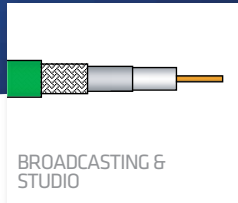
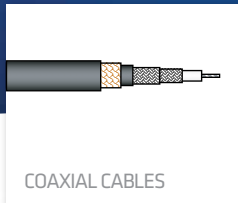


Multimedia Specials

DATA CABLES FOR INDUSTRIAL COMMUNICATIONS,
BUILDING MANAGEMENT & BROADCAST APPLICATIONS



Prysmian Group - Linking the future







As the worldwide leader in the cable industry, Prysmian Group believes in the effective, efficient and sustainable supply of energy and information as a primary driver in the development of communities. With this in mind, we provide major global organisations in many industries with best-in-class cable solutions, based on state-of-the-art technology. Through two renowned commercial brands – Prysmian and Draka – based in almost 100 countries, we're constantly close to our customers, enabling them to further develop the world's energy and telecoms infrastructures, and achieve sustainable, profitable growth.

What links communications to communities?

Cable solutions to support the development of the world's telecoms infrastructure. As the world's largest producer of telecoms cables, supporting the infrastructures of many of the world's leading telecoms operators, the Prysmian Group delivers optical fibre and copper cabling solutions that help link communications to communities around the globe. Covering voice, video and data transmission, we are world leader in the production of optical fibre, offering unique and fully owned technology. Our portfolio sets the benchmark in global innovation, and is the outcome of continuous multi-million Euro investment in R&D and production in more than 30 facilities worldwide.

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PRYSMIAN GROUP - LINKING THE FUTURE

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1. Industrial Communication Solutions

Industrial Communication Solutions

An interesting cabling concept for industrial automation has established itself under the keyword ICS (Industrial Communication Solutions). It concerns the structured cabling of industrial plants similar to the cabling used for office communications.

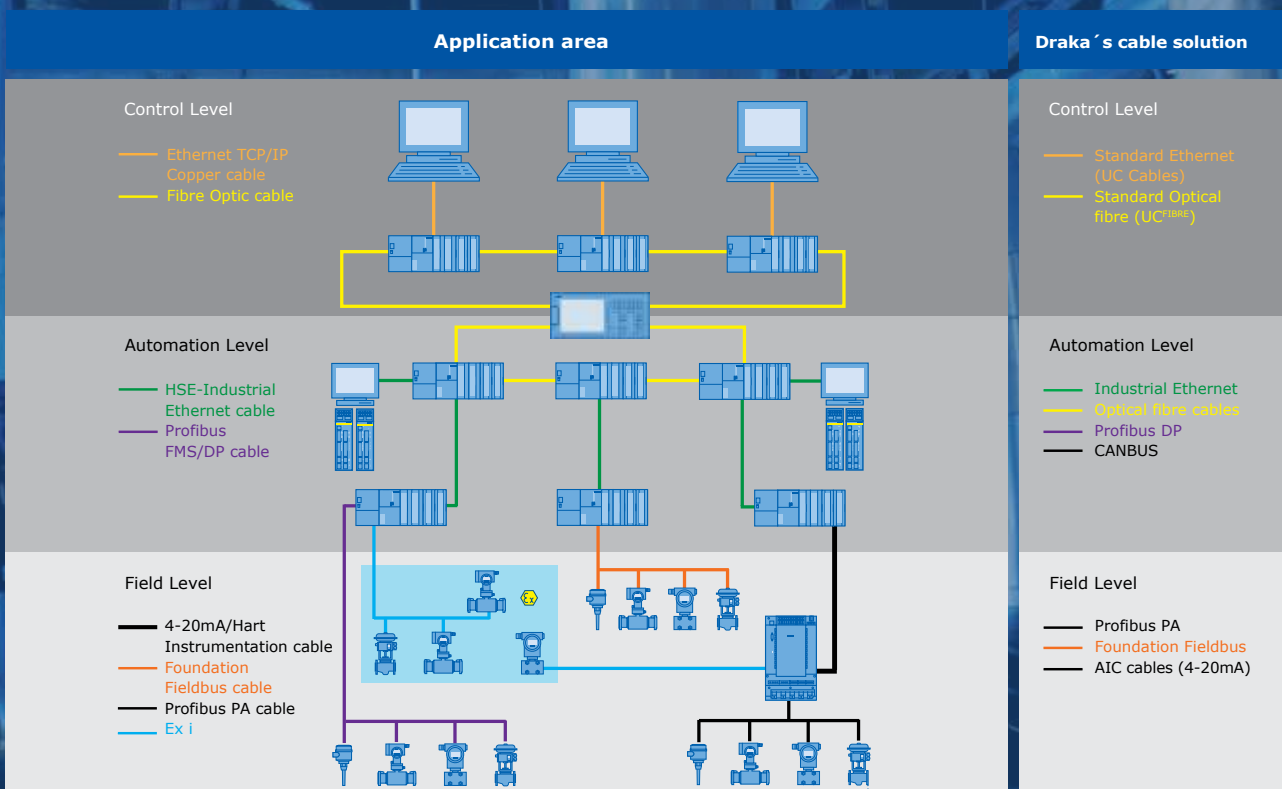
Ethernet in industry is increasingly asserting itself because the communication standard used in countless office applications can be classified today as being simple, cost-effective and highly flexible, as well as having broad support on the system side.

Industrial Ethernet and bussystems are proven standards in the industry. More and more plants are completely equipped with these systems and connected with special cabling, functioning in every environment.

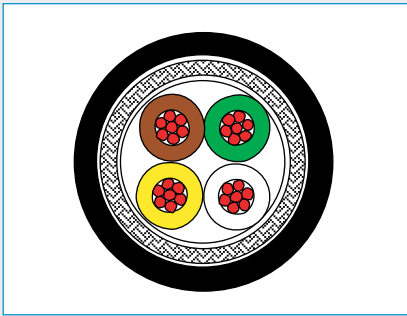
Access to specific areas throughout the network makes adjustments and changes easily manageable.

The Draka brand of Multimedia Specials cables are supplied to almost all of the world's major Industrial projects developments. These cables provide utmost protection and transmission capabilities in very harsh environments.

Requirements of the cabling



| | | |
|-----|---|----|
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Application

- The following CanBus cable is suitable for transmission of CanBus signals according to **DIN 19245 and EN 50170**
- The following CanBus cable is suitable for transmission of CanBus signals according to **ISO 11898-2**
- The cable is suited for fixed indoor and outdoor installation and under certain conditions also for mobile use.
- The cable is halogen free, flame retardant and oil resistant. The sheath material is tested in Hydraulic oil
- ARAL VITAM 32, Mobil DTE 13 M, Gear oil ARAL DEGOL BG Plus 320 and Tribol 1710/320.

Standards

acc. to customer Specification

Fire Rating

- IEC 60332-1, IEC 60332-3, IEC 60754-1/2

Li-2YC11Y 2 x 2 x 0.22 mm² FRNC

CanBus-Cable

Construction

| | | |
|----------------------------|---|--|
| Conductor | stranded bare copper wire, diameter 7 x 0.20 mm | Ø 0.60 mm (cross section 0.22 mm ²) |
| Insulation | PE, Wall thickness 0.46 mm | Ø 1.75 ± 0.05 mm |
| Colour code | Pair 1: 1 x white, 1 x brown | |
| Core identification | Pair 2: 1 x yellow, 1 x green | |
| Cable lay up | 4 cores twisted to a star quad | Ø 4.2 mm |
| Wrapping | 1 x PET-foil, overlapping | Ø 4.3 mm |
| Overall screen | Tinned copper braid Optical coverage ≥ 85% | Ø 5.0 mm |
| Foil | 1 x PET-foil under sheath | Ø 5.1 mm |
| Sheath | PUR Low Smoke Zero Halogen | Ø 6.9 ± 0.2 mm |
| Sheath colour | Black, RAL 9005 | |
| Outer Diameter | Nom. 6.9 mm | |
| Weight | Nom. 70 kg/km | |
| Tensile force N | 165 | |

Mechanical Properties

| | |
|---|--|
| Bending radius - moving application - fixed application | ≥ 10 x outer diameter of cable ≥ 5 x outer diameter of cable |
| Operating temperature | - 40°C up to + 85°C |
| UV resistance | acc. to IEC60068-2-5 |
| Testing of oil resistance of PU sheath material acc. to VDE 0282 Part 10 and EN 60811-2-1 and thermal endurance graph (Arrhenius) and life expectancy of PU sheath material acc. to ISO 2578 Requirements after aging: max. change of tensile strength: -50% max. change of elongation at break: -50% Mobil DTE 13 M (Hydraulic oil) | 150 days at 100°C approx. 24 years at 65°C ≥ 25 years at 20°C 140 days at 100°C approx. 18 years at 65°C ≥ 25 years at 20°C |
| Tribol 1710/20 (Gear oil) | |
| Ozone resistance | acc. to EN 60811-2-1, clause 8 |
| Smoke density | acc. to EN 50268-2, IEC61034-1 and 2 |
| Corrosivity | EN 50267-1 and 2, IEC 60754-1 and 2 |

Electrical Properties at 20°C

| | |
|---|-------------|
| Conductor resistance (at 20 ± 5 °C) | ≤ 87 Ω/km |
| Characteristic impedance at 1 MHz | 120 Ω ± 15% |
| Capacitance at 800 Hz (nominal) | 41 nF/km |
| Insulation resistance (at 20 ± 5 °C and 500 V) | ≥ 10 GΩxkm |
| Test voltage (AC, 1 min) Core/core and core/screen | 1.2 kV |

Ordering Information

| P/N | Product Description | P.U |
|-------------------|---|------------|
| 1003018 CS2878600 | CanBus, Li-2YC11Y 2 x 2 x 0.22 mm ² FRNC | 1000m/drum |

Li-09YS(St)C11Y 2 x 0.35 mm² LSZH CanBus-Cable

1.1 Canbus 120 Ohm & EIB Bus 100 Ohm

Construction

| | | |
|----------------------------|--|----------------------|
| Conductor | stranded bare copper wire, diameter 7 x 0.26 mm (cross section 0.35 mm ²) | Ø 0.78 mm |
| Insulation | Foam-Skin PP, wall thickness 0.71 mm | Ø 2.2 ± 0.1 mm |
| Twisting | 2 cores + 2 x PP-fillers twisted to the pair | Ø 4.4 mm |
| Core identification | 1x white, 1x green | |
| Overall screen | 1 x PET-Al-foil + tinned stranded drain wires 19 x 0,15 mm + tinned copper braid optical coverage ≥ 65% | Ø 4.6 mm Ø 5.2 mm |
| Foil | 1 x PET-foil under sheath | Ø 5.3 mm |
| Sheath | PUR Low Smoke Zero Halogen wall thickness 0.75 mm | Ø 6.8 ± 0.2 mm |
| Sheath colour | Black, RAL 9005 | |
| Outer Diameter | Nom. 6.8 mm | |
| Weight | Nom. 46.7 kg/km | |
| Tensile force N | 165 | |

Mechanical Properties

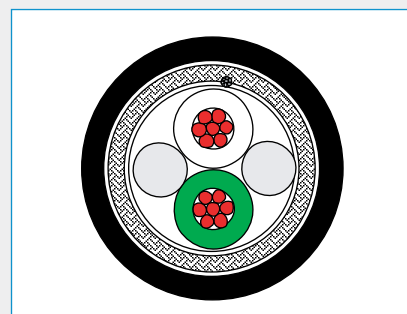
| | |
|--|---|
| Bending radius during installation - without load - with load | ≥ 5 x cable diameter ≥ 10 x cable diameter |
| Operating temperature | - 30°C up to + 70°C |
| Storage temperature | -40°C up to 85°C |
| UV resistance of sheath material | acc. to IEC60068-2-5 |
| Ozone resistance | acc. to EN 60811-2-1, clause 8 |
| Smoke density (light transmittance ≥ 25%) | acc. to EN 50268-2, IEC61034-1 and 2 |
| Corrosivity | acc. EN 50267-1 and 2, IEC 60754-1 and 2 |
| Testing of oil resistance of PU sheath material acc. to VDE 0282 Part 10 and EN 60811-2-1 and thermal endurance graph (Arrhenius) and life expectancy of PU sheath material acc. to ISO 2578 Requirements after aging: max. change of tensile strength: -50% max. change of elongation at break: -50% Mobil DTE 13 M (Hydraulic oil) | 150 days at 100°C approx. 24 years at 65°C ≥ 25 years at 20°C |
| Tribol 1710/20 (Gear oil) | 140 days at 100°C approx. 18 years at 65°C ≥ 25 years at 20°C |

Electrical Properties at 20°C

| | |
|---|-------------|
| Conductor resistance (at 20 ± 5 °C) | ≤ 54.5 Ω/km |
| Characteristic impedance at 1 MHz | 120 Ω ± 15% |
| Insulation resistance (at 20 ± 5 °C and 500 V) | ≥ 10 GΩxkm |
| Operating voltage (50 Hz, rms) | 60 V |
| Test voltage (AC, 1 min) Core/core and core/screen | 1.2 kV |
| Transfer impedance (up to 10 MHz, acc. to IEC 62153-4-3) | ≤ 10 mΩ/m |

Ordering Information

| P/N | Product Description | P.U |
|-------------------|---|------------|
| 1003011 CS2875900 | CanBus-Cable, Li-09YS(St)C11Y 2 x 0.35 mm ² LSZH | 1000m/drum |



Application

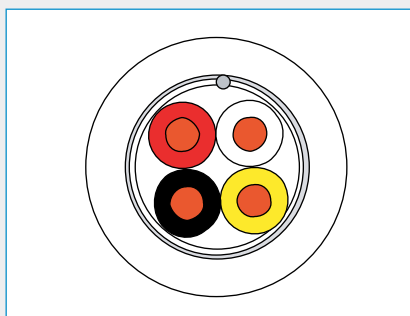
- The following CanBus cable is suitable for transmission of CanBus signals according to **DIN 19245 and EN 50170**
- The following CanBus cable is suitable for transmission of CanBus signals according to **ISO 11898-2**
- The cable is suited for fixed indoor and outdoor installation and under certain conditions also for mobile use.
- The cable is halogen free, flame retardant and oil resistant. The sheath material is tested in Hydraulic oil
- ARAL VITAM 32, Mobil DTE 13 M, Gear oil ARAL DEGOL BG Plus 320 and Tribol 1710/320.

Standards

acc. to customer Specification

Fire Rating

- IEC 60332-1, IEC 61034-2, IEC 60754-1/2



Application

Bus cable for indoor installations in EIB (European Installation Bus) systems. The cable is suitable for installation in ducts, on risers and under data floors. PE insulated plain copper conductors. The cable has an overall Al/PETP-foil screen and a tinned copper drain wire. The overall sheath is made of flame retardant PVC. The pair is colour coded for easy identification.

1 pair: black/red **2 pair:** yellow/white

Fire Rating

- IEC 60332-1

EIB - BUS, PVC

EIB Bus cables
Symmetrical data cable for EIB - BUS Systems

Construction

| | |
|---|--|
| Conductor | Copper wire, bare 0.5 mm ² , 0.80 mm Ø |
| Insulation | PE, 1.6 mm Ø |
| Conductor identification | Pair 1: red, black, Pair 2: Yellow, white |
| Pair stranding | 2 conductors to the pair |
| Cable lay up | 1 or 2 pairs to the core |
| Wrapping | 1 x PET foil |
| Overall shielding | Laminated AL-foil + copper drain wire 0.4mm ² |
| Rip cord and identification thread | yes |
| Outer sheath | PVC, alternative LSFROH, white RAL 9010 / green RAL 6018 |
| Outer Diameter | Nom. 5.5 - 7.5 mm |
| Weight | Nom. 35 - 60 kg/km |

Mechanical Properties

| | |
|--|-----------------------|
| Operating temperature | - 25°C up to + 70°C |
| Min. Installation temperature | - 5°C |
| Minimum bending radius | 7.5 x D |
| Smoke density (only for LSFROH types) | acc. to IEC 61034-2 |
| Corrosivity of fire gases (only for LSZH types) | acc. to IEC 60754-1/2 |

Electrical Properties at 20°C

| | |
|---|------------|
| Loop DC resistance (max.) | 73.2 Ω/km |
| Insulation resistance (at 500 V, 1 min.) | 10 GΩ*km |
| Mutual capacitance at 800 Hz (max.) | 100 nF/km |
| Inductance | 0.65 mH/km |
| Max. operating voltage DC | 800 V |
| AC Testvoltage, (5 min) | 2500 V |
| AC Testvoltage, (1 min) | 4000 V |

Ordering Information

| P/N | Product Description | P.U |
|---------|----------------------------------|------------|
| 1003582 | EIB BUS Cable PVC, 1x2x0.8 | 1000m/drum |
| 1003583 | EIB BUS Cable PVC, 2x2x0.8 | 1000m/drum |
| 1003584 | EIB BUS Cable LSFROH, 1x2x0.8 | 1000m/drum |
| 1003585 | EIB BUS Cable LSFROH, 2x2x0.8 | 1000m/drum |
| 1021615 | EIB BUS Cable LSFROH GN, 2x2x0.8 | 1000m/drum |

FF FC 1x2xAWG16/7 PVC

FOUNDATION Fieldbus FC AWG16 FLEX PVC Cable

1.2 Foundation Fieldbus

Construction

| | |
|------------------------|---|
| Conductor | stranded bare copper wires, 7x0.51 Ø 1.53 mm, (cross-section AWG16/7) |
| Insulation | PE, Ø 3.25 mm |
| Stranding | two cores gn / rd to the Pair |
| Bedding | PVC, filling the interstices |
| Static screen | PET-Al-Foil longitudinally applied |
| Braid | tinned copper braid, coverage approx. 70% |
| Sheath | PVC, Ø 9.5 mm |
| Colour | yellow |
| Outer Diameter | Nom. 9.5 mm |
| Weight | Nom. 129 kg/km |
| Tensile force N | 270 |

Mechanical Properties

| | |
|------------------------------|------------------|
| Bending radius | |
| Single bending | ≥ 50 mm |
| Repeated bending | ≥ 100 mm |
| Temperature range | - 40°C to + 70°C |
| Transport and storage | - 40°C to + 70°C |
| Installation | - 5°C to + 50°C |

Electrical Properties at 20°C

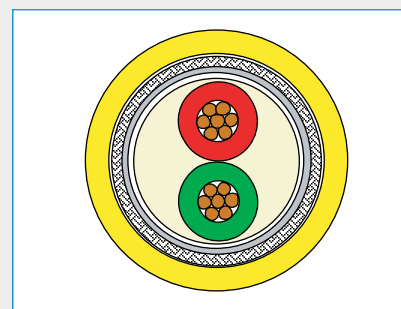
| | |
|---|------------------|
| Loop resistance | ≤ 28.6 Ω/km |
| Screen resistance nominal | 12 Ω/km |
| Characteristic impedance (at 31.25 kHz) | 100 Ω ± 20 Ω |
| Mutual capacitance (at 1 kHz) | approx. 60 nF/km |
| Capacitance unbalance to earth max. | 2 nF/km |
| Insulation resistance | ≥ 5 GΩ/km |
| Test Voltage (DC, 1 min) Core/Core and Core/Screen | 1 kV |
| Operating voltage (RMS) | ≤ 100 V |
| Inductance (nominal) | 0.70 mH/km |

Electrical Data at 20°C

| Frequency (kHz) | Impedance (Ohm) | Attenuation (dB/100m) | Propagation delay change (µs/km) |
|-----------------|-----------------|-----------------------|----------------------------------|
| 7.9-39 | - | - | ≤ 1.7 |
| 31.25 | 100 ± 20 | - | - |
| 39 | - | ≤ 0.3 | - |

Ordering Information

| P/N | Product Description | P.U |
|---------|--|------------|
| 1025039 | FOUNDATION Fieldbus FC AWG16 FLEX PVC Cable, FF FC 1x2xAWG16/7 PVC | 1000m/drum |



Application

Spur and trunk cable for flexible installation indoor and outdoor on racks in conduits, FastConnect-Assembly

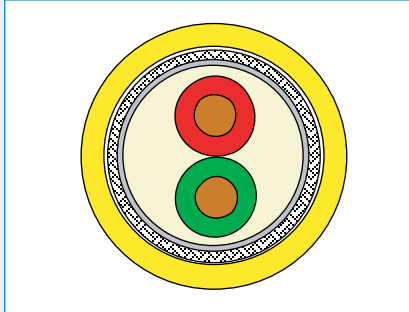
- UV-resistant
- Silicon free
- Oil and grease resistant

Standards

- IEC 61158 and IEC 61784
- Cable type A acc. to FOUNDATION Fieldbus

Fire Rating

- IEC 60332-1



Application

Spur and trunk cable for fixed installation indoor and outdoor on racks in conduits, FastConnect-Assembly

- UV-resistant
- Silicon free
- Oil and grease resistant

Standards

- IEC 61158 and IEC 61784
- Cable type A acc. to FOUNDATION Fieldbus

Fire Rating

- IEC 60332-1

FF FC 1x2xAWG18/1 PVC

FOUNDATION Fieldbus FC INST PVC Cable

Construction

| | |
|------------------------|--|
| Conductor | bare copper wire, \varnothing 1.05 mm, (cross-section AWG18) |
| Insulation | foam-skin-PE, \varnothing 2.55 mm |
| Stranding | two cores gn / rd to the Pair |
| Bedding | PVC, filling the interstices |
| Static screen | PET-Al-Foil longitudinally applied |
| Braid | tinned copper braid, coverage approx. 70% |
| Sheath | PVC, \varnothing 8.0 mm |
| Sheath Colour | yellow |
| Outer Diameter | Nom. 8.0 mm |
| Weight | Nom. 78 kg/km |
| Tensile force N | 175 |

Mechanical Properties

| | |
|------------------------------|------------------|
| Bending radius | |
| Single bending | ≥ 40 mm |
| Repeated bending | ≥ 80 mm |
| Temperature range | - 40°C to + 70°C |
| Transport and storage | - 40°C to + 70°C |
| Installation | - 5°C to + 50°C |

Electrical Properties at 20°C

| | |
|---|------------------------------------|
| Loop resistance | $\leq 46 \Omega/\text{km}$ |
| Screen resistance nominal | 12 Ω/km |
| Characteristic impedance (at 31.25 kHz) | 100 $\Omega \pm 20 \Omega$ |
| Mutual capacitance (at 1 kHz) | approx. 60 nF/km |
| Capacitance unbalance to earth max. | 2 nF/km |
| Insulation resistance | $\geq 5 \text{ G}\Omega/\text{km}$ |
| Test Voltage (DC, 1 min) Core/Core and Core/Screen | 1 kV |
| Operating voltage (RMS) | ≤ 100 V |
| Inductance (nominal) | 0.70 mH/km |

Electrical Data at 20°C

| Frequency (kHz) | Impedance (Ohm) | Attenuation (dB/100m) | Propagation delay change ($\mu\text{s}/\text{km}$) |
|-----------------|-----------------|-----------------------|--|
| 7.9-39 | - | - | ≤ 1.7 |
| 31.25 | 100 \pm 20 | - | - |
| 39 | - | ≤ 0.3 | - |

Ordering Information

| P/N | Product Description | P.U |
|---------|--|------------|
| 1025042 | FOUNDATION Fieldbus FC INST PVC Cable, FF FC 1x2xAWG18/1 PVC | 1000m/drum |

O2YSY(St)CY 1x2x1.3/2.55-100 Li PVC

FOUNDATION Fieldbus FC FLEX PVC Cable

1.2 Foundation Fieldbus

Construction

| | |
|------------------------|--|
| Conductor | Stranded bare copper wires, 19x0.26 Ø 1.3 mm (Cross-section AWC18/19) |
| Insulation | Foam-skin-PE, Ø 2.55 mm |
| Stranding | Two cores gn / rd to the Pair |
| Bedding | PVC, filling the interstices |
| Static screen | PET-Al-Foil longitudinally applied |
| Braid | Tinned copper Braid Coverage approx. 70% |
| Sheath | PVC, yellow, Ø 8.0 mm |
| Outer Diameter | Nom. 8.0mm |
| Weight | Nom. 89 kg/km |
| Tensile force N | 190 |

Mechanical Properties

| | |
|------------------------------|------------------|
| Bending radius | |
| Single bending | ≥ 40 mm |
| Repeated bending | ≥ 80 mm |
| Temperature range | - 40°C to + 70°C |
| Transport and storage | - 40°C to + 70°C |
| Installation | - 5°C to + 50°C |

Electrical Properties at 20°C

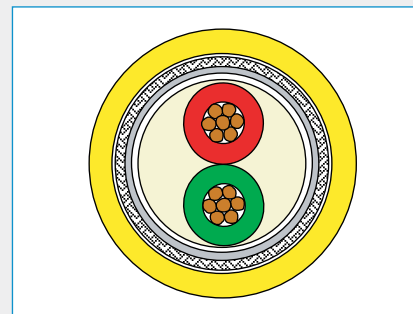
| | |
|---|------------------|
| Loop resistance | ≤ 43.6 Ω/km |
| Screen resistance nominal | 12 Ω/km |
| Characteristic impedance (at 31.25 kHz) | 100 Ω ± 20 Ω |
| Mutual capacitance (at 1 kHz) | approx. 60 nF/km |
| Capacitance unbalance to earth max. | 2 nF/km |
| Insulation resistance | ≥ 5 GΩkm |
| Test Voltage (DC, 1 min) Core/Core and Core/Screen | 1 kV |
| Operating voltage (RMS) | ≤ 100 V |
| Inductance (nominal) | 0.70 mH/km |

Electrical Data at 20°C

| Frequency (kHz) | Impedance (Ohm) | Attenuation (dB/100m) | Propagation delay change (µs/km) |
|-----------------|-----------------|-----------------------|----------------------------------|
| 7.9-39 | - | - | ≤ 1.7 |
| 31.25 | 100 ± 20 | - | - |
| 39 | - | ≤ 0.3 | - |

Ordering Information

| P/N | Product Description | P.U |
|---------|--|------------|
| 1025041 | FOUNDATION Fieldbus FC FLEX PVC Cable, O2YSY(St)CY 1x2x1.3/2.55-100 Li PVC | 1000m/drum |



Application

Spur and trunk cable for flexible installation indoor and outdoor on racks in conduits, FastConnect-Assembly

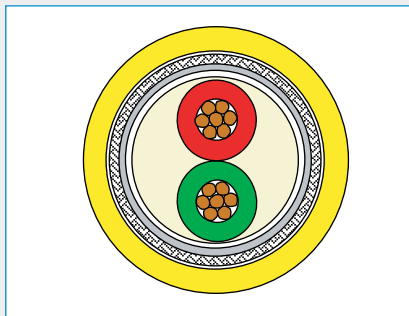
- UV-resistant
- Silicon free
- Oil and Grease resistant

Standards

- IEC 61158 and IEC 61784
- Cable type A acc. to FOUNDATION Fieldbus

Fire Rating

- IEC 60332-1



Application

Spur and trunk cable for flexible installation indoor and outdoor on racks in conduits, FastConnect-Assembly

- UV-resistant
- Silicon free
- Oil and grease resistant

Standards

- IEC 61158 and IEC 61784
- Cable type A acc. to FOUNDATION Fieldbus

Fire Rating

IEC 60332-1, IEC 60332-3-24, IEC 61034-2, IEC 60754-1/2

FF FC 1x2xAWG18/7 LSHF-FR

FOUNDATION Fieldbus FC FLEX LSZH-FR Cable

Construction

| | |
|------------------------|---|
| Conductor | stranded bare copper wires, 7x0.40 Ø 1.2 mm, (cross-section AWG18/7) |
| Insulation | foam-skin-PE, Ø 2.55 mm |
| Stranding | two cores gn / rd to the Pair |
| Bedding | halogen free, flame retardant thermoplastic sheathing compound acc. to EN 50290-2-27, filling the interstices |
| Static screen | PET-Al-Foil longitudinally applied |
| Braid | tinned copper braid, coverage approx. 70% |
| Sheath | halogen free, flame retardant thermoplastic sheathing compound acc. to EN 50290-2-27, Ø 8.0 mm |
| Colour | yellow |
| Outer Diameter | Nom. 8.0 mm |
| Weight | Nom. 83 kg/km |
| Tensile force N | 180 |

Mechanical Properties

| | |
|------------------------------|------------------|
| Bending radius | |
| Single bending | ≥ 40 mm |
| Repeated bending | ≥ 80 mm |
| Temperature range | - 40°C to + 70°C |
| Transport and storage | - 40°C to + 70°C |
| Installation | - 5°C to + 50°C |

Electrical Properties at 20°C

| | |
|---|------------------|
| Loop resistance | ≤ 43.6 Ω/km |
| Screen resistance nominal | 12 Ω/km |
| Characteristic impedance (at 31.25 kHz) | 100 Ω ± 20 Ω |
| Mutual capacitance (at 1 kHz) | approx. 60 nF/km |
| Capacitance unbalance to earth max. | 2 nF/km |
| Insulation resistance | ≥ 5 GΩkm |
| Test Voltage (DC, 1 min) Core/Core and Core/Screen | 1 kV |
| Operating voltage (RMS) | ≤ 100 V |
| Inductance (nominal) | 0.70 mH/km |

Electrical Data at 20°C

| Frequency (kHz) | Impedance (Ohm) | Attenuation (dB/100m) | Propagation delay change (µs/km) |
|-----------------|-----------------|-----------------------|----------------------------------|
| 7.9-39 | - | - | ≤ 1.7 |
| 31.25 | 100 ± 20 | - | - |
| 39 | - | ≤ 0.3 | - |

Ordering Information

| P/N | Product Description | P.U |
|---------|--|------------|
| 1025038 | FOUNDATION Fieldbus FC FLEX LSHF-FR Cable, FF FC 1x2xAWG18/7 LSZH-FR | 1000m/drum |

FF FC 1x2xAWG18/1 GST PVC

FOUNDATION Fieldbus FC Galvanized Steel Tape Armoured PVC Installation Cable

1.2 Foundation Fieldbus

Construction

| | |
|------------------------|--|
| Conductor | bare copper wire, \emptyset 1.05 mm, (cross-section AWG18) |
| Insulation | foam-skin-PE, \emptyset 2.55 mm |
| Stranding | two cores gn / rd to the Pair |
| Bedding | PVC, filling the interstices |
| Static screen | PET-Al-Foil longitudinally applied |
| Braid | tinned copper braid, coverage approx. 70% |
| Sheath | PVC, \emptyset 8.0 mm |
| Colour | yellow |
| Wrapping | PP foil overlapping, \emptyset 8.2 mm |
| Armouring | 2 galvanized steel tapes, thickness of tapes 0.10 mm, \emptyset 9.0 mm |
| Outer sheath | PVC, \emptyset 12.0 mm |
| Sheath colour | yellow |
| Outer Diameter | Nom. 12.0 mm |
| Weight | Nom. 193 kg/km |
| Tensile force N | 175 |

Mechanical Properties

| | |
|------------------------------|------------------|
| Bending radius | |
| Single bending | ≥ 120 mm |
| Repeated bending | ≥ 180 mm |
| Temperature range | - 40°C to + 70°C |
| Transport and storage | - 40°C to + 70°C |
| Installation | - 5°C to + 50°C |

Electrical Properties at 20°C

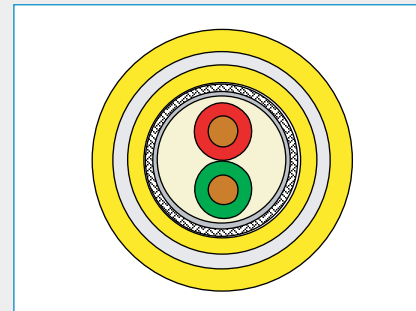
| | |
|---|------------------------------|
| Loop resistance | ≤ 46 Ω /km |
| Screen resistance nominal | 12 Ω /km |
| Characteristic impedance (at 31.25 kHz) | 100 $\Omega \pm 20$ Ω |
| Mutual capacitance (at 1 kHz) | approx. 60 nF/km |
| Capacitance unbalance to earth max. | 2 nF/km |
| Insulation resistance | ≥ 5 G Ω km |
| Test Voltage (DC, 1 min) Core/Core and Core/Screen | 1 kV |
| Operating voltage (RMS) | ≤ 100 V |
| Inductance (nominal) | 0.70 mH/km |

Electrical Data at 20°C

| Frequency (kHz) | Impedance (Ohm) | Attenuation (dB/100m) | Propagation delay change (μ s/km) |
|-----------------|-----------------|-----------------------|--|
| 7.9-39 | - | - | ≤ 1.7 |
| 31.25 | 100 ± 20 | - | - |
| 39 | - | ≤ 0.3 | - |

Ordering Information

| P/N | Product Description | P.U |
|---------|---|------------|
| 1025043 | FOUNDATION Fieldbus FC Galvanized Steel Tape Armoured PVC Installation Cable, FF FC 1x2xAWG18/1 GST PVC | 1000m/drum |



Application

Spur and trunk cable for fixed installation indoor and outdoor on racks in conduits, FastConnect-Assembly

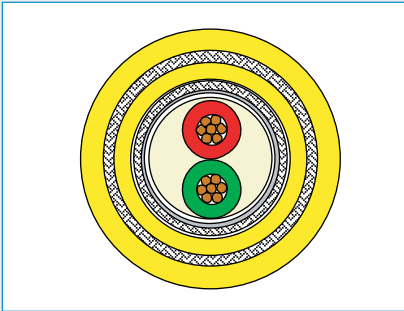
- UV-resistant
- Silicon free
- Oil and grease resistant

Standards

- IEC 61158 and IEC 61784
- Cable type A acc. to FOUNDATION Fieldbus

Fire Rating

- IEC 60332-1



Application

Spur and trunk cable for flexible installation indoor and outdoor on racks in conduits, FastConnect-Assembly
 - UV-resistant
 - Silicon free
 - Oil and grease resistant

Standards

- IEC 61158 and IEC 61784
- Cable type A acc. to FOUNDATION Fieldbus

Fire Rating

- IEC 60332-1

FF FC 1x2xAWG18/7 SWB PVC

FOUNDATION Fieldbus FC FLEX Steel Wire Braid Armoured PVC Cable

Construction

| | |
|------------------------|--|
| Conductor | stranded bare copper wires, 7x0.40 Ø 1.2 mm, (cross-section AWG18/7) |
| Insulation | foam-skin-PE, Ø 2.55 mm |
| Stranding | two cores gn / rd to the Pair |
| Bedding | PVC, filling the interstices |
| Static screen | PET-Al-Foil longitudinally applied |
| Braid | tinned copper braid, coverage approx. 70% |
| Sheath | PVC, Ø 8.0 mm |
| Colour | yellow |
| Armouring | galvanized steel wire braid, optical coverage 85%, Ø 9.3 mm |
| Outer sheath | PVC, Ø 12.0 mm |
| Colour | yellow |
| Outer Diameter | Nom. 12.0 mm |
| Weight | Nom. 211 kg/km |
| Tensile force N | 500 |

Mechanical Properties

| | |
|------------------------------|------------------|
| Bending radius | |
| Single bending | ≥ 60 mm |
| Repeated bending | ≥ 120 mm |
| Temperature range | - 40°C to + 70°C |
| Transport and storage | - 40°C to + 70°C |
| Installation | - 5°C to + 50°C |

Electrical Properties at 20°C

| | |
|---|------------------|
| Loop resistance | ≤ 43.6 Ω/km |
| Screen resistance nominal | 12 Ω/km |
| Characteristic impedance (at 31.25 kHz) | 100 Ω ± 20 Ω |
| Mutual capacitance (at 1 kHz) | approx. 60 nF/km |
| Capacitance unbalance to earth max. | 2 nF/km |
| Insulation resistance | ≥ 5 GΩkm |
| Test Voltage (DC, 1 min) Core/Core and Core/Screen | 1 kV |
| Operating voltage (RMS) | ≤ 100 V |
| Inductance (nominal) | 0.70 mH/km |

Electrical Data at 20°C

| Frequency (kHz) | Impedance (Ohm) | Attenuation (dB/100m) | Propagation delay change (µs/km) |
|-----------------|-----------------|-----------------------|----------------------------------|
| 7.9-39 | - | - | ≤ 1.7 |
| 31.25 | 100 ± 20 | - | - |
| 39 | - | ≤ 0.3 | - |

Ordering Information

| P/N | Product Description | P.U |
|---------|--|------------|
| 1025040 | FOUNDATION Fieldbus FC FLEX Steel Wire Braid Armoured PVC Cable, FF FC 1x2xAWG18/7 SWB PVC | 1000m/drum |

FF FC 1x2xAWG18/7 SWB LSZH

FOUNDATION Fieldbus FC FLEX Steel Wire Braid Armoured LSZH Cable

Construction

| | |
|------------------------|--|
| Conductor | stranded bare copper wires, 7x0.40 Ø 1.2 mm, (cross-section AWG18/7) |
| Insulation | foam-skin-PE, Ø 2.55 mm |
| Stranding | two cores blue / orange to the pair |
| Bedding | LSHF, filling the interstices |
| Static screen | PET-Al-Foil longitudinally applied |
| Braid | tinned copper braid, coverage approx. 70% |
| Sheath | LSZH, Ø 8.0 mm |
| Colour | grey |
| Armouring | galvanized steel wire braid, optical coverage 85%, Ø 9.3 mm |
| Outer sheath | LSZH, Ø 12.0 mm |
| Colour | grey |
| Outer Diameter | Nom. 12.0 mm |
| Weight | Nom. 202 kg/km |
| Tensile force N | 500 |

Mechanical Properties

| | |
|------------------------------|------------------|
| Bending radius | |
| Single bending | ≥ 60 mm |
| Repeated bending | ≥ 120 mm |
| Temperature range | - 30°C to + 70°C |
| Transport and storage | - 30°C to + 70°C |
| Installation | - 5°C to + 50°C |

Electrical Properties at 20°C

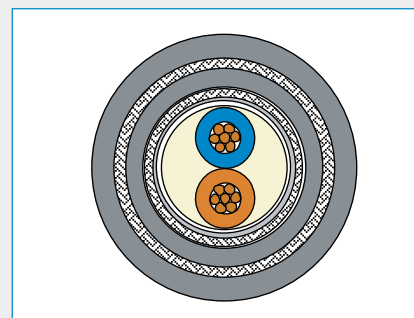
| | |
|---|------------------|
| Loop resistance | ≤ 43.6 Ω/km |
| Screen resistance nominal | 12 Ω/km |
| Characteristic impedance (at 31.25 kHz) | 100 Ω ± 20 Ω |
| Mutual capacitance (at 1 kHz) | approx. 60 nF/km |
| Capacitance unbalance to earth max. | 2 nF/km |
| Insulation resistance | ≥ 5 GΩkm |
| Test Voltage (DC, 1 min) Core/Core and Core/Screen | 1 kV |
| Operating voltage (RMS) | ≤ 100 V |
| Inductance (nominal) | 0.70 mH/km |

Electrical Data at 20°C

| Frequency (kHz) | Impedance (Ohm) | Attenuation (dB/100m) | Propagation delay change (µs/km) |
|-----------------|-----------------|-----------------------|----------------------------------|
| 7.9-39 | - | - | ≤ 1.7 |
| 31.25 | 100 ± 20 | - | - |
| 39 | - | ≤ 0.3 | - |

Ordering Information

| P/N | Product Description | P.U |
|---------|--|------------|
| 1030290 | FOUNDATION Fieldbus FC FLEX Steel Wire Braid Armoured LSZH Cable, FF FC 1x2xAWG18/7 SWB LSZH | 1000m/drum |



Application

Spur and trunk cable for flexible installation indoor and outdoor on racks in conduits,

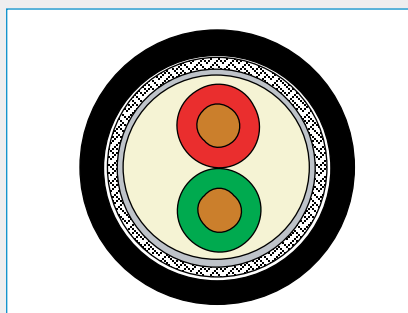
- FastConnect-Assembly
- Halogen free and flame resistant
- UV-resistant
- Silicon free
- Limited oil and grease resistance

Standards

- IEC 61158 and IEC 61784
- Cable type A acc. to FOUNDATION Fieldbus

Fire Rating

- IEC 60332-1, IEC 61034-2, IEC 60754-1/2



Application

Spur and trunk cable for fixed installation indoor and outdoor on racks in dry conduits, FastConnect-Assembly

- UV-resistant
- Silicon free
- Oil and grease resistant

Standards

- IEC 61158 and IEC 61784
- Cable type A acc. to Profibus PA

Fire Rating

- IEC 60332-1

PB PA FC 1x2xAWG18/1 PVC

PROFIBUS PA FC INST PVC Cable

Construction

| | |
|------------------------|--|
| Conductor | bare copper wire, \emptyset 1.05 mm, (cross-section AWG18) |
| Insulation | foam-skin-PE, \emptyset 2.55 mm |
| Stranding | two cores gn / rd to the Pair |
| Bedding | PVC, filling the interstices |
| Static screen | PET-Al-Foil longitudinally applied |
| Braid | tinned copper Braid Coverage approx. 70% |
| Sheath | PVC, \emptyset 8.0 mm |
| Colour | black |
| Outer Diameter | Nom. 8.0 mm |
| Weight | Nom. 87 kg/km |
| Tensile force N | 175 |

Mechanical Properties

| | |
|------------------------------|------------------|
| Bending radius | |
| single bending | ≥ 40 mm |
| repeated bending | ≥ 80 mm |
| Temperature range | - 40°C to + 70°C |
| Transport and storage | - 40°C to + 70°C |
| Installation | - 5°C to + 50°C |

Electrical Properties at 20°C

| | |
|---|------------------------------|
| Loop resistance | ≤ 46 Ω /km |
| Screen resistance nominal | 12 Ω /km |
| Characteristic impedance (at 31.25 kHz) | 100 $\Omega \pm 20$ Ω |
| Mutual capacitance (at 1 kHz) | approx. 60 nF/km |
| Capacitance unbalance to earth max. | 2 nF/km |
| Insulation resistance | ≥ 5 G Ω /km |
| Test Voltage (DC, 1 min) Core/Core and Core/Screen | 1 kV |
| Operating voltage (RMS) | ≤ 100 V |
| Inductance (nominal) | 0.70 mH/km |

Electrical Data at 20°C

| Frequency (kHz) | Impedance (Ohm) | Attenuation (dB/100m) | Propagation delay change (μ s/km) |
|-----------------|-----------------|-----------------------|--|
| 7.9-39 | - | - | ≤ 1.7 |
| 31.25 | 100 \pm 20 | - | - |
| 39 | - | ≤ 0.3 | - |

Ordering Information

| P/N | Product Description | P.U |
|---------|---|------------|
| 1025051 | PROFIBUS PA FC INST PVC Cable, PB PA FC 1x2xAWG18/1 PVC | 1000m/drum |

PB PA FC 1x2xAWG16/7 PVC

PROFIBUS PA FC AWG16 FLEX PVC Cable

Construction

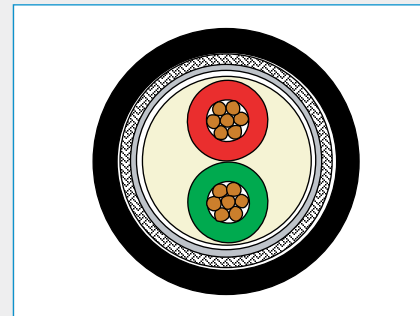
| | |
|------------------------|---|
| Conductor | stranded bare copper wires, 7x0.51 Ø 1.53 mm, (cross-section AWG16/7) |
| Insulation | PE, Ø 3.25 mm |
| Stranding | two cores gn / rd to the Pair |
| Bedding | PVC, filling the interstices |
| Static screen | PET-Al-Foil longitudinally applied |
| Braid | tinned copper braid, coverage approx. 70% |
| Sheath | PVC, Ø 9.5 mm |
| Colour | black or blue |
| Outer Diameter | Nom. 9.5 mm |
| Weight | Nom. 129 kg/km |
| Tensile force N | 270 |

Mechanical Properties

| | |
|-----------------------|------------------|
| Bending radius | |
| Single bending | ≥ 50 mm |
| Repeated bending | ≥ 100 mm |
| Temperature range | - 40°C to + 70°C |
| Transport and storage | - 40°C to + 70°C |
| Installation | - 5°C to + 50°C |

Electrical Properties at 20°C

| | |
|---|------------------|
| Loop resistance | ≤ 28.6 Ω/km |
| Screen resistance nominal | 12 Ω/km |
| Characteristic impedance (at 31.25 kHz) | 100 Ω ± 20 Ω |
| Mutual capacitance (at 1 kHz) | approx. 60 nF/km |
| Capacitance unbalance to earth max. | 2 nF/km |
| Insulation resistance | ≥ 5 GΩkm |
| Test Voltage (DC, 1 min) Core/Core and Core/Screen | 1 kV |
| Operating voltage (RMS) | ≤ 100 V |
| Inductance (nominal) | 0.70 mH/km |



Application

Spur and trunk cable for flexible installation indoor and outdoor on racks in conduits, FastConnect-Assembly

- UV-resistant
- Silicon free
- Oil and grease resistant

Standards

- IEC 61158 and IEC 61784
- Cable type A acc. to Profibus PA

Fire Rating

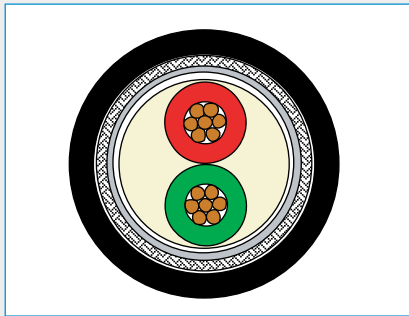
- IEC 60332-1

Electrical Data at 20°C

| Frequency (kHz) | Impedance (Ohm) | Attenuation (dB/100m) | Propagation delay change (µs/km) |
|-----------------|-----------------|-----------------------|----------------------------------|
| 7.9-39 | - | - | ≤ 1.7 |
| 31.25 | 100 ± 20 | - | - |
| 39 | - | ≤ 0.3 | - |

Ordering Information

| P/N | Product Description | P.U |
|---------|---|------------|
| 1025048 | PROFIBUS PA FC AWG16 FLEX PVC Cable, PB PA FC 1x2xAWG16/7 PVC | 1000m/drum |



Application

Spur and trunk cable for flexible installation indoor and outdoor on racks in conduits, FastConnect-Assembly

- UV-resistant
- Silikon free
- Limited oil and grease resistant

Standards

- IEC 61158 and IEC 61784
- Cable type A acc. to Profibus PA

Fire Rating

- IEC 60332-1, IEC 60332-3-24, IEC 61034-2, IEC 60754-1/2

PB PA FC 1x2xAWG16/7 LSHF-FR

PROFIBUS PA FC AWG16 FLEX LSHF-FR Cable, 100 Ohm

Construction

| | |
|------------------------|---|
| Conductor | stranded bare copper wires, 7x0.51 Ø 1.53 mm, (cross-section AWG16/7) |
| Insulation | PE, Ø 3.25 mm |
| Stranding | two cores gn / rd to the Pair |
| Bedding | halogen free, flame retardant thermoplastic sheathing compound acc. to EN 50290-2-27, filling the interstices |
| Static screen | PET-Al-Foil longitudinally applied |
| Braid | tinned copper braid, coverage approx. 70% |
| Sheath | halogen free, flame retardant thermoplastic sheathing compound acc. to EN 50290-2-27, Ø 9.5 mm |
| Colour | black |
| Outer Diameter | Nom. 9.5 mm |
| Weight | Nom. 143 kg/km |
| Tensile force N | 270 |

Mechanical Properties

| | |
|------------------------------|------------------|
| Bending radius | |
| single bending | ≥ 50 mm |
| repeated bending | ≥ 100 mm |
| Temperature range | - 30°C to + 70°C |
| Transport and storage | - 30°C to + 70°C |
| Installation | - 5°C to + 50°C |

Electrical Properties at 20°C

| | |
|---|------------------|
| Loop resistance | ≤ 28.6 Ω/km |
| Screen resistance nominal | 12 Ω/km |
| Characteristic impedance (at 31.25 kHz) | 100 Ω ± 20 Ω |
| Mutual capacitance (at 1 kHz) | approx. 60 nF/km |
| Capacitance unbalance to earth max. | 2 nF/km |
| Insulation resistance | ≥ 5 GΩ.km |
| Test Voltage (DC, 1 min) Core/Core and Core/Screen | 1 kV |
| Operating voltage (RMS) | ≤ 100 V |
| Inductance (nominal) | 0.70 mH/km |

Electrical Data at 20°C

| Frequency (kHz) | Impedance (Ohm) | Attenuation (dB/100m) | Propagation delay change (µs/km) |
|-----------------|-----------------|-----------------------|----------------------------------|
| 7.9-39 | - | - | ≤ 1.7 |
| 31.25 | 100 ± 20 | - | - |
| 39 | - | ≤ 0.3 | - |

Ordering Information

| P/N | Product Description | P.U |
|---------|---|------------|
| 1027134 | PROFIBUS PA FC AWG16 FLEX LSHF-FR Cable, PB PA FC 1x2xAWG16/7 LSHF-FR | 1000m/drum |

PB PA FC 1x2xAWG 18/19 PVC

PROFIBUS PA FC FLEX PVC Cable, 100 Ohm

1.3 Profibus

Construction

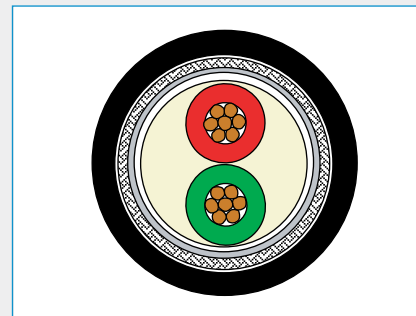
| | |
|------------------------|--|
| Conductor | Stranded bare copper wires, 19x0.26 Ø 1.3 mm (Cross-section AWG18/19) |
| Insulation | Foam-skin-PE, Ø 2.55 mm |
| Stranding | Two cores gn / rd to the Pair |
| Bedding | PVC, filling the interstices |
| Static screen | PET-Al-Foil longitudinally applied |
| Braid | Tinned copper Braid Coverage approx. 70% |
| Sheath | PVC, black or blue, Ø 8.0 mm |
| Outer Diameter | Nom. 8.0 mm |
| Weight | Nom. 89 kg/km |
| Tensile force N | 190 |

Mechanical Properties

| | |
|-----------------------|------------------|
| Bending radius | |
| Single bending | ≥ 40 mm |
| Repeated bending | ≥ 80 mm |
| Temperature range | - 40°C to + 70°C |
| Transport and storage | - 40°C to + 70°C |
| Installation | - 5°C to + 50°C |

Electrical Properties at 20°C

| | |
|---|------------------|
| Loop resistance | ≤ 43.6 Ω/km |
| Screen resistance nominal | 12 Ω/km |
| Characteristic impedance (at 31.25 kHz) | 100 Ω ± 20 Ω |
| Mutual capacitance (at 1 kHz) | approx. 60 nF/km |
| Capacitance unbalance to earth max. | 2 nF/km |
| Insulation resistance | ≥ 5 GΩkm |
| Test Voltage (DC, 1 min) Core/Core and Core/Screen | 1 kV |
| Operating voltage (RMS) | ≤ 100 V |
| Inductance (nominal) | 0.70 mH/km |



Application

Spur and trunk cable for flexible installation indoor and outdoor on racks in dry conduits, FastConnect-Assembly

- UV-resistant
- Silicon free
- Oil and grease resistant

Standards

- IEC 61158 and IEC 61784
- Cable type A acc. to Profibus PA

Fire Rating

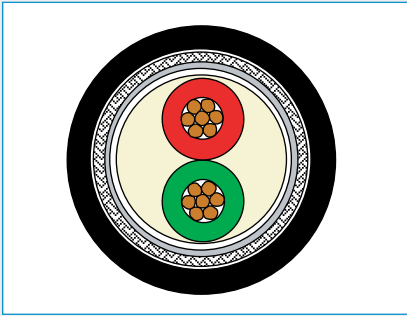
- IEC 60332-1

Electrical Data at 20°C

| Frequency (kHz) | Impedance (Ohm) | Attenuation (dB/100m) | Propagation delay change (µs/km) |
|-----------------|-----------------|-----------------------|----------------------------------|
| 7.9-39 | - | - | ≤ 1.7 |
| 31.25 | 100 ± 20 | - | - |
| 39 | - | ≤ 0.3 | - |

Ordering Information

| P/N | Product Description | P.U |
|---------|---|------------|
| 1025050 | PROFIBUS PA FC FLEX PVC Cable, PB PA FC 1x2xAWG 18/19 PVC | 1000m/drum |



Application

Spur and trunk cable for flexible installation indoor and outdoor on racks in dry conduits, FastConnect-Assembly

- UV-resistant
- Silicon free
- Limited oil and grease resistant

Standards

- IEC 61158 and IEC 61784
- Cable type A acc. to Profibus PA

Fire Rating

- IEC 60332-1, IEC 60332-3-24, IEC 61034-2, IEC 60754-1/2

PB PA FC 1x2xAWG18/7 LSHF-FR

PROFIBUS PA FC FLEX LSHF-FR Cable, 100 Ohm

Construction

| | |
|------------------------|---|
| Conductor | stranded bare copper wires, 7x0.40 Ø 1.2 mm, (cross-section AWG18/7) |
| Insulation | foam-skin-PE, Ø 2.55 mm |
| Stranding | two cores gn / rd to the Pair |
| Bedding | halogen free, flame retardant thermoplastic sheathing compound acc. to EN 50290-2-27, filling the interstices |
| Static screen | PET-Al-Foil longitudinally applied |
| Braid | tinned copper braid, coverage approx. 70% |
| Sheath | halogen free, flame retardant thermoplastic sheathing compound acc. to EN 50290-2-27, Ø 8.0 mm |
| Colour | black or blue |
| Outer Diameter | Nom. 8.0 mm |
| Weight | Nom. 83 kg/km |
| Tensile Force N | 180 |

Mechanical Properties

| | |
|------------------------------|------------------|
| Bending radius | |
| single bending | ≥ 40 mm |
| repeated bending | ≥ 80 mm |
| Temperature range | - 30°C to + 70°C |
| Transport and storage | - 30°C to + 70°C |
| Installation | - 5°C to + 50°C |

Electrical Properties at 20°C

| | |
|---|------------------|
| Loop resistance | ≤ 43.6 Ω/km |
| Screen resistance | 12 Ω/km |
| Characteristic impedance (Nominal) | 100 Ω ± 20 Ω |
| Mutual capacitance (at 1 kHz) | approx. 60 nF/km |
| Capacitance unbalance to earth max. | 2 nF/km |
| Insulation resistance | ≥ 5 GΩkm |
| Test Voltage (DC, 1 min) Core/Core and Core/Screen | 1 kV |
| Operating voltage (RMS) | ≤ 100 V |
| Inductance (nominal) | 0.70 mH/km |

Electrical Data at 20°C

| Frequency (kHz) | Impedance (Ohm) | Attenuation (dB/100m) | Propagation delay change (µs/km) |
|-----------------|-----------------|-----------------------|----------------------------------|
| 7.9-39 | - | - | ≤ 1.7 |
| 31.25 | 100 ± 20 | - | - |
| 39 | - | ≤ 0.3 | - |

Ordering Information

| P/N | Product Description | P.U |
|---------|--|------------|
| 1025047 | 1 x 2 x 1.2/2.55-100, PROFIBUS PA FC FLEX LSHF-FR Cable, PB PA FC 1x2xAWG18/7 LSZH-FR BK | 1000m/drum |
| 1029194 | 1 x 2 x 1.2/2.55-100, PROFIBUS PA FC FLEX LSHF-FR Cable, PB PA FC 1x2xAWG18/7 LSZH-FR BU | 1000m/drum |

PB PA 1x2xAWG18/7 LSHF-FR

PROFIBUS PA FLEX LSZH-FR Cable, 100 Ohm

1.3 Profibus

Construction

| | |
|------------------------|---|
| Conductor | stranded bare copper wires, 7x0.40 Ø 1.2 mm, (cross-section AWG18/7) |
| Insulation | Polypropylene (PP) Ø 2.0 mm |
| Stranding | two cores gn / rd to the pair + two fillers |
| Static screen | PET-Al-Foil longitudinally applied |
| Drain wire | Tinned Copper 0.5mm ² |
| Braid | tinned copper braid, coverage approx. 70% |
| Sheath | halogen free, flame retardant thermoplastic sheathing compound acc. to EN 50290-2-27 with thermal resistance up to 90°C Ø 7.0 mm |
| Colour | Blue RAL5015 |
| Outer Diameter | Nom. 7.0 mm |
| Weight | Nom. 72.3 kg/km |
| Tensile force N | 190 |

Mechanical Properties

| | |
|------------------------------|------------------|
| Bending radius | |
| single bending | ≥ 40 mm |
| repeated bending | ≥ 80 mm |
| Temperature range | - 40°C to + 90°C |
| Transport and storage | - 40°C to + 90°C |
| Installation | - 5°C to + 50°C |

Electrical Properties at 20°C

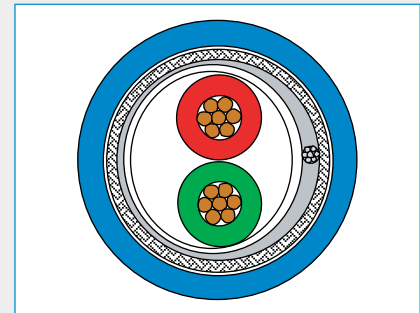
| | |
|---|------------------|
| Loop resistance | ≤ 43.6 Ω/km |
| Screen resistance nominal | 12 Ω/km |
| Characteristic impedance (at 31.25 kHz) | 100 Ω ± 20 Ω |
| Mutual capacitance (at 1 kHz) | approx. 60 nF/km |
| Capacitance unbalance to earth max. | 2 nF/km |
| Insulation resistance | ≥ 5 GΩkm |
| Test Voltage (DC, 1 min) Core/Core and Core/Screen | 1 kV |
| Operating voltage (RMS) | ≤ 100 V |
| Inductance (nominal) | 0.70 mH/km |

Electrical Data at 20°C

| Frequency (kHz) | Impedance (Ohm) | Attenuation (dB/100m) | Propagation delay change (µs/km) |
|-----------------|-----------------|-----------------------|----------------------------------|
| 7.9-39 | - | - | ≤ 1.7 |
| 31.25 | 100 ± 20 | - | - |
| 39 | - | ≤ 0.3 | - |

Ordering Information

| P/N | Product Description | P.U |
|----------|---|------------|
| 60031151 | PROFIBUS PA FLEX LSHF-FR Cable, PB PA 1x2xAWG18/7 LSZH-FR | 1000m/drum |



Application

Spur and trunk cable for flexible installation indoor and outdoor on racks in dry conduits,

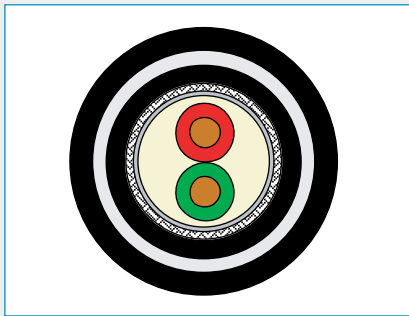
- UV-resistant
- Silicon free
- Limited oil and grease resistant

Standards

- IEC 61158 and IEC 61784
- Cable type A acc. to Profibus PA

Fire Rating

- IEC 60332-1, IEC 60332-3-24, IEC 61034-2, IEC 60754-1/2



Application

Spur and trunk cable for fixed installation indoor and outdoor on racks in conduits, FastConnect-Assembly

- UV-resistant
- Silicon free
- Oil and grease resistant

Standards

- IEC 61158 and IEC 61784
- Cable type A acc. to Profibus PA

Fire Rating

- IEC 60332-1

PB PA FC 1x2xAWG18/1 GST PVC

PROFIBUS PA FC Galvanized Steel Tape Armoured PVC Installation Cable, 100 Ohm

Construction

| | |
|------------------------|--|
| Conductor | bare copper wire, Ø 1.05 mm, (cross-section AWG18) |
| Insulation | foam-skin-PE, Ø 2.55 mm |
| Stranding | two cores gn / rd to the Pair |
| Bedding | PVC, filling the interstices |
| Static screen | PET-Al-Foil longitudinally applied |
| Braid | tinned copper Braid Coverage approx. 70% |
| Sheath | PVC, Ø 8.0 mm |
| Colour | black or blue |
| Wrapping | PP foil overlapping, Ø 8.2 mm |
| Armouring | 2 galvanized steel tapes, thickness of tapes 0.10 mm, Ø 9.0 mm |
| Outer sheath | PVC, Ø 12.0 mm |
| Colour | black or blue |
| Outer Diameter | Nom. 12.0 mm |
| Weight | Nom. 193 kg/km |
| Tensile force N | 175 |

Mechanical Properties

| | |
|------------------------------|------------------|
| Bending radius | |
| Single bending | ≥ 120 mm |
| repeated bending | ≥ 180 mm |
| Temperature range | - 40°C to + 70°C |
| Transport and storage | - 40°C to + 70°C |
| Installation | - 5°C to + 50°C |

Electrical Properties at 20°C

| | |
|---|------------------|
| Loop resistance | ≤ 46 Ω/km |
| Screen resistance nominal | 12 Ω/km |
| Characteristic impedance (Nominal) | 100 Ω ± 20 Ω |
| Mutual capacitance (at 1 kHz) | approx. 60 nF/km |
| Capacitance unbalance to earth max. | 2 nF/km |
| Insulation resistance | ≥ 5 GΩkm |
| Test Voltage (DC, 1 min) Core/Core and Core/Screen | 1 kV |
| Operating voltage (RMS) | ≤ 100 V |
| Inductance (nominal) | 0.70 mH/km |

Electrical Data at 20°C

| Frequency (kHz) | Impedance (Ohm) | Attenuation (dB/100m) | Propagation delay change (µs/km) |
|-----------------|-----------------|-----------------------|----------------------------------|
| 7.9-39 | - | - | ≤ 1.7 |
| 31.25 | 100 ± 20 | - | - |
| 39 | - | ≤ 0.3 | - |

Ordering Information

| P/N | Product Description | P.U |
|---------|--|------------|
| 1025052 | PROFIBUS PA FC Galvanized Steel Tape Armoured PVC Installation Cable, PB PA FC 1x2xAWG18/1 GST PVC | 1000m/drum |

PB PA FC 1x2xAWG18/7 SWB PVC

PROFIBUS PA FC FLEX Steel Wire Braid Armoured PVC Cable, 100 Ohm

Construction

| | |
|------------------------|--|
| Conductor | stranded bare copper wires, 7x0.40 Ø 1.2 mm, (cross-section AWG18/7) |
| Insulation | foam-skin-PE, Ø 2.55 mm |
| Stranding | two cores gn / rd to the Pair |
| Bedding | PVC, filling the interstices |
| Static screen | PET-Al-Foil longitudinally applied |
| Braid | tinned copper braid, coverage approx. 70% |
| Sheath | PVC, Ø 8.0 mm |
| Colour | black or blue |
| Armouring | galvanized steel wire braid, optical coverage 85% Ø 9.3 mm |
| Outer sheath | PVC, Ø 12.0 mm |
| Colour | black or blue |
| Outer Diameter | Nom. 12.0 mm |
| Weight | Nom. 211 kg/km |
| Tensile force N | 500 |

Mechanical Properties

| | |
|------------------------------|------------------|
| Bending radius | |
| single bending | ≥ 60 mm |
| repeated bending | ≥ 120 mm |
| Temperature range | - 40°C to + 70°C |
| Transport and storage | - 40°C to + 70°C |
| Installation | - 5°C to + 50°C |

Electrical Properties at 20°C

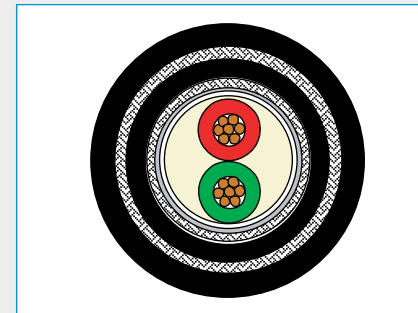
| | |
|---|------------------|
| Loop resistance | ≤ 43.6 Ω/km |
| Screen resistance nominal | 12 Ω/km |
| Characteristic impedance (at 31.25 kHz) | 100 Ω ± 20 Ω |
| Mutual capacitance (at 1 kHz) | approx. 60 nF/km |
| Capacitance unbalance to earth max. | 2 nF/km |
| Insulation resistance | ≥ 5 GΩkm |
| Test Voltage (DC, 1 min) Core/Core and Core/Screen | 1 kV |
| Operating voltage (RMS) | ≤ 100 V |
| Inductance (nominal) | 0.70 mH/km |

Electrical Data at 20°C

| Frequency (kHz) | Impedance (Ohm) | Attenuation (dB/100m) | Propagation delay change (µs/km) |
|-----------------|-----------------|-----------------------|----------------------------------|
| 7.9-39 | - | - | ≤ 1.7 |
| 31.25 | 100 ± 20 | - | - |
| 39 | - | ≤ 0.3 | - |

Ordering Information

| P/N | Product Description | P.U |
|---------|--|------------|
| 1025049 | PROFIBUS PA FC FLEX Steel Wire Braid Armoured PVC Cable, PB PA FC 1x2xAWG18/7 SWB PVC | 1000m/drum |



Application

Spur and trunk cable for flexible installation indoor and outdoor on racks in conduits, FastConnect-Assembly

- UV-resistant
- Silicon free
- Oil and grease resistant

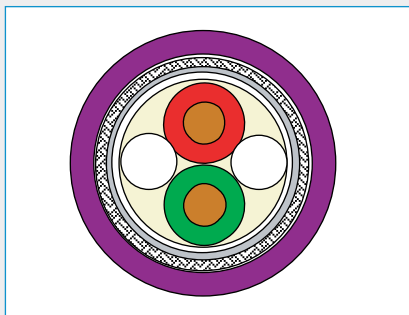
Standards

- IEC 61158 and IEC 61784
- Cable type A acc. to Profibus PA

Fire Rating

- IEC 60332-1

1.3 Profibus



Application

Installation cable :

- Halogen free and flame resistant
- Limited segment length (according to PROFIBUS-Net Manual)
- UV-resistant
- Silicon free
- Limited oil and grease resistance

Standards

- Customer specification
- EN 50170 part 8-2, cable type A, IEC 61158 and IEC 61784

Fire Rating

- IEC 60332-1, IEC 61034-2, IEC 60754-1/2

PB DP BASIC 1x2xAWG22/1 LSHF

PROFIBUS DP Basic LSZH Cable, 150 Ohm

Construction

| | |
|------------------------|--|
| Conductor | Bare copper wire, \emptyset 0.64 mm, (cross-section 0.32 mm ²) |
| Insulation | foam-skin-PE, \emptyset 2.5 mm |
| Stranding | two cores gn / rd to the pair and two fillers |
| Wrapping | PET-Foil, \emptyset 5.2 mm |
| Static screen | PET-Al-Foil longitudinally applied |
| Braid | tinned copper braid, coverage approx. 60% |
| Sheath | halogen free, flame retardant thermoplastic sheathing compound acc. to EN 50290-2-27, \emptyset 8.0 mm |
| Colour | violet RAL 4005 |
| Outer Diameter | Nom. 8.0 mm |
| Weight | Nom. 71 kg/km |
| Tensile force N | 100 |

Mechanical Properties

| | |
|-------------------------------------|------------------|
| Bending radius | |
| single bending | ≥ 60 mm |
| repeated bending | ≥ 80 mm |
| Max. operating voltage | - 25°C to + 80°C |
| Relative velocity factor NVP | - 25°C to + 80°C |
| Impedance (at 10 MHz) | - 25°C to + 80°C |

Electrical Properties at 20°C

| | |
|---|----------------|
| Loop resistance | ≤ 110 Ω/km |
| Screen resistance | ≤ 9,5 Ω/km |
| Characteristic impedance (Nominal) | 150 Ω |
| Mutual capacitance (at 1 kHz) | ca. 28.5 nF/km |
| Insulation resistance | ≥ 5 GΩkm |
| Test Voltage (DC, 1 min) Core/Core and Core/Screen | 1 kV |
| Operating voltage (RMS) | ≤ 100 V |

Electrical Data at 20°C

| Frequency (kHz) | Impedance (Ohm) | Attenuation (dB/100m) |
|-----------------|-----------------|-----------------------|
| 9.6 kHz | 270 ± 27 | ≤ 0.25 |
| 38.4 kHz | 185 ± 18.5 | ≤ 0.4 |
| 1 MHz | - | - |
| 3 MHz | 150 ± 15 | - |
| 4 MHz | 150 ± 15 | ≤ 2.2 |
| 16 MHz | 150 ± 15 | ≤ 4.2 |
| 20 MHz | 150 ± 15 | ≤ 4.7 |

Ordering Information

| P/N | Product Description | P.U |
|---------|--|------------|
| 1026560 | PROFIBUS DP Basic LSHF Cable, PB DP BASIC 1x2xAWG22/1 LSHF | 1000m/drum |

PB DP FC 1x2xAWG22/1 LSHF-FR

PROFIBUS FC LSHF-FR Cable, 150 Ohm

Construction

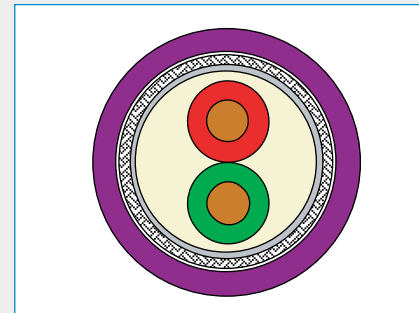
| | |
|------------------------|--|
| Conductor | bare copper wire, \emptyset 0.64 mm, (cross-section 0.32 mm ²) |
| Insulation | foam-skin-PE, \emptyset 2.5 mm |
| Stranding | two cores gn / rd to the Pair |
| Bedding | halogen free, flame retardant thermoplastic sheathing compound acc. to EN 50290-2-27, filling the interstices \emptyset 5.4 mm |
| Static screen | PET-Al-Foil longitudinally applied |
| Braid | tinned copper braid, coverage approx. 60% |
| Sheath | halogen free, flame retardant thermoplastic sheathing compound acc. to EN 50290-2-27, violet, \emptyset 8.0 mm |
| Outer Diameter | Nom. 8.0 mm |
| Weight | Nom. 83 kg/km |
| Tensile force N | 100 |

Mechanical Properties

| | |
|------------------------------|------------------|
| Bending radius | |
| single bending | \geq 60 mm |
| repeated bending | \geq 80 mm |
| Temperature range | - 25°C to + 80°C |
| Transport and storage | - 25°C to + 80°C |
| Installation | - 25°C to + 80°C |

Electrical Properties at 20°C

| | |
|---|-------------------------|
| Loop resistance | \leq 110 Ω /km |
| Screen resistance nominal | \leq 9.5 Ω /km |
| Characteristic impedance (Nominal) | 150 Ω |
| Mutual capacitance (at 1 kHz) | ca. 28.5 nF/km |
| Insulation resistance | \geq 5 G Ω km |
| Test Voltage (DC, 1 min) Core/Core and Core/Screen | 1 kV |
| Operating voltage (RMS) | \leq 100 V |



Application

Installation cable :

- Halogen free and flame resistant
- Limited segment length (according to PROFIBUS-Net Manual)
- FastConnect-assembly
- UV-resistant
- Silicon free
- Limited oil and grease resistance

Standards

- Customer specification

Fire Rating

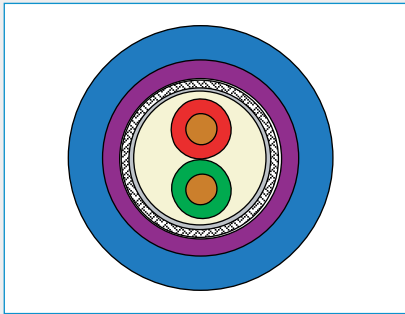
- IEC 60332-1, IEC 60332-3-24, IEC 61034-2, IEC 60754-1/2

Electrical Data at 20°C

| Frequency (kHz) | Impedance (Ohm) | Attenuation (dB/100m) |
|-----------------|-----------------|-----------------------|
| 9.6 kHz | 270 \pm 27 | \leq 0.25 |
| 38.4 kHz | 185 \pm 18.5 | \leq 0.4 |
| 1 MHz | - | - |
| 3 MHz | 150 \pm 15 | - |
| 4 MHz | 150 \pm 15 | \leq 2.5 |
| 16 MHz | 150 \pm 15 | \leq 4.2 |
| 20 MHz | 150 \pm 15 | - |

Ordering Information

| P/N | Product Description | P.U |
|---------|---|------------|
| 1026561 | PROFIBUS FC LSHF-FR Cable, PB DP FC 1x2xAWG22/1 LSHF-FR | 1000m/drum |



Application

Installation cable (up to inner sheath) :

- Halogen free and flame resistant
- Limited segment length (according to PROFIBUS-Net Manual)
- FastConnect-assembly
- UV-resistant
- Silicon free
- Limited oil and grease resistance

Standards

- Customer specification

Fire Rating

Basic cable:

- IEC 60332-1, IEC 60332-3-24, IEC 61034-2, IEC 60754-1/2

PB DP FC 1x2xAWG22/1 LSHF-FR + PE

PROFIBUS FC LSHF-FR Cable with additional PE-Sheath, 150 Ohm

Construction

| | |
|-----------------------|--|
| Conductor | bare copper wire, \emptyset 0.64 mm, (cross-section 0.32 mm ²) |
| Insulation | foam-skin-PE, \emptyset 2.5 mm |
| Stranding | two cores gn / rd to the Pair |
| Bedding | halogen free, flame retardant thermoplastic sheathing compound acc. to EN 50290-2-27, filling the interstices \emptyset 5.4 mm |
| Static screen | PET-Al-Foil longitudinally applied |
| Braid | tinned copper braid, coverage approx. 60% |
| Inner Sheath | halogen free, flame retardant thermoplastic sheathing compound acc. to EN 50290-2-27, violet, \emptyset 8.0 mm |
| Outer Sheath | PE, blue or black, \emptyset 10.8 mm |
| Outer Diameter | Nom. 10.8 mm |
| Weight | Nom. 122 kg/km |

Mechanical Properties

| | |
|------------------------------|--------------------|
| Bending radius | |
| single bending | $\geq 10 \times D$ |
| repeated bending | $\geq 15 \times D$ |
| Temperature range | - 25°C to + 70°C |
| Transport and storage | - 25°C to + 70°C |
| Installation | - 25°C to + 50°C |

Electrical Properties at 20°C

| | |
|---|------------------------------------|
| Loop resistance | $\leq 110 \Omega/\text{km}$ |
| Screen resistance | $\leq 9,5 \Omega/\text{km}$ |
| Characteristic impedance (Nominal) | 150 Ω |
| Mutual capacitance (at 1 kHz) | ca. 28.5 nF/km |
| Insulation resistance | $\geq 5 \text{ G}\Omega/\text{km}$ |
| Test Voltage (DC, 1 min) Core/Core and Core/Screen | 1 kV |
| Operating voltage (RMS) | $\leq 100 \text{ V}$ |

Electrical Data at 20°C

| Frequency (kHz) | Impedance (Ohm) | Attenuation (dB/100m) |
|-----------------|-----------------|-----------------------|
| 9.6 kHz | 270 \pm 27 | ≤ 0.25 |
| 38.4 kHz | 185 \pm 18.5 | ≤ 0.4 |
| 1 MHz | - | - |
| 3 MHz | 150 \pm 15 | - |
| 4 MHz | 150 \pm 15 | ≤ 2.2 |
| 16 MHz | 150 \pm 15 | ≤ 4.2 |
| 20 MHz | 150 \pm 15 | - |

Ordering Information

| P/N | Product Description | P.U |
|---------|--|------------|
| 1027325 | 1 x 2 x 0.64/2.55-150, PROFIBUS FC LSHF-FR Cable with additional PE-Sheath, PB DP FC 1x2xAWG22/1 LSHF-FR + PE, BLUE | 1000m/drum |
| 1027326 | 1 x 2 x 0.64/2.55-150, PROFIBUS FC LSHF-FR Cable with additional PE-Sheath, PB DP FC 1x2xAWG22/1 LSHF-FR + PE, BLACK | 1000m/drum |

PB DP FC 1x2xAWG22/1 PE

PROFIBUS DP FC PE Sheathed Cable, 150 Ohm

1.3 Profibus

Construction

| | |
|------------------------|--|
| Conductor | bare copper wire, \emptyset 0.64 mm, (cross-section 0.32 mm ²) |
| Insulation | foam-skin-PE, \emptyset 2.5 mm |
| Stranding | two cores gn / rd to the Pair |
| Bedding | halogen free, flame retardant thermoplastic sheathing compound acc. to EN 50290-2-27, filling the interstices \emptyset 5.4 mm |
| Static screen | PET-Al-Foil longitudinally applied |
| Braid | tinned copper braid, coverage approx. 70% |
| Sheath | halogen free, flame retardant thermoplastic sheathing compound acc. to EN 50290-2-27, violet, RAL 4005 \emptyset 8.0 mm |
| Outer sheath | PE, \emptyset 11.0 mm |
| Colour | black, RAL 9005 |
| Outer Diameter | Nom. 11.0 mm |
| Weight | Nom. 113 kg/km |
| Tensile force N | 120 |

Mechanical Properties

| | |
|------------------------------|------------------|
| Bending radius | |
| single bending | ≥ 60 mm |
| repeated bending | ≥ 120 mm |
| Temperature range | - 30°C to + 70°C |
| Transport and storage | - 30°C to + 70°C |
| Installation | - 5°C to + 50°C |

Electrical Properties at 20°C

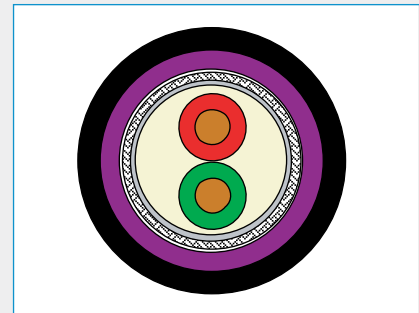
| | |
|---|-------------------------|
| Loop resistance | ≤ 110 Ω /km |
| Screen resistance nominal | 12 Ω /km |
| Characteristic impedance (nominal) | 150 Ω |
| Mutual capacitance (at 1 kHz) | approx. 28.5 nF/km |
| Capacitance unbalance to earth max. | 1.5 nF/km |
| Insulation resistance | ≥ 5 G Ω km |
| Test Voltage (DC, 1 min) Core/Core and Core/Screen | 1 kV |
| Operating voltage (RMS) | ≤ 100 V |
| Inductance (nominal) | 0.90 mH/km |

Electrical Data at 20°C

| Frequency (kHz) | Impedance (Ohm) | Attenuation (dB/100m) |
|-----------------|-----------------|-----------------------|
| 9.6 kHz | 270 \pm 27 | ≤ 0.25 |
| 38.4 kHz | 185 \pm 18.5 | ≤ 0.4 |
| 1 MHz | - | - |
| 3 MHz | 150 \pm 15 | - |
| 4 MHz | 150 \pm 15 | ≤ 2.2 |
| 16 MHz | 150 \pm 15 | ≤ 4.2 |
| 20 MHz | 150 \pm 15 | - |

Ordering Information

| P/N | Product Description | P.U |
|---------|---|------------|
| 1025046 | PROFIBUS DP FC PE Sheathed Cable, PB DP FC 1x2xAWG22/1 PE | 1000m/drum |



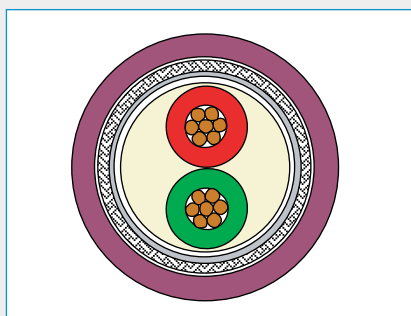
Application

Outdoor installation cable, also for direct burial :

- Limited segment length (according to PROFIBUS-Net Manual)
- FastConnect-assembly
- UV-resistant
- Silicon free
- Limited oil and grease resistance

Standards

- EN 50170 part 8-2 Cable type A, IEC 61158 and IEC 61784
- IEC 60754-1/2; IEC 61034



Application

Flexible cable :

- For mobile use
- FastConnect-assembly
- UV-resistant
- Silicon free
- Oil and grease resistant

Standards

- EN 50170 part 8-2, cable type A, IEC 61158 and IEC 61784

Fire Rating

- IEC 60332-1, VDE 0482-265-2-1
- IEC 61034-2, IEC 60754-1/2

PB DP FC 1x2xAWG24/19 PUR

PROFIBUS DP FC FLEX-PUR Cable, 150 Ohm

Construction

| | |
|------------------------|---|
| Conductor | Stranded bare copper wires, AWG24/7, 19 x0.13, Ø 0.65 mm, (Cross-section 0.25 mm ²) |
| Insulation | foam-skin-PE, Ø 2.5 mm |
| Stranding | two cores gn / rd to the pair |
| Bedding | PVC, filling the interstices, Ø 5.4 mm |
| Wrapping | non woven Polyestertape |
| Static screen | PET-Al-Foil spirally applied |
| Braid | tinned copper braid, coverage approx. 70% |
| Sheath | PUR, Ø 8.0 mm |
| Colour | violet, RAL 4005 |
| Outer Diameter | Nom. 8.0 mm |
| Weight | nom. 70 kg/km |
| Tensile force N | 120 |

Mechanical Properties

| | |
|------------------------------|------------------|
| Bending radius | |
| single bending | ≥ 40 mm |
| repeated bending | ≥ 120 mm |
| Temperature range | - 40°C to + 70°C |
| Transport and storage | - 40°C to + 60°C |
| Installation | - 40°C to + 60°C |

Electrical Properties at 20°C

| | |
|---|------------|
| Loop resistance | ≤ 135 Ω/km |
| Screen resistance nominal | 12 Ω/km |
| Characteristic impedance (Nominal) | 150 Ω |
| Mutual capacitance (at 1 kHz) | < 30 nF/km |
| Capacitance unbalance to earth max. | 1.5 nF/km |
| Insulation resistance | ≥ 5 GΩkm |
| Test Voltage (DC, 1 min) Core/Core and Core/Screen | 1 kV |
| Operating voltage (RMS) | ≤ 100 V |
| Inductance (nominal) | 0.90 mH/km |

Electrical Data at 20°C

| Frequency (kHz) | Impedance (Ohm) | Attenuation (dB/100m) |
|-----------------|-----------------|-----------------------|
| 9.6 kHz | 270 ± 27 | ≤ 0.3 |
| 38.4 kHz | 185 ± 18.5 | ≤ 0.4 |
| 1 MHz | - | - |
| 3 MHz | 150 ± 15 | - |
| 4 MHz | 150 ± 15 | ≤ 2.5 |
| 16 MHz | 150 ± 15 | ≤ 4.9 |
| 20 MHz | 150 ± 15 | - |

Ordering Information

| P/N | Product Description | P.U |
|---------|--|------------|
| 1025044 | PROFIBUS DP FC FLEX-PUR Cable, PB DP FC 1x2xAWG24/19 PUR | 1000m/drum |

PB DP FC 1x2xAWG24/19 TRAILING PUR

PROFIBUS DP FC Trailing-Cable, 150 Ohm

1.3 Profibus

Construction

| | |
|------------------------|---|
| Conductor | stranded bare copper wires, 19x0.13, Ø 0.65 mm, (cross-section 0.25 mm ²) |
| Insulation | foam-skin-PE, Ø 2.5 mm |
| Stranding | two cores gn / rd to the Pair |
| Wrapping | PET-Foil |
| Bedding | PVC, filling the interstices Ø 5,4 mm |
| Wrapping | non woven Polyestertape |
| Static screen | PET-Al-Foil spirally applied |
| Braid | tinned copper braid, coverage approx. 70% |
| Sheath | PUR, Ø 8.0 mm |
| Colour | petrol |
| Outer Diameter | Nom. 8.0 mm |
| Weight | Nom. 70 kg/km |
| Tensile force N | 100 |

Mechanical Properties

| | |
|---------------------------------|------------------|
| Bending radius | |
| single bending | ≥ 40 mm |
| repeated bending | ≥ 120 mm |
| Bending cycles (at 20°C) | 3.000.000 |
| Temperature range | - 40°C to + 60°C |
| Transport and storage | - 40°C to + 60°C |
| Installation | - 40°C to + 60°C |

Electrical Properties at 20°C

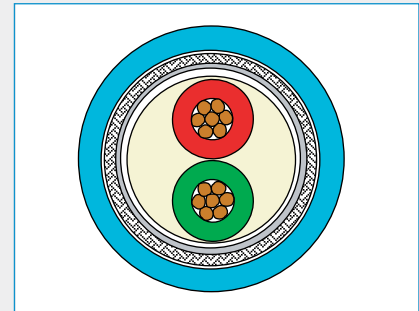
| | |
|---|----------------|
| Loop resistance | ≤ 133 Ω/km |
| Screen resistance | ≤ 14 Ω/km |
| Characteristic impedance (Nominal) | 150 Ω |
| Mutual capacitance (at 1 kHz) | ca. 28.5 nF/km |
| Insulation resistance | ≥ 5 GΩkm |
| Test Voltage (DC, 1 min) Core/Core and Core/Screen | 1 kV |
| Operating voltage (RMS) | ≤ 100 V |

Electrical Data at 20°C

| Frequency (kHz) | Impedance (Ohm) | Attenuation (dB/100m) |
|-----------------|-----------------|-----------------------|
| 9.6 kHz | 270 ± 27 | ≤ 0.3 |
| 38.4 kHz | 185 ± 18.5 | ≤ 0.4 |
| 1 MHz | - | - |
| 3 MHz | 150 ± 15 | - |
| 4 MHz | 150 ± 15 | ≤ 2.5 |
| 16 MHz | 150 ± 15 | ≤ 4.9 |
| 20 MHz | 150 ± 15 | - |

Ordering Information

| P/N | Product Description | P.U |
|---------|---|------------|
| 1026562 | PROFIBUS DP FC Trailing-Cable, PB DP FC 1x2xAWG24/19 TRAILING PUR | 1000m/drum |



Application

Trailing cable :

- Min. 3.000.000 bending cycles with min. bending radius and a maximum acceleration of 4 m/s²
- Limited segment length (according to PROFIBUS-Net Manual)
- FastConnect-assembly
- UV-resistant
- Silicon free
- Oil and grease resistant

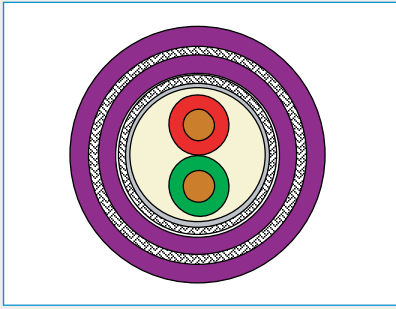
Standards

- Customer specification
- UL-Listing / 300V Rating / CMX

Fire Rating

- IEC 60332-1, VDE 0482-265-2-1
- UL1581 VW-1
- IEC 61034-2, IEC 60754-1/2

1.3 Profibus



Application

Armoured indoor and outdoor installation cable:

- Halogen free and flame resistant
- Limited segment length (according to PROFIBUS-Net Manual)
- FastConnect-assembly
- UV-resistant
- Silicon free
- Limited oil and grease resistance

Standards

- EN 50170 part 8-2, cable type A, IEC 61158 and IEC 61784

Fire Rating

- IEC 60332-1, IEC 61034-2, IEC 60754-1/2

PB DP FC 1x2xAWG22/1 SWB LSHF

PROFIBUS DP FC Steel Wire Braid Armoured LSHF Cable, 150 Ohm

Construction

| | |
|------------------------|--|
| Conductor | bare copper wire, \varnothing 0.64 mm, (cross-section 0.32 mm ²) |
| Insulation | foam-skin-PE, \varnothing 2.5 mm |
| Stranding | two cores gn / rd to the Pair |
| Bedding | halogen free, flame retardant thermoplastic sheathing compound acc. to EN 50290-2-27, filling the interstices \varnothing 5.4 mm |
| Static screen | PET-Al-Foil longitudinally applied |
| Braid | tinned copper braid, coverage approx. 70% |
| Sheath | halogen free, flame retardant thermoplastic sheathing compound acc. to EN 50290-2-27, violet, RAL 4005 \varnothing 12.0 mm |
| Armouring | EN 50290-2-27, violet, \varnothing 8.0 mm galvanized steel wire braid, optical coverage 85% \varnothing 9.1 mm |
| Outer sheath | halogen free, flame retardant thermoplastic sheathing compound acc. to EN 50290-2-27, violet, RAL 4005 \varnothing 12.0 mm |
| Outer Diameter | Nom. 12.0 mm |
| Weight | Nom. 208 kg/km |
| Tensile force N | 450 |

Mechanical Properties

| | |
|------------------------------|------------------|
| Bending radius | |
| single bending | \geq 60 mm |
| repeated bending | \geq 120 mm |
| Temperature range | - 30°C to + 70°C |
| Transport and storage | - 30°C to + 70°C |
| Installation | - 5°C to + 50°C |

Electrical Properties at 20°C

| | |
|---|-------------------------|
| Loop resistance | \leq 110 Ω /km |
| Screen resistance nominal | 12 Ω /km |
| Characteristic impedance (nominal) | 150 Ω |
| Mutual capacitance (at 1 kHz) | approx. 28.5 nF/km |
| Capacitance unbalance to earth max. | 1.5 nF/km |
| Insulation resistance | \geq 5 G Ω km |
| Test Voltage (DC, 1 min) Core/Core and Core/Screen | 1 kV |
| Operating voltage (RMS) | \leq 100 V |
| Inductance (nominal) | 0.90 mH/km |

Electrical Data at 20°C

| Frequency (kHz) | Impedance (Ohm) | Attenuation (dB/100m) |
|-----------------|-----------------|-----------------------|
| 9.6 kHz | 270 \pm 27 | \leq 0.25 |
| 38.4 kHz | 185 \pm 18.5 | \leq 0.4 |
| 1 MHz | - | - |
| 3 MHz | 150 \pm 15 | - |
| 4 MHz | 150 \pm 15 | \leq 2.2 |
| 16 MHz | 150 \pm 15 | \leq 4.2 |
| 20 MHz | 150 \pm 15 | - |

Ordering Information

| P/N | Product Description | P.U |
|----------|--|------------|
| 60039258 | PROFIBUS DP FC Steel Wire Braid Armoured LSHF Cable, PB DP FC 1x2xAWG22/1 SWB LSHF | 1000m/drum |

UC300 Cat.5e F/UTP SWB LSZH-FR

1.4 Industrial Ethernet

Category cable for demanding environments

Construction

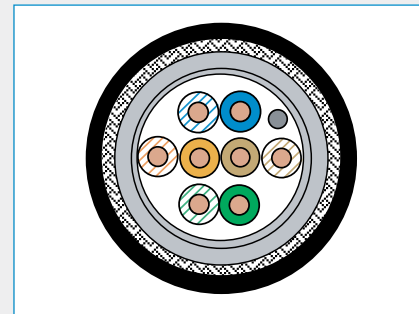
| | |
|-----------------------|--|
| Conductor | Bare copper wire Ø 0.51 mm (AWG24) |
| Insulation | PE, Nom. Ø 1.03 mm |
| Twisting | 2 cores to the pair |
| Overall screen | Aluminium Polyester Tape |
| Drain Wire | Tinned Copper ; Ø 0.495 ± 0.008 mm |
| Inner Sheath | LSZH-FR |
| Armouring | 0.3mm Galvanised Steel Braid, Coverage 80% |
| Outer sheath | LSZH-FR |
| Sheath colour | Black |

Mechanical Properties

| | | |
|--------------------------|---------------------|-----------------|
| Bending radius | Installation | 8 x D |
| Temperature range | During operation | -10°C to + 60°C |
| | During installation | -10°C to + 60°C |

Electrical Properties at at 20°C± 5°C

| | | |
|--|------------------|----------------|
| Loop resistance | - | ≤ 170 Ω/km |
| Resistance unbalance | - | ≤ 2% |
| Characteristic Impedence | 1-130MHz | 100 Ω ± 15 ohm |
| Mutual capacitance | at 800 Hz | Nom. 43 nF/km |
| Capacitance unbalance | (pair to ground) | ≤ 300 pF/km |
| Nominal Velocity of Propagation | - | 0.69c |



Application

- Generic Data transmission. This cable is a Cat5e F/UTP cable is meant for use as installation/horizontal cable in demanding electrical and mechanical environment.

Standards

- EIA/TIA 568C;
- ISO/IEC 11801 2nd ed.; IEC 61156-5
- EN 50173; EN 50288-3-1

Fire Rating

- IEC 60332-1, IEC 60332-3-24, IEC 61034-2, IEC 60754-1/2

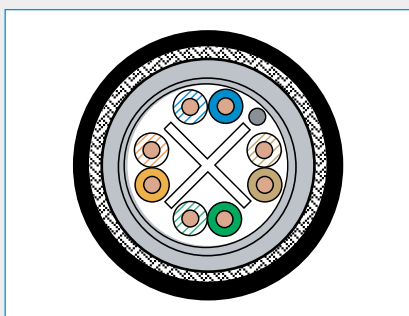
Electrical Data Nominal at 20°C

| F (MHZ) | Max. Ins. Loss (dB/100m) | Min. Return loss (dB) | Pair to Pair | | Power Sum | | ELFEXT (dB/100m) |
|------------|-----------------------------|--------------------------|------------------------|-------------------------|------------------------|-------------------------|---------------------|
| | | | Min. NEXT (dB/100m) | Min ELFEXT (dB/100m) | Min. NEXT (dB/100m) | Min ELFEXT (dB/100m) | |
| 1 | - | 20 | - | - | - | - | - |
| 4 | 4.1 | 23 | 56.3 | 52 | 53.3 | 55 | 552 |
| 10 | 6.5 | 25 | 50.3 | 44 | 47.3 | 47 | 545.4 |
| 16 | 8.3 | 25 | 47.2 | 39.9 | 44.2 | 42.9 | 543 |
| 20 | 9.3 | 25 | 45.8 | 38 | 42.8 | 41 | 542 |
| 31.2 | 11.7 | 23.6 | 42.9 | 34.1 | 39.9 | 37.1 | 540.4 |
| 62.5 | 17 | 21.5 | 38.4 | 28.1 | 35.4 | 31.1 | 538.6 |
| 100 | 22 | 20.1 | 35.3 | 24 | 32.3 | 27 | 537.6 |

Ordering Information

| P/N | Product Description | P.U |
|--------|--|-----------|
| 53048B | UC 300 Cat 5e F/UTP 24 AWG LSZH-FR SWB | 500m/drum |

1.4 Industrial Ethernet



Application

Generic Data transmission. This cable is a Cat6 F/UTP cable meant for use as installation/horizontal cable in demanding electrical and mechanical environment.

Standards

- EIA/TIA 568C;
- ISO/IEC 11801 2nd ed.; IEC 61156-5
- EN 50173; EN 50288-3-1

Fire Rating

- IEC 60332-1, IEC 60332-3-24, IEC 61034-2, IEC 60754-1/2

UC400 Cat.6 F/UTP SWB LSZH-FR

Category cable for demanding environments

Construction

| | |
|-----------------------|--|
| Conductor | Bare copper wire Ø 0.57 mm (AWG23) |
| Insulation | PE, Nom. Ø 0.95 mm |
| Twisting | 2 cores to the pair |
| Overall Screen | Aluminum Polyester Tape |
| Inner Sheath | Special Flame retardant and halogen free LSZH-FR |
| Armouring | 0.3mm Galvanised Steel Braid, Coverage 80% |
| Outer Sheath | Black Special Flame retardant and halogen free LSZH-FR |
| Sheath Colour | Black |

Mechanical Properties

| | | |
|--------------------------|---------------------|-----------------|
| Bending radius | Installation | 8 X D |
| Temperature range | During operation | -10°C to + 60°C |
| | During installation | -10°C to + 60°C |

Electrical Properties at 20°C± 5°C

| | | |
|------------------------------|---------------------------------------|---------------|
| Loop resistance | ≤ 110 Ω/km | ≤ 176 Ω/km |
| Resistance unbalance | 12 Ω/km | ≤ 2% |
| Insulation resistance | (500 V) | ≥ 2000 MΩ*km |
| Mutual capacitance | at 800 Hz | Nom. 43 nF/km |
| Capacitance unbalance | (pair/ground) | ≤ 1500 pF/km |
| Test voltage | (DC, 1 min) core/core and core/screen | 1000 V |

Electrical Data Nominal at 20°C

| F (MHZ) | Attenuation (dB/100m) | NEXT (dB) | ACR (dB/100m) | PS-NEXT (dB) | EL-FEXT (dB/100m) | PS-ELFEXT (dB/100m) | Return loss (dB) |
|---------|-----------------------|-----------|---------------|--------------|-------------------|---------------------|------------------|
| 1 | 2.1 | 81.3 | 78.2 | 77.3 | 71 | 68 | 21.5 |
| 4 | 3.8 | 71.3 | 67.4 | 68.3 | 59 | 56 | 24.5 |
| 10 | 6 | 65.3 | 59.3 | 62.3 | 51 | 48 | 26.5 |
| 16 | 7.6 | 62.2 | 54.6 | 59.2 | 46.9 | 43.9 | 26.5 |
| 20 | 8.5 | 60.8 | 52.3 | 57.8 | 45 | 42 | 26.5 |
| 31.2 | 10.7 | 57.9 | 47.1 | 54.9 | 41.1 | 38.1 | 25.1 |
| 62.5 | 15.5 | 53.4 | 37.9 | 50.4 | 35.1 | 32.1 | 23 |
| 100 | 19.9 | 50.3 | 30.4 | 47.3 | 31 | 28 | 21.6 |
| 155.5 | 25.3 | 47.4 | 22.1 | 44.4 | 27.2 | 24.2 | 20.3 |
| 200 | 29.1 | 45.8 | 16.6 | 42.8 | 25 | 22 | 19.5 |
| 250 | 33 | 44.3 | 11.3 | 41.3 | 23 | 20 | 18.8 |

Ordering Information

| P/N | Product Description | P.U |
|--------|--|-----------|
| 61048B | UC 400 Cat 6 F/UTP 23 AWG LSZH-FR SWB, IEC 60332-1 | 500m/drum |

IE ToughCat 5e LSHF-FR

S/FTP Installation Cable 4x2xAWG24/7 for tougher environments

1.4 Industrial Ethernet

Construction

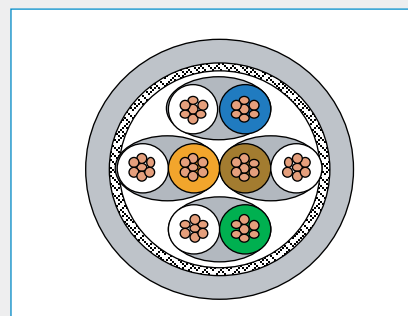
| | |
|------------------------|--|
| Conductor | Stranded copper wire, cross section 0.22 mm ² (AWG24/7) |
| Insulation | PE, Ø 1.4 mm |
| Twisting | 2 cores to the pair |
| Cable lay up | 4 pairs |
| Pair screen | Al-laminated plastic foil around each pair |
| Overall screen | Copper braid, tinned Ø 6.2 mm |
| Sheath | Oil resistant, Fire retardant and halogen free LSZH-FR (SHF1), diameter 7.7 mm |
| Colour | Grey RAL 7035 |
| Outer Diameter | Nom. 7.7 mm |
| Weight | Nom. 68 kg/km |
| Tensile force N | 100 |

Mechanical Properties

| | | |
|-----------------------------|---------------------|-----------------|
| Bending radius | Without load | 8 x D |
| | With load | 4 x D |
| Temperature range | During operation | -40°C to + 85°C |
| | During installation | -15°C to + 50°C |
| Fire load | 4 pair | 670 MJ/km |
| Maximum tensile load | During operation | No load |
| | During installation | 100 N |

Electrical Properties at 20°C

| | | |
|--|------------------|----------------|
| DC loop resistance | - | ≤ 158 Ω/km |
| Resistance unbalance | - | ≤ 2% |
| Insulation resistance | (500 V) | ≥ 5000 MΩxkm |
| Capacitance | at 800 Hz | Nom. 43 nF/km |
| Capacitance unbalance | (pair to ground) | ≤ 1500 pF/km |
| Mean Characteristic impedance | @ 100 MHz | 100 ± 5 Ω |
| Nominal velocity of propagation | - | 0.75c |
| Propagation delay | - | ≤ 450 ns/100 m |
| Delay skew | - | ≤ 15 ns/100 m |
| Transfer impedance | at 1 MHz | ≤ 10 mΩ /m |
| | at 10 MHz | ≤ 8 mΩ /m |
| | at 30 MHz | ≤ 10 mΩ /m |
| Coupling attenuation | - | ≥ 85 dB |



Application

- Generic Data transmission. This cable is a **Cat5e S/FTP** cable meant for use as installation/horizontal cable in tougher electrical and mechanical environment, including ships and offshore units.

Standards

- EN 50288-2-1
- Det Norske Veritas (DNV) specification No. 6-827.50-2 and Lloyd Register approval, system, 2002

Fire Rating

- IEC 60332-1, IEC 60332-3-24, IEC 61034-2, IEC 60754-1/2

Chemical Resistance

- Mineral oils IRM 902 (IEC60811-2-1) : 7 days/23°C, 4 hours/70°C
- Diesel - IRM 903 (IEC60811-2-1) : 7 days/23°C, 4 hours/70°C

Certification

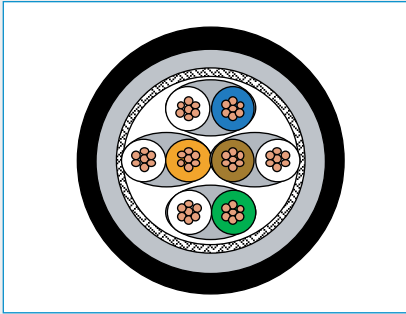
- This cable is certified by: Det Norske Veritas (DNV) and Lloyd Register

Nominal Transmission Characteristics at 20°C

| F (MHZ) | Attenuation (dB/100m) | NEXT (dB) | ACR (dB/100m) | Return loss (dB) | PS-NEXT (dB) | PS-ACR (dB/100m) | ELFEXT (dB/100m) | PS-ELFEXT (dB/100m) |
|---------|-----------------------|-----------|---------------|------------------|--------------|------------------|------------------|---------------------|
| 1 | 2.1 | 90 | 88 | - | 87 | 85 | 85 | 82 |
| 4 | 4.0 | 90 | 86 | 27 | 87 | 83 | 85 | 82 |
| 10 | 6.3 | 90 | 84 | 30 | 87 | 81 | 79 | 76 |
| 16 | 8.0 | 90 | 82 | 30 | 87 | 79 | 75 | 72 |
| 20 | 9.0 | 90 | 81 | 30 | 87 | 78 | 73 | 70 |
| 31.25 | 11.4 | 90 | 79 | 30 | 87 | 76 | 69 | 66 |
| 62.50 | 16.5 | 86 | 70 | 30 | 83 | 67 | 63 | 60 |
| 100 | 21.3 | 83 | 62 | 30 | 80 | 59 | 59 | 56 |
| 155 | 24.2 | 81 | 57 | 26 | 78 | 54 | 57 | 54 |
| 200 | 31.5 | 78 | 47 | 25 | 75 | 44 | 53 | 50 |
| 250 | 35.8 | 77 | 41 | 25 | 74 | 38 | 51 | 48 |
| 300 | 47.1 | 73 | 26 | 23 | 70 | 23 | 47 | 44 |
| 600 | 60.1 | 71 | 11 | 20 | 68 | 8 | 44 | 41 |

Ordering Information

| P/N | Product Description | P.U |
|----------|---|------------|
| 60015830 | S/FTP Installation Cable 4x2xAWG24/7 for tougher environments, IE ToughCat 5e LSHF-FR | 500m/drum |
| 60011599 | S/FTP Installation Cable 4x2xAWG24/7 for tougher environments, IE ToughCat 5e LSHF-FR | 1000m/drum |



Application

- Generic Data transmission. This **Cat5e S/FTP** cable is based on our DNV and Lloyd Register certified ToughCat, but with an additional fire retardant, halogen-free, low smoke MUD protecting outer jacket. This cable is meant for use as installation/horizontal cable in tougher electrical and mechanical environment, including ships and offshore units.

Standards

- EN 50173-1, EN 50288-4-1
- ISO/IEC 11801, IEC 61156-5

Fire Rating

- MUD protecting outer sheath : IEC 60754-2; IEC 61034, IEC 60332-3-24
- Inner sheath: IEC 60332-1, IEC 60332-3-24, IEC 61034-2, IEC 60754-1/2

Chemical Resistance

- Mineral oils IRM 902 (IEC60811-2-1) : 7 days/100°C
- Diesel - IRM 903 (IEC60811-2-1) : 7 days/100°C

IE ToughCat 5e LSHF-FR MUD

S/FTP Installation Cable 4x2xAWG24/7 for tougher environments

Construction

| | |
|------------------------|--|
| Conductor | Stranded copper wire, cross section 0.22 mm ² (AWG24/7) |
| Insulation | PE, Ø 1.4 mm |
| Twisting | 2 cores to the pair |
| Cable lay up | 4 pairs |
| Pair screen | Al-laminated plastic foil around each pair |
| Overall screen | Copper braid, tinned Ø 6.2 mm |
| Inner Sheath | Oil resistant, Fire retardant and halogen free LSZH-FR (SHF1), diameter 7.7 mm |
| Colour | Grey RAL 7035 |
| Outer sheath | MUD protecting, diameter 9.5 mm |
| Colour | Grey RAL 7024 |
| Outer Diameter | Nom. 9.5 mm |
| Weight | Nom. 100 kg/km |
| Tensile force N | 100 |

Mechanical Properties

| | | |
|-----------------------------|---------------------|--------------------|
| Bending radius | Without load | 8 x D |
| | With load | 4 x D |
| Temperature range | During operation | -40°C to + 85°C |
| | During installation | -15°C to + 50°C |
| Fire load | 4 pair | (on request) MJ/km |
| Maximum tensile load | During operation | No load |
| | During installation | 100 N |

Electrical Properties at 20°C

| | | |
|--|------------------|----------------|
| DC loop resistance | - | ≤ 158 Ω/km |
| Resistance unbalance | - | ≤ 2% |
| Insulation resistance | (500 V) | ≥ 5000 MΩxkm |
| Capacitance | at 800 Hz | Nom. 43 nF/km |
| Capacitance unbalance | (pair to ground) | ≤ 1500 pF/km |
| Mean Characteristic impedance | @ 100 MHz | 100 ± 5 Ω |
| Nominal velocity of propagation | - | 0.75c |
| Propagation delay | - | ≤ 450 ns/100 m |
| Delay skew | - | ≤ 15 ns/100 m |
| Transfer impedance | at 1 MHz | ≤ 10 mΩ /m |
| | at 10 MHz | ≤ 8 mΩ /m |
| | at 30 MHz | ≤ 10 mΩ /m |
| Delay skew | - | ≥ 85 dB |

Nominal Transmission Characteristics at 20°C

| F (MHZ) | Attenuation (dB/100m) | NEXT (dB) | ACR (dB/100m) | Return loss (dB) | PS-NEXT (dB) | PS-ACR (dB/100m) | ELFEXT (dB/100m) | PS-ELFEXT (dB/100m) |
|---------|-----------------------|-----------|---------------|------------------|--------------|------------------|------------------|---------------------|
| 1 | 2.1 | 90 | 88 | - | 87 | 85 | 85 | 82 |
| 4 | 4.0 | 90 | 86 | 27 | 87 | 83 | 85 | 82 |
| 10 | 6.3 | 90 | 84 | 30 | 87 | 81 | 79 | 76 |
| 16 | 8.0 | 90 | 82 | 30 | 87 | 79 | 75 | 72 |
| 20 | 9.0 | 90 | 81 | 30 | 87 | 78 | 73 | 70 |
| 31.25 | 11.4 | 90 | 79 | 30 | 87 | 76 | 69 | 66 |
| 62.50 | 16.5 | 86 | 70 | 30 | 83 | 67 | 63 | 60 |
| 100 | 21.3 | 83 | 62 | 30 | 80 | 59 | 59 | 56 |
| 155 | 24.2 | 81 | 57 | 26 | 78 | 54 | 57 | 54 |
| 200 | 31.5 | 78 | 47 | 25 | 75 | 44 | 53 | 50 |
| 250 | 35.8 | 77 | 41 | 25 | 74 | 38 | 51 | 48 |
| 300 | 47.1 | 73 | 26 | 23 | 70 | 23 | 47 | 44 |
| 600 | 60.1 | 71 | 11 | 20 | 68 | 8 | 44 | 41 |

Ordering Information

| P/N | Product Description | P.U |
|----------|---|------------|
| 60015703 | S/FTP Installation Cable 4x2xAWG24/7 for tougher environments, IE ToughCat 5e LSHF-FR MUD | 500m/drum |
| 60015701 | S/FTP Installation Cable 4x2xAWG24/7 for tougher environments, IE ToughCat 5e LSHF-FR MUD | 1000m/drum |

IE ToughCat 7 LSHF-FR

S/FTP Installation Cable 4x2xAWG23/7 for tougher environments

Construction

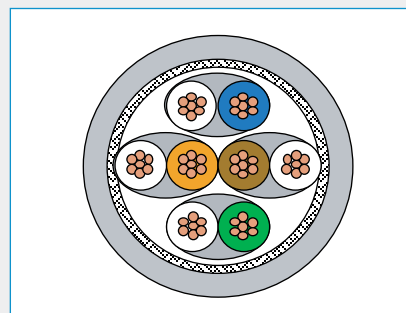
| | |
|------------------------|--|
| Conductor | Stranded copper wire, cross section 0.27 mm ² (AWG23/7) |
| Insulation | PE, Ø 1.6 mm |
| Twisting | 2 cores to the pair |
| Cable lay up | 4 pairs |
| Pair screen | Al-laminated plastic foil around each pair |
| Overall screen | Copper braid, tinned Ø 6.6 mm |
| Sheath | Oil resistant, Fire retardant and halogen free LSHF-FR (SHF1), diameter 8.1 mm |
| Colour | Grey RAL 7035 |
| Outer Diameter | Nom. 8.1 mm |
| Weight | Nom. 75 kg/km |
| Tensile force N | 100 |

Mechanical Properties

| | | |
|-----------------------------|---------------------|-----------------|
| Bending radius | Without load | 8 x D |
| | With load | 4 x D |
| Temperature range | During operation | -40°C to + 85°C |
| | During installation | -15°C to + 50°C |
| Fire load | 4 pair | 670 MJ/km |
| Maximum tensile load | During operation | No load |
| | During installation | 100 N |

Electrical Properties at 20°C

| | | |
|--|------------------|----------------|
| DC loop resistance | - | ≤ 138 Ω/km |
| Resistance unbalance | - | ≤ 2% |
| Insulation resistance | (500 V) | ≥ 5000 MΩxkm |
| Capacitance | at 800 Hz | Nom. 43 nF/km |
| Capacitance unbalance | (pair to ground) | ≤ 1500 pF/km |
| Mean Characteristic impedance | @ 100 MHz | 100 ± 5 Ω |
| Nominal velocity of propagation | - | 0.76c |
| Propagation delay | - | ≤ 450 ns/100 m |
| Delay skew | - | ≤ 15 ns/100 m |
| Transfer impedance | at 1 MHz | ≤ 10 mΩ /m |
| | at 10 MHz | ≤ 8 mΩ /m |
| | at 30 MHz | ≤ 10 mΩ /m |
| Coupling attenuation | - | ≥ 85 dB |



Application

- Generic Data transmission. This cable is a **Cat7 S/FTP** cable meant for use as installation/horizontal cable in tougher electrical and mechanical environment, including ships and offshore units.

Standards

- EN 50173-1; EN 50288-4-1
- ISO/IEC 11801; IEC 61156-5
- Det Norske Veritas (DNV) specification No. 6-827.50-2

Fire Rating

- IEC 60332-1, IEC 60332-3-24, IEC 61034-2, IEC 60754-1/2

Chemical Resistance

- Mineral oils IRM 902 (IEC60811-2-1) : 7 days/23°C, 4 hours/70°C
- Diesel - IRM 903 (IEC60811-2-1) : 7 days/23°C, 4 hours/70°C

Certification

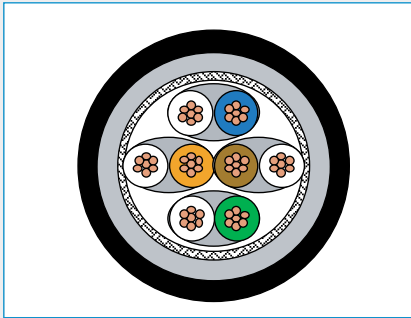
- This cable is certified by: Det Norske Veritas (DNV) and American Bureau of Shipping (ABS)

Nominal Transmission Characteristics at 20°C

| F (MHZ) | Attenuation (dB/100m) | NEXT (dB) | ACR (dB/100m) | Return loss (dB) | PS-NEXT (dB) | PS-ACR (dB/100m) | PS-ELFEXT (dB/100m) | PS-ELFEXT (dB/100m) |
|---------|-----------------------|-----------|---------------|------------------|--------------|------------------|---------------------|---------------------|
| 1 | 2.0 | 90 | 88 | - | 87 | 85 | 85 | 82 |
| 4 | 3.6 | 90 | 86 | 27 | 87 | 83 | 85 | 82 |
| 10 | 5.5 | 90 | 84 | 30 | 87 | 81 | 79 | 76 |
| 16 | 7.5 | 90 | 82 | 30 | 87 | 79 | 75 | 72 |
| 20 | 7.7 | 90 | 82 | 30 | 87 | 79 | 73 | 70 |
| 31.25 | 9.8 | 90 | 80 | 30 | 87 | 77 | 69 | 66 |
| 62.50 | 14.0 | 86 | 72 | 30 | 83 | 69 | 63 | 60 |
| 100 | 17.9 | 83 | 65 | 30 | 80 | 62 | 59 | 56 |
| 155 | 22.4 | 81 | 59 | 26 | 78 | 55 | 57 | 54 |
| 200 | 25.6 | 78 | 52 | 25 | 75 | 49 | 53 | 50 |
| 250 | 28.8 | 77 | 48 | 25 | 74 | 45 | 51 | 48 |
| 300 | 31.6 | 73 | 41 | 23 | 70 | 38 | 47 | 44 |
| 600 | 45.7 | 71 | 25 | 20 | 68 | 22 | 44 | 41 |

Ordering Information

| P/N | Product Description | P.U |
|----------|--|------------|
| 60015820 | S/FTP Installation Cable 4x2xAWG23/7 for tougher environments, IE ToughCat 7 LSHF-FR | 500m/drum |
| 60011619 | S/FTP Installation Cable 4x2xAWG23/7 for tougher environments, IE ToughCat 7 LSHF-FR | 1000m/drum |



Application

- Generic Data transmission. This **Cat7 S/FTP** cable is based on our DNV and Lloyd Register certified ToughCat, but with an additional fire retardant, halogen-free, low smoke MUD protecting outer jacket. This cable is meant for use as installation/horizontal cable in tougher electrical and mechanical environment, including ships and offshore units.

Standards

- EN 50173-1; EN 50288-4-1
- ISO/IEC 11801; IEC 61156-5
- Det Norske Veritas (DNV) specification No. 6-827.50-2

Fire Rating

- MUD protecting outer sheath : IEC 60754-2, IEC 61034, IEC 60332-3-24
- Inner sheath: IEC 60332-1, IEC 60332-3-24, IEC 61034-2, IEC 60754-1/2

Chemical Resistance

- Mineral oils IRM 902 (IEC60811-2-1): 7 days/100°C
- Diesel - IRM 903 (IEC60811-2-1) : 7 days/100°C

IE ToughCat 7 LSHF-FR MUD

S/FTP Installation Cable 4x2xAWG23/7 for tougher environments

Construction

| | |
|------------------------|--|
| Conductor | Stranded copper wire, cross section 0.27 mm ² (AWG23/7) |
| Insulation | PE, Ø 1.6 mm |
| Twisting | 2 cores to the pair |
| Cable lay up | 4 pairs |
| Pair screen | Al-laminated plastic foil around each pair |
| Overall screen | Copper braid, tinned Ø 6.6 mm |
| Inner Sheath | Oil resistant, Fire retardant and halogen free LSZH-FR (SHF1), diameter 8.1 mm |
| Colour | Grey RAL 7035 |
| Outer sheath | MUD protecting, diameter 10.1 mm |
| Colour | Grey RAL 7024 |
| Outer Diameter | Nom. 10.1 mm |
| Weight | Nom. 112 kg/km |
| Tensile force N | 100 |

Mechanical Properties

| | | |
|-----------------------------|---------------------|--------------------|
| Bending radius | Without load | 8 x D |
| | With load | 4 x D |
| Temperature range | During operation | -40°C to + 85°C |
| | During installation | -15°C to + 50°C |
| Fire load | 4 pair | (on request) MJ/km |
| Maximum tensile load | During operation | No load |
| | During installation | 100 N |

Electrical Properties at 20°C

| | | |
|--|------------------|----------------|
| DC loop resistance | - | ≤ 138 Ω/km |
| Resistance unbalance | - | ≤ 2% |
| Insulation resistance | (500 V) | ≥ 5000 MΩxkm |
| Capacitance | at 800 Hz | Nom. 43 nF/km |
| Capacitance unbalance | (pair to ground) | ≤ 1500 pF/km |
| Mean Characteristic impedance | @ 100 MHz | 100 ± 5 Ω |
| Nominal velocity of propagation | - | 0.76c |
| Propagation delay | - | ≤ 450 ns/100 m |
| Delay skew | - | ≤ 15 ns/100 m |
| Transfer impedance | at 1 MHz | ≤ 10 mΩ /m |
| | at 10 MHz | ≤ 8 mΩ /m |
| | at 30 MHz | ≤ 10 mΩ /m |
| Coupling attenuation | - | ≥ 85 dB |

Nominal Transmission Characteristics at 20°C

| F (MHZ) | Attenuation (dB/100m) | NEXT (dB) | ACR (dB/100m) | Return loss (dB) | PS-NEXT (dB) | PS-ACR (dB/100m) | PS-ELFEXT (dB/100m) | PS-ELFEXT (dB/100m) |
|---------|-----------------------|-----------|---------------|------------------|--------------|------------------|---------------------|---------------------|
| 1 | 2.0 | 90 | 88 | - | 87 | 85 | 85 | 82 |
| 4 | 3.6 | 90 | 86 | 27 | 87 | 83 | 85 | 82 |
| 10 | 5.5 | 90 | 84 | 30 | 87 | 81 | 79 | 76 |
| 16 | 7.5 | 90 | 82 | 30 | 87 | 79 | 75 | 72 |
| 20 | 7.7 | 90 | 82 | 30 | 87 | 79 | 73 | 70 |
| 31.25 | 9.8 | 90 | 80 | 30 | 87 | 77 | 69 | 66 |
| 62.50 | 14.0 | 86 | 72 | 30 | 83 | 69 | 63 | 60 |
| 100 | 17.9 | 83 | 65 | 30 | 80 | 62 | 59 | 56 |
| 155 | 22.4 | 81 | 59 | 26 | 78 | 55 | 57 | 54 |
| 200 | 25.6 | 78 | 52 | 25 | 75 | 49 | 53 | 50 |
| 250 | 28.8 | 77 | 48 | 25 | 74 | 45 | 51 | 48 |
| 300 | 31.6 | 73 | 41 | 23 | 70 | 38 | 47 | 44 |
| 600 | 45.7 | 71 | 25 | 20 | 68 | 22 | 44 | 41 |

Ordering Information

| P/N | Product Description | P.U |
|----------|--|------------|
| 60015695 | S/FTP Installation Cable 4x2xAWG23/7 for tougher environments, IE ToughCat 7 LSHF-FR MUD | 500m/drum |
| 60015692 | S/FTP Installation Cable 4x2xAWG23/7 for tougher environments, IE ToughCat 7 LSHF-FR MUD | 1000m/drum |

IE ToughCat 7S* Armoured

S/FTP Installation Cable for tougher environments

1.4 Industrial Ethernet

Construction

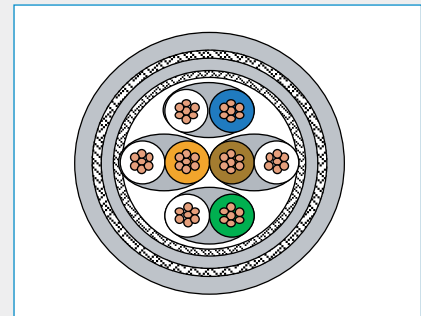
| | |
|-----------------------|---|
| Conductor | Solid copper wire, Ø 0.56 mm (AWG 23) |
| Insulation | foamskin PE, Ø 1.4 mm |
| Twisting | 2 cores to the pair |
| Pair screen | Al-laminated plastic foil |
| Cable lay up | 4 pairs (PiMF) to the core |
| Screen | copper braid, tinned |
| Inner Sheath | Oil resistant, Fire retardant and halogen free LSZH-FR (SHF1) |
| Outer sheath | Grey RAL7035 |
| Armouring | Galvanized steel wire braid, Wire diameter 0,25mm |
| Outer sheath | Oil resistant, Fire retardant and halogen free LSZH-FR (SHF1) |
| Outer Diameter | Nom. 10.6 mm |
| Weight | Nom. 168 kg/km |

Mechanical Properties

| | | |
|-----------------------------|---------------------|-----------------|
| Bending radius | Installation | 8 x D |
| | Installed | 4 x D |
| Temperature range | During operation | -40°C to + 85°C |
| | During installation | -15°C to + 50°C |
| Fire load | 4 pair | 1540 MJ/km |
| Maximum tensile load | During operation | No load |
| | During installation | 200 N |

Electrical Properties at 20°C ± 5°C

| | | |
|--|---------------------------------------|---------------|
| Loop resistance | - | ≤ 150 Ω/km |
| Resistance unbalance | - | ≤ 2% |
| Insulation resistance | (500 V) | ≥ 5000 MΩxkm |
| Mutual capacitance | at 800 Hz | Nom. 43 nF/km |
| Capacitance unbalance | (pair/ground) | ≤ 1500 pF/km |
| Characteristic impedance | (1-100 MHz) | 100 ± 5 Ω |
| | (100 - 250) MHz | 100 ± 10 Ω |
| | (250 - 600) MHz | 100 ± 15 Ω |
| Nominal velocity of propagation | - | ca. 79 % |
| Propagation delay | - | ≤ 570 ns/100m |
| Delay skew | - | ≤ 9 ns/100m |
| Test voltage | (DC, 1 min) core/core and core/screen | 1000 V |
| Transfer impedance(Grade 1) | at 1 MHz | ≤ 10 mΩ/m |
| | at 10 MHz | ≤ 10 mΩ/m |
| | at 30 MHz | ≤ 10 mΩ/m |
| | at 100 MHz | ≤ 20 mΩ/m |
| Coupling attenuation | - | ≥ 85 dB |



Application

- Generic Data transmission. This cable is a **Cat7 S/FTP** cable meant for use as installation/horizontal cable in tougher electrical and mechanical environment, including ships and offshore units.

Standards

- EN 50173-1; EN 50288-4-1
- ISO/IEC 11801; IEC 61156-5
- Det Norske Veritas (DNV) specification No. 6-827.50-2

Fire Rating

- IEC 60332-1, IEC 60332-3-24, IEC 61034-2, IEC 60754-1/2

Chemical Resistance

- Mineral oils IRM 902 (IEC60811-2-1) : 7 days/23°C, 4 hours/70°C
- Diesel - IRM 903 (IEC60811-2-1) : 7 days/23°C, 4 hours/70°C

Certification

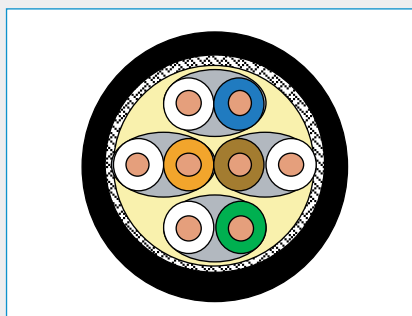
- This cable is based on the unarmoured version certified by: Det Norske Veritas (DNV)

Electrical Data (Nominal) acc. to Cat.7 (at 20°C)

| F (MHZ) | Attenuation (dB/100m) | NEXT (dB) | PS-NEXT (dB) | ACR (dB/100m) | PS-ACR (dB/100m) | ELFEXT (dB/100m) | PS-ELFEXT (dB/100m) | Return loss (dB/100m) |
|---------|-----------------------|-----------|--------------|---------------|------------------|------------------|---------------------|-----------------------|
| 1 | 1.8 | 100 | 97 | 98 | 95 | 105 | 105 | - |
| 4 | 3.4 | 100 | 97 | 97 | 94 | 105 | 102 | 27 |
| 10 | 5.4 | 100 | 97 | 95 | 92 | 97 | 94 | 30 |
| 16 | 6.8 | 100 | 97 | 93 | 90 | 93 | 90 | 30 |
| 20 | 7.7 | 100 | 97 | 92 | 89 | 91 | 88 | 30 |
| 31.2 | 9.6 | 100 | 97 | 90 | 87 | 87 | 84 | 30 |
| 62.5 | 13.7 | 100 | 97 | 86 | 83 | 81 | 78 | 30 |
| 100 | 17.4 | 100 | 97 | 83 | 80 | 77 | 74 | 30 |
| 125 | 19.5 | 95 | 92 | 75 | 72 | 75 | 72 | 26 |
| 155.5 | 21.9 | 94 | 91 | 72 | 69 | 73 | 70 | 26 |
| 175 | 23.3 | 93 | 90 | 70 | 67 | 72 | 69 | 25 |
| 200 | 25.0 | 92 | 89 | 67 | 64 | 71 | 68 | 25 |
| 250 | 28.1 | 90 | 87 | 62 | 59 | 69 | 66 | 24 |
| 300 | 30.9 | 89 | 86 | 58 | 55 | 67 | 64 | 24 |
| 450 | 38.3 | 87 | 84 | 48 | 45 | 64 | 61 | 23 |
| 600 | 44.8 | 85 | 82 | 40 | 37 | 61 | 58 | 22 |

Ordering Information

| P/N | Product Description | P.U |
|----------|---|-----------|
| 60027371 | S/FTP Installation Cable for tougher environments, IE ToughCat 7S* Armoured | 500m/drum |



Application

- Indoor- and outdoor installations, filled with compound to prevent water penetration
- Primary (Campus), Secondary (Riser), Tertiary (Horizontal)
- IEEE 802.3: 10Base-T; 100Base-T; 1000Base-T; 10GBase-T
- IEEE 802.5 16 MB; ISDN; TPDDI; ATM

Standards

- EN 50173-1; EN 50288-4-1
- ISO/IEC 11801; IEC 61156-5

Water Penetration Rating

- IEC 60794-1-2F5, method B

Fire Rating

- IEC 60332-1, IEC 60332-3-24, IEC 61034-2, IEC 60754-1/2

IE SuperCat 7 HS23 Cat.7 LSHF

Water resistant S/FTP Installation Cable 4x2xAWG23/1 for Indoor/Outdoor use

Construction

| | |
|---------------------------|---|
| Conductor | Solid bare copper wire, Ø 0.55 mm (AWG 23) |
| Insulation | Foam-skin PE, Ø 1.45 mm |
| Twisting | 2 cores to the pair, WBC filled |
| Pair screen | Al-laminated plastic foil |
| Cable lay up | 4 pairs (PIMF) to the core, swelling yarn and tape |
| Cable core filling | Special Waterproofing/compound to prevent moisture migration*). To prevent water penetration and to ensure electrical properties even in continuous wet conditions. |
| Screen | Copper braid, tinned |
| Sheath | LSZH, UV stabilized, diameter 8.7 mm |
| Colour | Black, RAL 9011 |
| Outer Diameter | Nom. 8.7 mm |
| Weight | Nom. 1000 kg/km |
| Tensile force N | 100 |

Mechanical Properties

| | | |
|-----------------------------|---------------------|--------------------|
| Bending radius | During operation | 4 x Outer diameter |
| | During installation | 8 x Outer diameter |
| Temperature range | During operation | -40°C to + 60°C |
| | During installation | -10°C to + 50°C |
| Fire load | - | 838 MJ/km |
| | During operation | - |
| Maximum tensile load | During installation | 100 N |

Electrical Properties at 20°C ± 5°C

| | | |
|--|---------------------------------------|---------------|
| Loop resistance | - | ≤ 165 Ω/km |
| Resistance unbalance | - | ≤ 2% |
| Insulation resistance | (500 V) | ≥ 2000 MΩ*km |
| Mutual capacitance | at 800 Hz | Nom. 43 nF/km |
| Capacitance unbalance | (pair/ground) | ≤ 1500 pF/km |
| Characteristic impedance | (1-100 MHz) | (100 ± 15) Ω |
| | (100 - 250) MHz | (100 ± 18) Ω |
| | (250 - 600) MHz | (100 ± 25) Ω |
| Nominal velocity of propagation | - | ca. 79 % |
| Propagation delay | - | ≤ 550 ns/100m |
| Delay skew | - | ≤ 10 ns/100m |
| Test voltage | (DC, 1 min) core/core and core/screen | 1000 V |
| Transfer impedance | at 1 MHz | ≤ 20 mΩ/m |
| | at 10 MHz | ≤ 30 mΩ/m |
| | at 30 MHz | ≤ 40 mΩ/m |
| | at 100MHz | ≤ 200 mΩ/m |
| Delay skew | - | ≥ 75 dB |

Nominal Transmission Characteristics at 20°C

| F (MHZ) | Attenuation (dB/100m) | NEXT (dB) | PS-NEXT* (dB) | ACR (dB/100m) | PS-ACR (dB/100m) | ELFEXT (dB/100m) | PS-ELFEXT (dB/100m) | Return loss (dB) |
|---------|-----------------------|-----------|---------------|---------------|------------------|------------------|---------------------|------------------|
| 1 | 1.8 | 100 | 97 | 98 | 95 | 105 | 105 | - |
| 4 | 3.4 | 100 | 97 | 97 | 94 | 105 | 102 | 27 |
| 10 | 5.4 | 100 | 97 | 95 | 92 | 97 | 94 | 30 |
| 16 | 6.8 | 100 | 97 | 93 | 90 | 93 | 90 | 30 |
| 20 | 7.7 | 100 | 97 | 92 | 89 | 91 | 88 | 30 |
| 31.2 | 9.6 | 100 | 97 | 90 | 87 | 87 | 84 | 30 |
| 62.5 | 13.7 | 100 | 97 | 86 | 83 | 81 | 78 | 30 |
| 100 | 17.4 | 100 | 97 | 83 | 80 | 77 | 74 | 30 |
| 125 | 19.5 | 95 | 92 | 75 | 72 | 75 | 72 | 26 |
| 155.5 | 21.9 | 94 | 91 | 72 | 69 | 73 | 70 | 26 |
| 175 | 23.3 | 93 | 90 | 70 | 67 | 72 | 69 | 25 |
| 200 | 25.0 | 92 | 89 | 67 | 64 | 71 | 68 | 25 |
| 250 | 28.1 | 90 | 87 | 62 | 59 | 69 | 66 | 24 |
| 300 | 30.9 | 89 | 86 | 58 | 55 | 67 | 64 | 24 |
| 450 | 38.3 | 87 | 84 | 48 | 45 | 64 | 61 | 23 |
| 600 | 44.8 | 85 | 82 | 40 | 37 | 61 | 58 | 22 |
| 750 | 52.0 | 83 | 80 | 31 | 28 | 59 | 56 | 21 |
| 900 | 59.4 | 82 | 79 | 23 | 20 | 58 | 55 | 20 |

Ordering Information

| P/N | Product Description | P,U |
|----------|--|------------|
| 60014892 | Water resistant S/FTP Installation Cable 4x2xAWG23/1 for Indoor/Outdoor use, IE SuperCat 7 HS23 Cat.7 LSHF | 500m/drum |
| 60014810 | Water resistant S/FTP Installation Cable 4x2xAWG23/1 for Indoor/Outdoor use, IE SuperCat 7 HS23 Cat.7 LSHF | 1000m/drum |

IE UC900 SS23 Cat.7 (L)H LSHF-FR

IE S/FTP cable 4x2xAWG23/1 with LSHF-FR moisture barrier sheath

1.4 Industrial Ethernet

Construction

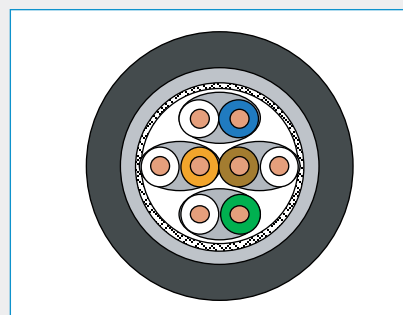
| | |
|------------------------|--|
| Conductor | bare copper wire, Ø 0.56 mm (AWG 23) |
| Insulation | foam-skin PE, Ø 1.4 mm |
| Twisting | 2 cores to the pair |
| Pair screen | Al-laminated plastic foil |
| Cable lay up | 4 pairs (PiMF) to the core |
| Screen | copper braid, tinned |
| Sheath | aluminum tape connected with halogen free, flame retardant thermoplastic sheathing compound acc. to EN 50290-2-27, wall thickness 1.5 mm |
| Colour | black RAL 9005 |
| Outer Diameter | Nom. 9.5 mm |
| Weight | Nom. 114 kg/km |
| Tensile force N | 350 |

Mechanical Properties

| | | |
|--------------------------|---------------------|-----------------|
| Bending radius | Without load | ≥ 40 mm |
| | With load | ≥ 80 mm |
| Temperature range | During operation | -20°C to + 60°C |
| | During installation | 0°C to + 50°C |

Electrical Properties at 20°C ± 5°C

| | | |
|--|---------------------------------------|---------------|
| Loop resistance | - | ≤ 165 Ω/km |
| Resistance unbalance | - | ≤ 2% |
| Insulation resistance | (500 V) | ≥ 5000 MΩ*km |
| Mutual capacitance | at 800 Hz | Nom. 43 nF/km |
| Capacitance unbalance | (pair/ground) | ≤ 1500 pF/km |
| Mean characteristic impedance | 100 MHz | 100 ± 5 Ω |
| Nominal velocity of propagation | - | ca. 79 % |
| Propagation delay | - | 427 ns/100m |
| Delay skew | - | 12 ns/100m |
| Test voltage | (DC, 1 min) core/core and core/screen | 1000 V |
| Transfer impedance | at 1 MHz | 10 mΩ/m |
| | at 10 MHz | 10 mΩ/m |
| | at 30 MHz | 30 mΩ/m |
| | at 100MHz | 60 mΩ/m |
| Coupling attenuation | - | 85 dB |



Application

- Primary (Campus), Secondary (Riser), Tertiary (Horizontal)
- IEEE 802.3: 10Base-T; 100Base-T; 1000Base-T; 10GBase-T
- IEEE 802.5 16 MB; ISDN; TPDDI; ATM

Standards

- EN 50173-1; EN 50288-4-1
- ISO/IEC 11801; IEC 61156-5

Fire Rating

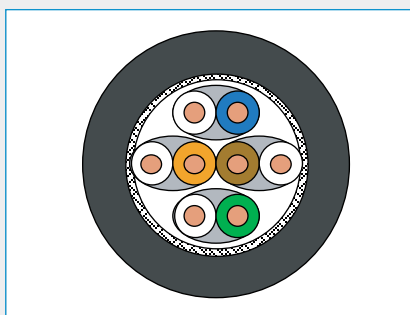
- IEC 60332-1, IEC 60332-3-24, IEC 61034-2, IEC 60754-1/2

Electrical Data (Nominal) acc. to Cat.7 (at 20°C)

| F (MHZ) | Attenuation (dB/100m) | NEXT (dB) | PS-NEXT (dB/100m) | ACR (dB) | PS-ACR (dB) | ELFEXT (dB/100m) | PS-ELFEXT (dB/100m) | Return loss (dB/100m) |
|---------|-----------------------|-----------|-------------------|----------|-------------|------------------|---------------------|-----------------------|
| 1 | 1.8 | 100 | 97 | 98 | 95 | 105 | 105 | - |
| 4 | 3.4 | 100 | 97 | 97 | 94 | 105 | 102 | 27 |
| 10 | 5.4 | 100 | 97 | 95 | 92 | 97 | 94 | 30 |
| 16 | 6.8 | 100 | 97 | 93 | 90 | 93 | 90 | 30 |
| 20 | 7.7 | 100 | 97 | 92 | 89 | 91 | 88 | 30 |
| 31.2 | 9.6 | 100 | 97 | 90 | 87 | 87 | 84 | 30 |
| 62.5 | 13.7 | 100 | 97 | 86 | 83 | 81 | 78 | 30 |
| 100 | 17.4 | 100 | 97 | 83 | 80 | 77 | 74 | 30 |
| 125 | 19.5 | 95 | 92 | 75 | 72 | 75 | 72 | 26 |
| 155.5 | 21.9 | 94 | 91 | 72 | 69 | 73 | 70 | 26 |
| 175 | 23.3 | 93 | 90 | 70 | 67 | 72 | 69 | 25 |
| 200 | 25.0 | 92 | 89 | 67 | 64 | 71 | 68 | 25 |
| 250 | 28.1 | 90 | 87 | 62 | 59 | 69 | 66 | 24 |
| 300 | 30.9 | 89 | 86 | 58 | 55 | 67 | 64 | 24 |
| 450 | 38.3 | 87 | 84 | 48 | 45 | 64 | 61 | 23 |
| 600 | 44.8 | 85 | 82 | 40 | 37 | 61 | 58 | 22 |
| 750 | 52.0 | 83 | 80 | 31 | 28 | 59 | 56 | 21 |
| 900 | 59.4 | 82 | 79 | 23 | 20 | 58 | 55 | 20 |
| 1000 | 63.1 | 80 | 77 | 17 | 14 | 57 | 54 | 20 |

Ordering Information

| P/N | Product Description | P.U |
|----------|---|------------|
| 60015223 | IE S/FTP cable 4x2xAWG23/1 with LSHF-FR moisture barrier sheath, IE UC900 SS23 Cat.7 (L)H LSHF-FR | 500m/drum |
| 60015222 | IE S/FTP cable 4x2xAWG23/1 with LSHF-FR moisture barrier sheath, IE UC900 SS23 Cat.7 (L)H LSHF-FR | 1000m/drum |



Application

- Primary (Campus), Secondary (Riser), Tertiary (Horizontal)
- IEEE 802.3: 10Base-T; 100Base-T; 1000Base-T; 10GBase-T
- IEEE 802.5 16 MB; ISDN; TPDDI; ATM

Fire Rating

- EN 50173-1; EN 50288-4-1
- ISO/IEC 11801; IEC 61156-5

IE UC900 SS23 Cat.7 PE

IE S/FTP cable 4x2xAWG23/1 with PE sheath

Construction

| | |
|------------------------|--------------------------------------|
| Conductor | bare copper wire, Ø 0.56 mm (AWG 23) |
| Insulation | foam-skin PE, Ø 1.4 mm |
| Twisting | 2 cores to the pair |
| Pair screen | Al-laminated plastic foil |
| Cable lay up | 4 pairs (PiMF) to the core |
| Screen | copper braid, tinned |
| Sheath | PE, for outdoor installation |
| Colour | black, RAL 9005 |
| Outer Diameter | Nom. 8.4 mm |
| Weight | Nom. 95 kg/km |
| Tensile force N | 340 |

Mechanical Properties

| | | |
|--------------------------|---------------------|-----------------|
| Bending radius | Without load | ≥ 40 mm |
| | With load | ≥ 80 mm |
| Temperature range | During operation | -55°C to + 60°C |
| | During installation | -20°C to + 50°C |

Electrical Properties at 20°C ± 5°C

| | | |
|--|---------------------------------------|---------------|
| Loop resistance | - | ≤ 165 Ω/km |
| Resistance unbalance | - | ≤ 2% |
| Insulation resistance | (500 V) | ≥ 5000 MΩ*km |
| Mutual capacitance | at 800 Hz | Nom. 43 nF/km |
| Capacitance unbalance | (pair/ground) | ≤ 1500 pF/km |
| Characteristic impedance | (1-100 MHz) | (100 ± 15) Ω |
| | (100 - 250) MHz | (100 ± 18) Ω |
| | (250 - 600) MHz | (100 ± 25) Ω |
| Nominal velocity of propagation | - | ca. 79 % |
| Propagation delay | - | ≤ 427 ns/100m |
| Delay skew | - | ≤ 12 ns/100m |
| Test voltage | (DC, 1 min) core/core and core/screen | 1000 V |
| Transfer impedance | at 1 MHz | 10 mΩ/m |
| | at 10 MHz | 10 mΩ/m |
| | at 30 MHz | 30 mΩ/m |
| | at 100MHz | 60 mΩ/m |
| Coupling attenuation | - | 85 dB |

Electrical Data (Nominal) acc. to Cat.7 (at 20°C)

| F (MHZ) | Attenuation (dB/100m) | NEXT (dB) | PS-NEXT (dB) | ACR (dB/100m) | PS-ACR (dB/100m) | ELFEXT (dB/100m) | PS-ELFEXT (dB/100m) | Return loss (dB) |
|---------|-----------------------|-----------|--------------|---------------|------------------|------------------|---------------------|------------------|
| 1 | 1.8 | 100 | 97 | 98 | 95 | 105 | 105 | - |
| 4 | 3.4 | 100 | 97 | 97 | 94 | 105 | 102 | 27 |
| 10 | 5.4 | 100 | 97 | 95 | 92 | 97 | 94 | 30 |
| 16 | 6.8 | 100 | 97 | 93 | 90 | 93 | 90 | 30 |
| 20 | 7.7 | 100 | 97 | 92 | 89 | 91 | 88 | 30 |
| 31.2 | 9.6 | 100 | 97 | 90 | 87 | 87 | 84 | 30 |
| 62.5 | 13.7 | 100 | 97 | 86 | 83 | 81 | 78 | 30 |
| 100 | 17.4 | 100 | 97 | 83 | 80 | 77 | 74 | 30 |
| 125 | 19.5 | 95 | 92 | 75 | 72 | 75 | 72 | 26 |
| 155.5 | 21.9 | 94 | 91 | 72 | 69 | 73 | 70 | 26 |
| 175 | 23.3 | 93 | 90 | 70 | 67 | 72 | 69 | 25 |
| 200 | 25.0 | 92 | 89 | 67 | 64 | 71 | 68 | 25 |
| 250 | 28.1 | 90 | 87 | 62 | 59 | 69 | 66 | 24 |
| 300 | 30.9 | 89 | 86 | 58 | 55 | 67 | 64 | 24 |
| 450 | 38.3 | 87 | 84 | 48 | 45 | 64 | 61 | 23 |
| 600 | 44.8 | 85 | 82 | 40 | 37 | 61 | 58 | 22 |
| 750 | 52.0 | 83 | 80 | 31 | 28 | 59 | 56 | 21 |
| 900 | 59.4 | 82 | 79 | 23 | 20 | 58 | 55 | 20 |
| 1000 | 63.1 | 80 | 77 | 17 | 14 | 57 | 54 | 20 |

Ordering Information

| P/N | Product Description | P.U |
|----------|---|------------|
| 60011276 | IE S/FTP cable 4x2xAWG23/1 with PE sheath, IE UC900 SS23 Cat.7 PE | 500m/drum |
| 60011278 | IE S/FTP cable 4x2xAWG23/1 with PE sheath, IE UC900 SS23 Cat.7 PE | 1000m/drum |

IE UC900 SS23 Cat.7 PUR

IE S/FTP cable 4x2xAWG23/1 with abrasion and oil resistant PUR sheath

1.4 Industrial Ethernet

Construction

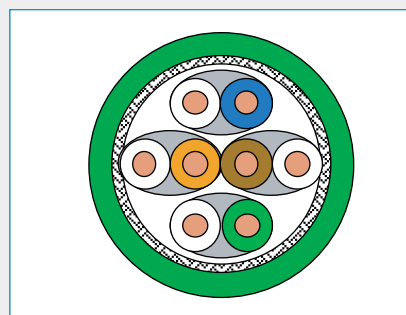
| | |
|------------------------|--------------------------------------|
| Conductor | bare copper wire, Ø 0.56 mm (AWG 23) |
| Insulation | foam-skin PE, Ø 1.4 mm |
| Twisting | 2 cores to the pair |
| Pair screen | Al-laminated plastic foil |
| Cable lay up | 4 pairs (PiMF) to the core |
| Screen | copper braid, tinned |
| Sheath | PUR, oil resistant |
| Colour | green RAL 6018 |
| Outer Diameter | Nom. 7.5 mm |
| Weight | Nom. 92 kg/km |
| Tensile force N | 340 |

Mechanical Properties

| | | |
|--------------------------|---------------------|-----------------|
| Bending radius | Without load | ≥ 30 mm |
| | With load | ≥ 60 mm |
| Temperature range | During operation | -30°C to + 75°C |
| | During installation | -0°C to + 50°C |

Electrical Properties at 20°C ± 5°C

| | | |
|--|---------------------------------------|---------------|
| Loop resistance | - | ≤ 150 Ω/km |
| Resistance unbalance | - | ≤ 2% |
| Insulation resistance | (500 V) | ≥ 5000 MΩ*km |
| Mutual capacitance | at 800 Hz | Nom. 43 nF/km |
| Capacitance unbalance | (pair/ground) | ≤ 1500 pF/km |
| Characteristic impedance | (1-100 MHz) | (100 ± 5) Ω |
| | (100 - 250) MHz | (100 ± 10) Ω |
| | (250 - 600) MHz | (100 ± 15) Ω |
| Nominal velocity of propagation | - | ca. 79 % |
| Propagation delay | - | ≤ 427 ns/100m |
| Delay skew | - | ≤ 9 ns/100m |
| Test voltage | (DC, 1 min) core/core and core/screen | 1000 V |
| Transfer impedance | at 1 MHz | 5 mΩ/m |
| | at 10 MHz | 5 mΩ/m |
| | at 30 MHz | 10 mΩ/m |
| | at 100MHz | 20 mΩ/m |
| Coupling attenuation | - | 85 dB |



Application

- Primär (Campus), Sekundär (Riser), Tertiär (Horizontal)
- IEEE 802.3: 10Base-T; 100Base-T; 1000Base-T; 10GBase-T
- IEEE 802.5 16 MB; ISDN; TPDDI; ATM

Standards

- EN 50173-1; EN 50288-4-1
- ISO/IEC 11801; IEC 61156-5

Fire Rating

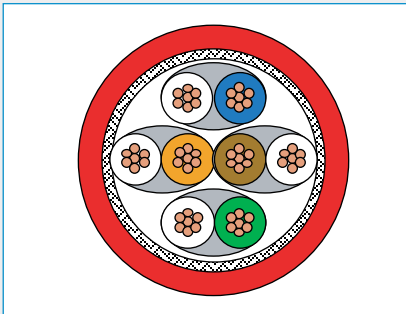
- IEC 60332-1; IEC 60754-2; IEC 61034

Electrical Data (Nominal) acc. to Cat.7 (at 20°C)

| F (MHZ) | Attenuation (dB/100m) | NEXT (dB) | PS-NEXT (dB) | ACR (dB/100m) | PS-ACR (dB/100m) | ELFEXT (dB/100m) | PS-ELFEXT (dB/100m) | Return loss (dB) |
|---------|-----------------------|-----------|--------------|---------------|------------------|------------------|---------------------|------------------|
| 1 | 1.8 | 100 | 97 | 98 | 95 | 105 | 105 | - |
| 4 | 3.4 | 100 | 97 | 97 | 94 | 105 | 102 | 27 |
| 10 | 5.4 | 100 | 97 | 95 | 92 | 97 | 94 | 30 |
| 16 | 6.8 | 100 | 97 | 93 | 90 | 93 | 90 | 30 |
| 20 | 7.7 | 100 | 97 | 92 | 89 | 91 | 88 | 30 |
| 31.2 | 9.6 | 100 | 97 | 90 | 87 | 87 | 84 | 30 |
| 62.5 | 13.7 | 100 | 97 | 86 | 83 | 81 | 78 | 30 |
| 100 | 17.4 | 100 | 97 | 83 | 80 | 77 | 74 | 30 |
| 125 | 19.5 | 95 | 92 | 75 | 72 | 75 | 72 | 26 |
| 155.5 | 21.9 | 94 | 91 | 72 | 69 | 73 | 70 | 26 |
| 175 | 23.3 | 93 | 90 | 70 | 67 | 72 | 69 | 25 |
| 200 | 25.0 | 92 | 89 | 67 | 64 | 71 | 68 | 25 |
| 250 | 28.1 | 90 | 87 | 62 | 59 | 69 | 66 | 24 |
| 300 | 30.9 | 89 | 86 | 58 | 55 | 67 | 64 | 24 |
| 450 | 38.3 | 87 | 84 | 48 | 45 | 64 | 61 | 23 |
| 600 | 44.8 | 85 | 82 | 40 | 37 | 61 | 58 | 22 |
| 750 | 52.0 | 83 | 80 | 31 | 28 | 59 | 56 | 21 |
| 900 | 59.4 | 82 | 79 | 23 | 20 | 58 | 55 | 20 |
| 1000 | 63.1 | 80 | 77 | 17 | 14 | 57 | 54 | 20 |

Ordering Information

| P/N | Product Description | P.U |
|----------|--|------------|
| 60015297 | IE S/FTP cable 4x2xAWG23/1 with abrasion and oil resistant PUR sheath, IE UC900 SS23 Cat.7 PUR | 500m/drum |
| 60015294 | IE S/FTP cable 4x2xAWG23/1 with abrasion and oil resistant PUR sheath, IE UC900 SS23 Cat.7 PUR | 1000m/drum |



Application

- Work area and patch cord cable
- IEEE 802.3: 10Base-T; 100Base-T; 1000Base-T; 10GBase-T
- IEEE 802.5 16 MB; ISDN; TPDDI; ATM

Standards

- EIA/TIA 568A;
- ISO/IEC 11801 2nd ed.; IEC 61156-6
- EN 50173-1; EN 50288-4-2

Fire Rating

- IEC 60332-1; IEC 60754-2; IEC 61034

Chemical Resistance

- Oil resistant against Mineral - oil, ASTM - oil
- The sheath material is tested in Hydraulic oil
- ARAL VITAM 32, Mobil DTE 13 M, Gear oil ARAL DEGOL BG Plus 320 and Tribol 1710/320.

IE UC900 SS27 Cat.7 PUR

IE S/FTP patch cable 4x2xAWG27/7 with abrasion and oil resistant PUR sheath

Construction

| | |
|------------------------|--|
| Conductor | stranded bare copper wires, \varnothing 0.42 mm (AWG 27/7) |
| Insulation | foam-skin Polyethylene, \varnothing 0.98 mm |
| Twisting | 2 cores to the pair |
| Pair screen | Al-laminated plastic foil |
| Cable lay up | 4 pairs (PIMF) to the core |
| Screen | copper braid, tinned |
| Sheath | PUR |
| Colour | red |
| Outer Diameter | Nom. 5.9 mm |
| Weight | Nom. 34 kg/km |
| Tensile force N | 100 |

Mechanical Properties

| | | |
|---|---------------------|--|
| Bending radius | Without load | ≥ 25 mm |
| | With load | ≥ 50 mm |
| Temperature range | During operation | -35°C to +75°C |
| | During installation | -5°C to +50°C |
| UV resistance of sheath material | - | acc. to IEC60068-2-5 |
| Ozone resistance | - | acc. to EN 60811-2-1, clause 8 |
| Smoke density | - | acc. to EN 50268-2, IEC61034-1 and 2 |
| Corrosivity | - | acc. EN 50267-1 and 2, IEC 60754-1 and 2 |

Electrical Properties at 20°C \pm 5°C

| | | |
|--|---------------------------------------|----------------------------|
| Loop resistance | - | ≤ 340 Ω /km |
| Resistance unbalance | - | $\leq 3\%$ |
| Insulation resistance | (500 V) | ≥ 2000 M Ω *km |
| Mutual capacitance | at 800 Hz | Nom. 43 nF/km |
| Capacitance unbalance | (pair/ground) | ≤ 1500 pF/km |
| Characteristic impedance | (1-100 MHz) | (100 \pm 15) Ω |
| | (100 - 250) MHz | (100 \pm 18) Ω |
| | (250 - 600) MHz | (100 \pm 25) Ω |
| Nominal velocity of propagation | - | ca. 79 % |
| Propagation delay | - | ≤ 427 ns/100m |
| Delay skew | - | ≤ 12 ns/100m |
| Test voltage | (DC, 1 min) core/core and core/screen | 1000 V |
| Transfer impedance | at 1 MHz | 25 m Ω /m |
| | at 10 MHz | 15 m Ω /m |
| | at 30 MHz | 30 m Ω /m |
| Coupling attenuation | - | 75 dB |

Electrical Data (Nominal) acc. to Cat.7 (at 20°C)

| F (MHZ) | Attenuation (dB/10m) | NEXT (dB) | PS-NEXT (dB) | ACR (dB/100m) | ELFEXT (dB/100m) | PS-ELFEXT (dB/100m) | Return loss (dB) |
|---------|----------------------|-----------|--------------|---------------|------------------|---------------------|------------------|
| 1 | 0.3 | 90 | 87 | 90 | 77 | 77 | 23 |
| 4 | 0.6 | 90 | 87 | 89 | 77 | 77 | 24 |
| 10 | 1.0 | 90 | 87 | 89 | 77 | 77 | 25 |
| 16 | 1.3 | 90 | 87 | 89 | 73 | 73 | 25 |
| 20 | 1.4 | 90 | 87 | 89 | 71 | 71 | 25 |
| 31.2 | 1.8 | 90 | 87 | 88 | 67 | 67 | 25 |
| 62.5 | 2.6 | 90 | 87 | 87 | 61 | 61 | 23 |
| 100 | 3.2 | 87 | 84 | 84 | 57 | 57 | 21 |
| 125 | 3.6 | 85 | 82 | 81 | 55 | 55 | 20 |
| 155.5 | 4.0 | 84 | 81 | 80 | 53 | 53 | 19 |
| 175 | 4.3 | 83 | 80 | 79 | 52 | 52 | 19 |
| 200 | 4.6 | 82 | 79 | 77 | 51 | 51 | 18 |
| 250 | 5.1 | 81 | 78 | 76 | 49 | 49 | 18 |
| 300 | 5.6 | 80 | 77 | 74 | 47 | 47 | 17 |
| 450 | 6.9 | 77 | 74 | 70 | 44 | 44 | 17 |
| 600 | 7.9 | 75 | 72 | 67 | 41 | 41 | 17 |
| 750 | 8.7 | 73 | 70 | 64 | 39 | 39 | - |
| 900 | 9.7 | 72 | 69 | 62 | 38 | 38 | - |
| 1000 | 10.2 | 71 | 68 | 61 | 37 | 37 | - |

Ordering Information

| P/N | Product Description | P.U |
|----------|--|------------|
| 60011459 | IE S/FTP patch cable 4x2xAWG27/7 with abrasion and oil resistant PUR sheath, IE UC900 SS27 Cat.7 PUR | 500m/drum |
| 60014237 | IE S/FTP patch cable 4x2xAWG27/7 with abrasion and oil resistant PUR sheath, IE UC900 SS27 Cat.7 PUR | 1000m/drum |

JAMAK®

Symmetrical data cable for industrial control equipment

1.5 JAMAK® Industrial Data

Construction

| | |
|---------------------------------|--|
| Conductor | Tinned stranded copper 7x 0.29 mm |
| Insulation | PE (2Y) |
| Conductor identification | a-conductor blue; b-conductor red |
| Stranding | 2 conductors to pair |
| Stranding to core | (0+4) |
| Pair shielding | Laminated AL-foil + copper drain wire 0.5 mm ² |
| Overall shielding | 2pairs- 48pairs: Laminated AL-foil + copper drain wire 0.5 mm ² , 1pair: without overall shielding |
| Outer sheath | PVC (Y), grey |
| Outer Diameter | Nom. 7.2(2pair) - 28.0(48pair) mm |
| Weight | Nom. 60(2pair) - 980(48pair) kg/km |

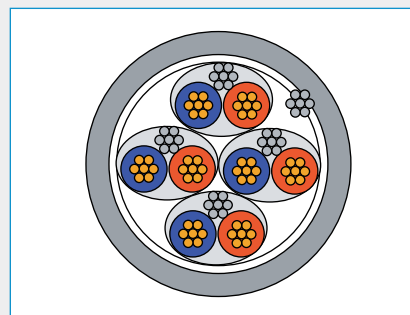
Mechanical Properties

| | |
|--------------------------------------|------------------|
| Operating temperature | - 30°C to + 70°C |
| Min. Installation temperature | - 5°C |

Electrical Properties at 20°C

| | |
|---|---------------|
| Loop resistance | 81 Ω/km |
| Insulation resistance (at 500 V, 1 min.) | 2 GΩ*km |
| Capacitance at 800 Hz | 85 nF/km |
| Max. operating voltage | 75 V |
| Relative velocity factor NVP | 0.66 |
| Impedance (at 10 MHz) | 70 Ω +/- 10 % |

| Frequency [kHz] | Attenuation [dB/100 m] |
|--------------------|---------------------------|
| 9.6 | 0.3 |
| 19.2 | 0.5 |
| 64 | 0.7 |
| 100 | 0.9 |
| 200 | 1.6 |
| 1000 | 4.5 |



Application

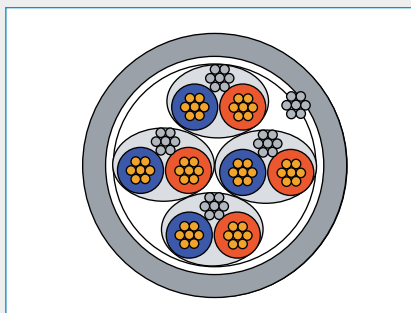
These symmetrical data transmission cables are used in control and supervision centre for industrial sites. They are suitable for fixed installation inside housings.

Fire Rating

- Oxygen Index LOI acc. to ASTM-D-2863: no limit
- IEC 60332-1

Ordering Information

| P/N | Product Description | P.U |
|-----------------|---|------------|
| 1004685 | 1x(2+1)x0.5, Symmetrical data cable for industrial control equipment, JAMAK® | 1000m/drum |
| 1006411-01000DX | 2x(2+1)x0.5, Symmetrical data cable for industrial control equipment, JAMAK® | 1000m/drum |
| 1005579-00200DX | 2x(2+1)x0.5, Symmetrical data cable for industrial control equipment, JAMAK® | 200m/drum |
| 1005540-01000DX | 4x(2+1)x0.5, Symmetrical data cable for industrial control equipment, JAMAK® | 1000m/drum |
| 1005578-00200DX | 4x(2+1)x0.5, Symmetrical data cable for industrial control equipment, JAMAK® | 200m/drum |
| 1005533-01000DX | 8x(2+1)x0.5, Symmetrical data cable for industrial control equipment, JAMAK® | 1000m/drum |
| 1005525-00500DX | 8x(2+1)x0.5, Symmetrical data cable for industrial control equipment, JAMAK® | 500m/drum |
| 1005534-01000DX | 12x(2+1)x0.5, Symmetrical data cable for industrial control equipment, JAMAK® | 1000m/drum |
| 1005524-00500DX | 24x(2+1)x0.5, Symmetrical data cable for industrial control equipment, JAMAK® | 500m/drum |
| 1005541-01000DX | 24x(2+1)x0.5, Symmetrical data cable for industrial control equipment, JAMAK® | 1000m/drum |
| 1005535-00500DX | 48x(2+1)x0.5, Symmetrical data cable for industrial control equipment, JAMAK® | 500m/drum |



Application

These halogen-free, flame retardant and symmetrical data transmission cables are used in control and supervision center for industrial sites. They are suitable for fixed installation inside housings.

Fire Rating

- IEC 60332-1; IEC 60754-2; IEC 61034

JAMAK®-C LSZH

Symmetrical Data Cable for Industrial Control Equipment

Construction

| | |
|---------------------------------|---|
| Conductor | Stranded tinned copper 7x 0.29 mm |
| Insulation | PE (2Y) |
| Conductor identification | a-conductor blue; b-conductor red |
| Stranding | 2 conductors to pair |
| Stranding to core | (0+4) |
| Pair shielding | Laminated AL-foil + copper drain wire 0.5 mm ² |
| Overall shielding | 2 Laminated AL-foils with inner copper drain wire 0.5 mm ² |
| Outer sheath | LSZH (H), grey (RAL 7035), light resistant |
| Outer Diameter | Nom. 7.5(2pair) - 30.5(48pair) mm |
| Weight | Nom. 70(2pair) - 1000(48pair) kg/km |

Mechanical Properties

| | |
|--------------------------------------|------------------|
| Operating temperature | - 30°C to + 70°C |
| Min. Installation temperature | - 5°C |

Electrical Properties at 20°C

| | |
|---|---------------|
| Loop resistance | 81 Ω/km |
| Insulation resistance (at 500 V, 1 min.) | 2 GΩ*km |
| Capacitance at 800 Hz | 85 nF/km |
| Max. operating voltage | 75 V |
| Relative velocity factor NVP | 0.66 |
| Impedance (at 10 MHz) | 70 Ω +/- 10 % |

| Frequency [kHz] | Attenuation [dB/100 m] |
|--------------------|---------------------------|
| 9.6 | 0.3 |
| 19.2 | 0.5 |
| 64 | 0.7 |
| 100 | 0.9 |
| 200 | 1.6 |
| 1000 | 4.5 |

Ordering Information

| P/N | Product Description | P.U |
|-----------------|--|------------|
| 1005528-01000DX | 2x(2+1)x0.5, Symmetrical Data Cable for Industrial Control Equipment, JAMAK®-C LSZH | 1000m/drum |
| 1005529-01000DX | 4x(2+1)x0.5, Symmetrical Data Cable for Industrial Control Equipment, JAMAK®-C LSZH | 1000m/drum |
| 1005530-01000DX | 8x(2+1)x0.5, Symmetrical Data Cable for Industrial Control Equipment, JAMAK®-C LSZH | 1000m/drum |
| 1005531-01000DX | 24x(2+1)x0.5, Symmetrical Data Cable for Industrial Control Equipment, JAMAK®-C LSZH | 1000m/drum |
| 1006195-01000DX | 24x(2+1)x0.5, Symmetrical Data Cable for Industrial Control Equipment, JAMAK®-C LSZH | 1000m/drum |
| 1006197-00500DX | 48x(2+1)x0.5, Symmetrical Data Cable for Industrial Control Equipment, JAMAK®-C LSZH | 500m/drum |

JAMAK[®] -HF

Symmetrical Data Cable for Industrial Control Equipment

1.5 JAMAK[®] Industrial Data

Construction

| | |
|---------------------------------|---|
| Conductor | Tinned stranded copper 7x 0.29 mm |
| Insulation | PE (2Y) |
| Conductor identification | a-conductor blue; b-conductor red |
| Stranding | 2 conductors to pair |
| Stranding to core | (0+4) |
| Pair shielding | Laminated AL-foil + copper drain wire 0.5 mm ² |
| Overall shielding | Laminated AL-foil + copper drain wire 0.5 mm ² |
| Outer sheath | LSZH (H), grey |
| Outer Diameter | Nom. 7.5(2pair) - 30.5(48pair) mm |
| Weight | Nom. 70(2pair) - 1500(48pair) kg/km |

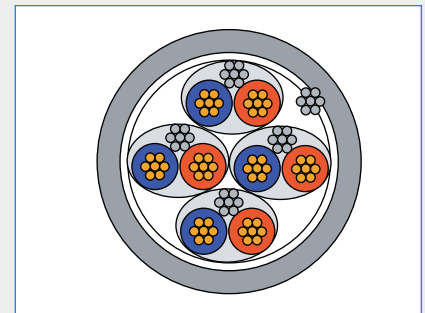
Mechanical Properties

| | |
|--------------------------------------|------------------|
| Operating temperature | - 30°C to + 70°C |
| Min. Installation temperature | - 5°C |

Electrical Properties at 20°C

| | |
|---|---------------|
| Loop resistance | 81 Ω/km |
| Insulation resistance (at 500 V, 1 min.) | 2 GΩ*km |
| Capacitance at 800 Hz | 85 nF/km |
| Max. operating voltage | 75 V |
| Relative velocity factor NVP | 0.66 |
| Impedance (at 10 MHz) | 70 Ω +/- 10 % |

| Frequency [kHz] | Attenuation [dB/100 m] |
|--------------------|---------------------------|
| 9.6 | 0.3 |
| 19.2 | 0.5 |
| 64 | 0.7 |
| 100 | 0.9 |
| 200 | 1.6 |
| 1000 | 4.5 |



Application

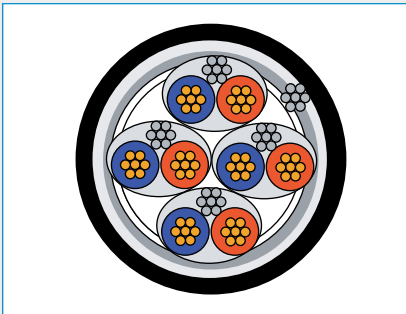
These symmetrical data transmission cables are used in control and supervision center for industrial sites. They are suitable for fixed installation inside housings.

Fire Rating

- IEC 60332-1; IEC 60754-2; IEC 61034

Ordering Information

| P/N | Product Description | P.U |
|-----------|---|------------|
| JAMAK -HF | 2x(2+1)x0.5, Symmetrical Data Cable for Industrial Control Equipment, JAMAK [®] -HF | 1000m/drum |
| JAMAK -HF | 4x(2+1)x0.5, Symmetrical Data Cable for Industrial Control Equipment, JAMAK [®] -HF | 1000m/drum |
| JAMAK -HF | 8x(2+1)x0.5, Symmetrical Data Cable for Industrial Control Equipment, JAMAK [®] -HF | 1000m/drum |
| JAMAK -HF | 12x(2+1)x0.5, Symmetrical Data Cable for Industrial Control Equipment, JAMAK [®] -HF | 1000m/drum |
| JAMAK -HF | 24x(2+1)x0.5, Symmetrical Data Cable for Industrial Control Equipment, JAMAK [®] -HF | 1000m/drum |
| JAMAK -HF | 48x(2+1)x0.5, Symmetrical Data Cable for Industrial Control Equipment, JAMAK [®] -HF | 500m/drum |



Application

These symmetrical data transmission cables are used in control and supervision center for industrial sites. The cables with armouring and PE outer sheath are suitable for direct buried installation.

Fire Rating

- Oxygen Index LOI acc. to ASTM-D-2863: no limit
- IEC 60332-1

Water Penetration Rating

MIL-C-24640A

JAMAK®-ARM

Symmetrical Data Cable for Industrial Control Equipment

Construction

| | |
|---------------------------------|---|
| Conductor | Stranded tinned copper 7x 0.29 mm |
| Insulation | PE (2Y) |
| Conductor identification | a-conductor blue; b-conductor red |
| Stranding | 2 conductors to pair |
| Stranding to core | (0+4) |
| Pair shielding | Laminated AL-foil + copper drain wire 0.5 mm ² |
| Overall shielding | Laminated AL-foil + copper drain wire 0.5 mm ² |
| Inner sheath | PVC (Y), grey |
| Armouring | Steel tape, helically wounded |
| Outer sheath | PE (2Y), black |
| Outer Diameter | Nom. 13(4pair) - 34.5(48pair) mm |
| Weight | Nom. 250 (4pair) - 1500(48pair) kg/km |

Mechanical Properties

| | |
|--------------------------------------|------------------|
| Operating temperature | - 30°C to + 70°C |
| Min. installation temperature | - 5°C |

Electrical Properties at 20°C

| | |
|---|---------------|
| Loop resistance | 81 Ω/km |
| Insulation resistance (at 500 V, 1 min.) | 2 GΩ*km |
| Capacitance at 800 Hz | 85 nF/km |
| Max. operating voltage | 75 V |
| Relative velocity factor NVP | 0.66 |
| Impedance (at 10 MHz) | 70 Ω +/- 10 % |

| Frequency [kHz] | Attenuation [dB/100 m] |
|--------------------|---------------------------|
| 9.6 | 0.3 |
| 19.2 | 0.5 |
| 64 | 0.7 |
| 100 | 0.9 |
| 200 | 1.6 |
| 1000 | 4.5 |

Ordering Information

| P/N | Product Description | P.U |
|-----------------|---|------------|
| 1005536-01000DX | 4x(2+1)x0.5, Symmetrical Data Cable for Industrial Control Equipment, JAMAK®-ARM | 1000m/drum |
| 1005537-01000DX | 8x(2+1)x0.5, Symmetrical Data Cable for Industrial Control Equipment, JAMAK®-ARM | 1000m/drum |
| 1005538-01000DX | 12x(2+1)x0.5, Symmetrical Data Cable for Industrial Control Equipment, JAMAK®-ARM | 1000m/drum |
| 1005539-01000DX | 24x(2+1)x0.5, Symmetrical Data Cable for Industrial Control Equipment, JAMAK®-ARM | 1000m/drum |
| 1005539-01000DX | 48x(2+1)x0.5, Symmetrical Data Cable for Industrial Control Equipment, JAMAK®-ARM | 1000m/drum |

NOMAK®

Symmetrical data cable for industrial control equipment

1.6 NOMAK® Industrial Data

Construction

| | |
|---------------------------------|--|
| Conductor | Stranded tinned copper 7x0,29 mm |
| Insulation | PVC (Y) |
| Conductor identification | a-conductor orange; b-conductor white (with number printing) |
| Stranding | 2 conductors to pair (0+4) |
| Stranding to core | |
| Overall shielding | Laminated AL-foil + tinned copper drain wire 0.5 mm ² |
| Outer sheath | PVC (Y), grey (RAL 7035) |
| Outer Diameter | Nom. 6.7(2pair) - 23.5(48pair) mm |
| Weight | Nom. 52(2pair) - 745(48pair) kg/km |

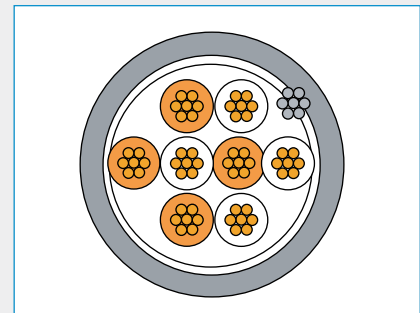
Mechanical Properties

| | |
|--------------------------------------|------------------|
| Operating temperature | - 30°C to + 70°C |
| Min. Installation temperature | - 5°C |

Electrical Properties at 20°C

| | |
|---|----------------|
| Loop resistance | 81 Ω/km |
| Insulation resistance (at 500 V, 1 min.) | 100 MΩ*km |
| Capacitance at 800 Hz | 85 nF/km |
| for 2 and 4 pairs | 90 nF/km |
| Max. operating voltage | 75 V |
| Relative velocity factor NVP | 0.60 |
| Impedance (at 10 MHz) | 100 Ω +/- 10 % |

| Frequency [kHz] | Attenuation [dB/100 m] |
|--------------------|---------------------------|
| 9.6 | 0.3 |
| 19.2 | 0.5 |
| 64 | 0.7 |
| 100 | 0.9 |
| 200 | 1.5 |
| 1000 | 2.9 |



Application

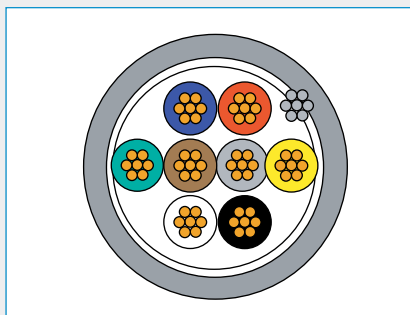
These symmetrical data transmission cables are used in control and supervision centre for industrial sites. They are suitable for fixed installation inside housings.

Fire Rating

- Oxygen Index LOI acc. to ASTM-D-2863: no limit
- IEC 60332-1

Ordering Information

| P/N | Product Description | P.U |
|------------------|---|------------|
| 1003555-010000D | 2x2x0.5, Symmetrical data cable for industrial control equipment, NOMAK® | 1000m/drum |
| 1003555-002000DW | 2x2x0.5, Symmetrical data cable for industrial control equipment, NOMAK® | 200m/drum |
| 1003575-010000D | 4x2x0.5, Symmetrical data cable for industrial control equipment, NOMAK® | 1000m/drum |
| 1003575-002000DW | 4x2x0.5, Symmetrical data cable for industrial control equipment, NOMAK® | 200m/drum |
| 1005542-010000DX | 8x2x0.5, Symmetrical data cable for industrial control equipment, NOMAK® | 1000m/drum |
| 1005543-010000DX | 12x2x0.5, Symmetrical data cable for industrial control equipment, NOMAK® | 1000m/drum |
| 1005544-010000DX | 24x2x0.5, Symmetrical data cable for industrial control equipment, NOMAK® | 1000m/drum |
| 1005545-010000DX | 48x2x0.5, Symmetrical data cable for industrial control equipment, NOMAK® | 1000m/drum |



Application

These symmetrical data transmission cables are used in control and supervision centre for industrial sites. They are suitable for fixed installation inside housings.

Fire Rating

- Oxygen Index LOI acc. to ASTM-D-2863: no limit
- IEC 60332-1

NOMAK®-E

Symmetrical data cable for industrial control equipment

Construction

| | | |
|---------------------------------|--|-------------|
| Conductor | Stranded tinned copper 7x0,29 mm | |
| Insulation | PVC (Y) | |
| Conductor identification | a-conductor | b-conductor |
| Pair 1 | Blue | Red |
| Pair 2 | Grey | Yellow |
| Pair 3 | Green | Brown |
| Pair 4 | White | Black |
| Stranding | 2 conductors to pair | |
| Stranding to core | (0+4) each 4-pair bundle with numbered | |
| Overall shielding | Laminated AL-foil + tinned copper drain wire 0.5 mm ² | |
| Outer sheath | PVC (Y), grey (RAL 7035) | |
| Outer Diameter | Nom. 7.0(2pair) - 23.5(48pair) mm | |
| Weight | Nom. 55(2pair) - 747(48pair) kg/km | |

Mechanical Properties

| | |
|--------------------------------------|------------------|
| Operating temperature | - 30°C to + 70°C |
| Min. Installation temperature | - 5°C |

Electrical Properties at 20°C

| | |
|---|----------------|
| Loop resistance | 81 Ω/km |
| Insulation resistance (at 500 V, 1 min.) | 100 MΩ*km |
| Capacitance at 800 Hz | 85 nF/km |
| for 2 and 4 pairs | 90 nF/km |
| Max. operating voltage | 75 V |
| Relative velocity factor NVP | 0.60 |
| Impedance (at 10 MHz) | 100 Ω +/- 10 % |

| Frequency [kHz] | Attenuation [dB/100 m] |
|--------------------|---------------------------|
| 9.6 | 0.3 |
| 19.2 | 0.5 |
| 64 | 0.7 |
| 100 | 0.9 |
| 200 | 1.5 |
| 1000 | 2.9 |

Ordering Information

| P/N | Product Description | P.U |
|-----------------|---|------------|
| 1003576 | 2x2x0.5, Symmetrical data cable for industrial control equipment, NOMAK®-E | 1000m/drum |
| 1003577 | 4x2x0.5, Symmetrical data cable for industrial control equipment, NOMAK®-E | 200m/drum |
| 1005546-01000DX | 8x2x0.5, Symmetrical data cable for industrial control equipment, NOMAK®-E | 1000m/drum |
| 1005551-01000DX | 12x2x0.5, Symmetrical data cable for industrial control equipment, NOMAK®-E | 200m/drum |
| 1005547-01000DX | 24x2x0.5, Symmetrical data cable for industrial control equipment, NOMAK®-E | 1000m/drum |
| 1006473-01000DX | 48x2x0.5, Symmetrical data cable for industrial control equipment, NOMAK®-E | 1000m/drum |

LONAK[®] 2 x 1.3 mm²

Building automation cable

1.7 LONAK[®] Industrial Data

Construction

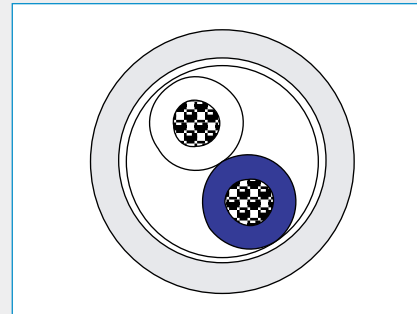
| | |
|---------------------------------|--|
| Conductor | Stranded copper wires, tinned 1.3 mm ² , 7x0.49 mm, Ø 1.47 mm |
| Insulation | PVC, 2.69 mm Ø |
| Conductor identification | 1 x white, 1 x blue |
| Pair stranding | 2 conductors to the pair |
| Cable lay up | 1 pair to the core |
| Wrapping | 1 x PET foil |
| Rip cord | yes |
| Outer sheath | PVC, grey RAL 7035, Ø 7.0 mm |
| Outer Diameter | Nom. 7.0 mm |
| Weight | Nom. 70 kg/km |

Mechanical Properties

| | |
|--|------------------|
| Operating temperature | - 30°C to + 70°C |
| Min. Installation temperature | - 5°C |
| Minimum bending radius | 10 x D |
| Minimum bending radius (during pulling) | 15 x D |
| Maximum pulling force | 130 N |

Electrical Properties at 20°C

| | |
|---|-----------|
| Loop DC resistance (max.) | 28 Ω/km |
| Insulation resistance (at 500 V, 1 min.) | 100 MΩ*km |
| Mutual capacitance at 800 Hz (max.) | 72 nF/km |
| Velocity factor | 0.55 |
| Max. operating voltage DC | 75 V |
| Test voltage conductor/conductor | 3.5 kV |



Application

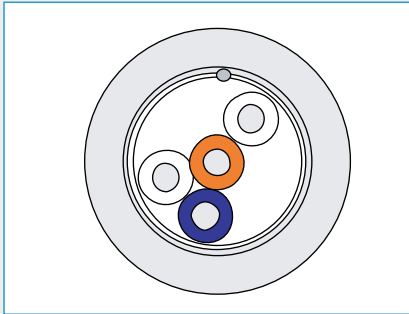
- Fixed indoor installations
- LON cabling
- Building automation

Fire Rating

- IEC 60332-1

Ordering Information

| P/N | Product Description | P.U |
|---------------------------------|---|------------|
| 60013675 (1003578) (L432332) | 2x1.3 mm ² , Building automation cable, LONAK [®] 2 x 1.3 mm ² | 1000m/drum |



Application

- Fixed indoor installations
- LON cabling
- Building automation

Fire Rating

- IEC 60332-1

LONAK® 2x2x0.65

Building automation cable

Construction

| | |
|---|--|
| Conductor | Copper wire, tinned 0.34 mm ² , Ø 0.65 mm |
| Insulation | PE, 1.55 mm Ø |
| Conductor identification | Pair 1: white, blue, Pair 2: white, orange |
| Stranding | 2 conductors to the pair |
| Cable lay up | 2 pairs to the core |
| Wrapping | 1 x PET foil |
| Overall shielding | Laminated AL-foil + copper drain wire |
| Rip cord and identification thread | yes |
| Outer sheath | PVC, grey RAL 7035, Ø 7.1 mm |
| Outer Diameter | Nom. 7.1 mm |
| Weight | Nom. 43 kg/km |

Mechanical Properties

| | |
|--|------------------|
| Operating temperature | - 30°C to + 70°C |
| Min. Installation temperature | - 5°C |
| Minimum bending radius | 10 x D |
| Minimum bending radius (during pulling) | 15 x D |
| Maximum pulling force | 65 N |

Electrical Properties at 20°C

| | |
|---|-----------------|
| Loop DC resistance (max.) | 106 Ω/km |
| Insulation resistance (at 500 V, 1 min.) | 100 MΩ*km |
| Mutual capacitance at 800 Hz (max.) | 49 nF/km |
| Velocity factor | 0.67 |
| Resistance unbalance (max.) | 3 % |
| Capacitance unbalance (max.) | 1600 pF/m |
| Max. operating voltage DC | 75 V |
| Test voltage conductor/conductor | 2 kV DC, 1 min |
| Test voltage conductor/screen | 2 kV DC, 1 min. |

Ordering Information

| P/N | Product Description | P.U |
|---------------------------|---|------------|
| 1003579 CS2638100 L432911 | 2x2x0.65 mm, Building automation cable, LONAK® 2x2x0.65 | 1000m/drum |

LONAK[®] 2x2x0.8

Building automation cable

1.7 LONAK[®] Industrial Data

Construction

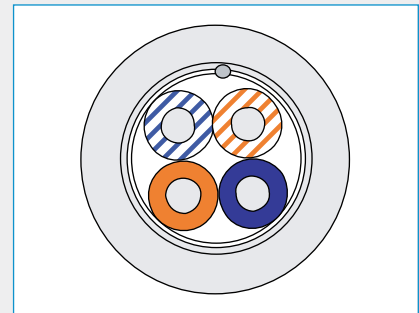
| | |
|---|--|
| Conductor | Copper wire, tinned 0.5 mm ² , Ø 0.80 mm |
| Insulation | PVC, 1.6 mm Ø |
| Conductor identification | Pair 1: white-blue, blue, Pair 2: white-orange, orange |
| Stranding | 4 conductors to the quad |
| Cable lay up | 1 quad to the core |
| Wrapping | 1 x PET foil |
| Overall shielding | Laminated AL-foil + copper drain wire |
| Rip cord and identification thread | yes |
| Outer sheath | PVC, grey RAL 7035, Ø 7.0 mm |
| Outer Diameter | Nom. 7.0 mm |
| Weight | Nom. 54 kg/km |

Mechanical Properties

| | |
|--|---------------------|
| Operating temperature | - 30°C up to + 70°C |
| Min. Installation temperature | - 5°C |
| Minimum bending radius | 10 x D |
| Minimum bending radius (during pulling) | 15 x D |
| Maximum pulling force | 100 N |

Electrical Properties at 20°C

| | |
|---|--------------------|
| Loop DC resistance (max.) | 73 Ω/km |
| Insulation resistance (at 500 V, 1 min.) | 100 MΩ*km |
| Mutual capacitance at 800 Hz (max.) | 98 nF/km |
| Velocity factor | 0.55 |
| Max. operating voltage DC | 75 V |
| Test voltage conductor/conductor | 2.25 kV DC, 1 min. |
| Test voltage conductor/screen | 1.5 kV DC, 1 min. |



Application

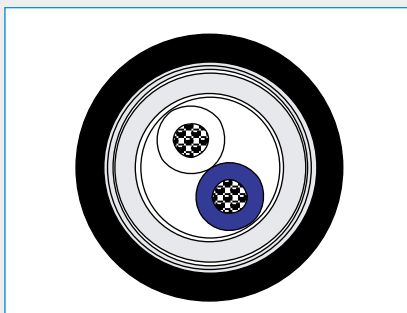
- Fixed indoor installations
- LON cabling
- Building automation

Fire Rating

- IEC 60332-1

Ordering Information

| P/N | Product Description | P.U |
|------------------------------|---|------------|
| 1003580 CS2638200 L432498 | 2x2x0.8 mm, Building automation cable, LONAK [®] 2x2x0.8 | 1000m/drum |



Application

- Fixed indoor installations
- LON cabling
- Building automation

LONAK® 2 x 1.3 mm² ARM

Building automation cable

Construction

| | |
|---|--|
| Conductor | Stranded copper wires, tinned 1.3 mm ² , 7x0.49 mm, Ø 1.47 mm |
| Insulation | PE, 2.69 mm Ø |
| Conductor identification | 1 x white, 1 x blue |
| Pair stranding | 2 conductors to the pair |
| Cable lay up | 1 pair to the core |
| Wrapping | 1 x PET foil |
| Rip cord and identification thread | yes |
| Inner sheath | PVC, grey RAL 7035, Ø 7.0 mm |
| Wrapping | 1 x PET foil |
| Armouring | 2 x galvanized steel tape 15x0.20 mm |
| Outer sheath | PE, black RAL 9005, Ø 10.3 mm |
| Outer Diameter | Nom. 10.3 mm |
| Weight | Nom. 172 kg/km |

Mechanical Properties

| | |
|--|---------------------|
| Operating temperature | - 30°C up to + 70°C |
| Min. Installation temperature | - 5°C |
| Minimum bending radius | 10 x D |
| Minimum bending radius (during pulling) | 15 x D |
| Maximum pulling force | 130 N |

Electrical Properties at 20°C

| | |
|---|-----------|
| Loop DC resistance (max.) | 28 Ω/km |
| Insulation resistance (at 500 V, 1 min.) | 100 MΩ*km |
| Mutual capacitance at 800 Hz (max.) | 72 nF/km |
| Velocity factor | 0.67 |
| Max. operating voltage DC | 75 V |
| Test voltage conductor/conductor | 3.5 kV |

Ordering Information

| P/N | Product Description | P.U |
|---------------------------------|---|------------|
| 60013680 (1003581) (L432494) | 2x1.3 mm ² , Building automation cable, LONAK® 2 x 1.3 mm ² ARM | 1000m/drum |

UMNWW

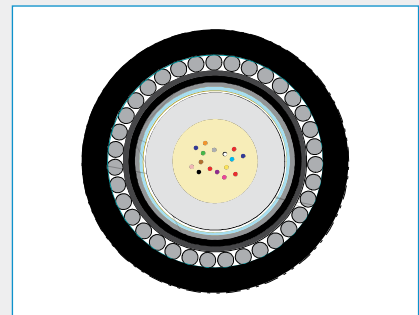
Steel Wire Armoured ALPA™ Uni-tube Optical Cable



1.8 Outside Plant Industrial FO Cables

Features

- **Loose Tube:** The secondary coating consists of a central loose tube made of special thermoplastic plastic. Each fibre in the central tube is uniquely identified by a different colour, for fibre counts above 12 fibres a coloured bundle yarn is used.
- **Cable core:** the cable core is covered with water blocking swellable tape.
- **Moisture Barrier:** The cable is completely covered with an aluminium foil applied longitudinally with an overlap. The aluminium foil is bonded to the inner sheath.
- **1st Inner sheath:** The 1st inner sheath consists of HDPE (high density polyethylene) (Black) compound. (Two ripcords underneath).
- **2nd Inner Sheath:** The 2nd inner sheath consists of PA.
- **Armour:** The armour consists of one layer of galvanized soft steelwires (SWA)
- **Outer sheath:** The cable sheath consists of Flame Retardant PVC compound, resistant to UV, Heat & Oil. (Black)



Technical Data

| No. of Fibres | | 1 - 24 |
|----------------------------|-------|--------|
| Loose Tube- Ø | mm | 3.1 |
| 1st Inner sheath thickness | mm | 1.0 |
| 2nd Inner sheath thickness | mm | 0.5 |
| Dia over 2nd inner sheath | mm | 7.1 |
| Armour SWA thickness | mm | 1.0 |
| Dia over SWA armour | mm | 9.1 |
| Sheath thickness | mm | 1.6 |
| Cable Diameter | mm | 12.3 |
| Cable Weight | kg/km | 280 |

Please refer to our General Installation, Safety & Handling recommendations before handling.

Application

The cable is especially designed for harsh environments. The multi-layer inner sheath system ALPA™: Aluminium/HDPE/PA (nylon) withstands aggressive constituents and fluids that might occur on (petro)chemical plants. (chemical moisture - barrier). The steel wire armour and the PVC outer sheath make the cable suitable for installation under and above ground.

- The ALPA design provides anti-termite protection.
 - The steel wire armour provides rodent protection.
- The outer sheath is of a Flame Retardant, Poly Vinyl Chloride (PVC) compound, resistant to Heat & Oil and UV.

Fire Rating

- IEC 60332-1, IEC 60332-3-24

Main Characteristics

| Test | Standard | Specified value | Acceptance Criteria* |
|-----------------------------------|------------------------|--|--|
| Max. Tension(long term) | IEC 60794-1-2-E1 | 4000N | $\Delta\alpha \leq 0.05$ dB(MM), no fibre strain |
| Max. Tension(short term) | IEC 60794-1-2-E1 | 4800N | $\Delta\alpha \leq 0.05$ dB(MM), no fibre strain |
| Crush | IEC 60794-1-2-E3 | 2500N / 100mm, short term | $\Delta\alpha$ reversible |
| Impact | IEC 60794-1-2-E4 | 20 Nm, R=200mm, 3 impacts | $\Delta\alpha \leq 0.05$ dB(MM), no damage |
| Repeated bending | IEC 60794-1-2-E6 | R= 20 x cable Ø, 100 cycles | $\Delta\alpha \leq 0.05$ dB(MM), no damage |
| Cable bend | IEC 60794-1-2-E11 | R= 15 x cable Ø, 5 turns, 3cycles | $\Delta\alpha \leq 0.05$ dB(MM), no damage |
| Water Penetration | IEC 60794-1-2-F5B | sample=3m, water=1m | No water leakage after 24 hour, up to inner sheath |
| UV resistancy | ISO 4892-2 | | In ISO |
| Heat & Oil resistancy | IEC 60811 | IRM902 ; 4 hrs, 70°C | |
| Flame retardancy | | Reduced flame propagation | In IEC |
| Single cable test | IEC 60332-1 | | |
| Bundle cable test | IEC 60332-3-24 (Cat C) | | |
| Resistance to nitric acid | Draka - Kema | 7 mol/l, 6 weeks | No damage to optical fibers |
| Resistance to hydrocarbon mixture | Draka - Kema | Metyl-etyl-keton, trichloro-ethene, cyclo-hexane, heptane, toluene | No damage to optical fibers |

* values for single-mode fibres, all optical measurements performed at 1550 nm

| Min. bending radius | mm | Without Tension 15 x Cable-Ø | Under Maximum Tension 25 x Cable-Ø |
|---------------------|----|------------------------------|---|
| Temperature range | °C | Installation -10 to +50 | Transport. & Storage -30 to +70 Operation -30 to +70 |

Ordering Information

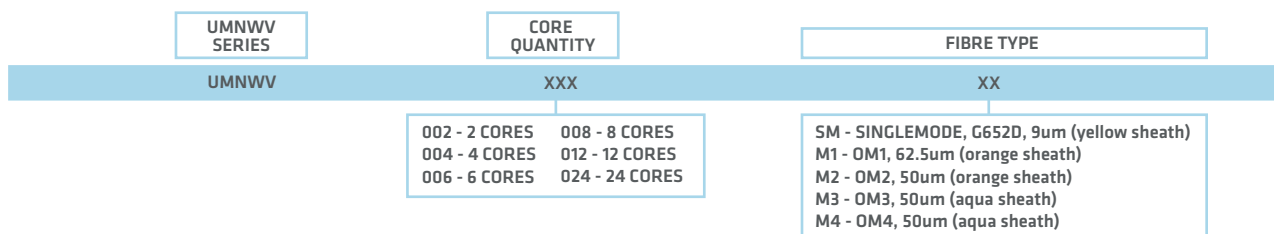
UMNWW SERIES FO Cable part numbers are made up using the table below.

The part number always starts with the letters UMNWW to denote that it is a UMNWW SERIES FO Cable. This is followed by 3 numbers which symbolises the core quantity and then 2 letters to denote the fibre type.

Example of a UMNWW SERIES FO Cable part number:

UMNWW008M1

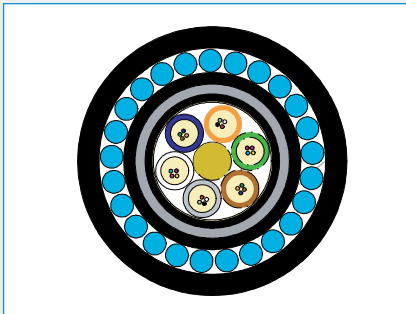
The above example describes an OM1 (62.5um, Orange Sheath) UMNWW SERIES FO Cable, with 8 cores.





SM-LVLVWV

Loose Tube Fibre Optic Cable - Dry Core - Lead Sheath - Steel Wire Armour - FR-PVC Sheaths



Application

This cable is especially designed for harsh environments. The steel wire armour and the PVC outer sheath make the cable suitable for installation under and above ground. Swellable water blocking tape over the stranding and water tightness compound within loose tube provide resilient and robust moisture protection to the fibre. Having an outer PVC sheath over an inner lead sheath make this cable relatively flexible, flame retardant, and resistant to chemical solvent, oil, and abrasion.

Fire Rating

- IEC 60332-1, IEC 60332-3-24

Features

- **Central Strength Member (CSM):** glass fiber reinforced plastic rod (FRP), with plastic oversheathing when needed
- **Loose Tube:** thermoplastic material, containing up to 12 fibers and filled with a suitable water tightness compound
- **Filler Elements:** thermoplastic rods, where needed
- **Stranding:** loose tubes (and fillers), SZ stranded around the CSM
- **Cable core:** swellable water blocking tapes are applied over the stranding
- **1st Inner sheath:** Flame retardant PVC (Black)
- **Lead sheath:** lead compound 0,55% antimony
- **2nd Inner sheath:** Flame retardant PVC (Black)
- **Armour:** one layer of galvanized steel wires
- **Outer sheath:** The outer sheath is of a flame retardant PVC compound

Configuration

| No. of Fibres | 12 | 16 | 24 | 48 | 96 |
|---------------------------------|-------|-------|-------|-------|-----------|
| No: of tubes/ fillers | 2 / 0 | 4 / 0 | 4 / 0 | 4 / 0 | 8 / 0 |
| Loose Tube / Filler - Ø [mm] | 2.1 | 2.1 | 2.1 | 2.4 | 2.4 |
| CSM - Ø [mm] | 2.3 | 2.3 | 2.3 | 2.6 | 2.6 [4.2] |
| 1st Inner sheath [mm] | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lead Sheath [mm] | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lead Weight [kg/km] | 410 | 410 | 410 | 440 | 460 |
| 2nd Inner sheath [mm] | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Armor wire [mm] | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Outer Sheath [mm] | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| Cable Diameter [mm] | 19.6 | 19.6 | 19.6 | 20.5 | 21.9 |
| Cable Weight [kg/km] | 980 | 980 | 980 | 1070 | 1161 |
| Pulling Force Da E 0.05 dB [kN] | 7 | 7 | 7 | 8 | 8 |

Main Mechanical and Environmental Characteristics

| Test | Standard | Specified value | Acceptance Criteria* |
|-------------------------|------------------------|-----------------------------------|---|
| Max. Tension(long term) | IEC 60794-1-2-E1 | See configuration | $\Delta\alpha \leq 0.10$ dB |
| Crush | IEC 60794-1-2-E3 | 4000 N / 100 mm ; reversible | $\Delta\alpha \leq 0.10$ dB |
| Impact | IEC 60794-1-2-E4 | 30 Nm, R= 200 mm, 3 spots | $\Delta\alpha \leq 0.10$ dB |
| Repeated bending | IEC 60794-1-2-E6 | R=20x D, 100 cycle | $\Delta\alpha \leq 0.10$ dB |
| Cable bend | IEC 60794-1-2-E11 | R=15x D | $\Delta\alpha \leq 0.10$ dB |
| Water Penetration | IEC 60794-1-2-F5B | sample=3m, water column=1m | no water leakage in 24h, up to inner sheath |
| Flame retardancy | | Reduced flame propagation, In IEC | In IEC |
| Single cable test | IEC 60332-1 | | |
| Bundle cable test | IEC 60332-3-24 (Cat C) | | |

All optical measurements at 1550 nm.

| | | |
|-------------------|---------------------------|----------------|
| Temperature Range | Transportation & Storage: | - 30 to + 70°C |
| Temperature range | Installation: | - 10 to + 50°C |
| | Operation: | - 30 to + 70°C |

Ordering Information

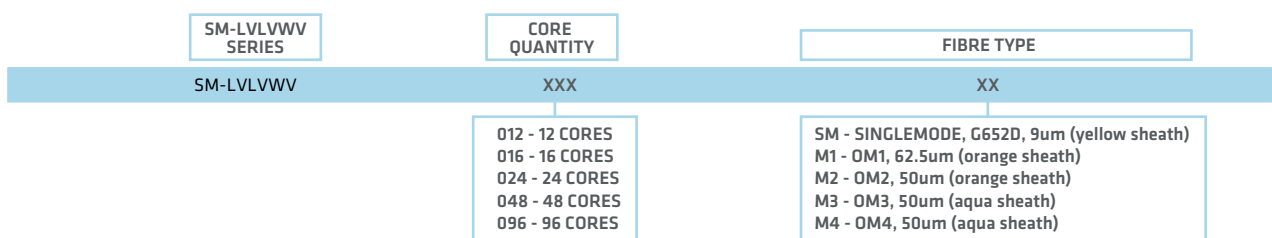
SM-LVLVWV SERIES FO Cable part numbers are made up using the table below.

The part number always starts with the letters SM-LVLVWV to denote that it is a SM-LVLVWV SERIES FO Cable. This is followed by 3 numbers which symbolises the core quantity and then 2 letters to denote the fibre type.

Example of a SM-LVLVWV SERIES FO Cable part number:

SM-LVLVWV012M1

The above example describes an OM1 (62.5um, Orange Sheath) SM-LVLVWV SERIES FO Cable, with 12 cores.



LMNWG

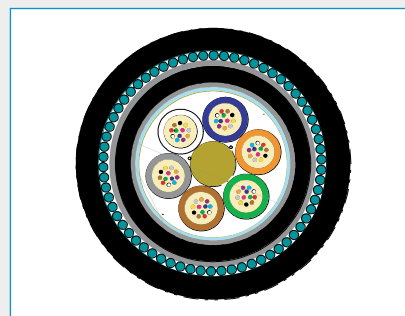
Steel Wire Armoured ALPA™ Optical Cable



1.8 Outside Plant Industrial FO Cables

Features

- **Central Strength Member (CSM):** glass fiber reinforced plastic rod (FRP), with plastic oversheathing when needed.
- **Loose Tube:** The secondary coating consists of a loose tube made of thermoplastic polyester. Each fibre in a tube is uniquely identified by a different colour.
- **Filler Elements:** thermoplastic rods, where needed.
- **Stranding:** loose tubes (and fillers), SZ stranded around the CSM.
- **Cable core:** the cable core is covered with water blocking swellable tape.
- **Aramid yarns:** are applied to give extra tensile performance.
- **Moisture Barrier:** The cable is completely covered with an aluminium foil applied longitudinally with an overlap. The aluminium foil is bonded to the inner sheath.
- **1st Inner sheath:** The 1st inner sheath consists of HDPE (high density polyethylene) (Black) compound. (Two ripcords underneath).
- **2nd Inner Sheath:** The 2nd inner sheath consists of PA (Black)
- **Armour:** The armour consists of one layer of galvanized steel wire (SWA) with a counter spiral binder.
- **Outer sheath:** Flame Retardant Low Smoke, Zero Halogen compound. This compound is UV, Heat & Oil resistant.



Application

The cable is especially designed for harsh environments. The multi-layer inner sheath system ALPA: Aluminium/HDPE/PA (nylon) withstands aggressive constituents and fluids that might occur on (petro)chemical plants. (chemical moisture - barrier). The Steel Wire Armour and FR LSZH sheath make the cable suitable for installation under and above ground.

- The ALPA design provides anti-termite protection.
- The Steel Wire Armour provides rodent protection.

Fire Rating

- IEC 60332-1, IEC 60332-3-22

Technical Data

| No. of Fibres | | 12 | 24 | 48 | 72 | 120 |
|----------------------------|-------|-------|-------|-------|-------|---------|
| Number of tubes / fillers | | 2 / 4 | 4 / 2 | 4 / 2 | 6 / 0 | 10 / 0 |
| Number of fibres per tube | mm | 6 | | 12 | | |
| Loose Tube- Ø | mm | 2.1 | | 2.4 | | |
| Central Strength member | mm | 2.3 | | 2.6 | | 3.0/5.8 |
| 1st Inner sheath thickness | mm | 1.0 | | | | |
| 2nd Inner sheath thickness | mm | 0.5 | | | | |
| Dia over 2nd inner sheath | mm | 10.8 | | 11.7 | | 14.8 |
| Steel Wire thickness | mm | 1.0 | | | | |
| Sheath thickness | mm | 2.0 | | | | |
| Cable Diameter | mm | 16.8 | | 17.7 | | 20.8 |
| Cable Weight | kg/km | 465 | | 510 | | 665 |

Please refer to our General Installation, Safety & Handling recommendations before handling.

Main Characteristics

| Test | Standard | Specified value | Acceptance Criteria* |
|-----------------------------------|--------------------------|---|--|
| Max. Tension | IEC 60794-1-2-E1 | 7000 N | $\Delta\alpha \leq 0.05$ dB(MM), no fibre strain |
| Crush | IEC 60794-1-2-E3 | 4000N / 100mm, short term | $\Delta\alpha$ reversible |
| Impact | IEC 60794-1-2-E4 | 30 Nm, R=200mm, 3 impacts | $\Delta\alpha \leq 0.10$ dB(MM), no damage |
| Repeated bending | IEC 60794-1-2-E6 | R= 20 x cable Ø, 100 cycles | $\Delta\alpha \leq 0.10$ dB(MM), no damage |
| Cable bend | IEC 60794-1-2-E11 | R= 15 x cable Ø, 5 turns, 3cycles | $\Delta\alpha \leq 0.10$ dB(MM), no damage |
| Torsion | IEC 60794-1-2-E7 | $\pm 180^\circ$, L=1m, 10 cycles | No damage |
| Water Penetration | IEC 60794-1-2-F5B | sample=3m, water=1m | No water leakage after 24 hour, up to inner sheath |
| UV resistancy | ISO 4892-2 | - | In ISO |
| Halogen free | IEC 60754-1 IEC 60811 | Amount of halogen acid pH value | In IEC |
| Heat & Oil resistancy | - | IRM902 ; 4 hrs, 70°C | In IEC |
| Flame retardancy | | Reduced flame propagation | |
| Single cable test | IEC 60332-1 | | |
| Bundle cable test | IEC 60332-3-22 (Cat A) | | |
| Resistance to nitric acid | Draka - Kema | 7 mol/l, 6 weeks | No damage to optical fibers |
| Resistance to hydrocarbon mixture | Draka - Kema | Metyl-etyl-ke-ton, trichloro-ethene, cyclo-hexane, heptane, toluene | No damage to optical fibers |

* values for single-mode fibres, all optical measurements performed at 1550 nm

| Min. bending radius | mm | Without Tension 15 x Cable-Ø | Under Maximum Tension 25 x Cable-Ø |
|---------------------|----|------------------------------|---|
| Temperature range | °C | Installation -10 to +70 | Transport. & Storage -40 to +70 Operation -40 to +70 |

Ordering Information

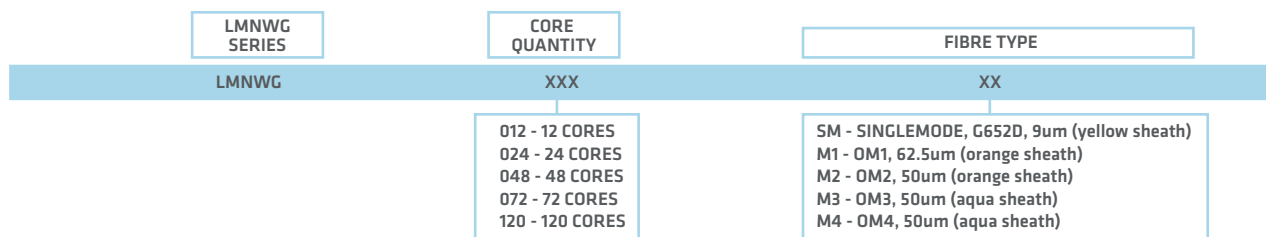
LMNWG SERIES FO Cable part numbers are made up using the table below.

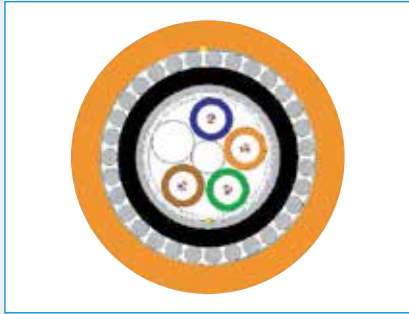
The part number always starts with the letters LMNWG to denote that it is a LMNWG SERIES FO Cable. This is followed by 3 numbers which symbolises the core quantity and then 2 letters to denote the fibre type.

Example of a LMNWG SERIES FO Cable part number:

LMNWG024M1

The above example describes an OM1 (62.5um, Orange Sheath) LMNWG SERIES FO Cable, with 24 cores.





Application

This cable is especially designed for harsh environments. The steel wire armour and the flame retardant zero halogen outer sheath make the cable suitable for installation under and above ground. Its UV stabilized low smoke zero halogen double sheath makes this cable flame retardant and relatively resistant to UV, oil, water and nuclear radiation. This dry core cable employs dual-side copolymer coated aluminum tape and water tightness compound within loose tube to provide resilient and robust moisture protection to the fibre.

Fire Rating

- IEC 60332-1, IEC 60332-24, IEC 61034-2, IEC 60754-1/2

TF10020

Dry Core, Aluminium Tape Screened, Steel Wire Armoured, LSZH Double Sheathed, Fibre Optic Cable



Features

- **Central strength member (CSM):** glass fibre reinforced plastic material, LSZH covered if needed.
- **Tube:** thermoplastic material, containing up to 12 single mode optical fibres and filled with a suitable water tightness compound.
- **Stranding:** The required numbers of elements (tubes or fillers) are SZ stranded around the central strength member.
- **Longitudinal Water Tightness:** dry core
- **Peripheral reinforcement:** glass yarns.
- **Moisture barrier:** both sides copolymer coated aluminiumtape. (Nomaluminium thickness 0.15mm, one rip cord beneath the tape)
- **Inner sheath:** LSZH according to EN 50290-2-27, UV stabilised (Nom thickness: 0.9mm, oxygen index \geq %25).
- **Armour :** Galvanized steel wire (Nom wire diameter : 0.9 mm, one layer helically polyester tape will applied over the armour)
- **Outer Sheath:** LSZH according to EN 50290-2-27, UV stabilised (one rip cord beneath the sheath, oxygen index \geq %25)

Technical Data

| No. of Fibres | | 12 | 24 | 48 | 120 |
|---------------------------------|-------|---------------------------------|----------------------------------|---------------------------------------|---------|
| Design | | 2x6E+3Fillers | 4x6E+1Filler | 4x12E+1Filler | 10x12E |
| Loose Tube / Filler - Ø | mm | 2.0 | 2.0 | 2.3 | 2.3 |
| CSM/Covered | mm | 1.5 | 1.5 | 1.8 | 3.0/5.5 |
| Sheath thickness-nom | mm | 1.5 | 1.5 | 1.5 | 1.5 |
| Cable Diameter | mm | 14.0 | 14.0 | 14.9 | 19.0 |
| Cable Weight | kg/km | 321 | 321 | 357 | 544 |
| Max installation tension | N | 6000 Nt | | | |
| Min. bending radius | mm | Without Tension 15 x Cable-Ø | | Under Maximum Tension 20 x Cable-Ø | |
| Temperature range | °C | Installation -10->+60; | Transport & Storage -40->+70; | Operation -20->+70; | |

Please refer to our General Installation, Safety & Handling recommendations before handling.

Main Characteristics

| Test | Standard | Value | Sanction* |
|---|-------------------|---------------------------------|--|
| Maximum Tension at installation (short term) | IEC 60794-1-2-E1 | 6000 Nt | Δ l/l fibre \leq 0.33%, $\Delta\alpha$ reversible |
| Tension opération max | IEC 60794-1-2-E1 | 2000 Nt | no fiber strain(\leq 0.05), $\Delta\alpha \leq$ 0.05 dB |
| Crush | IEC 60794-1-2-E3 | 2500 N / 100mm, max. 5 min | $\Delta\alpha$ reversible, after test |
| Impact | IEC 60794-1-2-E4 | 10 Nm, 3 impacts, r=300mm | $\Delta\alpha \leq$ 0.05 dB (after the test) |
| Repeated bending | IEC 60794-1-2-E6 | R= 20 x cable Ø, 100N, 5 cycles | $\Delta\alpha \leq$ 0.05 dB (after the test) |
| Cable bend | IEC 60794-1-2-E11 | R = 15 x cable Ø | $\Delta\alpha \leq$ 0.05 dB (after the test) |
| Temperature range | IEC 60794-1-2-F1 | -30 -> +60°C | $\Delta\alpha \leq$ 0.05 dB /km |
| Water Penetration | IEC 60794-1-2-F5B | sample=3m, water=1m | No water leakage after 24 hour (up to inner sheath) |

* values for single-mode fibres, all optical measurements performed at 1550 nm

Ordering Information

TF10020 SERIES FO Cable part numbers are made up using the table below.

The part number always starts with the letters TF10020 to denote that it is a TF10020 SERIES FO Cable. This is followed by 3 numbers which symbolises the core quantity and then 2 letters to denote the fibre type.

Example of a TF10020 SERIES FO Cable part number:

TF10020048M1

The above example describes an OM1 (62.5um, Orange Sheath) TF10020 SERIES FO Cable, with 48 cores.

| TF10020 SERIES | CORE QUANTITY | FIBRE TYPE |
|----------------|---|---|
| TF10020 | XXX | XX |
| | 012 - 12 CORES 024 - 24 CORES 048 - 48 CORES 120 - 120 CORES | SM - SINGLEMODE, G652D, 9um (yellow sheath) M1 - OM1, 62.5um (orange sheath) M2 - OM2, 50um (orange sheath) M3 - OM3, 50um (aqua sheath) M4 - OM4, 50um (aqua sheath) |

2~36 Core I10AW Fire Resistant Cable, APL Moisture Barrier, Steel Wire Armored, LSZH

1.8 Outside Plant Industrial FO Cables

Features

- **Central Strength Member (CSM):** glass fibre reinforced plastic material (FRP)
- **Tube:** thermoplastic material, containing up to 6 optical fibres and filled with a suitable water tightness compound
- **Stranding:** the required number of elements (tubes or fillers) are SZ stranded around the central strength member
- **Core Wrapping:** Water blocking tape (dry core)
- **Fire resistance layer:** Mica tape
- **Moisture barrier:** Aluminum tape
- **Inner Sheath:** White Ceramic LSZH insulation oxygen material
- **Armour:** Galvanized steel wire, comply with BS5467
- **Binder tape:** Water blocking tape
- **Fire resistance layer:** Ceramic tape
- **Outer Sheath:** LSZH



Application

Suitable for critical system installation requiring circuit integrity in the event of FIRE. Comply with IEC60331-25(90 minutes 750°C) & BS6387(180 minutes 950°C), IEC 60332-1-2, IEC 60332-3-24, IEC 61034-2, IEC 60754-1&2, ISO 4589-2&3, Anti Rodent and UL1581 UV

Technical Data

| No. of Fibres | | 2, 4, 8, 16 | 6, 12, 24 | 36 |
|---------------------------|-------|---------------------------------|---------------------------------------|-------------------------|
| Number of fibres per tube | | 6 x 4 | 6 x 6 | 6 x 6 |
| Loose Tube / Filler - Ø | mm | | 2.1 nominal | |
| CSM/sheath diameter | mm | | 2.3 nominal | |
| Inner sheath thickness | mm | | 1.7 nominal | |
| Outer sheath thickness | mm | | 1.8 nominal | |
| Cable Diameter | mm | | 19.4 nominal | |
| Cable Weight | kg/km | | 680 | |
| Min. bending radius | mm | Without Tension 15 x Cable-Ø | Under Maximum Tension 25 x Cable-Ø | |
| Temperature range | °C | Installation -10 -> +50; | Transport. & Storage -40 -> +70 ; | Operation -40 -> +70 |

Please refer to our General Installation, Safety & Handling recommendations before handling.

Main Characteristics

| Test | Standard | Specified value | Sanction* |
|---------------------------|-------------------|---------------------|---------------------------------------|
| Max. installation tension | IEC 60794-1-2-E1 | 5000N | fibre strain ≤ 0.33%, Δα ≤ reversible |
| Crush(short term) | IEC 60794-1-2-E3 | 4000 N / 100mm | Δα ≤ 0.1 dB(SM), 0.3 dB(MM) |
| Temperature range | IEC 60794-1-2-F1 | -40 -> +70°C | Δα ≤ 0.1 dB/km, 0.3 dB/km(MM) |
| Water Penetration | IEC 60794-1-2-F5B | sample=3m, water=1m | No water leakage after 24 hour |

* values for single-mode fibres, all optical measurements performed at 1550 nm.

* values for multi-mode fibres, all optical measurements performed at 1300 nm.

Ordering Information

UC^{FIBRE™} I10AW SERIES FO Cable part numbers are made up using the table below.

The part number always starts with the letters i10AW to denote that it is a UC FIBRE® I10AW SERIES FO Cable. This is followed by 3 numbers which symbolises the core quantity and then 2 letters to denote the fibre type.

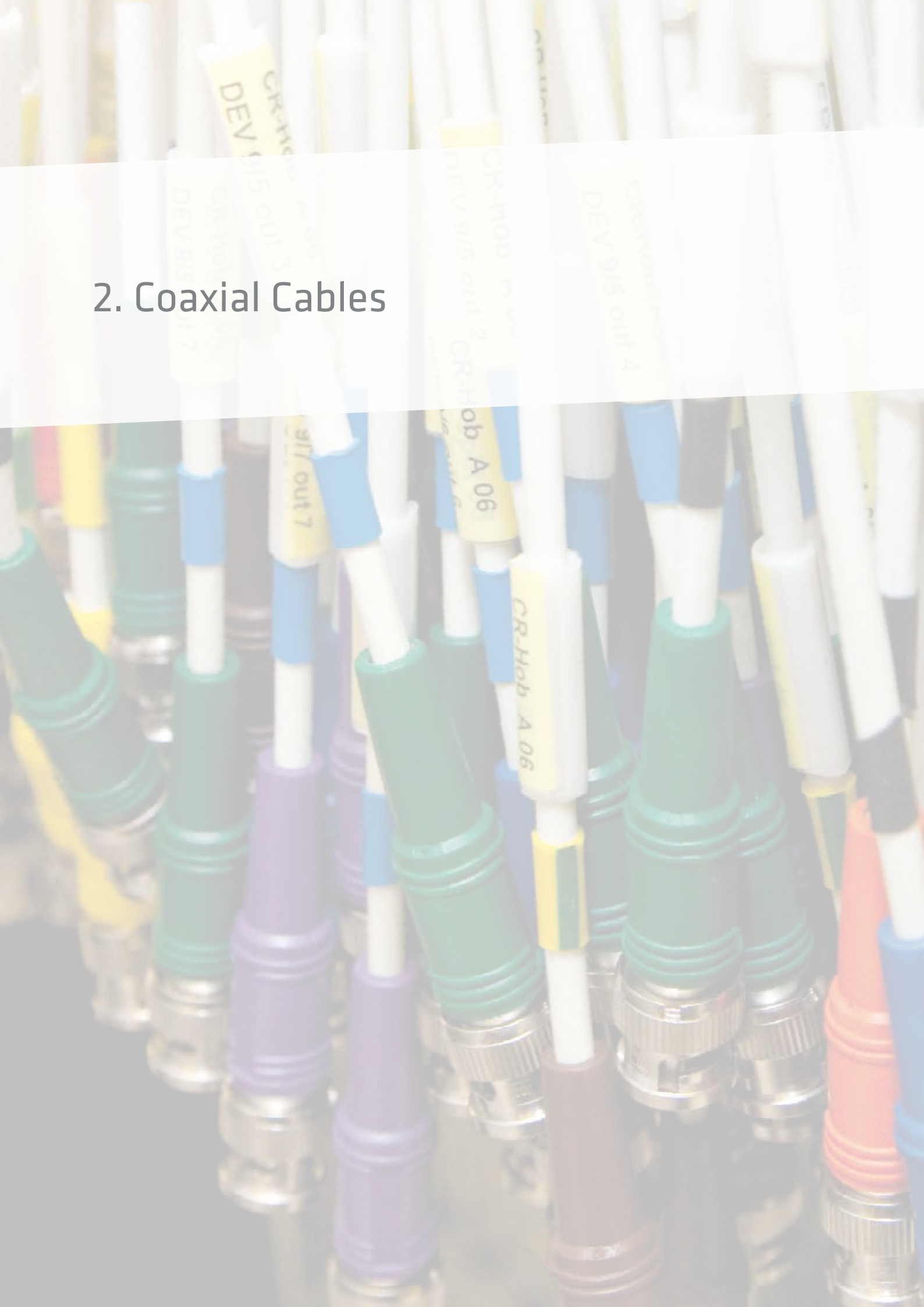
Example of a UC FIBRE® I10AW SERIES FO Cable part number:

I10AW008SM

The above example describes a singlemode (G652D, 9um, Black Sheath) UC FIBRE® I10AW SERIES FO Cable, with 8 cores.

| I10AW SERIES | CORE QUANTITY | FIBRE TYPE |
|--------------|--|--|
| I10AW | XX | XX |
| | 002 - 2 CORES 004 - 4 CORES 006 - 6 CORES 008 - 8 CORES | 012 - 12 CORES 024 - 24 CORES 036 - 36 CORES |
| | | SM - SINGLEMODE, G652D, 9um (black sheath) M1 - OM1, 62.5um (black sheath) M2 - OM2, 50um (black sheath) M3 - OM3, 50um (black sheath) M4 - OM4, 50um (black sheath) |

2. Coaxial Cables



2. Coaxial Cables

| | |
|--|----|
| 50 Ohm Coaxial Cable, RG58, STC, 95% TCB | 60 |
| 75 Ohm Coaxial Cable, RG59, CCS, APA, 65% ALB | 60 |
| 75 Ohm Coaxial Cable, RG 59, CCS, Quad Shield 60%/40% ALB | 61 |
| 75 Ohm Coaxial Cable, RG59, BC, 95% BCB | 61 |
| 75 Ohm Coaxial Cable, RG6, CCS, APA, 60% ALB | 62 |
| 75 Ohm Coaxial Drop Cable, RG6, CCS, APA, 60% ALB | 62 |
| 75 Ohm Coaxial Cable, RG6, CCS, APA, 90% ALB | 63 |
| 75 Ohm Coaxial Cable, RG6, CCS, APA, 60% ALB, APA, 40% ALB | 63 |
| 75 Ohm Coaxial Cable, RG6, BC, 60% TCB | 64 |
| 75 Ohm Coaxial Cable, RG6 BC, APA, 95% TCB | 64 |
| 75 Ohm Coaxial Cable, RG11, CCS, APA, 60% ALB | 65 |
| 75 Ohm Coaxial Drop Cable, RG11, CCS, APA, 60% ALB | 65 |
| 75 Ohm Coaxial Cable, RG11 BC, 95% BCB | 66 |
| 75 Ohm Coaxial Cable, RG11 BC, APA, 95% BCB | 66 |
| 50 Ohm Coaxial Cable, RG213 BC, 95% BCB | 67 |
| 50 Ohm Coaxial Cable, RG214 Stranded BC, 94% 97% SCB | 67 |
| Firetuf™ DATA Coaxial | 68 |

Application

Any device that functions as a transmitter or transceiver tends to use 50 Ohm Coaxial Cable. Widely used for radiocommunication and amateur radio, thin Ethernet (10BASE2) and Nuclear Instrumentation Module electronics.

Suitable for high EMI environments.

Fire Rating

- IEC 60332-1, IEC 61034-2, IEC 60754-1/2, MIL-C17

50 Ohm Coaxial Cable, RG58, STC, 95% TCB

Construction

| Material | Detail | mm |
|-------------------------|---|-----------|
| Inner Conductor | Stranded Tin Copper (19*32) | 0.94 |
| Dielectric | Solid PE | 2.90 |
| First Shield | 36 AWG Tinned Copper Braid (TCB) 95% coverage | N.A |
| Jacket | PVC / LSZH | 4.93 |
| Fire Performance | IEC 60332-1 | N.A |
| Bending Radius | | 10 x O.D. |

Electrical Characteristics

| | |
|---------------------------------------|--------------------------|
| Impedance, Ω | 50 \pm 3.0 Ohm |
| Capacitance, Nominal | 87 \pm 3 pF/m |
| Velocity of Propagation, % | > 73 % |
| Return Loss | 5 - 1000 MHz \geq 20dB |

Ordering Information

| P/N | Product Description | P.U |
|--------|---|-----------|
| RG8156 | RG58, Stranded TC, 95% Tin Copper Braid, PVC, 50 Ohm | 500m/reel |
| RG8756 | RG58, Stranded TC, 95% Tin Copper Braid, PVC CM, 50 Ohm | 500m/reel |
| RG8256 | RG58, Stranded TC, 95% Tin Copper Braid, LSZH, 50 Ohm | 500m/reel |

75 Ohm Coaxial Cable, RG59, CCS, APA, 65% ALB

Construction

| Material | Detail | mm |
|-------------------------|--|-----------|
| Inner Conductor | Copper Clad Steel (CCS) | 0.81 |
| Dielectric | Foam PE | 3.66 |
| First Shield | Aluminum/Polymer/Aluminum (APA) Bonded | N.A |
| Second Shield | 36 AWG Aluminum Braid (ALB) 65% coverage | N.A |
| Jacket | PVC / PVC CM / LSZH | 6.00 |
| Fire Performance | IEC 60332-1 | N.A |
| Bending Radius | | 10 x O.D. |

Electrical Characteristics

| | |
|---------------------------------------|---|
| Impedance, Ω | 75 \pm 3.0 Ohm |
| Capacitance, Nominal | 52 \pm 3 pF/m |
| Velocity of Propagation, % | > 83% |
| Return Loss | 5 - 1000 MHz \geq 20dB 1000 - 3000 MHz \geq 20dB |

Ordering Information

| P/N | Product Description | P.U |
|--------|---|-----------|
| RG9175 | RG59, CCS, 65% Aluminum Braid, PVC, 75 Ohm | 500m/reel |
| RG9775 | RG59, CCS, 65% Aluminum Braid, PVC CM, 75 Ohm | 500m/reel |
| RG9275 | RG59, CCS, 65% Aluminum Braid, LSZH, 75 Ohm | 500m/reel |

Application

RG59 75 Ohm coaxial is used to carry baseband video in closed-circuit television. expect to get a distance of about 225m - 305m.

Suitable for CATV applications.

Fire Rating

- IEC 60332-1

75 Ohm Coaxial Cable, RG59, CCS, APA, 60% ALB, APA, 40% ALB

Construction

| Material | Detail | mm |
|------------------|--|-----------|
| Inner Conductor | Copper Clad Steel (CCS) | 0.81 |
| Dielectric | Foam PE | 3.66 |
| First Shield | Aluminum/Polymer/Aluminum (APA) Bonded | N.A |
| Second Shield | 36 AWG Aluminum Braid (ALB) 60% coverage | N.A |
| Third shield | Aluminum/Polymer/Aluminum (APA) | N.A |
| Quad Shield | 36 AWG Aluminum Braid 40% coverage | N.A |
| Jacket | PVC CMR / LSZH | 6.60 |
| Fire Performance | IEC 60332-1 | N.A |
| Bending Radius | | 10 x O.D. |

Electrical Characteristics

| | |
|----------------------------|---|
| Impedance, Ω | 75 \pm 3.0 Ohm |
| Capacitance, Nominal | 52 \pm 3 pF/m |
| Velocity of Propagation, % | > 83 % |
| Return Loss | 5 - 1000 MHz \geq 20dB 1000 - 3000 MHz \geq 20dB |

Ordering Information

| P/N | Product Description | P.U |
|--------|---|-----------|
| RG9570 | RG59, CCS, 60% Aluminum Braid, APA, 40% Aluminum Braid, PVC CMR, 75 Ohm | 500m/reel |
| RG9270 | RG59, CCS, 60% Aluminum Braid, APA, 40% Aluminum Braid, LSZH, 75 Ohm | 500m/reel |

Application

RG59 75 Ohm coaxial is used to carry baseband video in closed-circuit television. Expect to get a distance of about 225m - 305m. Steel wire braid provides outdoor protection against harsh handling.

Fire Rating

- IEC 60332-1, IEC 61034-2, IEC 60754-1/2, IEC 60332-3C(SWB)

75 Ohm Coaxial Cable, RG59, BC, 95% BCB

Construction

| Material | Detail | mm |
|------------------|---|-----------|
| Inner Conductor | Bare Copper (BC) | 0.81 |
| Dielectric | Foam PE | 3.66 |
| First Shield | 36 AWG Bare Copper Braid (BCB) 95% coverage | N.A |
| Jacket | PVC / PVC CM / LSZH | 6.00 |
| Fire Performance | IEC 60332-1 | N.A |
| Bending Radius | | 10 x O.D. |

Electrical Characteristics

| | |
|----------------------------|--------------------------|
| Impedance, Ω | 75 \pm 3.0 Ohm |
| Capacitance, Nominal | 52 \pm 3 pF/m |
| Velocity of Propagation, % | > 83 % |
| Return Loss | 5 - 1000 MHz \geq 20dB |

Ordering Information

| P/N | Product Description | P.U |
|--------|---|-----------|
| RG9171 | RG59, BC, 95% Bare Copper Braid, PVC, 75 Ohm | 500m/reel |
| RG9771 | RG59, BC, 95% Bare Copper Braid, PVC CM, 75 Ohm | 500m/reel |
| RG9271 | RG59, BC, 95% Bare Copper Braid, LSZH, 75 Ohm | 500m/reel |

Application

RG59 75 Ohm coaxial is used to carry baseband video in closed-circuit television. expect to get a distance of about 225m - 305m.

Fire Rating

- IEC 60332-1

75 Ohm Coaxial Cable, RG6, CCS, APA, 60% ALB

Application

RG6 75 Ohm coaxial is used for cable television, satellite television and cable modems. Can expect distances of about 305m - 457m.

Suitable for CATV applications.

Fire Rating

- IEC 60332-1

Construction

| Material | Detail | mm |
|-------------------------|--|-----------|
| Inner Conductor | Copper Clad Steel (CCS) | 1.02 |
| Dielectric | Foam PE | 4.57 |
| First Shield | Aluminum/Polymer/Aluminum (APA) bonded | 4.75 |
| Second Shield | 34 AWG Aluminum Braid (ALB) 60% coverage | N.A |
| Jacket | PVC / PVC CM / LSZH | 6.93 |
| Fire Performance | IEC 60332-1 | N.A |
| Bending Radius | | 10 x O.D. |

Electrical Characteristics

| | |
|---------------------------------------|---|
| Impedance, Ω | 75 \pm 3.0 Ohm |
| Capacitance, Nominal | 52 \pm 3 pF/m |
| Velocity of Propagation, % | > 83 % |
| Return Loss | 5 - 1000 MHz \geq 20dB 1000 - 3000 MHz \geq 20dB |

Ordering Information

| P/N | Product Description | P.U |
|--------|--|-----------|
| RG6176 | RG6, CCS, 60% Aluminum Braid, PVC, 75 Ohm | 500m/reel |
| RG6776 | RG6, CCS, 60% Aluminum Braid, PVC CM, 75 Ohm | 500m/reel |
| RG6276 | RG6, CCS, 60% Aluminum Braid, LSZH, 75 Ohm | 500m/reel |

75 Ohm Coaxial Drop Cable, RG6, CCS, APA, 60% ALB

Application

RG6 75 Ohm coaxial is used for cable television, satellite television and cable modems. Can expect distances of about 305m - 457m.

Suitable for CATV applications.

Fire Rating

- IEC 60332-1

Construction

| Material | Detail | mm |
|-------------------------|--|-----------|
| Inner Conductor | Copper Clad Steel (CCS) | 1.02 |
| Dielectric | Foam PE | 4.57 |
| First Shield | Aluminum/Polymer/Aluminum (APA) bonded | N.A |
| Second Shield | 34 AWG Aluminum Braid (ALB) 60% coverage | N.A |
| Jacket | PVC CMR / LSZH / PE | 6.93 |
| Messenger | 16 AWG Galvanized Steel Wire | N.A |
| Fire Performance | IEC 60332-1 | N.A |
| Bending Radius | | 10 x O.D. |

Electrical Characteristics

| | |
|---------------------------------------|---|
| Impedance, Ω | 75 \pm 3.0 Ohm |
| Capacitance, Nominal | 52 \pm 3 pF/m |
| Velocity of Propagation, % | > 83 % |
| Return Loss | 5 - 1000 MHz \geq 20dB 1000 - 3000 MHz \geq 20dB |

Ordering Information

| P/N | Product Description | P.U |
|---------|--|-----------|
| RG6576M | RG6 Drop, CCS, 60% Aluminum Braid, PVC CMR, 75 Ohm | 500m/reel |
| RG6276M | RG6 Drop, CCS, 60% Aluminum Braid, LSZH, 75 Ohm | 500m/reel |
| RG6676M | RG6 Drop, CCS, 60% Aluminum Braid, PE, 75 Ohm | 500m/reel |

75 Ohm Coaxial Cable, RG6, CCS, APA, 90% ALB

Construction

| Material | Detail | mm |
|------------------|--|-----------|
| Inner Conductor | Copper Clad Steel (CCS) | 1.02 |
| Dielectric | Foam PE | 4.57 |
| First Shield | Aluminum/Polymer/Aluminum (APA) Bonded | 4.75 |
| Second Shield | 34 AWG Aluminum Braid (ALB) 90% coverage | N.A |
| Jacket | PVC / PVC CM / LSZH | 6.93 |
| Fire Performance | IEC 60332-1 | N.A |
| Bending Radius | | 10 x O.D. |

Electrical Characteristics

| | |
|----------------------------|---|
| Impedance, Ω | 75 \pm 3.0 Ohm |
| Capacitance, Nominal | 52 \pm 3 pF/m |
| Velocity of Propagation, % | > 83 % |
| Return Loss | 5 - 1000 MHz \geq 20dB 1000 - 3000 MHz \geq 20dB |

Ordering Information

| P/N | Product Description | P.U |
|--------|--|-----------|
| RG6174 | RG6, CCS, 90% Aluminum Braid, PVC, 75 Ohm | 500m/reel |
| RG6774 | RG6, CCS, 90% Aluminum Braid, PVC CM, 75 Ohm | 500m/reel |
| RG6274 | RG6, CCS, 90% Aluminum Braid, LSZH, 75 Ohm | 500m/reel |

Application

RG6 75 Ohm coaxial is used for cable television, satellite television and cable modems. Can expect distances of about 305m - 457m.

Suitable for CATV applications.

Fire Rating

- IEC 60332-1

75 Ohm Coaxial Cable, RG6, CCS, APA, 60% ALB, APA, 40% ALB

Construction

| Material | Detail | mm |
|------------------|--|-----------|
| Inner Conductor | Copper Clad Steel (CCS) | 1.02 |
| Dielectric | Foam PE | 4.57 |
| First Shield | Aluminum/Polymer/Aluminum (APA) Bonded | N.A |
| Second Shield | 34 AWG Aluminum Braid (ALB) 60% coverage | N.A |
| Third Shield | Aluminum/Polymer/Aluminum (APA) | N.A |
| Fourth Shield | 34AWG Aluminum Braid (ALB) 40% coverage | N.A |
| Jacket | PVC / PVC CM / LSZH | 7.54 |
| Fire Performance | IEC 60332-1 | N.A |
| Bending Radius | | 10 x O.D. |

Electrical Characteristics

| | |
|----------------------------|---|
| Impedance, Ω | 75 \pm 3.0 Ohm |
| Capacitance, Nominal | 52 \pm 3 pF/m |
| Velocity of Propagation, % | > 83% |
| Return Loss | 5 - 1000 MHz \geq 20dB 1000 - 3000 MHz \geq 20dB |

Ordering Information

| P/N | Product Description | P.U |
|--------|---|-----------|
| RG6170 | RG6, CCS, 60% Aluminum Braid, APA, 40% Aluminum Braid, PVC, 75 Ohm | 500m/reel |
| RG6770 | RG6, CCS, 60% Aluminum Braid, APA, 40% Aluminum Braid, PVC CM, 75 Ohm | 500m/reel |
| RG6270 | RG6, CCS, 60% Aluminum Braid, APA, 40% Aluminum Braid, LSZH, 75 Ohm | 500m/reel |

Application

RG6 75 Ohm coaxial is used for cable television, satellite television and cable modems. Can expect distances of about 305m - 457m.

Fire Rating

- IEC 60332-1



Application

RG6 75 Ohm coaxial is used for cable television, satellite television and cable modems. Can expect distances of about 305m - 457m.

Suitable for high EMI environments.

Fire Rating

- IEC 60332-1

75 Ohm Coaxial Cable, RG6, BC, 60% TCB

Construction

| Material | Detail | mm |
|------------------|--|-----------|
| Inner Conductor | Bare Copper (BC) | 1.02 |
| Dielectric | Foam PE | 4.57 |
| First Shield | Aluminum/Polymer/Aluminum (APA) bonded | N.A |
| Second Shield | 36 AWG Tin Copper Braid (TCB) 60% coverage | N.A |
| Jacket | PVC / LSZH | 6.83 |
| Fire Performance | IEC 60332-1 | N.A |
| Bending Radius | | 10 x O.D. |

Electrical Characteristics

| | |
|----------------------------|---|
| Impedance, Ω | 75 \pm 3.0 Ohm |
| Capacitance, Nominal | 52 \pm 3 pF/m |
| Velocity of Propagation, % | > 83 % |
| Return Loss | 5 - 1000 MHz \geq 20dB 1000 - 3000 MHz \geq 20dB |

Ordering Information

| P/N | Product Description | P.U |
|--------|---|-----------|
| RG6179 | RG6, BC. 60% Tin Copper Braid, PVC, 75 Ohm | 500m/reel |
| RG6279 | RG6, BC. 60% Tin Copper Braid, LSZH, 75 Ohm | 500m/reel |



Application

RG6 75 Ohm coaxial is used for cable television, satellite television and cable modems. Can expect distances of about 305m - 457m.

Suitable for high EMI environments.

Fire Rating

- IEC 60332-1

75 Ohm Coaxial Cable, RG6 BC, APA, 95% TCB

Construction

| Material | Detail | mm |
|------------------|--|-----------|
| Inner Conductor | Bare Copper (BC) | 1.02 |
| Dielectric | Foam PE | 4.57 |
| First Shield | Aluminium Polymer Aluminium (APA) Bonded | 4.75 |
| Second Shield | 36 AWG Tin Copper Braid (TCB) 95% coverage | N.A |
| Outer Jacket | PVC / PVC CM / PVC CMR / LSZH / LSFRZH | 6.93 |
| Fire Performance | IEC 60332-1 or IEC 60332-24 (LSFRZH) | N.A |
| Bending Radius | | 10 x O.D. |

Electrical Characteristics

| | |
|----------------------------|---|
| Impedance, Ω | 75 \pm 3.0 Ohm |
| Capacitance, Nominal | 52 \pm 3 pF/m |
| Velocity of Propagation, % | > 83% |
| Return Loss | 5 - 1000 MHz \geq 20dB 1000 - 3000 MHz \geq 20dB |

Ordering Information

| P/N | Product Description | P.U |
|--------|--|-----------|
| RG6178 | RG6, BC. 95% Tin Copper Braid, PVC, 75 Ohm | 500m/reel |
| RG6778 | RG6, BC. 95% Tin Copper Braid, PVC CM, 75 Ohm | 500m/reel |
| RG6578 | RG6, BC. 95% Tin Copper Braid, PVC CMR, 75 Ohm | 500m/reel |
| RG6278 | RG6, BC. 95% Tin Copper Braid, LSZH, 75 Ohm | 500m/reel |
| RG6478 | RG6, BC. 95% Tin Copper Braid, LSFRZH, 75 Ohm | 500m/reel |

75 Ohm Coaxial Cable, RG11, CCS, APA, 60% ALB

Construction

| Material | Detail | mm |
|------------------|--|-----------|
| Inner Conductor | Copper Clad Steel (CCS) | 1.63 |
| Dielectric | Foam PE | 7.11 |
| First Shield | Aluminum/Polymer/Aluminum (APA) bonded | N.A |
| Second Shield | 34 AWG Aluminum Braid (ALB) 60% coverage | N.A |
| Jacket | PVC CMR / LSZH / PE | 10.03 |
| Fire Performance | IEC 60332-1 | N.A |
| Bending Radius | | 10 x O.D. |

Electrical Characteristics

| | |
|----------------------------|---|
| Impedance, Ω | 75 \pm 3.0 Ohm |
| Capacitance, Nominal | 52 \pm 3 pF/m |
| Velocity of Propagation, % | > 83 % |
| Return Loss | 5 - 1000 MHz \geq 20dB 1000 - 3000 MHz \geq 20dB |

Ordering Information

| P/N | Product Description | P.U |
|--------|--|-----------|
| RG1576 | RG11, CCS, 60% Aluminum Braid, PVC CMR, 75 Ohm | 500m/reel |
| RG1276 | RG11, CCS, 60% Aluminum Braid, LSZH, 75 Ohm | 500m/reel |
| RG1676 | RG11, CCS, 60% Aluminum Braid, PE, 75 Ohm | 500m/reel |

Application

RG11 75 Ohm coaxial is ideal if the device being connected is a receiver of some kind. This includes devices such as Satellite and Cable TV Receiver Boxes. Can expect distances of up to 610m.

Suitable for CATV applications.

Fire Rating

- IEC 60332-1, IEC 61034-2, IEC 60754-1/2

75 Ohm Coaxial Drop Cable, RG11, CCS, APA, 60% ALB

Construction

| Material | Detail | mm |
|------------------|--|-----------|
| Inner Conductor | Copper Clad Steel (CCS) | 1.63 |
| Dielectric | Foam PE | 7.11 |
| First Shield | Aluminum/Polymer/Aluminum (APA) Bonded | N.A |
| Second Shield | 34 AWG Aluminum Braid (ALB) 60% coverage | N.A |
| Jacket | PVC CMR / LSZH / PE | 10.03 |
| Messenger | 13 AWG Galvanized Steel Wire | 1.80 |
| Fire Performance | IEC 60332-1 | N.A |
| Bending Radius | | 10 x O.D. |

Electrical Characteristics

| | |
|----------------------------|---|
| Impedance, Ω | 75 \pm 3.0 Ohm |
| Capacitance, Nominal | 52 \pm 3 pF/m |
| Velocity of Propagation, % | > 83 % |
| Return Loss | 5 - 1000 MHz \geq 20dB 1000 - 3000 MHz \geq 20dB |

Ordering Information

| P/N | Product Description | P.U |
|---------|--|-----------|
| RG1576M | RG11, Drop, CCS, 60% Aluminum Braid, PVC CMR, 75 Ohm | 500m/reel |
| RG1276M | RG11, Drop, CCS, 60% Aluminum Braid, LSZH, 75 Ohm | 500m/reel |
| RG1676M | RG11, Drop, CCS, 60% Aluminum Braid, PE, 75 Ohm | 500m/reel |

Application

RG11 75 Ohm coaxial is ideal if the device being connected is a receiver of some kind. This includes devices such as Satellite and Cable TV Receiver Boxes. Can expect distances of up to 610m.

Suitable for CATV applications.

Fire Rating

- IEC 60332-1, IEC 61034-2, IEC 60754-1/2



Application

RG11 75 Ohm coaxial is ideal if the device being connected is a receiver of some kind. This includes devices such as Satellite and Cable TV Receiver Boxes. Can expect distances of up to 610m.

Suitable for high EMI environments.

Fire Rating

- IEC 60332-1, IEC 61034-2, IEC 60754-1/2

75 Ohm Coaxial Cable, RG11 BC, 95% BCB

Construction

| Material | Detail | mm |
|------------------|---|-----------|
| Inner Conductor | Bare Copper (BC) | 1.63 |
| Dielectric | Foam PE | 7.11 |
| First Shield | 34 AWG Bare Copper Braid (BCB) 95% coverage | N.A |
| Jacket | PVC / PVC CM / LSZH | 10.03 |
| Fire Performance | IEC 60332-1 | N.A |
| Bending Radius | | 10 x O.D. |

Electrical Characteristics

| | |
|----------------------------|--------------------------|
| Impedance, Ω | 75 \pm 3.0 Ohm |
| Capacitance, Nominal | 52 \pm 3 pF/m |
| Velocity of Propagation, % | > 83% |
| Return Loss | 5 - 1000 MHz \geq 20dB |

Ordering Information

| P/N | Product Description | P.U |
|--------|---|-----------|
| RG1171 | RG11, BC. 95% Bare Copper Braid, PVC, 75 Ohm | 500m/reel |
| RG1771 | RG11, BC. 95% Bare Copper Braid, PVC CM, 75 Ohm | 500m/reel |
| RG1271 | RG11, BC. 95% Bare Copper Braid, LSZH, 75 Ohm | 500m/reel |



Application

RG11 75 Ohm coaxial is ideal if the device being connected is a receiver of some kind. This includes devices such as Satellite and Cable TV Receiver Boxes. Can expect distances of up to 610m.

Suitable for high EMI environments.

Fire Rating

- IEC 60332-1, IEC 61034-2, IEC 60754-1/2

75 Ohm Coaxial Cable, RG11 BC, APA, 95% BCB

Construction

| Material | Detail | mm |
|------------------|---|-----------|
| Inner Conductor | Bare Copper (BC) | 0.94 |
| Dielectric | Foam PE | 2.90 |
| First Shield | Aluminium/Polymer/Aluminium (APA) Bonded | N.A |
| Second Shield | 34 AWG Bare Copper Braid (BCB) 95% coverage | N.A |
| Jacket | PVC CMR / LSZH / LSFZRH | 4.93 |
| Fire Performance | IEC 60332-1 or IEC 60332-24 (LSFRZH) | N.A |
| Bending Radius | | 10 x O.D. |

Electrical Characteristics

| | |
|----------------------------|---|
| Impedance, Ω | 75 \pm 3.0 Ohm |
| Capacitance, Nominal | 52 \pm 3 pF/m |
| Velocity of Propagation, % | > 83 % |
| Return Loss | 5 - 1000 MHz \geq 20dB 1000 - 3000 MHz \geq 20dB |

Ordering Information

| P/N | Product Description | P.U |
|--------|---|-----------|
| RG157C | RG11, BC. APA, 95% Bare Copper Braid, PVC CMR, 75 Ohm | 500m/reel |
| RG127C | RG11, BC. APA, 95% Bare Copper Braid, LSZH, 75 Ohm | 500m/reel |
| RG147C | RG11, BC. APA, 95% Bare Copper Braid, LSFZRH, 75 Ohm | 500m/reel |

50 Ohm Coaxial Cable, RG213 BC, 95% BCB

Construction

| Material | Detail | mm |
|------------------|---|-----------|
| Inner Conductor | Stranded Bare Copper (SBC) | 7 x 0.75 |
| Dielectric | Solid PE | 7.25 |
| First Shield | 34 AWG Bare Copper Braid (BCB) 95% coverage | N.A |
| Jacket | PVC / PVC CM / LSZH | 10.03 |
| Fire Performance | IEC 60332-1 | N.A |
| Bending Radius | | 10 x O.D. |

Electrical Characteristics

| | |
|--------------------------------|------------------|
| Impedance, Ω | 50 \pm 3.0 Ohm |
| Capacitance, Nominal | 100 \pm 3 pF/m |
| Velocity of Propagation, % | > 66 % |
| Maximum Operating Voltage VRMS | 3.7 kV |
| Spark Test | 5.0 kV |

Ordering Information

| P/N | Product Description | P.U |
|--------|--|-----------|
| RG3151 | RG213, BC, 95% Bare Copper Braid, PVC, 50 Ohm | 500m/reel |
| RG3751 | RG213, BC, 95% Bare Copper Braid, PVC CM, 50 Ohm | 500m/reel |
| RG3251 | RG213, BC, 95% Bare Copper Braid, LSZH, 50 Ohm | 500m/reel |



Application

Any device that functions as a transmitter or transceiver tends to use 50 Ohm Coaxial Cable (e.g. radiocommunication and amateur radio, EMC test antenna cables). Typically lower loss than RG58.

Suitable for high EMI environments.

Fire Rating

- IEC 60332-1

50 Ohm Coaxial Cable, RG214 Stranded BC, 94% 97% SCB

Construction

| Material | Detail | mm |
|------------------|--|-----------|
| Inner Conductor | Stranded Silver-plated Copper | 7 x 0.75 |
| Dielectric | Solid PE | 7.25 |
| First Shield | 34 AWG Silver-plated Copper Braid (SCB) 94% coverage | N.A |
| Second Shield | 34 AWG Silver-plated Copper Braid (SCB) 97% coverage | N.A |
| Jacket | PVC / LSZH | 10.80 |
| Fire Performance | IEC 60332-1 | N.A |
| Bending Radius | | 10 x O.D. |

Electrical Characteristics

| | |
|--------------------------------|------------------|
| Impedance, Ω | 50 \pm 3.0 Ohm |
| Capacitance, Nominal | 101 \pm 3 pF/m |
| Velocity of Propagation, % | > 66 % |
| Maximum Operating Voltage VRMS | 3.7 kV |
| Spark Test | 5.0 kV |

Ordering Information

| P/N | Product Description | P.U |
|--------|---|-----------|
| RG4157 | RG214, Stranded BC, 94%/97% Silver Copper Braid, PVC, 50 Ohm | 500m/reel |
| RG4257 | RG214, Stranded BC, 94%/97% Silver Copper Braid, LSZH, 50 Ohm | 500m/reel |



Application

Any device that functions as a transmitter or transceiver tends to use 50 Ohm Coaxial Cable. Widely used for industrial and commercial two-way radio frequency applications (including radio, and telecommunications). Used for high-frequency signal transmission.

Suitable for high EMI environments.

Fire Rating

- IEC 60332-1, IEC 61034-2, IEC 60754-1/2



Application

Firetuf™ Data Coax (FDZ_6CU7SS) is designed for sending high frequency or high data rates. The FDZ_6CU7SS is capable of withstanding the Fire Test that are currently used to indicate whether a power cable has Circuit Integrity (CI), this does and must include voltage pressure test. This combination offers the system applications designer to consider mission critical systems that require extended working/-monitoring during fire conditions.

Fire Rating

- IEC 60332-1-2, IEC60332.3.24, IEC60332.3.22, IEC60332.3.25, BS5839-1 (clause 26.2e), BS8434-2, BS5839 BSEN 50200 (180 mins), EN50200, EN50399 B2 S1a, IEC 60331-23, IEC 60332-1-2, IEC 60754-2

Firetuf™ DATA Coaxial

Construction

| | |
|------------------------|---|
| Inner Conductor | bare copper wire, diameter 1/0.65±.01 mm |
| Insulation | PE skin, natural colour, silicone rubber outer insulation 4.65±.1 mm (Patent Protected) |
| Outer conductor | Glass Tape, copper braid, optical coverage 95%, + second braid, optical coverage 70% |
| Sheath | LSHR, flame retardant non-corrosive Copolymer Diameter 9.1 ± 0.2 mm |
| Sheath Colour | Red |

Mechanical Properties

| | | |
|--------------------------|---------------------|----------------|
| Bending radius | without load | 5 x Ø Cable |
| | with load | 10 x Ø Cable |
| Temperature range | during operation | -30°C to +70°C |
| | during installation | -5°C to +60°C |

Electrical Properties at 20°C ± 5°C

| | | |
|-------------------------------------|---------------------|--------------|
| Impedance, Ω | | 75 ± 5 |
| Attenuation at | 0,5 MHz | 0.65dB/100m |
| | 1 MHz | 0.90dB/100m |
| | 5 MHz | 2.24dB/100m |
| | 10 MHz | 3.35dB/100m |
| | 100 MHz | 15.03dB/100m |
| Screening Attenuation | 300 MHz | 32.51dB/100m |
| | 30-1000 MHz | > 100dB |
| | 1000 MHz-2000 MHz | > 95dB |
| | 2000 MHz-3000 MHz | > 89dB |
| Transfer Impedance | 5 MHz-30 MHz | ≤ 5mΩ/m |
| Velocity Ratio | | 61.4% |
| DC Resistance | | - |
| Inner Conductor | | 55.3Ω/km |
| Outer Conductor | | 3.7Ω/km |
| Return Loss | 5 - 1000 MHz ≥ 22dB | |
| Mutual Capacitance | 76pF/m | |
| Electrical Strength (1 Min.) | Dielectric | 2kV d.c. |
| | Sheath | 3.75kV d.c. |

Ordering Information

| P/N | Product Description | P.U |
|----------|---------------------|-----------|
| 60017668 | FTZ_6CU7SS Coax | 500m/drum |

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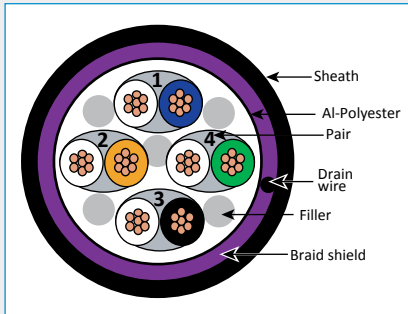
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3. Building Management Systems



| | | |
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EIA-485 22 & 24AWG LSZH Serial Data Communication Cable



Application

For multidropped, medium-speed, serial data communication in electrically noisy industrial environments.

Application includes industrial networks using RS-485/RS-422 transceivers :

- RS-422 systems for Process Automation (chemicals, brewing, paper mills), factory automation (autos, metal fabrication), HVAC, security, motor control and motion control.

Fire Rating

- IEC 60332-1, IEC 61034-2, IEC 60754-1/2

Optional

- PVC / PE

Construction

| | |
|------------------------------|--|
| Conductor | Stranded Tinned Copper |
| Insulation | Foam PE |
| Colour | Pair 1: 1 x white, 1 x blue Pair 2: 1 x white, 1 x orange Pair 3: 1 x white, 1 x black Pair 4: 1 x green, 1 x white |
| 1st screen | 1 x AL-Polyester Wrap, overlapping $\geq 25\%$ |
| Drain wire | Stranded Tinned Copper |
| Braid Shield | Tinned copper |
| Braid Shield Coverage | $\geq 85\%$ |
| Sheath | LSZH |
| Sheath colour | Black |

| AWG / Pair | 22 / 1P | 22 / 2P | 22 / 3P | 22 / 4P | 24 / 1P | 24 / 2P | 24 / 3P | 24 / 4P |
|---|---------------|---------|---------|---------|---------------|---------|---------|---------|
| Conductor \emptyset mm | 0.77 | | | | 0.61 | | | |
| Insulation \emptyset mm | 2.2 \pm 0.2 | | | | 1.9 \pm 0.2 | | | |
| Drain wire \emptyset mm | 7 * 0.254 | | | | 7 * 0.254 | | | |
| Sheath \emptyset mm | 6.5 | 9.0 | 10 | 11.5 | 6.3 | 8.0 | 9.2 | 10.2 |

Electrical Specification at 20°C

| AWG / Pair | 22 / 1P | 22 / 2P | 22 / 3P | 22 / 4P | 24 / 1P | 24 / 2P | 24 / 3P | 24 / 4P |
|-----------------------------|----------------------------|---------|---------|---------|------------------------------|---------|---------|---------|
| Conductor resistance | $\leq 59 \Omega/\text{km}$ | | | | $\leq 94.2 \Omega/\text{km}$ | | | |
| Rated Voltage | 300 V | | | | | | | |

Mechanical Properties

| AWG / Pair | 22 / 1P | 22 / 2P | 22 / 3P | 22 / 4P | 24 / 1P | 24 / 2P | 24 / 3P | 24 / 4P |
|--------------------------|---------|---------|---------|---------|---------|---------|---------|---------|
| Rated temperature | +80°C | | | | | | | |

Ordering Information

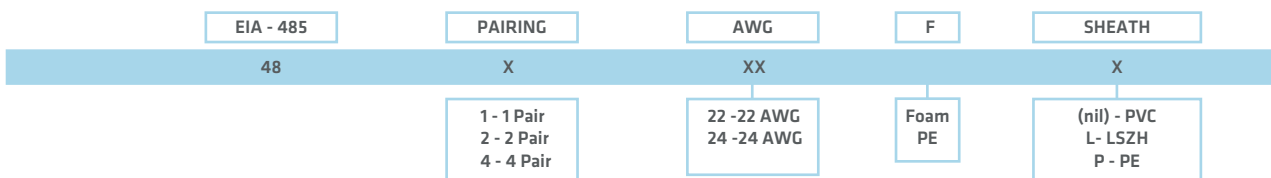
EIA-485 22 & 24 AWG part numbers are made up using the table below.

The part number starts with 48 to denote that it is an EIA-485 cable. The following number shows the number of pairing and the last 2 numbers signifies the AWG. Any letter behind would describe the sheath type.

Example of an EIA-485 part number -

48422L

The above example describes an EIA-485 cable with 4 pairing, 22 AWG. Sheath type LSZH.



EIA-485 22&24 AWG SWB LSZH

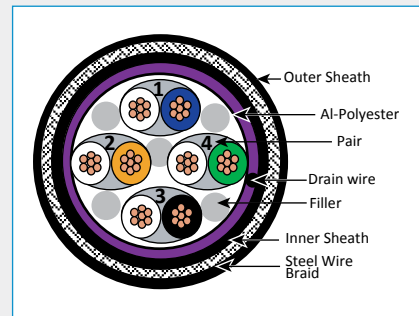
Serial Data Communication Cable, Armoured

3.1 EIA-485

Construction

| | |
|---------------------|--|
| Conductor | Stranded Tinned Copper |
| Insulation | Foam PE |
| Colour | Pair 1: 1 x white, 1 x blue Pair 2: 1 x white, 1 x orange Pair 3: 1 x white, 1 x black Pair 4: 1 x green, 1 x white |
| 1st screen | 1 x AL-Polyester Wrap, overlapping >= 25 % |
| Drain wire | Stranded Tinned Copper |
| Braid Shield | Tinned copper ; coverage >85% |
| Inner Sheath | PVC or LSZH |
| Braid Armour | Galvanized Steel Wire Braid ; >85% |
| Outer Sheath | LSZH |

| AWG / Pair | 22 / 1P | 22 / 2P | 22 / 3P | 22 / 4P | 24 / 1P | 24 / 2P | 24 / 3P | 24 / 4P |
|--------------------------|---------|-----------|---------|---------|---------|------------|---------|---------|
| Conductor Ø mm | | 0.77 | | | | 0.61 | | |
| Insulation Ø mm | | 2.2 ± 0.2 | | | | 1.9+/- 0.2 | | |
| Drain wire Ø mm | | 7 *0.254 | | | | 7 *0.254 | | |
| Inner Sheath Ø mm | 6.5 | 9.0 | 10.0 | 11.5 | 6.3 | 8.0 | 9.2 | 10.2 |
| Outer Sheath Ø mm | 11.1 | 13.0 | 14.7 | 16.7 | 10.8 | 13.1 | 14.1 | 12.5 |



Application

For multidropped, medium-speed, serial data communication in electrically noisy industrial environments.

Application includes industrial networks using RS-485/RS-422 transceivers:

- RS-422 systems for Process Automation (chemicals, brewing, paper mills), factory automation (autos, metal fabrication), HVAC, security, motor control and motion control.
- Suitable for outdoor installation due to steel wire braiding.

Fire Rating

- IEC 60332-1, IEC 61034-2, IEC 60754-1/2

Optional

- PVC / PE

Electrical Specification at 20°C

| AWG / Pair | 22 / 1P | 22 / 2P | 22 / 3P | 22 / 4P | 24 / 1P | 24 / 2P | 24 / 3P | 24 / 4P |
|-----------------------------|-----------|---------|---------|---------|-------------|---------|---------|---------|
| Conductor resistance | ≤ 59 Ω/km | | | | ≤ 94.2 Ω/km | | | |
| Rated Voltage | 300 V | | | | | | | |

Mechanical Properties

| AWG / Pair | 22 / 1P | 22 / 2P | 22 / 3P | 22 / 4P | 24 / 1P | 24 / 2P | 24 / 3P | 24 / 4P |
|--------------------------|---------|---------|---------|---------|---------|---------|---------|---------|
| Rated temperature | +80°C | | | | | | | |

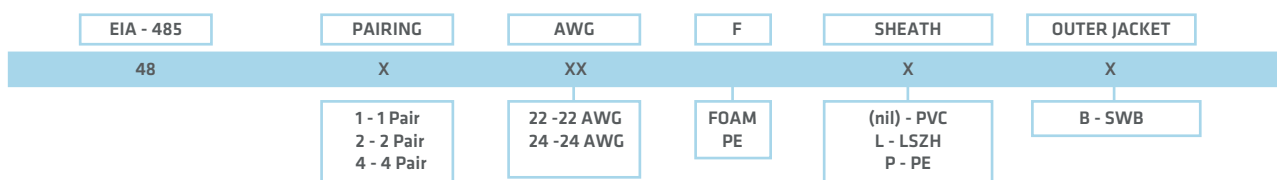
Ordering Information

EIA-485 22 & 24 AWG SWB part numbers are made up using the table below.

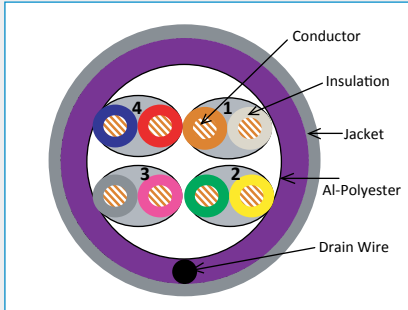
The part number starts with 48 to denote that it is an EIA-485 cable. The following number shows the number of pairing and the last 2 numbers signifies the AWG. The following letter describes the sheath type and the alphabet at the end shows that this is a steel wire braided cable.

Example of an EIA-485 SWB part number - **48422LB**

The above example describes an EIA-485 SWB cable with 4 pairing, 22 AWG. Sheath type LSZH, SWB.



3.2 Screened Control Cable



Application

For installation requiring flexible connector cable to fulfill measuring, controls & command applications ie Computer Interconnection, Data Transmission, Control Circuits, Industrial Equipment Control, suitable for EIA RS-232 and RS-422 applications.

Optional

- LSZH Gray Colour

UL 2464 Overall Screen 16-24AWG PVC

Overall Screened Data Control Cable

Technical Details

| | |
|--------------------------------------|---|
| Conductor | Fully annealed stranded tinned copper per ASTM B-33 |
| Max Operating Voltage | 300V |
| Insulation | Premium grade SR-PVC |
| Overall diameter (±0.2mm) | 4.6 to 6.2 nominal |
| Insulation Dia. (±0.2mm) | 1.1 to 2.1 nominal |
| Twist(Direction) | S |
| Drain wire(Construction,mm) | 7/0.254mm Stranded Tinned Copper |
| Assembly | Pairs + Drain wire |
| Al-Mylar Wrap(overlapping, %) | ≥25% |
| Jacket | PVC Gray Colour |
| Insulation colour | White/Brown, Green/Yellow, Gray/Pink, Blue/Red |
| Rated Temperature | +80°C |

Cable Dimension

| Conductor Size | DC Resistance @ 20°C (Ω/km) | No of Pairs | OD (mm) ± 5% |
|----------------|-----------------------------|-------------|--------------|
| 16 AWG | ≤ 14.6 | 1 Pair | 6.2 |
| | ≤ 14.6 | 2 Pairs | 9.00 |
| | ≤ 14.6 | 3 Pairs | 9.60 |
| | ≤ 14.6 | 4 Pairs | 11.0 |
| 18 AWG | ≤ 23.60 | 1 Pair | 5.60 |
| | ≤ 23.60 | 2 Pairs | 8.0 |
| | ≤ 23.60 | 3 Pairs | 8.2 |
| | ≤ 23.60 | 4 Pairs | 10.0 |
| 20 AWG | ≤ 36.7 | 1 Pair | 5.00 |
| | ≤ 36.7 | 2 Pairs | 6.40 |
| | ≤ 36.7 | 3 Pairs | 7.70 |
| | ≤ 36.7 | 4 Pairs | 8.00 |
| 22 AWG | ≤ 59.4 | 1 Pair | 4.60 |
| | ≤ 59.4 | 2 Pairs | 5.50 |
| | ≤ 59.4 | 3 Pairs | 6.40 |
| | ≤ 59.4 | 4 Pairs | 7.00 |
| 24 AWG | ≤ 94.2 | 1 Pair | 4.00 |
| | ≤ 94.2 | 2 Pairs | 5.00 |
| | ≤ 94.2 | 3 Pairs | 5.80 |
| | ≤ 94.2 | 4 Pairs | 6.70 |

Ordering Information

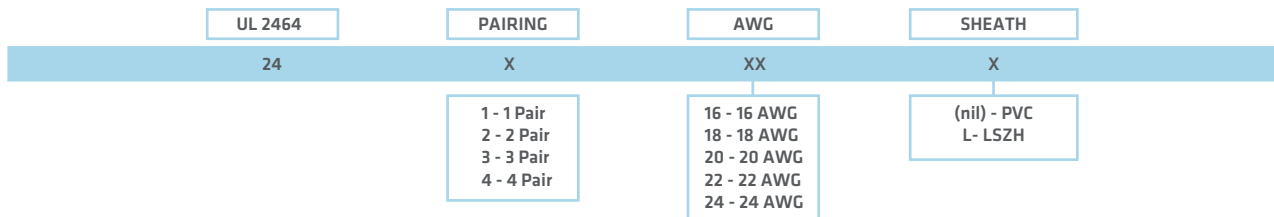
UL 2464 16-24 AWG part numbers are made up using the table below.

The part number starts with 24 to denote that it is an UL 2464 cable. The following number shows the number of pairing and the last 2 numbers signifies the AWG. Any letter behind would describe the sheath type.

Example of an UL 2464 part number -

24318L

The above example describes an UL 2464 cable with 3 pairing, 18 AWG. Sheath type LSZH.



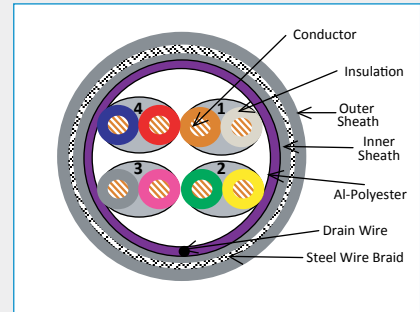
UL 2464 OVERALL SCREEN 16-24AWG SWB LSZH

3.2 Screened Control Cable

Overall Screened Data Control Cable, Armoured

| Technical Details | |
|--------------------------------------|---|
| Conductor | Fully annealed stranded tinned copper per ASTM B-33 |
| Max Operating Voltage | 300V |
| Insulation | Premium grade SR-PVC |
| Insulation colour | White/Brown, Green/Yellow, Gray/Pink, Blue/Red |
| Insulation Dia. (±0.2mm) | 1.1 to 2.1 nominal |
| Twist(Direction) | S |
| Drain wire(Construction,mm) | 7/0.254mm Stranded Tinned Copper |
| Assembly | Pairs + Drain wire |
| Al-Mylar Wrap(overlapping, %) | ≥ 25% |
| Inner Sheath | LSZH Gray Colour |
| Braid Armour | Galvanized Steel Wire Braid , >85% |
| Outer Sheath | LSZH Gray Colour |
| Rated Temperature | +80°C |

| Cable Dimension | | | | |
|-----------------|-----------------------------|-------------|------------------------|--|
| Conductor Size | DC Resistance @ 20°C (Ω/km) | No of Pairs | Inner Sheath (mm) ± 5% | Outer Sheath over Armour Braid (mm) + 5% |
| 16 AWG | <= 14.6 | 1 Pair | 6.2 | 8.00 |
| | <= 14.6 | 2 Pairs | 9.00 | 10.60 |
| | <= 14.6 | 3 Pairs | 9.60 | 11.30 |
| | <= 14.6 | 4 Pairs | 11.0 | 12.80 |
| 18 AWG | <= 23.60 | 1 Pair | 5.60 | 7.10 |
| | <= 23.60 | 2 Pairs | 8.0 | 9.60 |
| | <= 23.60 | 3 Pairs | 8.2 | 9.90 |
| | <= 23.60 | 4 Pairs | 10.0 | 11.80 |
| 20 AWG | <= 36.7 | 1 Pair | 5.00 | 6.50 |
| | <= 36.7 | 2 Pairs | 6.40 | 8.00 |
| | <= 36.7 | 3 Pairs | 7.70 | 9.40 |
| | <= 36.7 | 4 Pairs | 8.00 | 9.80 |
| 22 AWG | <= 59.4 | 1 Pair | 4.60 | 6.10 |
| | <= 59.4 | 2 Pairs | 5.50 | 7.10 |
| | <= 59.4 | 3 Pairs | 6.40 | 8.10 |
| | <= 59.4 | 4 Pairs | 7.00 | 8.80 |
| 24 AWG | <= 94.2 | 1 Pair | 4.00 | 5.50 |
| | <= 94.2 | 2 Pairs | 5.00 | 6.60 |
| | <= 94.2 | 3 Pairs | 5.80 | 7.50 |
| | <= 94.2 | 4 Pairs | 6.70 | 8.50 |



Application

For installation requiring flexible connector cable to fulfill measuring, controls & command applications ie Computer Interconnection, Data Transmission, Control Circuits, Industrial Equipment Control, suitable for EIA RS-232 and RS-422 applications. Steel wire braid provides outdoor protection against harsh handling.

Optional

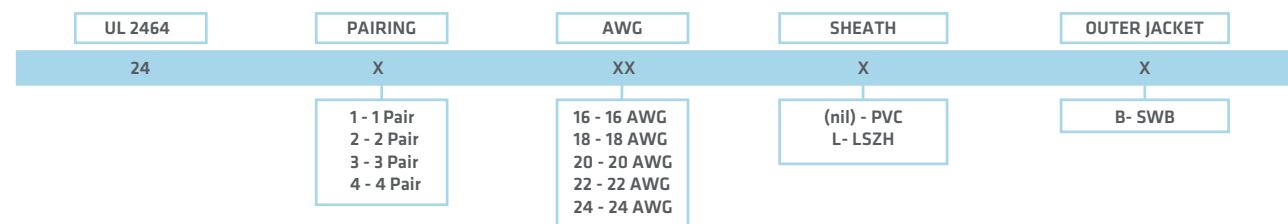
- PVC Gray Colour

Ordering Information

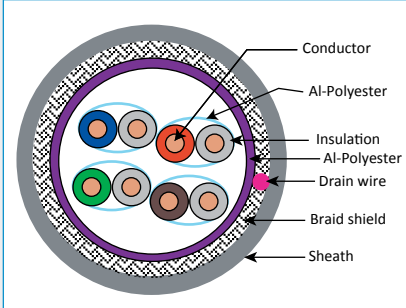
UL 2464 16-24 AWG SWB part numbers are made up using the table below. The part number starts with 24 to denote that it is an UL 2464 cable. The following number shows the number of pairing and the last 2 numbers signifies the AWG. The following letter describes the sheath type and the alphabet at the end shows that this is a steel wire braided cable.

Example of an UL 2464 SWB part number - **24220LB**

The above example describes an UL 2464 cable with 2 pairing, 20 AWG. Sheath type LSZH, SWB.



3.2 Screened Data Control Cable



Application

Multipairs individual shielded in sensitive EMI environment for general data control & BUS applications, including RS-422 and RS-485.

Can be used for Security & Control Application. Designed to pass UC 1666 burn test.

Suitable for high EMI environments.

Optional:

- PVC / Steel Wire Braid
- High pair counts upon request.

UL 2919 INDIV-PAIR SCREEN 18-24AWG LSZH

Individual Pair Screened and Overall Screened Control Cable

Technical Details

| | |
|------------------------------|--|
| Conductor | Stranded Tinned Copper , AWG 18, diameter 16 x 0.254 mm |
| Max Operating Voltage | 300V |
| Insulation | HD-PE |
| Insulation colour | Pair 1: 1 x white, 1 x Blue Pair 2 : 1 x white , 1 x orange Pair 3 : 1 x white , 1 x green Pair 4 : 1 x white , 1 x brown |
| Overall screen | Individual Pair Screen 1 x AL-Polyester Wrap, overlapping >= 25 % |
| Drain wire | 7/0.254mm Stranded Tinned Copper |
| Coverage | Braid Shield coverage >=85% |
| Sheath | LSZH |
| Sheath colour | Grey |
| Rated temperature | +80°C |

Cable Dimension

| Conductor Size | DC Resistance @ 20°C (Ω/km) | No. of Pairs | Insulation Diameter (MM) | OD (mm) ± 5% |
|----------------|-----------------------------|--------------|--------------------------|--------------|
| 18 AWG | <= 23.2 | 1 Pair | 2.4 ± 0.2 | 7.5 |
| | <= 23.2 | 2 Pairs | 2.4 ± 0.2 | 10.4 |
| | <= 23.2 | 3 Pairs | 2.4 ± 0.2 | 11.2 |
| | <= 23.2 | 4 Pairs | 2.4 ± 0.2 | 13.0 |
| 20 AWG | <= 36.7 | 1 Pair | 2.1+/-0.2 | 7.0 |
| | <= 36.7 | 2 Pairs | 2.1+/-0.2 | 9.5 |
| | <= 36.7 | 3 Pairs | 2.1+/-0.2 | 10.3 |
| | <= 36.7 | 4 Pairs | 2.1+/-0.2 | 11.8 |
| 22 AWG | <= 59.4 | 1 Pair | 2.2+/-0.2 | 6.5 |
| | <= 59.4 | 2 Pairs | 2.2+/-0.2 | 8.7 |
| | <= 59.4 | 3 Pairs | 2.2+/-0.2 | 9.8 |
| | <= 59.4 | 4 Pairs | 2.2+/-0.2 | 11.0 |
| 24 AWG | <= 94.2 | 1 Pair | 1.9+/-0.2 | 5.9 |
| | <= 94.2 | 2 Pairs | 1.9+/-0.2 | 8.7 |
| | <= 94.2 | 3 Pairs | 1.9+/-0.2 | 9.2 |
| | <= 94.2 | 4 Pairs | 1.9+/-0.2 | 10.2 |

Ordering Information

UL 2919 18-24 AWG part numbers are made up using the table below.

The part number starts with 24 to denote that it is a UL 2919 cable. The following number shows the number of pairing and the last 2 numbers signifies the AWG. Any letter behind would describe the sheath type.

Example of a UL 2919 part number - **29418L**

The above example describes an UL 2919 cable with 4 pairing, 18 AWG. Sheath type LSZH.

| UL 2919 | PAIRING | AWG | SHEATH |
|---------|--|--|-------------------------|
| 29 | X | XX | X |
| | 1 - 1 Pair 2 - 2 Pair 3 - 3 Pair 4 - 4 Pair | 18 - 18 AWG 20 - 20 AWG 22 - 22 AWG 24 - 24 AWG | (nil) - PVC L - LSZH |

Security & Comms Cable, SACU Series

Unshielded, PVC CMR, PE, LSZH

3.3 Security & Comms Cable

Construction

| | |
|--------------------------|--|
| Conductor | Grade A Bare Copper, Stranded |
| Operating Voltage | 300V |
| Insulation | PVC |
| Insulation colour | 1 - Black, 2 - Red, 3 - White, 4 - Green |
| Ripcord | Available |
| Sheath colour | PVC-CMR or LSZH Grey; PE Black |
| Rated temperature | Up to 75°C |



Cable Dimension

| Conductor Size | Conductor Diameter (mm) | No. of Pairs | Insulation Diameter (MM) | OD (mm) |
|----------------|-------------------------|--------------|--------------------------|---------|
| 12 AWG | 19*0.47 | 1 Pair | 0.3 | 6.95 |
| | | 2 Pairs | | 7.60 |
| 14 AWG | 19*0.37 | 1 Pair | 0.3 | 6.08 |
| | | 2 Pairs | | 7.15 |
| 16 AWG | 19*0.29 | 1 Pair | 0.25 | 4.81 |
| | | 2 Pairs | | 5.63 |
| 18 AWG | 7*0.39 | 1 Pair | 0.25 | 4.23 |
| | | 2 Pairs | | 4.92 |
| 20 AWG | 7*0.31 | 1 Pair | 0.20 | 3.65 |
| | | 2 Pairs | | 4.23 |
| 22 AWG | 7*0.25 | 1 Pair | 0.20 | 3.29 |
| | | 2 Pairs | | 3.80 |

Application

Security, Intercom, Broadcast, Sound, Audio Systems

Fire Rating

PVC IEC 60332-1, NEC A T SPLR, CMR
 LSZH IEC 61034, IEC 60754-1 & 2, IEC 60332-1

Ordering Information

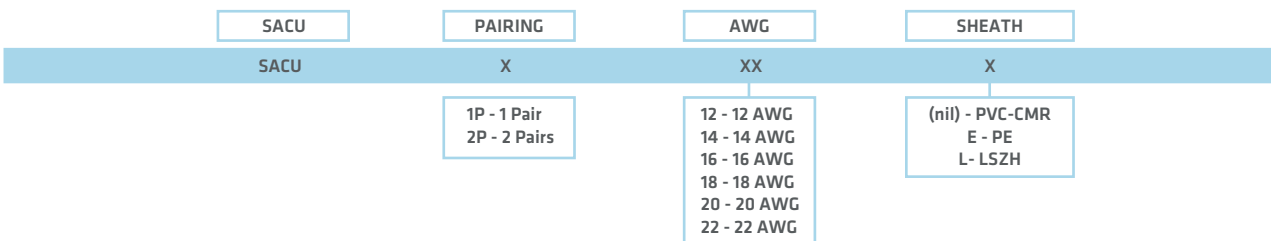
SACU 12-22 AWG part numbers are made up using the table below.

The part number starts with SACU to denote that it is a SACU cable. The following number shows the number of pairing and the last 2 numbers signifies the AWG. Any letter behind would describe the sheath type.

Example of a SACU part number -

SACU2P16E

The above example describes an SACU cable with 2 pairing, 16 AWG. Sheath type PE.





Application

Security, Intercom, Broadcast, Sound, Audio Systems

Fire Rating

PVC IEC 60332-1, NEC A T SPLR, CMR
 LSZH IEC 61034, IEC 60754-1 & 2, IEC 60332-1

Security & Comms Cable, SACS Series

Shielded, PVC CMR, PE, LSZH

Construction

| | |
|--------------------------|--|
| Conductor | Grade A Bare Copper, Stranded |
| Operating Voltage | 300V |
| Insulation | PVC |
| Insulation colour | 1 - Black, 2 - Red, 3 - White, 4 - Green |
| 1st Screen | 100% Overall Aluminum Foil Screen |
| Sheath | PVC-CMR, PE or LSZH with Ripcord |
| Sheath colour | PVC-CMR Grey or LSZH Grey; PE Black |
| Rated temperature | Up to 75°C |

Cable Dimension

| Conductor Size | Conductor Diameter (mm) | No. of Pairs | Insulation Diameter (MM) | OD (mm) |
|----------------|-------------------------|--------------|--------------------------|---------|
| 12 AWG | 19*0.47 | 1 Pair | 0.3 | 7.15 |
| | | 2 Pairs | | 7.80 |
| 14 AWG | 19*0.37 | 1 Pair | 0.3 | 6.19 |
| | | 2 Pairs | | 7.56 |
| 16 AWG | 19*0.29 | 1 Pair | 0.25 | 4.92 |
| | | 2 Pairs | | 5.73 |
| 18 AWG | 7*0.39 | 1 Pair | 0.25 | 4.33 |
| | | 2 Pairs | | 5.02 |
| 20 AWG | 7*0.31 | 1 Pair | 0.20 | 3.72 |
| | | 2 Pairs | | 4.31 |
| 22 AWG | 7*0.25 | 1 Pair | 0.20 | 3.34 |
| | | 2 Pairs | | 3.90 |

Ordering Information

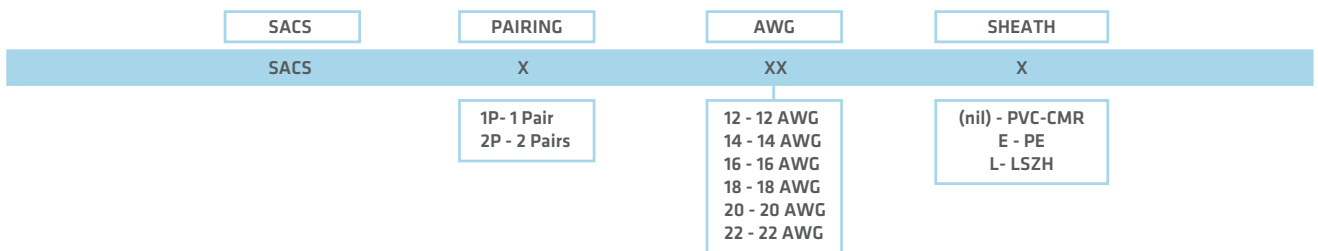
SACS 12-22 AWG part numbers are made up using the table below.

The part number starts with SACS to denote that it is a SACS cable. The following number shows the number of pairing and the last 2 numbers signifies the AWG. Any letter behind would describe the sheath type.

Example of a SACS part number -

SACS1P22L

The above example describes an SACS cable with 1 pairing, 22 AWG. Sheath type LSZH.



Security & Comms Cable, FACU Series

Unshielded, PVC CMR, PE, LSZH

3.3 Security & Comms Cable

Construction

| | |
|--------------------------|---|
| Conductor | Grade A Bare Copper, Solid |
| Operating Voltage | 300V |
| Insulation | PVC |
| Insulation colour | 1 - Black, 2 - Red, 3 - Brown, 4 - Blue |
| Ripcord | Available |
| Sheath colour | PVC-CMR or LSZH RED ; PE Black |
| Rated temperature | Up to 75°C |

Cable Dimension

| Conductor Size | Conductor Diameter (mm) | No. of Pairs | Insulation Diameter (MM) | OD (mm) |
|----------------|-------------------------|--------------|--------------------------|---------|
| 12 AWG | 2.05 | 1 Pair | 0.3 | 6.34 |
| | | 2 Pairs | | 6.85 |
| 14 AWG | 1.63 | 1 Pair | 0.3 | 5.55 |
| | | 2 Pairs | | 6.52 |
| 16 AWG | 1.29 | 1 Pair | 0.25 | 4.56 |
| | | 2 Pairs | | 5.25 |
| 18 AWG | 1.02 | 1 Pair | 0.25 | 3.98 |
| | | 2 Pairs | | 4.61 |



Application

Widely used in indoor fire alarm or intercom system requiring flame retardancy properties.

Fire Rating

PVC IEC 60332-1, NEC A T SPLR, CMR
 LSZH IEC 61034, IEC 60754-1 & 2, IEC 60332-1

Ordering Information

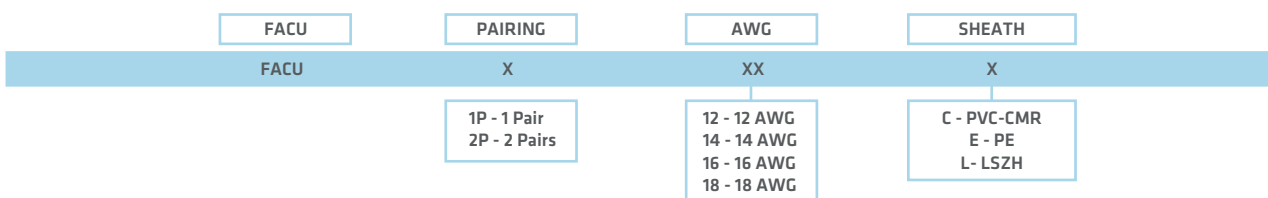
FACU 12-18 AWG part numbers are made up using the table below.

The part number starts with FACU to denote that it is a FACU cable. The following number shows the number of pairing and the last 2 numbers signifies the AWG. Any letter behind would describe the sheath type.

Example of a FACU part number -

FACU2P12C

The above example describes an FACU cable with 2 pairing, 12 AWG. Sheath type PVC-CMR.



Security & Comms Cable, FACS Series

Shielded, PVC CMR, PE, LSZH



Application

Widely used in indoor fire alarm or intercom system requiring flame retardancy properties.

Fire Rating

PVC IEC 60332-1, NEC A T SPLR, CMR
 LSZH IEC 61034, IEC 60754-1 & 2, IEC 60332-1

Construction

| | |
|--------------------------|---|
| Conductor | Grade A Bare Copper, Solid |
| Operating Voltage | 300V |
| Insulation | PVC |
| Insulation colour | 1 - Black, 2 - Red, 3 - Brown, 4 - Blue |
| 1st Screen | 100% Overall Aluminum Foil Screen |
| Sheath | PVC-CMR, PE or LSZH with Ripcord |
| Sheath colour | PVC-CMR or LSZH RED ; PE Black |
| Rated temperature | Up to 75°C |

Cable Dimension

| Conductor Size | Conductor Diameter (mm) | No. of Pairs | Insulation Diameter (MM) | OD (mm) |
|----------------|-------------------------|--------------|--------------------------|---------|
| 12 AWG | 2.05 | 1 Pair | 0.3 | 6.44 |
| | | 2 Pairs | | 7.05 |
| 14 AWG | 1.63 | 1 Pair | 0.3 | 5.65 |
| | | 2 Pairs | | 6.62 |
| 16 AWG | 1.29 | 1 Pair | 0.25 | 4.66 |
| | | 2 Pairs | | 5.35 |
| 18 AWG | 1.02 | 1 Pair | 0.25 | 4.08 |
| | | 2 Pairs | | 4.71 |

Ordering Information

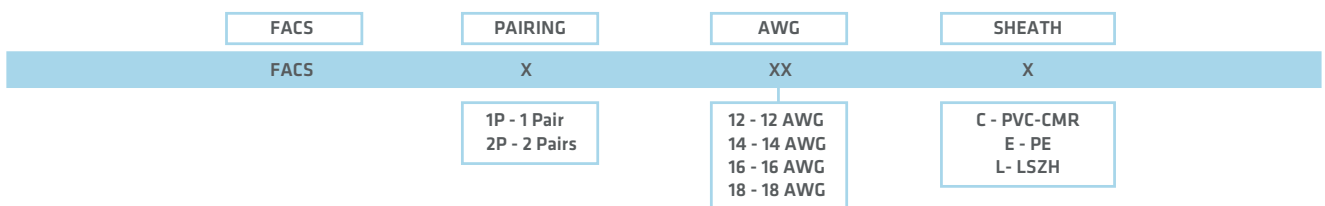
FACS 12-18 AWG part numbers are made up using the table below.

The part number starts with FACS to denote that it is a FACS cable. The following number shows the number of pairing and the last 2 numbers signifies the AWG. Any letter behind would describe the sheath type.

Example of a FACS part number -

FACS1P18L

The above example describes an FACS cable with 1 pairing, 18 AWG. Sheath type LSZH.



MAX-FOH™ Flexible Speaker Cable, PAGA Series

Unshielded Public Address General Alarm, Data Cable, Fire Resistance



Construction

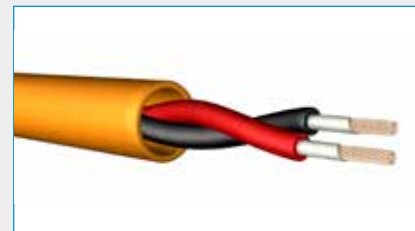
| | |
|------------------------|---|
| Conductor | Grade A Copper specially protected by fire barrier tape to ensure circuit integrity in fire situations. |
| Construction | Twisted pair for better signal transmission |
| Core Insulation | High temperature resistance PE |
| Outer Sheath | LSZH in accordance to IEC 61034, IEC 60754-1 & 2. |

Main Characteristics

| Nominal Conductor Size | mm ² | 2 Core x 1.5 | 2 Core x 2.5 | 2 Core x 4.0 |
|---|-----------------|--------------|--------------|--------------|
| Nominal overall diameter | mm | 8.0 ± 0.5 | 9.5 ± 0.5 | 10.9 ± 1.0 |
| Nominal weight (completed cable) | Kg/km | 68 | 91 | 136 |
| Min bending radius | mm | 72 | 76 | 88 |
| Max pulling tension | kgf | 21 | 35 | 56 |
| Max conductor DC resistance @ 20°C | Ω/km | 12.1 | 7.41 | 4.61 |
| Min insulation resistance @ 20°C | MΩ.km | 2000 | | |
| Dielectric withstand test | kV/min | 2 | | |

Technical Data

| | | |
|-----------------------------------|----|--|
| Conductor material | mm | Plain annealed stranded copper wire to IEC 60228 / BS EN 60228 |
| Max. operating temperature | °C | 90 |
| Conductor shape | na | Circular stranded Class 2 |
| Insulation material | na | Cross-linked PE, XLPE |
| Insulation thickness | mm | 0.5 nominal |
| Core Colour | mm | Black and White (Standard) ; Black and Red (*Non standard) |



Application

Most widely used fire resistance speaker & Audio/Motor control cables, which is highly flexible due to the unique tubing design. Draka MAX-FOH™ flexible speaker cables meets the stringent BS 6387 fire performance standards and can be used in all critical Public Address General Alarm Systems.

Fire Rating

Generally to: ISO/IEC 11801: 95, IEC 61156, EN 50173:95; EN 50288-1, BS 6387

Ordering Information

| P/N | Product Description | P.U |
|----------|--|-----------|
| PAGA2C15 | MAXFOH™ FlexiTube, 2Cx1.5mm ² , PAGA Fire Res, BS 6387, 60331, LSZH, Orange | 500m/drum |
| PAGA2C25 | MAXFOH™ FlexiTube, 2Cx2.5mm ² , PAGA Fire Res, BS 6387, 60331, LSZH, Orange | 500m/drum |
| PAGA2C40 | MAXFOH™ FlexiTube, 2Cx4.0mm ² , PAGA Fire Res, BS 6387, 60331, LSZH, Orange | 500m/drum |

3.4 Max FOH™



Application

Most widely used fire resistance speaker & Audio/Motor control cables, which is highly flexible due to the unique tubing design. Draka MAX-FOH™ flexible speaker cables meets the stringent BS 6387 fire performance standards and can be used in all critical Public Address General Alarm Systems.

Fire Rating

Generally to: ISO/IEC 11801: 95, IEC 61156, EN 50173:95; EN 50288-1, BS 6387

Max FOH™ SHIELD Flexible Speaker Cable, PAGAS Series

Shielded Public Address General Alarm, Data Cable, Fire Resistance

Construction

| | |
|------------------------|---|
| Conductor | Grade A Copper specially protected by fire barrier tape to ensure circuit integrity in fire situations. |
| Construction | Twisted pair for better signal transmission |
| Core Insulation | Aluminium Foil |
| Overall Screen | High temperature resistance PE |
| Outer Sheath | LSZH in accordance to IEC 61034, IEC 60754-1 & 2. |

Main Characteristics

| | | | |
|---|-----------------|--------------|--------------|
| Nominal Conductor Size | mm ² | 1 Pair x 1.5 | 1 Pair x 2.5 |
| Nominal overall diameter | mm | 9.3.0 ± 0.5 | 10.8 ± 0.5 |
| Nominal weight (completed cable) | Kg/km | 85 | 124 |
| Min bending radius | mm | 76 | 88 |
| Max pulling tension | kgf | 21 | 35 |
| Max conductor DC resistance @ 20°C | Ω/km | | 7.46 |
| Min insulation resistance @ 20°C | MΩ.km | | 2000 |
| Dielectric withstand test | kV/min | | 2 |

Technical Data

| | | |
|----------------------------------|----|--|
| Conductor material | mm | Plain annealed stranded copper wire to IEC 60228 / BS EN 60228 |
| Max operating temperature | °C | 90 |
| Conductor shape | - | Circular stranded Class 2 |
| Insulation material | - | Cross-linked PE, XLPE |
| Insulation thickness | mm | 0.5 nominal |
| Core Colour | | Black and White (Standard) ; Black and Red (*Non standard) |

Ordering Information

| P/N | Product Description | P.U |
|-----------|---|-----------|
| PAGAS1P15 | MAX FOH™ SHIELD FlexiTube, 1Px1.5mm ² , PAGAS Fire Res, BS 6387, 60331, LSZH, Orange | 500m/drum |
| PAGAS1P25 | MAX FOH™ SHIELD FlexiTube, 1Px2.5mm ² , PAGAS Fire Res, BS 6387, 60331, LSZH, Orange | 500m/drum |

IE Firetuf™ DATA 1P, 2P or 4P LSZH-FR

IE SF/UTP 4x2xAWG22/1 cable with circuit integrity behaviour



3.5 Firetuf™

Construction

| | |
|---------------------------------|---|
| Conductor | bare copper wire, Ø 0.65 mm (AWG 22) |
| Insulation | PE/Sil Rbr, Ø 1.7 mm |
| Twisting | 2 cores to the pair |
| Cable lay up | 1, 2 or 4 pairs to the core |
| Fire protection wrapping | glass tape |
| Screen | copper braid, tinned |
| Sheath | halogen free, flame retardant thermoplastic sheathing compound acc. to EN 50290-2-27, Ø 10.5 mm |
| Colour | red RAL 3000 |
| Outer Diameter | Nom. 6.8(1 Pair) - 10.5 (4 Pair) mm |
| Weight | Nom. 48(1 Pair) - 122 (4 Pair) kg/km |
| Tensile force N | 100 |

Mechanical Properties

| | | |
|--------------------------|---------------------|-----------------|
| Bending radius | without load | ≥ 42 mm |
| | with load | ≥ 84 mm |
| Temperature range | during operation | -20°C to + 60°C |
| | during installation | 0°C to + 50°C |

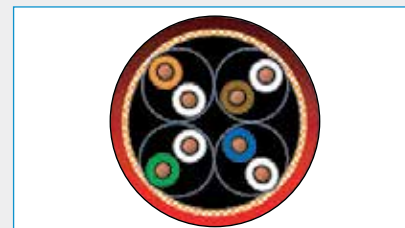
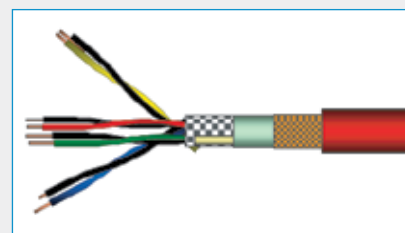
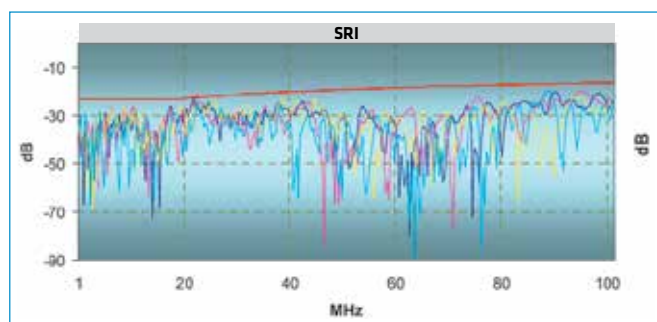
Fire Tests BC 5839: 2002 & IEC60331

| | |
|--|-----------|
| BS5839 enhanced 3 in 1 | passed |
| Continued Data Operation @ 950° | > 2 Hours |
| BS6387 | > 3 Hours |
| BS EN 50200 (IEC60331) | > 3 Hours |

Electrical Properties at 20°C ± 5°C

| | | |
|--|---------------------------------------|---------------|
| Loop resistance | - | ≤ 110 Ω/km |
| Resistance unbalance | - | ≤ 2% |
| Insulation resistance | (500 V) 1 minute | ≥ 2000 MΩ*km |
| Mutual capacitance | at 800 Hz | Nom. 60 nF/km |
| Capacitance unbalance | (pair/ground) | ≤ 1600 pF/km |
| Characteristic impedance | (at 10) MHz | (100 ± 15) Ω |
| Nominal velocity of propagation | - | ca. 57 % |
| Test voltage | (DC, 1 min) core/core and core/screen | 1000 V |
| Transfer Impedance | at 10 MHz | 5 mΩ/m |

Electrical Data (Nominal) acc. to Cat.5 (at 20°C)



Application

- Primär (Campus), Sekundär (Riser), Tertiär (Horizontal)
- IEEE 802.3: 10Base-T; 100Base-T;
- IEEE 802.5 16 MB; ISDN; TPDDI; ATM
- RS485 (10Mbits)
- Circuit integrity structured wiring alarm cable, compatible with all known connection systems to EN 50173, part of intelligent building technology

Standards

Generally to: ISO/IEC 11801: 95, IEC 61156; EN 50173:95; EN 50288-1

Fire Rating

- IEC 60332-1, IEC 60754-1&2, IEC 61034-2, IEC 60332-3-24, UL 1581 VW 1, BS5839-1 (clause 26.2e), BS8434-2, BSEN 50200, BS4066 part 3, BSEN 20568, IEC60332-3-24, EN50399

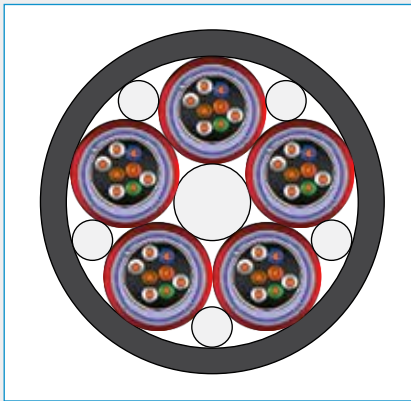
Certification

- Approved to LUL - Fire resistant BS5839-1 (clause 26.2e); BS8434-2; BSEN 50200
- Flame retardant BS4066 part 3; Smoke emission BSEN 20568
- LUL-Flammability, smoke & fume 2-01001-002
- LUL STANDARD e4156 part 1 - approved

Ordering Information

| P/N | Product Description | P,U |
|---------|----------------------------|-----------|
| 1010851 | IE FIRETUF DATA 1P LSZH-FR | 500m/drum |
| 1010852 | IE FIRETUF DATA 2P LSZH-FR | 500m/drum |
| 1010853 | IE FIRETUF DATA 4P LSZH-FR | 500m/drum |

3.5 Firetuf™



Application

Campus wiring, Riser applications, Horizontal backbone wiring, Building control systems, Intelligent fire alarm systems. Circuit integrity structured wiring alarm cable, compatible with all known connection systems to EN 50173 IEEE 802.3: 10Base-T; (100Base-T <75m), IEEE 802.5 16 MB; ISDN; TPDDI; ATM RS485 (10Mbits)

Fire Rating

- IEC 61034-2, IEC 60754-1&2, IEC 60332-1, IEC 60332-3-24

ICS IE Firetuf™ Data N x 2xAWG22/1 LSHF-FR

IE SF/UTP N x 2xAWG22/1 cable with circuit integrity behavior and MUD resistance

Construction

| | |
|------------------------|--|
| Conductor | Bare copper wire, Ø 0.65 mm (AWG 22) 0.332mm ² |
| Insulation | PE/Silicone Rubber1, Ø PE 1.0mm and Silicone Rubber 1.7 mm |
| Fire Protection | Glass Tape |
| Wrapping | |
| Screen | Aluminium tape + tinned copper braid + Drain Wire |
| Sheath | Halogen free, flame retardant thermoplastic sheathing compound acc. to EN 50290-2-27, Ø OD - 10.5 mm |
| Sheath Colour | Anthracite RAL 7016 |

Mechanical Properties

| | | |
|--------------------------|-------------------------|------------------|
| Bending radius | without load (4P - 20P) | ≥ 50 mm - 130mm |
| | with load (4P - 20P) | ≥ 100 mm - 260mm |
| Temperature range | during operation | -20°C to + 60°C |
| | during installation | 0°C to + 50°C |

Electrical Properties at 20°C ± 5°C

| | | |
|--|---------------------------------------|--------------------------------|
| Loop resistance | | ≤ 110 Ω/km |
| Braid resistance | | 9.9Ω/Km |
| Drain wire + braid resistance | | 78Ω/Km (with braid = 8.79Ω/Km) |
| Resistance unbalance | | ≤ 2% |
| Insulation resistance | (500 V) 1 minute | ≥ 2000 MΩ*km |
| Mutual capacitance | at 800 Hz | Nom. 60 nF/km |
| Capacitance unbalance | (pair/ground) | ≤ 1600 pF/km |
| Characteristic impedance | (at 10) MHz | (100 ± 15) Ω |
| Nominal velocity of propagation | | ca. 57 % |
| Test voltage | (DC, 1 min) core/core and core/screen | 1000 V |
| Transfer impedance | at 10 MHz | 5 mΩ/m |

Ordering Information

| P/N | Product Description | P.U |
|-----|--|-----------|
| TBA | DRAKA ICS IE FIRETUF™ DATA 4P LSHF-FR - MUD | 500m/drum |
| TBA | DRAKA ICS IE FIRETUF™ DATA 10P LSHF-FR - MUD | 500m/drum |
| TBA | DRAKA ICS IE FIRETUF™ DATA 20P LSHF-FR - MUD | 500m/drum |

Firetuf™ OFC-UT-NM Fire Resistant Universal Central Tube Cable

Indoor/Outdoor non-metallic LSHF-FR sheathed optical cable with 2 – 24 fibres.
VDE: A/I-DQ(ZN)H



Fire Rating

| Fire resistance tests | |
|-----------------------------|--|
| IEC 60331-25 (120) | Fire resistance: 120 minutes at 750 °C (No fibre break) |
| EN 50200 PH 120 | Fire resistance with fire and impact 120 minutes 830 °C (No fibre break) |
| EN 50200 ANNEX E PH 30 | Fire resistance until 15 minutes of fire and impact alone, followed by 15 minutes of fire, impact and water spray at 830 °C (No fibre break) |
| BS 8434 - 2 | Fire resistance until 60 minutes of fire and impact alone, followed by 60 minutes of fire, impact and water spray at 930 °C (No fibre break) |
| Flame retardant tests | |
| IEC 60332-1-2 | Single vertical wire test |
| Flame propagation test | |
| IEC 60332-3-24 = IEC 332-3C | Vertically-mounted bunched wires and cables |
| Halogen acid & gas tests | |
| IEC 60754-1 | No halogens |
| IEC 60754-2 | No acid matters |
| Smoke emission tests | |
| IEC 61034-2 | No dense smoke |

Construction

| | | |
|-------------------|--|---------------------------------|
| Loose tube | Ø4.0 mm jelly filled loose tube green colored with up to 2 - 24 fibres | |
| Fibre colour code | 1 Red | 13 Yellow w/mark per 100 mm |
| | 2 Green | 14 White w/mark per 100 mm |
| | 3 Blue | 15 Grey w/mark per 100 mm |
| | 4 Yellow | 16 Turquoise w/mark per 100 mm |
| | 5 White | 17 Orange w/mark per 100 mm |
| | 6 Grey | 18 Pink w/mark per 100 mm |
| | 7 Brown | 19 Yellow w/mark every 50 mm |
| | 8 Violet | 20 White w/mark every 50 mm |
| | 9 Turquoise | 21 Grey w/mark every 50 mm |
| | 10 Black | 22 Turquoise w/mark every 50 mm |
| | 11 Orange | 23 Orange w/mark every 50 mm |
| | 12 Pink | 24 Pink w/mark every 50 mm |
| Fire barrier | Tape(s) | |
| Strength member | Water blocked E-Glass fibre elements | |
| Ripcord | 1 | |
| Inner sheath | 2.5 mm black LSHF-FR sheath according to EN 50290-2-27 , UV stabilised | |



Application

The application of this cable is circumstances where a very high degree of fire safety is required as the cable will function during a fire, has limited fire spread, has limited smoke generation and is halogen free.

The typical installation environment is indoor and indoor/outdoor in and between public buildings, in tunnels, metro lines and other places where one need very high degree of fire safety and support for critical communication.

This cable is also suitable shipboard application. The primary means of installation is on cable ladders, raceways and cable trays. The cable may also be pulled or blown into ducts over short distances. The cable can be installed outdoor in the open, but shall be not be installed directly exposed the sun.

Standards

- ISO 11801 2nd edition, EN 50173-1:2002, IEC 60794-1

Fire Rating

- IEC 60332-1, IEC 60332-3-24, IEC 61034-2, IEC 60754-1/2

Physical Properties

| Property | Test method | Value |
|---------------------------------------|-------------|--|
| Nominal outer diameter | - | 12.1 mm |
| Nominal weight | - | 167 kg/km |
| Maximum installation tensile strength | E1 | 2000 N ($\Delta l/l$ fibre 0.5%, $\Delta \alpha$ reversible) * |
| Compressive strength (crush) | E3 | 1500 N / 100 mm, max 5 min ($\Delta \alpha$ reversible) * |
| Impact | E7 | No fibre break, 5 Nm, 3 impacts, r=300mm |
| Torsion | E7 | 5 cycles \pm 1 turn |
| Kink | E10 | The cables do not form a kink when a loop is drawn together to a diameter of 20xD (Cable diameter) mm |
| Min. bending radius, unloaded | E11 | R = 121 mm |
| Min. bending radius, loaded | - | R = 240 mm |
| Temperature range | F1 | Storage: -30°C to +60°C Installation: 0°C to +50°C Operation: -25°C to +70°C. ($\Delta \alpha$ 0.05 dB /km)** |
| Water penetration | F5B | No water leakage after 24 hour, sample=3m, water=1m |

* Values for single-mode fibres, all optical measurements performed at 1550 nm,

** Values for multi-mode fibres, all optical measurements performed at 850 nm or 1300 nm with 0.10 dB as threshold (tensile and crush will not be performed for MM fibres)

Ordering Information

| P/N | Product Description | P.U |
|-------------|---|----------|
| A/I-DQ(ZN)H | Indoor/outdoor non-metallic LSHF-FR sheathed optical cable with 2-24 fibres | 4km/drum |

3.5 Firetuf™



Application

The application of this cable is circumstances where a very high degree of fire safety is required as the cable will function during a fire, has limited fire spread, has limited smoke generation and is halogen free.

The typical installation environment is indoor and indoor/outdoor in and between public buildings, in tunnels, metro lines and other places where one need very high degree of fire safety and support for critical communication.

This cable is also suitable for shipboard application. The steel tape armouring makes the cable rodent proof.

The primary means of installation are on cable ladders, raceways and cable trays. The cable may however also be directly buried. The cable can be installed outdoor in the open, but shall be not be installed directly exposed the sun.

Standards

- ISO 11801, EN 50173

Fire Rating

- IEC 60332-1, IEC 60332-3-24, IEC 61034-2, IEC 60754-1/2

Firetuf™ OFC-UT-CST Fire Resistant Armoured Central Tube Cable

Indoor/Outdoor steel tape armoured (CST) double LSHF-FR sheathed optical cable with 2 - 24 fibres.
VDE: A/I-DQ(ZN)H(SR)H



Fire Rating

Fire resistance tests

| | |
|------------------------|--|
| IEC 60331-25 (120) | Fire resistance: 120 minutes at 750 °C (No fibre break) |
| EN 50200 PH 120 | Fire resistance with fire and impact 120 minutes 830 °C (No fibre break) |
| EN 50200 ANNEX E PH 30 | Fire resistance until 15 minutes of fire and impact alone , followed by 15 minutes of fire , impact and water spray at 830 °C (No fibre break) |
| BS 8434 - 2 | Fire resistance until 60 minutes of fire and impact alone , followed by 60 minutes of fire , impact and water spray at 930 °C (No fibre break) |

Flame retardant tests

| | |
|---------------|---------------------------|
| IEC 60332-1-2 | Single vertical wire test |
|---------------|---------------------------|

Flame propagation test

| | |
|-----------------------------|---|
| IEC 60332-3-24 = IEC 332-3C | Vertically-mounted bunched wires and cables |
|-----------------------------|---|

Halogen acid & gas tests

| | |
|-------------|-----------------|
| IEC 60754-1 | No halogens |
| IEC 60754-2 | No acid matters |

Smoke emission tests

| | |
|-------------|----------------|
| IEC 61034-2 | No dense smoke |
|-------------|----------------|

Construction

| | | | |
|-------------------|---|---------------------------------|--|
| Loose tube | Ø 4.0 mm jelly filled loose tube green colored with up to 2 - 24 fibres | | |
| Fibre colour code | 1 Red | 13 Yellow w/mark per 100 mm | |
| | 2 Green | 14 White w/mark per 100 mm | |
| | 3 Blue | 15 Grey w/mark per 100 mm | |
| | 4 Yellow | 16 Turquoise w/mark per 100 mm | |
| | 5 White | 17 Orange w/mark per 100 mm | |
| | 6 Grey | 18 Pink w/mark per 100 mm | |
| | 7 Brown | 19 Yellow w/mark every 50 mm | |
| | 8 Violet | 20 White w/mark every 50 mm | |
| | 9 Turquoise | 21 Grey w/mark every 50 mm | |
| | 10 Black | 22 Turquoise w/mark every 50 mm | |
| | 11 Orange | 23 Orange w/mark every 50 mm | |
| | 12 Pink | 24 Pink w/mark every 50 mm | |
| Fire barrier | Tape(s) | | |
| Strength member | Water blocked E-Glass fibre elements | | |
| Ripcord | 1 | | |
| Inner sheath | 2.5 mm black LSHF-FR sheath according to EN 50290-2-27 , UV stabilised | | |
| Armouring | Coated and corrosion protected corrugated steel tape (CST), thickness 0.15 mm | | |
| Ripcord | 1 | | |
| Outer sheath | 1.4 mm black LSHF-FR sheath according to EN 50290-2-27, UV stabilised | | |

Physical Properties

| Property | Test method | Value |
|---------------------------------------|-------------|---|
| Nominal outer diameter | - | 17 mm |
| Nominal weight | - | 351 kg/km |
| Maximum installation tensile strength | E1 | 2500 N ($\Delta I/I$ fibre 0.5%, $\Delta \alpha$ reversible) * |
| Compressive strength (crush) | E3 | 2500 N / 100 mm, max 5 min ($\Delta \alpha$ reversible) * |
| Impact | E7 | 10 Nm, No fibre break, 3 impacts, r=300mm, |
| Torsion | E7 | 5 cycles \pm 1 turn |
| Kink | E10 | The cables do not form a kink when a loop is drawn together to a diameter of 20xD (Cable diameter) mm |
| Min. bending radius, unloaded | E11 | R = 255 mm |
| Min. bending radius, loaded | - | R = 340 mm |
| Temperature range | F1 | Storage: -40°C to +80°C Installation: 0°C to +50°C Operation: -40°C to +70°C. ($\Delta \alpha$ 0.05 dB / km)** |
| Water penetration | F5B | No water leakage after 24 hour, sample=3m, water=1m, |

* Values for single-mode fibres, all optical measurements performed at 1550 nm.

** Values for multi-mode fibres, all optical measurements performed at 850 nm or 1300 nm with 0.10 dB as threshold (tensile and crush will not be performed for MM fibres)

Ordering Information

| P/N | Product Description | P.U |
|------------------|---|----------|
| A/I-DQ(ZN)H(SR)H | Indoor/outdoor steel tape armoured (CST) double LSHF-FR sheathed optical cable with 2-24 fibres | 4km/drum |

12-96 Core Firetuf™ I10S Fire Resistant Fibre Optic Cable, LSZH

Features

- **Central strength member (CSM)** : steel wire with plastic coating when needed.
- **Tube**: thermoplastic material, containing up 4,6 or 12 optical fibres and filled with a suitable water tightness compound.
- **Stranding**: The required numbers of elements (tubes or fillers) are SZ stranded around the central strength member.
- **Longitudinal Water Tightness**: Water Blocking Tape & Yarn.
- **Fire Barriers**: Inner & outer special fire blocking tapes.
- **Armours**: Inner & outer corrugated steel tapes.
- **Sheaths**: Inner & outer LSZH

Technical Data

| No. of Fibres | | 4,6,12,24 | 36,48,72 | 96 |
|--|-------|---|-----------------------|--------------|
| Design (Elements × Fibres per Tube) | | Up to 4x6 | 6x6, 4x12, 6x12 | 8x12 |
| Loose Tube / Filler-Ø | mm | 2.1 | 2.1 | 2.1 |
| CSM / sheath diameter | mm | 2.0 | 2.2 | 2.0/3.5 |
| Inner sheath thickness | mm | 1.0 nominal | 1.0 nominal | 1.0 nominal |
| Outer sheath thickness | mm | 2.0 nominal | 2.0 nominal | 2.0 nominal |
| Cable Diameter | mm | 15.3 nominal | 15.3 nominal | 16.8 nominal |
| Cable Weight | kg/km | 300 | 317 | 340 |
| Max installation tension | N | 3000 | | |
| Min. bending radius | mm | Without Tension | Under Maximum Tension | |
| | | 10 x Cable-Ø | 20 x Cable-Ø | |
| Temperature range | °C | Installation | Transport & Storage | Operation |
| Flame Retardant | | -10->+60; | -10->+60; | -10->+60; |
| Fire Resistance | | IEC 60332-3-24 | | |
| | | IEC60331-25, In house test up to 800°C, 2hrs. | | |

Please refer to our General Installation, Safety & Handling recommendations before handling.



Application

The application of this cable is circumstances where a very high degree of fire safety is required as the cable will function during a fire, has limited fire spread, has limited smoke generation and is halogen free. Widely used in Industrial environment due to its robust construction.

Standards

- EN 60794-3-10

Fire Rating

- IEC 60332-1, IEC 61034-2, IEC 60754-1/2

Optional

- Armouring SWA or SWB

Main Characteristics

| Test | Standard | Value | Sanction* |
|----------------------------------|-------------------|----------------|-------------------------------------|
| Max. installation tension | IEC 60794-1-2-E1 | 3000 N | fibre strain ≤ 0.33%, Δα reversible |
| Crush (short term) | IEC 60794-1-2-E3 | 3000 N / 100mm | Δα ≤ 0.3 dB(MM), 0.1 dB(SM) |
| Temperature range | IEC 60794-1-2-F1 | 40->+70°C | Δα ≤ 0.3 dB/km(MM), 0.1 dB/km(SM) |
| Water Penetration | IEC 60794-1-2-F5B | 40->+70°C | No water leakage after 24 hour |

* values for single-mode fibres, all optical measurements performed at 1550 nm.

* values for multi-mode fibres, all optical measurements performed at 1300 nm

Ordering Information

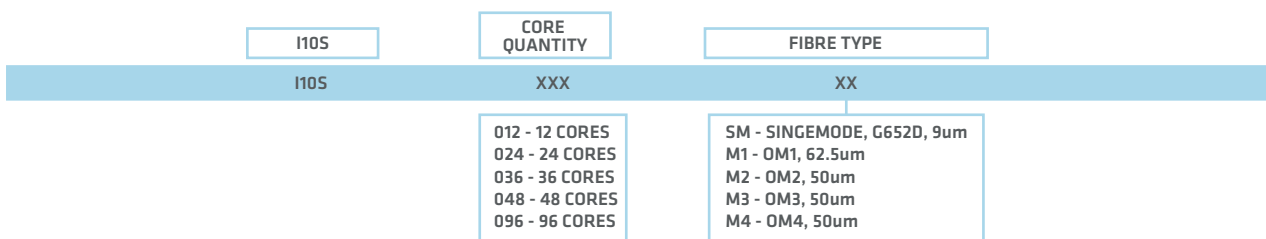
FIRETUF® I10S Fire Resistant FO Cable part numbers are made up using the table below.

The part number always starts with the letters I10S to denote that it is a FIRETUF® I10S Fire Resistant FO Cable. This is followed by 3 numbers which symbolises the core quantity and then 2 letters to denote the fibre type.

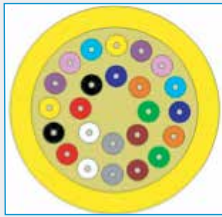
Example of a I10S part number:

I10S024M1

The above example describes an OM1 (50um) FIRETUF® I10S Fire resistance FO Cable, with 24 cores.



3.6 Fibre Optic Cables



Overview

One of the most widely used UC^{FIBRE}® Indoor cable, MT series is excellent for indoor installation that provides a safe setup against flame propagation and its flexible yet robust construction makes installation at ease.

Additional Options

- PVC Sheath for indoor applications
- PE Sheath for outdoor applications
- Steel Wire Braiding for armouring protection.

Fire Rating

- IEC 60332-1, IEC 61034-2, IEC 60754-1/2

UC^{FIBRE}® MT SERIES

2-24 Cores, Indoor Tight Buffer Distribution Cable, LSZH

Features

- **Tight buffer** : Each fibre is coated to 0.9mm with LSZH
- **Strength Member** : Aramid yarn
- **Outer Sheath** : LSZH compliant to IEC 61034, IEC 60754-1&2, IEC 60332-1 & 60332-3-24
- **Suitable for indoor installation requiring flame retardant, low smoke and halogen free environment**

Main Characteristics

| Test | Standard | Value | Sanction* |
|--|------------------|-------------------------------------|--|
| Maximum installation load (a few hours) | IEC 60794-1-2-E1 | 1000 N (2F-8F), 1200N (12F, 24F) | Fibre strain ≤ 0.6%, Δα reversible |
| Short term tensile strength (some days) | IEC 60794-1-2-E1 | 600N | Fibre strain ≤ 0.4%, Δα reversible |
| Max operation tension | IEC 60794-1-2-E1 | 280N (2F-12F), 340N (24F) | Fibre strain ≤ 0.2%, Δα ≤ 0.4 dB(MM), ≤0.30(SM) |
| Crush (short term) | IEC 60794-1-2-E3 | 1000 N / 100mm | Δα ≤ 0.4 dB(MM), ≤0.30(SM), no damage |
| Temperature range | IEC 60794-1-2-F1 | -20 -> +70°C | Δα ≤ 0.6 dB / km(MM), ≤ 0.40dB/km(SM) |

* values for multi-mode fibres, all optical measurements performed at 1300 nm
values for single-mode fibres, all optical measurements performed at 1550 nm

Technical Data

| No. of Fibres | | 2,4,6 | 8 | 12 | 24 |
|-------------------------------|---------|---------------------------------|--------------------------------------|---------------------------------------|-------------------------|
| Design | | 1×6 TB | 1×8 TB | 1×12 TB | 1×24 TB |
| Tight buffer | mm | 0.9 ± 0.05 | 0.9 ± 0.05 | 0.9 ± 0.05 | 0.9 ± 0.05 |
| Outer sheath thickness | mm | 0.7 nominal | 0.75 nominal | 0.75 nominal | 0.9 nominal |
| Cable Nominal Diameter | mm | 4.8 nominal | 5.4 nominal | 6.2 nominal | 8.8 nominal |
| Cable Weight | kg / km | 20 | 26 | 33 | 60 |
| Min. bending radius | mm | Without Tension 10 × Cable-Ø | | Under Maximum Tension 20 × Cable-Ø | |
| Temperature range | °C | Installation -10 -> +60; | Transport. & Storage -40 -> +70 ; | | Operation -20 -> +70 |
| Flame Retardant | | IEC 60332-3-24 | | | |

Ordering Information

UC^{FIBRE}® MT SERIES FO Cable part numbers are made up using the table below.

The part number always starts with the letters MT to denote that it is a UC^{FIBRE}® MT SERIES FO Cable. This is followed by 3 numbers which symbolises the core quantity and then 2 letters to denote the fibre type.

Example of a UC^{FIBRE}® MT SERIES FO Cable part number:

MT008M1

The above example describes an OM1 (62.5um, Orange Sheath) UC^{FIBRE}® MT SERIES FO Cable, with 8 cores.

| MT SERIES | CORE QUANTITY | FIBRE TYPE |
|-----------|--|--|
| MT | XXX | XX |
| | 002 - 2 CORES 004 - 4 CORES 006 - 6 CORES 008 - 8 CORES 012 - 12 CORES | SM - SINGEMODE, G652D, 9um (yellow sheath) M1 - OM1, 62.5um (orange sheath) M2 - OM2, 50um (orange sheath) M3 - OM3, 50um (aqua sheath) M4 - OM4, 50um (aqua sheath) |

UCFIBRE® MT SERIES

36,48,96 Cores, Indoor Tight Buffer Distribution Cable, LSZH

3.6 Fibre Optic Cables

Features

- **Tight buffer:** Each fibre is coated to 0.9mm with LSZH.
- **Strength Member:** Aramid yarn within each sub-unit
- **Sub-unit sheath:** LSZH material
- **Central Strength Member:** FRP with up-coating
- **Core Wrapping:** Polyester tape
- **Outer Sheath:** LSZH compliant to IEC 61034, IEC 60754-1&2, IEC 60332-1 & 60332-3-24
- **Suitable for Indoor Flame Retardant, Low Smoke and Halogen Free Environment**

Main Characteristics

| Test | Standard | Value | Sanction* |
|--|------------------|--------------------------------|--|
| Maximum installation load (a few hours) | IEC 60794-1-2-E1 | 4200 N (36F, 48F), 6600N (96F) | Fibre strain ≤ 0.6%, Δα reversible |
| Short term tensile strength (some days) | IEC 60794-1-2-E1 | 2800 N (36F, 48F), 4400N (96F) | Fibre strain ≤ 0.4%, Δα reversible |
| Max operation tension | IEC 60794-1-2-E1 | 1400 N (36F, 48F), 2200N (96F) | Fibre strain ≤ 0.2%, Δα ≤ 0.4 dB(MM), ≤ 0.30(SM) |
| Crush (short term) | IEC 60794-1-2-E3 | 1000 N / 100mm | Δα ≤ 0.4 dB(MM), ≤ 0.30(SM), no damage |
| Temperature range | IEC 60794-1-2-F1 | -20 -> +70°C | Δα ≤ 0.6 dB /km(MM), ≤ 0.40dB/km(SM) |

* values for multi-mode fibres, all optical measurements performed at 1300 nm
values for single-mode fibres, all optical measurements performed at 1550 nm



Overview

One of the most widely used UCFIBRE® Indoor cable, MT series is excellent for indoor installation that provides a safe setup against flame propagation and its flexible yet robust construction makes installation at ease.

Additional Options

- PVC Sheath for indoor applications
- PE Sheath for outdoor applications
- Steel Wire Braiding for armouring protection.

Fire Rating

- IEC 60332-1, IEC 60332-3-24, IEC 61034-2, IEC 60754-1/2

Technical Data

| No. of Fibres | | 36 | 48 | 96 |
|----------------------------------|-------|---------------------------------|--------------------------------------|---------------------------------------|
| Design | | 6x6 TB | 4x12 TB | 8x12 TB |
| Tight buffer | mm | 0.9 ± 0.05 | 0.9 ± 0.05 | 0.9 ± 0.2 |
| Sub-unit Diameter | mm | 4.8 ± 0.2 | 6.0 ± 0.2 | 6.0 ± 0.2 |
| Cable Nominal Diameter | mm | 0.7 nominal | 0.65 nominal | 0.65 nominal |
| Sub-unit sheath thickness | mm | 1.4 nominal | 1.4 nominal | 1.5 nominal |
| Outer sheath thickness | mm | 17.7 ± 1.5 | 17.9 ± 1.5 | 25.3 ± 1.5 |
| Cable Outer Diameter | kg/km | 276 | 244 | 538 |
| Min. bending radius | mm | Without Tension 10 × Cable-Ø | | Under Maximum Tension 20 × Cable-Ø |
| Temperature range | °C | Installation -10 -> +60; | Transport. & Storage -40 -> +70 ; | Operation -20 -> +70 |
| Flame Retardant | | IEC 60332-3-24 | | |

Please refer to our General Installation, Safety & Handling recommendations before handling.

Ordering Information

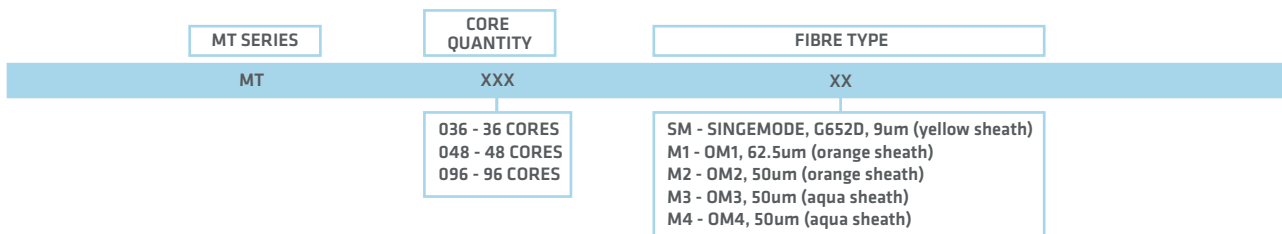
UCFIBRE® MT SERIES FO Cable part numbers are made up using the table below.

The part number always starts with the letters MT to denote that it is a UCFIBRE® MT SERIES FO Cable. This is followed by 3 numbers which symbolises the core quantity and then 2 letters to denote the fibre type.

Example of a UCFIBRE® MT SERIES FO Cable part number:

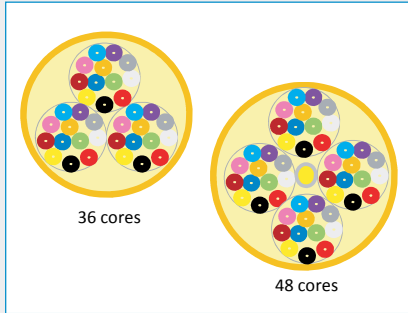
MT036M1

The above example describes an OM1 (62.5um, Orange Sheath) UCFIBRE® MT SERIES FO Cable, with 36 cores.



UC^{FIBRE}® MTC SERIES, 36 & 48 Cores, COMPACT Indoor

Tight Buffer Distribution Cable, LSZH



Fire Rating

- IEC 60332-1, IEC 60332-3-24, IEC 61034-2, IEC 60754-1/2

Features

- **Tight buffer:** Each fibre is coated to 0.9mm with LSZH.
- **Strength Member:** Aramid yarn
- **Core Wrapping:** Polyester tape
- **Outer Sheath:** LSZH compliant to IEC 61034, IEC 60754-1&2, IEC 60332-1 & 60332-3-24.
- **Suitable for Indoor Flame Retardant Environment.**
- **Up to 40% more compact & lighter than standard indoor types but with lesser tensile load.**

Main Characteristics

| Test | Standard | Value | Sanction* |
|---|------------------|-------------------|---|
| Maximum installation load (a few hours) | IEC 60794-1-2-E1 | 1300 N (36F, 48F) | Fibre strain ≤ 0.6%, Δα reversible |
| Short term tensile strength. (some days) | IEC 60794-1-2-E1 | 1300 N (36F, 48F) | Fibre strain ≤ 0.4%, Δα reversible |
| Max operation tension | IEC 60794-1-2-E1 | 400 N (36F, 48F) | Fibre strain ≤ 0.2%, Δα ≤ 0.4 dB(MM), ≤0.30(SM) |
| Crush (short term) | IEC 60794-1-2-E3 | 1000 N / 100mm | Δα ≤ 0.4 dB(MM), ≤0.30(SM), no damage |
| Temperature range | IEC 60794-1-2-F1 | -20 -> +70°C | Δα ≤ 0.6 dB / km(MM), ≤ 0.30dB/km(SM) |

* values for multi-mode fibres, all optical measurements performed at 1300 nm
values for single-mode fibres, all optical measurements performed at 1550 nm

Technical Data

| No. of Fibres | | 36 | 48 |
|-------------------------------|---------|---------------------------------|---|
| Design | | 6x6 TB | 4x12 TB |
| Tight buffer Size | mm | 0.9 ± 0.05 | 0.9 ± 0.05 |
| Outer sheath thickness | mm | 1.2 nominal | 1.2 nominal |
| Cable Outer Diameter | mm | 11.0± 1.5 | 12± 1.5 |
| Cable Weight | mm | 100 | 140 |
| Min. bending radius | kg / km | Without Tension 10 × Cable-Ø | Under Maximum Tension 20 × Cable-Ø |
| Temperature range | °C | Installation -10 -> +60; | Transport. & Storage -40 -> +70 ; Operation -20 -> +70 |
| Flame Retardant | | IEC 60332-3-24 (3C) | |

Ordering Information

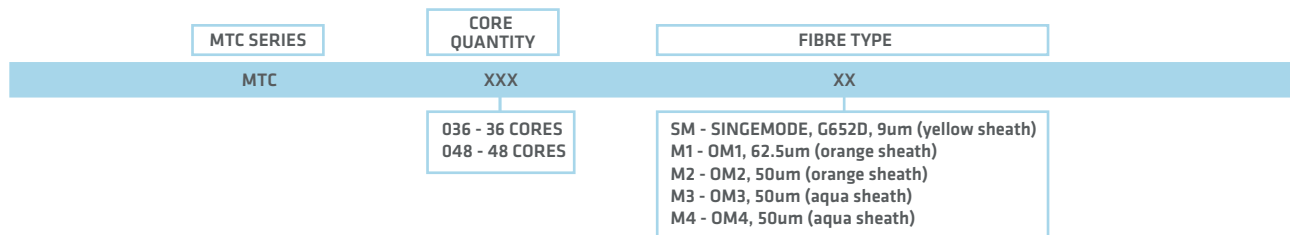
UC^{FIBRE}® MTC SERIES FO Cable part numbers are made up using the table below.

The part number always starts with the letters MTC to denote that it is a UC^{FIBRE}® MTC SERIES FO Cable. This is followed by 3 numbers which symbolises the core quantity and then 2 letters to denote the fibre type.

Example of a UC^{FIBRE}® MTC SERIES FO Cable part number:

MTC048M4

The above example describes an OM4 (50um, Aqua Sheath) UC^{FIBRE}® MTC SERIES FO Cable, with 48 cores.



UC^{FIBRE}® MB SERIES

2-12 Core, Indoor, Breakout, Tight Buffer Distribution Cable, LSZH

3.6 Fibre Optic Cables

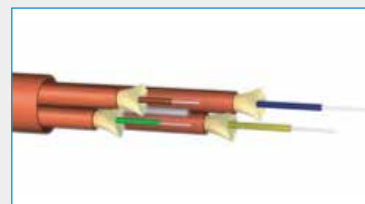
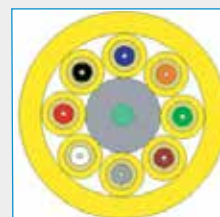
Features

- **Buffer Coating** : LSZH, 0.9mm tight buffered fibre.
- **Strength Member** : Aramid yarn within each sub-unit
- **Sub-unit sheath** : LSZH
- **Central Strength Member** : FRP with up-coating when needed
- **Outer Sheath** : LSZH compliant to IEC 61034, IEC 60754-1&2, IEC 60332-1 & 60332-3-24
- Easy to strip and excellent for use in indoor installations requiring efficient terminations, and also in flame retardant, low smoke and halogen free environments.

Main Characteristics

| Test | Standard | Value | Sanction* |
|---|------------------|----------------|--|
| Maximum Tension at installation (short term) | IEC 60794-1-2-E1 | 600N | $\Delta I/I$ fibre $\leq 0.6\%$, $\Delta\alpha$ reversible |
| Tension opération max (long term) | IEC 60794-1-2-E1 | 198N | $\Delta I/I$ fibre $\leq 0.2\%$, $\Delta\alpha \leq 0.30$ dB(SM)/ 0.40 dB(MM) |
| Crush | IEC 60794-1-2-E3 | 1000 N / 100mm | $\Delta\alpha \leq 0.30$ dB(SM)/ 0.40 dB(MM) , cable integrity |

* values for multi-mode fibres, all optical measurements performed at 1300 nm
 values for single-mode fibres, all optical measurements performed at 1550 nm



Overview

MB Series provides easy stripping and terminations in indoor application due to its unique tight buffering of each fibre unit.

Additional Options

- PVC Sheath (MBV Series) for indoor applications
- PE Sheath (MBP Series) for outdoor applications
- Steel Wire Braiding (MBB Series) for armouring protection

Fire Rating

- IEC 60332-1, IEC 60332-3-24, IEC 61034-2, IEC 60754-1/2

Technical Data

| No. of Fibres | | 2,4 | 6 | 8 | 12 |
|----------------------------------|---------|---------------------------------|-----------------|---------------------------------------|-------------------------|
| Design | | Breakout | | | |
| Buffer Diameter - Ø | mm | 0.9 ± 0.05 | 0.9 ± 0.05 | 0.9 ± 0.05 | 0.9 ± 0.05 |
| CSM/sheath diameter | mm | 1.0 nominal | 1.0/2.2 nominal | 2.0/3.5 nominal | 2.0/6.2 nominal |
| Sub-unit sheath thickness | mm | 0.35 nominal | 0.35 nominal | 0.35 nominal | 0.35 nominal |
| Sub-units diameter | mm | 2.0 ± 0.15 | 2.0 ± 0.15 | 2.0 ± 0.15 | 2.0 ± 0.15 |
| Outer sheath thickness | mm | 1.0 nominal | 1.0 nominal | 1.0 nominal | 1.0 nominal |
| Cable Diameter (AxB) | mm | 7.0 ± 0.5 | 8.2 ± 0.5 | 9.9 ± 0.5 | 12.3 ± 0.5 |
| Cable Weight | kg / km | 48 | 64 | 89 | 149 |
| Min. bending radius | | Without Tension 10 × Cable-Ø | | Under Maximum Tension 20 × Cable-Ø | |
| Temperature range | °C | Installation -10 -> +60; | | Transport. & Storage -40 -> +70 ; | Operation -20 -> +70 |
| Flame Retardant | | IEC 60332-1, IEC60332-3-24 | | | |

Ordering Information

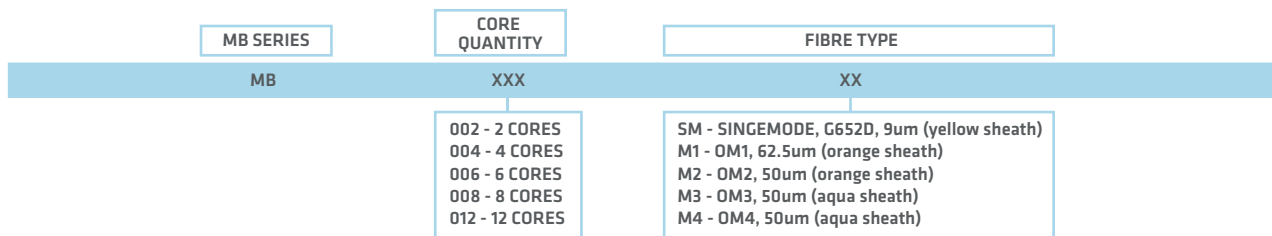
UC^{FIBRE}® MB SERIES FO Cable part numbers are made up using the table below.

The part number always starts with the letters MB to denote that it is a UC^{FIBRE}® MB SERIES FO Cable. This is followed by 3 numbers which symbolises the core quantity and then 2 letters to denote the fibre type.

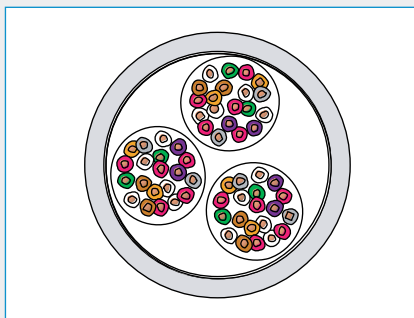
Example of a UC^{FIBRE}® MB SERIES FO Cable part number:

MB008M3

The above example describes an OM3 (50um, Aqua Sheath) UC^{FIBRE}® MB SERIES FO Cable, with 8 cores.



3.7 Multi-Pair Category Cables



Application

Supports up to 100Base-T4, 16MHz frequency range. Suitable for Telephony & Security applications.

Standards

- IEC 61156, ISO/IEC 11801 /1995, TIA/EIA 568-B

Fire Rating

PVC IEC 60332-1
 LSZH IEC 60332-1, IEC 61034-2, IEC 60754-1/2

*Category 5 multipairs available upon request.

Category 3 UTP Multipairs

U/UTP Data Cable

Construction

| | | | | |
|------------------------|--|-----------------------|-----------------------|----------|
| Conductor | Solid bare copper wire, diameter 0.45 mm | | | |
| Insulation | High-density polyethylene HDPE | | | |
| Stranding | 25 pairs stranded to sub units. Cables with 100 pairs are built up with 1st layer: 3 basic units, 2nd layer: 7 basic units | | | |
| Sub-units no. | One | Two | Three | Four |
| Pair no. | 1 ~ 25 | 26 ~ 50 | 51 ~ 75 | 75 ~ 100 |
| Identification | Pair 1 Blue-White | Pair 10 Grey-Red | Pair 19 Brown-Yellow | |
| | Pair 2 Orange-White | Pair 11 Blue-Black | Pair 20 Grey-Yellow | |
| | Pair 3 Green-White | Pair 12 Orange-Black | Pair 21 Blue-Violet | |
| | Pair 4 Brown-White | Pair 13 Green-Black | Pair 22 Orange-Violet | |
| | Pair 5 Grey-White | Pair 14 Brown-Black | Pair 23 Green-Violet | |
| | Pair 6 Blue-Red | Pair 15 Grey-Black | Pair 24 Brown-Violet | |
| | Pair 7 Orange-Red | Pair 16 Blue-Yellow | Pair 25 Grey-Violet | |
| | Pair 8 Green-Red | Pair 17 Orange-Yellow | - | |
| | Pair 9 Brown-Red | Pair 18 Green-Yellow | - | |
| Wrapping | Polyester | | | |
| Sheath | PVC Black, also available on request with LSZH or PE | | | |
| Outer Diameter | Nom. 11.05(25pair) - 21.14(100pair PVC) mm | | | |
| Tensile force N | Nom. 500(25pair) - 2000(100pair PVC) | | | |

Mechanical Properties

| | | |
|-------------------------------|--------------------------|----------------------------|
| Minimum bending radius | Without load | 15 x D (D= outer diameter) |
| Temperature | Installation Temperature | -20° C to 50° C |
| | Operating temperature | -20° C to +60° C |

Electrical Properties at 20°C

| | |
|--|-----------------|
| Maximum DC Resistance | ≤ 95 Ω / km |
| Minimum Insulation DC Resistance | ≥ 5000 M Ω . km |
| Dielectric Strength (DC) | 1KV / min |
| Conductor resistance maximum unbalance percentage | ≤ 2.5 % |

Electrical Data at 20°C

| Frequency (MHZ) | Max. Insertion Loss (dB) (nominal value) | Min. Return Loss (dB) | Min. NEXT (Test length> 300 m) (dB) (nominal value) | Min. ELFEXT (dB/100m) | Min. PSELFEXT (dB/100m) | Max. DELAY (dB/100m) |
|-----------------|---|-----------------------|--|-----------------------|-------------------------|----------------------|
| 1 | 26 | 12 | 41 | 39 | 39 | 570 |
| 4 | 56 | 12 | 32 | 27 | 27 | 552 |
| 8 | 6.7 | 12 | 28 | 21 | 21 | 547 |
| 10 | 98 | 12 | 26 | 19 | 19 | 545 |
| 16 | 131 | 12 | 23 | 15 | 15 | 543 |

Technical Data

| Type | Outer diameter mm | Standard delivery length m | Tensile force N |
|----------------------------|-------------------|----------------------------|-----------------|
| 25 x 2 x 0.45 Cat. 3 PVC | 11.05 ± 1.0 | 500 | 500 |
| 50 x 2 x 0.45 Cat. 3 PVC | 15.50 ± 1.0 | 500 | 1000 |
| 100 x 2 x 0.45 Cat. 3 PVC | 21.14 ± 1.0 | 500 | 2000 |
| 25 x 2 x 0.45 Cat. 3 LSZH | 11.04 ± 1.0 | 500 | 500 |
| 50 x 2 x 0.45 Cat. 3 LSZH | 15.50 ± 1.0 | 500 | 1000 |
| 100 x 2 x 0.45 Cat. 3 LSZH | 21.14 ± 1.0 | 500 | 2000 |

Ordering Information

| P/N | Product Description | P.U |
|--------------|--|-----------|
| ISV Series | Cat 3 U/UTP, Multipairs, Indoor, PE/PVC, 2~200 prs* | 500m/drum |
| ISAV Series | Cat 3 F/UTP, Multipairs, Indoor, PE/APL/PVC, 2~100 prs** | 500m/drum |
| ISM Series | Cat 3 U/UTP, Multipairs, Indoor, PE/LSZH 2~200 prs* | 500m/drum |
| ISAM Series | Cat 3 F/UTP, Multipairs, Indoor, PE/APL/LSZH 2~100 prs** | 500m/drum |
| OSP Series | Cat 3 U/UTP, Multipairs, Outdoor, PE/PE 2~200 prs* | 500m/drum |
| OSAP Series | Cat 3 F/UTP, Multipairs, Outdoor, PE/APL/PE 2~100 prs** | 500m/drum |
| OSJP Series | Cat 3 U/UTP, Multipairs, Outdoor, PE/JF/PE 2~200 prs* | 500m/drum |
| OSJAP Series | Cat 3 F/UTP, Multipairs, Outdoor, PE/JF/APL/PE 2~100 prs** | 500m/drum |

*Available in X pairs x 0.5mm; X = 2, 5, 10, 20, 25, 30, 40, 50, 100, 200

**Available in Y pairs x 0.5mm; X = 2, 5, 10, 20, 25, 30, 40, 50, 100

Category 5e Multipairs

U/UTP Symmetrical Data Cable

3.7 Multi-Pair Category Cables

Construction

| | |
|------------------------|--|
| Conductor | Bare copper wire, diameter 0.50 mm (AWG24) |
| Insulation | PE, diameter 0.95 mm |
| Twisting | 2 cores to pair, diameter 1.9 mm |
| Identification | The cable is produced with central filler with the pairs surrounding the central point in each Unit and cable; The cable is produced with 5 Units of 10 pairs. Units identified using a colour ID tape. Pair 1 Blue-White Pair 10 Grey-Red Pair 2 Orange-White Pair 3 Green-White Pair 4 Brown-White Pair 5 Grey-White Pair 6 Blue-Red Pair 7 Orange-Red Pair 8 Green-Red Pair 9 Brown-Red |
| Sheath | PVC or LSZH, diameter 15.5 mm grey, RAL 7035 |
| Outer Diameter | PVC or LSZH, diameter 15.5 mm |
| Weight | Nom. 15.5(25pair) - 35.8(100pair PVC) mm |
| Tensile force N | Nom. 207(25pair) LSZH - 920(100pair PVC) kg/km Nom. 500(25 pair) - 2000(100pair) |

Mechanical Properties

| | | |
|-------------------------------|------------------|------------------------------|
| Minimum bending radius | Without load | 10 x D (D= outer diameter) |
| Temperature | During operation | - 20° C to + 60° C |
| | During operation | 0° C to + 50° C |

Electrical Properties (Nominal) at 20°C

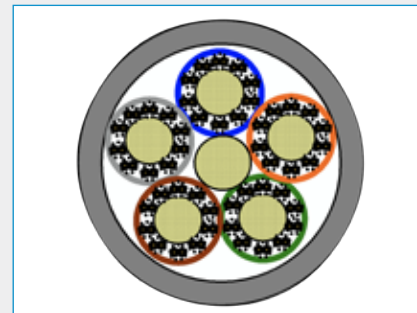
| | | |
|--|-------------|----------------|
| Loop resistance | - | ≤ 190 Ω/km |
| Resistance unbalance | - | ≤ 2% |
| Test voltage | core/core | 1000 VDC 1 min |
| Mutual capacitance | 800 Hz | Nom. 48 nF/km |
| Capacitance unbalance | pair/ground | ≤ 1500 pF/km |
| Mean characteristic impedance | 100 MHz | 100 Ω ± 5 Ω |
| Nominal velocity of propagation | - | ca. 67% |
| Insulation resistance | 500 V | ≥ 2000 MΩ*km |

Nominal Transmission Characteristics at 20°C

| F (MHZ) | Attenuation (dB/100m) | NEXT (dB) | PS-NEXT (dB) | ACR (dB/100m) | PS-ACR (dB/100m) | ELFEXT (dB/100m) | PS-ELFEXT (dB/100m) | Return loss (dB) |
|---------|-----------------------|-----------|--------------|---------------|------------------|------------------|---------------------|------------------|
| 1 | 1.9 | 71 | 68 | 69.1 | 66.1 | 68 | 65 | 20 |
| 4 | 3.7 | 62 | 59 | 58.3 | 55.3 | 56 | 53 | 23 |
| 10 | 6.0 | 56 | 53 | 50.0 | 47.0 | 48 | 45 | 25 |
| 16 | 7.6 | 53 | 50 | 45.4 | 42.4 | 44 | 41 | 25 |
| 20 | 8.5 | 51 | 48 | 42.5 | 39.5 | 42 | 39 | 25 |
| 31.2 | 10.7 | 49 | 46 | 38.3 | 35.3 | 38 | 35 | 24 |
| 62.5 | 15.7 | 44 | 41 | 28.3 | 25.3 | 32 | 29 | 22 |
| 100 | 19.8 | 41 | 38 | 21.2 | 18.2 | 28 | 25 | 20 |
| 125 | 22.3 | 40 | 37 | 17.7 | 14.7 | 26 | 23 | 19 |

Ordering Information

| P/N | Product Description | P.U |
|-----------|---|-----------|
| ISV5E2524 | Cat 5e U/UTP, Multipairs, Indoor, PE/PVC, 25pr x 24AWG | 500m/drum |
| ISV5E5024 | Cat 5e U/UTP, Multipairs, Indoor, PE/PVC, 50pr x 24AWG | 500m/drum |
| ISM5E2524 | Cat 5e U/UTP, Multipairs, Indoor, PE/LSZH 60332-1, 25pr x 24AWG | 500m/drum |
| ISM5E5024 | Cat 5e U/UTP, Multipairs, Indoor, PE/LSZH 60332-1, 50pr x 24AWG | 500m/drum |



Application

- IEEE 802.3: 10Base-T; 100Base-T; ISDN; xDSL
- IEEE 802.5 16 MB; ISDN; TPDDI; ATM155Mbit/s

Standards

- EN 50173, ISO/IEC 11801, IEC 56-5

Fire Rating

- PVC IEC 60332-1
LSZH IEC 60332-1, IEC 61034-2, IEC 60754-1/2

4. Broadcasting & Studio

Quality cables for the transmission of digital and analogue audio and video signals to professional levels

RANKED AS NUMBER ONE IN EUROPE, DRAKA IS A LEADING PROVIDER OF PROFESSIONAL BROADCAST AND STUDIO CABLES. SINCE 1958 DRAKA BROADCAST SOLUTIONS HAVE DELIVERED LEVELS OF TECHNICAL EXCELLENCE THAT HAVE PROVEN THEMSELVES IN PRACTICE UNDER THE MOST DEMANDING CONDITIONS.

Draka broadcast cables are optimally tailored to an information and entertainment market which is now spanning the analogue and digital world. Whether broadcasting a regional traffic report by a local radio station or the transmission of a World Class soccer into the world – the success of broadcast production always depends on the reliability of the audio, video, camera and lighting control cables. Draka has decades of experience in the cable manufacturing, research and development in close cooperation with broadcasting professionals.

Inspiring partnerships

Since the beginning of professional broadcasting, Draka has worked in close cooperation with leading national and international broadcasting companies. Leading edge solutions in the form of high-quality analogue, SDI, HDTV and hybrid fiber optic arise from these partnerships. With 30 billion viewers around the globe, the World Cup 2006 in Germany, for example, was the most-watched event in television history during a period of 4 weeks. Draka delivered the cables necessary for this new record and enabled broadcasts in HDTV for the first time. Draka also supported Euro Masters 2008 in Austria and Switzerland. Draka meets the specifications of national broadcasters as well as with AES/EBU, SMPTE, IEC, EN and VDE.

Leading sound studios are users of Draka cables. Superior quality of sound requires cutting edge technology where cabling is an essential link. In this field, Draka offers modern cable solutions for analogue and digital recording as well as for microphone and speaker cabling. As one of the world's leading manufacturers of passive network cables, Draka can guarantee the high efficiency of passive transmission cables which are produced using the latest technology. For live events, there is only a single chance for a successful performance. There is no alternative to absolute reliability. Draka offers the best solutions for lighting control, sound, microphone and speaker interconnections and can quickly respond to the requirements of production companies in order to guarantee an optimum live performance.

Comprehensive product line

The studio broadcast solutions of Draka comprise:

- High-precision analogue and digital 75 Ω video cables
- Analogue and digital multicore audio cables
- Microphone cables, speaker cables
- Lighting control and Sound cables
- Camera cables for studio and outdoor transmission
- Multicore camera cables
- Studio connecting cables
- Hybrid camera cables

4.1 Video Cables

| | |
|-------------------------|-----|
| HD PRO 0.6/2.8 AF | 96 |
| HD PRO 1.0/4.8 AF | 97 |
| HR PRO FLEX 1.0L/4.8 Dz | 98 |
| 0.8L/3.7 Dz | 99 |
| 1.6/7.3 AF | 100 |
| 1.2L/4.8 Dz | 101 |

4.2 Audio Cables

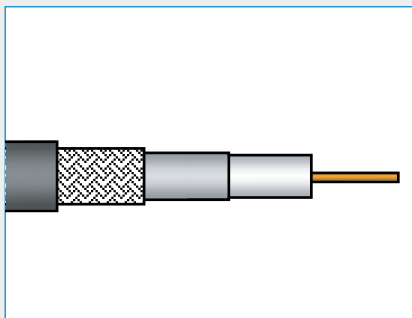
| | |
|---------------------------------|-----|
| AC10 SS 23/1 nxP | 102 |
| AC10 SS 26/7 x pairs | 103 |
| XLR PRO FLEX analogue / digital | 104 |

4.3 Camera Cables

| | |
|-----------------------------------|-----|
| Triax Cables | 105 |
| SMPTE 311M-HD-Hybrid-Camera Cable | 107 |

HD PRO 0.6/2.8 AF

HD Video Cable 75 Ω



Application

Video cables are primarily used in closed circuit TV systems and in several studio applications for transmission of image signals.

Standards

For analogue and digital video signals (Composite, component, SDI, SDV, SDTI, HDTV)

Fire Rating

FRNC: IEC 60332-1, IEC 60754, IEC 61034

Construction

| | |
|------------------------|---|
| Inner conductor | solid copper wire, bare, diameter 0.6 mm |
| Insulation | Foam-PE, diameter 2.8 mm |
| Outer conductor | Al-PET-Al-foil under tinned copper braid, diameter 3.4 mm |
| Sheath | FRNC, diameter 4.5 mm Anthracite |
| Printing | DRAKA - HD PRO 0.6/2.8 AF - 75 Ω ± 1% |

Electrical Properties at 20°C

| | | |
|---------------------------------|-----------------|---------------|
| DC resistance | Inner conductor | 61 Ω/km |
| | Outer conductor | 17 Ω/km |
| Mutual capacitance | - | 56 pF/m |
| Characteristic impedance | - | 75 Ω ± 0.75 Ω |
| Velocity ratio | - | 78 % |
| Screening factor | - | > 100 dB |

Electrical Data at 20°C

| Frequency (MHz) | Attenuation (dB/100m) | Frequency (MHz) | Return loss (dB) |
|-----------------|-----------------------|-----------------|------------------|
| 1 | 1.2 | 50 - 300 | ≥ 26 |
| 3 | 1.9 | 300 - 3000 | ≥ 22 |
| 5 | 2.5 | 3000 - 3500 | ≥ 18 |
| 10 | 3.5 | 3500 - 5000 | ≥ 15 |
| 30 | 5.9 | - | - |
| 100 | 10.0 | - | - |
| 200 | 14.1 | - | - |
| 300 | 17.8 | - | - |
| 500 | 24.0 | - | - |
| 800 | 29.7 | - | - |
| 1000 | 33.2 | - | - |
| 1500 | 39.6 | - | - |
| 2250 | 50.2 | - | - |
| 3000 | 60.9 | - | - |
| 3500 | 65.8 | - | - |
| 4000 | 69.8 | - | - |
| 4500 | 74.2 | - | - |
| 5000 | 78.9 | - | - |

Ordering Information

| P/N | Product Description | P.U |
|---------|--|------------|
| 1014488 | HD PRO 0.6/2.8 AF, HD Video Cable 75 Ω | 1000m/drum |

HD PRO 1.0/4.8 AF

HD Video Cable 75 Ω

4.1 Video Cables

Construction

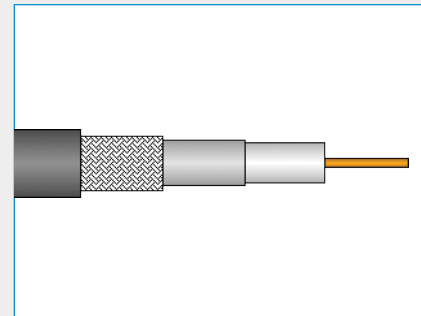
| | |
|------------------------|---|
| Inner conductor | Solid copper wire, bare, diameter 1.0 mm |
| Insulation | Foam-PE, diameter 4.8 mm |
| Outer conductor | Al-PET-Al-foil under tinned copper braid, diameter 5.6 mm |
| Sheath | FRNC diameter 7.0 mm Anthracite |
| Printing | DRAKA - HD PRO 1.0/4.8 AF - 75 Ω ± 1% |

Electrical Properties at 20°C

| | | |
|---------------------------------|-----------------|---------------|
| DC resistance | Inner conductor | 22 Ω/km |
| | Outer conductor | 7 Ω/km |
| Mutual capacitance | - | 56 pF/m |
| Characteristic impedance | - | 75 Ω ± 0.75 Ω |
| Velocity ratio | - | 78 % |
| Screening factor | - | ≥ 100 dB |

Electrical Data at 20°C

| Frequency (MHz) | Attenuation (dB/100m) | Frequency (MHz) | Return loss (dB) |
|-----------------|-----------------------|-----------------|------------------|
| 1 | 0.8 | 50 - 300 | ≥ 26 |
| 3 | 1.3 | 300 - 3000 | ≥ 22 |
| 5 | 1.6 | 3000 - 3500 | ≥ 18 |
| 10 | 2.1 | 3500 - 5000 | ≥ 15 |
| 30 | 3.5 | - | - |
| 100 | 6.2 | - | - |
| 200 | 8.9 | - | - |
| 300 | 11.3 | - | - |
| 500 | 14.8 | - | - |
| 800 | 18.5 | - | - |
| 1000 | 20.7 | - | - |
| 1500 | 24.9 | - | - |
| 2250 | 31.7 | - | - |
| 3000 | 37.3 | - | - |
| 3500 | 41.5 | - | - |
| 4000 | 47.2 | - | - |
| 4500 | 51.2 | - | - |
| 5000 | 55.1 | - | - |



Application

Video cables are primary used in closed circuit TV systems and in several studio applications for transmission of image signals.

Standards

For analogue and digital video signals (Composite, Component, SDI, SDV, SDTI, HDTV)

Fire Rating

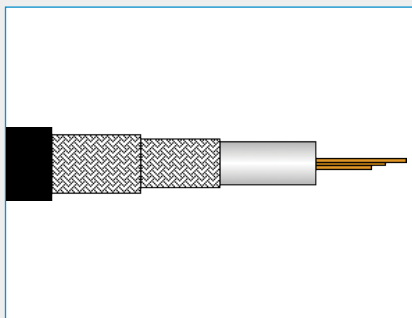
FRNC: IEC 60332-1; IEC 60754-2; IEC 61034

Ordering Information

| P/N | Product Description | P.U |
|---------|--|------------|
| 1014490 | HD PRO 1.0/4.8 AF, HD Video Cable 75 Ω | 1000m/drum |

HD PRO FLEX 1.0L/4.8 Dz

HD Video Cable 75 Ω



Application

Video cables are primary used in closed circuit TV systems and in studio applications.

Standards

For analogue and digital video signals (Composite, Component, SDI, SDV, SDTI, HDTV)

Construction

| | |
|------------------------|---|
| Inner conductor | Stranded copper wire, diameter 1.0 mm |
| Insulation | Foam-PE, diameter 4.8 mm |
| Outer conductor | 2xCu-braid, tinned |
| Sheath | DMC FLEX PVC diameter 7.0 mm black, RAL 9005 |
| Printing | DRAKA COMTEQ - HD PRO FLEX 1.0L/4.8Dz - 75 Ω ± 1% - HDTV |

Electrical Properties at 20°C

| | | |
|---------------------------------|-----------------|---------------|
| DC resistance | Inner conductor | 21 Ω/km |
| | Outer conductor | 5 Ω/km |
| Mutual capacitance | - | 56 pF/m |
| Characteristic impedance | - | 75 Ω ± 0.75 Ω |
| Velocity ratio | - | 67 % |
| Screening factor | - | > 90 dB |

Electrical Data at 20°C

| Frequency (MHz) | Attenuation (dB/100m) | Frequency (MHz) | Return loss (dB) |
|-----------------|-----------------------|-----------------|------------------|
| 1 | 0.5 | 50 - 300 | ≥ 26 |
| 10 | 1.9 | 300 - 3000 | ≥ 22 |
| 100 | 8.0 | 3000 - 3500 | ≥ 18 |
| 200 | 10.1 | 3500 - 5000 | ≥ 15 |
| 300 | 14.0 | - | - |
| 500 | 17.3 | - | - |
| 800 | 22 | - | - |
| 1000 | 25.8 | - | - |
| 1500 | 32 | - | - |
| 2250 | 41.6 | - | - |
| 3000 | 49 | - | - |
| 3500 | 54.4 | - | - |
| 4000 | 57.1 | - | - |
| 4500 | 62.2 | - | - |
| 5000 | 67.1 | - | - |

Ordering Information

| P/N | Product Description | P.U |
|----------|---|------------|
| 60011389 | HD PRO FLEX 1.0L/4.8Dz PVC, Video Cables 75 Ω | 1000m/drum |

0.8L/3.7 Dz

High Flexible Video Cable 75 Ω

Construction

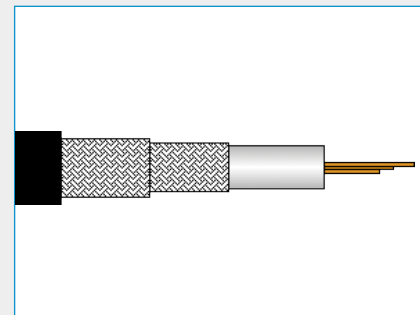
| | |
|------------------------|---|
| Inner conductor | Stranded copper wire, diameter 0.8 mm |
| Insulation | Foam-PE, diameter 3.7 mm |
| Outer conductor | 2xCu-braid, tinned 4.6 mm |
| Sheath | DMC FLEX PVC diameter 6.0 mm black, RAL 9005 |
| Printing | DRAKA 0.8L/3.7Dz - 75 Ω +- 1% - HIGHFLEX HDTV 5GHz + batch no. + meter marking |

Electrical Properties at 20°C

| | | |
|---------------------------------|-----------------|---------------|
| DC resistance | Inner conductor | 50 Ω/km |
| | Outer conductor | 10 Ω/km |
| Mutual capacitance | - | 56 pF/m |
| Characteristic impedance | - | 75 Ω ± 0.75 Ω |
| Velocity ratio | - | 78 % |
| Screening factor | - | > 90 dB |

Electrical Data at 20°C

| Frequency (MHz) | Attenuation (dB/100m) | Frequency (MHz) | Return loss (dB) |
|-----------------|-----------------------|-----------------|------------------|
| 1 | 1.0 | 50 - 300 | ≥ 26 |
| 10 | 2.9 | 300 - 3000 | ≥ 22 |
| 100 | 8.4 | 3000 - 3500 | ≥ 18 |
| 200 | 11.6 | 3500 - 5000 | ≥ 15 |
| 300 | 14.1 | - | - |
| 500 | 18.6 | - | - |
| 800 | 24.2 | - | - |
| 1000 | 27 | - | - |
| 1500 | 33.9 | - | - |
| 2250 | 44.1 | - | - |
| 3000 | 51.9 | - | - |
| 3500 | 57.4 | - | - |
| 4000 | 60.2 | - | - |
| 4500 | 65.8 | - | - |
| 5000 | 71.1 | - | - |



Application

Video cables are primary used in closed circuit TV systems and in studio applications.

Standards

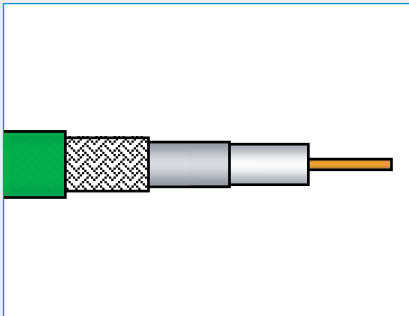
For analogue and digital video signals
(Composite, Component, SDI, SDV, SDTI, HDTV)

Ordering Information

| P/N | Product Description | P.U |
|----------|--------------------------------------|------------|
| 60014488 | DR 0.8L/3.7Dz PVC/rubber black HDTV | TBA |
| 60014489 | DR 0.8L/3.7Dz PVC/rubber HDTV 500DW | 500m/drum |
| 60014492 | DR 0.8L/3.7Dz PVC/rubber HDTV 1000DW | 1000m/drum |

1.6/7.3 AF

Video Cable 75 Ω



Application

Video cables are primarily used in closed circuit TV systems and in several studio applications for transmission of image signals.

Standards

For analogue and digital video signals (Composite, Component, SDI, SDV, SDTI, HDTV)

Fire Rating

- PVC: IEC 60332-1
- LSZH: IEC 60332-1, IEC 61034-2, IEC 60754-1/2
- FRNC-C: EC 60332-3 C

Construction

| | |
|------------------------|---|
| Inner conductor | solid copper wire, bare, diameter 1.6 mm |
| Insulation | Foam-PE, diameter 7.3 mm |
| Outer conductor | Al-PET-Al-foil under tinned copper braid, diameter 8.2 mm |
| Sheath | FRNC, diameter 10.3 mm green, RAL 6018 |
| Weight | Nom. 120(PUR) - 135(LSZH) kg/km |
| Tensile force N | 270 |

Electrical Properties at 20°C

| | | |
|---------------------------------|-----------------|---------------|
| DC resistance | Inner conductor | 9.5 Ω/km |
| | Outer conductor | 4.3 Ω/km |
| Mutual capacitance | - | 56 pF/m |
| Characteristic impedance | - | 75 Ω ± 0.75 Ω |
| Velocity ratio | - | 78 % |
| Screening factor | - | ≥ 100 dB |

Electrical Data at 20°C

| Frequency (MHz) | Attenuation (dB/100m) | Frequency (MHz) | Return loss (dB) |
|-----------------|-----------------------|-----------------|------------------|
| 1 | 0.4 | 50 - 300 | ≥ 26 |
| 3 | 0.7 | 300 - 3000 | ≥ 22 |
| 5 | 0.9 | 3000 - 3500 | ≥ 18 |
| 10 | 1.3 | 3500 - 5000 | ≥ 15 |
| 30 | 2.2 | - | - |
| 100 | 3.9 | - | - |
| 200 | 5.3 | - | - |
| 300 | 7.0 | - | - |
| 500 | 9.2 | - | - |
| 800 | 11.8 | - | - |
| 1000 | 13.2 | - | - |
| 1500 | 16.9 | - | - |
| 2250 | 22.0 | - | - |
| 3000 | 26.4 | - | - |
| 3500 | 30.6 | - | - |
| 4000 | 36.1 | - | - |
| 4500 | 38.1 | - | - |
| 5000 | 41.3 | - | - |

Ordering Information

| P/N | Product Description | P.U |
|-------------------|---|------------|
| 1002202 CT2760901 | Video Cable 75 Ω, 1.6/7.3 AF FRNC-C gn. | 1000m/drum |
| 1002197 CT2757800 | Video Cable 75 Ω, 1.6/7.3 AF PVC green | 1000m/drum |
| 1002461 CT2757900 | Video Cable 75 Ω, 1.6/7.3 AF PUR green | 1000m/drum |
| 1002462 CT2757902 | Video Cable 75 Ω, 1.6/7.3 AF PUR blue | 1000m/drum |

1.2L/4.8 Dz

Video Cable 75 Ω

Construction

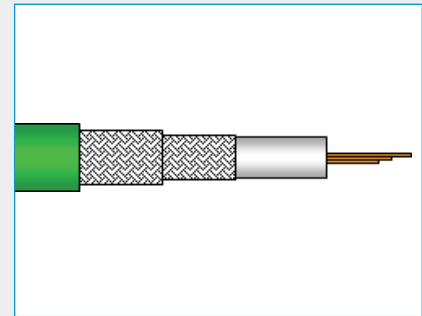
| | |
|------------------------|---|
| Inner conductor | Stranded copper wire, diameter 1.2 mm |
| Insulation | Foam-PE, diameter 4.8 mm |
| Outer conductor | 2xCu-braid, tinned |
| Sheath | DMC FLEX PUR, PUR, diameter 7.2 mm green, RAL 6018 |
| Printing | DRAKA COMTEQ - 1.2L/4.8Dz - 75 Ω ± 1% - HDTV |

Electrical Properties at 20°C

| | | |
|---------------------------------|-----------------|---------------|
| DC resistance | Inner conductor | 21 Ω/km |
| | Outer conductor | 5 Ω/km |
| Mutual capacitance | - | 56 pF/m |
| Characteristic impedance | - | 75 Ω ± 0.75 Ω |
| Velocity ratio | - | 67 % |
| Screening factor | - | > 90 dB |

Electrical Data at 20°C

| Frequency (MHz) | Attenuation (dB/100m) | Frequency (MHz) | Return loss (dB) |
|-----------------|-----------------------|-----------------|------------------|
| 1 | 0.5 | 50 - 300 | ≥ 26 |
| 10 | 1.9 | 300 - 3000 | ≥ 22 |
| 100 | 8.0 | 3000 - 3500 | ≥ 18 |
| 200 | 10.1 | 3500 - 5000 | ≥ 15 |
| 300 | 14.0 | - | - |
| 500 | 17.3 | - | - |
| 800 | 22 | - | - |
| 1000 | 25.8 | - | - |
| 1500 | 32 | - | - |
| 2250 | 41.6 | - | - |
| 3000 | 49 | - | - |
| 3500 | 54.4 | - | - |
| 4000 | 57.1 | - | - |
| 4500 | 62.2 | - | - |
| 5000 | 67.1 | - | - |



Application

Video cables are primary used in closed circuit TV systems and in studio applications.

Standards

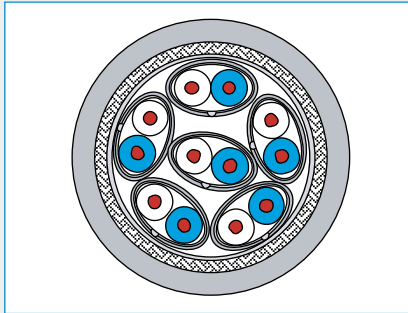
For analogue and digital video signals
(Composite, Component, SDI, SDV, SDTI, HDTV)

Ordering Information

| P/N | Product Description | P.U |
|----------|--|------------|
| 60016740 | DR 1.2L/4.8DZ DMC FLEX PUR HDTV | TBA |
| 60016741 | DR 1.2L/4.8DZ DMC FLEX PUR HDTV 1000DW | 1000m/drum |

AC10 SS 23/1 nxP

Audio Cable



Application

Audio cables are used in professional broadcasting systems for the transmission of analogue and digital audio signals.

Standards

Basing upon ARD-Specification and acc. to AES/EBU-Recommendation.)

Fire Rating

- VDE 0472 part 804 class B or C and IEC 332-1 or 332-3 cat. CF

Construction

| | | |
|--|---|-----------|
| Conductor | solid copper wire, bare 0.56 mm (cross section 0.26 mm ²) | Ø AWG23/1 |
| Insulation | Foam-skin-PE | Ø 1.4 mm |
| Pair stranding | Two cores twisted to the pair | |
| Pair identification | a - core: white, b - core: blue (the above colours in regular intervals) | |
| Pair screen | Al-PET-foil, Aluminium outside + solid copper drain wire, tinned | Ø 2.9 mm |
| Pair insulation of the one pair cable | PET-foil | |
| Overall screen of the one pair cable | copper braid, tinned | |
| Pair sheath of the multi-pair cables | halogen free, flame retardant copolymer | |
| Colour and identification | grey RAL 7001 with number printing | |
| Sheath | halogen free, flame retardant copolymer | |
| Sheath colour | grey, RAL 7001 | |
| Outer Diameter | Nom. 4.6(1pair) - 15.6(12pair) mm | |
| Weight | Nom. 27(1pair) - 320 (12pair) kg/km | |
| Tensile force N | Nom. 80(1pair) - 725(12pair) | |

Mechanical Properties at 20°C

| | | |
|---|---------------------|-----------------------|
| Bending radius during installation | with load | ≥ 15 x cable diameter |
| | without load | ≥ 10 x cable diameter |
| Temperature range | - 30 °C bis + 70 °C | |

Electrical Properties at 20°C

| | | |
|---|---------------------|------------|
| BendaDC loop resistance | ≤ 165 Ω/km | |
| Insulation resistance | ≥ 2000 MΩxkm | |
| Mutual capacitance at 800 Hz | nom. 45 nF/km | |
| Capacitance unbalance (pair to ground) | ≤ 1200 pF/km | |
| Velocity ratio | approx. 78 % | |
| Test voltage (50 Hz, 1 min) | 700 V rms | |
| core/core and core/screen | | |
| Characteristic impedance | 6 MHz : 110 Ω ± 10% | |
| Transfer impedance | up to 10 MHz | ≤ 10 mΩ/m |
| | up to 100 MHz | ≤ 100 mΩ/m |

Nominal Transmission Characteristics at 20°C

| Frequency (MHz) | Near-end crosstalk (cable length: 300 m) Draka Multimedia Cable - Measurement values | | Attenuation Draka Multimedia Cable - Measurement values |
|-----------------|---|---------------------------|--|
| | neighbouring pairs [dB] | unneighbouring pairs [dB] | [dB/100m] |
| 0.015 | 85 | 95 | 0.33 |
| 1.0 | 90 | 90 | 2.45 |
| 4.0 | 90 | 90 | 4.2 |
| 10.0 | 90 | 90 | 6.3 |
| 20.0 | 90 | 90 | 8.6 |

Ordering Information

| P/N | Product Description | P,U |
|-------------------|--|------------|
| 1002105 CT7649010 | Audio Cable, AC10 SS 23/1 nxP, AC10 SS 23/1 1P FRNC-C | 1000m/drum |
| 1002115 CT7649710 | Audio Cable, AC10 SS 23/1 nxP, AC10 SS 23/1 2P FRNC-C | 1000m/drum |
| 1002106 CT7649110 | Audio Cable, AC10 SS 23/1 nxP, AC10 SS 23/1 3P FRNC-C | 1000m/drum |
| 1002108 CT7649210 | Audio Cable, AC10 SS 23/1 nxP, AC10 SS 23/1 5P FRNC-C | 1000m/drum |
| 1002109 CT7649310 | Audio Cable, AC10 SS 23/1 nxP, AC10 SS 23/1 6P FRNC-C | 1000m/drum |
| 1002103 CT7648710 | Audio Cable, AC10 SS 23/1 nxP, AC10 SS 23/1 8P FRNC-C | 1000m/drum |
| 1002111 CT7649410 | Audio Cable, AC10 SS 23/1 nxP, AC10 SS 23/1 10P FRNC-C | 1000m/drum |
| 1002113 CT7649510 | Audio Cable, AC10 SS 23/1 nxP, AC10 SS 23/1 12P FRNC-C | 1000m/drum |

AC10 SS 26/7 x pairs

Audio Cable

Construction

| | | |
|--|--|--------------|
| Conductor | stranded copper wires, bare 0.48 mm (cross section 0.14 mm ²) | Ø AWG26/7 mm |
| Insulation | Foam-skin-PE | Ø 1.2 mm |
| Pair stranding | two cores twisted to the pair | Ø 2.4 mm |
| Pair identification | a - core: white, b - core: blue (the above colours in regular intervals) | |
| Pair screen | Al-PET-foil, Aluminum inside + stranded copper drain wires, tinned | Ø 2.5 mm |
| Pair insulation of the one pair cable | PET-foil, | |
| Pair sheath of the multi-pair cables | FRNC, flame retardant | |
| Colour and identification | grey RAL 7001 with number printing | |
| Cable lay up | n pairs twisted in layers | |
| Overall screen | Al-PET-foil + copper braid, tinned | |
| Sheath | LSZH-C | |
| Sheath colour | grey, RAL 7001 | |
| Outer Diameter | Nom. 4.2(1pair) - 19.5(24pair) mm | |
| Weight | Nom. 23(1pair) - 395(24pair) kg/km | |
| Tensile force N | Nom. 50(1pair) - 1325(24pair) | |

Mechanical Properties at 20°C

| | | |
|---|--------------|---|
| Bending radius during installation | with load | ≥ 10 x cable diameter |
| | without load | ≥ 15 x cable diameter |
| Temperature range | - | - 30 °C up to + 70 °C |
| Fire propagation | - | VDE 0472 part 804 class B or C and IEC 332-1 or 332-3 cat. CF |

Electrical Properties at 20°C

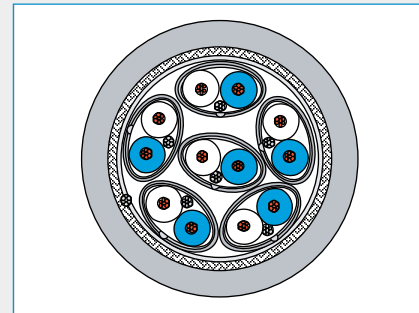
| | | |
|---|---------------------|------------|
| DC loop resistance (at 20 ± 5 °C) | ≤ 288 Ω/km | |
| Insulation resistance (at 20 ± 5 °C and 500 V) | ≥ 2000 MΩxkm | |
| Mutual capacitance at 800 Hz | nom. 45 nF/km | |
| Capacitance unbalance (pair to ground) | ≤ 1200 pF/km | |
| Velocity ratio | approx. 78 % | |
| Test voltage (50 Hz, 1 min) | 700 V rms | |
| core/core and core/screen | | |
| Characteristic impedance | 6 MHz : 110 Ω ± 10% | |
| Transfer impedance | up to 10 MHz | ≤ 10 mΩ/m |
| | up to 100 MHz | ≤ 100 mΩ/m |

Electrical Data at 20°C

| Frequency (MHz) | Near-end crosstalk (cable length: 300 m) Draka Multimedia Cable - Measurement values | | Attenuation Draka Multimedia Cable - Measurement values |
|-----------------|---|---------------------------|--|
| | neighbouring pairs [dB] | unneighbouring pairs [dB] | [dB/100m] |
| 0.015 | 85 | 85 | 0.55 |
| 1.0 | 90 | 85 | 3.0 |
| 4.0 | 90 | 90 | 5.3 |
| 10.0 | 90 | 90 | 8.1 |
| 20.0 | 90 | 85 | 11.5 |

Ordering Information

| P/N | Product Description | P.U |
|----------|--------------------------------------|------------|
| 60011576 | Audio Cable, AC10 SS 26/7 1P FRNC-C | 1000m/drum |
| 60011555 | Audio Cable, AC10 SS 26/7 2P FRNC-C | 1000m/drum |
| 60011556 | Audio Cable, AC10 SS 26/7 4P FRNC-C | 1000m/drum |
| 60013624 | Audio Cable, AC10 SS 26/7 6P FRNC-C | 1000m/drum |
| 60010079 | Audio Cable, AC10 SS 26/7 8P FRNC-C | 1000m/drum |
| 60013628 | Audio Cable, AC10 SS 26/7 10P FRNC-C | 1000m/drum |
| 60013631 | Audio Cable, AC10 SS 26/7 12P FRNC-C | 1000m/drum |
| 60013635 | Audio Cable, AC10 SS 26/7 16P FRNC-C | 1000m/drum |
| 60013674 | Audio Cable, AC10 SS 26/7 24P FRNC-C | 1000m/drum |



Application

Audio cables are used in professional broadcasting systems for the transmission of analog and digital audio signals.

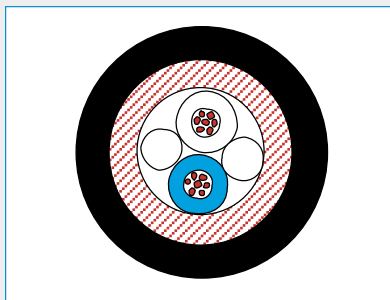
Standards

Basing upon ARD-Specification and acc. to AES/EBU-Recommendation.)

Fire Rating

- VDE 0472 part 804 class B or C and IEC 332-1 or 332-3 cat. CF

4.2 Audio Cables



Application

Audio cables are used in professional broadcasting systems for the transmission of analogue and digital audio signals.

Standards

AES/EBU and analogue Audio

XLR PRO FLEX analogue / digital

Construction

| | |
|------------------------|--|
| Conductor | stranded copper wires, bare, diameter 0.60 mm |
| Insulation | Foam-PE + skin-layer, diameter 1.5 mm |
| Identification | a - core: white; b - core: blue |
| Stranding | two cores twisted to the bundle + cotton filler, diameter 3.0 mm |
| Screen | spiralled wires, CU bare, diameter 3.2 mm |
| Sheath | DMC FLEX PVC, diameter 6.5 mm ± 0.2 mm black, RAL 9005 |
| Outer Diameter | Nom. 6.5 mm |
| Weight | Nom. 50 kg/km |
| Tensile force N | 55 |

Mechanical Properties

| | | |
|-------------------------------|---------------------|-------------------------------|
| Minimum bending radius | without load | ≥ 4 x D (D= outer diameter) |
| | with load | ≥ 8 x D (D= outer diameter) |
| Temperature range | during operation | - 30° C to + 70° C |
| | during installation | - 5° C to + 50° C |

Electrical Properties at 20°C

| | | |
|---------------------------------|---------------------------|---------------|
| Loop resistance | - | ≤ 175 Ω/km |
| Insulation resistance | 500 V | ≥ 2000 MΩ*km |
| Mutual capacitance | 800 Hz | nom. 45 nF/km |
| Velocity ratio | - | ca .78% |
| Test voltage | (DC. 1 min) core/core and | 1000 V |
| | core/screen | |
| Characteristic impedance | 6 MHz | 110 Ω ± 10 % |

Electrical Data at 20°C

| Frequency (MHz) | Attenuation (dB/100m) |
|-----------------|-----------------------|
| 0.015 | 0.3 |
| 1.0 | 1.5 |
| 4.0 | 3.8 |
| 10.0 | 6.0 |
| 20.0 | 8.5 |

Ordering Information

| P/N | Product Description | P.U |
|---------|---|-----------|
| 1018270 | 1x2x0.22 ² , XLR PRO FLEX analogue / digital | 500m/drum |

Triax Cables

Triaxial Camera Cables

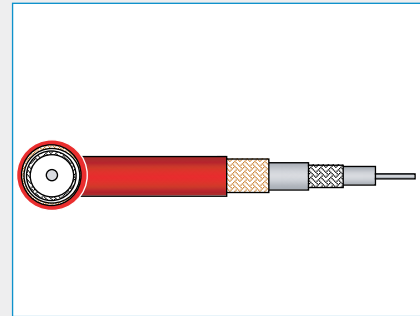
4.3 Camera Cables

Construction

| | |
|----------------------------|--|
| Inner conductor | solid copper wire, silvered or stranded copper wires, silvered |
| Insulation | Foam-PE |
| 1st outer conductor | copper braid, thick silvered |
| Insulation | PE |
| 2nd outer conductor | copper braid, bare |
| Sheath | PVC, PU (standard or reinforced type) or LSZH red, RAL 3000 altern. black or grey |
| Weight | 87(Triax8PU) - 250(Triax 14 PVC) mm |
| Tensile force N | 220(Triax8PU) - 550(Triax 14 PVC) |

Dimensions

| | Triax 8 | Triax 11, Triax 11/1 | AtteTriax 14ation |
|--|----------|----------------------|-------------------|
| Inner conductor copper wire, silvered | Ø 1.0 mm | Ø 1.4 mm | - |
| stranded copper wires, silvered | - | - | Ø 2.2 mm |
| Insulation foam-PE | Ø 4.5 mm | Ø 6.5 mm | Ø 9.7 mm |
| Inner screen copper braid, silvered | Ø 5.1 mm | Ø 7.1 mm | Ø 10.5 mm |
| Insulation PE | Ø 6.6 mm | Ø 8.6 mm | Ø 11.9 mm |
| Outer screen copper braid, bare | Ø 7.2 mm | Ø 9.2 mm | Ø 12.7 mm |
| Sheath red, RAL 3000 | Ø 8.4 mm | Ø 10.9 mm | Ø 14.5 mm |
| reinforced, sign/1 | Ø 8.9 mm | Ø 12.2 mm | - |



Application

Triaxial camera cables are used in professional studio applications for simultaneous transmission of energy and multiplex image signals between camera head and control system for SDI and HD-SD.

They are available as different types optimized for use inside studios and outdoor application.

Electrical properties: Triax 8 at 20°C

| | | |
|---------------------------------|------------------------------|-------------------------|
| Characteristic impedance | - | 75 Ω ± 3 % |
| Mutual capacitance | 800 Hz | 54 pF/m |
| DC resistance | inner conductor | 25 Ω/km |
| | inner screen | 12 Ω/km |
| | outer screen | 10 Ω/km |
| Insulation resistance | inner conductor/inner screen | ≥ 10 ⁴ MΩ*km |
| | inner screen/outer screen | ≥ 10 ³ MΩ*km |
| Max. operating voltage | - | 300 V |
| Screening factor | - | ≥ 75 dB |

Electrical properties: Triax 11, Triax 11/1 at 20°C

| | | |
|---------------------------------|------------------------------|-------------------------|
| Characteristic impedance | - | 75 Ω ± 3 % |
| Mutual capacitance | 800 Hz | 54 pF/m |
| DC resistance | inner conductor | 13 Ω/km |
| | inner screen | 10 Ω/km |
| | outer screen | 8 Ω/km |
| Insulation resistance | inner conductor/inner screen | ≥ 10 ⁴ MΩ*km |
| | inner screen/outer screen | ≥ 10 ³ MΩ*km |
| Max. operating voltage | - | 400 V |
| Screening factor | - | ≥ 75 dB |

Electrical properties: Triax 14

| | | |
|---------------------------------|------------------------------|-------------------------|
| Characteristic impedance | - | 75 Ω ± 3 % |
| Mutual capacitance | 800 Hz | 54 pF/m |
| DC resistance | inner conductor | 6 Ω/km |
| | inner screen | 6 Ω/km |
| | outer screen | 4 Ω/km |
| Insulation resistance | inner conductor/inner screen | ≥ 10 ⁴ MΩ*km |
| | inner screen/outer screen | ≥ 10 ³ MΩ*km |
| Max. operating voltage | - | 600 V |
| Screening factor | - | ≥ 75 dB |

4.3 Camera Cables

Electrical Properties: Triax 8 at 20°C

| Frequency (MHz) | Attenuation (dB/100m) | Frequency (MHz) | Return loss (dB) |
|-----------------|-----------------------|-----------------|------------------|
| 1 | 0.6 | 1 - 100 | > 26 |
| 10 | 2.2 | 100 - 300 | > 23 |
| 20 | 3.2 | - | - |
| 40 | 4.6 | - | - |
| 50 | 5.1 | - | - |
| 60 | 5.6 | - | - |
| 100 | 7.5 | - | - |
| 300 | 13.8 | - | - |

Electrical Data: Triax 11, Triax 11/1 at 20°C

| Frequency (MHz) | Attenuation (dB/100m) | Frequency (MHz) | Return loss (dB) |
|-----------------|-----------------------|-----------------|------------------|
| 1 | 0.5 | 1 - 100 | > 26 |
| 10 | 1.6 | 100 - 300 | > 23 |
| 20 | 2.3 | - | - |
| 40 | 3.3 | - | - |
| 50 | 3.7 | - | - |
| 60 | 4.1 | - | - |
| 100 | 5.4 | - | - |
| 300 | 10.3 | - | - |

Electrical Data: Triax 14 at 20°C

| Frequency (MHz) | Attenuation (dB/100m) | Frequency (MHz) | Return loss (dB) |
|-----------------|-----------------------|-----------------|------------------|
| 1 | 0.4 | 1 - 100 | > 26 |
| 10 | 1.1 | 100 - 300 | > 23 |
| 20 | 1.6 | - | - |
| 40 | 2.3 | - | - |
| 50 | 2.6 | - | - |
| 60 | 2.8 | - | - |
| 100 | 3.8 | - | - |
| 300 | 7.7 | - | - |

Ordering Information

| P/N | Product Description | P.U |
|-------------------|--|------------|
| 1002223 CT2765700 | Triax 8 PVC red, Triaxial Camera Cables | 1000m/drum |
| 1017271 CT2765702 | Triax 8 PVC black, Triaxial Camera Cables | 1000m/drum |
| 1002221 CT2765500 | Triax 8 PU, Triaxial Camera Cables | 1000m/drum |
| 1002266 CT2853201 | Triax 8 LSZH, Triaxial Camera Cables | 1000m/drum |
| 1002268 CT2853203 | Triax 8 LSZH reinforced, Triaxial Camera Cables | 1000m/drum |
| 1002226 CT2766400 | Triax 11 PVC, Triaxial Camera Cables | 1000m/drum |
| 1002229 CT2766404 | Triax 11 PE black, Triaxial Camera Cables | 1000m/drum |
| 1002233 CT2766600 | Triax 11 PU red, Triaxial Camera Cables | 1000m/drum |
| 1002234 CT2766601 | Triax 11 PU black, Triaxial Camera Cables | 1000m/drum |
| 1002243 CT2767101 | Triax 11/1 PU reinforced, Triaxial Camera Cables | 1000m/drum |
| 1002264 CT2850801 | Triax 11 LSZH, Triaxial Camera Cables | 1000m/drum |
| 1002236 CT2766700 | Triax 14 PVC, Triaxial Camera Cables | 1000m/drum |
| 1002239 CT2766704 | Triax 14 PE, Triaxial Camera Cables | 1000m/drum |
| 1002273 CT7666700 | Triax 14 LSZH, Triaxial Camera Cables | 1000m/drum |
| 1002240 CT2767000 | Triax 14 PU, Triaxial Camera Cables | 1000m/drum |

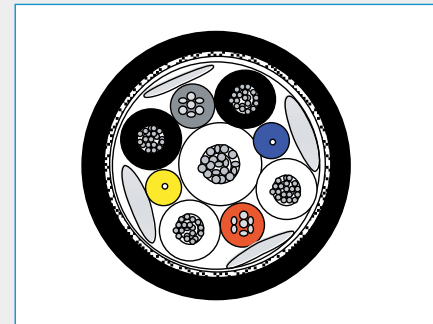
SMPTE 311M-HD-Hybrid-Camera Cable

Hybrid-HDTV-Camera Cable

4.3 Camera Cables

Construction

| | |
|---|---|
| Element 1: Auxiliary Conductors AWG20 (4 x 0.6 mm²) | |
| Conductor | tinned stranded copper wires, 19 x 0.20 mm, diameter 1.0 mm |
| Insulation | HDPE, diameter 1.5 mm |
| Identification | 2 x black, 2 x white |
| Element 2: Signal Conductors AWG24 (2 x 0.22 mm²) | |
| Conductor | tinned stranded copper wires, 7 x 0.20 mm, diameter 0.6 mm |
| Insulation | HDPE, diameter 1.1 mm |
| Identification | 1 x red, 1 x grey |
| Element 3: Fibre Optic Single Mode (2 x 9/125µ) | |
| Mode field diameter | at 1310 nm, diameter 9.5 µm ± 1 µm |
| Cladding diameter | diameter 125 µm ± 1 µm |
| Concentricity error | ≤ 1 µm |
| Coating material | UV-cross-linked Acrylate, diameter 245 µm |
| Buffer material | Thermoplastic, diameter 0.9 µm ± 0.05 µm |
| Identification | 1 x blue, 1x yellow |
| Element 4: Strength Member AWG16 (1 x 1.22 mm²) | |
| Conductor | galvanized steel wires, diameter 1.6 mm |
| Insulation | HDPE, diameter 2.1 mm |
| Identification | 1 x white |
| Cable lay up | |
| Stranding | Core: 1 x Element 4, diameter 2.1 mm Layer: 4 x Element 1 + 2 x Element 2 + 2 x Element 3 and in the outer interstices 4 x fibrillated Polypropylene as needed for roundness, diameter 5.2 mm Sequence according to the above drawing |
| Wrapping | 1 x non-woven fabric tape, diameter 5.4 mm |
| Screen | Copper wire braid, tinned 95% opt. coverage, diameter 5.9 mm |
| Sheath | FRNC, diameter 9.2 mm |
| | black, RAL 9005 |
| Weight | Nom. 115 kg/km |
| Tensile force N | Nom. 800 |



Application

This Hybrid HD Camera Cable 25M 9/125 + 4 x AWG20 + 2 x AWG24 acc. to SMPTE 311M-Standard contains Single-Mode Optical Fibres, Auxiliary- and Signal Conductors. It is used in professional video productions for simultaneous transmission of energy, video, audio and control signals and is intended to interconnect Camera Units and Base Stations in conjunction with the Connector Interface Standard. It is suitable for all new digital camera systems of well-known manufacturers.

Standards

SMPTE 311M

Fire Rating

IEC 60332-1, IEC 60754-2, IEC 61034

Mechanical Properties at 20°C

| | | |
|-------------------------------------|------------------|------------------------------------|
| Temperature range PUR (FRNC) | during operation | - 40° C to +70° C (-25°C to +70°C) |
| Max. humidity | - | 95 % |

Electrical Properties at 20°C

| | | |
|--|---|--------------------------|
| Auxiliary Conductors AWG20 (4 x 0.6 mm²) | | |
| DC resistance | - | ≤ 35.3 Ω/km |
| Loop resistance | - | ≤ 43 Ω/km |
| Insulation resistance | - | ≥ 10 ⁴ MΩ*km |
| Test voltage | - | 1750 VAC _{rms} |
| Operating voltage | - | ≤ 300 VAC _{rms} |
| Signal Conductors AWG24 (2 x 0.22 mm²) | | |
| DC resistance | - | ≤ 97.5 Ω/km |
| Loop resistance | - | ≤ 184 Ω/km |
| Insulation resistance | - | ≥ 10 ⁴ MΩ*km |
| Test voltage | - | 1750 VAC _{rms} |
| Operating voltage | - | ≤ 300 VAC _{rms} |
| Overall screen | | |
| DC resistance | - | ≤ 20 Ω/km |

Optical Properties

| | | |
|---|------------|----------------|
| Fibre Optic Single Mode (2 x 9/125µ) | | |
| Cut-off wavelength | - | 1100 - 1350 nm |
| Attenuation | at 1310 nm | 0.5 dB |
| Dispersion | at 1310 nm | 3.5 ps/nm*km |

Ordering Information

| P/N | Product Description | P.U |
|----------|--------------------------------------|------------|
| 60011292 | SMPTE 311M Hybrid Camera Cable, FRNC | 1000m/drum |

Services and related documents

Certified engineers enjoy full vendor support before, during and after completion of their projects.

Before

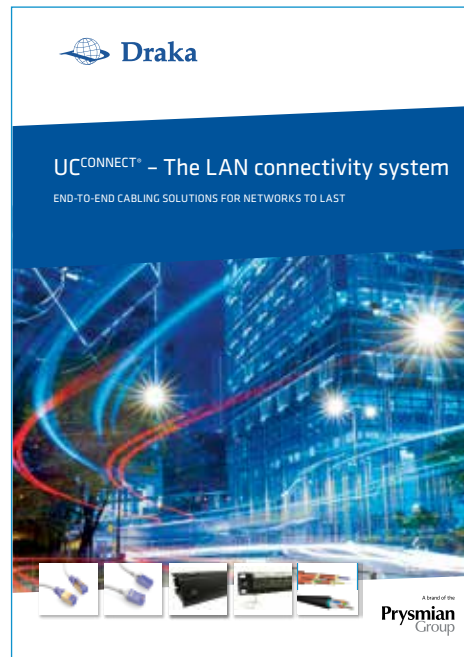
Already before your project commences – we are there to train you on all features of Draka UC cabling system. If you are an experienced professional or still improving your engineering skills – it offers you the right mix of theory and practice to get you going better. Take advantage of a world leading manufacturer’s resources.

During

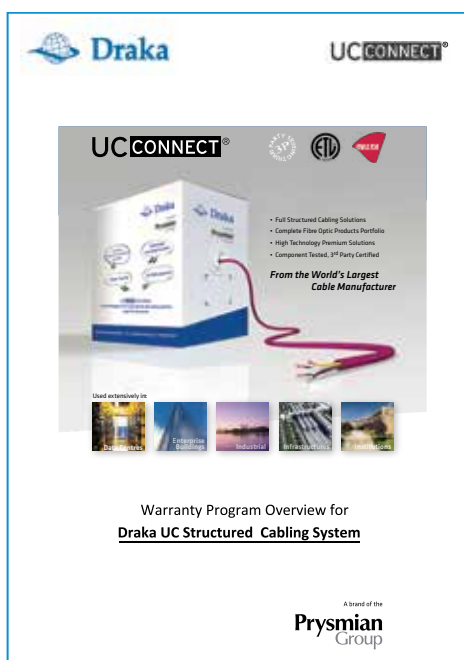
If your project is fully running and you face an issue – trust in our experienced in-field support. You will not be alone if there are questions about testing, standards or installation practices. If there is uncertainty about your specification, we are there to give you support.

After

Needless to say – the 3rd party approved Draka solutions are entirely covered by an end-to-end system warranty. Please contact our local offices to enquire about the Draka UC Structure Cabling System Warranty Program.



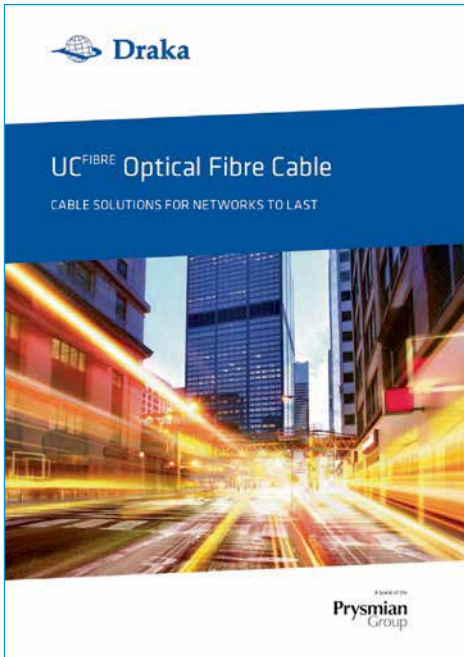
UCCONNECT® The LAN connectivity system



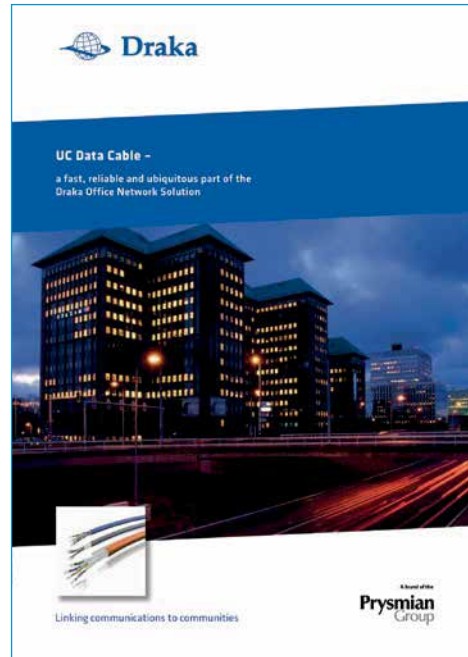
Draka UC Structured Cabling Warranty



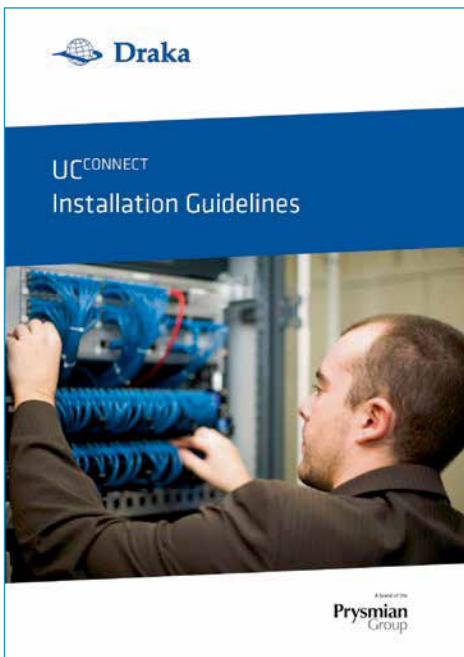
UCCONNECT® 3rd party approvals



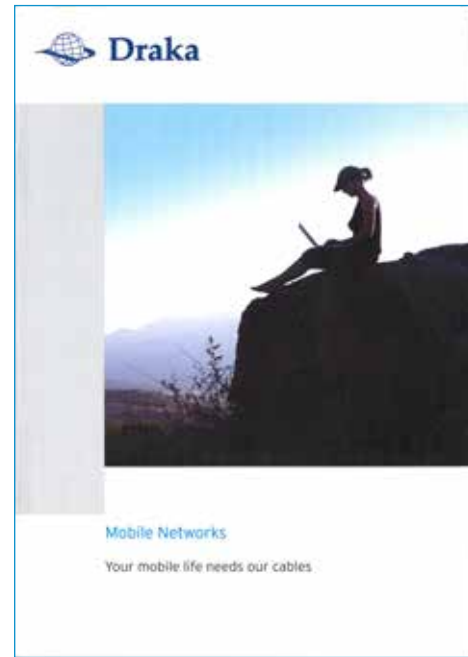
UC FIBRE® Optical Fibre Cable



UC Data® Cable



UC CONNECT® Installation Guidelines



Mobile Networks

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by serving you in every way to realize your
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