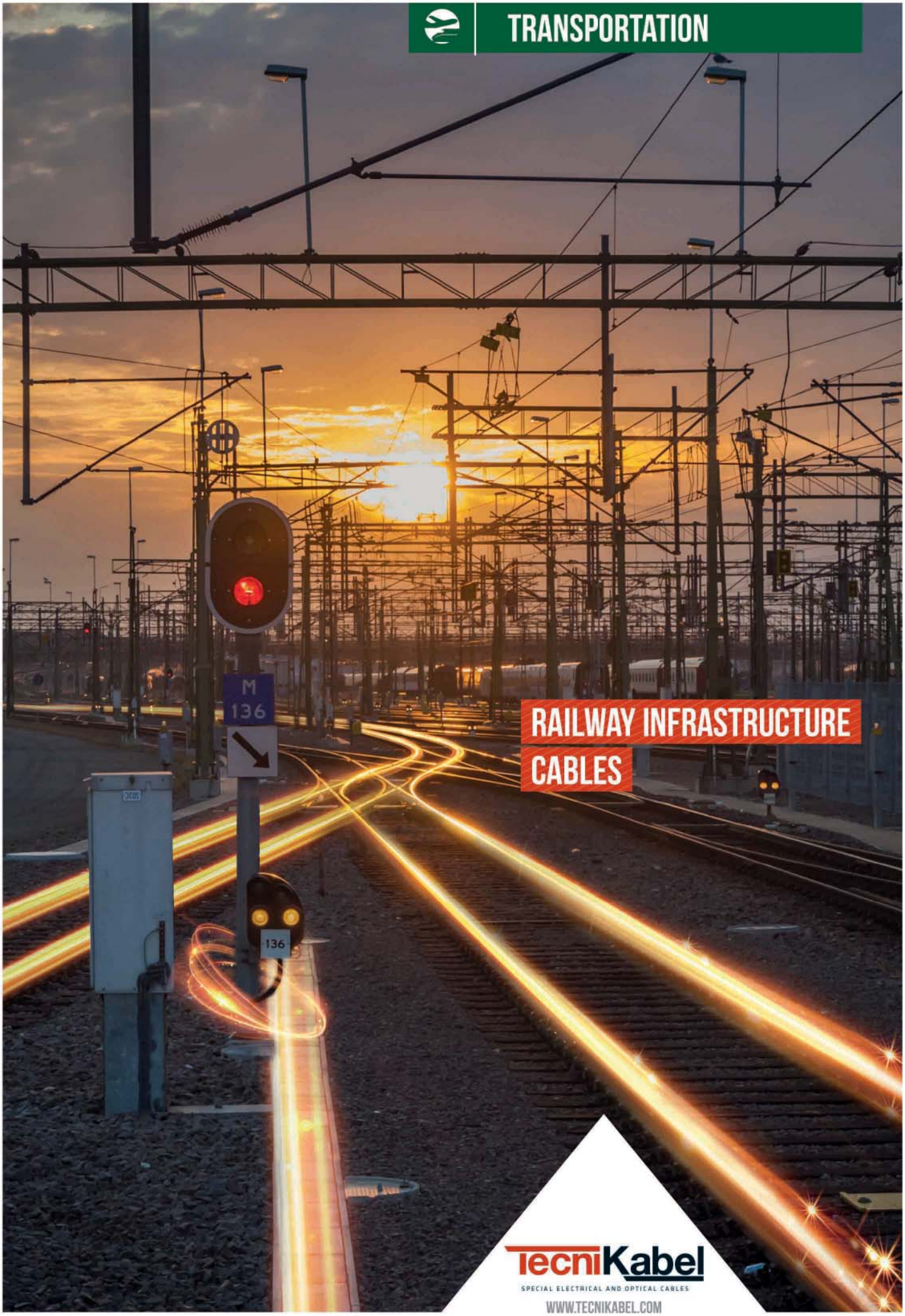
TRANSPORTATION
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RAILWAY INFRASTRUCTURE
CABLES
TecniKabel
SPECIAL ELECTRICAL AND OPTICAL CABLES
WWW.TECNIKABEL.COM

SPECIAL ELECTRICAL AND OPTICAL CABLES


Tecni Kabel

INTRODUCTION

The new high-speed trains and the sensible increase of the traffic, with congested lines, is the result of the latest development of the rail sector.
As a result, the need for high safety standards for the rail transport has become more critical and drew the attention of the Transportation sector.
In order to provide users with high standards and a reliable service, the industry has focused its efforts on the development of the signalling equipment, handling the exchange of information between the system and the moving vehicle.
We engineer and manufacture copper and fiber optic cables for the entire range of the signalling systems adopted by both the mass transit and high-speed lines.
Our different product lines meet system requirements of the whole Industry; our cables are specially designed for any specific application, being indoor/outdoor, aerial, directly buries or in-duct.
We constantly focus our efforts on satisfying the transportation requirements in terms of construction, and stand out in the market for our expertise in the product engineering according with any specific requirement.
Our production range includes a wide range of products suitable for:
- *Tunnel installation and indoor environments*. This is achieved by our LZOH non-propagating compounds which satisfy the severe international standards
- *Security Systems*. Our Fire resistant cables guarantee a steady supply of the system, even in the event of a fire.
- *High mechanical stress*. Our cables can withstand heavy loads and severe environmental conditions, such as Arctic temperatures and High Magnetic Interferences
Our cables are the result of broad enthusiasm, constant research and deep expertise, always aiming at the full satisfaction of our customers, an endless improvement of the comfort and the safety in the rail transportation.

PRODUCT LINES

- TRANSPORTATION
- OIL / GAS & PETROCHEMICALS
- TELECOMMUNICATION
- OPTICAL
- AUTOMATION
- SUBMARINE
- HEALTHCARE
- AUDIOVIDEO
- NAVAL
- DEFENSE
- HYBRID
- BUILDING TECHNOLOGY

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.

In 30 years of activity, we produced more than 26.000 different types of cables.

FINAL INSPECTIONS

At the end of every production process each cable is checked in its electrical 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 tests required by current norms, we invest on new special equipment for additional mechanical and electrical testing, heading to a steady increase of standard performance of our cables.

MATERIALS RESEARCH AND DEVELOPMENT

Our thirty year experience took us to carry on research of new materials in order to improve performances, costs and fulfill 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.

ISO 9001:2008 9125 TEKA

ENVIRONMENTAL PROPERTIES


FLAME RETARDANT SINGLE WIRE
(EN/IEC 60332-1-2, EN 50265-2-1)


FLAME RETARDANT BUNCHED WIRES
(IEC 60332-3, EN 50305 9.1.2, EN 503059-1,
EN 50266-2-5, EN 50266-2)


FIRE RESISTANCE
(IEC 60331, EN50200, EN 50362, BS6387 CWZ)


REDUCED EMISSION OF FUMES AND TOXIC
GASES (IEC 60754-1; EN 50267-2-1/2,
EN 50305 9.2)


SMOKE DENSITY (EN/IEC 61034-1/2)
(EN 50268-2; EN 50268-1/2)


LOW ACIDITY AND CORROSIVITY OF EVOLVED
GASES (IEC 60754-2, EN 50267-2-2)


WEATHERING TEST RESISTANCE
(OUTDOOR)


INDOOR


WATER RESISTANCE


RODENT RESISTANCE


HAZARDOUS AREA


FLEXIBLE INSTALLATION


FULLY DIELECTRIC


DIRECT BURIAL


ANTIBALLISTIC PROTECTION


UV RESISTANT


ARCTIC CABLE


INDOOR/OUTDOOR


REDUCTION FACTOR

CHEMICAL PROPERTIES


MUD RESISTANCE

MINERAL OIL RESISTANCE


HYDROCARBONS RESISTANCE

PVC VERSION

MECHANICAL PROPERTIES


MECHANICAL RESISTANCE


REDUCED BENDING RADIUS


WORK AT LOW TEMPERATURE

FIRE PERFORMANCES

IEC 60332-1-2 / EN 50265:

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.

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

IEC 60332-3 / EN 50266 / EN 50305 9.1 :

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 samples 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/FR 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 / EN 50362 : 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 It's 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 (typical 750°C or 830°C). During the test a current for continuity checking is passed through all conductors of the cable and the voltage must be maintained during the test duration.

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) 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 by the quantity and composition of the liquid fuel. At the end of the test the light transmittance of the smoke must be 60% minimum.

IEC 60754-1 / EN 50267-2-1/2: 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.

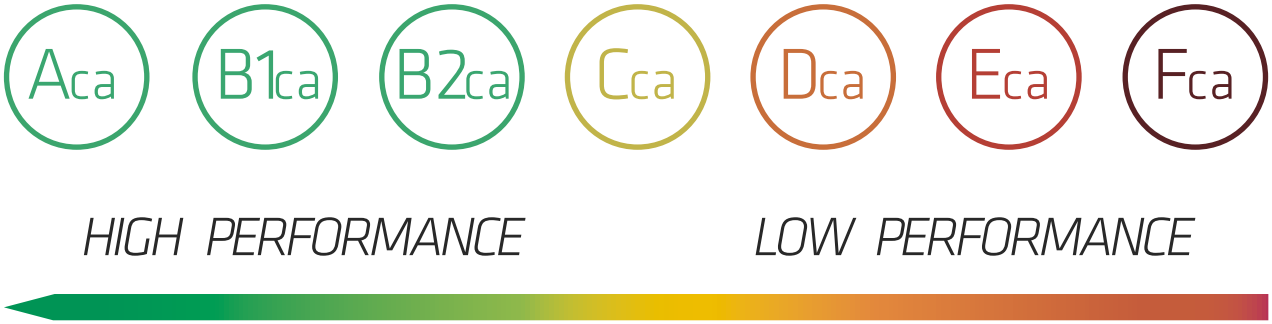
The minimum pH value of the washing water must 4.3, and the maximum conductivity must be 10 µS/mm.

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.



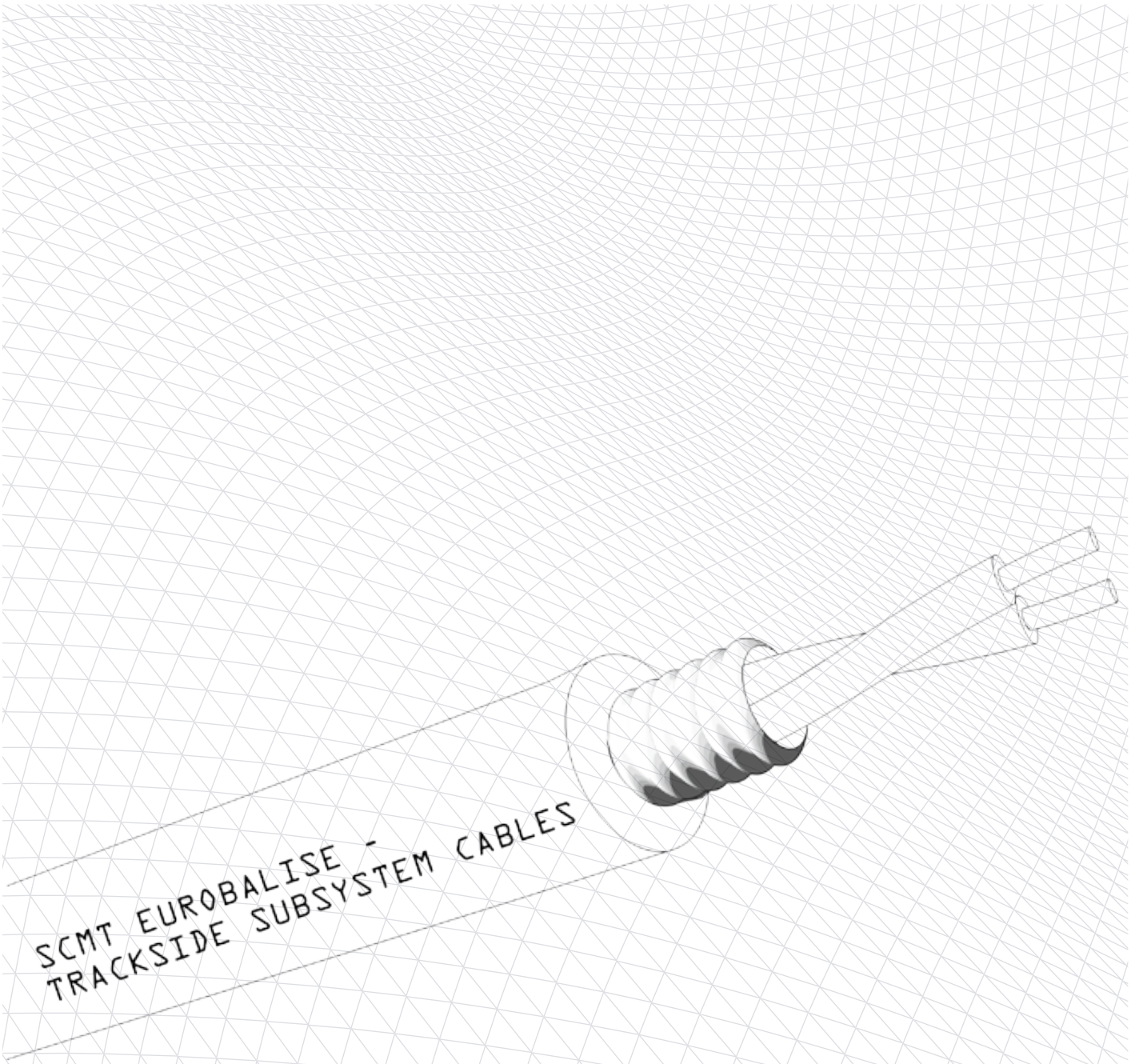
Furthermore, there are additional criteria establishing requirements on the amount of smoke produced, the fall of droplets and flamed particles during combustion, and acid content or toxicity of smoke produced.

- 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.

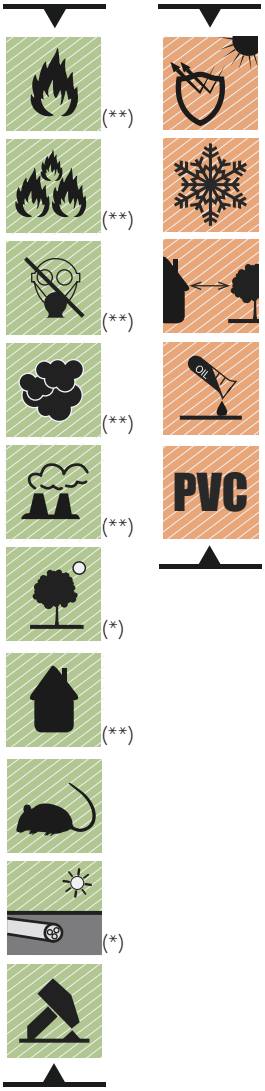
SCMT EUROBALISE - TRACKSIDE SUBSYSTEM CABLES



The images are for illustrative purposes only

TK-SCMT-SST ENCODER BOA 1x2x0.9

ON REQUEST



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

CABLE SPECIFICATIONS

Conductor	Solid bare copper, 0.9 mm
Insulation	Coloured Polyethylene
Pair	Two conductors assembled to form a pair
Total Assembling	N° pairs assembled together with eventual filler and tape
Armouring	Corrugated steel tape thermowelded to outer sheath
Outer sheath	Green flame retardant, low smoke and halogen-free compound or black Polyethylene

TECHNICAL DATA

Operating temperature	- 30 °C ÷ + 70 °C
Minimum bending radius	10xØ

FIRE PERFORMANCE

(**) Only for LSZH version

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

MAIN FEATURES

Test voltage	3000 V DC x 1 minute
Characteristic impedance @ 20 to 50 KHz	130 ± 10 Ω
Mutual capacitance @ 800 Hz	≤ 50 pF/m
Capacitance unbalance	≤ 400 pF/500m
Max attenuation @ 20 to 50 KHz	2 dB/km

ON REQUEST

UV resistant
Arctic cables
Indoor/Outdoor
Oil resistant
PVC version

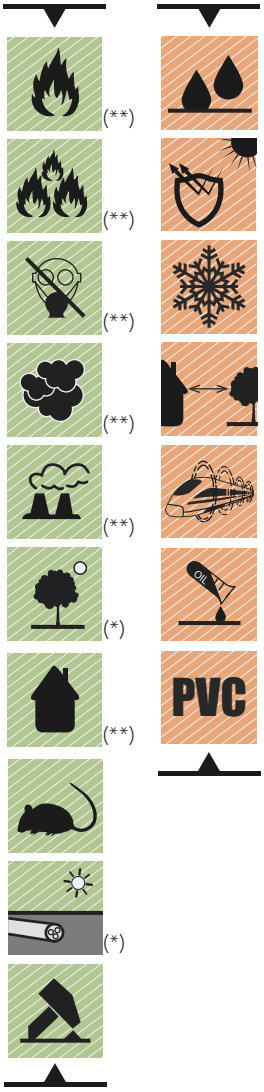
TK-SCMT-SST ENCODER BOA 1x2x0.9

MAIN FEATURES

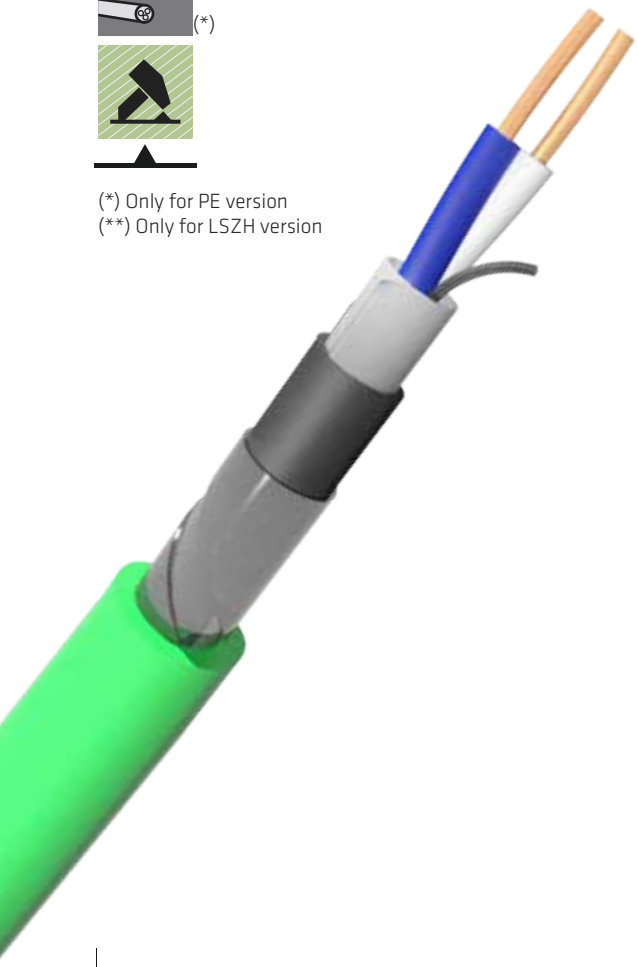
Formation	Conductor diameter Ø	Resistance of conductor @20 °C	Insulation resistance @20 °C	Outer sheath nominal thickness	Outer sheath nominal Ø	Nominal weight	
						PE	LSZH
(n° of pairs)	(mm)	(Ω/km)	(GΩxkm)	(mm)	(mm)	(kg/km)	(kg/km)
1	0.9	≤ 28.4	≥ 10	1.5	9.5	90	115
2	0.9	≤ 28.4	≥ 10	1.5	12.0	120	160
4	0.9	≤ 28.4	≥ 10	1.5	14.0	150	210
10	0.9	≤ 28.4	≥ 10	1.5	18.0	280	360

TK-SCMT-SST 1x2x1.4

ON REQUEST



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



CABLE SPECIFICATIONS

Conductor	Solid bare copper, 1.4 mm
Insulation	Coloured foam Polyolefin
Assembling	Two conductors assembled to form a pair with eventual filler and tape
Screen and moisture barrier	Aluminium/PE/tape thermowelded to inner sheath + drain wire
Inner sheath	Flame retardant, low smoke and halogen-free compound or Polyethylene
Armouring	Two steel tapes helically applied
Outer sheath	Green flame retardant, low smoke and halogen-free compound or black Polyethylene
Outer diameter	12.8 mm

TECHNICAL DATA

Operating temperature	- 30 °C ÷ + 70 °C
Minimum bending radius	10xØ

FIRE PERFORMANCE

(**) Only for LSZH version

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

MAIN FEATURES

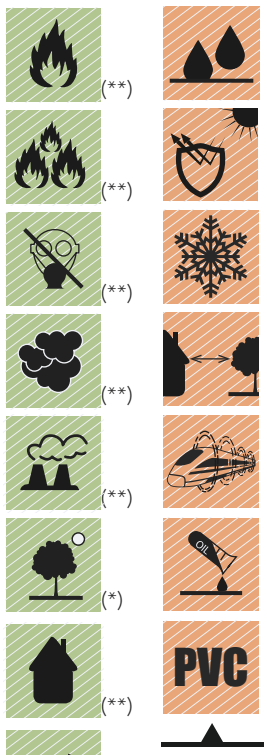
Resistance of conductor	@ 20 °C	≤ 12.1 Ω/km
Insulation resistance	@ 20 °C	≥ 10 GΩ x km
Test voltage		3000 V AC x 1 minute
Characteristic impedance	@ 8.9 KHz @ 560 KHz	130 Ω 102 Ω
Mutual capacitance	@ 800 Hz	≤ 45 pF/m
Capacitance unbalance		≤ 3000 pF/km
Max attenuation	@ 8.9 KHz @ 560 KHz	≤ 0.9 dB/km ≤ 5.5 dB/km
Nominal weight		285 kg/km (*) 220 kg/km (**)

ON REQUEST

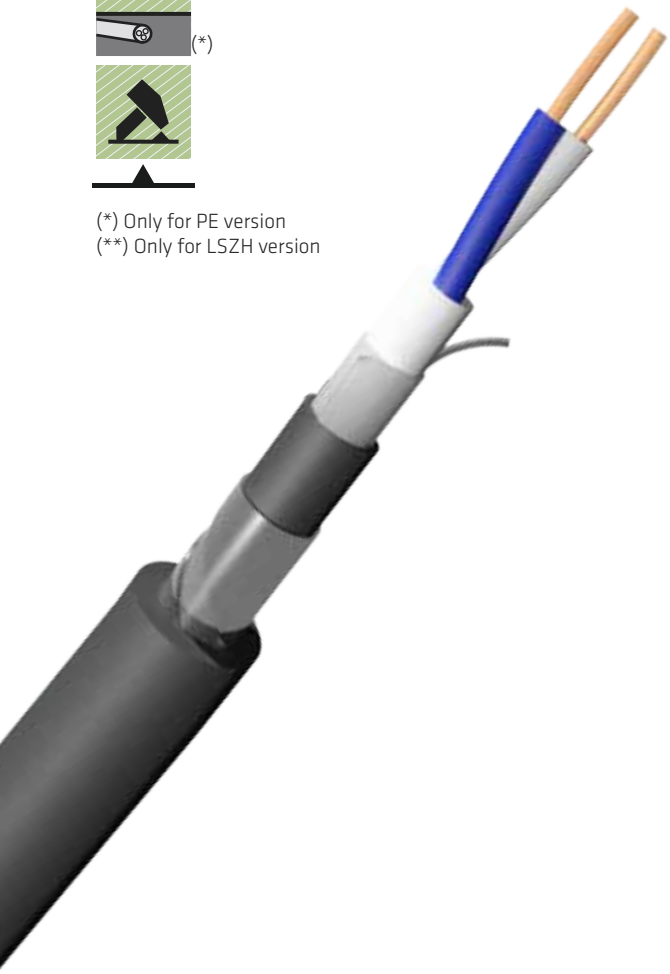
Filling compound
UV resistant
Arctic cables
Indoor/Outdoor
Reduction factor
Oil resistant
PVC version

TK-SCMT-SST 1x2x1.6

ON REQUEST



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



CABLE SPECIFICATIONS

Conductor	Solid bare copper, 1.6 mm
Insulation	Coloured foam Polyolefin
Assembling	Two conductors assembled to form a pair with filler and tape
Inner sheath	Natural Polyethylene
Screen and moisture barrier	Aluminium/PE/tape thermowelded to intermediate sheath + drain wire
Intermediate sheath	Flame retardant, low smoke and halogen-free compound or Polyethylene
Armouring	Two steel tapes helically applied
Outer sheath	Black flame retardant, low smoke and halogen-free compound or black Polyethylene
Outer diameter	16.5 mm

TECHNICAL DATA

Operating temperature	- 30 °C ÷ + 70 °C
Minimum bending radius	10xØ

FIRE PERFORMANCE

(**) Only for LSZH version

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

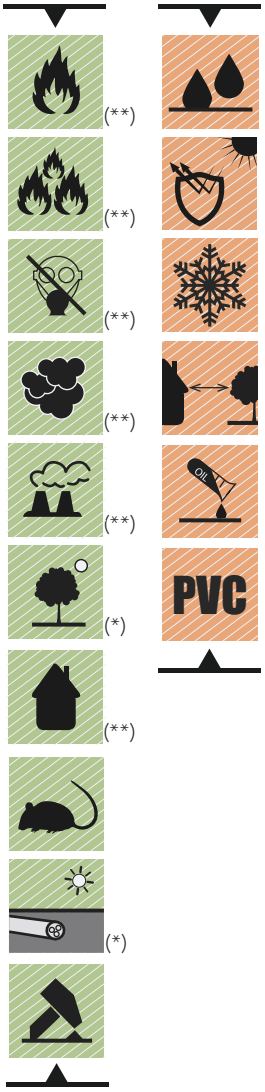
MAIN FEATURES

Resistance of conductor	@ 20 °C	≤ 9.3 Ω/km
Insulation resistance	@ 20 °C	≥ 10 GΩ x km
Test voltage		3000 V AC x 1 minute
Characteristic impedance	@ 8.9 KHz @ 560 KHz	130 Ω 110 Ω
Mutual capacitance	@ 800 Hz	≤ 39 pF/m
Capacitance unbalance		≤ 3000 pF/km
Max attenuation	@ 8.9 KHz @ 560 KHz	0.7 dB/km 3.8 dB/km
Inductance	@ 8.9 KHz @ 560 KHz	≤ 0.65 µH/m ≤ 0.50 µH/m
Nominal weight		420 kg/km (*) 360 kg/km (**)

ON REQUEST

Filling compound
UV resistant
Arctic cables
Indoor/Outdoor
Reduction factor
Oil resistant
PVC version

TK-BOA EUROBALISE 1x2x1.02



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

CABLE SPECIFICATIONS

Conductor	Solid Bare Copper, 1.02 mm
Insulation	Coloured Polyethylene
Assembling	Two conductors assembled to form a pair with eventual filler and tape
Screen and moisture barrier	Aluminium/PE/tape thermowelded to inner sheath
Inner sheath	Flame retardant, low smoke and halogen-free compound or Polyethylene
Armouring	Corrugated steel tape thermowelded to outer sheath
Outer sheath	Green flame retardant, low smoke and halogen-free compound or black Polyethylene
Outer diameter	14 mm

TECHNICAL DATA

Operating temperature	- 30 °C ÷ + 70 °C
Minimum bending radius	30xØ

FIRE PERFORMANCE

(**) Only for LSZH version

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

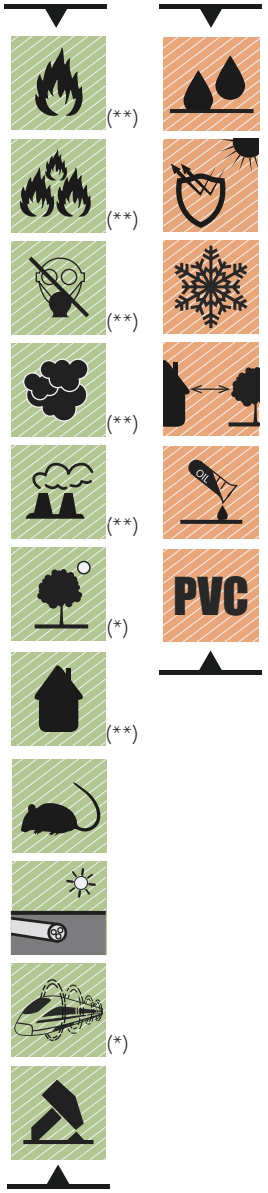
MAIN FEATURES

Resistance of conductor	@ 20°C	≤ 21.5 Ω/km
Insulation resistance	@ 20°C	≥ 10 GΩ x km
Test voltage		1500 V DC x 1 minute
Characteristic impedance	@ 1 MHz	115 Ω
Mutual capacitance	@ 800 Hz	44 pF/m
Max attenuation	@ 8.8 KHz @ 560 KHz @ 1000 KHz	≤ 1.7 dB/km ≤ 7.0 dB/km ≤ 9.5 dB/km
Nominal weight		160 kg/km (*) 220 kg/km (**)

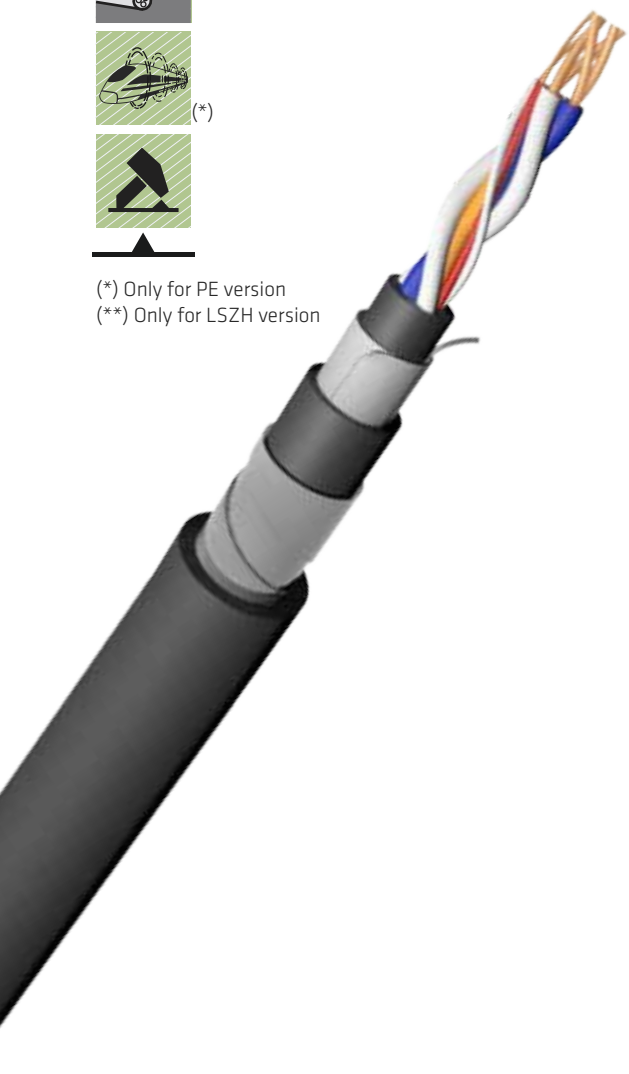
ON REQUEST

Filling compound
UV resistant
Arctic cables
Indoor/Outdoor
Oil resistant
PVC version

TK-CDB AUDIOFREQUENCY MULTIPAIRS 1.4



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



CABLE SPECIFICATIONS

Conductor	Solid bare copper, 1.4 mm Solid Bare Copper, 0.6 mm (Service pair)
Insulation	Coloured Polyethylene
Assembling	One or two pairs + service pair assembled together
Inner sheath	Polyethylene
Screen and moisture barrier	Aluminium/PE/tape thermowelded to intermediate sheath
Intermediate sheath	Flame retardant, low smoke and halogen-free compound or Polyethylene
Armouring	Two steel tapes helically applied
Outer sheath	Green flame retardant, low smoke and halogen-free compound or black Polyethylene
Outer diameter	17 mm (1 pair) 21 mm (2 pairs)

TECHNICAL DATA

Operating temperature	- 30 °C ÷ + 70 °C
Minimum bending radius	6xØ

FIRE PERFORMANCE

(**) Only for LSZH version

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

MAIN FEATURES

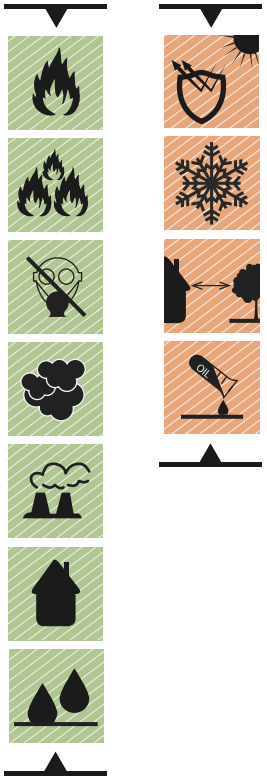
Resistance of conductor @ 20 °C	≤ 12.1 Ω/km
Insulation resistance @ 20 °C	≥ 5 GΩ x km
Test voltage	3000 V DC x 1 minute
Characteristic impedance @ 1 KHz	110 Ω
Mutual capacitance @ 800 Hz	≤ 45 pF/m
Capacitance unbalance	≤ 400 pF/500m
Max attenuation @ 4.1 KHz **@ 9.5 KHz**	≤ 0.76 dB/km ≤ 1.05 dB/km
Nominal weight	380 kg/km (1 pair) (*) 500 kg/km (2 pairs) (*) 470 kg/km (1 pair) (**) 580 kg/km (2 pairs) (**)
Reduction factor @ 50 KHz @50÷250 V/km	≤ 0.8

ON REQUEST

Filling compound
UV resistant
Arctic cables
Indoor/Outdoor
Oil resistant
PVC version

TK- EUROBALISE TUNNEL MULTIPAIRS 0.9

ON REQUEST



CABLE SPECIFICATIONS

Conductor	Solid bare copper, 0.90 mm
Insulation	Coloured Polyethylene
Filling	Waterblock yarn (dry core)
Pair	2 conductors assembled to firm a pair
Total Assembling	N° pairs assembled together with eventual filler and tape
Screen and moisture barrier	Aluminium/PE/tape thermowelded to outer sheath + drain wire
Inner sheath	Green flame retardant, low smoke and halogen-free compound
Outer sheath	Green flame retardant, low smoke and halogen-free compound

TECHNICAL DATA

Operating temperature	- 25 °C ÷ + 70 °C
Minimum bending radius	20xØ

FIRE PERFORMANCE

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

MAIN FEATURES

Test voltage		1500 V DC x 1 minute
Characteristic impedance	@ 1 MHz	125 Ω
Mutual capacitance	@ 800 Hz	45 pF/m
Max attenuation	@ 8.8 KHz	≤ 1.7 dB/km
	@ 100 KHz	≤ 3.1 dB/km
	@ 1000 KHz	≤ 10 dB/km

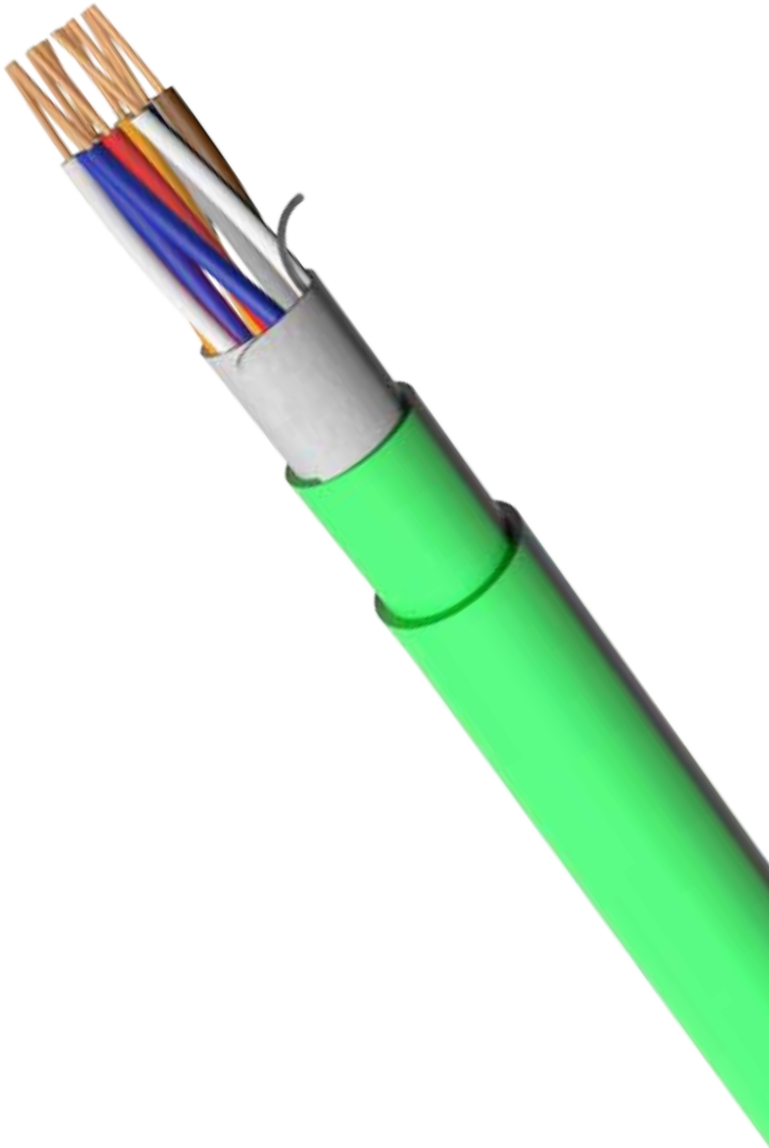
ON REQUEST

UV resistant
Arctic cables
Indoor/Outdoor
Oil resistant

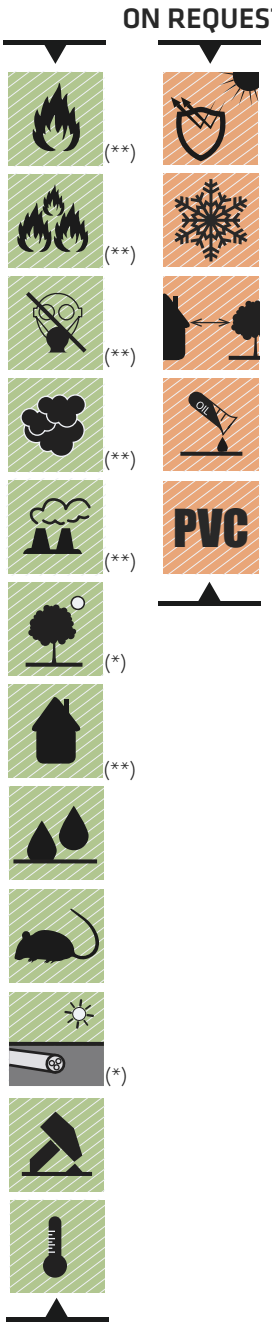
TK- EUROBALISE TUNNEL MULTIPAIRS 0.9

MAIN FEATURES

Formation	Conductor diameter Ø	Resistance of conductor @20 °C	Insulation resistance @20 °C	Outer sheath nominal thickness	Outer sheath nominal Ø	Nominal weight LSZH
(n° of pairs)	(mm)	(Ω/km)	(GΩxkm)	(mm)	(mm)	(kg/km)
2	0.9	≤ 28.4	≥ 10	1.5	14.0	180
4	0.9	≤ 28.4	≥ 10	1.5	15.0	250
7	0.9	≤ 28.4	≥ 10	1.5	18.0	320
10	0.9	≤ 28.4	≥ 10	1.5	20.0	420



TK- EUROBALISE MULTIPAIRS 0.9



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

CABLE SPECIFICATIONS

Conductor	Solid bare copper, 0.90mm
Insulation	Coloured foam Polyethylene
Filling	Petroleum jelly
Pair	Two conductors assembled to form a pair
Total Assembling	N° pairs assembled together with eventual filler and tape
Screen and moisture barrier	Aluminium/PE/tape thermowelded to inner sheath + drain wire
Inner sheath	Flame retardant, low smoke and halogen-free compound or Polyethylene
Armouring	Corrugated steel tape thermowelded to outer sheath
Outer sheath	Green flame retardant, low smoke and halogen-free compound of black Polyethylene

TECHNICAL DATA

Operating temperature	- 40 °C ÷ + 70 °C
Minimum bending radius	30xØ

FIRE PERFORMANCE

(**) Only for LSZH version

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

MAIN FEATURES

Test voltage	1500 V DC x 1 minute
Characteristic impedance @ 1 MHz	125 Ω
Mutual capacitance @ 800 Hz	45 pF/m
Max attenuation @ 8.8 KHz @ 100 KHz @ 1000 KHz	≤ 1.7 dB/km ≤ 3.1 dB/km ≤ 10 dB/km

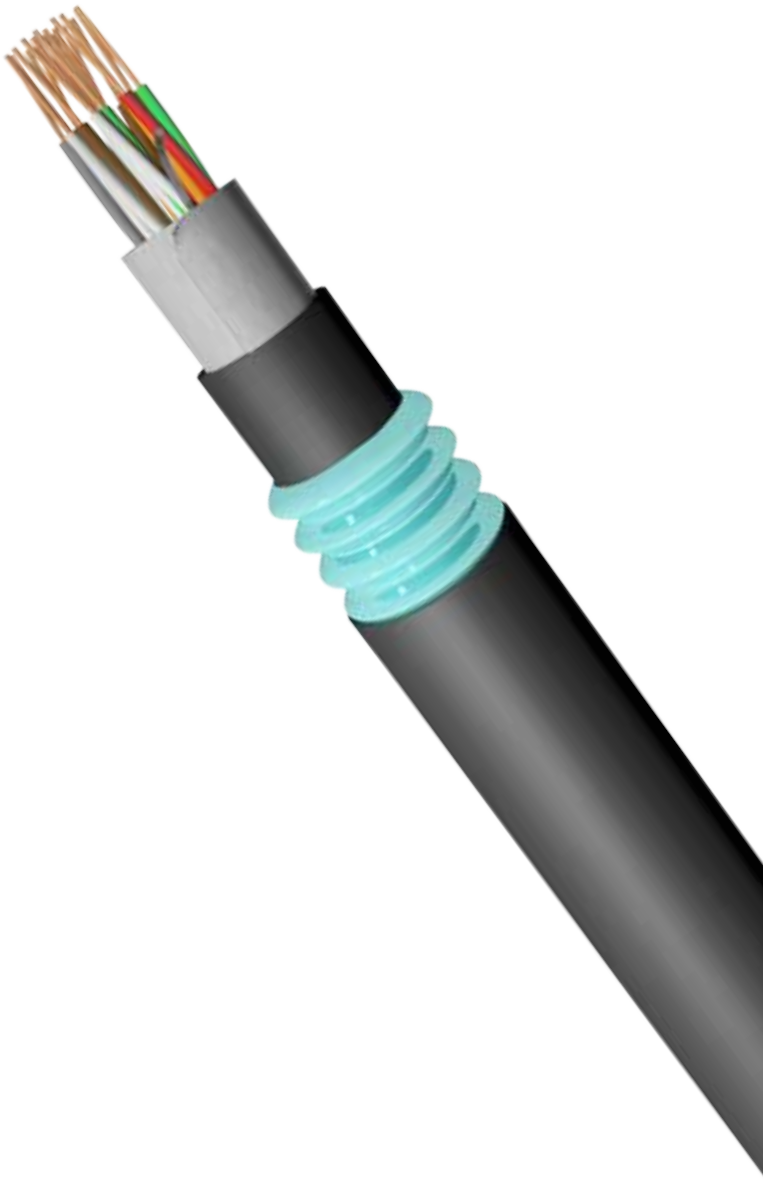
ON REQUEST

- UV resistant
- Arctic cables
- Indoor/Outdoor
- Oil resistant
- PVC version

TK- EUROBALISE MULTIPAIRS 0.9

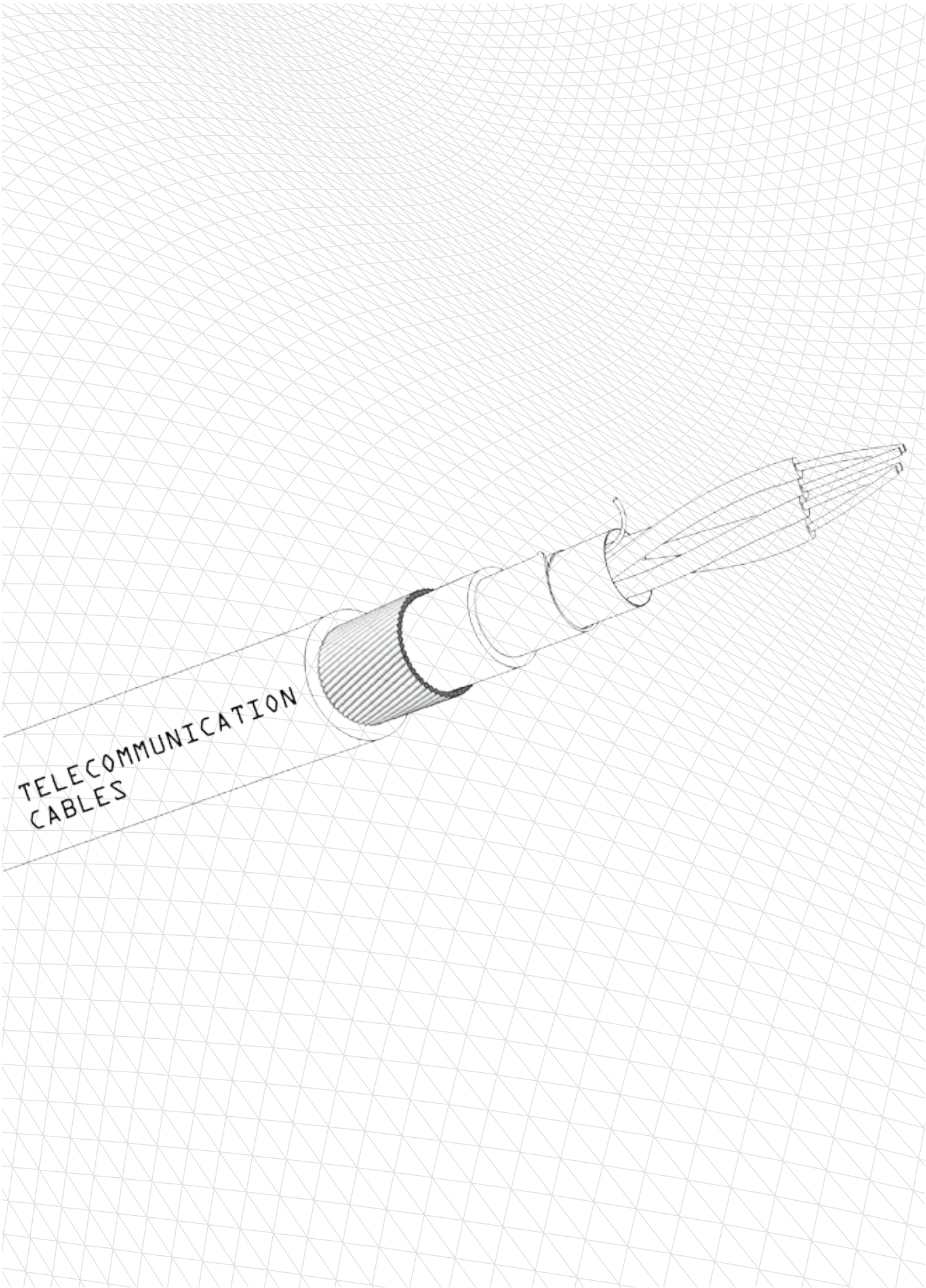
MAIN FEATURES

Formation	Conductor diameter Ø	Resistance of conductor @20 °C	Insulation resistance @20 °C	Outer sheath nominal thickness	Outer sheath nominal Ø	Nominal weight	
						PE	LSZH
(n° of pairs)	(mm)	(Ω/km)	(GΩxkm)	(mm)	(mm)	(kg/km)	(kg/km)
2	0.9	≤ 28.4	≥ 10	1.2	15.5	220	240
4	0.9	≤ 28.4	≥ 10	1.2	16.5	270	300
7	0.9	≤ 28.4	≥ 10	1.2	19.0	350	390
10	0.9	≤ 28.4	≥ 10	1.3	21.0	450	510



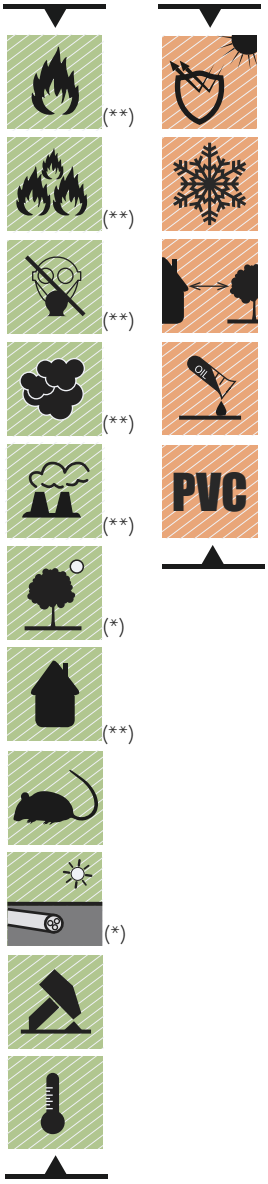
NOTE

TELECOMMUNICATION CABLES



TK-TELEPHONE MULTIPAIRS 0.7

ON REQUEST



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

CABLE SPECIFICATIONS

Conductor	Solid bare copper, 0.7 mm
Insulation	Coloured Polyethylene
Pair	4 conductors assembled to form a pair
Total Assembling	4 pairs assembled together with eventual filler and tape
Screen	Aluminium tape + drain wire
Armouring	Corrugated steel tape thermowelded to outer sheath
Outer sheath	Green flame retardant, low smoke and halogen-free or black Polyethylene
Outer diameter	12.5 mm

TECHNICAL DATA

Operating temperature	- 40 °C ÷ + 70 °C
Minimum bending radius	15xØ

FIRE PERFORMANCE

(**) Only for LSZH version

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

MAIN FEATURES

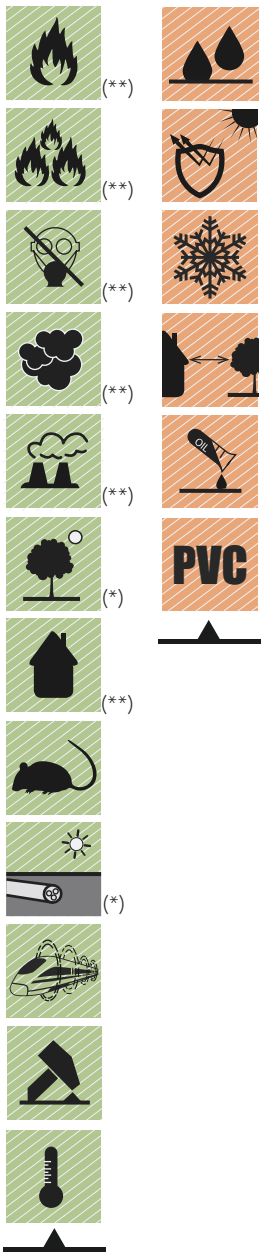
Resistance of conductor @ 20 °C	≤ 47 Ω/km
Insulation resistance @ 20 °C	≥ 5 GΩ x km
Test voltage	2000 V AC x 1 minute
Mutual capacitance @ 800 Hz	≤ 50 pF/m
Capacitance unbalance	≤ 600 pF/500m
Nominal weight	150 kg/km(*) 180 kg/km (**)

ON REQUEST

UV resistant
Arctic cables
Indoor/Outdoor
Oil resistant
PVC version

TK-TRAIN DETECTION 4x1.4

ON REQUEST



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

CABLE SPECIFICATIONS

Conductor	Solid bare copper, 1.4 mm
Insulation	Coloured foam Polyolefin
Assembling	4 conductors assembled together to form a star quad
Screen	Corrugated copper tape
Inner sheath	Flame retardant, low smoke and halogen-free compound or Polyethylene
Armouring	Two steel tapes helically applied
Outer sheath	Green flame retardant, low smoke and halogen-free compound or black Polyethylene
Outer diameter	17.5 mm

TECHNICAL DATA

Operating temperature	- 40 °C ÷ + 70 °C
Minimum bending radius	20xØ

FIRE PERFORMANCE

(**) Only for LSZH version

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

MAIN FEATURES

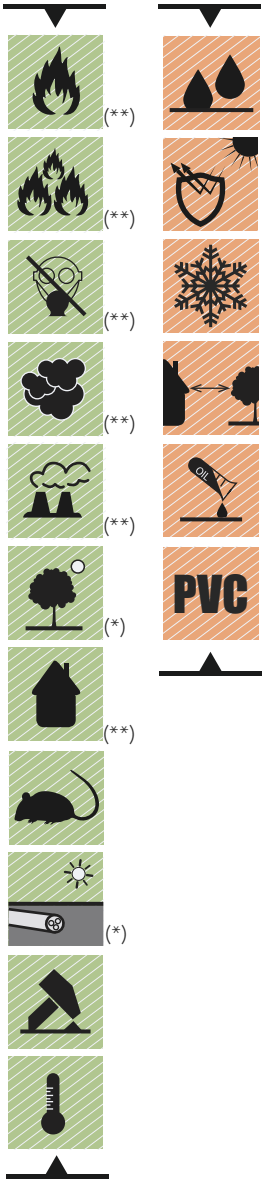
Resistance of conductor	@ 20 °C	≤ 12.1 Ω/km
Insulation resistance	@ 20 °C	≥ 10 GΩ x km
Test voltage		3500 V DC x 1 minute
Mutual capacitance	@ 800 Hz	≤ 41 pF/m
Capacitance unbalance		≤ 250 pF/500m
Max attenuation	@ 1 KHz @ 10 KHz	≤ 0.46 dB/km ≤ 0.85 dB/km
Nominal weight		540 kg/km (*) 630 kg/km (*)
Reduction factor @100÷350 V/km	@ 50 KHz	≤ 0.3

ON REQUEST

Filling compound
UV resistant
Arctic cables
Indoor/Outdoor
Oil resistant
PVC version

TK-CANCABLE 2x2x1.3

ON REQUEST



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

CABLE SPECIFICATIONS

Conductor	Stranded bare copper, 1.3 mm²
Insulation	Coloured foam Polyolefin
Conductor communication core	Stranded bare copper, 0.5 mm²
Insulation communication core	Coloured Polyethylene
Assembling	Two pairs + 1 communication core assembled together + drain wire
Screen	Aluminium or Aluminium/Polyester + drain wire
Armouring	Corrugated steel tape thermowelded to outer sheath
Outer sheath	Black flame retardant, low smoke and halogen-free or Polyethylene
Outer diameter	16 mm

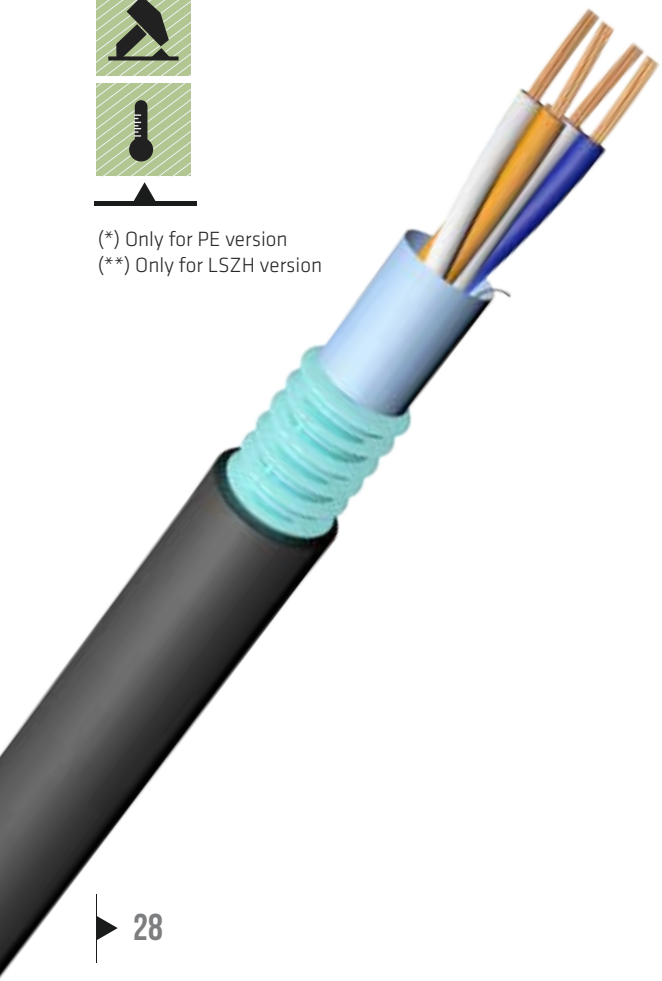
TECHNICAL DATA

Operating temperature	- 40 °C ÷ + 70 °C
Minimum bending radius	10xØ

FIRE PERFORMANCE

(**) Only for LSZH version

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



MAIN FEATURES

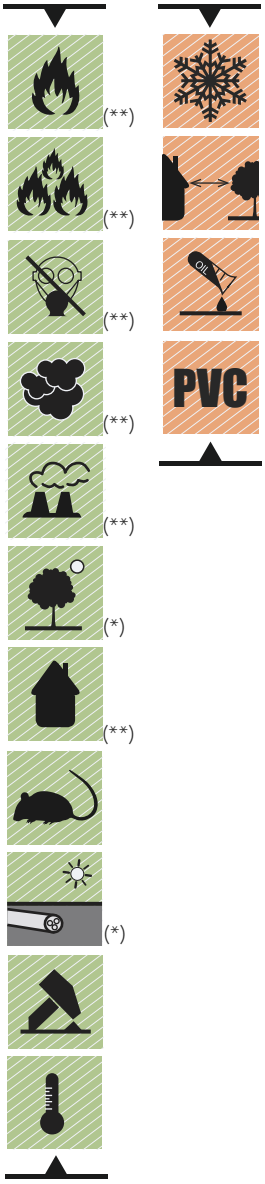
Resistance of conductor @ 20 °C	≤ 14.2 Ω/km
Resistance unbalance	≤ 3%
Insulation resistance @ 20 °C	≥ 5000 MΩ x km
Test voltage	2000 V DC x 1 minute
Mutual capacitance @ 800 Hz	≤ 75 pF/m
Max attenuation @ 60 KHz	≤ 0.88 dB/km
Nominal weight	270 kg/km (*) 320 kg/km (**)

ON REQUEST

Filling compound
UV resistant
Arctic cables
Indoor/Outdoor
Oil resistant
PVC version

TK-UNBALANCED CURRENT SENSOR 2x2x0.9

ON REQUEST



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

CABLE SPECIFICATIONS

Conductor	Solid bare copper, 0.90 mm
Insulation	Coloured Polyethylene
Pair	2 conductors assembled to form a pair
Pair screen	Aluminium/PE tape + drain wire
Total Assembling	2 pairs assembled together with eventual filler and tape
Screen and moisture barrier	Aluminium/PE tape thermowelded to inner sheath
Inner sheath	Flame retardant, low smoke and halogen-free or Polyethylene
Armouring	Steel wire armour (SWA)
Outer sheath	Green flame retardant, low smoke and halogen-free or black Polyethylene
Outer diameter	19 mm

TECHNICAL DATA

Operating temperature	- 40 °C ÷ + 70 °C
Minimum bending radius	20xØ

FIRE PERFORMANCE

(**) Only for LSZH version

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

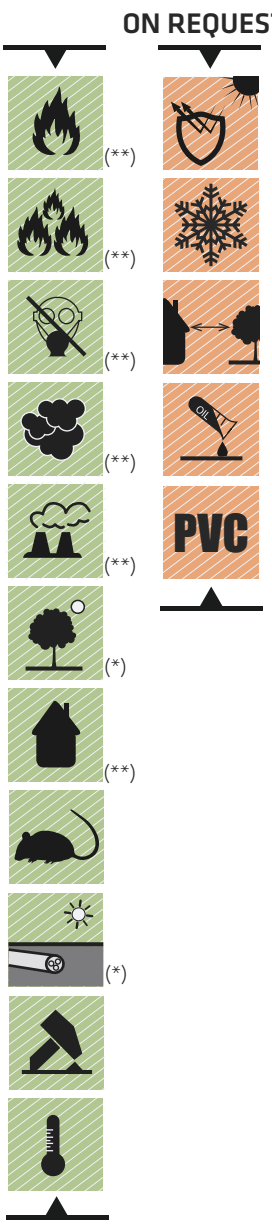
MAIN FEATURES

Resistance of conductor @ 20 °C	≤ 28.4 Ω/km
Insulation resistance @ 20 °C	≥ 20 GΩ x km
Test voltage	3000 V AC x 10 minute
Characteristic impedance @ 1 KHz	400 Ω
Mutual capacitance @ 800 Hz	≤ 56 pF/m
Max attenuation @ 1 KHz	0.81 dB/km
Nominal weight @ 800 Hz	470 kg/km (*) 530 kg/km (**)

ON REQUEST

Arctic cables
Indoor/Outdoor
Oil resistant
PVC version

TK- TELEPHONE MULTIQUADS 0.7



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

CABLE SPECIFICATIONS

Conductor	Solid bare copper, 0.7 mm
Insulation	Coloured Polyethylene
Quad	4 conductors assembled together to form a star quad + service quad
Total Assembling	N° star quads assembled with eventual filler and tape
Armouring	Aluminium welded, nominal thickness 1.2mm
Outer sheath	Green flame retardant, low smoke and halogen-free compound or black Polyethylene

TECHNICAL DATA

Operating temperature	- 40 °C ÷ + 70 °C
Minimum bending radius	30xØ

FIRE PERFORMANCE

(**) Only for LSZH version

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

MAIN FEATURES

Test voltage	4000 V AC x 1 minute
Mutual capacitance @ 800 Hz	38.5 pF/m
Capacitance unbalance	180 pF/500m

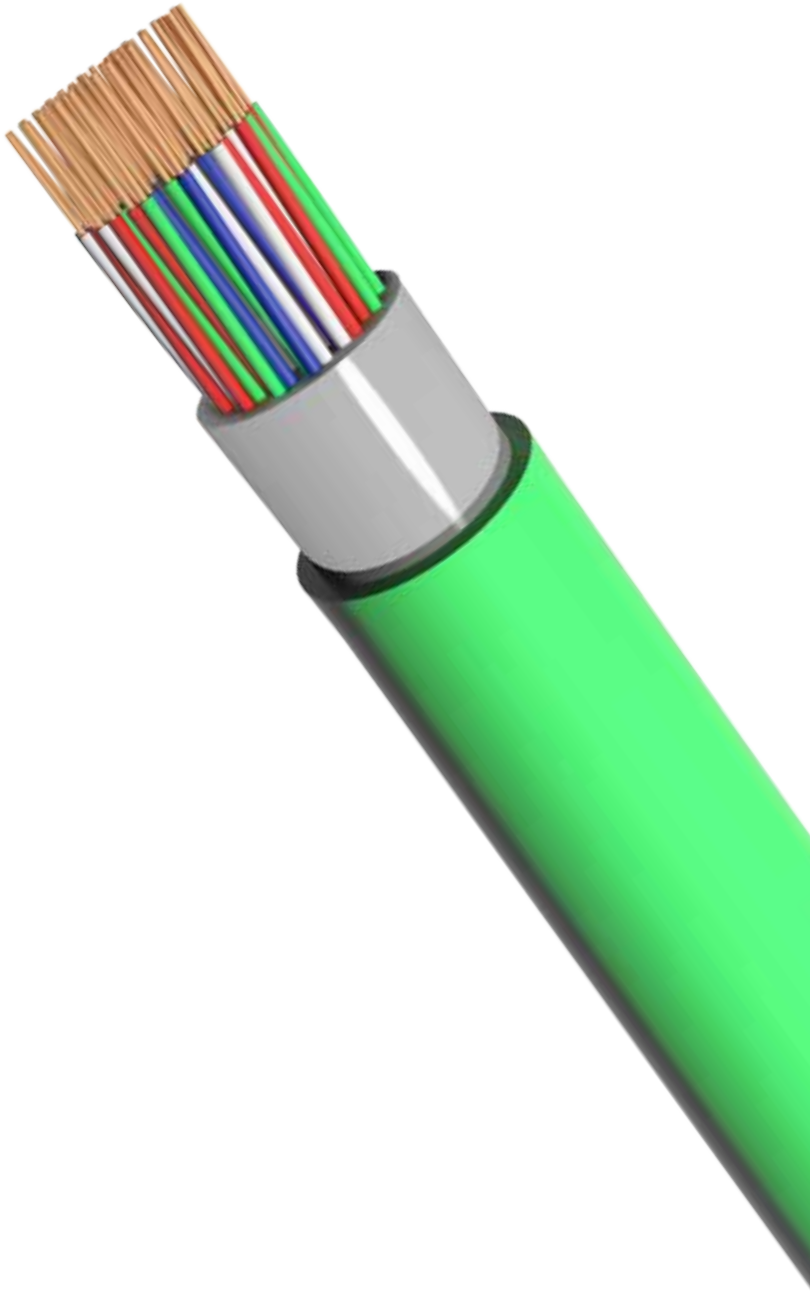
ON REQUEST

UV resistant
Arctic cables
Indoor/Outdoor
Oil resistant
PVC version

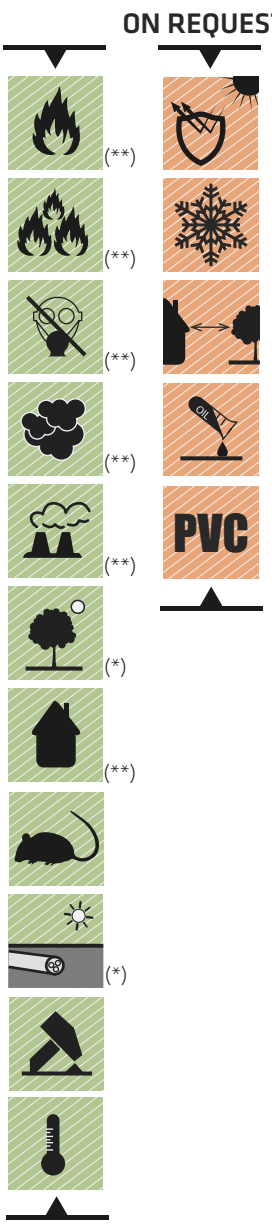
TK- TELEPHONE MULTIQUADS 0.7

MAIN FEATURES

Formation	Conductor diameter Ø	Resistance of conductor @20 °C	Insulation resistance @20 °C	Outer sheath nominal thickness	Outer sheath nominal Ø	Nominal weight	
						PE	LSZH
(n° of pairs)	(mm)	(Ω/km)	(GΩxkm)	(mm)	(mm)	(kg/km)	(kg/km)
10	0.7	≤ 47	≥ 10	2.0	17.5	370	410
20	0.7	≤ 47	≥ 10	2.0	21.0	450	600
30	0.7	≤ 47	≥ 10	2.2	23.0	660	720
40	0.7	≤ 47	≥ 10	2.2	24.0	770	880
50	0.7	≤ 47	≥ 10	2.2	27.5	930	1010
100	0.7	≤ 47	≥ 10	2.6	38.0	1600	1750



TK- TELEPHONE MULTIQUADS 0.9/1



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

CABLE SPECIFICATIONS

Conductor	Solid bare copper, 0.9mm/1mm
Insulation	Coloured foam Polyolefin
Quad	4 conductors assembled together to form a star quad + service quad
Total Assembling	N° star quads assembled with eventual filler and tape
Armouring	Aluminium welded, nominal thickness 1.2mm
Outer sheath	Green flame retardant, low smoke and halogen-free compound or black Polyethylene

TECHNICAL DATA

Operating temperature	- 40 °C ÷ + 70 °C
Minimum bending radius	30xØ

FIRE PERFORMANCE

(**) Only for LSZH version

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

MAIN FEATURES

Test voltage	4000 V AC x 1 minute
Mutual capacitance @ 800 Hz	≤ 33 pF/m (0.9 mm) ≤ 38.5 pF/m (1 mm)
Capacitance unbalance	180 pF/500m

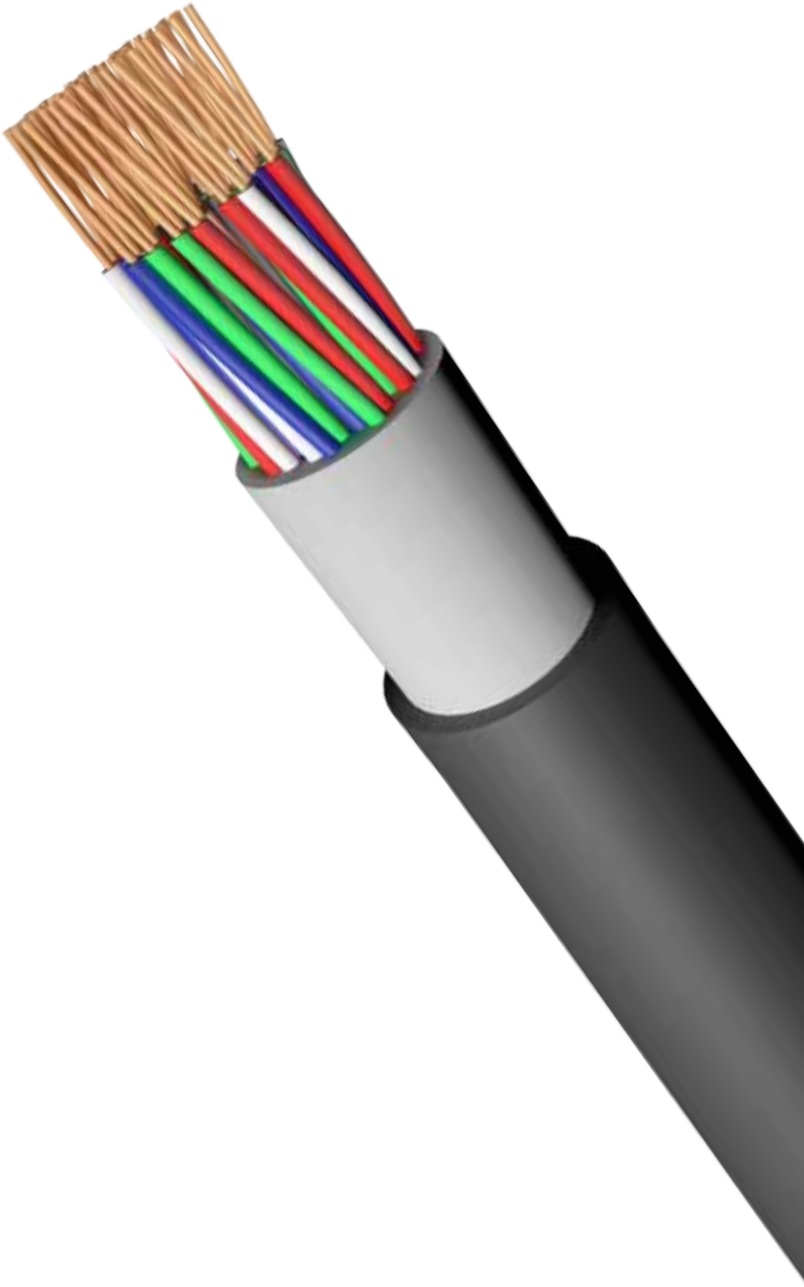
ON REQUEST

UV resistant
Arctic cables
Indoor/Outdoor
Oil resistant
PVC version

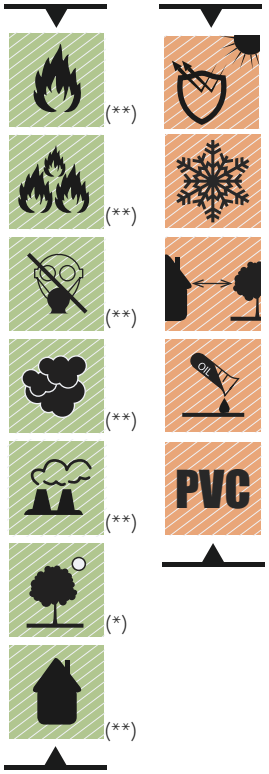
TK- TELEPHONE MULTIQUADS 0.9/1

MAIN FEATURES

Formation	Conductor diameter Ø	Resistance of conductor @20 °C	Insulation resistance @20 °C	Outer sheath nominal thickness	Outer sheath nominal Ø	Nominal weight	
						PE	LSZH
(n° of pairs)	(mm)	(Ω/km)	(GΩxkm)	(mm)	(mm)	(kg/km)	(kg/km)
20	0.9	≤ 28.4	≥ 10	2.2	24.0	660	730
30	0.9	≤ 28.4	≥ 10	2.2	27.5	850	940
40	0.9	≤ 28.4	≥ 10	2.4	30.5	1060	1170
50	0.9	≤ 28.4	≥ 10	2.4	33.0	1270	1380
40	1.0	≤ 23	≥ 10	2.4	30.5	1150	1270
50	1.0	≤ 23	≥ 10	2.4	33.0	1400	1510



TK-PZB INDUSI AUTOMATIC TRAIN CONTROL 4x0.75



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

CABLE SPECIFICATIONS

Conductor	Stranded bare copper, 0.75 mm²
Insulation	Coloured Polyethylene
Assembling	4 conductors assembled together to form a star quad with eventual filler and tape
Inner sheath	Flame retardant, low smoke and halogen-free or Polyethylene
Screen and moisture barrier	Aluminium/PE/tape thermowelded to outer sheath
Outer sheath	Green flame retardant, low smoke and halogen-free or black Polyethylene
Outer diameter	14.5 mm

TECHNICAL DATA

Operating temperature	- 30 °C ÷ + 80 °C
Minimum bending radius	20xØ

FIRE PERFORMANCE

(**) Only for LSZH version

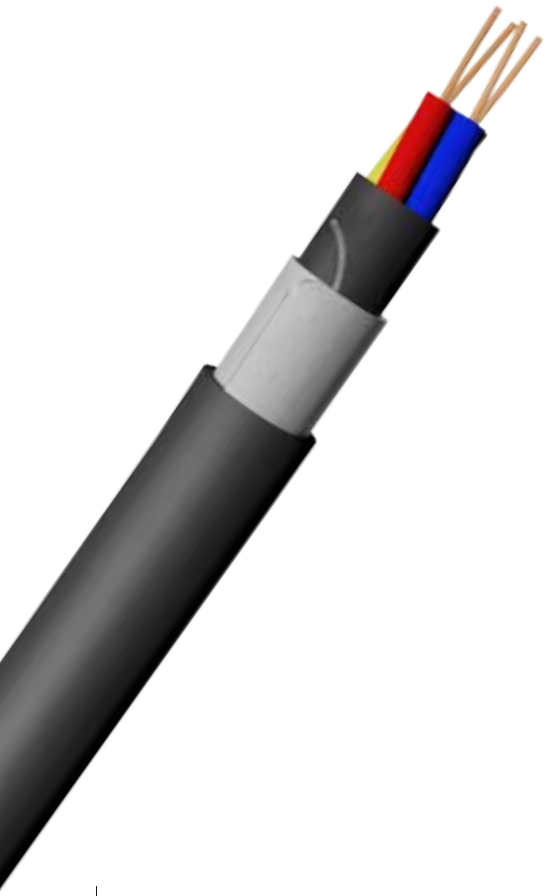
Fire propagation	IEC 60332-1-2 IEC 60332-3-24
Smoke density	IEC 61034-1/2
Halogen-free	IEC 60754-1/2
Fumes	No corrosive and toxic fumes

MAIN FEATURES

Resistance of conductor @ 20 °C	≤ 26 Ω/km
Insulation resistance @ 20 °C	≥ 5 GΩ x km
Test voltage	2500 V AC x 1 minute
Mutual capacitance @ 800 Hz	≤ 38 pF/m
Nominal weight	180 kg/km (*) 215 kg/km (**)

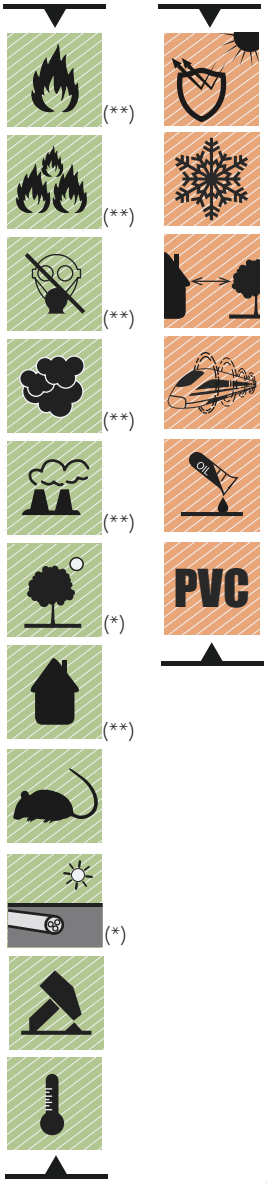
ON REQUEST

UV resistant
Arctic cables
Indoor/Outdoor
Oil Resistant
PVC version

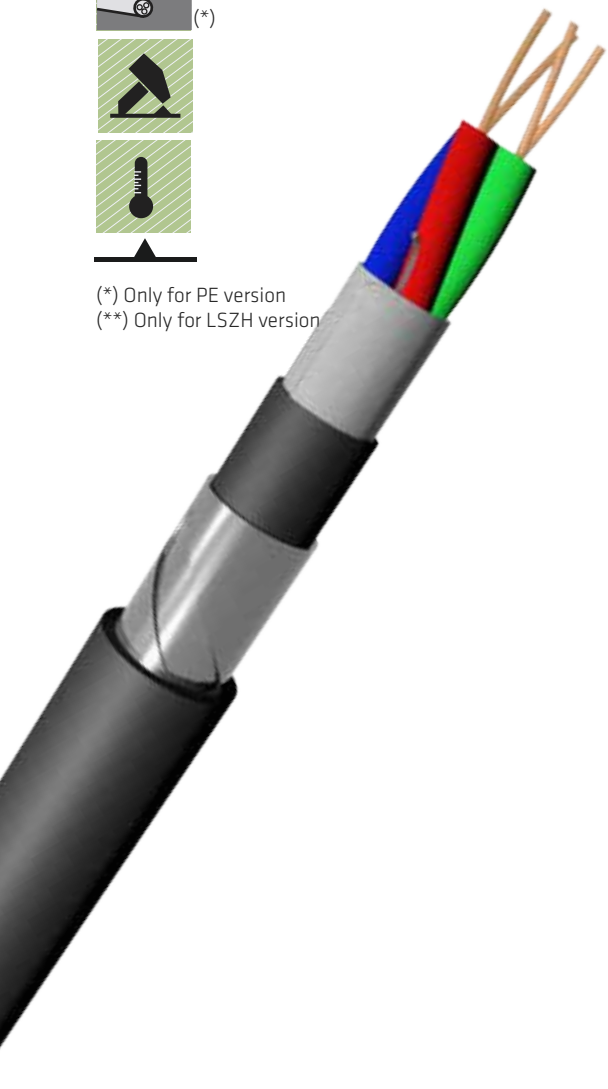


TK-ARMOURED PZB INDUSI AUTOMATIC TRAIN CONTROL 4x0.8

ON REQUEST



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



CABLE SPECIFICATIONS

Conductor	Solid bare copper, 0.80 mm
Insulation	Coloured Foam Polyolefin
Assembling	4 conductors assembled together to form a star quad with eventual filler and tape
Screen and moisture barrier	Aluminium/PE/tape thermowelded to inner sheath
Inner sheath	Flame retardant, low smoke and halogen-free or Polyethylene
Armouring	Two steel tapes helically applied
Outer sheath	Green flame retardant, low smoke and halogen-free or black Polyethylene
Outer diameter	15 mm

TECHNICAL DATA

Operating temperature	- 30 °C ÷ + 80 °C
Minimum bending radius	20xØ

FIRE PERFORMANCE

(**) Only for LSZH version

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

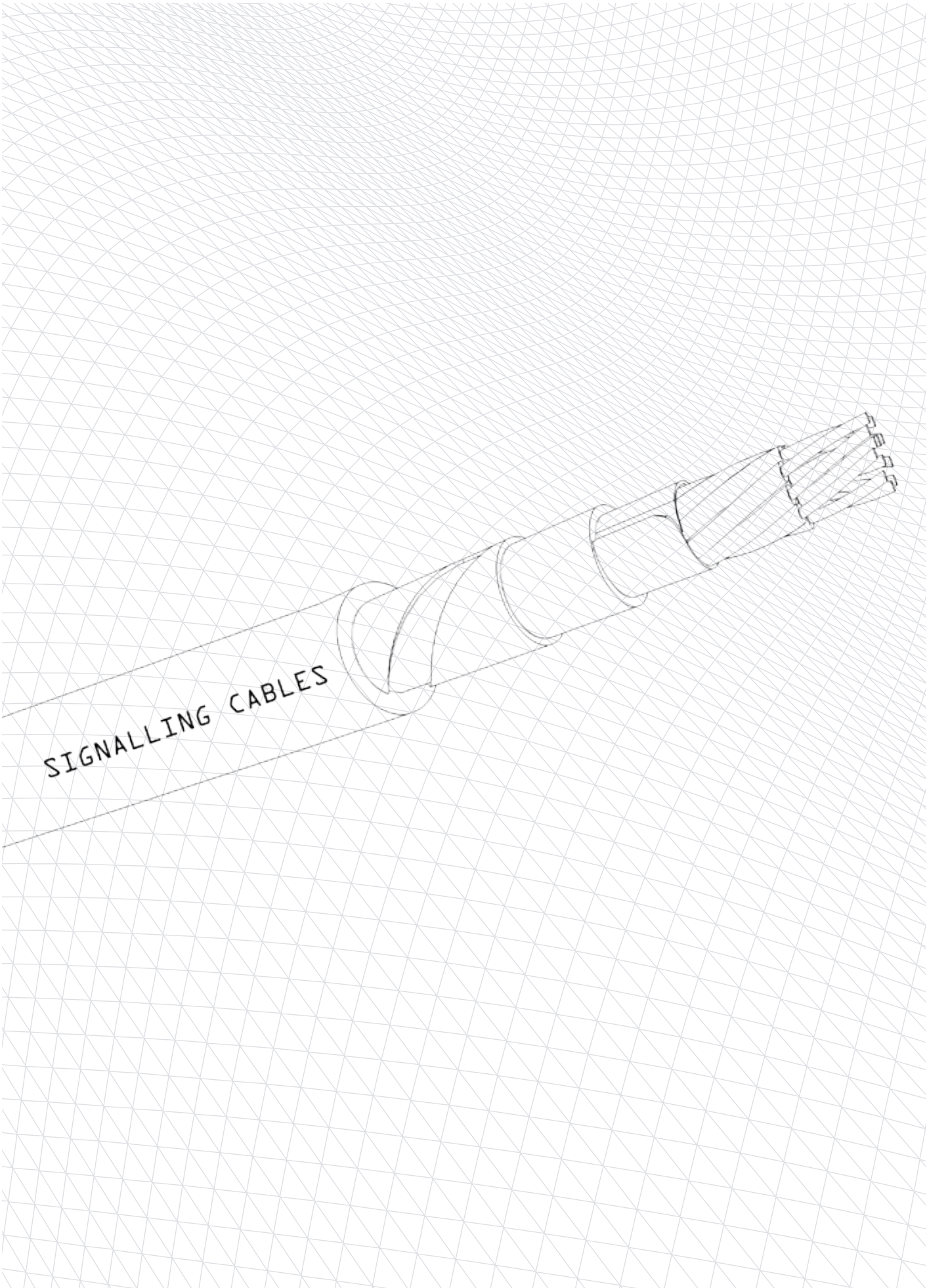
MAIN FEATURES

Resistance of conductor	@ 20 °C	≤ 38 Ω/km
Insulation resistance	@ 20 °C	≥ 5 GΩ x km
Test voltage		2500 V AC x 1 minute
Mutual capacitance	@ 800 Hz	≤ 30 pF/m
Nominal weight		250 kg/km (*) 330 kg/km (**)

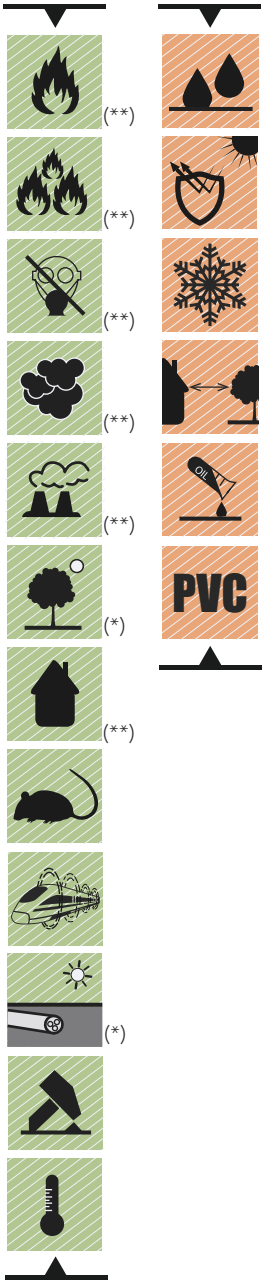
ON REQUEST

UV resistant
Arctic cables
Indoor/Outdoor
Reduction factor
Oil resistant
PVC version

NOTE


SIGNALLING CABLES

TK- H5 SIGNAL MULTICONDUCTORS - REDUCTION FACTOR



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

CABLE SPECIFICATIONS

Conductor	Solid bare copper
Insulation	Black numbered Polyethylene
Assembling	N° conductors assembled together with eventual filler and tape
Screen and moisture barrier	Aluminium/PE/tape thermowelded to inner sheath
Inner sheath	Flame retardant, low smoke and halogen-free or Polyethylene
Armouring	Two steel tapes helically applied
Outer sheath	Green flame retardant, low smoke and halogen-free or black Polyethylene

TECHNICAL DATA

Operating temperature	- 40 °C ÷ + 70 °C
Minimum bending radius	20xØ

FIRE PERFORMANCE

(**) Only for LSZH version

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

MAIN FEATURES

Test voltage	3500 V DC x 1 minute
Mutual capacitance @ 800 Hz	≤ 65 pF/m
Reduction factor @ 50-250 V/km @ 50 Hz	≤ 0.3

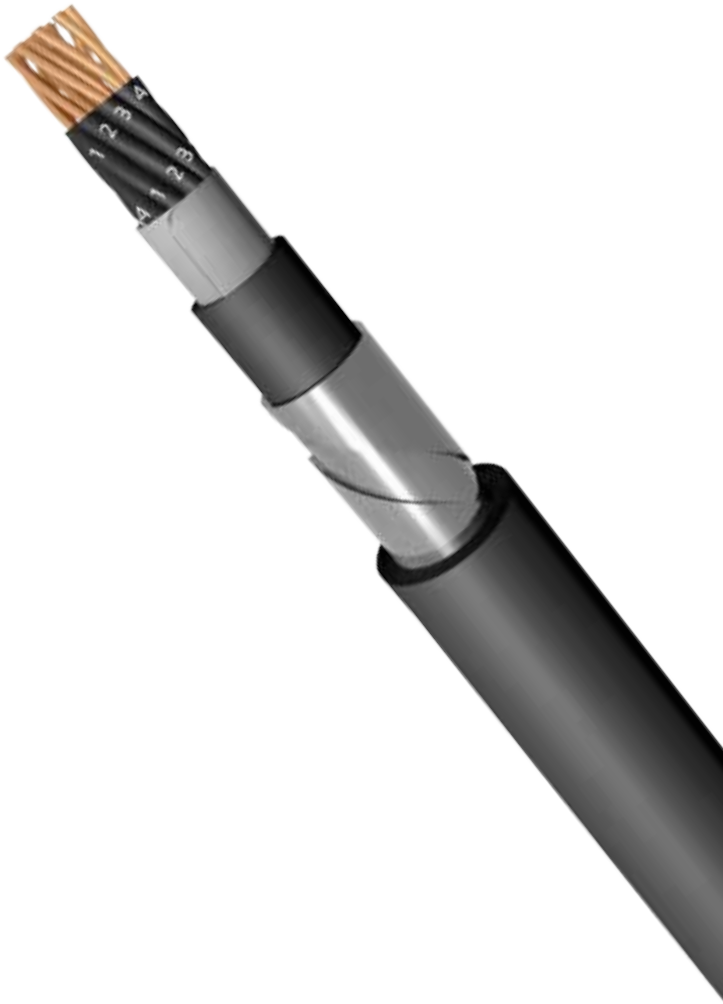
ON REQUEST

- Filling compound
- UV resistant
- Arctic cables
- Indoor/Outdoor
- Oil resistant
- PVC version

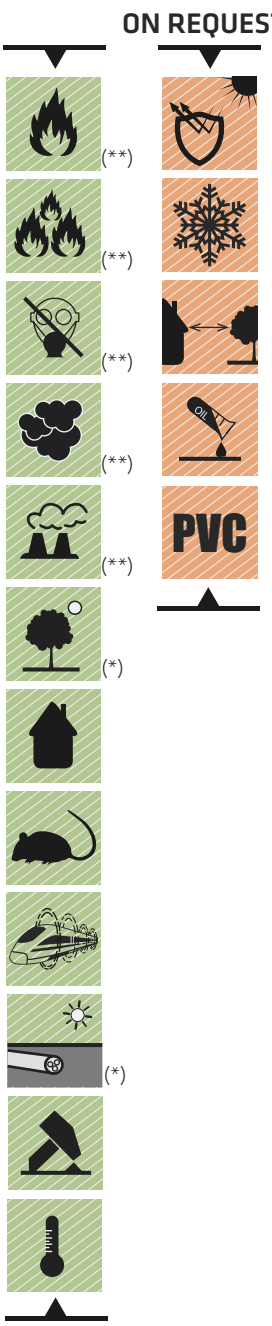
TK- H5 SIGNAL MULTICONDUCTORS - REDUCTION FACTOR

MAIN FEATURES

Formation	Conductor diameter Ø	Resistance of conductor @20 °C	Insulation resistance @20 °C	Outer sheath nominal thickness	Outer sheath nominal Ø	Nominal weight	
						PE	LSZH
(n° of conductors)	(mm)	(Ω/km)	(GΩxkm)	(mm)	(mm)	(kg/km)	(kg/km)
4	1.4	≤12.1	≥ 10	1.8	16.7	390	450
8	1.4	≤12.1	≥ 10	1.8	19.0	560	620
12	1.4	≤12.1	≥ 10	1.8	22.0	700	780
20	1.4	≤12.1	≥ 10	1.8	26.0	900	1000
28	1.4	≤12.1	≥ 10	1.8	30.0	1160	1300
4	1.8	≤ 7.41	≥ 10	1.8	15.6	480	530
8	1.8	≤ 7.41	≥ 10	1.8	18.0	670	740
12	1.8	≤ 7.41	≥ 10	1.8	20.0	850	930
20	1.8	≤ 7.41	≥ 10	1.8	23.5	1200	1330
28	1.8	≤ 7.41	≥ 10	1.8	26.5	1430	1600



TK- H7 SIGNAL MULTICONDUCTORS - REDUCTION FACTOR



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

CABLE SPECIFICATIONS

Conductor	Solid bare copper, 0.9mm/1.4mm
Insulation	Black numbered Polyethylene
Assembling	N° conductors assembled with eventual filler and tape
Screen	Corrugated copper tape
Inner sheath	Flame retardant, low smoke and halogen-free or Polyethylene
Armouring	Two steel tapes helically applied
Outer sheath	Green flame retardant, low smoke and halogen-free or black Polyethylene

TECHNICAL DATA

Operating temperature	- 40 °C ÷ + 70 °C
Minimum bending radius	20xØ

FIRE PERFORMANCE

(**) Only for LSZH version

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

MAIN FEATURES

Test voltage		3500 V DC x 1 minute
Mutual capacitance	@ 800 Hz	≤ 45 pF/m
Max attenuation	@ 1 KHz	≤ 0.7 dB/km (0.9 mm)
	@ 10 KHz	≤ 1.6 dB/km (0.9 mm)
	@ 1 KHz	≤ 0.46 dB/km (1.4 mm)
	@ 10 KHz	≤ 0.85 dB/km (1.4 mm)
Reduction factor @ 50-250 V/km	@ 50 Hz	≤ 0.3

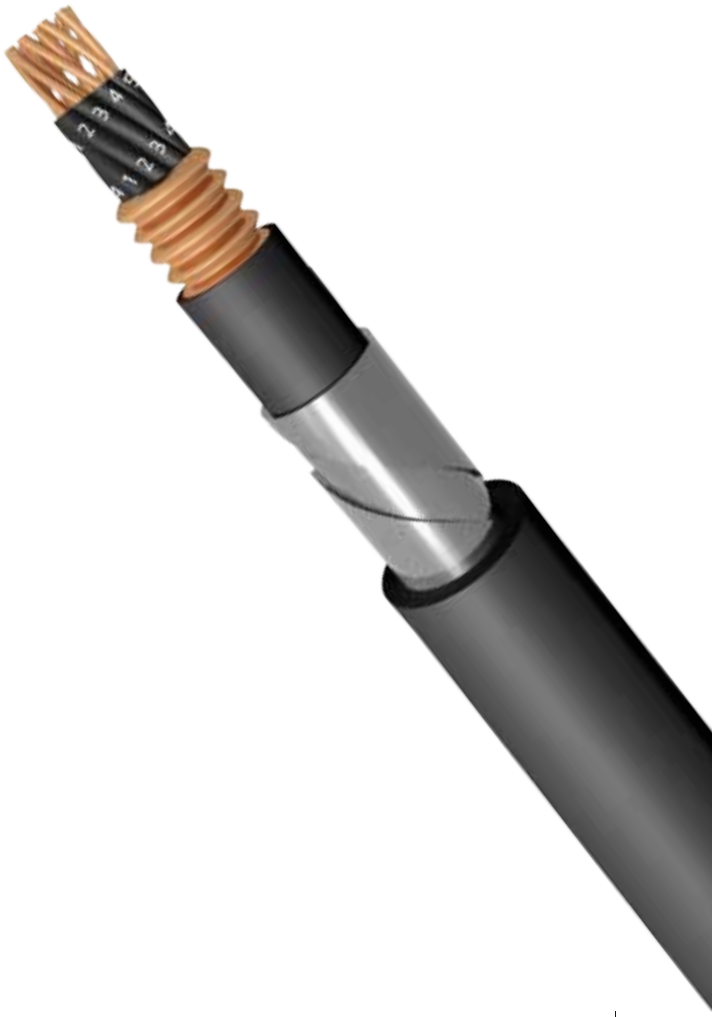
ON REQUEST

- UV resistant
- Arctic cables
- Indoor/Outdoor
- Oil resistant
- PVC version

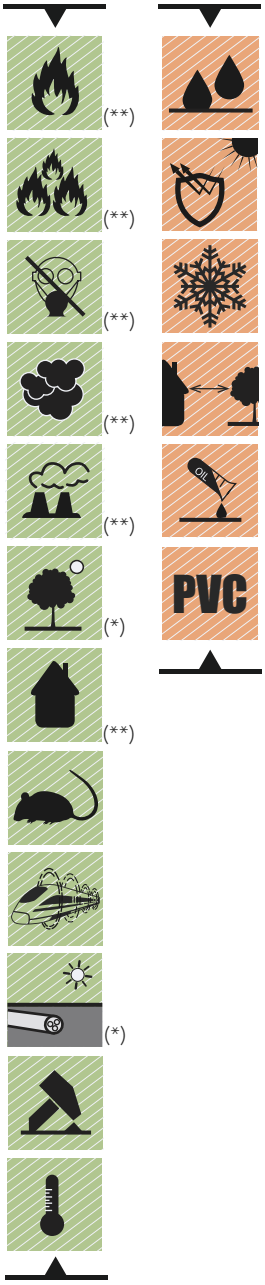
TK- H7 SIGNAL MULTICONDUCTORS - REDUCTION FACTOR

MAIN FEATURES

Formation	Conductor diameter Ø	Resistance of conductor @20 °C	Insulation resistance @20 °C	Outer sheath nominal thickness	Outer sheath nominal Ø	Nominal weight	
						PE	LSZH
(n° of conductors)	(mm)	(Ω/km)	(GΩxkm)	(mm)	(mm)	(kg/km)	(kg/km)
4	0.9	≤28.4	≥ 10	1.8	16.5	450	520
12	0.9	≤28.4	≥ 10	1.8	21.0	690	800
20	0.9	≤28.4	≥ 10	2.0	24.0	900	1020
28	0.9	≤28.4	≥ 10	2.0	27.0	1080	1500
48	0.9	≤28.4	≥ 10	2.0	31.0	1420	1700
56	0.9	≤28.4	≥ 10	2.0	33.0	1560	1900
4	1.4	≤ 12.1	≥ 10	1.8	18.0	550	630
12	1.4	≤ 12.1	≥ 10	1.8	23.5	900	1020
20	1.4	≤ 12.1	≥ 10	2.0	27.5	1220	1380
28	1.4	≤ 12.1	≥ 10	2.0	31.5	1550	1730
48	1.4	≤ 12.1	≥ 10	2.0	37.0	2080	2350
56	1.4	≤ 12.1	≥ 10	2.0	39.5	2350	2670



TK- H7 SIGNAL MULTIPAIRS - REDUCTION FACTOR



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

CABLE SPECIFICATIONS

Conductor	Solid bare copper
Insulation	Coloured Polyethylene
Pair	2 conductors assembled together to form a pair
Total assembling	N° pairs assembled with eventual filler and tape
Inner sheath	Flame retardant, low smoke and halogen-free or Polyethylene
Screen	Corrugated copper tape
Intermediate sheath	Flame retardant, low smoke and halogen-free or Polyethylene
Armouring	Two steel tapes helically applied
Outer sheath	Green flame retardant, low smoke and halogen-free or black Polyethylene

TECHNICAL DATA

Operating temperature	- 40 °C ÷ + 70 °C
Minimum bending radius	20xØ

FIRE PERFORMANCE

(**) Only for LSZH version

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

MAIN FEATURES

Test voltage	2500 V DC x 1 minute
Mutual capacitance @ 800 Hz	≤ 55 pF/m
Capacitance unbalance	≤ 650 pF/500m
Max attenuation @ 45 KHz	≤ 2.5 dB/km
Characteristic impedance @ 45 KHz	120 Ω
Reduction factor @ 50 Hz @ 100-320 V/km	≤ 0.3

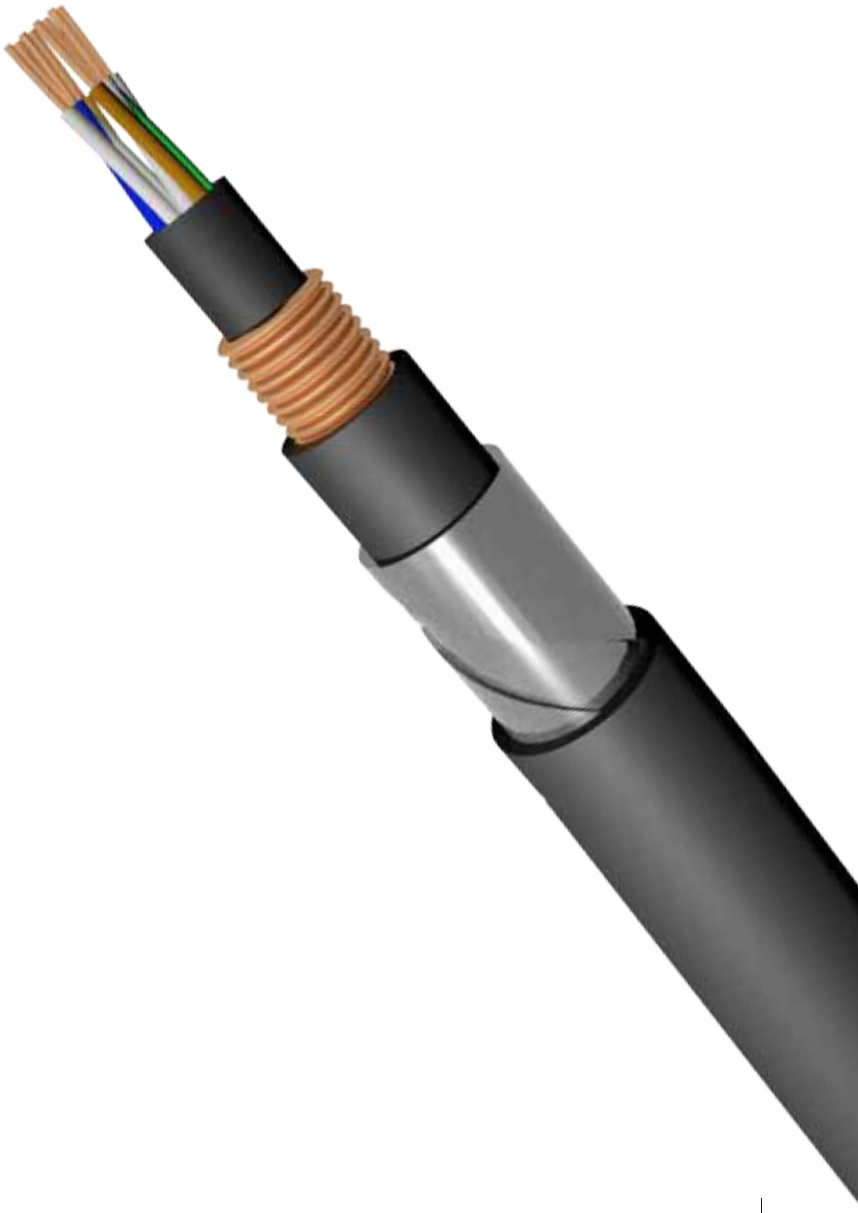
ON REQUEST

Filling compound
UV resistant
Arctic cables
Indoor/Outdoor
Oil resistant
PVC version

TK- H7 SIGNAL MULTIPAIRS - REDUCTION FACTOR

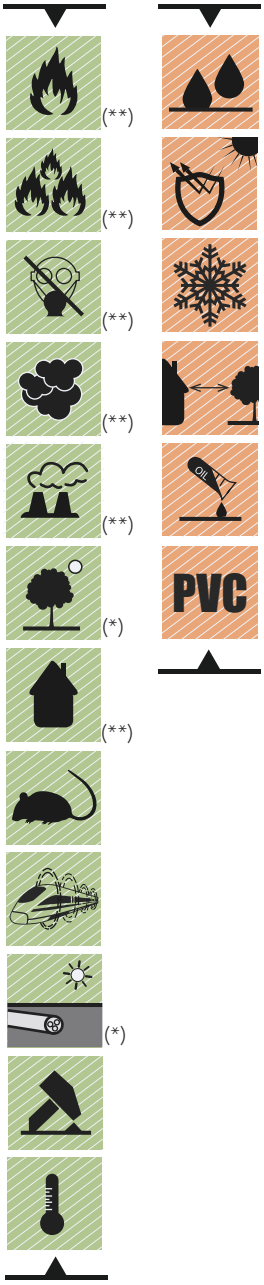
MAIN FEATURES

Formation	Conductor nominal section	Resistance of conductor @20 °C	Insulation resistance @20 °C	Outer sheath nominal thickness	Outer sheath nominal Ø	Nominal weight	
						PE	LSZH
(n° of pairs)	(mm^2)	(Ω/km)	(GΩxkm)	(mm)	(mm)	(kg/km)	(kg/km)
2	1	≤ 18.1	≥ 10	1.8	19.2	600	670
3	1	≤ 18.1	≥ 10	1.8	19.8	650	730
4	1	≤ 18.1	≥ 10	1.8	20.8	720	820
7	1	≤ 18.1	≥ 10	1.8	24.5	950	1070
14	1	≤ 18.1	≥ 10	2.0	31.2	1400	1550
21	1	≤ 18.1	≥ 10	2.2	36.2	1700	1930
28	1	≤ 18.1	≥ 10	2.2	41.0	2150	2410
4	1.5	≤ 12.1	≥ 10	1.8	22.1	800	860
7	1.5	≤ 12.1	≥ 10	1.8	25.0	930	1100
14	1.5	≤ 12.1	≥ 10	2.0	32.5	1500	1670
21	1.5	≤ 12.1	≥ 10	2.2	37.5	1800	2000
28	1.5	≤ 12.1	≥ 10	2.2	43.0	2220	2500



TK- CW SIGNAL MULTIQUADS - REDUCTION FACTOR

ON REQUEST



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

CABLE SPECIFICATIONS

Conductor	Solid bare copper
Insulation	Coloured Polyethylene
Quad	4 conductors assembled together to form a star quad
Total assembling	N° star quads assembled together with eventual filler and tape
Screen and moisture barrier	Aluminium/PE/tape thermowelded to inner sheath
Inner sheath	Flame retardant, low smoke and halogen-free or Polyethylene
Concentric screen	One solid copper layer
Armouring	Two steel tapes helically applied
Outer sheath	Green flame retardant, low smoke and halogen-free or black Polyethylene

TECHNICAL DATA

Operating temperature	- 40 °C ÷ + 70 °C
Minimum bending radius	20xØ

FIRE PERFORMANCE

(**) Only for LSZH version

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

MAIN FEATURES

Test voltage	2500 V AC x 1 minute
Mutual capacitance @ 800 Hz	≤ 45 pF/m
Capacitance unbalance	≤ 650 pF/500m
Max attenuation @ 90 KHz	≤ 3.3 dB/km (0.9 mm) ≤ 2.6 dB/km (1.4 mm)
Reduction factor @ 50 Hz @ 50-250 V/km	≤ 0.3

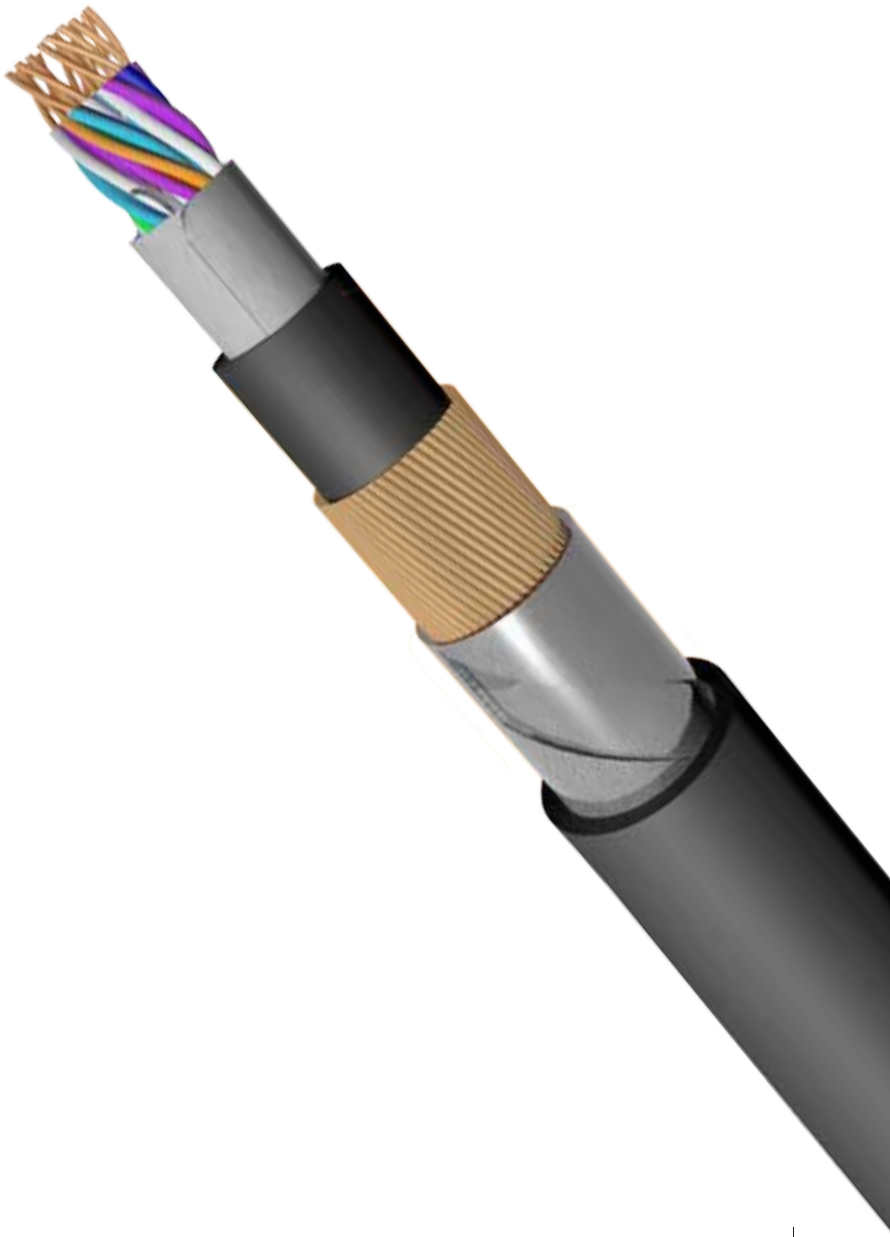
ON REQUEST

Filling compound
UV resistant
Arctic cables
Indoor/Outdoor
Oil resistant
PVC version

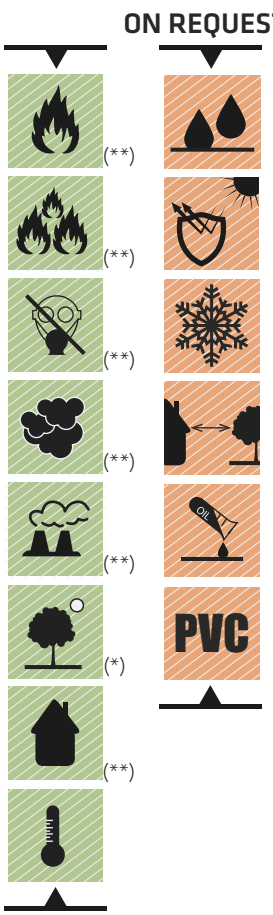
TK- CW SIGNAL MULTIQUADS - REDUCTION FACTOR

MAIN FEATURES

Formation	Conductor diameter Ø	Resistance of conductor @20 °C	Insulation resistance @20 °C	Outer sheath nominal thickness	Outer sheath nominal Ø	Nominal weight	
						PE	LSZH
(n° of quads)	(mm)	(Ω/km)	(GΩxkm)	(mm)	(mm)	(kg/km)	(kg/km)
3	0.9	≤ 28.4	≥ 10	1.8	21.0	800	850
5	0.9	≤ 28.4	≥ 10	1.8	23.0	1010	1080
10	0.9	≤ 28.4	≥ 10	2.0	28.0	1430	1500
20	0.9	≤ 28.4	≥ 10	2.2	35.0	2130	2210
30	0.9	≤ 28.4	≥ 10	2.2	40.0	2800	2940
40	0.9	≤ 28.4	≥ 10	2.5	45.0	3380	3510
3	1.4	≤ 12.1	≥ 10	2.0	25.0	1350	1410
5	1.4	≤ 12.1	≥ 10	2.0	29.0	1760	1820
10	1.4	≤ 12.1	≥ 10	2.2	37.0	2620	2730
20	1.4	≤ 12.1	≥ 10	2.6	47.0	4040	4200
30	1.4	≤ 12.1	≥ 10	3.0	54.0	5330	5610
40	1.4	≤ 12.1	≥ 10	3.0	61.0	6550	6900



TK- 409 SIGNAL



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

CABLE SPECIFICATIONS

Conductor	Solid tinned copper, section from 1 to 6 mm^2 Stranded copper, section from 10 to 25 mm^2 Extra-flexible copper, section 1.5 mm^2
Insulation	Coloured type crosslinked LSZH compound
Assembling	N° conductors assembled with eventual filler and tape
Inner sheath	Type crosslinked LSZH
Outer sheath	Black crosslinked flame retardant, low smoke and halogen-free compound or black Polyethylene

TECHNICAL DATA

Operating temperature	- 40 °C ÷ + 70 °C
Minimum bending radius	15xØ

FIRE PERFORMANCE

(**) Only for LSZH version

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

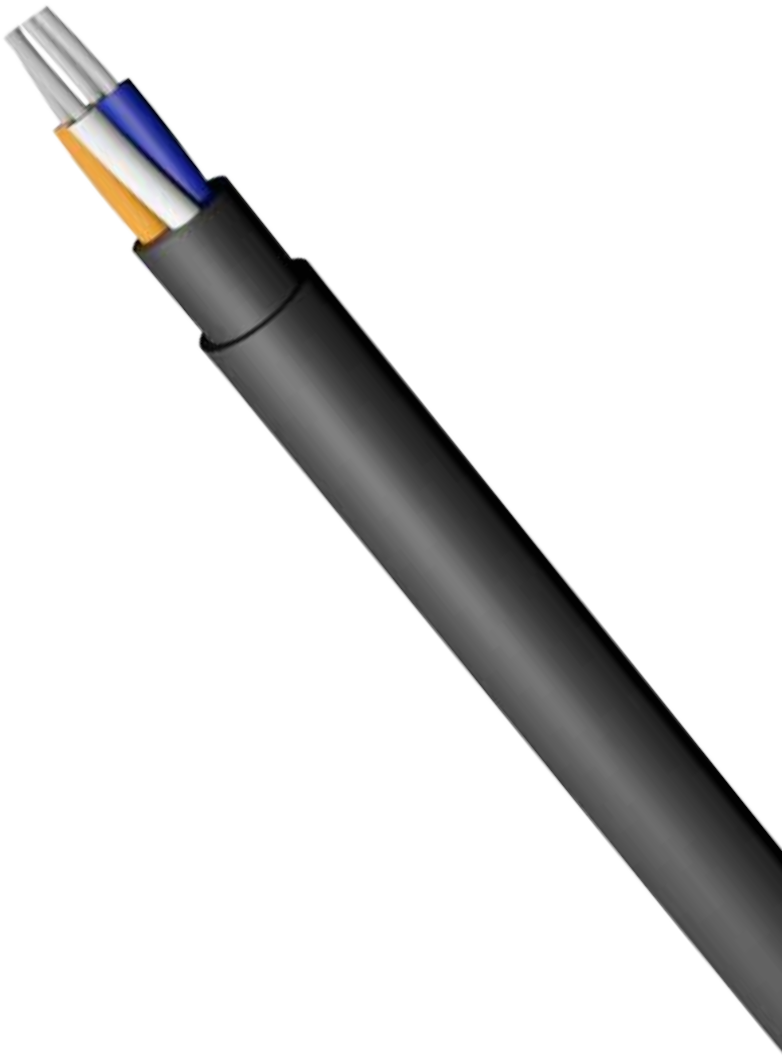
ON REQUEST

Filling compound
UV resistant
Arctic cables
Indoor/Outdoor
Oil resistant
PVC version

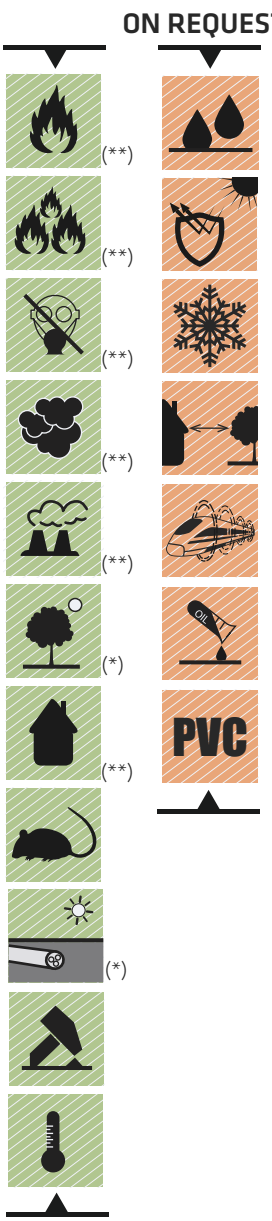
TK- 409 SIGNAL

MAIN FEATURES

Formation	Conductor nominal section	Resistance of conductor @20 °C	Insulation resistance @20 °C	Outer sheath nominal thickness	Outer sheath nominal Ø	Nominal weight	
						PE	LSZH
(n° of conductors)	(mm^2)	(Ω/km)	(MΩxkm)	(mm)	(mm)	(kg/km)	(kg/km)
4	1	≤18.2	≥ 300	1.4	11.6	90	110
8	1	≤18.2	≥ 300	1.6	15.0	170	190
16	1	≤18.2	≥ 300	2.0	19.5	310	350
2	2.5	≤7.56	≥ 250	1.6	13.0	130	150
4	2.5	≤7.56	≥ 250	1.6	14.5	170	200
2	4	≤4.70	≥ 200	1.6	13.8	160	190
3	4	≤4.70	≥ 200	1.6	14.6	190	220
2	6	≤3.11	≥ 200	1.6	15.0	220	260
3	6	≤3.11	≥ 200	1.6	15.5	230	280
3	10	≤1.84	≥ 150	2.0	19.0	400	460
3	16	≤1.16	≥ 150	2.0	21.5	540	630
3	25	≤0.734	≥ 150	2.0	24.5	810	900
4	1.5	≤13.70	≥ 300	1.4	12.6	110	130
8	1.5	≤13.70	≥ 300	1.8	16.8	200	240
16	1.5	≤13.70	≥ 300	2.5	23.0	400	470



TK- ARMOURED 409 SIGNAL



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

CABLE SPECIFICATIONS

Conductor	Solid tinned copper, section from 1 to 6 mm^2 Stranded copper, section from 10 to 25 mm^2 Extra-flexible copper, section 1.5 mm^2
Insulation	Coloured type crosslinked LSZH compound
Assembling	N° conductors assembled with eventual filler and tape
Inner sheath	Type crosslinked LSZH compound
Intermediate sheath	Type crosslinked LSZH compound
Armouring	Two steel tapes helically applied
Outer sheath	Black flame retardant, low smoke and halogen-free compound or black polyethylene

TECHNICAL DATA

Operating temperature	- 40 °C ÷ + 70 °C
Minimum bending radius	20xØ

FIRE PERFORMANCE

(**) Only for LSZH version

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

ON REQUEST

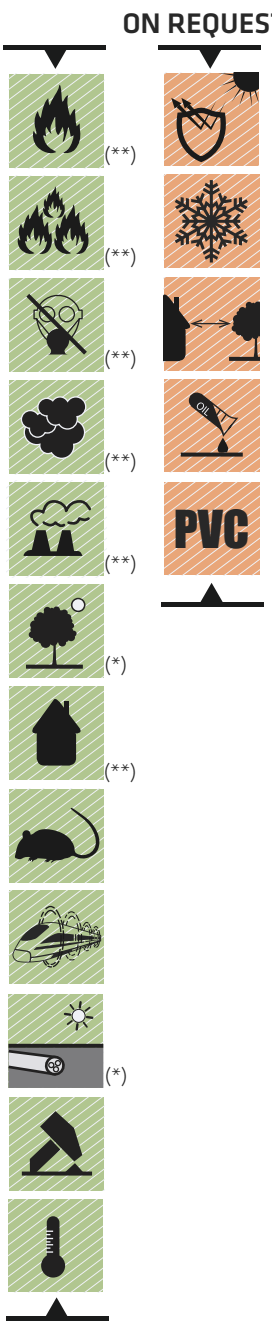
Filling compound
UV resistant
Arctic cables
Indoor/Outdoor
Reduction factor
Oil resistant
PVC version

TK- ARMOURED 409 SIGNAL

MAIN FEATURES

Formation	Conductor diameter Ø	Resistance of conductor @20 °C	Insulation resistance @20 °C	Outer sheath nominal thickness	Outer sheath nominal Ø	Nominal weight	
						PE	LSZH
(n° of conductors)	(mm)	(Ω/km)	(MΩxkm)	(mm)	(mm)	(kg/km)	(kg/km)
4	1	≤ 18.2	≥ 300	0.8	16.0	280	320
8	1	≤ 18.2	≥ 300	0.8	19.5	420	480
16	1	≤ 18.2	≥ 300	0.8	24.0	620	680
2	2.5	≤ 7.56	≥ 250	0.8	17.0	360	395
4	2.5	≤ 7.56	≥ 250	0.8	19.0	410	460
2	4	≤ 4.70	≥ 200	0.8	18.5	395	440
3	4	≤ 4.70	≥ 200	0.8	19.0	430	480
2	6	≤ 3.11	≥ 200	0.8	19.5	460	510
3	6	≤ 3.11	≥ 200	0.8	20.0	500	560
3	10	≤ 1.84	≥ 150	0.8	23.5	700	780
3	16	≤ 1.16	≥ 150	0.8	26.0	940	1020
3	25	≤ 0.73	≥ 150	0.8	29.5	1240	1350
4	1.5	≤ 13.7	≥ 300	0.8	17.0	320	360
8	1.5	≤ 13.7	≥ 300	0.8	21.0	490	540
16	1.5	≤ 13.7	≥ 300	0.8	27.0	800	880

TK- POINT MACHINE



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

CABLE SPECIFICATIONS

Conductor	Solid bare copper
Insulation	Black numbered Polyethylene
Assembling	5 conductors assembled with eventual filler and tape
Screen	Corrugated copper tape
Inner sheath	Flame retardant, low smoke and halogen-free or Polyethylene
Armouring	Two steel tapes helically applied
Outer sheath	Green flame retardant, low smoke and halogen-free or black Polyethylene

TECHNICAL DATA

Operating temperature	- 40 °C ÷ + 70 °C
Minimum bending radius	20xØ

FIRE PERFORMANCE

(**) Only for LSZH version

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

MAIN FEATURES

Test voltage		3500 V AC x 5 minute
Mutual capacitance	@800 Hz	≤ 50 pF/m
Max attenuation	@ 1 KHz	≤ 0.44 dB/km (2.5 mm^2)
	@ 10 KHz	≤ 0.81 dB/km (2.5 mm^2)
	@ 1 KHz	≤ 0.41 dB/km (4 mm^2)
	@ 10 KHz	≤ 0.78 dB/km (4 mm^2)
	@ 1 KHz	≤ 0.41 dB/km (6 mm^2)
	@ 10 KHz	≤ 0.78 dB/km (6 mm^2)
Reduction factor @100-350 v/km	@ 50 Hz	≤ 0.3

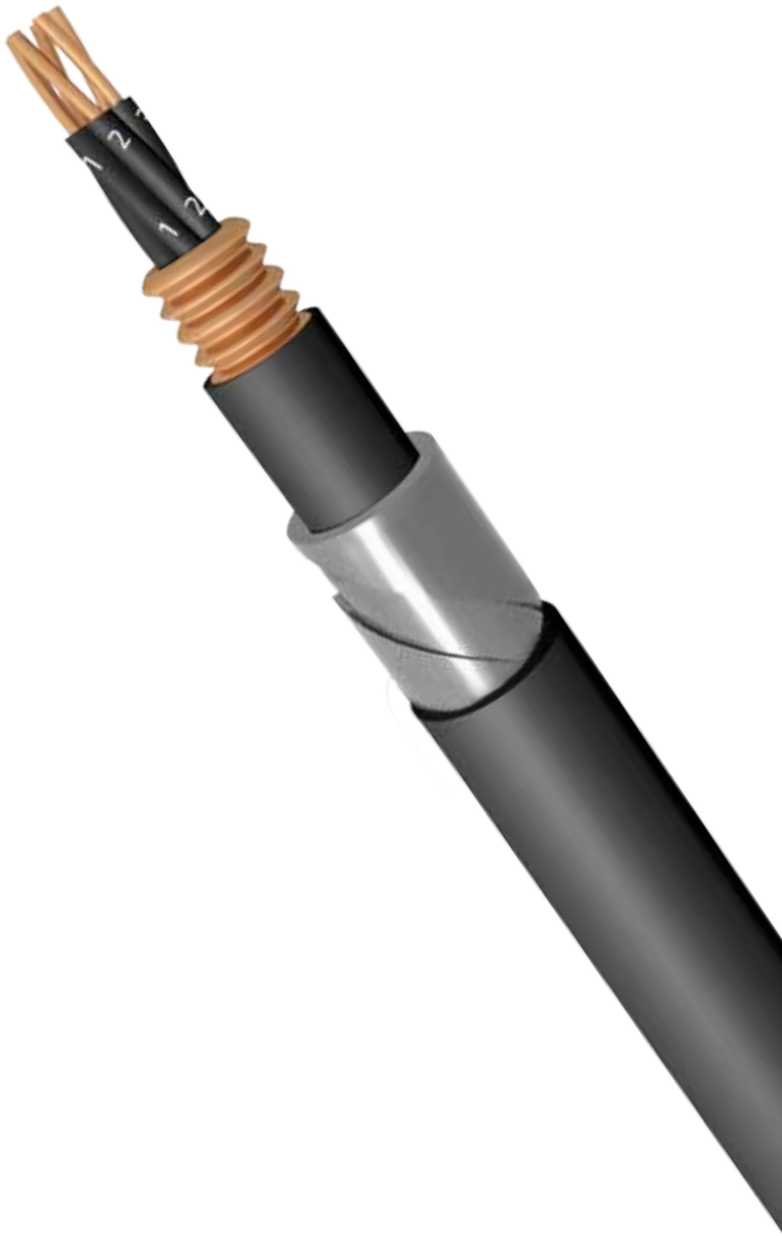
ON REQUEST

Arctic cables
Indoor/Outdoor
Reduction factor
Oil resistant
PVC version

TK- POINT MACHINE

MAIN FEATURES

Formation	Conductor nominal section	Resistance of conductor @20 °C	Insulation resistance @20 °C	Outer sheath nominal thickness	Outer sheath nominal Ø	Nominal weight	
						PE	LSZH
(n° of conductors)	(mm^2)	(Ω/km)	(GΩxkm)	(mm)	(mm)	(kg/km)	(kg/km)
5	2.5	≤ 7.41	≥10	1.8	20.0	720	820
5	4	≤ 4.61	≥10	1.8	22.5	880	1000
5	6	≤ 3.08	≥10	1.8	24.0	1000	1120



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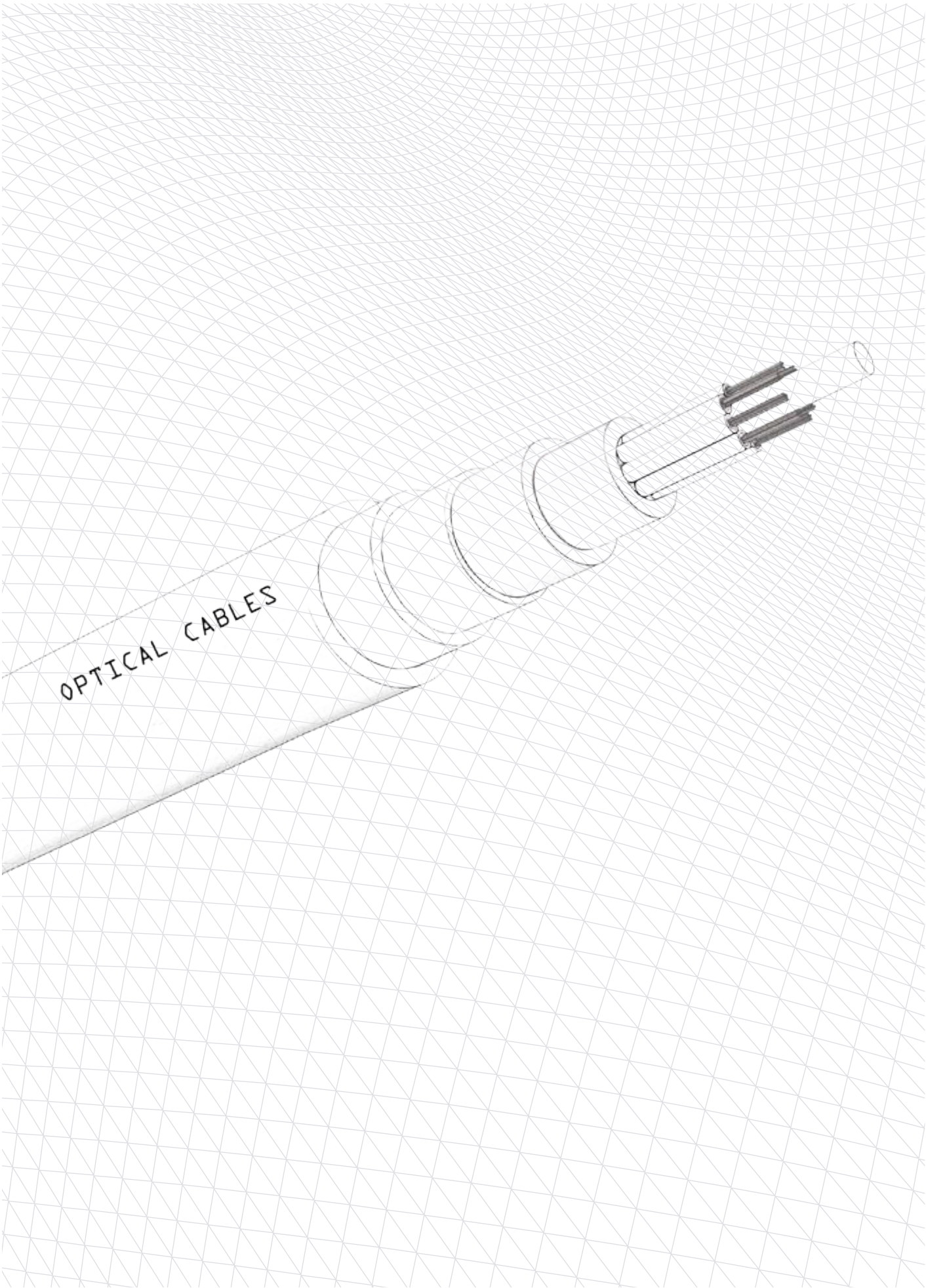

OPTICAL CABLES

TK-BCA FIBER OPTIC TRAIN DETECTION

ON REQUEST

CABLE SPECIFICATIONS

Fiber structure	Tight buffer 900 µm Semitight buffer 900 µm
Tight colour code	See table C
Assembling	4 ÷ 24 fibers
Protection	Aramidic yarns
Inner sheath	Flame retardant, low smoke and halogen-free
Armouring	Corrugated steel tape thermowelded to outer sheath
Outer sheath	Flame retardant, low smoke and halogen-free

All cables are available with all type of fibers.

TECHNICAL DATA

Operating temperature	- 40 °C ÷ + 80 °C
Minimum bending radius	10xØ

FIRE PERFORMANCE

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

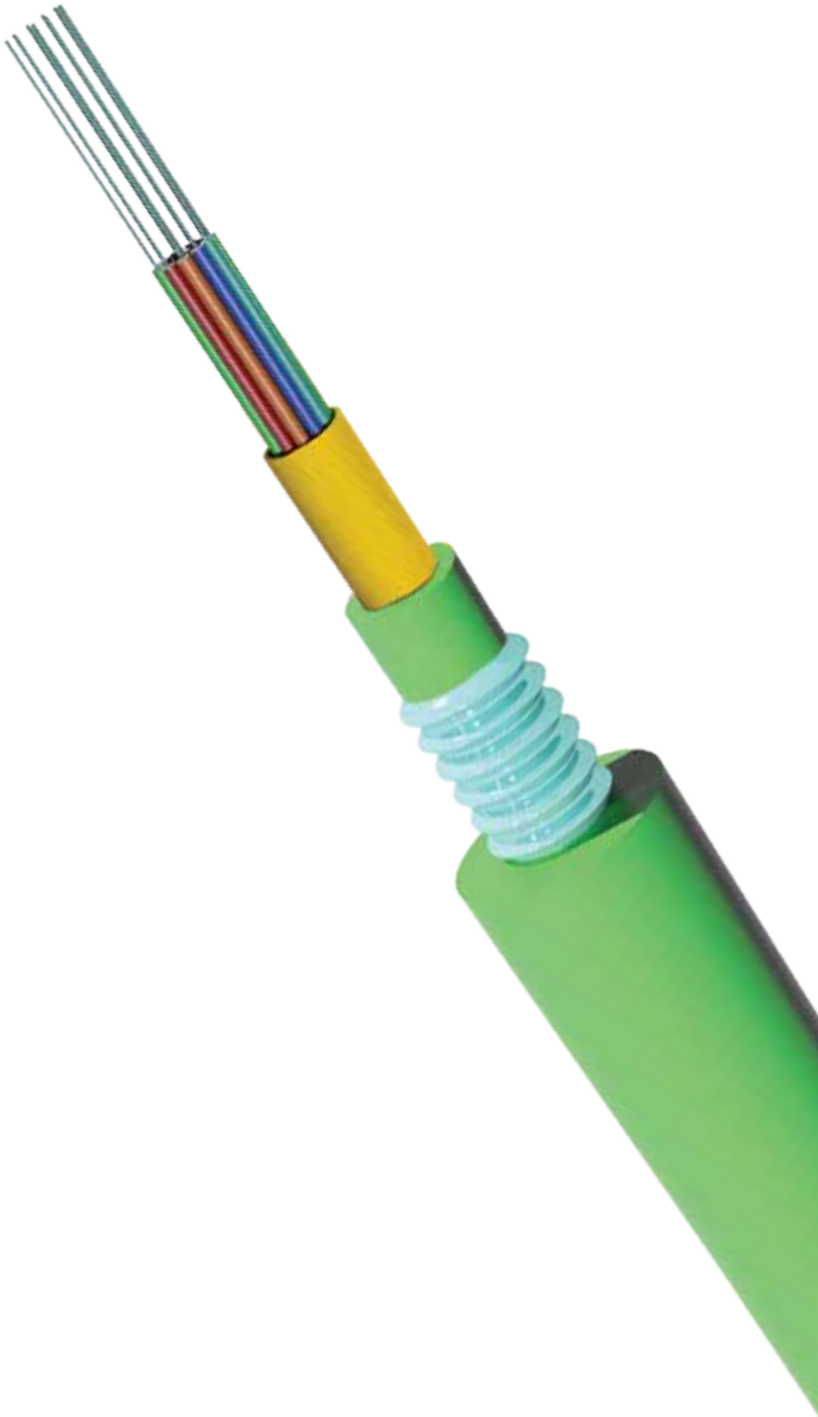
ON REQUEST

Water resistant
Polyethylene sheath for direct buried
UV resistant
Arctic cables
Indoor/Outdoor
Oil resistance

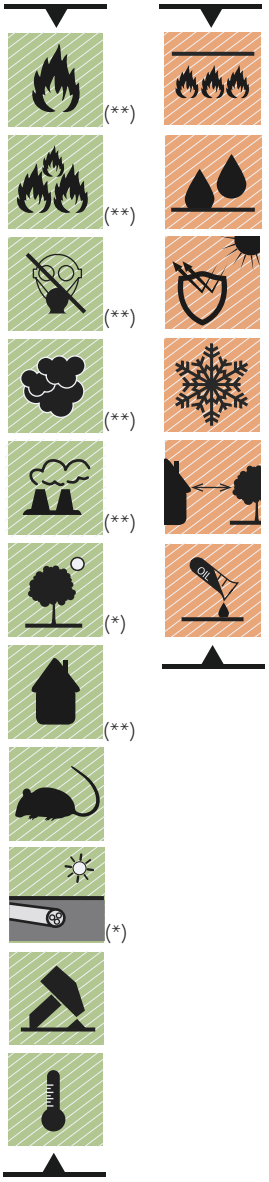
TK-BCA FIBER OPTIC TRAIN DETECTION

MAIN FEATURES

No. of fiber	Nominal diameter Ø	Nominal weight	Max pulling force	Max crush	Impact
	(mm)	(kg/km)	(N)	(N/dm)	(J)
4	11.0	120	2000	2000	20
8	12.0	150	2000	2000	20
12	13.0	180	2500	2000	20
24	14.0	220	3000	2000	20



TK- UT9X ARMOURED UNITUBE



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

CABLE SPECIFICATIONS

Fiber structure	Jelly filled loose tube
Fiber colour code	See table A
Loose tube colour	Natural
Assembling	2 ÷ 24 fibers
Protection	With or without Aramidic/Glass yarns
Armouring	Corrugated steel tape thermowelded to outer sheath
Outer sheath	Flame retardant, low smoke and halogen-free or Polyethylene

All cables are available with all type of fibers.

TECHNICAL DATA

Operating temperature	- 40 °C ÷ + 80 °C
Minimum bending radius	10xØ

FIRE PERFORMANCE

(**) Only for LSZH version

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

ON REQUEST

- Fire resistant
- Water resistant
- UV resistant
- Arctic cables
- Indoor/Outdoor
- Oil resistance

TK- UT9X ARMOURED UNITUBE

MAIN FEATURES CST + LSZH SHEATH

No. of fiber	Loose nominal diameter Ø	Cable nominal diameter Ø	Nominal weight	Max pulling force	Max crush	Impact
	(mm)	(mm)	(kg/km)	(N)	(N/dm)	(J)
2 ÷ 24	3.5	9.0	95	750	2500	10

MAIN FEATURES CST + ARAMIDIC YARNS + LSZH SHEATH

No. of fiber	Loose nominal diameter Ø	Cable nominal diameter Ø	Nominal weight	Max pulling force	Max crush	Impact
	(mm)	(mm)	(kg/km)	(N)	(N/dm)	(J)
2 ÷ 24	3.5	9.0	110	1500	3000	15

MAIN FEATURES CST + GLASS YARNS + LSZH SHEATH

No. of fiber	Loose nominal diameter Ø	Cable nominal diameter Ø	Nominal weight	Max pulling force	Max crush	Impact
	(mm)	(mm)	(kg/km)	(N)	(N/dm)	(J)
2 ÷ 24	3.5	10	140	3000	3500	20

MAIN FEATURES CST + PE SHEATH

No. of fiber	Loose nominal diameter Ø	Cable nominal diameter Ø	Nominal weight	Max pulling force	Max crush	Impact
	(mm)	(mm)	(kg/km)	(N)	(N/dm)	(J)
2 ÷ 24	3.5	9.0	55	750	2500	10

MAIN FEATURES CST + ARAMIDIC YARNS + PE SHEATH

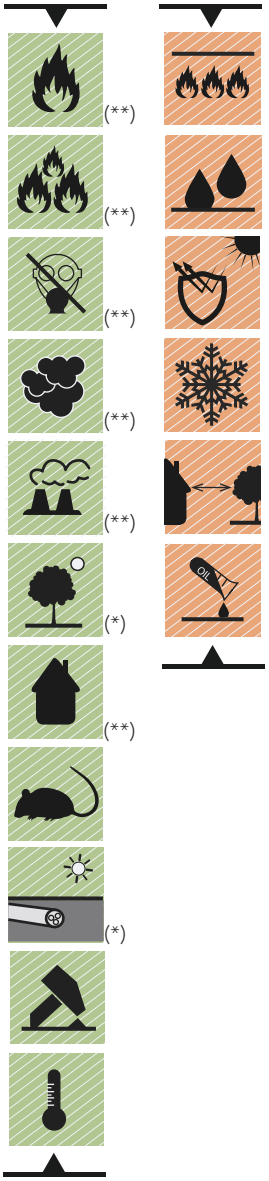
No. of fiber	Loose nominal diameter Ø	Cable nominal diameter Ø	Nominal weight	Max pulling force	Max crush	Impact
	(mm)	(mm)	(kg/km)	(N)	(N/dm)	(J)
2 ÷ 24	3.5	9.0	85	1500	3000	15

MAIN FEATURES CST + GLASS YARNS + PE SHEATH

No. of fiber	Loose nominal diameter Ø	Cable nominal diameter Ø	Nominal weight	Max pulling force	Max crush	Impact
	(mm)	(mm)	(kg/km)	(N)	(N/dm)	(J)
2 ÷ 24	3.5	10	100	3000	3500	20

TK- UTXD ARMOURED UNITUBE DOUBLE SHEATH

ON REQUEST



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

CABLE SPECIFICATIONS

Fiber structure	Jelly filled loose tube
Fiber colour code	See table A
Loose tube colour	Natural
Assembling	2 ÷ 24 fibers
Strain relief	Aramidic/Glass yarns
Inner sheath	Flame retardant, low smoke and halogen-free or Polyethylene
Armouring	Galvanized steel wire braid or corrugated and thermowelded steel tape
Outer sheath	Flame retardant, low smoke and halogen-free or Polyethylene

All cables are available with all type of fibers.

TECHNICAL DATA

Operating temperature	- 40 °C ÷ + 80 °C
Minimum bending radius	10xØ

FIRE PERFORMANCE

(**) Only for LSZH version

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

ON REQUEST

Fire resistant
Water resistant
UV resistant
Arctic cables
Indoor/Outdoor
Oil resistance

TK- UTXD ARMOURED UNITUBE DOUBLE SHEATH

MAIN FEATURES LSZH + GSWB + LSZH SHEATH

No. of fiber	Loose nominal diameter Ø	Cable nominal diameter Ø	Nominal weight	Max pulling force	Max crush	Impact
	(mm)	(mm)	(kg/km)	(N)	(N/dm)	(J)
2 ÷ 12	2.8	8.6	100	1500	2500	10
13 ÷ 24	3.5	10	130	1500	2500	10

MAIN FEATURES PE + GSWB + PE SHEATH

No. of fiber	Loose nominal diameter Ø	Cable nominal diameter Ø	Nominal weight	Max pulling force	Max crush	Impact
	(mm)	(mm)	(kg/km)	(N)	(N/dm)	(J)
2 ÷ 12	2.8	8.6	70	1500	2500	10
13 ÷ 24	3.5	10	90	1500	2500	10

MAIN FEATURES LSZH + CST + LSZH SHEATH

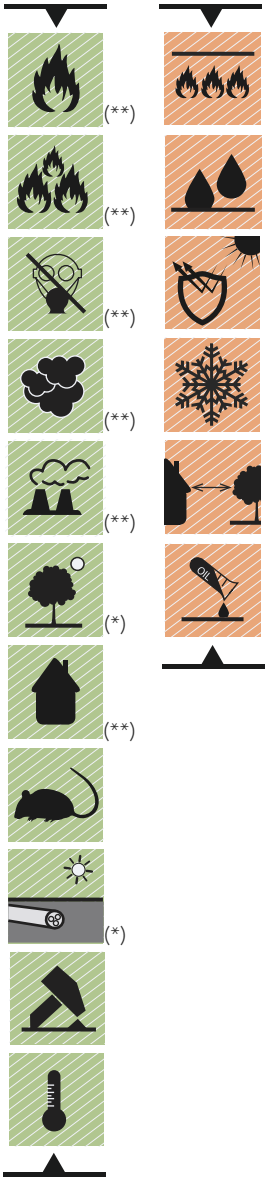
No. of fiber	Loose nominal diameter Ø	Cable nominal diameter Ø	Nominal weight	Max pulling force	Max crush	Impact
	(mm)	(mm)	(kg/km)	(N)	(N/dm)	(J)
2 ÷ 12	2.8	10	125	2000	3000	15
13 ÷ 24	3.5	10.5	145	2000	3000	15

MAIN FEATURES PE + CST + PE SHEATH

No. of fiber	Loose nominal diameter Ø	Cable nominal diameter Ø	Nominal weight	Max pulling force	Max crush	Impact
	(mm)	(mm)	(kg/km)	(N)	(N/dm)	(J)
2 ÷ 12	2.8	10	85	2000	3000	15
13 ÷ 24	3.5	10.5	105	2000	3000	15

TK- MT9X ARMOURED MULTITUBE

ON REQUEST



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

CABLE SPECIFICATIONS

Fiber structure	Jelly filled loose tube
Fiber colour code	See table A
Loose tube colour	See table B
Assembling	6 ÷ 24 loose tubes/fillers 12 ÷ 288 fibers
Central element	Fiber reinforced polymer
Protection	With or without Aramidic/Glass yarns
Armouring	Corrugated steel tape thermowelded to outer sheath
Outer sheath	Flame retardant, low smoke and halogen-free or Polyethylene

All cables are available with all type of fibers.

TECHNICAL DATA

Operating temperature	- 40 °C ÷ + 80 °C
Minimum bending radius	10xØ

FIRE PERFORMANCE

(**) Only for LSZH version

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

ON REQUEST

- Fire resistant
- Water resistant
- UV resistant
- Arctic cables
- Indoor/Outdoor
- Oil resistance

TK- MT9X ARMOURED MULTITUBE

MAIN FEATURES CST + LSZH SHEATH

No. of fiber	Loose nominal diameter Ø	No. loose	No. filler	Cable nominal diameter Ø	Nominal weight	Max pulling force	Max crush	Impact
	(mm)			(mm)	(kg/km)	(N)	(N/dm)	(J)
12	1.9	1	5	11.0	150	1500	2000	15
24	1.9	2	4	11.0	150	1500	2000	15
36	1.9	3	3	11.0	150	1500	2000	15
48	1.9	4	2	11.0	150	1500	2000	15
60	1.9	5	1	11.0	150	1500	2000	15
72	1.9	6	0	11.0	150	1500	2000	15
96	1.9	8	0	12.0	170	2000	2500	20
144	1.9	12	0	14.5	230	2000	2500	20
192	1.9	16	0	14.5	230	2000	2000	20
216	1.9	18	0	15.5	260	2000	2000	25
288	1.9	24	0	17.5	350	2000	3000	25

MAIN FEATURES ARAMIDIC + CST + LSZH SHEATH

No. of fiber	Loose nominal diameter Ø	No. loose	No. filler	Cable nominal diameter Ø	Nominal weight	Max pulling force	Max crush	Impact
	(mm)			(mm)	(kg/km)	(N)	(N/dm)	(J)
12	1.9	1	5	12.0	160	2000	2000	15
24	1.9	2	4	12.0	160	2000	2000	15
36	1.9	3	3	12.0	160	2000	2000	15
48	1.9	4	2	12.0	160	2000	2000	15
60	1.9	5	1	12.0	160	2000	2000	15
72	1.9	6	0	12.0	160	2000	2000	15
96	1.9	8	0	13.0	180	2500	2500	20
144	1.9	12	0	15.5	250	2500	2500	20
192	1.9	16	0	15.5	250	3000	3000	25
216	1.9	18	0	16.5	280	3000	3000	25
288	1.9	24	0	18.5	360	3500	3000	25

TK- MT9X ARMOURED MULTITUBE

MAIN FEATURES GLASS YARNS + CST + LSZH SHEAT

No. of fiber	Loose nominal diameter Ø	No. loose	No. filler	Cable nominal diameter Ø	Nominal weight	Max pulling force	Max crush	Impact
	(mm)			(mm)	(kg/km)	(N)	(N/dm)	(J)
12	1.9	1	5	12.0	170	2500	2000	15
24	1.9	2	4	12.0	170	2500	2000	15
36	1.9	3	3	12.0	170	2500	2000	15
48	1.9	4	2	12.0	170	2500	2000	15
60	1.9	5	1	12.0	170	2500	2000	15
72	1.9	6	0	12.0	170	2500	2000	15
96	1.9	8	0	13.0	190	3000	2500	20
144	1.9	12	0	15.5	270	2500	2500	20
192	1.9	16	0	15.5	270	3000	3000	25
216	1.9	18	0	15.5	300	3000	3000	25
288	1.9	24	0	17.5	380	3500	3000	25

MAIN FEATURES CST + PE SHEATH

No. of fiber	Loose nominal diameter Ø	No. loose	No. filler	Cable nominal diameter Ø	Nominal weight	Max pulling force	Max crush	Impact
	(mm)			(mm)	(kg/km)	(N)	(N/dm)	(J)
12	1.9	1	5	11.0	120	1500	2000	15
24	1.9	2	4	11.0	120	1500	2000	15
36	1.9	3	3	11.0	120	1500	2000	15
48	1.9	4	2	11.0	120	1500	2000	15
60	1.9	5	1	11.0	120	1500	2000	15
72	1.9	6	0	11.0	120	1500	2000	15
96	1.9	8	0	12.0	140	2000	2500	20
144	1.9	12	0	14.5	190	2000	2500	20
192	1.9	16	0	14.5	190	2000	2000	20
216	1.9	18	0	15.5	220	2000	2000	25
288	1.9	24	0	17.5	260	2500	3000	25

TK- MT9X ARMOURED MULTITUBE

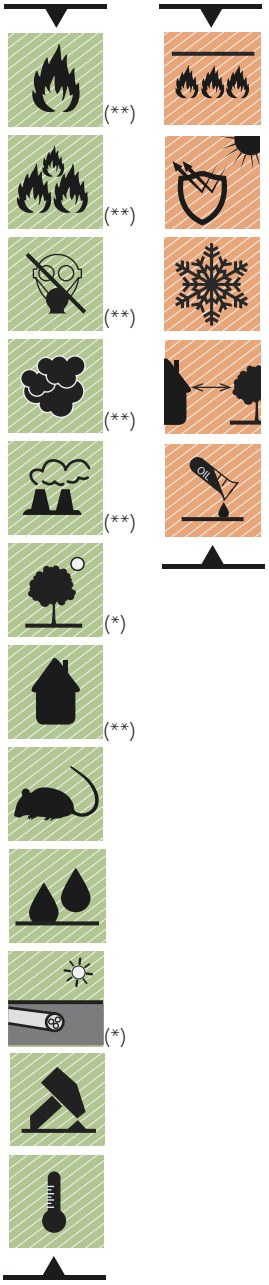
MAIN FEATURES ARAMIDIC + CST + PE SHEATH

No. of fiber	Loose nominal diameter Ø	No. loose	No. filler	Cable nominal diameter Ø	Nominal weight	Max pulling force	Max crush	Impact
	(mm)			(mm)	(kg/km)	(N)	(N/dm)	(J)
12	1.9	1	5	12.0	130	2000	2000	15
24	1.9	2	4	12.0	130	2000	2000	15
36	1.9	3	3	12.0	130	2000	2000	15
48	1.9	4	2	12.0	130	2000	2000	15
60	1.9	5	1	12.0	130	2000	2000	15
72	1.9	6	0	12.0	130	2000	2000	15
96	1.9	8	0	13.0	150	2500	2500	20
144	1.9	12	0	15.5	210	2500	2500	20
192	1.9	16	0	15.5	210	3000	3000	25
216	1.9	18	0	16.5	240	3000	3000	25
288	1.9	24	0	18.5	290	3500	3000	25

MAIN FEATURES GLASS YARNS + CST + PE SHEATH

No. of fiber	Loose nominal diameter Ø	No. loose	No. filler	Cable nominal diameter Ø	Nominal weight	Max pulling force	Max crush	Impact
	(mm)			(mm)	(kg/km)	(N)	(N/dm)	(J)
12	1.9	1	5	12.0	140	2000	2000	15
24	1.9	2	4	12.0	140	2000	2000	15
36	1.9	3	3	12.0	140	2000	2000	15
48	1.9	4	2	12.0	140	2000	2000	15
60	1.9	5	1	12.0	140	2000	2000	15
72	1.9	6	0	12.0	140	2000	2000	15
96	1.9	8	0	13.0	160	2500	2500	20
144	1.9	12	0	15.5	220	2500	2500	20
192	1.9	16	0	15.5	220	3000	3000	25
216	1.9	18	0	16.5	250	3000	3000	25
288	1.9	24	0	18.5	310	3500	3000	25

TK- API AIRBAG PROTECTION



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

CABLE SPECIFICATIONS

Fiber structure	Jelly filled loose tube
Fiber colour code	See table A
Loose tube color	See table B
Assembling	8 loose tubes/fillers 16 ÷ 96 fibers
Central element	Fiber reinforced polymer
Inner sheath	Flame retardant, low smoke and halogen-free or Polyethylene
Mechanical protection	Dielectric layer
Armouring	Anti rodent glass protection
Outer sheath	Flame retardant, low smoke and halogen-free or Polyethylene

All cables are available with all type of fibers.

TECHNICAL DATA

Operating temperature	- 40 °C ÷ + 80 °C
Minimum bending radius	15xØ

FIRE PERFORMANCE

(**) Only for LSZH version

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

ON REQUEST

Fire resistant
UV resistant
Arctic cables
Indoor/Outdoor
Oil resistance

TK- API AIRBAG PROTECTION

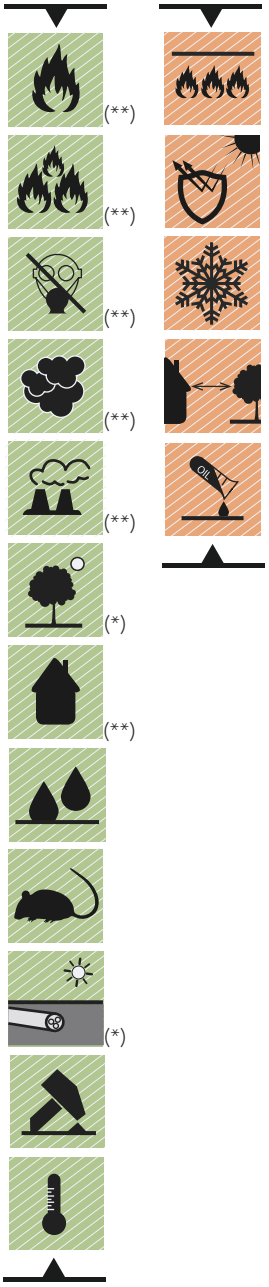
MAIN FEATURES LSZH + AIRBAG + GLASS TAPE AND YARNS + LSZH SHEATH

No. of fiber	Loose nominal diameter Ø	No. loose	No. filler	Cable nominal diameter Ø	Nominal weight	Max pulling force	Max crush	Impact
	(mm)			(mm)	(kg/km)	(N)	(N/dm)	(J)
16	1.8	4	4	18.0	290	3000	10000	30
32	1.8	8	0	18.0	290	3000	10000	30
48	1.8	6	2	20.0	345	3000	10000	30
64	1.8	8	0	20.0	345	3000	10000	30
96	1.8	8	0	20.0	345	3000	10000	30

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

No. of fiber	Loose nominal diameter Ø	No. loose	No. filler	Cable nominal diameter Ø	Nominal weight	Max pulling force	Max crush	Impact
	(mm)			(mm)	(kg/km)	(N)	(N/dm)	(J)
16	1.8	4	4	18.0	235	3000	10000	30
32	1.8	8	0	18.0	235	3000	10000	30
48	1.8	6	2	20.0	280	3000	10000	30
64	1.8	8	0	20.0	280	3000	10000	30
96	1.8	8	0	20.0	280	3000	10000	30

TK- MT6X ARMOURED MULTITUBE



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

CABLE SPECIFICATIONS

Fiber structure	Jelly filled loose tube
Fiber colour code	See table A
Loose tube color	See table B
Assembling	8 loose tubes/fillers 16 ÷ 96 fibers
Central element	Fiber reinforced polymer
Inner sheath	Flame retardant, low smoke and halogen-free or Polyethylene
Strain relief	Aramidic layer
Armouring	Welded and corrugated steel tape (H6)
Anticorrosion protection	Bituminous/Jelly layer
Outer sheath	Flame retardant, low smoke and halogen-free or Polyethylene

All cables are available with all type of fibers.

TECHNICAL DATA

Operating temperature	- 40 °C ÷ + 80 °C
Minimum bending radius	15xØ

FIRE PERFORMANCE

(**) Only for LSZH version

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

ON REQUEST

Fire resistant
UV resistant
Arctic cables
Indoor/Outdoor
Oil resistance

TK- MT6X ARMOURED MULTITUBE

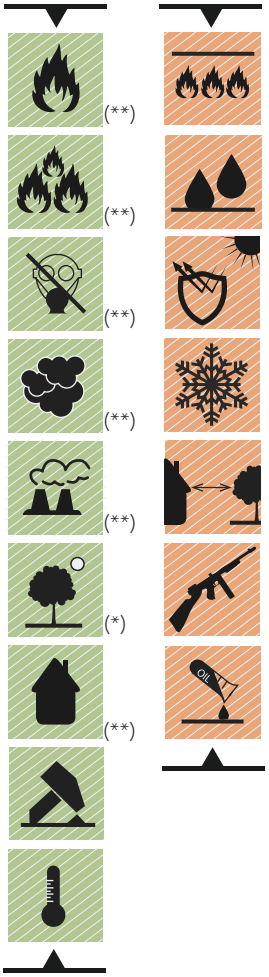
MAIN FEATURES LSZH + ARAMIDIC YARNS + H6 + LSZH SHEATH

No. of fiber	Loose nominal diameter Ø	No. loose	No. filler	Cable nominal diameter Ø	Nominal weight	Max pulling force	Max crush	Impact
	(mm)			(mm)	(kg/km)	(N)	(N/dm)	(J)
16	1.8	4	4	20.0	460	3000	10000	30
32	1.8	8	0	20.0	460	3000	10000	30
48	1.8	6	2	20.0	460	3000	10000	30
64	1.8	8	0	20.0	460	3000	10000	30
96	1.8	8	0	20.0	460	3000	10000	30

MAIN FEATURES PE + ARAMIDIC YARNS + H6 + PE SHEATH

No. of fiber	Loose nominal diameter Ø	No. loose	No. filler	Cable nominal diameter Ø	Nominal weight	Max pulling force	Max crush	Impact
	(mm)			(mm)	(kg/km)	(N)	(N/dm)	(J)
16	1.8	4	4	20.0	380	3000	10000	30
32	1.8	8	0	20.0	380	3000	10000	30
48	1.8	6	2	20.0	380	3000	10000	30
64	1.8	8	0	20.0	380	3000	10000	30
96	1.8	8	0	20.0	380	3000	10000	30

TK- MTAS MULTITUBE ADSS



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

CABLE SPECIFICATIONS

Fiber structure	Jelly filled loose tube
Fiber colour code	See table A
Loose tube color	See table B
Assembling	6 ÷ 24 loose tubes/fillers 12 ÷ 288 fibers
Central element	Fiber reinforced polymer
Inner sheath	Flame retardant, low smoke and halogen-free or Polyethylene
***Antiballistic protection**	Aramidic tapes or glass flats
Strain relief	Aramidic layer
Outer sheath	Flame retardant, low smoke and halogen-free or Polyethylene

* On request. All cables are available with all type of fibers.

TECHNICAL DATA

Operating temperature	- 40 °C ÷ + 80 °C
Minimum bending radius	15xØ

FIRE PERFORMANCE

(**) Only for LSZH version

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

ON REQUEST

- Fire resistant
- Water resistant
- UV resistant
- Arctic cables
- Indoor/Outdoor
- Oil resistance

TK- MTAS MULTITUBE ADSS

MAIN FEATURES LSZH + ARAMIDIC YARNS + LSZH SHEATH

No. of fiber	Loose nominal diameter Ø	No. loose	No. filler	Cable nominal diameter Ø	Nominal weight	Max pulling force	Max crush	Impact
	(mm)			(mm)	(kg/km)	(N)	(N/dm)	(J)
12	1.9	1	5	13.0	160	7500	3000	20
24	1.9	2	4	13.0	160	7500	3000	20
36	1.9	3	3	13.0	160	7500	3000	20
48	1.9	4	2	13.0	190	7500	3000	20
60	1.9	5	1	13.0	160	7500	3000	20
72	1.9	6	0	13.0	160	7500	3000	20
96	1.9	8	0	14.0	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	17.0	280	7500	3000	20
288	1.9	24	0	19.0	370	7500	3000	20

MAIN FEATURES LSZH +ARAMIDIC YARNS AND TAPES + LSZH SHEATH

No. of fiber	Loose nominal diameter Ø	No. loose	No. filler	Cable nominal diameter Ø	Nominal weight	Max pulling force	Max crush	Impact
	(mm)			(mm)	(kg/km)	(N)	(N/dm)	(J)
12	1.9	1	5	15.0	190	7500	3000	20
24	1.9	2	4	15.0	190	7500	3000	20
36	1.9	3	3	15.0	190	7500	3000	20
48	1.9	4	2	15.0	190	7500	3000	20
60	1.9	5	1	15.0	190	7500	3000	20
72	1.9	6	0	15.0	190	7500	3000	20
96	1.9	8	0	16.0	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	19.0	320	7500	3000	20
288	1.9	24	0	21.0	420	7500	3000	20

TK- MTAS MULTITUBE ADSS

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

No. of fiber	Loose nominal diameter Ø	No. loose	No. filler	Cable nominal diameter Ø	Nominal weight	Max pulling force	Max crush	Impact
	(mm)			(mm)	(kg/km)	(N)	(N/dm)	(J)
12	1.9	1	5	15.0	210	7500	3000	20
24	1.9	2	4	15.0	210	7500	3000	20
36	1.9	3	3	15.0	210	7500	3000	20
48	1.9	4	2	15.0	210	7500	3000	20
60	1.9	5	1	15.0	210	7500	3000	20
72	1.9	6	0	15.0	210	7500	3000	20
96	1.9	8	0	16.0	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	19.0	360	7500	3000	20
288	1.9	24	0	21.0	480	7500	3000	20

MAIN FEATURES PE + ARAMIDIC YARNS + PE SHEATH

No. of fiber	Loose nominal diameter Ø	No. loose	No. filler	Cable nominal diameter Ø	Nominal weight	Max pulling force	Max crush	Impact
	(mm)			(mm)	(kg/km)	(N)	(N/dm)	(J)
12	1.9	1	5	13.0	120	7500	3000	20
24	1.9	2	4	13.0	120	7500	3000	20
36	1.9	3	3	13.0	120	7500	3000	20
48	1.9	4	2	13.0	120	7500	3000	20
60	1.9	5	1	13.0	120	7500	3000	20
72	1.9	6	0	13.0	120	7500	3000	20
96	1.9	8	0	14.0	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	17.0	230	7500	3000	20
288	1.9	24	0	19.0	290	7500	3000	20

TK- MTAS MULTITUBE ADSS

MAIN FEATURES PE + ARAMIDIC YARNS AND TAPES + PE SHEATH

No. of fiber	Loose nominal diameter Ø	No. loose	No. filler	Cable nominal diameter Ø	Nominal weight	Max pulling force	Max crush	Impact
	(mm)			(mm)	(kg/km)	(N)	(N/dm)	(J)
12	1.9	1	5	15.0	150	7500	3000	20
24	1.9	2	4	15.0	150	7500	3000	20
36	1.9	3	3	15.0	150	7500	3000	20
48	1.9	4	2	15.0	150	7500	3000	20
60	1.9	5	1	15.0	150	7500	3000	20
72	1.9	6	0	15.0	150	7500	3000	20
96	1.9	8	0	16.0	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	19.0	270	7500	3000	20
288	1.9	24	0	21.0	330	7500	3000	20

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

No. of fiber	Loose nominal diameter Ø	No. loose	No. filler	Cable nominal diameter Ø	Nominal weight	Max pulling force	Max crush	Impact
	(mm)			(mm)	(kg/km)	(N)	(N/dm)	(J)
12	1.9	1	5	15.0	170	7500	3000	20
24	1.9	2	4	15.0	170	7500	3000	20
36	1.9	3	3	15.0	170	7500	3000	20
48	1.9	4	2	15.0	170	7500	3000	20
60	1.9	5	1	15.0	170	7500	3000	20
72	1.9	6	0	15.0	170	7500	3000	20
96	1.9	8	0	16.0	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	19.0	310	7500	3000	20
288	1.9	24	0	21.0	380	7500	3000	20

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

	OM1	OM2	OM3	OM4
Core diameter	62,5 ± 2,5 µm	50 ± 2,5 µm	50 ± 2,5 µm	50 ± 2,5 µm
Core non-circularity	≤ 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
Coating diameter	242 ± 5 µm	242 ± 5 µm	242 ± 5 µm	242 ± 5 µm
Cladding non-circularity	≤ 0,7 %	≤ 0,7 %	≤ 0,7 %	≤ 0,7 %
Core/cladding concentricity error	≤ 1 µm	≤ 1 µm	≤ 1 µm	≤ 1 µm
Coating/cladding concentricity error	≤ 10 µm	≤ 6 µm	≤ 6 µm	≤ 6 µm
Numerical Aperture	0,275 ± 0,015	0,200 ± 0,015	0,200 ± 0,015	0,200 ± 0,015
Attenuation @ 850 nm	≤ 3,50 dB/km	≤ 2,80 dB/km	≤ 2,80 dB/km	≤ 2,80 dB/km
Attenuation @ 1300 nm	≤ 1,00 dB/km	≤ 0,80 dB/km	≤ 0,80 dB/km	≤ 0,80 dB/km
Overfilled Modal Bandwidth @ 850 nm	≥ 200 MHz*km	≥ 500 MHz*km	≥ 1500 MHz*km	≥ 3500 MHz*km
Overfilled Modal Bandwidth @ 1300 nm	≥ 500 MHz*km	≥ 500 MHz*km	≥ 500 MHz*km	≥ 500 MHz*km
Effective Modal Bandwidth (EMB)@ 850 nm			≥ 2000 MHz*km	≥ 4700 MHz*km
Fibre capacity 10GBASE-SR	33 m	83 m	300 m	550 m
Fibre capacity 1000BASE-SX	274 m	600 m	1000 m	1100 m
Fibre capacity 40GBASE-SR4/100GBASE-SR10			140 m	170 m
Proof test	≥ 0,7 GPa	≥ 0,7 GPa	≥ 0,7 GPa	≥ 0,7 GPa

CONTACT

HEADQUARTER
VOLPIANO
via Brandizzo, 243
10088 Volpiano (Turin) Italy
Tel. +39 011 9951997
Fax +39 011 9953062
www.tecnikabel.com

PRODUCTION PLANTS
VOLPIANO
via Brandizzo, 243
10088 Volpiano (Turin) Italy

ALMESE
via Rivera, 100
10040 Almese (Turin) Italy

COMMERCIAL OFFICES

TK ROME

TECNIKABEL ROME
via Casali delle Cornacchiole, 154
00178 ROMA - ITALY

TK MIDDLE EAST

TECNIKABEL M.E. JLT
3008 Mazaya Business Avenue
Jumeirah Lake Towers
DUBAI, UAE

TK ASIA-PACIFIC

TECNIKABEL ASIA PTE LTD
11 Tuas Cres
SINGAPORE 638705

TK DEUTSCHLAND

TK DEUTSCHLAND GmbH
Herdewerg 8
83623 Steingau, GERMANY

AGENT / DEALER

TecniKabel
SPECIAL ELECTRICAL AND OPTICAL CABLES
WWW.TECNIKABEL.COM