OPTICAL

TecniKabel

SPECIAL ELECTRICAL AND OPTICAL CABLES

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Tecni Kabel

INTRODUCTION

The context in which we are living is rapidly changing.
Optical fiber is a daily reality in our life and gives its contribution to the development in different sectors as telecommunication, internet service and data transmission. Speeds available with simple connections based on classic copper's wire are distant memories.
Some of the main advantages brought by the use of optical cables are:

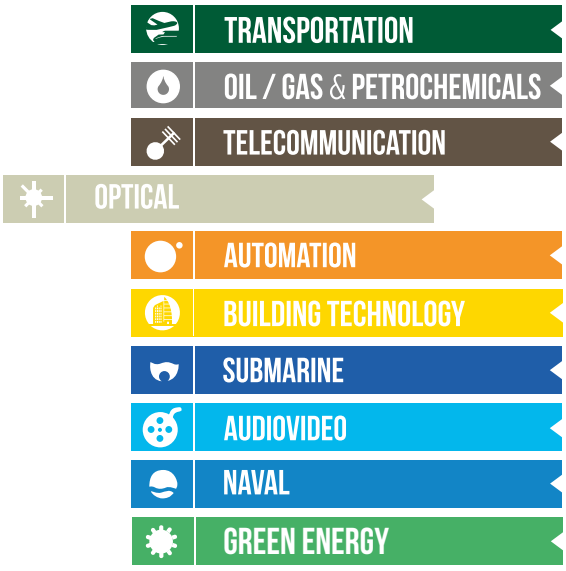
- Transmission distance
- Bandwidth
- Transmission speed
- Transmission protection

The use of the light as a transmissive instrument allows smaller attenuation and a greater transmission speed bandwidth compared to traditional copper cables, excluding any kind of electromagnetic interference.
Tecnikabel designs and produces high performance optical cables able to satisfy different requirements:

- Resistance to tough operating conditions (movement, flexions, temperature, pressure, moisture, oil)
- Safety and environment (fire resistance, low smoke emission and absence of corrosive gas emission during fire)
- Use in long distance and metropolitan areas with different number of fibers
- Use in access networks with a wide range of cables, from multi-fiber's cable to the miniaturized cable in order to bring the optical fiber to private premises.

Our strength is the passion in the design of our cables, being sure to always supply a high quality product that fulfils any customers' need.

PRODUCT LINES



TECNIKABEL

is focused on constant product innovation to get competitive advantages with endless commitment to research and development.

PRODUCTION

Updated production Systems, stringent process procedures and expert operators reached the goal to carry out our production efficient and flexible.

FINAL INSPECTIONS

At the end of production processes each cable is checked in its electrical optical and physical performances for a complete compliance to customer specifications.

LABORATORY TESTS

We submit our cables to the most severe tests, simulating critical applications. In addition to the classic tests required by current rules, we made special equipments for different types of mechanical, environmental, electric and optical tests.

MATERIALS RESEARCH AND DEVELOPMENT

Our thirty year experience took us to carry on research of new materials in order to improve performances, costs and fulfil the standards required by our customers.

QUALITY SYSTEM

Since 1978, constant commitment to Quality has awarded Tecnikabel approval from American and European Authorities, complying with the most demanding international manufacturing and quality standards.

cert. number:
2017010103948372

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FIBER TYPES

- Singlemode ITU-T G.652D - IEC 60793-2-50 Type B.1.3
- Singlemode ITU-T G.657A1 - IEC 60793-2-50 Type B.1.3 and B.6.A
- Singlemode ITU-T G.657A2 / B2 - IEC 60793-2-50 Type B.1.3 and B.6.A&B
- Singlemode ITU-T G.657A1 / A2 / B2 Type 200micron
- Singlemode NZD ITU-T G.655E/656 - IEC 60793-2-50 Type B4/B5

- Multimode 62.5/125 OM1 IEC 60793-2-10 Type A1b
- Multimode 50/125 OM2 ITU-T G.651 IEC 60793-2-10 Type A1a.1
- Multimode 50/125 OM3 - ISO/IEC 11801 - IEC 60793-2-10 Type A1a.2
- Multimode 50/125 OM4 - ISO/IEC 11801 - IEC 60793-2-10 Type A1a.3
- Multimode 50/125 OM5 - ISO/IEC 11801 - IEC 60793-2-10 Type A1a.3

STANDARD FIBER COLOUR CODE (TABLE A)

1- Natural	7- Violet	13- Turquoise	19- Violet with black ring
2- Red	8- Orange	14- Red with black ring	20- Orange with black ring
3- Green	9- Grey	15- Green with black ring	21- Grey with black ring
4- Yellow	10- White	16- Yellow with black ring	22- White with black ring
5- Brown	11- Black	17- Brown with black ring	23- Pink with black ring
6- Blue	12- Pink	18- Blue with black ring	24- Turquoise with black ring

*Other colours on request

STANDARD LOOSE TUBE COLOUR CODE (TABLE B)

1- Red (Pilot)	7- White	13- White	19- White
2- Green (Directional)	8- White	14- White	20- White
3- White	9- White	15- White	21- White
4- White	10- White	16- White	22- White
5- White	11- White	17- White	23- White
6- White	12- White	18- White	24- White

*Other colours on request

STANDARD TIGHT COLOUR CODE (TABLE C)

1- Blue	7- Red	13- Blue with black ring	19- Red with black ring
2- Orange	8- Black	14- Orange with black ring	20- Yellow with black ring
3- Green	9- Yellow	15- Green with black ring	21- Violet with black ring
4- Brown	10- Violet	16- Brown with black ring	22- Pink with black ring
5- Grey	11- Pink	17- Grey with black ring	23- Turquoise with black ring
6- White	12- Turquoise	18- White with black ring	24- White with double black ring

*Other colours on request

SINGLEMODE FIBER PROPERTIES

	SM-LWP ITU-T G.652.D	SM ITU-T G.657.A1	SM ITU-T G.657.A2	SM 200 µm ITU-T G.657.A2	SM NZD ITU-T G.655.D
Mode Field Diameter @ 1310 nm	9.1 ± 0.4 µm	9.1 ± 0.4 µm	8.6 ± 0.4 µm	8.8 ± 0.4 µm	
Mode Field Diameter @ 1550 nm	10.2 ± 0.5 µm	10.2 ± 0.5 µm		9.8 ± 0.5 µm	9.6 ± 0.4 µm
Cladding diameter	125.0 ± 0.7 µm	125.0 ± 0.7 µm	125.0 ± 0.7 µm	125.0 ± 0.7 µm	125.0 ± 0.7 µm
Coating diameter	242 ± 7 µm	242 ± 7 µm	242 ± 7 µm	200 ± 10 µm	242 ± 7 µm
Cladding non-circularity	≤ 0.7 %	≤ 0.7 %	≤ 0.7 %	≤ 0.7 %	≤ 1.0 %
Core/cladding concentricity error	≤ 0.5 µm	≤ 0.5 µm	≤ 0.5 µm	≤ 0.5 µm	≤ 0.5 µm
Coating/cladding concentricity error	≤ 12 µm	≤ 12 µm	≤ 12 µm	≤ 12 µm	≤ 12 µm
Cable cut-off wavelength	≤ 1260 nm	≤ 1260 nm	≤ 1260 nm	≤ 1260 nm	≤ 1450 nm
Zero dispersion wavelength (λo)	1300-1324 nm	1300-1324 nm	1300-1324 nm	1300-1324 nm	
Dispersion slope (So) @ (λo)	≤ 0.090 ps/(nm²*km)	≤ 0.090 ps/(nm²*km)	≤ 0.092 ps/(nm²*km)	≤ 0.092 ps/(nm²*km)	
Chromatic dispersion @ 1285 – 1330 nm	≤ 3.5 ps/(nm*km)	≤ 3.5 ps/(nm*km)			
Chromatic dispersion @ 1550 nm	≤ 18 ps /(nm*km)	≤ 18 ps/(nm*km)			
Chromatic dispersion @ 1625 nm	≤ 22 ps/(nm*km)	≤ 22 ps/(nm*km)			
Chromatic dispersion @ 1530 – 1565 nm					2.0 -6.0 ps/(nm*km)
Chromatic dispersion @ 1565 – 1625 nm					4.5 to 11.2 ps/(nm*km)
PMD Individual Fiber @ 1550 nm	≤ 0.1 ps/√km	≤ 0.1 ps/√km	≤ 0.1 ps/√km	≤ 0.1 ps/√km	≤ 0.15 ps/√km
Attenuation @ 1310 nm	≤ 0.36 dB/km	≤ 0.36 dB/km	≤ 0.36 dB/km	≤ 0.36 dB/km	
Attenuation @ 1383nm	≤ 0.36 dB/km	≤ 0.36 dB/km	≤ 0.36 dB/km	≤ 0.36 dB/km	
Attenuation @ 1550 nm	≤ 0.25 dB/km	≤ 0.25 dB/km	≤ 0.25 dB/km	≤ 0.25 dB/km	≤ 0.27 dB/km
Attenuation @ 1625 nm	≤ 0.28 dB/km	≤ 0.28 dB/km	≤ 0.28 dB/km	≤ 0.28 dB/km	≤ 0.30 dB/km
Attenuation with bending					
Mandrel Radius 15mm@1550 10 turns		≤ 0.25 dB	≤ 0.03 dB	≤ 0.03 dB	
Mandrel Radius 15mm@1625 10 turns		≤ 1.0 dB	≤ 0.1 dB	≤ 0.1 dB	
Mandrel Radius 10mm@1550 1 turns		≤ 0.75 dB	≤ 0.1 dB	≤ 0.1 dB	
Mandrel Radius 10mm@1625 1 turns		≤ 1.5 dB	≤ 0.2 dB	≤ 0.2 dB	
Mandrel Radius 7.5mm@1550 1 turns			≤ 0.5 dB	≤ 0.5 dB	
Mandrel Radius 7.5mm@1625 1 turns			≤ 1.0 dB	≤ 1.0 dB	
Proof test	≥ 0.7 GPa	≥ 0.7 GPa	≥ 0.7 GPa	≥ 0.7 GPa	≥ 0.7 GPa

MULTIMODE FIBER PROPERTIES

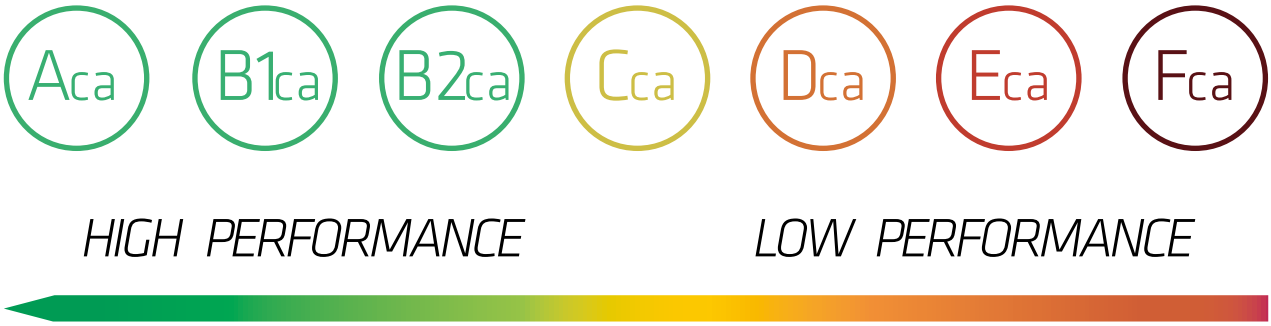
	MM62.5 OM1	MM50 OM1+	MM50 OM2	MM50 OM3	MM50 OM4	MM50 OM5
Core diameter	62.5 ± 2.5 µm	62.5 ± 2.5 µm	50 ± 2.5 µm	50 ± 2.5 µm	50 ± 2.5 µm	50 ± 2.5 µm
Core non-circularity	≤ 5 %	≤ 5 %	≤ 5 %	≤ 5 %	≤ 5 %	≤ 5 %
Cladding diameter	125.0 ± 1.0 µm	125.0 ± 1.0 µm	125.0 ± 1.0 µm	125.0 ± 1.0 µm	125.0 ± 1.0 µm	125.0 ± 1.0 µm
Coating diameter	242 ± 5 µm	242 ± 5 µm	242 ± 5 µm	242 ± 5 µm	242 ± 5 µm	242 ± 5 µm
Cladding non-circularity	≤ 0.7 %	≤ 0.7 %	≤ 0.7 %	≤ 0.7 %	≤ 0.7 %	≤ 0.7 %
Core/cladding concentricity error	≤ 1 µm	≤ 1 µm	≤ 1 µm	≤ 1 µm	≤ 1 µm	≤ 1 µm
Coating/cladding concentricity error	≤ 10 µm	≤ 10 µm	≤ 6 µm	≤ 6 µm	≤ 6 µm	≤ 6 µm
Numerical Aperture	0.275 ± 0.015	0.275 ± 0.015	0.200 ± 0.015	0.200 ± 0.015	0.200 ± 0.015	0.200 ± 0.015
Attenuation @ 850 nm	≤ 3.50 dB/km	≤ 3.50 dB/km	≤ 3.20 dB/km	≤ 3.20 dB/km	≤ 3.20 dB/km	≤ 3.20 dB/km
Attenuation @ 950 nm						≤ 1.50 dB/km
Attenuation @ 1300 nm	≤ 1.00 dB/km	≤ 1.00 dB/km	≤ 1.20 dB/km	≤ 1.20 dB/km	≤ 1.20 dB/km	≤ 1.20 dB/km
Overfilled Modal Bandwidth @ 850 nm	≥ 200 MHz*km	≥ 220 MHz*km	≥ 500 MHz*km	≥ 1500 MHz*km	≥ 3500 MHz*km	≥ 3500 MHz*km
Overfilled Modal Bandwidth @ 950 nm						≥ 1850 MHz*km
Overfilled Modal Bandwidth @ 1300 nm	≥ 500 MHz*km	≥ 800 MHz*km	≥ 500 MHz*km	≥ 500 MHz*km	≥ 500 MHz*km	≥ 500 MHz*km
Effective Modal Bandwidth (EMB)@ 850 nm				≥ 2000 MHz*km	≥ 4700 MHz*km	≥ 4700 MHz*km
Effective Modal Bandwidth (EMB)@ 950 nm						≥ 2470 MHz*km
Fibre capacity 10GBASE-SR	33 m	83 m	83 m	300 m	550 m	550 m
Fibre capacity 1000BASE-SX	274 m	500 m	600 m	1000 m	1100 m	1100 m
Fibre capacity 40GBASE-SR4/100GBASE-SR10				140 m	170 m	170 m
Proof test	≥ 0.7 GPa	≥ 0.7 GPa	≥ 0.7 GPa	≥ 0.7 GPa	≥ 0.7 GPa	≥ 0.7 GPa

CONSTRUCTION PRODUCTS REGULATION

Regulation No. 305/2011 (Construction Products Regulation. or CPR) of the European Parliament and of the European Council is a regulation of 9 March 2011 that lays down harmonised conditions for the marketing of construction products and replaces Construction Products Directive (89/106/EEC). The EU regulation is designed to simplify and clarify the existing framework for the placing on the EU market of construction products.

The main objective of the CPR is the removal of technical barriers to trade in order to guarantee the free movement of construction products within the common internal market due to differing product and test standards, approval processes and conformity documents in the various member states.

After the transition period, which ended on 1 July 2017, the Construction Products Regulation governs cables intended to be incorporated in construction works (permanent installations) in both buildings and civil engineering.
CPR Euroclasses are: Aca, B1ca, B2ca, Cca, Dca, Eca, Fca.

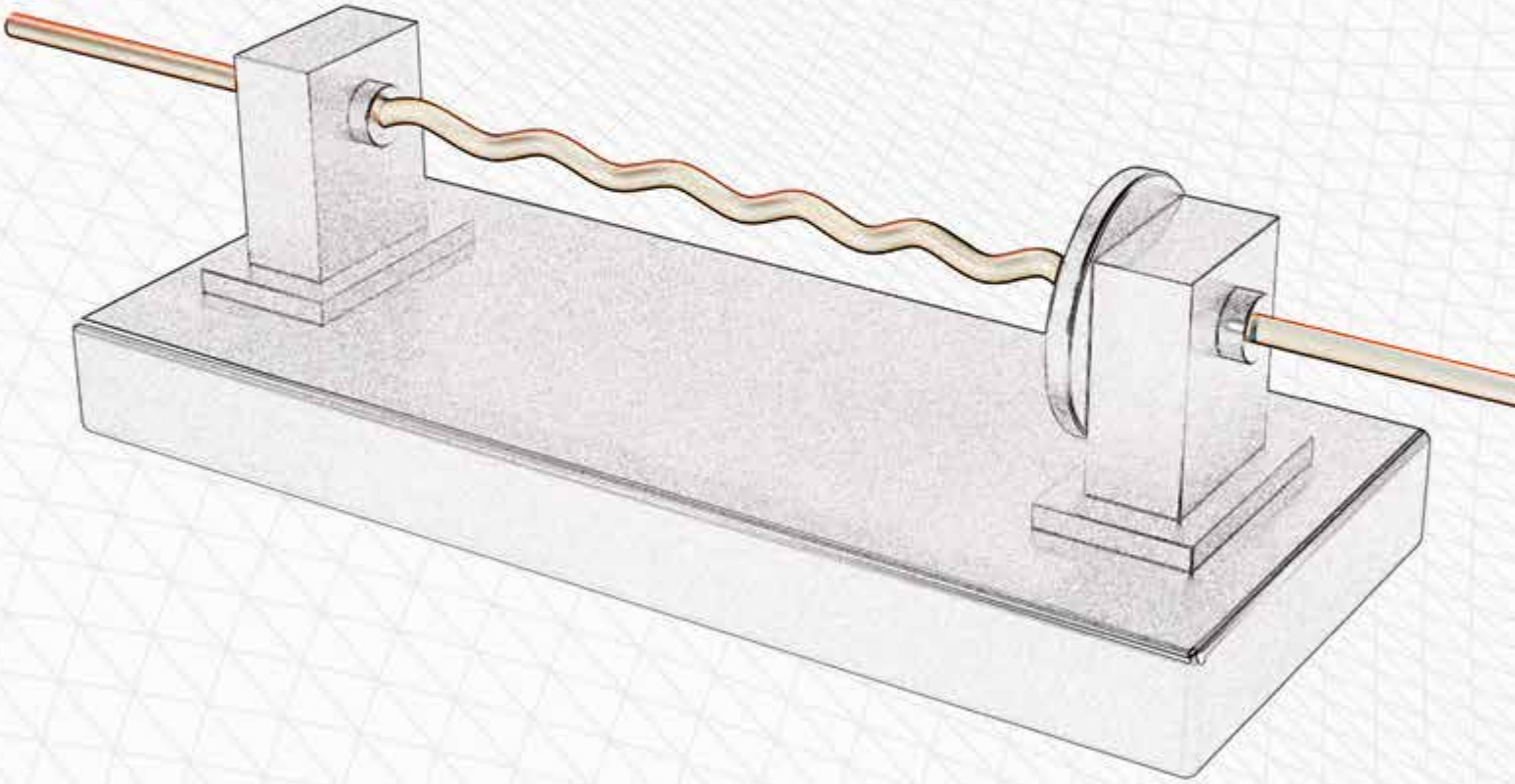


Furthermore, there are additional criteria establishing requirements on the amount of smoke produced, the fall of droplets and flamed particles during combustion, and acid content or toxicity of smoke produced.

- s = smoke production. With decreasing performance, varies from s1 to s3. Furthermore, s1 classification can be classified as s1, s1a or s1b on the basis of smoke opacity.
- d = flaming droplets. With decreasing performance, varies from d0 to d2
- a = smoke acidity. With decreasing performance, varies from a1 to a3

The DoP (Declaration of Performance) is a document issued by the manufacturer in which all relevant information is recorded: the manufacturer, cable identification, evaluation system used, applicable standard. CPR certification body and performance of the product.

We are committed to adopting Euroclasses, and their relevant DoP, to express the fire performance of our products for the different construction applications, even if incumbent operators' specifications eventually conflict with the CPR Regulations.

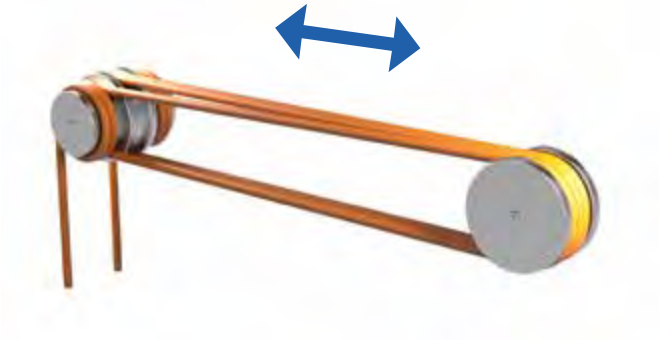


MECHANICAL AND ENVIRONMENTAL TESTS IEC 60794-1-21/22

Method E1: Cable Tensile performance.

This measuring method applies to optical fibre cables in order to examine the behaviour of the attenuation and the fibre elongation strain, as a function of the load on a cable which may occur during installation. This method is intended to be non-destructive.

The optical transmission of the fibers is monitored and the change in attenuation is recorded during the test.

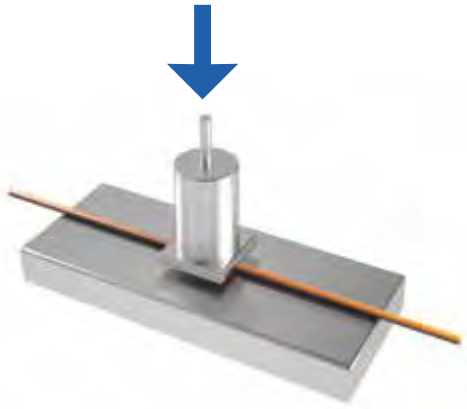


Method E3 : Cable Crush.

The purpose of this test is to determine the ability of an optical fibre cable to withstand crushing.

The apparatus shall allow a sample of cable to be crushed between a flat steel base plate and a movable steel plate which applies the crushing force uniformly over a 100 mm length of the sample. The edges of the movable plate shall be rounded with a radius of about 5 mm.

The optical transmission of the fibers is monitored and the change in attenuation is recorded during the test.



Method E4: Cable Impact.

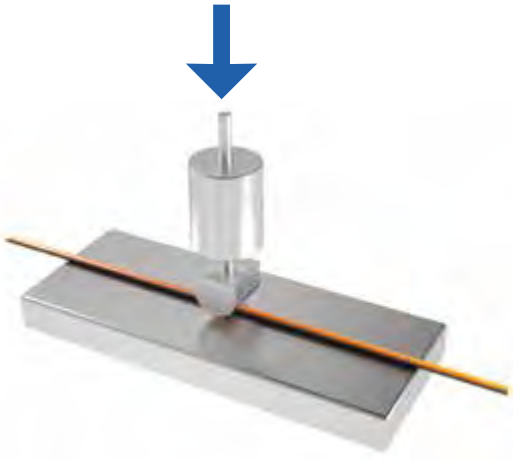
The purpose of this test is to determine the ability of an optical fibre cable to withstand impact.

When only physical damage is to be evaluated, the length may range from 1m (small diameter) to 5m (for larger diameter cables). Longer lengths may be necessary to permit optical measurements.

To perform this test is important to establish:

- Mass of the weight or drop hammer
- Height of drop
- Number of impacts and their location
- Test temperature

The optical transmission of the fibers is monitored and the change in attenuation is recorded during the test.



Method E6: Cable Repeated Bending.

The purpose of this test is to determine the ability of an optical fibre cable to withstand repeated bending.

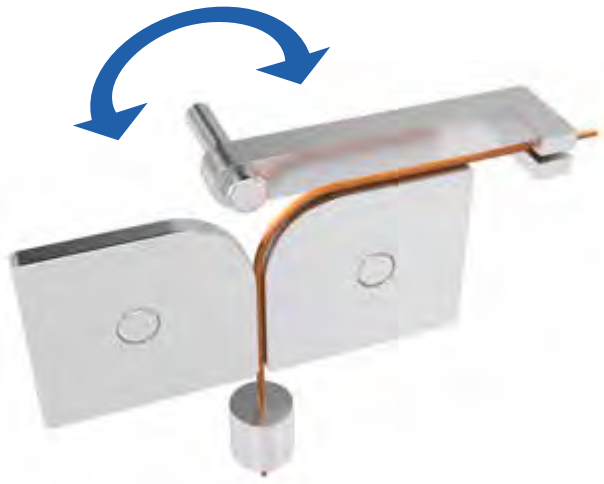
The apparatus shall permit a sample to be bent backwards and forwards through angles +/- of 90° whilst the sample is subjected to a tensile load.

The apparatus shall be capable of cycling, displacing the sample from the vertical position to the extremes positions and returning to the original position.

To perform this test is important to establish:

- Bending radius
- Number of cycles
- Tensile load
- Test temperature

The optical transmission of the fibers is monitored and the change in attenuation is recorded during the test.



Method E7: Cable Torsion test.

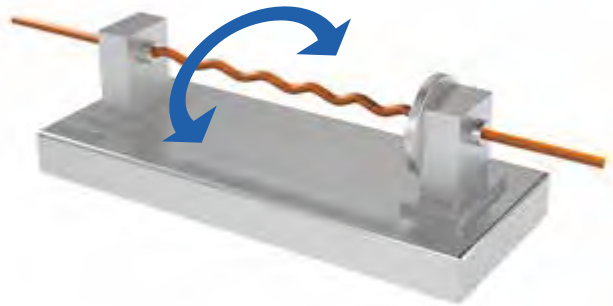
This test method is intended to establish the ability of a fibre optic cable to withstand mechanical twisting. The twisting apparatus consists essentially of two cable gripping devices or clamps, one fixed and one that can rotate, supported as appropriate, the distance between them being adjustable.

The sample shall be twisted at an angle of +/- 180° for a certain number of cycles.

To perform this test is important to establish:

- Length of sample
- Number of cycles
- Tensile load
- Test temperature

The optical transmission of the fibers is monitored and the change in attenuation is recorded during the test.



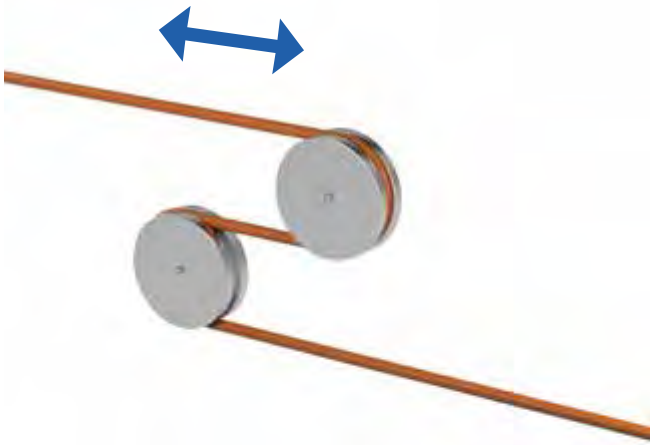
Method E8: Cable Flexing test.

The purpose of this test is to determine the ability of an optical fibre cable to withstand repeated flexing in service. The sample shall be stretched over the pulleys in a S shape end being loaded with a weight. The sample shall be flexed for a certain number of cycles.

To performing this test is important to establish:

- Diameter of pulleys
- Number of cycles
- Mass of weights
- Test temperature

The optical transmission of the fibers is monitored and the change in attenuation is recorded during the test.



Method E11: Cable bend.

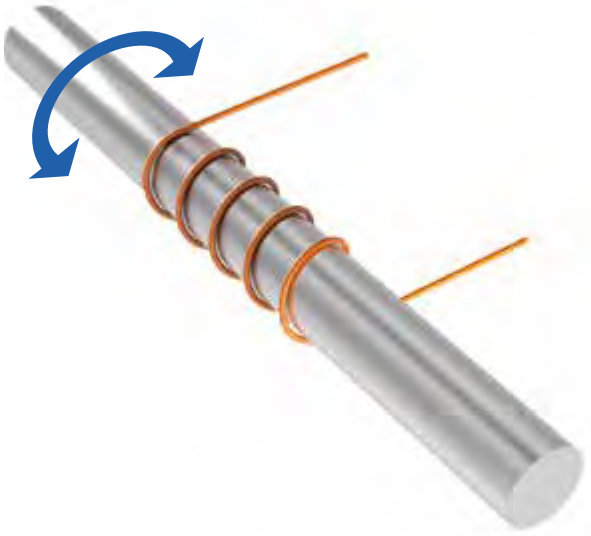
The purpose of this test is to determine the ability of an optical fibre cable to withstand bending around a test mandrel.

A single mandrel shall enable the sample to be wrapped tangentially in a close helix around a test mandrel at a uniform rate with sufficient tension to ensure that the sample contours the mandrel. The sample shall then be unwrapped. A cycle consists of one wrapping and one unwrapping.

To performing this test is important to establish:

- Diameter of mandrel
- Number of cycles
- Number of windings
- Test temperature

The optical transmission of the fibers is monitored and the change in attenuation is recorded during the test.



Method F1: Temperature cycling.

This measuring method determines the stability behaviour of the attenuation of cables submitted to temperature changes.

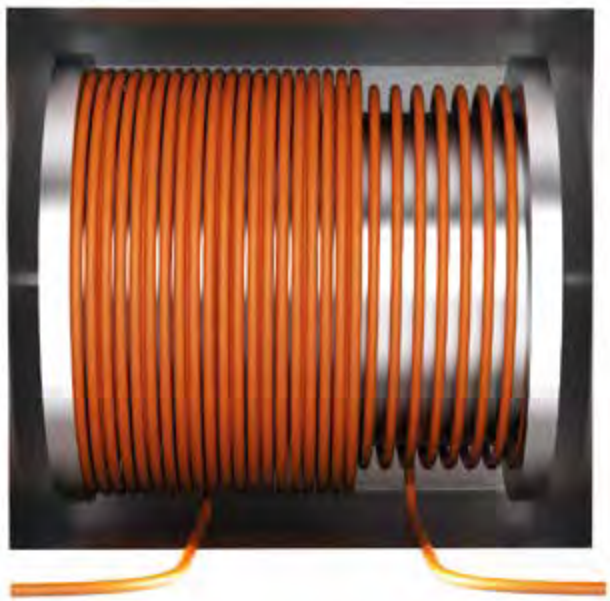
This test is used for monitoring cable behaviour in the temperature range which may occur during storage, transportation and usage or to check, in a selected temperature range (usually wider than that required for the above-mentioned case).

Changing temperatures can cause buckling or tensioning of the fibres, resulting from differences between the thermal expansion coefficient from optical fibers and cable strength members.

To performing this test is important to establish:

- Limit of temperature
- Number of temperature cycles
- Time and changing rate of temperature

The optical transmission of the fibers is monitored and the change in attenuation is recorded during the test.



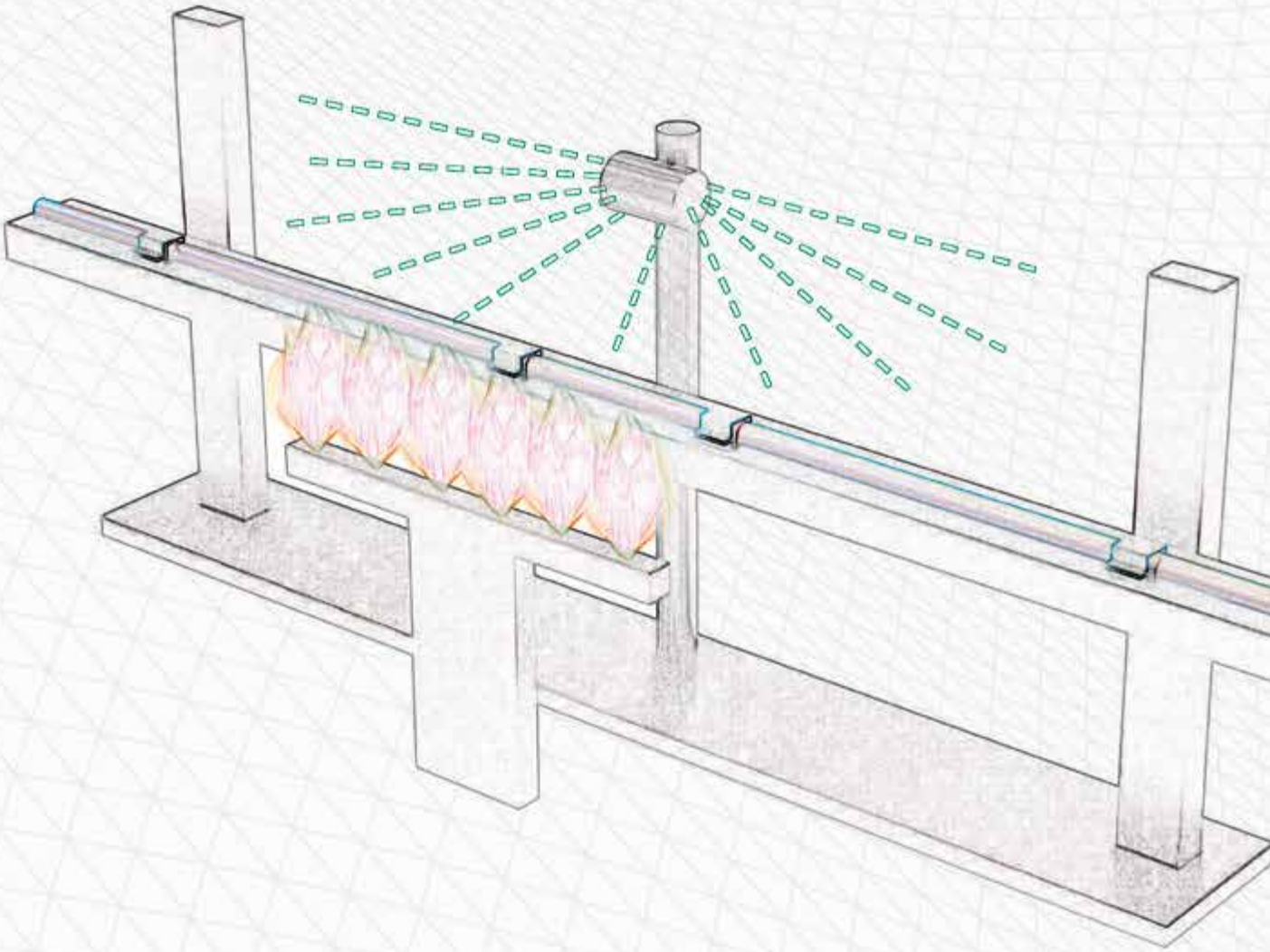
Method F5: Water penetration.

The purpose of this test is to determine the ability of a cable to block water migration along a specified length.

Compliance shall be checked on samples of cable, using one of the two methods:

- F5A: tests for water migration between the outer interstices of the optical core and the outer sheath.
- F5B: tests for water migration over the entire cross-section designed to be water-blocked.

  For both methods a 3m long sample and 1m height of water column applied for 24 hours are used.



FIRE PERFORMANCE

FIRE PERFORMANCES

IEC 60332-1-2 / EN 50265 / BS 4066:
Fire propagation on a vertical single cable.

The single cable is mounted vertically and flamed with a Bunsen burner.

The flame must extinguish itself, at least 50 mm below the upper fixing clamp.

Power of burner, duration and angle of flame application, are described in the reference standards.

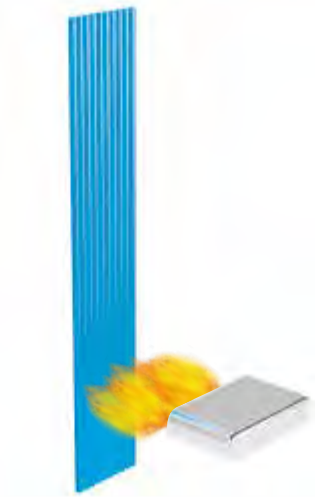
IEC 60332-3 / EN 50266 :
Fire propagation on a vertical cables bundle.

A certain number of cable samples are fixed on a 3.5m long ladder, and flamed with an appropriate burner.

The sample number, the duration of flame application, and the power/temperature of burner are described in the reference standards. After flame application, the visible area of fire damage must not exceed 2.5 m in height from the bottom of the burner.

The volume of tested material define a differentiation in categories:

A F/R Part 3-21	7 l/m
A Part 3-22	7 l/m
B Part 3-23	3.5 l/m
C Part 3-24	1.5 l/m
D Part 3-25	0.5 l/m



IEC 60331 / EN 50200 : Fire test resistance.

A sample of cable is horizontally applied supported by metal rings, or in U shape fixed on a fireproof wall.

Through using a gas burner the cable is maintained in flame contact for a certain time.

The test and the temperature of burner are described in the reference standards. In U shape test, the fireproof wall is hit every five minutes by a mechanical shock, to simulate a potential collapse during the fire.

The time of fire application, and the temperature of flame are described in the reference standards (typically 750°C or 830°C). The optical transmission of the fibers is checked and the change in attenuation is recorded during the test.

and 15 minutes after flame extinction.

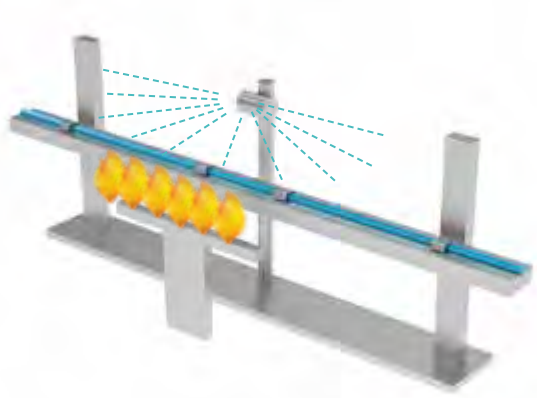
BS 6387 Category CWZ.

The full test consists of subjecting the cable to 3 different protocols.

Protocol C: a flame with a temperature attack of 950°C is applied to the cable.

Protocol W: a flame with a temperature attack of 650°C is applied to the cable together with water simulating a sprinkler system.

Protocol Z: a flame with a temperature attack of 950°C is applied to the cable together with mechanical shock.



IEC 61034-1/2 / EN 50268-1/2 Measurement of smoke density of cables burning under defined conditions.

A few samples of cable are burnt in a cubic ($3x3x3m^3$) chamber using a flammable liquid.

The light transmittance of the resulting smoke is measured using an optical light detector. The test duration is about 40 minutes, depending on the quantity and composition of the liquid fuel. During the test the light transmittance of the smoke must be 60% minimum.

IEC 60754-1 / EN 50267-2-1 Test on gases evolved during combustion of materials from cables - Determination of the halogen acid gas content.

This standard covers the general aspects of potential hazard caused from corrosiveness of smoke and combustion gases.

A small quantity of non-metallic material is heated in a tube, the resulting gases are tested for their halogen content. The flame temperature is 800 °C ± 10 °C, with a test duration of 40 ± 5 min in total.

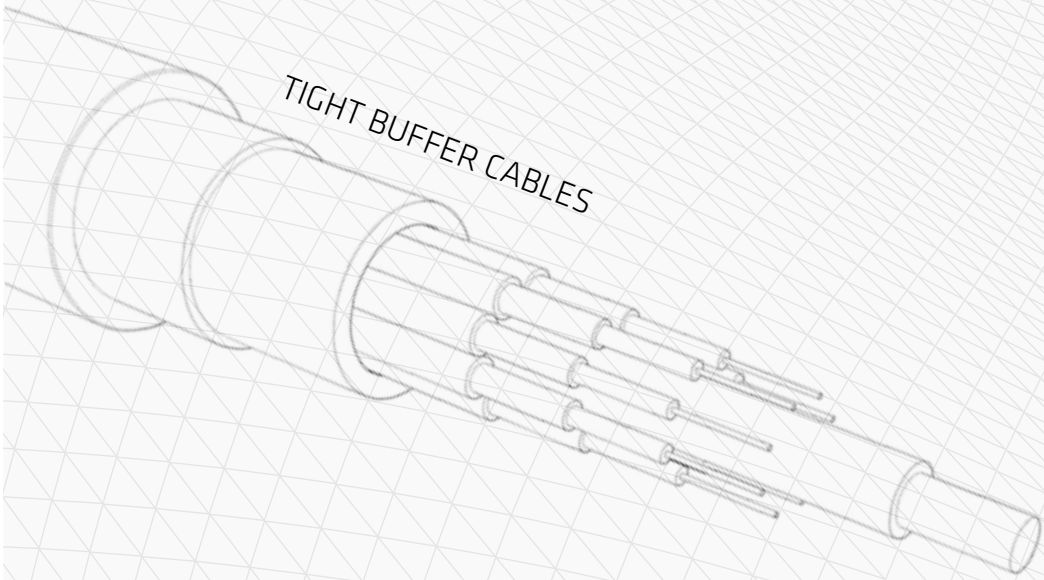
The halogen content of non-metallic materials must be less than 0.5% or 5 mg/g.

IEC 60754-2 / EN 50267-2-2 Test on gases evolved during combustion of materials from cables - Determination of acidity (by pH measurement) and conductivity.

A small quantity of non-metallic material is burnt in a furnace, the pH and conductivity combustion gases dissolved in water are measured.

The minimum pH value of the washing water must 4.3, and the maximum conductivity must be 10 µS/mm.

NOTE


TIGHT BUFFER CABLES

TK-SAD SIMPLEX AND DUPLEX CABLES - LSZH

ON REQUEST

OPTICAL CORE

Fiber Structure	Tight Buffer 600 µm or 900 µm Semitight Buffer 900 µm
Tight Colour Code	White, Red
Strain relief	Aramid yarns
Outer Sheath	Flame retardant, low smoke and halogen-free material

All cables are available with all type of fibers.

TECHNICAL DATA

Operating temperature range	-40°C to + 70°C
Installation temperature	-10°C to + 50°C
Minimum bending radius	Static: 10 x outer diameter Dynamic: 15 x outer diameter

FIRE PERFORMANCE

Fire propagation	IEC 60332-1-2 IEC 60332-3-24 Cat. C
Halogen-free	IEC 60754-1/2
Smoke density	IEC 61034-1/2
Fumes	No corrosive and toxic fumes

ON REQUEST

UV-Resistant
Polyurethane sheath for dynamic applications

MAIN FEATURES

No. of Fiber	Nominal Diameter (mm)	Nom. Weight (kg/km)	Max pulling Force (N)	Max Crush (N/dm)	Impact (J)
1	2.0	5	200	250	5
1	3.0	8	200	400	8
2	1.6x3.2	7	300	200	5
2	2.0x4.0	10.5	400	250	5

Types mentioned here are standard. Other configurations available on request.

CPR
available in CPR version

FIELDS OF APPLICATION

- TRANSPORTATION
- TELECOMMUNICATION
- AUTOMATION
- AUDIOVIDEO
- NAVAL
- GREEN ENERGY

TK-SAR ARMOURED SIMPLEX CABLES - LSZH

ON REQUEST

OPTICAL CORE

Fiber Structure	Tight Buffer 600 µm or 900 µm Semitight Buffer 900 µm
Tight Colour Code	White
Strain relief	Aramid yarns
Inner Sheath	Flame retardant, low smoke and halogen-free material
Armouring	Galvanized steel wire braid (GSWB)
Outer Sheath	Flame retardant, low smoke and halogen-free material

All cables are available with all type of fibers.

TECHNICAL DATA

Operating temperature range	-40°C to + 70°C
Installation temperature	-10°C to + 50°C
Minimum bending radius	Static: 10 x outer diameter Dynamic: 15 x outer diameter

FIRE PERFORMANCE

Fire propagation	IEC 60332-1-2 IEC 60332-3-24 Cat. C
Halogen-free	IEC 60754-1/2
Smoke density	IEC 61034-1/2
Fumes	No corrosive and toxic fumes

ON REQUEST

UV-Resistant
Mud resistant
Oil resistant
Hydrocarbons resistant
Polyethylene sheath for direct buried
Fully dielectric
Armouring (with aramidic or glass yarns)

CPR
available in CPR version

MAIN FEATURES

No. of Fiber	Nominal Diameter (mm)	Nom. Weight (kg/km)	Max pulling Force (N)	Max Crush (N/dm)	Impact (J)
1	5.5	40	500	1000	10

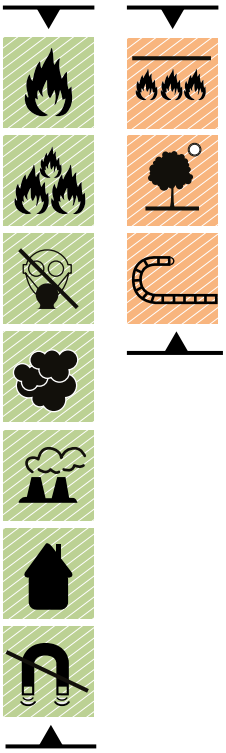
Types mentioned here are standard. Other configurations available on request.

FIELDS OF APPLICATION

- TRANSPORTATION
- OIL / GAS & PETROCHEMICALS
- TELECOMMUNICATION
- NAVAL
- GREEN ENERGY

TK-MTB BREAKOUT CABLES - LSZH

ON REQUEST



OPTICAL CORE

Fiber Structure	Tight Buffer 900 µm Semitight Buffer 900 µm
Tight Colour Code	White
Strain relief	Aramid yarns
Sub unit Sheath	Numbered flame retardant, low smoke and halogen-free material
Assembling	4 to 24 sub units
Outer Sheath	Flame retardant, low smoke and halogen-free material

All cables are available with all type of fibers.

TECHNICAL DATA

Operating temperature range	-40°C to + 70°C
Installation temperature	-10°C to + 50°C
Minimum bending radius	Static: 10 x outer diameter Dynamic: 15 x outer diameter

FIRE PERFORMANCE

Fire propagation	IEC 60332-1-2 IEC 60332-3-24 Cat. C
Halogen-free	IEC 60754-1/2
Smoke density	IEC 61034-1/2
Fumes	No corrosive and toxic fumes

ON REQUEST

Fire resistant
UV-Resistant
Polyuretane sheath
for dynamic applications

CPR
available in CPR version

TK-MTB BREAKOUT CABLES - LSZH

MAIN FEATURES

No. of Fiber	Nominal Diameter (mm)	Nom. Weight (kg/km)	Max pulling Force (N)	Max Crush (N/dm)	Impact (J)
4	6.8	45	500	1000	10
6	8.0	60	1000	1000	10
8	9.8	90	1500	1000	10
12	12.6	165	2000	1000	10
16	12.0	150	3000	1000	10
24	15.0	210	4000	1000	10

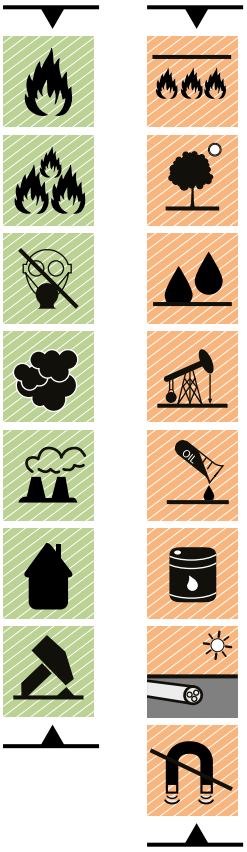
Types mentioned here are standard. Other configurations available on request.

FIELDS OF APPLICATION

- TRANSPORTATION
- TELECOMMUNICATION
- AUTOMATION
- AUDIOVIDEO
- NAVAL
- GREEN ENERGY

TK-MTBA ARMOURED BREAKOUT CABLES - LSZH

ON REQUEST



OPTICAL CORE

Fiber Structure	Tight Buffer 900 µm Semitight Buffer 900 µm
Tight Colour Code	White
Strain relief	Aramid yarns
Sub unit Sheath	Numbered flame retardant, low smoke and halogen-free material Ø 2mm
Assembling	4 to 24 sub units
Inner Sheath	Flame retardant, low smoke and halogen-free material
Armouring	Galvanized steel wire braid (GSWB) or tinned copper wire braid (TCWB)
Outer Sheath	Flame retardant, low smoke and halogen-free material

All cables are available with all type of fibers.

TECHNICAL DATA

Operating temperature range	-40°C to + 70°C
Installation temperature	-10°C to + 50°C
Minimum bending radius	Static: 12 x outer diameter Dynamic: 18 x outer diameter

FIRE PERFORMANCE

Fire propagation	IEC 60332-1-2 IEC 60332-3-24 Cat. C
Halogen-free	IEC 60754-1/2
Smoke density	IEC 61034-1/2
Fumes	No corrosive and toxic fumes

ON REQUEST

Fire resistant
UV-Resistant
Water resistant
Mud resistant
Oil resistant
Hydrocarbons resistant
Polyethylene sheath for direct buried
Fully dielectric
Armouring (with aramidic or glass yarns)

CPR
available in CPR version

TK-MTBA ARMOURED BREAKOUT CABLES - LSZH

MAIN FEATURES

No. of Fiber	Nominal diameter (mm)	Nom. Weight (kg/km)	Max pulling Force (N)	Max Crush (N/dm)	Impact (J)
4	11.0	180	1000	2000	20
6	12.0	200	1500	2000	20
8	13.8	230	2000	2000	20
12	16.5	300	2500	2000	20
16	16.0	280	3500	2000	20
24	19.0	350	4500	2000	20

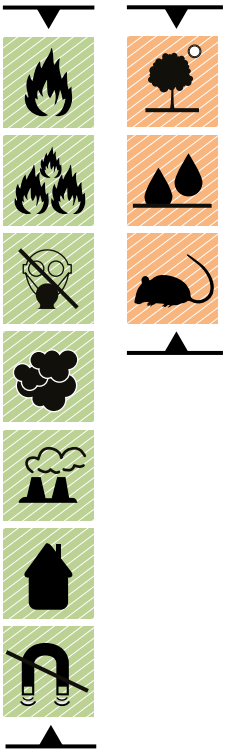
Types mentioned here are standard. Other configurations available on request.

FIELDS OF APPLICATION

- TRANSPORTATION
- OIL / GAS & PETROCHEMICALS
- TELECOMMUNICATION
- NAVAL
- GREEN ENERGY

TK-MTD MULTI TIGHT DISTRIBUTION CABLES - LSZH

ON REQUEST



OPTICAL CORE

Fiber Structure	Tight Buffer 900 µm Semitight Buffer 900 µm
Tight Colour Code	See table C
Assembling	2 to 24 fibers
Strain relief	Aramid/Glass yarns
Inner Sheath*	Flame retardant, low smoke and halogen-free material
Assembling	48 (4x12 inner sheath*) 96 fibers (8x12 inner sheath*)
Outer Sheath	Flame retardant, low smoke and halogen-free material

*Inner Sheath for 48/96 fibers.

All cables are available with all type of fibers.

TECHNICAL DATA

Operating temperature range	-40°C to + 70°C
Installation temperature	-10°C to + 50°C
Minimum bending radius	Static: 10 x outer diameter Dynamic: 15 x outer diameter

FIRE PERFORMANCE

Fire propagation	IEC 60332-1-2 IEC 60332-3-24 Cat. C
Halogen-free	IEC 60754-1/2
Smoke density	IEC 61034-1/2
Fumes	No corrosive and toxic fumes

ON REQUEST

UV-Resistant
Water resistant
Rodent resistant

CPR
available in CPR version

TK-MTD MULTI TIGHT DISTRIBUTION CABLES - LSZH

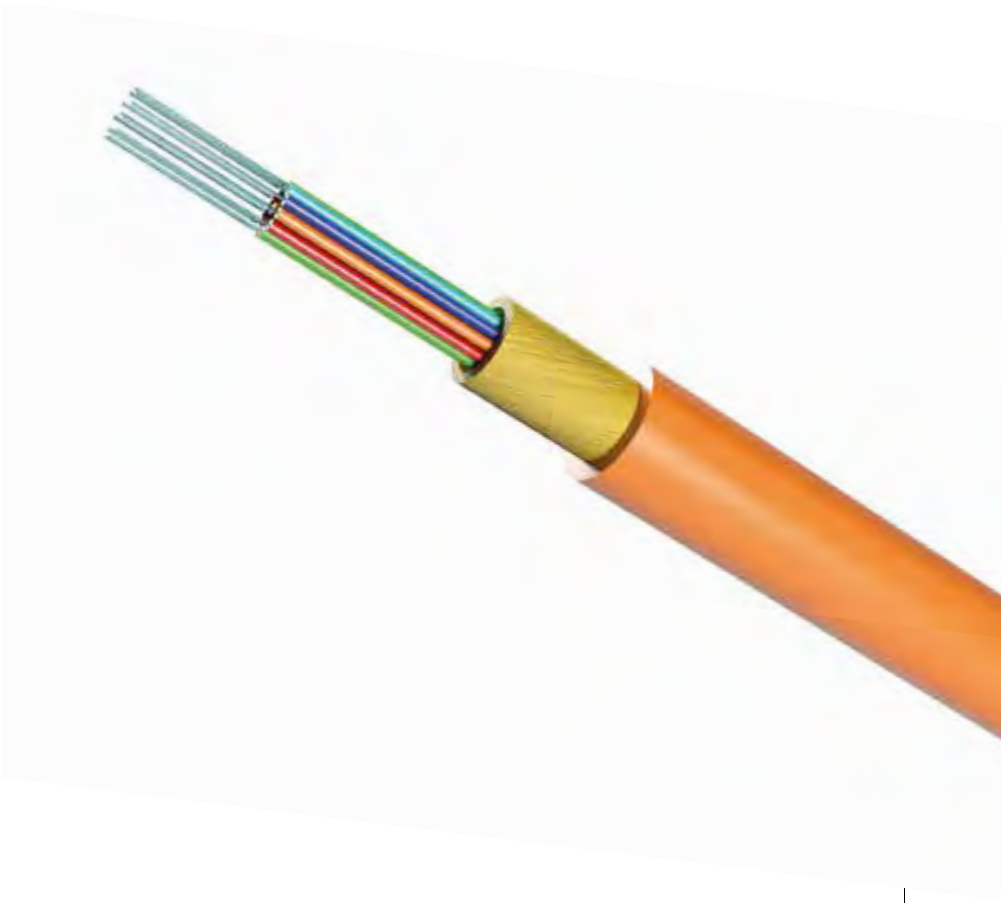
MAIN FEATURES

No. of Fiber	Nominal Diameter (mm)	Nom. Weight (kg/km)	Max pulling Force (N)	Max Crush (N/dm)	Impact (J)
2	4.8	20	500	2000	5
4	5.2	25	500	2000	5
6	6.0	30	500	2000	5
8	6.2	35	500	2000	5
12	6.7	45	750	2000	5
16	7.7	55	750	2000	5
24	8.5	70	1000	2000	5
48 (4x12)	19.0	300	3000	3000	15
96 (8x12)	26.5	630	5000	3000	15

Types mentioned here are standard. Other configurations available on request.

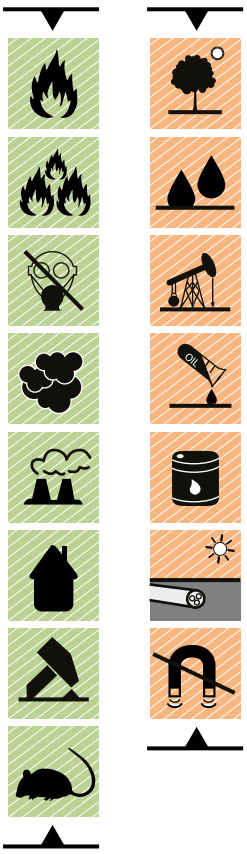
FIELDS OF APPLICATION

- TRANSPORTATION
- TELECOMMUNICATION
- AUTOMATION
- AUDIOVIDEO
- NAVAL
- GREEN ENERGY



TK-MTDA ARMOURED MULTI TIGHT DISTRIBUTION CABLES - LSZH

ON REQUEST



OPTICAL CORE

Fiber Structure	Tight Buffer 900 µm Semitight Buffer 900 µm
Tight Colour Code	See table C
Assembling	4 to 24 fibers
Protection	Glass yarns
Inner Sheath	Flame retardant, low smoke and halogen-free material
Armouring	Galvanized steel wire braid (GSWB) or tinned copper wire braid (TCWB)
Outer Sheath	Flame retardant, low smoke and halogen-free material

All cables are available with all type of fibers.

TECHNICAL DATA

Operating temperature range	-40°C to + 70°C
Installation temperature	-10°C to + 50°C
Minimum bending radius	Static: 10 x outer diameter Dynamic: 15 x outer diameter

FIRE PERFORMANCE

Fire propagation	IEC 60332-1-2 IEC 60332-3-22 Cat. A
Halogen-free	IEC 60754-1/2
Smoke density	IEC 61034-1/2
Fumes	No corrosive and toxic fumes

ON REQUEST

UV-Resistant
Water resistant
Mud resistant
Oil resistant
Hydrocarbons resistant
Polyethylene sheath for direct buried
Fully dielectric

CPR
available in CPR version

TK-MTDA ARMOURED MULTI TIGHT DISTRIBUTION CABLES - LSZH

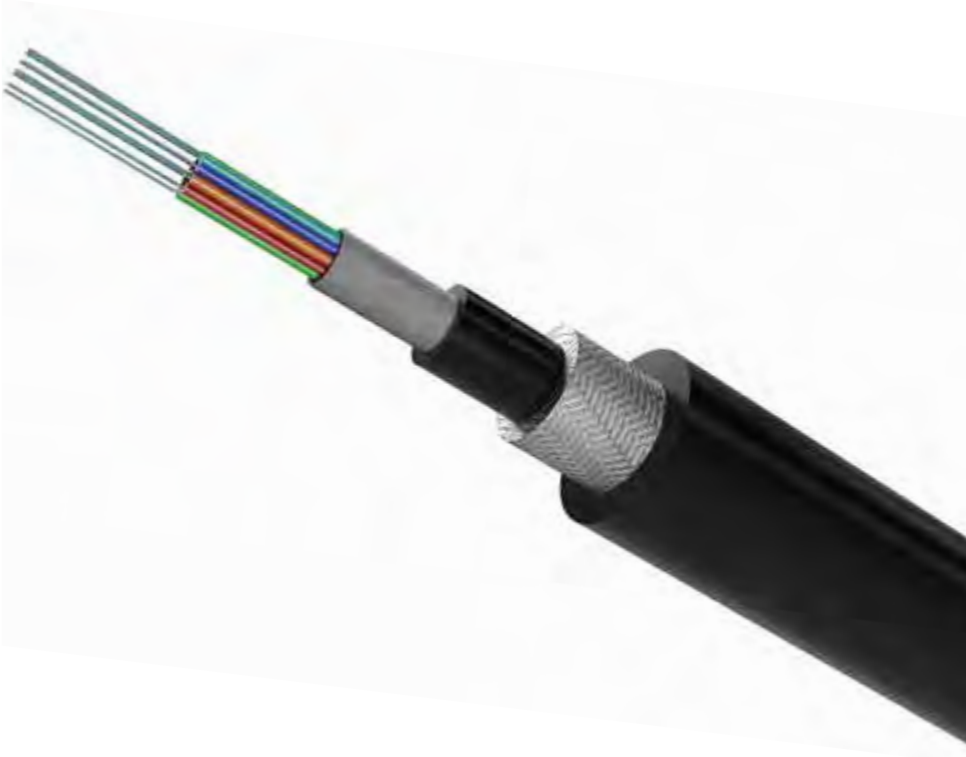
MAIN FEATURES

No. of Fiber	Nominal Diameter (mm)	Nom. Weight (kg/km)	Max pulling Force (N)	Max Crush (N/dm)	Impact (J)
4	8.5	100	1000	2000	25
8	9.4	115	1000	2000	25
12	10.3	140	1500	2000	25
24	12.1	180	2000	2000	25

Types mentioned here are standard. Other configurations available on request.

FIELDS OF APPLICATION

- TRANSPORTATION
- OIL / GAS & PETROCHEMICALS
- TELECOMMUNICATION
- NAVAL
- GREEN ENERGY



TK-PB SINGLE PICO BREAKOUT FTTH CABLES - LSZH

OPTICAL CORE INDOOR

Fiber Structure	Optical fiber 250 µm
Strain Relief	Aramid yarns
Sub unit Sheath	Flame retardant, low smoke and halogen-free material Ø 0.9 mm
Strain Relief	Aramid yarns
Outer Sheath	Flame retardant, low smoke and halogen-free material - ø 2.6 mm

OPTICAL CORE OUTDOOR

Fiber Structure	Optical fiber 250 µm
Strain Relief	Aramid yarns
Sub unit Sheath	Flame retardant, low smoke and halogen-free material Ø 0.9 mm
Strain Relief	Aramid yarns
Inner Sheath	Flame retardant, low smoke and halogen-free material
Strain Relief	Aramid yarns
Outer Sheath	Flame retardant, low smoke and halogen-free material - ø 4.5 mm

TECHNICAL DATA

Operating temperature range	-10°C to + 60°C
Installation temperature	-0°C to + 50°C
Minimum bending radius	Static: 10 x outer diameter Dynamic: 15 x outer diameter

FIRE PERFORMANCE

Fire propagation	IEC 60332-1-2 IEC 60332-3-25 Cat. D
Halogen-free	IEC 60754-1/2
Smoke density	IEC 61034-1/2
Fumes	No corrosive and toxic fumes

CPR

available in CPR version

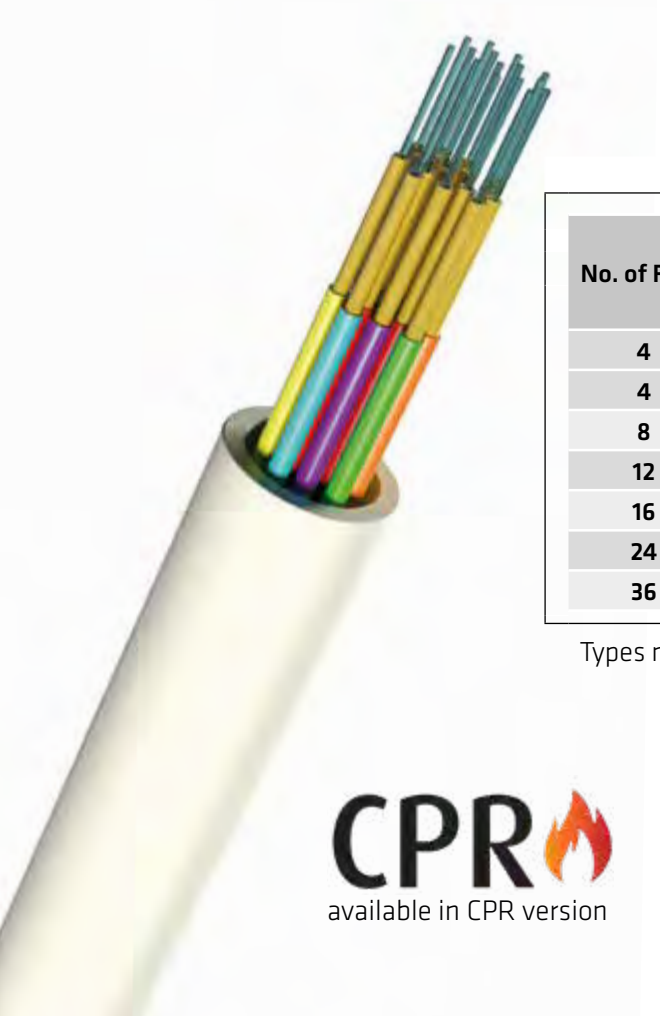
FIELDS OF APPLICATION

TELECOMMUNICATION

TK-PB MULTI PICO BREAKOUT FTTH CABLES - LSZH

ON REQUEST

OPTICAL CORE	
Fiber Structure	Optical fiber 250 µm
Strain Relief	Aramid yarns
Sub unit Sheath	Flame retardant, low smoke and halogen-free material Ø 0.9 mm
Assembling	4 to 36 fibers
Outer Sheath	Flame retardant, low smoke and halogen-free material
TECHNICAL DATA	
Operating temperature range	-10°C to + 60°C
Installation temperature	-0°C to + 50°C
Minimum bending radius	Static: 10 x outer diameter Dynamic: 15 x outer diameter
FIRE PERFORMANCE	
Fire propagation	IEC 60332-1-2 IEC 60332-3-25 Cat. D
Halogen-free	IEC 60754-1/2
Smoke density	IEC 61034-1/2
Fumes	No corrosive and toxic fumes



MAIN FEATURES

No. of Fiber	Nominal Diameter (mm)	Nom. Weight (kg/ km)	Max pulling Force (N)	Max Crush (N/dm)	Impact (J)
4	3.0	16	400	500	3
4	4.0	20	400	500	3
8	5.0	28	400	500	3
12	6.0	30	500	500	5
16	7.0	50	500	500	5
24	8.0	67	500	500	5
36	9.5	95	500	500	5

Types mentioned here are standard. Other configurations available on request.

CPR

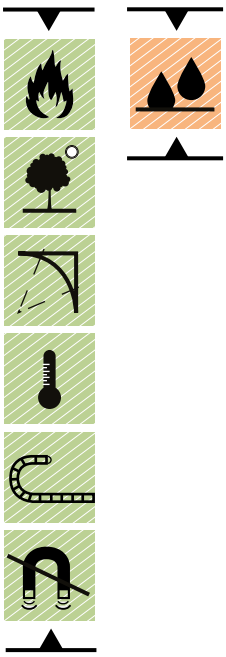
available in CPR version

FIELDS OF APPLICATION

TELECOMMUNICATION

TK-TAT TACTICAL CABLES

ON REQUEST



OPTICAL CORE

Fiber Structure	Tight Buffer 900 µm
Tight Colour Code	See table C
Assembling	2 to 12 fibers
Strain Relief	Aramid yarns
Outer Sheath	Soft polyurethane

All cables are available with all type of fibers.

TECHNICAL DATA

Operating temperature range	-40°C to + 80°C
Installation temperature	-10°C to + 50°C
Minimum bending radius	Static: 5 x outer diameter Dynamic: 8 x outer diameter

FIRE PERFORMANCE

Fire propagation	IEC 60332-1-2

ON REQUEST

Water resistant

MAIN FEATURES

No. of Fiber	Nominal Diameter (mm)	Nom. Weight (kg/km)	Max pulling Force (N)	Max Crush (N/dm)	Impact (J)
2	5.0	25	1500	4000	15
4	5.5	30	1500	4000	15
6	6.0	35	1500	4000	15
8	7.2	45	2000	4000	15
12	8.5	60	2000	4000	15

Types mentioned here are standard. Other configurations available on request.

FIELDS OF APPLICATION

- OIL / GAS & PETROCHEMICALS
- TELECOMMUNICATION
- AUTOMATION
- AUDIOVIDEO

TK-FLX CHAIN CABLES

ON REQUEST

OPTICAL CORE

Fiber Structure	Optical fiber 900 µm Semitight Buffer 900 µm
Tight Colour Code	White
Strain Relief	Aramid yarns
Sub unit Sheath	Numbered flame retardant, low smoke and halogen-free material Ø 2 mm
Assembling	2 to 12 sub unit
Armouring	Aramid yarns braid
Outer Sheath	Flame retardant, halogen-free Polyurethan material

All cables are available with all type of fibers.

TECHNICAL DATA

Operating temperature range	-40°C to + 80°C
Installation temperature	-10°C to + 50°C
Minimum bending radius	Static: 5 x outer diameter Dynamic: 10 x outer diameter

FIRE PERFORMANCE

Fire propagation	IEC 60332-1-2
Halogen-free	IEC 60754-1/2

ON REQUEST

UV - Resistant

MAIN FEATURES

No. of Fiber	Nominal Diameter (mm)	Nom. Weight (kg/km)	Max pulling Force (N)	Max Crush (N/dm)	Impact (J)
2	8.0	60	1000	2000	10
4	8.5	65	1500	2000	10
6	10.5	95	2000	2000	10
12	14.5	155	3000	2000	10

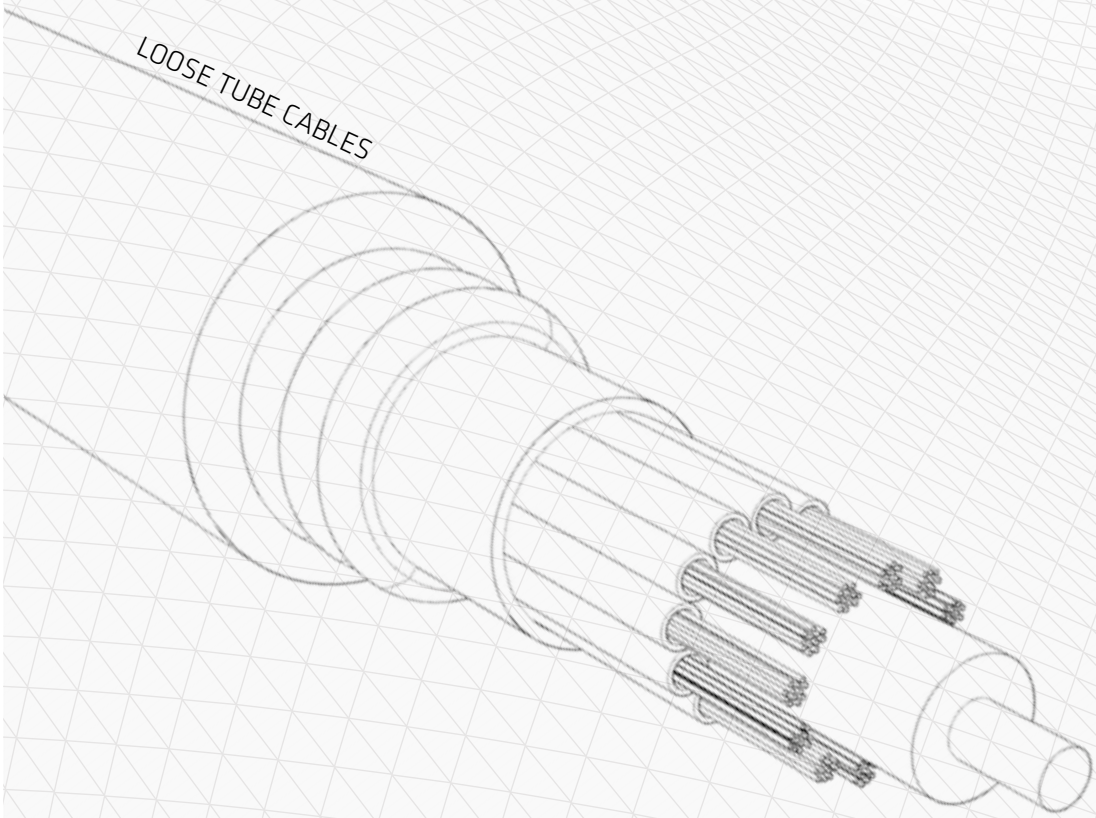
Types mentioned here are standard. Other configurations available on request.

FIELDS OF APPLICATION

- OIL / GAS & PETROCHEMICALS
- TELECOMMUNICATION
- AUTOMATION
- AUDIOVIDEO

NOTE

LOOSE TUBE CABLES



TK-DP DROP CABLES - LSZH

ON REQUEST

OPTICAL CORE

Fiber Structure	Optical fiber 250 µm
Fiber Colour Code	Red, Green
Reinforce	Steel wire
Assembling	1 to 2 fibers
Outer Sheath	Flame retardant, low smoke and halogen-free material

All cables are available with all type of fibers.

TECHNICAL DATA

Operating temperature range	-25°C to + 70°C
Installation temperature	-10°C to + 50°C
Minimum bending radius	Static: 10 x outer diameter Dynamic: 15 x outer diameter

FIRE PERFORMANCE

Fire propagation	IEC 60332-1-2 IEC 60332-3-24 Cat. C
Halogen-free	IEC 60754-1/2
Smoke density	IEC 61034-1/2
Fumes	No corrosive and toxic fumes

ON REQUEST

UV-Resistant
Mud resistant
Oil resistant
Hydrocarbons resistant
Fully dielectric

MAIN FEATURES

No. of Fiber	Nominal Diameter (mm)	Nom. Weight (kg/km)	Max pulling Force (N)	Max Crush (N/dm)	Impact (J)
1	1.6 x 2.3	8	150	1000	5
1	1.6 x 2	6	150	500	3
2	1.6 x 2.3	8	150	1000	5

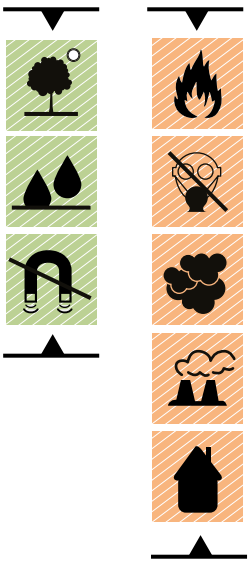
Types mentioned here are standard. Other configurations available on request.

CPR
available in CPR version

FIELDS OF APPLICATION

- OIL / GAS & PETROCHEMICALS
- TELECOMMUNICATION
- AUDIOVIDEO

TK-VBBX UNITUBE CABLES



ON REQUEST

OPTICAL CORE

Fiber Structure	Jelly filled loose tube
Fiber Colour Code	See table A
Loose tube Colour	Natural
Assembling	1 to 24 fibers
Outer Sheath	Polyethylene material UV-Resistant

All cables are available with all type of fibers.

TECHNICAL DATA

Operating temperature range	-40°C to + 80°C
Installation temperature	-10°C to + 50°C
Minimum bending radius	Static: 10 x outer diameter Dynamic: 15 x outer diameter

ON REQUEST

LSZH Sheath for indoor installation

MAIN FEATURES

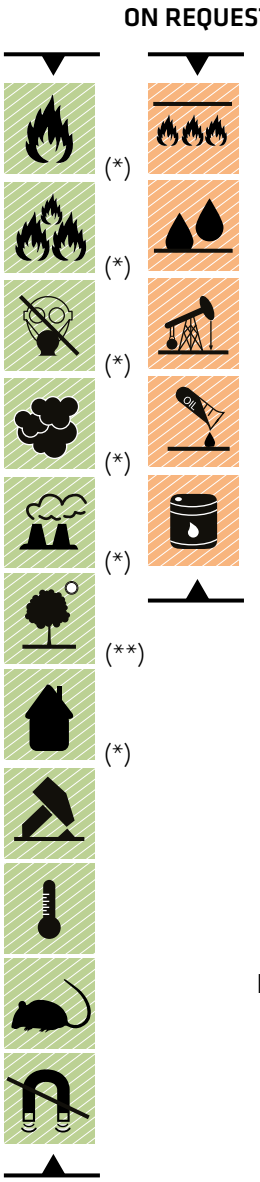
No. of Fiber	Nominal Diameter (mm)	Nom. Weight (kg/km)	Max pulling Force (N)	Max Crush (N/dm)	Impact (J)
1 to 12	2.8	3.8	12	100	3
13 to 24	3.0	4	15	100	3

Types mentioned here are standard. Other configurations available on request.

FIELDS OF APPLICATION

TELECOMMUNICATION

TK-UTX UNITUBE DIELECTRIC CABLES



OPTICAL CORE

Fiber Structure	Jelly filled loose tube
Fiber Colour Code	See table A
Loose tube Colour	Natural
Protection	Aramid/Glass yarns
Outer Sheath	Flame retardant, low smoke and halogen-free or Polyethylene material

All cables are available with all type of fibers.

TECHNICAL DATA

Operating temperature range	-40°C to + 70°C
Installation temperature	-10°C to + 50°C
Minimum bending radius	Static: 10 x outer diameter Dynamic: 15 x outer diameter

FIRE PERFORMANCE
(Only for LSZH version)

Fire propagation	IEC 60332-1-2 IEC 60332-3-24 Cat. C
Halogen-free	IEC 60754-1/2
Smoke density	IEC 61034-1/2
Fumes	No corrosive and toxic fumes

(*) Only for LSZH version

(**) Only for PE version

ON REQUEST

UV-Resistant
Fire resistant
Water resistant
Mud resistant
Oil resistant
Hydrocarbons resistant

CPR

available in CPR version

TK-UTX UNITUBE DIELECTRIC CABLES

MAIN FEATURES ARAMID YARNS + LSZH SHEATH

No. of Fiber	Nominal diameter loose (mm)	Nominal diameter cable (mm)	Nom. Weight (kg/km)	Max pulling Force (N)	Max Crush (N/dm)	Impact (J)
2 to 12	2.8	6.4	40	1500	2000	10
13 to 24	3.5	6.9	50	1500	2000	10

MAIN FEATURES GLASS YARNS + LSZH SHEATH

No. of Fiber	Nominal diameter loose (mm)	Nominal diameter cable (mm)	Nom. Weight (kg/km)	Max pulling Force (N)	Max Crush (N/dm)	Impact (J)
2 to 12	2.8	7.0	55	2500	2000	10
13 to 24	3.5	8.0	65	2500	2000	10

MAIN FEATURES ARAMID YARNS + PE SHEATH

No. of Fiber	Nominal diameter loose (mm)	Nominal diameter cable (mm)	Nom. Weight (kg/km)	Max pulling Force (N)	Max Crush (N/dm)	Impact (J)
2 to 12	2.8	6.4	35	1500	2000	10
13 to 24	3.5	6.9	45	1500	2000	10

MAIN FEATURES GLASS YARNS + PE SHEATH

No. of Fiber	Nominal diameter loose (mm)	Nominal diameter cable (mm)	Nom. Weight (kg/km)	Max pulling Force (N)	Max Crush (N/dm)	Impact (J)
2 to 12	2.8	7.0	45	2500	2000	10
13 to 24	3.5	8.0	55	2500	2000	10

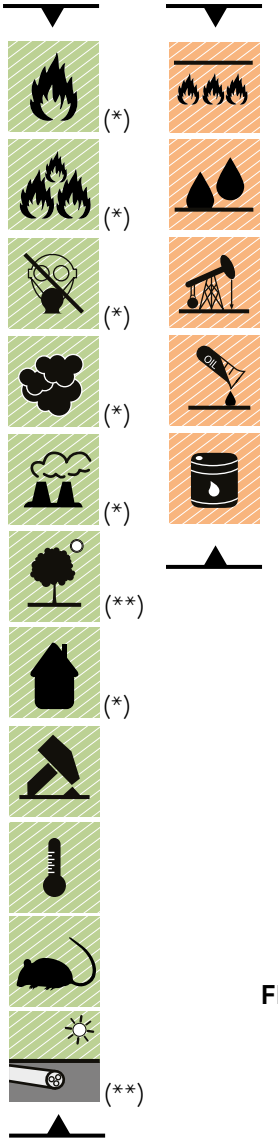
Types mentioned here are standard. Other configurations available on request.

FIELDS OF APPLICATION

- TRANSPORTATION
- OIL / GAS & PETROCHEMICALS
- TELECOMMUNICATION
- AUDIOVIDEO
- NAVAL
- GREEN ENERGY

TK-UT9X ARMOURED UNITUBE CABLES

ON REQUEST



(*) Only for LSZH version
(**) Only for PE version

OPTICAL CORE

Fiber Structure	Jelly filled loose tube
Fiber Colour Code	See table A
Loose tube Colour	Natural
Assembling	2 to 24 fibers
Protection	With or without Aramid/Glass yarns
Armouring	Corrugated and thermowelded steel tape (CST)
Outer Sheath	Flame retardant, low smoke and halogen-free or Polyethylene material

All cables are available with all type of fibers.

TECHNICAL DATA

Operating temperature range	-40°C to + 70°C
Installation temperature	-10°C to + 50°C
Minimum bending radius	Static: 10 x outer diameter Dynamic: 15 x outer diameter

FIRE PERFORMANCE
(Only for LSZH version)

Fire propagation	IEC 60332-1-2 IEC 60332-3-24 Cat. C
Halogen-free	IEC 60754-1/2
Smoke density	IEC 61034-1/2
Fumes	No corrosive and toxic fumes

ON REQUEST

UV-Resistant
Fire resistant
Water resistant
Mud resistant
Oil resistant
Hydrocarbons resistant

CPR
available in CPR version

TK-UT9X ARMOURED UNITUBE CABLES

MAIN FEATURES CST + LSZH SHEATH

No. of Fiber	Nominal diameter loose (mm)	Nominal diameter cable (mm)	Nom. Weight (kg/km)	Max pulling Force (N)	Max Crush (N/dm)	Impact (J)
2 to 24	3.5	9.0	95	750	2500	10

MAIN FEATURES CST + ARAMID YARNS + LSZH SHEATH

No. of Fiber	Nominal diameter loose (mm)	Nominal diameter cable (mm)	Nom. Weight (kg/km)	Max pulling Force (N)	Max Crush (N/dm)	Impact (J)
2 to 24	3.5	9.0	110	1500	3000	15

MAIN FEATURES CST + GLASS YARNS + LSZH SHEATH

No. of Fiber	Nominal diameter loose (mm)	Nominal diameter cable (mm)	Nom. Weight (kg/km)	Max pulling Force (N)	Max Crush (N/dm)	Impact (J)
2 to 24	3.5	10	140	3000	3500	20

MAIN FEATURES CST + PE SHEATH

No. of Fiber	Nominal diameter loose (mm)	Nominal diameter cable (mm)	Nom. Weight (kg/km)	Max pulling Force (N)	Max Crush (N/dm)	Impact (J)
2 to 24	3.5	9.0	55	750	2500	10

MAIN FEATURES CST + ARAMID YARNS + PE SHEATH

No. of Fiber	Nominal diameter loose (mm)	Nominal diameter cable (mm)	Nom. Weight (kg/km)	Max pulling Force (N)	Max Crush (N/dm)	Impact (J)
2 to 24	3.5	9.0	85	1500	3000	15

MAIN FEATURES CST + GLASS YARNS + PE SHEATH

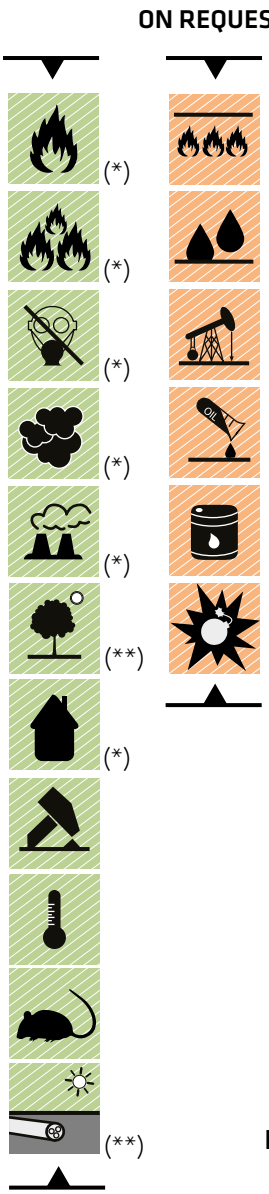
No. of Fiber	Nominal diameter loose (mm)	Nominal diameter cable (mm)	Nom. Weight (kg/km)	Max pulling Force (N)	Max Crush (N/dm)	Impact (J)
2 to 24	3.5	10	100	3000	3500	20

Types mentioned here are standard. Other configurations available on request.

FIELDS OF APPLICATION

- TRANSPORTATION
- OIL / GAS & PETROCHEMICALS
- TELECOMMUNICATION
- AUDIOVIDEO
- NAVAL
- GREEN ENERGY

TK-UTXD ARMOURED UNITUBE DOUBLE SHEATH CABLES



(*) Only for LSZH version
(**) Only for PE version

OPTICAL CORE

Fiber Structure	Jelly filled loose tube
Fiber Colour Code	See table A
Loose tube Colour	Natural
Assembling	2 to 24 fibers
Strain relief	Aramid/Glass yarns
Inner Sheath	Flame retardant, low smoke and halogen-free or Polyethylene material
Armouring	Galvanized steel wire braid (GSWB) or corrugated and thermowelded steel tape (CST)
Outer Sheath	Flame retardant, low smoke and halogen-free or Polyethylene material

All cables are available with all type of fibers.

TECHNICAL DATA

Operating temperature range	-40°C to + 70°C
Installation temperature	-10°C to + 50°C
Minimum bending radius	Static: 10 x outer diameter Dynamic: 20 x outer diameter

FIRE PERFORMANCE
(Only for LSZH version)

Fire propagation	IEC 60332-1-2 IEC 60332-3-22 Cat. A
Halogen-free	IEC 60754-1/2
Smoke density	IEC 61034-1/2
Fumes	No corrosive and toxic fumes

ON REQUEST

UV-Resistant
Fire resistant
Water resistant
Mud resistant
Oil resistant
Hydrocarbons resistant
Fully dielectric Bronze braid for installation in hazardous areas

CPR
available in CPR version

TK-UTXD ARMOURED UNITUBE DOUBLE SHEATH CABLES

MAIN FEATURES LSZH + GSWB + LSZH SHEATH

No. of Fiber	Nominal diameter loose (mm)	Nominal diameter cable (mm)	Nom. Weight (kg/km)	Max pulling Force (N)	Max Crush (N/dm)	Impact (J)
2 to 12	2.8	8.6	100	1500	2500	10
13 to 24	3.5	10	130	1500	2500	10

MAIN FEATURES PE + GSWB + PE SHEATH

No. of Fiber	Nominal diameter loose (mm)	Nominal diameter cable (mm)	Nom. Weight (kg/km)	Max pulling Force (N)	Max Crush (N/dm)	Impact (J)
2 to 12	2.8	8.6	70	1500	2500	10
13 to 24	3.5	10	90	1500	2500	10

MAIN FEATURES LSZH + CST + LSZH SHEATH

No. of Fiber	Nominal diameter loose (mm)	Nominal diameter cable (mm)	Nom. Weight (kg/km)	Max pulling Force (N)	Max Crush (N/dm)	Impact (J)
2 to 12	2.8	10	125	2000	3000	15
13 to 24	3.5	10.5	145	2000	3000	15

MAIN FEATURES PE + CST + PE SHEATH

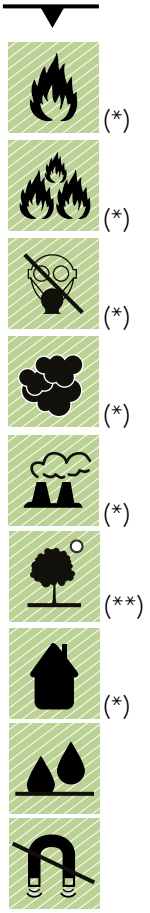
No. of Fiber	Nominal diameter loose (mm)	Nominal diameter cable (mm)	Nom. Weight (kg/km)	Max pulling Force (N)	Max Crush (N/dm)	Impact (J)
2 to 12	2.8	10	85	2000	3000	15
13 to 24	3.5	10.5	105	2000	3000	15

Types mentioned here are standard. Other configurations available on request.

FIELDS OF APPLICATION

- TRANSPORTATION
- OIL / GAS & PETROCHEMICALS
- TELECOMMUNICATION
- AUDIOVIDEO
- NAVAL
- GREEN ENERGY

TK-ABI AIRBLOWN MICROCABLES



(*) Only for LSZH version
(**) Only for PE version

OPTICAL CORE

Fiber Structure	Jelly filled loose tube
Fiber Colour Code	See table A
Loose tube Colour	See table B
Assembling	5 to 12 loose tubes/fillers 12 to 288 fibers
Central element	Fiber reinforced polymer or galvanized steel wire
Outer Sheath	Flame retardant, low smoke and halogen-free or Polyethylene material

All cables are available with all type of fibers.

TECHNICAL DATA

Operating temperature range	-30°C to + 70°C
Installation temperature	-10°C to + 50°C
Minimum bending radius	Static: 10 x outer diameter Dynamic: 15 x outer diameter

FIRE PERFORMANCE
(Only for LSZH version)

Fire propagation	IEC 60332-1-2 IEC 60332-3-25 Cat. D
Halogen-free	IEC 60754-1/2
Smoke density	IEC 61034-1/2
Fumes	No corrosive and toxic fumes

CPR
available in CPR version

FIELDS OF APPLICATION

TELECOMMUNICATION

TK-ABI AIRBLOWN MICROCABLES

MAIN FEATURES LSZH SHEATH

No. of Fiber	No. of fiber each loose	Nominal Diameter loose (mm)	No. loose	No. filler	Nominal Diameter cable (mm)	Nom. Weight (kg/km)	Max pulling force (N)	Max crush (N/dm)	Impact (J)
12	12	1.9	1	4	7.2	55	1000	1000	3
12	12	1.8	1	5	7.3	60	1000	1000	3
24	12	1.9	2	3	7.2	55	1000	1000	3
24	12	1.8	2	4	7.3	60	1000	1000	3
36	12	1.9	3	2	7.2	55	1000	1000	3
36	12	1.8	3	3	7.3	60	1000	1000	3
48	12	1.9	4	1	7.2	55	1000	1000	3
48	12	1.8	4	2	7.3	60	1000	1000	3
60	12	1.9	5	/	7.2	55	1000	1000	3
60	12	1.8	5	1	7.3	60	1000	1000	3
72	12	1.8	6	/	7.3	60	1000	1000	3
96	12	1.7	8	/	7.5	60	1000	1000	3
96*	24	2.0	4	2	7.5	65	1000	1000	3
120*	24	2.0	5	1	7.5	65	1000	1000	3
144*	24	2.0	6	/	7.5	65	1000	1000	3
192*	24	2.0	8	/	8.5	70	1000	1000	3

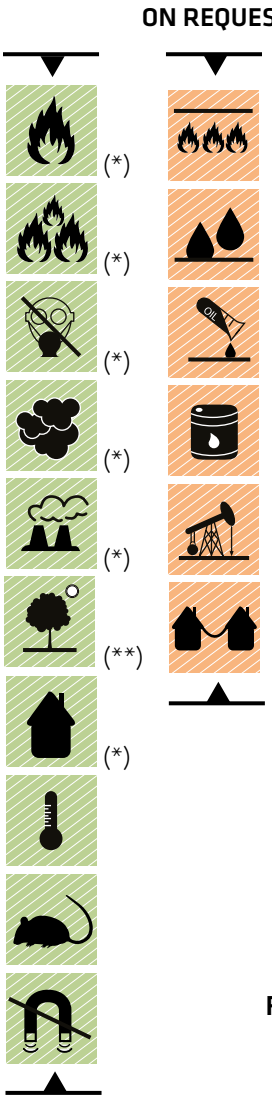
* 200µm OF

MAIN FEATURES PE SHEATH

No. of Fiber	No. of fiber each loose	Nominal Diameter loose (mm)	No. loose	No. filler	Nominal Diameter cable (mm)	Nom. Weight (kg/km)	Max pulling force (N)	Max crush (N/dm)	Impact (J)
12	12	1.9	1	4	6.3	35	1000	1000	3
12	12	1.8	1	5	6.3	40	1000	1000	3
24	12	1.9	2	3	6.3	35	1000	1000	3
24	12	1.8	2	4	6.3	40	1000	1000	3
36	12	1.9	3	2	6.3	35	1000	1000	3
36	12	1.8	3	3	6.3	40	1000	1000	3
48	12	1.9	4	1	6.3	35	1000	1000	3
48	12	1.8	4	2	6.3	40	1000	1000	3
60	12	1.9	5	/	6.3	35	1000	1000	3
60	12	1.8	5	1	6.3	40	1000	1000	3
72	12	1.8	6	/	6.3	40	1000	1000	3
96	12	1.8	8	/	7.5	50	1000	1000	3
96	24	2.2	4	2	7.5	65	1000	1000	3
120	24	2.2	5	1	7.5	65	1000	1000	3
144	24	2.2	6	/	7.5	65	1000	1000	3
192*	24	1.8	8	/	7.5	50	1000	1000	3
288*	36	2.0	8	/	8	70	1000	1000	3
396*	36	2.0	11	/	11	80	1000	1000	3
432	36	2.0	12	/	11.2	100	1000	1000	3

* 200µm OF

TK-MTX MULTITUBE DIELECTRIC CABLES



(*) Only for LSZH version
(**) Only for PE version

OPTICAL CORE

Fiber Structure	Jelly filled loose tube
Fiber Colour Code	See table A
Loose tube Colour	See table B
Assembling	6 to 24 loose tubes/fillers 12 to 288 fibers
Central element	fiber reinforced polymer
Protection	Aramid/Glass yarns
Outer Sheath	Flame retardant, low smoke and halogen-free or Polyethylene material

All cables are available with all type of fibers.

TECHNICAL DATA

Operating temperature range	-40°C to + 70°C
Installation temperature	-10°C to + 50°C
Minimum bending radius	Static: 10 x outer diameter Dynamic: 15 x outer diameter

FIRE PERFORMANCE
(Only for LSZH version)

Fire propagation	IEC 60332-1-2 IEC 60332-3-24 Cat. C
Halogen-free	IEC 60754-1/2
Smoke density	IEC 61034-1/2
Fumes	No corrosive and toxic fumes

ON REQUEST

UV-Resistant
Fire resistant
Water resistant
Mud resistant
Oil resistant
Hydrocarbons resistant

CPR
available in CPR version

MAIN FEATURES ARAMID YARNS + LSZH SHEATH

No. of Fiber	Nominal Diameter loose (mm)	No. loose	No. filler	Nominal Diameter cable (mm)	Nom. Weight (kg/km)	Max pulling force (N)	Max crush (N/dm)	Impact (J)
12	1.9	1	5	9	80	1500	1500	15
24	1.9	2	4	9	80	1500	1500	15
36	1.9	3	3	9	80	1500	1500	15
48	1.9	4	2	9	80	1500	1500	15
60	1.9	5	1	9	80	1500	1500	15
72	1.9	6	/	9	80	1500	1500	15
96	1.9	8	/	10	95	2000	2000	20
144	1.9	12	/	13	150	2500	2000	20
192	1.9	16	/	13	150	2500	2000	20
216	1.9	18	/	13.5	160	2500	2000	20
288	1.9	24	/	15	180	3000	3000	25

MAIN FEATURES GLASS YARNS + LSZH SHEATH

No. of Fiber	Nominal Diameter loose (mm)	No. loose	No. filler	Nominal Diameter cable (mm)	Nom. Weight (kg/km)	Max pulling force (N)	Max crush (N/dm)	Impact (J)
12	1.9	1	5	9.5	90	2500	2000	15
24	1.9	2	4	9.5	90	2500	2000	15
36	1.9	3	3	9.5	90	2500	2000	15
48	1.9	4	2	9.5	90	2500	2000	15
60	1.9	5	1	9.5	90	2500	2000	15
72	1.9	6	/	9.5	90	2500	2000	15
96	1.9	8	/	10.5	105	3000	3000	20
144	1.9	12	/	13.5	160	3500	3000	20
192	1.9	16	/	13.5	160	3500	3000	20
216	1.9	18	/	14	170	3500	3000	20
288	1.9	24	/	15.5	190	4000	4000	25

Types mentioned here are standard. Other configurations available on request.

MAIN FEATURES ARAMID YARNS + PE SHEATH

No. of Fiber	Nominal Diameter loose (mm)	No. loose	No. filler	Nominal Diameter cable (mm)	Nom. Weight (kg/km)	Max pulling force (N)	Max crush (N/dm)	Impact (J)
12	1.9	1	5	9	70	1500	1500	15
24	1.9	2	4	9	70	1500	1500	15
36	1.9	3	3	9	70	1500	1500	15
48	1.9	4	2	9	70	1500	1500	15
60	1.9	5	1	9	70	1500	1500	15
72	1.9	6	/	9	70	1500	1500	15
96	1.9	8	/	10	80	2000	2000	20
144	1.9	12	/	13	120	2500	2000	20
192	1.9	16	/	13	120	2500	2000	20
216	1.9	18	/	13.5	130	2500	2000	20
288	1.9	24	/	15	150	3000	3000	25

MAIN FEATURES GLASS YARNS +PE SHEATH

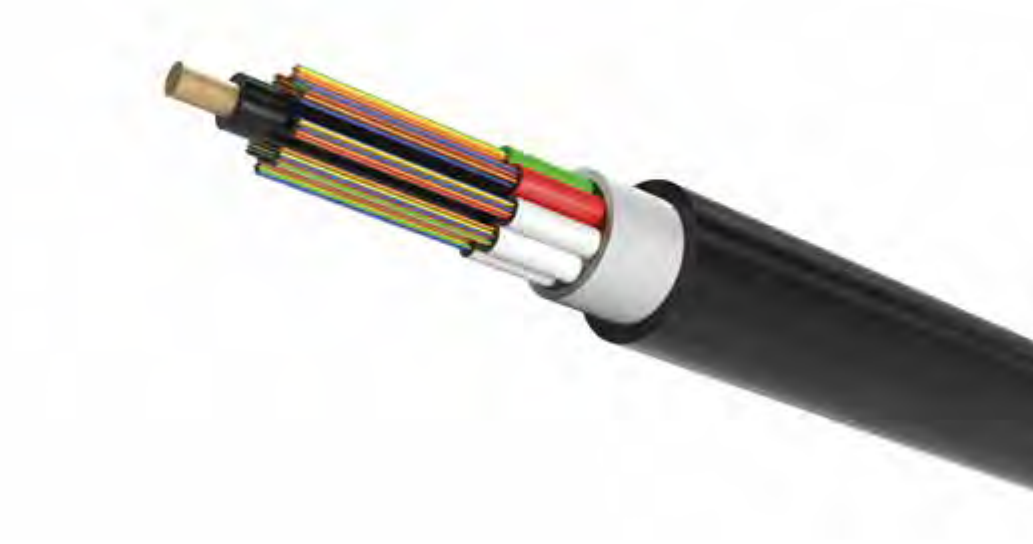
No. of Fiber	Nominal Diameter loose (mm)	No. loose	No. filler	Nominal Diameter cable (mm)	Nom. Weight (kg/km)	Max pulling force (N)	Max crush (N/dm)	Impact (J)
12	1.9	1	5	9.5	75	2500	2000	15
24	1.9	2	4	9.5	75	2500	2000	15
36	1.9	3	3	9.5	75	2500	2000	15
48	1.9	4	2	9.5	75	2500	2000	15
60	1.9	5	1	9.5	75	2500	2000	15
72	1.9	6	/	9.5	75	2500	2000	15
96	1.9	8	/	10.5	85	3000	3000	20
144	1.9	12	/	13.5	130	3500	3000	20
192	1.9	16	/	13.5	130	3500	3000	20
216	1.9	18	/	14	140	3500	3000	20
288	1.9	24	/	15.5	160	4000	4000	25

Types mentioned here are standard. Other configurations available on request.

TK-MTX MULTITUBE DIELECTRIC CABLES

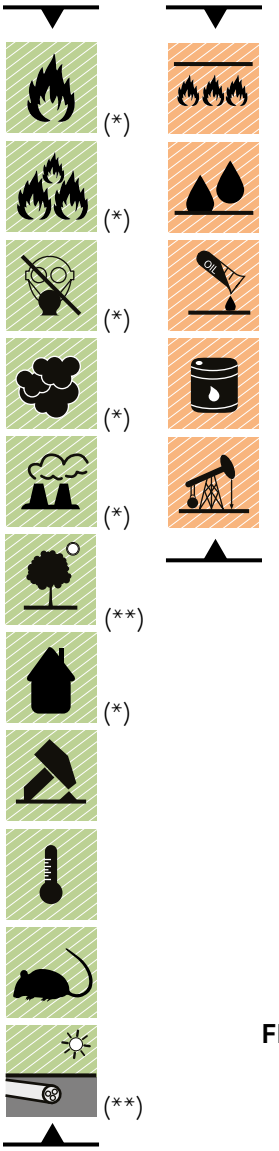
FIELDS OF APPLICATION

- TRANSPORTATION
- OIL / GAS & PETROCHEMICALS
- TELECOMMUNICATION
- AUDIOVIDEO
- NAVAL
- GREEN ENERGY



TK-MT9X ARMOURED MULTITUBE CABLES

ON REQUEST



(*) Only for LSZH version
(**) Only for PE version

OPTICAL CORE

Fiber Structure	Jelly filled loose tube
Fiber Colour Code	See table A
Loose tube Colour	See table B
Assembling	6 to 24 loose tubes/filler 12 to 288 fibers
Central element	fiber reinforced polymer
Protection	With or without Aramid/Glass yarns
Armouring	Corrugated and thermowelded steel tape (CST)
Outer Sheath	Flame retardant, low smoke and halogen-free or Polyethylene material

All cables are available with all type of fibers.

TECHNICAL DATA

Operating temperature range	-40°C to + 70°C
Installation temperature	-10°C to + 50°C
Minimum bending radius	Static: 10 x outer diameter Dynamic: 15 x outer diameter

FIRE PERFORMANCE
(Only for LSZH version)

Fire propagation	IEC 60332-1-2 IEC 60332-3-24 Cat. C
Halogen-free	IEC 60754-1/2
Smoke density	IEC 61034-1/2
Fumes	No corrosive and toxic fumes

ON REQUEST

UV-Resistant
Fire resistant
Water resistant
Mud resistant
Oil resistant
Hydrocarbons resistant

CPR
available in CPR version

TK-MT9X ARMOURED MULTITUBE CABLES

MAIN FEATURES CST+LSZH SHEATH

No. of Fiber	Nominal Diameter loose (mm)	No. loose	No. filler	Nominal Diameter cable (mm)	Nom. Weight (kg/km)	Max pulling force (N)	Max crush (N/dm)	Impact (J)
12	1.9	1	5	11	150	1500	2000	15
24	1.9	2	4	11	150	1500	2000	15
36	1.9	3	3	11	150	1500	2000	15
48	1.9	4	2	11	150	1500	2000	15
60	1.9	5	1	11	150	1500	2000	15
72	1.9	6	/	11	150	1500	2000	15
96	1.9	8	/	12	170	2000	2500	20
144	1.9	12	/	14.5	230	2000	2500	20
192	1.9	16	/	14.5	230	2000	2000	20
216	1.9	18	/	15.5	260	2000	2000	25
288	1.9	24	/	17.5	350	2500	3000	25

MAIN FEATURES ARAMID+CST +LSZH SHEATH

No. of Fiber	Nominal Diameter loose (mm)	No. loose	No. filler	Nominal Diameter cable (mm)	Nom. Weight (kg/km)	Max pulling force (N)	Max crush (N/dm)	Impact (J)
12	1.9	1	5	12	160	2000	2000	15
24	1.9	2	4	12	160	2000	2000	15
36	1.9	3	3	12	160	2000	2000	15
48	1.9	4	2	12	160	2000	2000	15
60	1.9	5	1	12	160	2000	2000	15
72	1.9	6	/	12	160	2000	2000	15
96	1.9	8	/	13	180	2500	2500	20
144	1.9	12	/	15.5	250	2500	2500	20
192	1.9	16	/	15.5	250	3000	3000	25
216	1.9	18	/	16.5	280	3000	3000	25
288	1.9	24	/	18.5	360	3500	3000	25

Types mentioned here are standard. Other configurations available on request.

TK-MT9X ARMOURED MULTITUBE CABLES

MAIN FEATURES GLASS YARNS +CST +LSZH SHEATH

No. of Fiber	Nominal Diameter loose (mm)	No. loose	No. filler	Nominal Diameter cable (mm)	Nom. Weight (kg/km)	Max pulling force (N)	Max crush (N/dm)	Impact (J)
12	1.9	1	5	12	170	2500	2000	15
24	1.9	2	4	12	170	2500	2000	15
36	1.9	3	3	12	170	2500	2000	15
48	1.9	4	2	12	170	2500	2000	15
60	1.9	5	1	12	170	2500	2000	15
72	1.9	6	/	12	170	2500	2000	15
96	1.9	8	/	13	190	3000	2500	20
144	1.9	12	/	15.5	270	2500	2500	20
192	1.9	16	/	15.5	270	3000	3000	25
216	1.9	18	/	15.5	300	3000	3000	25
288	1.9	24	/	17.5	380	3500	3000	25

MAIN FEATURES CST+PE SHEATH

No. of Fiber	Nominal Diameter loose (mm)	No. loose	No. filler	Nominal Diameter cable (mm)	Nom. Weight (kg/km)	Max pulling force (N)	Max crush (N/dm)	Impact (J)
12	1.9	1	5	11	120	1500	2000	15
24	1.9	2	4	11	120	1500	2000	15
36	1.9	3	3	11	120	1500	2000	15
48	1.9	4	2	11	120	1500	2000	15
60	1.9	5	1	11	120	1500	2000	15
72	1.9	6	/	11	120	1500	2000	15
96	1.9	8	/	12	140	2000	2500	20
144	1.9	12	/	14.5	190	2000	2500	20
192	1.9	16	/	14.5	190	2000	2000	20
216	1.9	18	/	15.5	220	2000	2000	25
288	1.9	24	/	17.5	260	2500	3000	25

Types mentioned here are standard. Other configurations available on request.

TK-MT9X ARMOURED MULTITUBE CABLES

MAIN FEATURES ARAMID+CST +PE SHEATH

No. of Fiber	Nominal Diameter loose (mm)	No. loose	No. filler	Nominal Diameter cable (mm)	Nom. Weight (kg/km)	Max pulling force (N)	Max crush (N/dm)	Impact (J)
12	1.9	1	5	12	130	2000	2000	15
24	1.9	2	4	12	130	2000	2000	15
36	1.9	3	3	12	130	2000	2000	15
48	1.9	4	2	12	130	2000	2000	15
60	1.9	5	1	12	130	2000	2000	15
72	1.9	6	/	12	130	2000	2000	15
96	1.9	8	/	13	150	2500	2500	20
144	1.9	12	/	15.5	210	2500	2500	20
192	1.9	16	/	15.5	210	3000	3000	25
216	1.9	18	/	16.5	240	3000	3000	25
288	1.9	24	/	18.5	290	3500	3000	25

MAIN FEATURES GLASS YARNS+CST +PE SHEATH

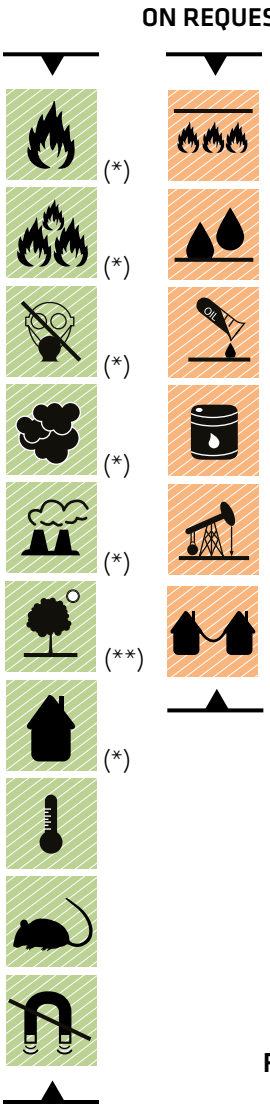
No. of Fiber	Nominal Diameter loose (mm)	No. loose	No. filler	Nominal Diameter cable (mm)	Nom. Weight (kg/km)	Max pulling force (N)	Max crush (N/dm)	Impact (J)
12	1.9	1	5	12	140	2500	2000	15
24	1.9	2	4	12	140	2500	2000	15
36	1.9	3	3	12	140	2500	2000	15
48	1.9	4	2	12	140	2500	2000	15
60	1.9	5	1	12	140	2500	2000	15
72	1.9	6	/	12	140	2500	2000	15
96	1.9	8	/	13	160	3000	2500	20
144	1.9	12	/	15.5	220	2000	2500	20
192	1.9	16	/	15.5	220	3000	3000	25
216	1.9	18	/	16.5	250	3000	3000	25
288	1.9	24	/	18.5	310	3500	3000	25

Types mentioned here are standard. Other configurations available on request.

FIELDS OF APPLICATION

- TRANSPORTATION
- OIL / GAS & PETROCHEMICALS
- TELECOMMUNICATION
- AUDIOVIDEO
- GREEN ENERGY

TK-MTXD DIELECTRIC MULTITUBE DOUBLE SHEATH CABLES



OPTICAL CORE

Fiber Structure	Jelly filled loose tube
Fiber Colour Code	See table A
Loose tube Colour	See table B
Assembling	6 to 24 loose tubes/fillers 12 to 288 fibers
Central element	Fiber reinforced polymer
Inner Sheath	Flame retardant, low smoke and halogen-free or Polyethylene material
Protection	Aramid/Glass yarns
Outer Sheath	Flame retardant, low smoke and halogen-free or Polyethylene material

All cables are available with all type of fibers.

TECHNICAL DATA

Operating temperature range	-40°C to + 70°C
Installation temperature	-10°C to + 50°C
Minimum bending radius	Static: 10 x outer diameter Dynamic: 15 x outer diameter

FIRE PERFORMANCE
(Only for LSZH version)

Fire propagation	IEC 60332-1-2 IEC 60332-3-24 Cat. C
Halogen-free	IEC 60754-1/2
Smoke density	IEC 61034-1/2
Fumes	No corrosive and toxic fumes

ON REQUEST

UV-Resistant
Fire resistant
Water resistant
Mud resistant
Oil resistant
Hydrocarbons resistant

(*) Only for LSZH version
(**) Only for PE version

CPR
available in CPR version

TK-MTXD DIELECTRIC MULTITUBE DOUBLE SHEATH CABLES

MAIN FEATURES LSZH+ARAMID YARNS +LSZH SHEATH

No. of Fiber	Nominal Diameter loose (mm)	No. loose	No. filler	Nominal Diameter cable (mm)	Nom. Weight (kg/km)	Max pulling force (N)	Max crush (N/dm)	Impact (J)
12	1.9	1	5	11.5	130	1500	2500	15
24	1.9	2	4	11.5	130	1500	2500	15
36	1.9	3	3	11.5	130	1500	2500	15
48	1.9	4	2	11.5	130	1500	2500	15
60	1.9	5	1	11.5	130	1500	2500	15
72	1.9	6	0	11.5	130	1500	2500	15
96	1.9	8	0	12.5	170	2000	3000	20
144	1.9	12	0	15	210	2500	3000	25
192	1.9	16	0	15	210	2500	3000	25
216	1.9	18	0	15.5	240	2500	3000	25
288	1.9	24	0	17.5	320	3000	3500	30

MAIN FEATURES LSZH+GLASS YARNS +LSZH SHEATH

No. of Fiber	Nominal Diameter loose (mm)	No. loose	No. filler	Nominal Diameter cable (mm)	Nom. Weight (kg/km)	Max pulling force (N)	Max crush (N/dm)	Impact (J)
12	1.9	1	5	12	150	2500	3000	20
24	1.9	2	4	12	150	2500	3000	20
36	1.9	3	3	12	150	2500	3000	20
48	1.9	4	2	12	150	2500	3000	20
60	1.9	5	1	12	150	2500	3000	20
72	1.9	6	0	12	150	2500	3000	20
96	1.9	8	0	13.5	190	3000	3000	25
144	1.9	12	0	16	250	3500	3000	25
192	1.9	16	0	16	250	3500	3000	25
216	1.9	18	0	16.5	280	3500	3500	30
288	1.9	24	0	18.5	350	4000	4000	30

Types mentioned here are standard. Other configurations available on request.

TK-MTXD DIELECTRIC MULTITUBE DOUBLE SHEATH CABLES

MAIN FEATURES PE+ARAMID YARNS +PE SHEATH

No. of Fiber	Nominal Diameter loose (mm)	No. loose	No. filler	Nominal Diameter cable (mm)	Nom. Weight (kg/km)	Max pulling force (N)	Max crush (N/dm)	Impact (J)
12	1.9	1	5	11.5	90	1500	2500	15
24	1.9	2	4	11.5	90	1500	2500	15
36	1.9	3	3	11.5	90	1500	2500	15
48	1.9	4	2	11.5	90	1500	2500	15
60	1.9	5	1	11.5	90	1500	2500	15
72	1.9	6	0	11.5	90	1500	2500	15
96	1.9	8	0	12.5	110	2000	3000	20
144	1.9	12	0	15	170	2500	3000	25
192	1.9	16	0	15	180	2500	3000	25
216	1.9	18	0	15.5	190	2500	3000	25
288	1.9	24	0	17.5	250	3000	3500	30

MAIN FEATURES PE+GLASS YARNS +PE SHEATH

No. of Fiber	Nominal Diameter loose (mm)	No. loose	No. filler	Nominal Diameter cable (mm)	Nom. Weight (kg/km)	Max pulling force (N)	Max crush (N/dm)	Impact (J)
12	1.9	1	5	12	110	2500	3000	20
24	1.9	2	4	12	110	2500	3000	20
36	1.9	3	3	12	110	2500	3000	20
48	1.9	4	2	12	110	2500	3000	20
60	1.9	5	1	12	110	2500	3000	20
72	1.9	6	0	12	110	2500	3000	20
96	1.9	8	0	13.5	140	3000	3000	25
144	1.9	12	0	16	200	3500	3000	25
192	1.9	16	0	16	210	3500	3000	25
216	1.9	18	0	16.5	220	3500	3500	30
288	1.9	24	0	18.5	275	4000	4000	30

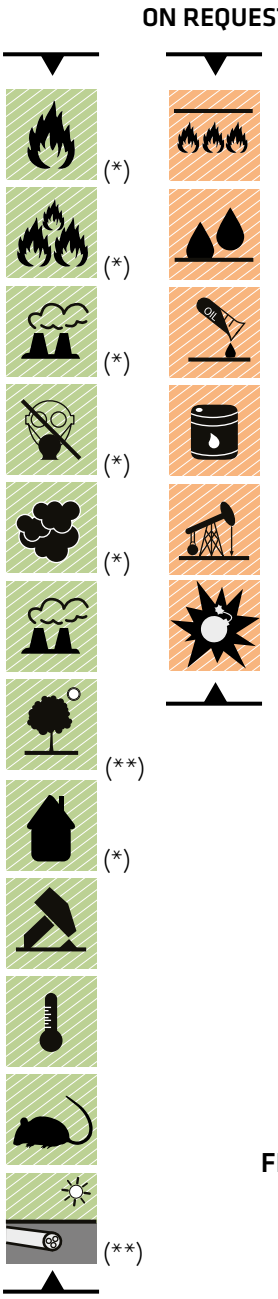
Types mentioned here are standard. Other configurations available on request.

TK-MTXD DIELECTRIC MULTITUBE DOUBLE SHEATH CABLES

FIELDS OF APPLICATION

- TRANSPORTATION
- OIL / GAS & PETROCHEMICALS
- TELECOMMUNICATION
- AUDIOVIDEO
- NAVAL
- GREEN ENERGY

TK-MTAX ARMOURED MULTITUBE DOUBLE SHEATH CABLES



(*) Only for LSZH version
(**) Only for PE version

OPTICAL CORE

Fiber Structure	Jelly filled loose tube
Fiber Colour Code	See table A
Loose tube Colour	See table B
Assembling	6 to 12 loose tubes/fillers 12 to 144 fibers
Central element	Fiber reinforced polymer
Inner Sheath	Flame retardant, low smoke and halogen-free or Polyethylene material
Armouring	Galvanized steel tapes (GSTA) / Galvanized steel wires braid (GSWB) / Steel wires armoured (SWA) / Corrugated and thermowelded steel tape (CST)
Outer Sheath	Flame retardant, low smoke and halogen-free or Polyethylene material

All cables are available with all type of fibers.

TECHNICAL DATA

Operating temperature range	-40°C to + 70°C
Installation temperature	-10°C to + 50°C
Minimum bending radius	Static: 10 x outer diameter Dynamic: 20 x outer diameter

FIRE PERFORMANCE
(Only for LSZH version)

Fire propagation	IEC 60332-1-2 IEC 60332-3-22 Cat. A
Halogen-free	IEC 60754-1/2
Smoke density	IEC 61034-1/2
Fumes	No corrosive and toxic fumes

ON REQUEST

UV-Resistant
Fire resistant
Water resistant
Mud resistant
Oil resistant
Hydrocarbons resistant
Bronze braid for installation in hazardous area

CPR
available in CPR version

TK-MTAX ARMOURED MULTITUBE DOUBLE SHEATH CABLES

MAIN FEATURES LSZH+GSWB+LSZH SHEATH

No. of Fiber	Nominal Diameter loose (mm)	No. loose	No. filler	Nominal Diameter cable (mm)	Nom. Weight (kg/km)	Max pulling force (N)	Max crush (N/dm)	Impact (J)
12	1.9	1	5	12	190	2000	2000	10
24	1.9	2	4	12	190	2000	2000	10
36	1.9	3	3	12	190	2000	2000	10
48	1.9	4	2	12	190	2000	2000	10
60	1.9	5	1	12	190	2000	2000	10
72	1.9	6	0	12	190	2000	2000	10
96	1.9	8	0	13	205	2000	2000	10
144	1.9	12	0	15.5	300	2000	2000	10
192	1.9	16	0	15.5	300	2000	2000	10
216	1.9	18	0	16.5	330	2500	2500	15
288	1.9	24	0	18.0	390	2500	2500	15

MAIN FEATURES LSZH+SWA+LSZH SHEATH

No. of Fiber	Nominal Diameter loose (mm)	No. loose	No. filler	Nominal Diameter cable (mm)	Nom. Weight (kg/km)	Max pulling force (N)	Max crush (N/dm)	Impact (J)
12	1.9	1	5	13.5	350	3000	3000	20
24	1.9	2	4	13.5	350	3000	3000	20
36	1.9	3	3	13.5	350	3000	3000	20
48	1.9	4	2	13.5	350	3000	3000	20
60	1.9	5	1	13.5	350	3000	3000	20
72	1.9	6	0	13.5	350	3000	3000	20
96	1.9	8	0	15	400	4000	3000	25
144	1.9	12	0	17	460	5000	3000	25
192	1.9	16	0	17	460	5000	3000	25
216	1.9	18	0	18	500	5000	3000	25
288	1.9	24	0	19.5	580	5000	3000	25

Types mentioned here are standard. Other configurations available on request.

TK-MTAX ARMOURED MULTITUBE DOUBLE SHEATH CABLES

MAIN FEATURES LSZH+GSTA+LSZH SHEATH

No. of Fiber	Nominal Diameter loose (mm)	No. loose	No. filler	Nominal Diameter cable (mm)	Nom. Weight (kg/km)	Max pulling force (N)	Max crush (N/dm)	Impact (J)
12	1.9	1	5	12	200	2000	2500	10
24	1.9	2	4	12	200	2000	2500	10
36	1.9	3	3	12	200	2000	2500	10
48	1.9	4	2	12	200	2000	2500	10
60	1.9	5	1	12	200	2000	2500	10
72	1.9	6	0	12	200	2000	2500	10
96	1.9	8	0	13	225	2000	2500	10
144	1.9	12	0	15.5	320	2000	2500	10
192	1.9	16	0	15.5	320	2000	2500	10
216	1.9	18	0	16.5	360	2500	2500	15
288	1.9	24	0	18.0	420	2500	2500	15

MAIN FEATURES LSZH+CST+LSZH SHEATH

No. of Fiber	Nominal Diameter loose (mm)	No. loose	No. filler	Nominal Diameter cable (mm)	Nom. Weight (kg/km)	Max pulling force (N)	Max crush (N/dm)	Impact (J)
12	1.9	1	5	13.5	190	2000	3000	15
24	1.9	2	4	13.5	190	2000	3000	15
36	1.9	3	3	13.5	190	2000	3000	15
48	1.9	4	2	13.5	190	2000	3000	15
60	1.9	5	1	13.5	190	2000	3000	15
72	1.9	6	0	13.5	190	2000	3000	15
96	1.9	8	0	15	205	2000	3000	20
144	1.9	12	0	17	300	2000	3000	20
192	1.9	16	0	17	300	2000	3000	20
216	1.9	18	0	18	330	2500	3000	20
288	1.9	24	0	19.5	390	2500	3000	20

Types mentioned here are standard. Other configurations available on request.

TK-MTAX ARMOURED MULTITUBE DOUBLE SHEATH CABLES

MAIN FEATURES PE+GSWB+PE SHEATH

No. of Fiber	Nominal Diameter loose (mm)	No. loose	No. filler	Nominal Diameter cable (mm)	Nom. Weight (kg/km)	Max pulling force (N)	Max crush (N/dm)	Impact (J)
12	1.9	1	5	12	155	2000	2000	10
24	1.9	2	4	12	155	2000	2000	10
36	1.9	3	3	12	155	2000	2000	10
48	1.9	4	2	12	155	2000	2000	10
60	1.9	5	1	12	155	2000	2000	10
72	1.9	6	0	12	155	2000	2000	10
96	1.9	8	0	13	170	2000	2000	10
144	1.9	12	0	15.5	240	2000	2000	10
192	1.9	16	0	15.5	240	2000	2000	10
216	1.9	18	0	16.5	270	2500	2500	15
288	1.9	24	0	18.0	320	2500	2500	15

MAIN FEATURES PE+SWA+PE SHEATH

No. of Fiber	Nominal Diameter loose (mm)	No. loose	No. filler	Nominal Diameter cable (mm)	Nom. Weight (kg/km)	Max pulling force (N)	Max crush (N/dm)	Impact (J)
12	1.9	1	5	13.5	280	3000	3000	20
24	1.9	2	4	13.5	280	3000	3000	20
36	1.9	3	3	13.5	280	3000	3000	20
48	1.9	4	2	13.5	280	3000	3000	20
60	1.9	5	1	13.5	280	3000	3000	20
72	1.9	6	0	13.5	280	3000	3000	20
96	1.9	8	0	15	340	4000	3000	25
144	1.9	12	0	17	400	5000	3000	25
192	1.9	16	0	17	400	5000	3000	25
216	1.9	18	0	18	430	5000	3000	25
288	1.9	24	0	19.5	500	5000	3000	25

Types mentioned here are standard. Other configurations available on request.

TK-MTAX ARMOURED MULTITUBE DOUBLE SHEATH CABLES

MAIN FEATURES PE+GSTA+PE SHEATH

No. of Fiber	Nominal Diameter loose (mm)	No. loose	No. filler	Nominal Diameter cable (mm)	Nom. Weight (kg/km)	Max pulling force (N)	Max crush (N/dm)	Impact (J)
12	1.9	1	5	12	165	2000	2500	10
24	1.9	2	4	12	165	2000	2500	10
36	1.9	3	3	12	165	2000	2500	10
48	1.9	4	2	12	165	2000	2500	10
60	1.9	5	1	12	165	2000	2500	10
72	1.9	6	0	12	165	2000	2500	10
96	1.9	8	0	13	190	2000	2500	10
144	1.9	12	0	15.5	260	2000	2500	10
192	1.9	16	0	15.5	260	2000	2500	10
216	1.9	18	0	16.5	300	2500	2500	15
288	1.9	24	0	18.0	350	2500	2500	15

MAIN FEATURES PE+CST+PE SHEATH

No. of Fiber	Nominal Diameter loose (mm)	No. loose	No. filler	Nominal Diameter cable (mm)	Nom. Weight (kg/km)	Max pulling force (N)	Max crush (N/dm)	Impact (J)
12	1.9	1	5	13.5	155	2000	3000	15
24	1.9	2	4	13.5	155	2000	3000	15
36	1.9	3	3	13.5	155	2000	3000	15
48	1.9	4	2	13.5	155	2000	3000	15
60	1.9	5	1	13.5	155	2000	3000	15
72	1.9	6	0	13.5	155	2000	3000	15
96	1.9	8	0	15	170	2000	3000	20
144	1.9	12	0	17	240	2000	3000	20
192	1.9	16	0	17	240	2000	3000	20
216	1.9	18	0	18	270	2500	3000	20
288	1.9	24	0	19.5	320	2500	3000	20

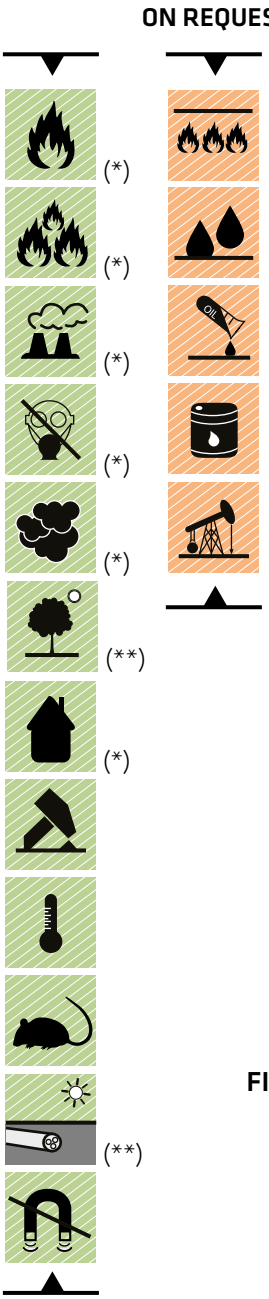
Types mentioned here are standard. Other configurations available on request.

TK-MTAX ARMOURED MULTITUBE DOUBLE SHEATH CABLES

FIELDS OF APPLICATION

- TRANSPORTATION
- OIL / GAS & PETROCHEMICALS
- TELECOMMUNICATION

TK-API AIRBAG PROTECTION CABLES



OPTICAL CORE

Fiber Structure	Jelly filled loose tube
Fiber Colour Code	See table A
Loose tube Colour	See table B
Assembling	8 loose tubes/fillers 16 to 96 fibers
Central element	Fiber reinforced polymer
Inner Sheath	Flame retardant, low smoke and halogen-free or Polyethylene material
Mechanical protection	Dielectric layer
Armouring	Anti rodent Glass protection
Outer Sheath	Flame retardant, low smoke and halogen-free or Polyethylene material

All cables are available with all type of fibers.

TECHNICAL DATA

Operating temperature range	-40°C to + 70°C
Installation temperature	-10°C to + 50°C
Minimum bending radius	Static: 15 x outer diameter Dynamic: 20 x outer diameter

FIRE PERFORMANCE
(Only for LSZH version)

Fire propagation	IEC 60332-1-2 IEC 60332-3-24 Cat. C
Halogen-free	IEC 60754-1/2
Smoke density	IEC 61034-1/2
Fumes	No corrosive and toxic fumes

(*) Only for LSZH version
(**) Only for PE version

ON REQUEST

UV-Resistant
Fire resistant
Water resistant
Mud resistant
Oil resistant
Hydrocarbons resistant

CPR
available in CPR version

TK-API AIRBAG PROTECTION CABLES

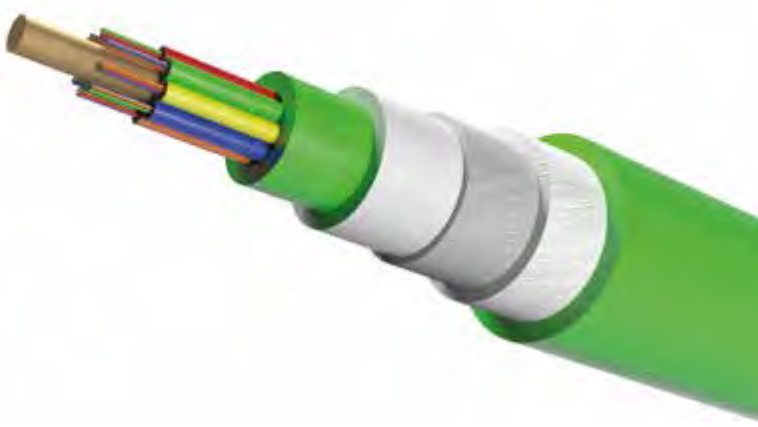
MAIN FEATURES LSZH+AIRBAG+GLASS TAPE AND YARNS+LSZH SHEATH

No. of Fiber	Nominal Diameter loose (mm)	No. loose	No. filler	Nominal Diameter cable (mm)	Nom. Weight (kg/km)	Max pulling force (N)	Max crush (N/dm)	Impact (J)
16	1.8	4	4	18	290	3000	10000	30
32	1.8	8	0	18	290	3000	10000	30
48	1.8	6	2	20	345	3000	10000	30
64	1.8	8	0	20	345	3000	10000	30
96	1.8	8	0	20	345	3000	10000	30

MAIN FEATURES PE+AIRBAG+GLASS TAPE AND YARNS +PE SHEATH

No. of Fiber	Nominal Diameter loose (mm)	No. loose	No. filler	Nominal Diameter cable (mm)	Nom. Weight (kg/km)	Max pulling force (N)	Max crush (N/dm)	Impact (J)
16	1.8	4	4	18	235	3000	10000	30
32	1.8	8	0	18	235	3000	10000	30
48	1.8	6	2	20	280	3000	10000	30
64	1.8	8	0	20	280	3000	10000	30
96	1.8	8	0	20	280	3000	10000	30

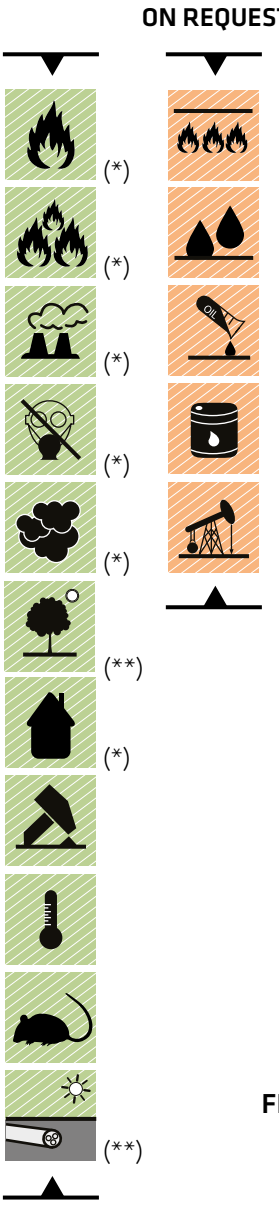
Types mentioned here are standard. Other configurations available on request.



FIELDS OF APPLICATION

- TRANSPORTATION
- OIL / GAS & PETROCHEMICALS
- TELECOMMUNICATION

TK-MT6X ARMOURED MULTITUBE CABLES



(*) Only for LSZH version
(**) Only for PE version

OPTICAL CORE

Fiber Structure	Jelly filled loose tube
Fiber Colour Code	See table A
Loose tube Colour	See table B
Assembling	8 loose tubes/fillers 16 to 96 fibers
Central element	Fiber reinforced polymer
Inner Sheath	Flame retardant, low smoke and halogen-free or Polyethylene material
Strain Relief	Aramid yarns
Armouring	Welded and corrugated steel tape (H6)
Anticorrosion Protection	Bituminous/jelly layer
Outer Sheath	Flame retardant, low smoke and halogen-free or Polyethylene material

All cables are available with all type of fibers.

TECHNICAL DATA

Operating temperature range	-40°C to + 70°C
Installation temperature	-10°C to + 50°C
Minimum bending radius	Static: 15 x outer diameter Dynamic: 20 x outer diameter

FIRE PERFORMANCE
(Only for LSZH version)

Fire propagation	IEC 60332-1-2 IEC 60332-3-24 Cat. C
Halogen-free	IEC 60754-1/2
Smoke density	IEC 61034-1/2
Fumes	No corrosive and toxic fumes

ON REQUEST

UV-Resistant
Fire resistant
Water resistant
Mud resistant
Oil resistant
Hydrocarbons resistant

CPR
available in CPR version

TK-MT6X ARMOURED MULTITUBE CABLES

MAIN FEATURES LSZH+ARAMID YARNS+H6+LSZH SHEATH

No. of Fiber	Nominal Diameter loose (mm)	No. loose	No. filler	Nominal Diameter cable (mm)	Nom. Weight (kg/km)	Max pulling force (N)	Max crush (N/dm)	Impact (J)
16	1.8	4	4	20	460	3000	10000	30
32	1.8	8	0	20	460	3000	10000	30
48	1.8	6	2	20	460	3000	10000	30
64	1.8	8	0	20	460	3000	10000	30
96	1.8	8	0	20	460	3000	10000	30

MAIN FEATURES PE+ARAMID YARNS+H6+PE SHEATH

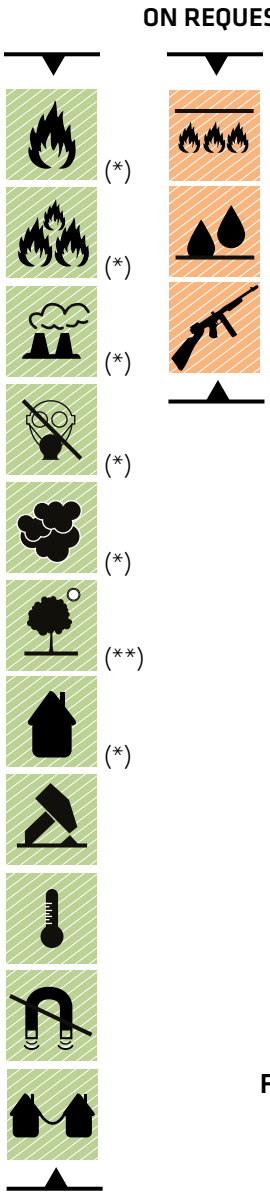
No. of Fiber	Nominal Diameter loose (mm)	No. loose	No. filler	Nominal Diameter cable (mm)	Nom. Weight (kg/km)	Max pulling force (N)	Max crush (N/dm)	Impact (J)
16	1.8	4	4	20	380	3000	10000	30
32	1.8	8	0	20	380	3000	10000	30
48	1.8	6	2	20	380	3000	10000	30
64	1.8	8	0	20	380	3000	10000	30
96	1.8	8	0	20	380	3000	10000	30

Types mentioned here are standard. Other configurations available on request.

FIELDS OF APPLICATION

- TRANSPORTATION
- OIL / GAS & PETROCHEMICALS
- TELECOMMUNICATION

TK-MTAS MULTITUBE ADSS CABLES



(*) Only for LSZH version
(**) Only for PE version

OPTICAL CORE

Fiber Structure	Jelly filled loose tube
Fiber Colour Code	See table A
Loose tube Colour	See table B
Assembling	6 to 24 loose tubes/fillers 12 to 288 fibers
Central element	Fiber reinforced polymer
Inner Sheath	Flame retardant, low smoke and halogen-free or Polyethylene material
***Antibalistic protection**	Aramid tapes or glass flats
Strain Relief	Aramid yarns
Outer Sheath	Flame retardant, low smoke and halogen-free or Polyethylene material

*On request.

All cables are available with all type of fibers.

TECHNICAL DATA

Operating temperature range	-40°C to + 70°C
Installation temperature	-10°C to + 50°C
Minimum bending radius	Static: 10 x outer diameter Dynamic: 15 x outer diameter

FIRE PERFORMANCE
(Only for LSZH version)

Fire propagation	IEC 60332-1-2 IEC 60332-3-24 Cat. C
Halogen-free	IEC 60754-1/2
Smoke density	IEC 61034-1/2
Fumes	No corrosive and toxic fumes

ON REQUEST

UV-Resistant
Fire resistant
Water resistant

CPR
available in CPR version

TK-MTAS MULTITUBE ADSS CABLES

MAIN FEATURES LSZH+ARAMID YARNS+LSZH SHEATH

No. of Fiber	Nominal Diameter loose (mm)	No. loose	No. filler	Nominal Diameter cable (mm)	Nom. Weight (kg/km)	Max pulling force (N)	Max crush (N/dm)	Impact (J)
12	1.9	1	5	13	160	7500	3000	20
24	1.9	2	4	13	160	7500	3000	20
36	1.9	3	3	13	160	7500	3000	20
48	1.9	4	2	13	190	7500	3000	20
60	1.9	5	1	13	160	7500	3000	20
72	1.9	6	0	13	160	7500	3000	20
96	1.9	8	0	14	200	7500	3000	20
144	1.9	12	0	16.5	240	7500	3000	20
192	1.9	16	0	16.5	240	7500	3000	20
216	1.9	18	0	17	280	7500	3000	20
288	1.9	24	0	19	370	7500	3000	20

MAIN FEATURES LSZH+ARAMID YARNS AND TAPES +LSZH SHEATH

No. of Fiber	Nominal Diameter loose (mm)	No. loose	No. filler	Nominal Diameter cable (mm)	Nom. Weight (kg/km)	Max pulling force (N)	Max crush (N/dm)	Impact (J)
12	1.9	1	5	15	190	7500	3000	20
24	1.9	2	4	15	190	7500	3000	20
36	1.9	3	3	15	190	7500	3000	20
48	1.9	4	2	15	190	7500	3000	20
60	1.9	5	1	15	190	7500	3000	20
72	1.9	6	0	15	190	7500	3000	20
96	1.9	8	0	16	230	7500	3000	20
144	1.9	12	0	18.5	280	7500	3000	20
192	1.9	16	0	18.5	280	7500	3000	20
216	1.9	18	0	19	320	7500	3000	20
288	1.9	24	0	21	420	7500	3000	20
288	1.9	24	0	21	420	7500	3000	20

Types mentioned here are standard. Other configurations available on request.

MAIN FEATURES LSZH+ARAMID YARNS+GLASS FLAT + LSZH SHEATH

No. of Fiber	Nominal Diameter loose (mm)	No. loose	No. filler	Nominal Diameter cable (mm)	Nom. Weight (kg/km)	Max pulling force (N)	Max crush (N/dm)	Impact (J)
12	1.9	1	5	15	210	7500	3000	20
24	1.9	2	4	15	210	7500	3000	20
36	1.9	3	3	15	210	7500	3000	20
48	1.9	4	2	15	210	7500	3000	20
60	1.9	5	1	15	210	7500	3000	20
72	1.9	6	0	15	210	7500	3000	20
96	1.9	8	0	16	260	7500	3000	20
144	1.9	12	0	18.5	320	7500	3000	20
192	1.9	16	0	18.5	320	7500	3000	20
216	1.9	18	0	19	360	7500	3000	20
288	1.9	24	0	21	480	7500	3000	20

MAIN FEATURES PE+ARAMID YARNS+PE SHEATH

No. of Fiber	Nominal Diameter loose (mm)	No. loose	No. filler	Nominal Diameter cable (mm)	Nom. Weight (kg/km)	Max pulling force (N)	Max crush (N/dm)	Impact (J)
12	1.9	1	5	13	120	7500	3000	20
24	1.9	2	4	13	120	7500	3000	20
36	1.9	3	3	13	120	7500	3000	20
48	1.9	4	2	13	120	7500	3000	20
60	1.9	5	1	13	120	7500	3000	20
72	1.9	6	0	13	120	7500	3000	20
96	1.9	8	0	14	140	7500	3000	20
144	1.9	12	0	16.5	200	7500	3000	20
192	1.9	16	0	16.5	200	7500	3000	20
216	1.9	18	0	17	230	7500	3000	20
288	1.9	24	0	19	290	7500	3000	20

Types mentioned here are standard. Other configurations available on request.

TK-MTAS MULTITUBE ADSS CABLES

MAIN FEATURES PE+ARAMID YARNS AND TAPES +PE SHEATH

No. of Fiber	Nominal Diameter loose (mm)	No. loose	No. filler	Nominal Diameter cable (mm)	Nom. Weight (kg/km)	Max pulling force (N)	Max crush (N/dm)	Impact (J)
12	1.9	1	5	15	150	7500	3000	20
24	1.9	2	4	15	150	7500	3000	20
36	1.9	3	3	15	150	7500	3000	20
48	1.9	4	2	15	150	7500	3000	20
60	1.9	5	1	15	150	7500	3000	20
72	1.9	6	0	15	150	7500	3000	20
96	1.9	8	0	16	160	7500	3000	20
144	1.9	12	0	18.5	240	7500	3000	20
192	1.9	16	0	18.5	240	7500	3000	20
216	1.9	18	0	19	270	7500	3000	20
288	1.9	24	0	21	330	7500	3000	20

MAIN FEATURES PE+ARAMID YARNS+GLASS FLAT + PE SHEATH

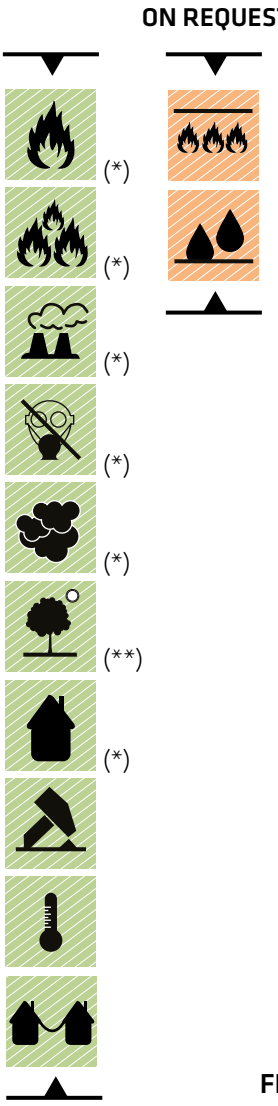
No. of Fiber	Nominal Diameter loose (mm)	No. loose	No. filler	Nominal Diameter cable (mm)	Nom. Weight (kg/km)	Max pulling force (N)	Max crush (N/dm)	Impact (J)
12	1.9	1	5	15	170	7500	3000	20
24	1.9	2	4	15	170	7500	3000	20
36	1.9	3	3	15	170	7500	3000	20
48	1.9	4	2	15	170	7500	3000	20
60	1.9	5	1	15	170	7500	3000	20
72	1.9	6	0	15	170	7500	3000	20
96	1.9	8	0	16	190	7500	3000	20
144	1.9	12	0	18.5	260	7500	3000	20
192	1.9	16	0	18.5	260	7500	3000	20
216	1.9	18	0	19	310	7500	3000	20
288	1.9	24	0	21	380	7500	3000	20

Types mentioned here are standard. Other configurations available on request.

FIELDS OF APPLICATION

- TRANSPORTATION
- TELECOMMUNICATION

TK-MTS8 MULTITUBE SELF SUPPORTING CABLES



OPTICAL CORE

Fiber Structure	Jelly filled loose tube
Fiber Colour Code	See table A
Loose tube Colour	See table B
Assembling	6 to 24 loose tubes/fillers 12 to 288 fibers
Central element	Fiber reinforced polymer or galvanized steel wire
Metallic suspension	Galvanized steel wire 7x1.7 mm
Outer Sheath	Flame retardant, low smoke and halogen-free or Polyethylene material

All cables are available with all type of fibers.

TECHNICAL DATA

Operating temperature range	-40°C to + 70°C
Installation temperature	-10°C to + 50°C
Minimum bending radius	Static: 10 x outer diameter Dynamic: 15 x outer diameter

FIRE PERFORMANCE
(Only for LSZH version)

Fire propagation	IEC 60332-1-2 IEC 60332-3-24 Cat. C
Halogen-free	IEC 60754-1/2
Smoke density	IEC 61034-1/2
Fumes	No corrosive and toxic fumes

ON REQUEST

UV-Resistant
Fire resistant
Water resistant

(*) Only for LSZH version
(**) Only for PE version

CPR
available in CPR version

TK-MTS8 MULTITUBE SELF SUPPORTING CABLES

MAIN FEATURES S8 LSZH SHEATH

No. of Fiber	Nominal Diameter loose (mm)	No. loose	No. filler	Nominal Diameter cable (mm)	Nom. Weight (kg/km)	Max pulling force (N)	Max crush (N/dm)	Impact (J)
12	1.9	1	5	18x9	255	6000	2000	15
24	1.9	2	4	18x9	255	6000	2000	15
36	1.9	3	3	18x9	255	6000	2000	15
48	1.9	4	2	18x9	255	6000	2000	15
60	1.9	5	1	18x9	255	6000	2000	15
72	1.9	6	0	18x9	255	6000	2000	15
96	1.9	8	0	19x10	270	6000	2000	15
144	1.9	12	0	22x13	320	6000	2000	15
192	1.9	16	0	22x13	320	6000	2000	15
216	1.9	18	0	23x14	335	6000	2000	15
288	1.9	24	0	24x15	360	6000	2000	15

MAIN FEATURES S8 PE SHEATH

No. of Fiber	Nominal Diameter loose (mm)	No. loose	No. filler	Nominal Diameter cable (mm)	Nom. Weight (kg/km)	Max pulling force (N)	Max crush (N/dm)	Impact (J)
12	1.9	1	5	18x9	230	6000	2000	15
24	1.9	2	4	18x9	230	6000	2000	15
36	1.9	3	3	18x9	230	6000	2000	15
48	1.9	4	2	18x9	230	6000	2000	15
60	1.9	5	1	18x9	230	6000	2000	15
72	1.9	6	0	18x9	230	6000	2000	15
96	1.9	8	0	19x10	240	6000	2000	15
144	1.9	12	0	22x13	280	6000	2000	15
192	1.9	16	0	22x13	280	6000	2000	15
216	1.9	18	0	23x14	300	6000	2000	15
288	1.9	24	0	24x15	320	6000	2000	15

Types mentioned here are standard. Other configurations available on request.

FIELDS OF APPLICATION

- TRANSPORTATION
- TELECOMMUNICATION

HYBRID CABLES

Hybrid cables are made by optical fibers together with copper conductors.
These cables are generally used for data / signal transmission and power supply.
These cables can be used for different applications.

Steel Armoured cable - optical fibers + data transmission copper pairs

OIL / GAS & PETROCHEMICALS

SSLT optical fibers + signaling conductors

SUBMARINE

2 optical fibers + 2 power supply conductors

AUTOMATION

Optical fibers + power supply conductors

GREEN ENERGY

Optical Fiber + Pairs Data Transmission + Coax + Power Supply Conductors

TELECOMMUNICATION

ADDITIONAL OPTIONS

Tecnikabel is also able to propose alternative options, studied for particular uses.

SSLT (STAINLESS STEEL LOOSE TUBE)

Stainless steel tube containing a number from 2 to 96 optical fibers with pressure tightness characteristics, particularly suitable to underwater installation up to a depth of 4000 meters (400 bar).
The steel type is such as to be suitable for installation in aggressive environments such as sewers pipes and industrial discharges.

LEAD SHEATH

Lead sheath is able to guarantee a perfect tightness to the cable on which it is applied and a maximum durability over time.
Typical thickness 1.5 - 2.0 mm.

ALUMINIUM SHEATH

Aluminium sheath is able to guarantee a perfect tightness to the cable on which it is applied, but lighter than lead version.
Typical thickness 1.0 - 1.2 mm.

THERMOWELDED ALUMINIUM TAPE

The Aluminium tape thermowelded to the outer sheath is able to guarantee to the cable a light and efficient moisture barrier.
Typical thickness 0.15 - 0.20 mm.

POLYAMMIDE SHEATH

This type of sheath grants to the cable resistance to termites and vermin protection.
Typical thickness 0.5 - 1.0 mm.

NOTE

TecniKabel

SPECIAL ELECTRICAL AND OPTICAL CABLES

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