | 0.85 |
| 4 × 10 RM | 0.7 | 0.8 | 1.5 | 19.4 | 718 | 1.83 | 71 | 76 | - | 4 | 1.4 |
| 4 × 16 RM | 0.7 | 0.8 | 1.6 | 22.1 | 1010 | 1.15 | 96 | 100 | - | 2.5 | 2.2 |

* current ratings acc. to BS 7671 table 4E1A, 4E1B, 4E2A, 4E2B

Rating factors for air temperature

| Ambient air temperature, °C | 25 | 30 | 35 | 40 | 45 | 50 | 55 | 60 |
|-----------------------------|------|-----|------|------|------|------|------|------|
| Rating factors | 1.02 | 1.0 | 0.96 | 0.91 | 0.87 | 0.82 | 0.76 | 0.71 |

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BS 7846
Cert No. 814d; 1354c

FLAME-X 950 SERIES 4

600/1000V

BS 7846 - F2

Armoured fire resistant electric power and control cable having low emission of smoke and corrosive gases when affected by fire

CONSTRUCTION

| | |
|----------------------------|--|
| Conductors: | Circular, circular compacted or shaped, stranded, annealed copper conductor, class 2 acc. to BS EN 60228 |
| Primary insulation: | A suitable wrapping of mica tape with a glass cloth |
| Insulation: | Cross-linked polyethylene (XLPE) of GP8 type acc. to BS 7655-1.3 |
| Bedding: | Special low smoke zero halogen (LSOH) compound |
| Armour: | Single layer of galvanized steel wires applied helically over the bedding |
| Outer sheath: | Thermoplastic halogen free compound (LSOH) of LTS1 type acc. to BS 7655-6.1 |



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CHARACTERISTICS

| | |
|---|--|
| Colour of sheath: | Black. Other colours are available on special request. |
| Core identification: | 2 – core: brown, blue 3 – core: brown, black, grey 4 – core: blue, brown, black, grey |
| Maximum conductor operating temperature: | +90°C |
| Lowest installation temperature: | 0°C |
| Minimum operating temperature after installation without movement: | -40°C |
| Maximum short-circuit conductor temperature: | +250°C |
| Fire resistance: | Category F2 acc. to BS 7846, BS 6387 – Category C, W, Z |
| Flame propagation: | BS EN 60332-1-2, EN 60332-3-24 |
| Low smoke emission: | BS EN 61034-2 |
| Low corrosive and acid gas emission: | BS EN 60754-1, HCl content < 0.5% BS EN 60754-2, pH ≥ 4.3 & conductivity ≤ 10 mSmm-1 |
| Minimum bending radius: | 6 × D for cables with circular copper conductors and 8 × D for cables with shaped copper conductors; D – overall diameter of the cable |

FLAME-X 950 SERIES 4

600/1000V

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Applications

Fire resistant armoured cables for use in fixed installations in industrial areas, public buildings (as for example power plants, hospitals, shopping centres, theatres) and similar applications where maintenance of power supply during a fire is required for a defined period of time.

Standard length cable packing:

500 or 1,000 m on drums.
Other forms of packing and delivery are available on request.

Approvals

BASEC

25 mm² to 400 mm² 2-core, 3-core, 4-core and 1,5 mm² to 16 mm² 2-core, 3-core, 4-core

LPCB

1,5 mm² to 400 mm² 2-core, 3-core, 4-core and 1,5 mm² to 16 mm² 2-core, 3-core, 4-core

FLAME-X 950 SERIES 4

600/1000V

Technical and Electrical Characteristics

| Number and CSA of conductor | Nominal thickness of insulation | Nominal thickness of outer sheath | Nominal diameter of armour wires | Approx. overall diameter | Approx. net weight of cables | Maximum conductor resistance at 20°C | Current rating single-phase A.C. or D.C. * | | Voltage Drop D.C.* | Voltage Drop single-phase A.C.* |
|-----------------------------|---------------------------------|-----------------------------------|----------------------------------|--------------------------|------------------------------|--------------------------------------|--|----------|--------------------|---------------------------------|
| | | | | | | | Clipped direct | Free Air | | |
| n × mm ² | mm | mm | mm | mm | kg/km | Ω/km | Amp | Amp | mV/A/m | mV/A/m |
| 2 × 1.5 | 0.6 | 1.3 | 0.9 | 12.8 | 346 | 12.1 | 27 | 29 | 31.0 | 31.0 |
| 2 × 2.5 | 0.7 | 1.4 | 0.9 | 14.3 | 420 | 7.41 | 36 | 39 | 19.0 | 19.0 |
| 2 × 4 | 0.7 | 1.4 | 0.9 | 15.3 | 491 | 4.61 | 49 | 52 | 12.0 | 12.0 |
| 2 × 6 | 0.7 | 1.4 | 0.9 | 16.1 | 554 | 3.08 | 62 | 66 | 7.9 | 7.9 |
| 2 × 10 | 0.7 | 1.5 | 0.9 | 18.1 | 712 | 1.83 | 85 | 90 | 4.7 | 4.7 |
| 2 × 16 | 0.7 | 1.5 | 1.25 | 20.8 | 1032 | 1.15 | 110 | 115 | 2.9 | 2.9 |
| 2 × 25 | 0.9 | 1.6 | 1.25 | 24.8 | 1421 | 0.727 | 146 | 152 | 1.85 | 1.90 |
| 2 × 25 | 0.9 | 1.6 | 1.25 | 20.8 | 1097 | 0.727 | 146 | 152 | 1.85 | 1.90 |
| 2 × 35 | 0.9 | 1.7 | 1.6 | 28.2 | 1944 | 0.524 | 180 | 188 | 1.35 | 1.35 |
| 2 × 35 | 0.9 | 1.7 | 1.6 | 23.5 | 1494 | 0.524 | 180 | 188 | 1.35 | 1.35 |
| 2 × 50 | 1.0 | 1.8 | 1.6 | 25.7 | 1830 | 0.387 | 219 | 228 | 0.98 | 1.00 |
| 2 × 70 | 1.1 | 1.9 | 1.6 | 28.7 | 2370 | 0.268 | 279 | 291 | 0.67 | 0.69 |
| 2 × 95 | 1.1 | 2.0 | 2.0 | 32.6 | 3239 | 0.193 | 338 | 354 | 0.49 | 0.52 |
| 2 × 120 | 1.2 | 2.1 | 2.0 | 35.1 | 3823 | 0.153 | 392 | 410 | 0.39 | 0.42 |
| 2 × 150 | 1.4 | 2.2 | 2.0 | 38.1 | 4534 | 0.124 | 451 | 472 | 0.31 | 0.35 |
| 2 × 185 | 1.6 | 2.4 | 2.5 | 42.9 | 5856 | 0.0991 | 515 | 539 | 0.25 | 0.29 |
| 2 × 240 | 1.7 | 2.5 | 2.5 | 46.7 | 7155 | 0.0754 | 607 | 636 | 0.195 | 0.24 |
| 2 × 300 | 1.8 | 2.6 | 2.5 | 50.7 | 8555 | 0.0601 | 698 | 732 | 0.155 | 0.21 |

FLAME-X 950 SERIES 4

600/1000V

28 Technical and Electrical Characteristics

| Number and CSA of conductor | Nominal thickness of insulation | Nominal thickness of outer sheath | Nominal diameter of armour wires | Approx. overall diameter | Approx. net weight of cables | Maximum conductor resistance at 20°C | Short circuit current rating | Current rating three phase A.C.* | | Voltage Drop three phase A.C.* |
|-----------------------------|---------------------------------|-----------------------------------|----------------------------------|--------------------------|------------------------------|--------------------------------------|------------------------------|----------------------------------|------------|--------------------------------|
| | | | | | | | | Clipped direct | Free Air | |
| n × mm² | mm | mm | mm | mm | kg/km | Ω/km | Amp | Amp | Amp | mV/A/m |
| 3 × 1.5 | 0.6 | 1.3 | 0.9 | 13.4 | 377 | 12.1 | 210 | 23 | 25 | 27.0 |
| 3 × 2.5 | 0.7 | 1.4 | 0.9 | 15 | 465 | 7.41 | 350 | 31 | 33 | 16.0 |
| 3 × 4 | 0.7 | 1.4 | 0.9 | 16.1 | 544 | 4.61 | 570 | 42 | 44 | 10.0 |
| 3 × 6 | 0.7 | 1.4 | 0.9 | 16.9 | 628 | 3.08 | 850 | 53 | 56 | 6.8 |
| 3 × 10 | 0.7 | 1.5 | 1.25 | 19.7 | 944 | 1.83 | 1400 | 73 | 78 | 4.0 |
| 3 × 16 | 0.7 | 1.6 | 1.25 | 22.1 | 1215 | 1.15 | 2200 | 94 | 99 | 2.5 |
| 3 × 25 | 0.9 | 1.7 | 1.6 | 27.5 | 1887 | 0.727 | 3575 | 124 | 131 | 1.65 |
| 3 × 25 | 0.9 | 1.7 | 1.6 | 25 | 1637 | 0.727 | 3575 | 124 | 131 | 1.65 |
| 3 × 35 | 0.9 | 1.8 | 1.6 | 30 | 2314 | 0.524 | 5005 | 154 | 162 | 1.15 |
| 3 × 35 | 0.9 | 1.8 | 1.6 | 27.4 | 2025 | 0.524 | 5005 | 154 | 162 | 1.15 |
| 3 × 50 | 1.0 | 1.8 | 1.6 | 29.8 | 2472 | 0.387 | 7150 | 187 | 197 | 0.87 |
| 3 × 70 | 1.1 | 1.9 | 1.6 | 33.5 | 3237 | 0.268 | 10010 | 238 | 251 | 0.60 |
| 3 × 95 | 1.1 | 2.1 | 2.0 | 38 | 4434 | 0.193 | 13585 | 289 | 304 | 0.45 |
| 3 × 120 | 1.2 | 2.2 | 2.0 | 41.1 | 5287 | 0.153 | 17160 | 335 | 353 | 0.37 |
| 3 × 150 | 1.4 | 2.3 | 2.5 | 46.5 | 6768 | 0.124 | 21450 | 386 | 406 | 0.30 |
| 3 × 185 | 1.6 | 2.4 | 2.5 | 50.4 | 8094 | 0.0991 | 26455 | 441 | 463 | 0.26 |
| 3 × 240 | 1.7 | 2.6 | 2.5 | 55.4 | 10053 | 0.0754 | 34320 | 520 | 546 | 0.21 |
| 3 × 300 | 1.8 | 2.7 | 2.5 | 60.2 | 11949 | 0.0601 | 42900 | 599 | 628 | 0.185 |
| 3 × 400 | 2.0 | 2.9 | 2.5 | 66.8 | 14895 | 0.0470 | 57200 | 673 | 728 | 0.165 |

FLAME-X 950 SERIES 4

600/1000V

Technical and Electrical Characteristics

| Number and CSA of conductor | Nominal thickness of insulation | Nominal thickness of outer sheath | Nominal diameter of armour wires | Approx. Overall diameter | Approx. Net weight of cables | Maximum conductor resistance at 20°C | Short circuit current rating | Current rating three phase A.C.* | | Voltage Drop Three phase A.C.* |
|-----------------------------|---------------------------------|-----------------------------------|----------------------------------|--------------------------|------------------------------|--------------------------------------|------------------------------|----------------------------------|------------|--------------------------------|
| | | | | | | | | Clipped direct | Free Air | |
| n × mm² | mm | mm | mm | mm | kg/km | Ω/km | Amp | Amp | Amp | mV/A/m |
| 4 × 1.5 | 0.6 | 1.3 | 0.9 | 14.4 | 422 | 12.1 | 210 | 23 | 25 | 27.0 |
| 4 × 2.5 | 0.7 | 1.4 | 0.9 | 16.1 | 522 | 7.41 | 350 | 31 | 33 | 16.0 |
| 4 × 4 | 0.7 | 1.4 | 0.9 | 17.4 | 628 | 4.61 | 570 | 42 | 44 | 10.0 |
| 4 × 6 | 0.7 | 1.5 | 1.25 | 19.1 | 848 | 3.08 | 850 | 53 | 56 | 6.8 |
| 4 × 10 | 0.7 | 1.5 | 1.25 | 21.3 | 1091 | 1.83 | 1400 | 73 | 78 | 4.0 |
| 4 × 16 | 0.7 | 1.6 | 1.25 | 24 | 1440 | 1.15 | 2200 | 94 | 99 | 2.5 |
| 4 × 25 | 0.9 | 1.7 | 1.6 | 29.9 | 2240 | 0.727 | 3575 | 124 | 131 | 1.65 |
| 4 × 25 | 0.9 | 1.7 | 1.6 | 27.7 | 2028 | 0.727 | 3575 | 124 | 131 | 1.65 |
| 4 × 35 | 0.9 | 1.8 | 1.6 | 32.6 | 2769 | 0.524 | 5005 | 154 | 162 | 1.15 |
| 4 × 35 | 0.9 | 1.8 | 1.6 | 30.3 | 2491 | 0.524 | 5005 | 154 | 162 | 1.15 |
| 4 × 50 | 1.0 | 1.9 | 1.6 | 33.3 | 3111 | 0.387 | 7150 | 187 | 197 | 0.87 |
| 4 × 70 | 1.1 | 2.1 | 2.0 | 38.9 | 4418 | 0.268 | 10010 | 238 | 251 | 0.60 |
| 4 × 95 | 1.1 | 2.2 | 2.0 | 42.6 | 5607 | 0.193 | 13585 | 289 | 304 | 0.45 |
| 4 × 120 | 1.2 | 2.3 | 2.5 | 47.9 | 7216 | 0.153 | 17160 | 335 | 353 | 0.37 |
| 4 × 150 | 1.4 | 2.4 | 2.5 | 51.9 | 8559 | 0.124 | 21450 | 386 | 406 | 0.30 |
| 4 × 185 | 1.6 | 2.6 | 2.5 | 56.6 | 10275 | 0.0991 | 26455 | 441 | 463 | 0.26 |
| 4 × 240 | 1.7 | 2.7 | 2.5 | 62.4 | 12855 | 0.0754 | 34320 | 520 | 546 | 0.21 |
| 4 × 300 | 1.8 | 2.9 | 2.5 | 67.4 | 15307 | 0.0601 | 42900 | 599 | 628 | 0.185 |
| 4 × 400 | 2.0 | 3.2 | 3.15 | 77.0 | 19826 | 0.0470 | 57200 | 673 | 728 | 0.165 |

* acc to BS 7671 table 4E4A & 4E4B

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BS 7846
Cert No. 1354a

FLAME-X 950 SERIES 6

600/1000V

BS 7846 - F120

Armoured fire resistant electric power and control cable having low emission of smoke and corrosive gases when affected by fire

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CONSTRUCTION

| | |
|----------------------------|---|
| Conductors: | Circular, circular compacted or shaped stranded, annealed copper conductor, class 2 acc. to BS EN 60228 |
| Primary insulation: | Fire resistant mica tape with a glass cloth |
| Insulation: | Cross-linked polyethylene (XLPE) of GP8 type acc. to BS 7655-1.3 |
| Cable core: | Insulated conductors twisted together wrapped by fire resistance tape (optional also by polyester film) |
| Bedding: | Thermoplastic zero halogen low smoke compound (LSOH) wrapped by fire resistance tape |
| Armour: | Galvanized steel wires applied helically (optional polyester film over the armour) |
| Outer sheath: | Thermoplastic zero halogen low smoke compound of LTS1 type acc. to BS 7655-6.1 |



CHARACTERISTICS

| | |
|---|--|
| Colour of sheath: | Black. Other colours are available on special request. |
| Core identification: | 2 – core: brown, blue 3 – core: brown, black, grey 4 – core: blue, brown, black, grey |
| Maximum conductor operating temperature | +90°C |
| Lowest installation temperature: | 0°C |
| Minimum operating temperature after installation without movement: | -40°C |
| Maximum short-circuit conductor temperature: | +250°C |
| Minimum bending radius: | 6 × D for cables with circular copper conductors 8 × D for cables with shaped copper conductors D – overall diameter |

FLAME-X 950 SERIES 6

600/1000V

Fire performance

| | | |
|---|-----------------------------|---|
| Fire resistance: | BS 8491 | Category F120 |
| | BS 8519 | Category 1, 2 and 3 |
| Flame propagation: | BS EN 60332-1-2 | |
| | BS EN 60332-3-24 | |
| Smoke density: | BS EN 61034-2 | |
| Corrosive and acid gases emission: | BS EN 60754-1 ¹⁾ | HCl content < 0.5% |
| | BS EN 60754-2 ¹⁾ | pH ≥ 4.3 & conductivity ≤ 10 μSmm ⁻¹ |

1) BS EN 60754-1 & BS EN 60754-2 standards replace BS EN 50267-2-1

Applications

Enhanced fire resistant armoured cables for use in life safety and fire fighting systems of public buildings (hospitals, shopping centres, theatres, stadiums) and similar applications where maintenance of power supply during a fire is critical.

| | |
|---------------------------------------|---|
| Standard length cable packing: | 500 or 1,000 m on drums. Other forms of packing and delivery are available on request. |
|---------------------------------------|---|

Approvals

| | |
|--------------|--|
| BASEC | 4 mm ² to 16 mm ² 3-core, 4-core and 25 mm ² to 400 mm ² 2-core, 3-core, 4-core; |
| LPCB | 4 mm ² to 16 mm ² 3-core, 4-core and 25 mm ² to 400 mm ² 3-core, 4-core |

FLAME-X 950 SERIES 6

600/1000V

32 Technical and Electrical Characteristics

| Number and CSA of conductor | Nominal thickness of insulation | Nominal thickness of outer sheath | Nominal diameter of armour wires | Approx. overall diameter | Approx. net weight of cables | Maximum conductor resistance at 20°C | Current rating single-phase A.C. or D.C. * | | Voltage Drop D.C.* | Voltage Drop single-phase A.C.* |
|-----------------------------|---------------------------------|-----------------------------------|----------------------------------|--------------------------|------------------------------|--------------------------------------|--|------------|--------------------|---------------------------------|
| | | | | | | | Clipped direct | Free Air | | |
| n × mm² | mm | mm | mm | mm | kg/km | Ω/km | Amp | Amp | mV/A/m | mV/A/m |
| 2 × 4 RM | 0.7 | 1.4 | 1.25 | 20.1 | 712 | 4.61 | 49 | 52 | 12.0 | 12.0 |
| 2 × 6 RM | 0.7 | 1.4 | 1.25 | 20.1 | 744 | 3.08 | 62 | 66 | 7.9 | 7.9 |
| 2 × 10 RM | 0.7 | 1.5 | 1.25 | 20.9 | 839 | 1.83 | 85 | 90 | 4.7 | 4.7 |
| 2 × 16 RM | 0.7 | 1.5 | 1.25 | 22.9 | 1027 | 1.15 | 110 | 115 | 2.9 | 2.9 |
| 2 × 25 RM | 0.9 | 1.6 | 1.25 | 26.4 | 1425 | 0.727 | 146 | 152 | 1.85 | 1.90 |
| 2 × 35 RM | 0.9 | 1.7 | 1.6 | 29.8 | 1929 | 0.524 | 180 | 188 | 1.35 | 1.35 |
| 2 × 50 SM | 1.0 | 1.8 | 1.6 | 27.1 | 1963 | 0.387 | 219 | 228 | 0.98 | 1.00 |
| 2 × 70 SM | 1.1 | 1.9 | 1.6 | 31.0 | 2552 | 0.268 | 279 | 291 | 0.67 | 0.69 |
| 2 × 95 SM | 1.1 | 2.0 | 2.0 | 34.0 | 3392 | 0.193 | 338 | 354 | 0.49 | 0.52 |
| 2 × 120 SM | 1.2 | 2.1 | 2.0 | 36.5 | 4014 | 0.153 | 392 | 410 | 0.39 | 0.42 |
| 2 × 150 SM | 1.4 | 2.2 | 2.0 | 39.5 | 4717 | 0.124 | 451 | 472 | 0.31 | 0.35 |
| 2 × 185 SM | 1.6 | 2.4 | 2.5 | 44.3 | 6069 | 0.0991 | 515 | 539 | 0.25 | 0.29 |
| 2 × 240 SM | 1.7 | 2.5 | 2.5 | 48.1 | 7390 | 0.0754 | 607 | 636 | 0.195 | 0.24 |
| 2 × 300 SM | 1.8 | 2.6 | 2.5 | 52.1 | 8772 | 0.0601 | 698 | 732 | 0.155 | 0.21 |
| 2 × 400 SM | 2.0 | 2.8 | 2.5 | 59.6 | 11120 | 0.047 | 787 | 847 | 0.120 | 0.19 |

FLAME-X 950 SERIES 6

600/1000V

Technical and Electrical Characteristics

| Number and CSA of conductor | Nominal thickness of insulation | Nominal thickness of outer sheath | Nominal diameter of armour wires | Approx. overall diameter | Approx. net weight of cables | Maximum conductor resistance at 20°C | Short circuit current rating | Current rating three phase A.C.* | | Voltage Drop three phase A.C.* |
|-----------------------------|---------------------------------|-----------------------------------|----------------------------------|--------------------------|------------------------------|--------------------------------------|------------------------------|----------------------------------|------------|--------------------------------|
| | | | | | | | | Clipped direct | Free Air | |
| n × mm² | mm | mm | mm | mm | kg/km | Ω/km | Amp | Amp | Amp | mV/A/m |
| 3 × 4 RM | 0.7 | 1.4 | 1.25 | 20.2 | 832 | 4.61 | 570 | 42 | 44 | 10.0 |
| 3 × 6 RM | 0.7 | 1.4 | 1.25 | 20.1 | 803 | 3.08 | 850 | 53 | 56 | 6.8 |
| 3 × 10 RM | 0.7 | 1.5 | 1.25 | 21.8 | 985 | 1.83 | 1400 | 73 | 78 | 4.0 |
| 3 × 16 RM | 0.7 | 1.6 | 1.25 | 24.2 | 1241 | 1.15 | 2200 | 94 | 99 | 2.5 |
| 3 × 25 RM | 0.9 | 1.7 | 1.6 | 29.1 | 1930 | 0.727 | 3575 | 124 | 131 | 1.65 |
| 3 × 35 RM | 0.9 | 1.8 | 1.6 | 31.6 | 2328 | 0.524 | 5005 | 154 | 162 | 1.15 |
| 3 × 50 SM | 1.0 | 1.8 | 1.6 | 31.2 | 2629 | 0.387 | 7150 | 187 | 197 | 0.87 |
| 3 × 70 SM | 1.1 | 1.9 | 1.6 | 34.9 | 3394 | 0.268 | 10010 | 238 | 251 | 0.60 |
| 3 × 95 SM | 1.1 | 2.1 | 2.0 | 39.4 | 4617 | 0.193 | 13585 | 289 | 304 | 0.45 |
| 3 × 120 SM | 1.2 | 2.2 | 2.0 | 42.5 | 5486 | 0.153 | 17160 | 335 | 353 | 0.37 |
| 3 × 150 SM | 1.4 | 2.3 | 2.5 | 47.9 | 7003 | 0.124 | 21450 | 386 | 406 | 0.30 |
| 3 × 185 SM | 1.6 | 2.4 | 2.5 | 51.8 | 8352 | 0.0991 | 26455 | 441 | 463 | 0.26 |
| 3 × 240 SM | 1.7 | 2.6 | 2.5 | 56.8 | 10299 | 0.0754 | 34320 | 520 | 546 | 0.21 |
| 3 × 300 SM | 1.8 | 2.7 | 2.5 | 61.6 | 12262 | 0.0601 | 42900 | 599 | 628 | 0.185 |
| 3 × 400 SM | 2.0 | 2.9 | 2.5 | 68.9 | 15520 | 0.0470 | 57200 | 673 | 728 | 0.165 |

FLAME-X 950 SERIES 6

600/1000V

34 Technical and Electrical Characteristics

| Number and CSA of conductor | Nominal thickness of insulation | Nominal thickness of outer sheath | Nominal diameter of armour wires | Approx. overall diameter | Approx. net weight of cables | Maximum conductor resistance at 20°C | Short circuit current rating | Current rating three phase A.C.* | | Voltage Drop Three phase A.C.* |
|-----------------------------|---------------------------------|-----------------------------------|----------------------------------|--------------------------|------------------------------|--------------------------------------|------------------------------|----------------------------------|------------|--------------------------------|
| | | | | | | | | Clipped direct | Free Air | |
| n × mm² | mm | mm | mm | mm | kg/km | Ω/km | Amp | Amp | Amp | mV/A/m |
| 4 × 4 RM | 0.7 | 1.4 | 1.25 | 20.1 | 869 | 4.61 | 570 | 42 | 44 | 10.0 |
| 4 × 6 RM | 0.7 | 1.5 | 1.25 | 21.2 | 906 | 3.08 | 850 | 53 | 56 | 6.8 |
| 4 × 10 RM | 0.7 | 1.5 | 1.25 | 23.4 | 1140 | 1.83 | 1400 | 73 | 78 | 4.0 |
| 4 × 16 RM | 0.7 | 1.6 | 1.25 | 26.1 | 1466 | 1.15 | 2200 | 94 | 99 | 2.5 |
| 4 × 25 RM | 0.9 | 1.7 | 1.6 | 31.5 | 2261 | 0.727 | 3575 | 124 | 131 | 1.65 |
| 4 × 35 RM | 0.9 | 1.8 | 1.6 | 34.2 | 2752 | 0.524 | 5005 | 154 | 162 | 1.15 |
| 4 × 50 SM | 1.0 | 1.9 | 1.6 | 34.7 | 3271 | 0.387 | 7150 | 187 | 197 | 0.87 |
| 4 × 70 SM | 1.1 | 2.1 | 2.0 | 40.3 | 4605 | 0.268 | 10010 | 238 | 251 | 0.60 |
| 4 × 95 SM | 1.1 | 2.2 | 2.0 | 44.0 | 5789 | 0.193 | 13585 | 289 | 304 | 0.45 |
| 4 × 120 SM | 1.2 | 2.3 | 2.5 | 49.3 | 7460 | 0.153 | 17160 | 335 | 353 | 0.37 |
| 4 × 150 SM | 1.4 | 2.4 | 2.5 | 53.3 | 8785 | 0.124 | 21450 | 386 | 406 | 0.30 |
| 4 × 185 SM | 1.6 | 2.6 | 2.5 | 58.0 | 10528 | 0.0991 | 26455 | 441 | 463 | 0.26 |
| 4 × 240 SM | 1.7 | 2.7 | 2.5 | 63.8 | 13141 | 0.0754 | 34320 | 520 | 546 | 0.21 |
| 4 × 300 SM | 1.8 | 2.9 | 2.5 | 68.8 | 15622 | 0.0601 | 42900 | 599 | 628 | 0.185 |
| 4 × 400 SM | 2.0 | 3.2 | 3.15 | 79.1 | 20575 | 0.0470 | 57200 | 673 | 728 | 0.165 |

* acc to BS 7671 table 4E4A & 4E4B

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TF

TF Cable

FLAMEBLOCKER EXQ Light 3G1,5 500V

Standard: WO 98 424 02-19-5
Batch: 02-18247
Net Weight: 33 [KG]
Index: Ø128081
Date: 2017-05-03
Length: 300 [M]

Supply of electricity and communications works with the objective of limiting the generation and spread of fire and smoke

CE
Notification Unit: 1488
Certification year: 17

DoP: EN 50575:2014 + A1: 2016
Reaction to fire: D2ca-s2,d2,a2
Dangerous substances: No



EXQ



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