Prysmian Group

Railway Main Line Cables

BALTICS

PRYSMIAN
Draka

Prysmian Group

Linking the Future

As the worldwide leader in the cable industry, Prysmian Group believes in the effective, efficient and sustainable supply of energy and information as a primary driver in the development of communities.

With this in mind, we provide major global organisations in many industries with best-in-class cable solutions, based on state-of-the-art technology.

Through two renowned commercial brands - Prysmian and Draka - based in almost 50 countries, we're constantly close to our customers, enabling them to further develop the world's energy and telecoms infrastructures and achieve sustainable and profitable growth.

For our energy business, we design, produce, distribute and install cables and systems for the transmission and distribution of power at low, medium, high and extra-high voltage.

For telecoms, the Group is a leading manufacturer of all types of copper and fibre cables, systems and accessories for voice, video and data transmission.

Drawing on over 130 years' experience and continuously investing in R&D, we apply excellence, understanding and integrity to everything we do, meeting and exceeding the needs of our customers across all continents - while at the same time shaping the evolution of our industry.

What links global expertise to the wheels of industry?

High-performing cable solutions to keep the wheels of industry turning

On every continent, in applications that range from rolling stock and vehicles for high-speed trains and urban mass transit lines, to all types of rail transport infrastructure, Prysmian's specialist cable solutions sit at the heart of significant international projects - supporting the work of major customers, with high-performing, durable and safe technology.

As the world leader in cabling, we draw on global expertise and local presence to work in close proximity with our customers in order to deliver product and service solutions built on workability, customized solutions and effective supply chain, that help them drive the wheels of industry and achieve sustainable growth and profitability.

Railway Main Line Cables

History of the railways

When George Stephenson's steam locomotive "The Rocket" emerged as the winner of the Rainhill Race in 1829, with an average speed of 12.5 mph = 20 km/h, no one could predict the triumphant progress the railways would make in the almost 200 year period that followed. Within just a few decades, the railway developed into a broadly integrated transport system, which drastically reduced travel times, and made it possible to develop infrastructure - especially in the New World on the continent of North America. The triumph of the railways began with a 330 km railway line, as early as 1830. Over the next fifty years, the industry grew exponentially and reached almost 370,000 km. Nowadays, the railway infrastructure extends to more than 1.1 million km.

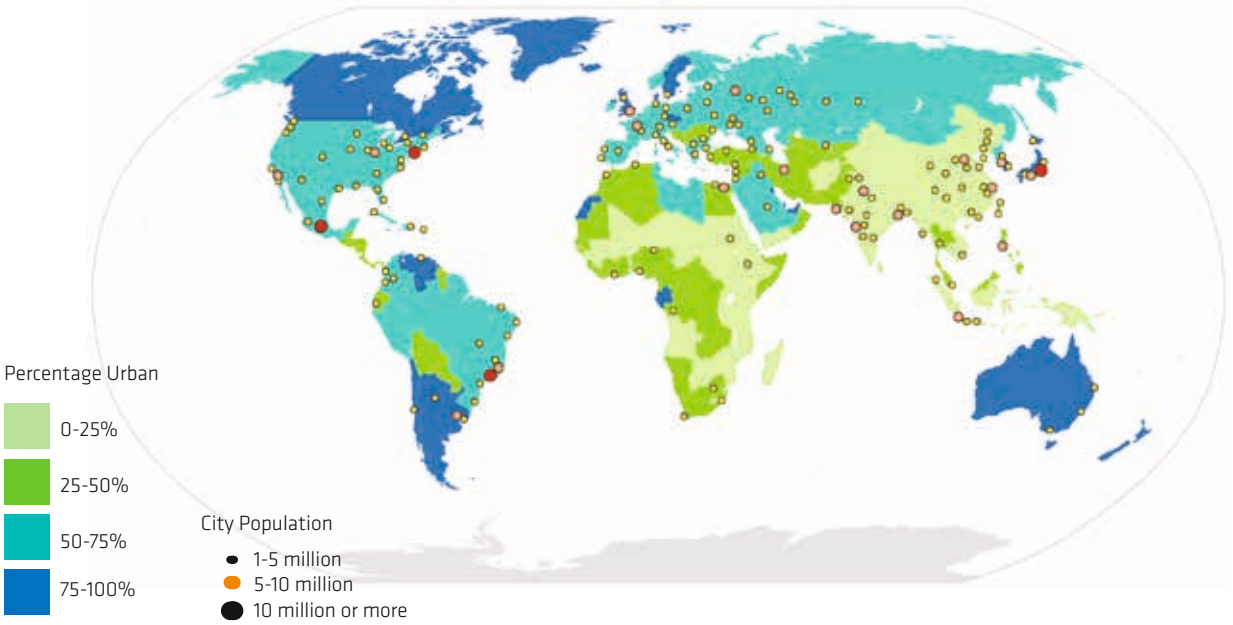
With the advent of civil aviation, the railway lost its role as the main means of transport for middle and long distances, and has long been regarded as outdated, slow and uncomfortable. But in recent years, the railway has experienced a revival. With the introduction of electronic interlocking technology and agreement on a European system for the management and control of railway transport - ERTMS (European Rail Traffic Management System), the rail transport once again plays an important role especially over medium distances. Thanks to a variety of European and other internationally operating system providers in the field of interlocking technology, the ERTMS system, which originated in Europe, has been experiencing an explosive worldwide acceptance over the past few years.

Urbanisation

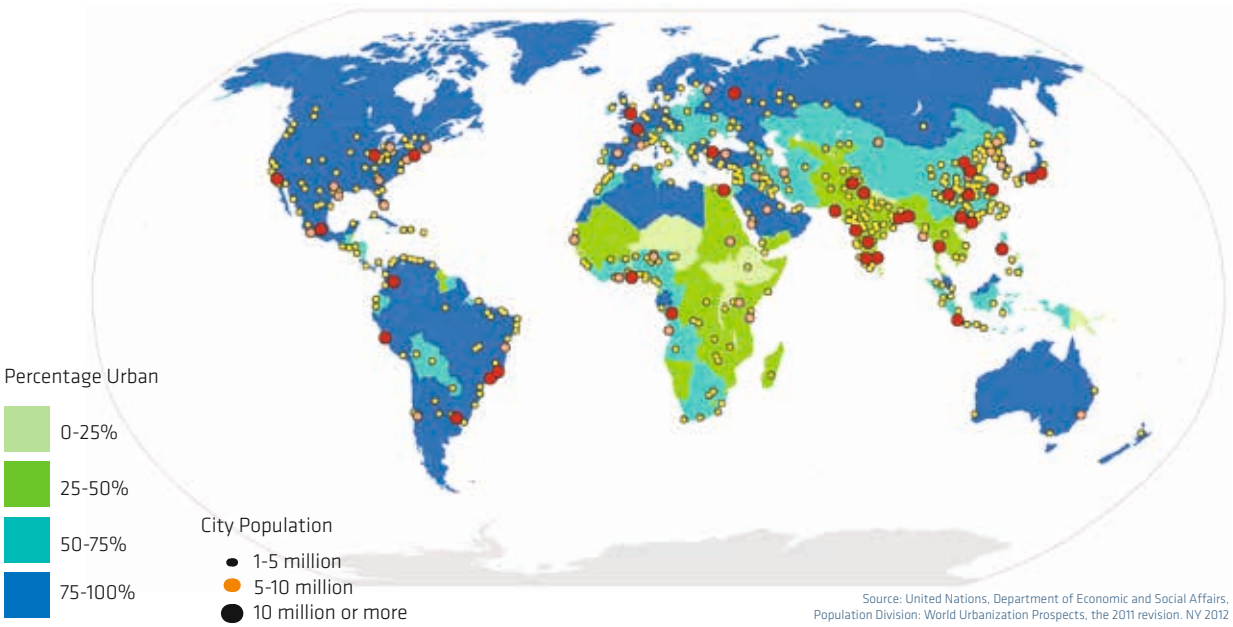
A major challenge for the railways as a means of mass transport, which is also an unparalleled opportunity, is represented by the increasing urbanisation of the world's population. In 2013, approximately 51% of the 7 billion people inhabiting the planet recided in an urban environment. By 2050, not only will the world's population have increased to approximately 9 billion people, but the proportion of people living in cities will have grown to about 70%. Thus, some 6.3 billion inhabitans will reside every day in large cities and be on the move. Car-bound private transport is destined to collapse and a change to rail-based transportation is therefore, without rival.

Tram and metro systems as well as regional trains and light rail vehicles will interconnect the cities into low-emission zones. Megacities are already in planning, such as the Chinese project "Turn The Pearl Delta Into One", in which nine cities with a total of 42 million people are to be merged into a single city. The most modern railway systems will form the backbone of this metropolis. A total of 29 lines with a network of altogether 1500 km will service the region and allow transit times of maximum one hour from one end of town to the other.

Percentage of urban population and agglomerations by size, class 1980



Percentage of urban population and agglomerations by size, class 2025



Source: United Nations, Department of Economic and Social Affairs, Population Division: World Urbanization Prospects, the 2011 revision. NY 2012

Development of technology

The safety requirements for the railway technology are extraordinary and similar to that in aviation or aerospace. With increasing traffic volume in both directions on single track lines, continuous monitoring which provides permanent communication between the train conductor's cab and the railway control center is essential for the railway line safety. The rail vehicles cannot leave their track in case of imminent collision by opposing traffic on the same track.

In Europe, there has been a number of train control technologies that worked well within the country borders, but, led to considerable additional costs in the cross-border traffic. Currently, locomotives have more than one train control system installed, which ensure safe participation in railway traffic in neighboring countries without the need to change the locomotive.

Research aimed at reducing the number of systems and develop a uniform operational management approach for railways across Europe already started in the 80's on behalf of the International Union of Railways (UIC) and the European Rail Research Institute (ERRI). In April 2000, the guidelines for adopting specifications were presented under the name ERTMS - European Rail Traffic Management System.

The ERTMS system mainly consists of the following components:

- ETCS (European Train Control System) is a train control system, which is intended to prevent a train entering an occupied sector, or running at too high speed, using interlocking electronic control systems, with integrated train and trackside elements.
- GSM-R (Global System for Mobile Communications - Railway) is a mobile communications system for railway data and voice communications between moving trains and fixed locations, designed to satisfy the highest safety standards.

ERTMS was initially developed for intercity trains on routes of Trans-European Networks (TEN), but is gaining worldwide attention and it is being implemented outside Europe as well.

Another well recognized railway technology is CBTC - Communication Based Train Control system. CBTC systems are commonly used for urban rail traffic such as underground railways, light rail vehicles and trams, in urban areas with short transportation systems.

Both ETCS and CBTC systems are based on the same principles , namely high safety level in highly dense traffic. However, CBTC goes one step further and offers fully automated train operation. The train starts and stops automatically without a driver.

Even though CBTC complies with international standards the systems of each individual developer are not freely replaceable. The implementation of CBTC is highly complex and significantly more expensive than ERTMS on comparable routes. However, CBTC is unbeatable when it comes to achieving the shortest possible intervals between trains, down to 60-90 seconds. During the peak morning and evening periods, thousands of commuters can be comfortably transported and hence the streets can be relieved of congestion.

Prysmian Group has accompanied this development from the outset and today is able to offer a full range of cables for all applications in the railway sector.

Prysmian Group has the experience and the know-how to assist you and your projects worldwide.

Railway projects are unique!

Railway Main Line Cables

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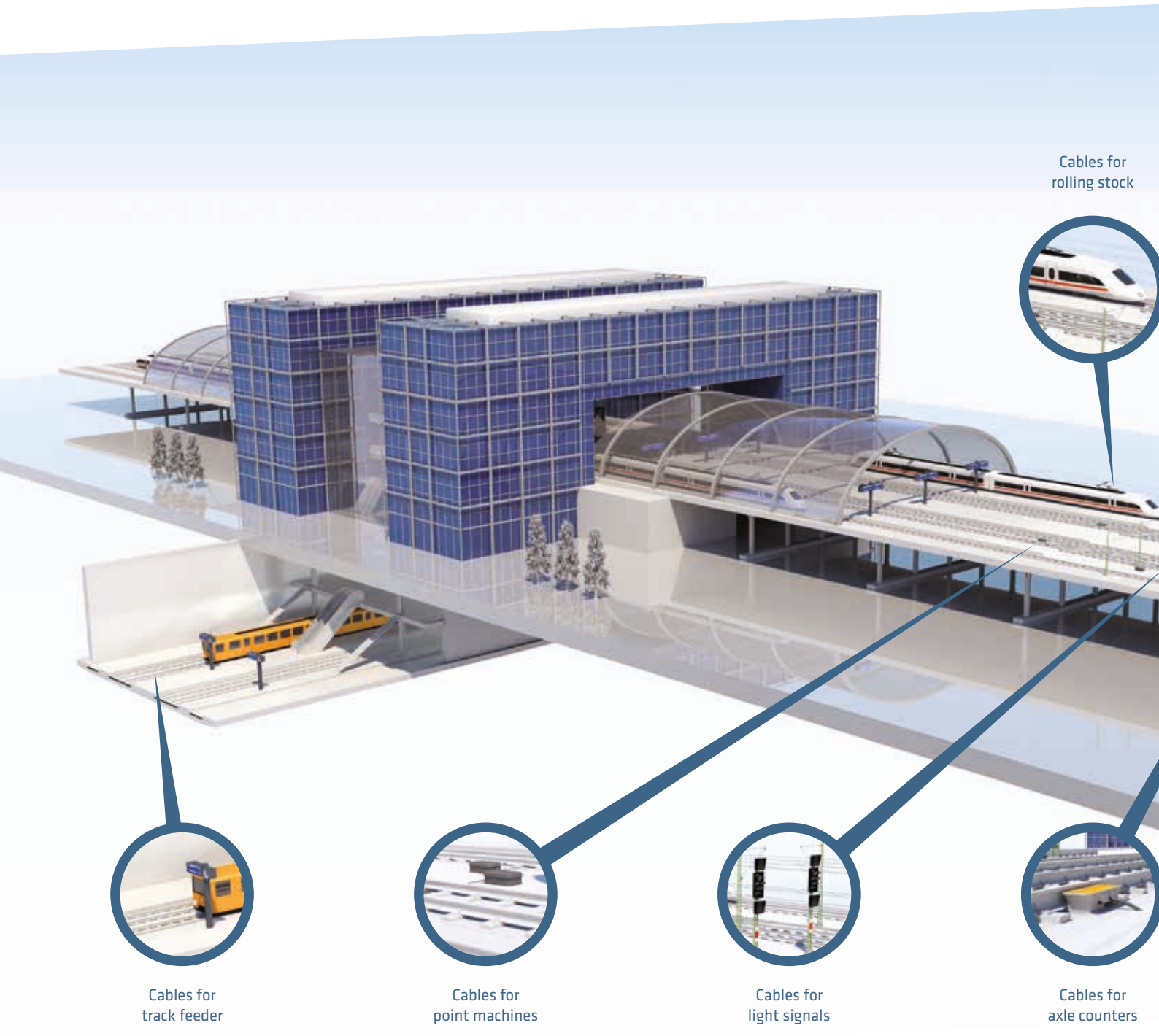
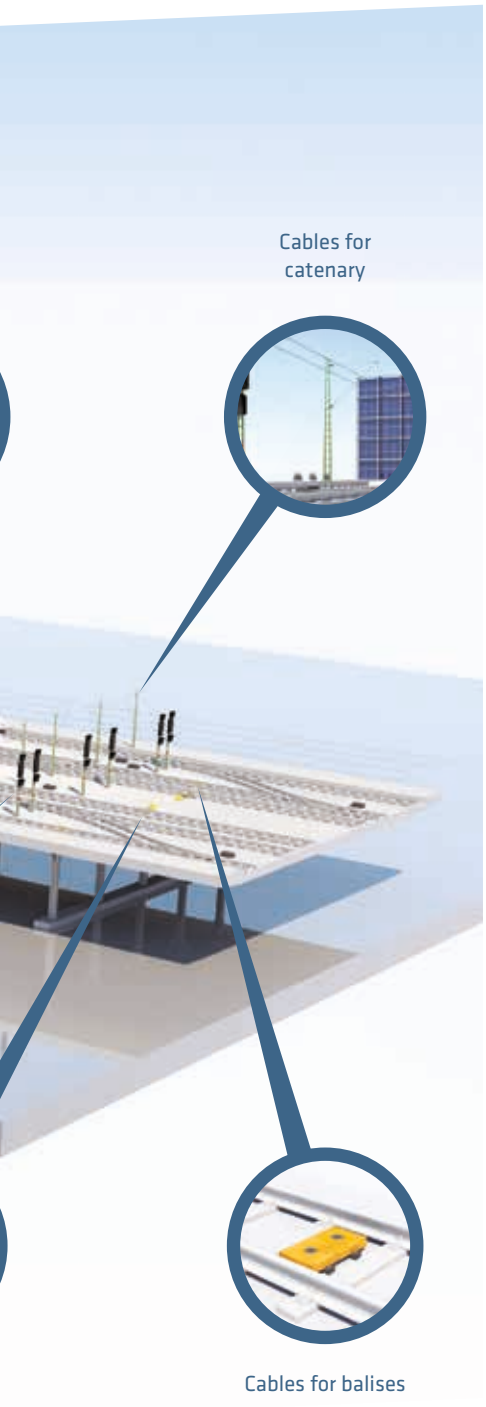
Railway Main Line Cables

Cables for any application





As the leading worldwide supplier, Prysmian Group offers an extensive range of cabling solutions for different railway network applications.

Typical cable applications for main railway lines include:

Substations and Transformers

- HV cables to substations for traction power
- MV cables to transformers for power distribution networks

Traction Tower Networks

- MV cables for AC systems
- MV and LV cables for DC systems

Railway Network Systems

- MV and LV cables to distribute current to control and telecommunication systems, lighting, heating and real estate along the railway.

Grounding of Electrical Systems

- Bare conductors or insulated cables to guarantee the integrity of electrical systems.

Overheard Catenary Lines

- Cables to supply electric power to railway trains and to make them move.

Control and Signalling Systems

- Cables to cover a wide range of control and signalling applications to direct trains and keep trains clear of each other.

Mobile Communication Systems (GSM-R)

- Data and fiber optic cables for railway data and voice communication between moving trains and fixed locations.

Railway Main Line Cables

Wikipidia - RVR train in Riga - Altonavas Iela

Explanation of symbols

Conductor temperature
Max. conductor temperature °C in continuous operation.

Flexible installation
Due to IEC 60228 class 5 multi-standed conductor.

Smoke density
Smoke propagation acc. to EN/IEC 61034.

Halogen free
Halogen free acc. to EN/IEC 60754-1 and EN/IEC 50267-1.

Acidity
Corrosivity acc. to EN/IEC 60754-2.

Fire retardant
Flame propagation acc. to EN/IEC 60332-1.
Bundled and vertical acc. to EN/IEC 60332-3.

Screened or armoured
With either copper, aluminum or steel wire, foil and tape.

Fire resistant
Fire resistant acc. to EN/IEC 60331-1 & 2.

UV resistant
Filling and or outer sheath suitable for outdoor application.

EMC resistant
Fulfills EMC-directive with 100% dense screen with low coupling impedance.

Impact resistant
Against shocks.

Pull resistant
High tensile stress required to create cable failure.

Weather proof

Watertight or proof
Axial and radial water blocking via water swellable tape or yarn.

Index of data sheets

Index of datasheets

Many more cable types and tailor-made cables are available for your individual application.


Litrail.lt
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TRACTION POWER NETWORK

AXLJ-TTCL (TSLF) 36 kV

SCREENED & WATER PROOF

Application
Single core distribution cable suitable for installation outdoors in soil, air and water. Outer sheath of semi-conductive material enables electrical testing of the sheath and detection of sheath damage. For indoor installation the cables must be painted with fire retardant paint or laid in a duct.

Technical data
Rated voltage:
- 18/30 (36) kV

Test voltage:
- Max 170 kV

Bending radius:
- During installation: 15 x D
- Fixed: 10 x D
- Ploughed down: 8 x D

Temperature range
- Max. conductor temperature: +90°C
- Short circuit temperature: +250°C
- Lowest temp. at installation: -20°C
- Below 0°C exercise caution

Standard & Directive
- SS 424 14 16
- HD 620 part 10, section K and M

Construction
Conductor:
- Round alumimium wires
- Compacted and stranded
- Acc. to IEC 60228 class 2.
- Longitudinal watertight

Conductor screen:
- Extruded semi-conductive

Insulation:
- XLPE, min. thickness 7.1 mm

Insulation screen:
- Extruded, bonded

Longitudinal water blocking:
- Semi-conductive water swelling tape

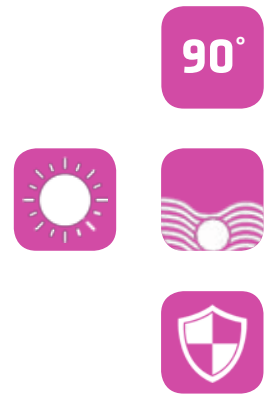
Screen:
- Concentrically applied
- Annealed copper wires
- Aluminium tape - 100% coverage

Radial water blocking:
- Aluminium-PE laminate, fixed
- Bonded to sheath

Rip cord:
- Kevlar

Outer sheath:
- PE, transparent
- UV resistant

Conductive layer:
- Semi-conductive
- Double extruded
- Black



Content is subject to changes acc. to current product development and or any changes to standards.

Conductor cross-section mm²	Outer diameter mm	Weight kg/km	Max. short circuit current on conductor at 90°C - kA	Standard length m	Prysmian article no.
1 x 50/25	33.0	970	4.7	500 - K14	20114470
1 x 70/25	34.5	1,080	6.6	500 - K14	20114471
1 x 95/25	36.5	1,210	8.9	500 - K16	20102188
1 x 120/35	37.5	1,390	11.3	500 - K16	20114472
1 x 150/35	39.5	1,545	14.2	500 - K18	20114473
1 x 185/35	41.0	1,700	17.5	500 - K18	20102189
1 x 240/35	43.5	1,910	22.7	500 - K18	20114474
1 x 300/35	46.0	2,215	28.3	500 - K20	20102190
1 x 400/35	49.5	2,545	37.8	500 - K20	20102191
1 x 500/35	52.5	2,920	47.2	500 - K22	20102192
1 x 630/50	57.0	3,630	59.5	500 - K22	20114469
1 x 800/50	60,5	4,230	75.6	500 - K24	20114475
1 x 1000/50	69.5	5,385	94.5	500 - K26	80160229

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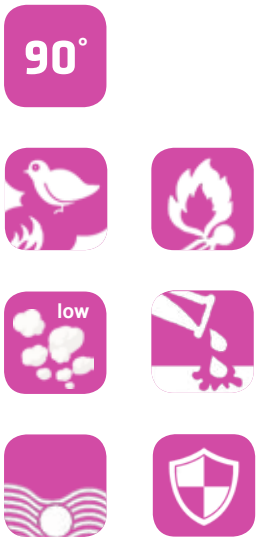
TRACTION POWER NETWORK

AXQJ-TT (TSLI) 36 kV

FLAME RETARDANT & WATER PROOF



Application

Halogen free and flame retardant distribution cable for indoor use in 3-phase installations. Can be placed in pipes or directly in the ground. The cable is radially and axial waterproof.

Technical data

Rated voltage:
- 18/30 (36) kV AC

Test voltage:
- 125 kV AC

Bending radius:
- During installation: 15 x D
- Fixed: 10 x D

Temperature range
- Max. conductor temperature: +90°C
- Short circuit temperature: +250°C
- Lowest temp. at installation: -20°C
- Below 0°C exercise caution

Standard & Directive & Approval

Standard:
- HD 620 part 10 section K and M
- HD 604 halogen free sheath

Directive:
- Fulfills RoHS and REACH

Approval:
- CPR class: Dca-s2d2a2

Construction

Conductor:
- Round aluminium wires
- Compacted and stranded
- Acc. to IEC 60228 class 2.
- Longitudinal watertight

Conductor screen:
- Extruded semi-conductive

Insulation:
- XLPE, min. thickness 7.1 mm

Insulation screen:
- Extruded
- Bonded

Longitudinal water blocking:
- Semi-conductive water swelling tape

Screen:
- Concentrically applied
- Annealed copper wires

Radial water blocking:
- Aluminium/PD laminate, fixed

Outer sheath:
- Halogen free polymer
- Fire retardant
- Black

Material property
- Flame retardant: EN 60332-3-24
- Halogen free: IEC 60754-1
- Acidity: EN 60754-2
- Smoke denisty: EN 60134

Content is subject to changes acc. to current product development and or any changes to standards.

Conductor cross-section mm²	Diameter over insulation mm	Outer diameter mm	Weight kg/km	Standard length m	Prysmian article no.
1 x 50/16	24.3	32.5	1,061	1000 - K18	1060224
1 x 70/16	25.9	34.0	1,176	1000 - K20	1060225
1 x 95/25	27.6	36.0	1,318	1000 - K20	1060226
1 x 120/25	28.9	37.5	1,506	1000 - K20	1060227
1 x 150/25	30.5	39.0	1,670	1000 - K22	1060229
1 x 185/35	32.2	40.5	1,830	1000 - K22	1060230
1 x 240/35	34.4	43.0	2,059	1000 - K24	1060231
1 x 300/35	36.9	46.0	2,379	1000 - K24	1060232
1 x 400/35	40.1	49.5	2,737	1000 - K24	1060233
1 x 500/35	43.0	52.5	3,135	1000 - K26	1060234
1 x 630/50	46.9	56.5	3,872	1000 - K26	1060235
1 x 800/50	50.4	60.5	4,510	1000 - K26	1060236

TRACTION POWER NETWORK

AHXCMK 52 kV

SCREENED DISTRUBUTION CABLE

90°

Application

Single core distribution cable for outdoor installation in pipes, directly in the ground or for ploughing down.

Technical data

Rated voltage:

- 26/45 (52) kV

Phase induction:

- In trefoil: 0.37 mH/km
- Flat: 0.56 mH/km

Operating capacitance:

- 0.22 µF/km

Thermal short-circuit current:

- For phase conductor: max. 28.3 kA
- For metallic screen: max. 6.9 kA

Bending radius:

- Min. 0.76 m

Temperature range

- Max. conductor temperature: +90°C
- Short circuit temperature: +250°C

Standard

- IEC 60840
- IEC 60228

Construction

Conductor:

- Round aluminium wires
- Compacted and stranded
- Nom. diameter 20.3 mm
- DC resistance at 20°C max. 0.1 Ω/km

Conductor screen:

- Semi-conductive copolymer compound

Insulation:

- XLPE compound
- Nom. thickness 9.0 mm

Insulation screen::

- Semi-conductive copolymer compound

Wrapping:

- Semi-conductive creped paper tape

Screen:

- Helix of copper wires
- Counter helix of copper contact tape

Binder tape:

- PA tape

Outer sheath:

- HDPE compound
- Black

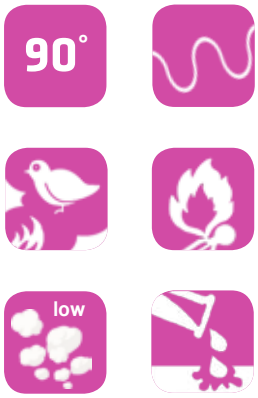
Content is subject to changes acc. to current product development and or any changes to standards.

Conductor cross-section mm²	Outer diameter mm	Weight kg/km	Standard length m	Prysmian article no.
1 x 300/50	51	2,640	500	20022766

RAILWAY NETWORK SYSTEM

ACEFLEX PURE 0.6/1 kV

FLEXIBLE & HALOGEN FREE - CPR CLASS D



Application

Halogen free and low smoke installation cable with high flexibility and low bending radius. Suitable for installation in machines and factories either in cable pipes, trays or cabinets. The insulation is not UV resistant and must be protected against sun and artificial light.

Technical data

Rated voltage:
- 0.6/1 kV

Test voltage:
- 3,500 kV

Bending radius:
- 5 x D

Temperature range

- Max. conductor temperature: +90°C
- Short circuit temperature: +250°C
- Lowest temp. at installation: -20°C

Standard & Directive & Approval

Standard:
- Cenelec UNE 21123-4
- IEC 60502-1, EN 50575

Directive:
- Fulfills LVD, RoHS & REACH

Approval:
- CPR class: Dca, s2d2a2

Construction

Conductor:
- Round copper wires
- Multi-stranded
- Acc. to IEC 60228 class 5.

Insulation:
- XLPE

Core colouring:
- 3-core: Green/yellow, blue, brown
- 4-core: Green/yellow, brown, black, grey

Outer sheath:
- Halogen free polymer
- Black

Material property

- Flame retardant: IEC 60332-3-24 cat. 3
- Halogen free: IEC 60754-1
- Acidity: IEC 60754-2
- Smoke density: IEC 61034

Content is subject to changes acc. to current product development and or any changes to standards.

Conductor cross-section mm²	Outer diameter mm	Weight kg/km	Standard length m	Prysmian article no.
3 G 1.5	9.1	121	500	20217172
3 G 2.5	10	161	500	20217122
5 G 1.5	10.7	170	1000	20217189
5 G 2.5	11.9	230	500	20217125
5 G 6	14.8	444	500	20217126
5 G 10	17.4	662	500	20217123
5 G 16	20.1	958	500	20217124

RAILWAY NETWORK SYSTEM

AXPK-PLUS 0.6/1 kV

XLPE INSULATED & HALOGEN FREE - CPR CLASS E

Application

Halogen free and flame retardant power cable for fixed installation indoors in buildings or outdoors directly in the ground or ploughed down. Not suitable for installations with severe electrical interference.

Technical data

Rated voltage:
- 0,6/1 (1.2) kV

Test voltage:
- 4,000 V AC

Bending radius:
- During installation: 12 x D
- Fixed: 8 x D

Pulling force:
- With grip: max. 15 N/mm²
- With eye: max. 50 N/mm²

Temperature range

- Max. conductor temperature: +90°C
- Short circuit temperature: +250°C
- Lowest temp. at installation: -20°C
- Below 0°C exercise caution

Standard & Directive & Approval

Standard:
- SFS 4879
- IEC 60502-1

Directive:
- Fulfills RoHS and REACH

Approval:
- CPR class: Eca

Construction

Conductor:
- Round aluminium wires
- Stranded and annealed
- 25 mm²: Compacted
- 35-300 mm²: Compacted and sector shaped

Insulation:
- XLPE compound
- Halogen free

Core colours:
- 4-core: yellow/green, brown, black, grey

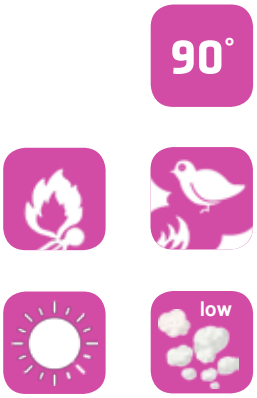
Wrapping:
- Plastic tape

Rip cord:
- Kevlar

Outer sheath:
- PE compound
- Halogen free
- UV resistant
- Black

Material property

- Halogen free: IEC 60754
- Flame retardant: IEC 60332-1-2
- Smoke density: EN 60134



Content is subject to changes acc. to current product development and or any changes to standards.

Conductor cross-section mm²	Outer diameter mm	Weight kg/km	Current rating at 90°C in free air A	Standard length m	Prysmian article no.
4 G 16	18.79	350	75	2000	20097601
4 G 25	22.5	500	105	1500	20076250
4 G 35	22.54	630	130	500	20076251
4 G 50	26.09	820	165	1000	20076252
4 G 70	29.90	1,130	205	500	20076253
4 G 95	33.56	1,450	245	1000	20076254
4 G 120	37.40	1,850	280	500	20076245
4 G 150	41.38	2,250	320	1000	20076256
4 G 185	46.38	2,800	365	500	20076257
4 G 240	52.08	3,600	430	500	20076258
4 G 300	57.95	4,500	480	500	20076259

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RAILWAY NETWORK SYSTEM

MCMK 0.6/1 kV

PVC INSULATED & SCREENED - CPR CLASS E

70°

Application

Halogen free, flame retardant and screened power cable for fixed installation indoors in buildings or outdoors directly in the ground, water or ploughed down. Also suitable for swtichgear and explosive areas. Not suitable for installations with severe electrical interference.

Technical data

- Rated voltage: 0,6/1 (1.2) kV
- Test voltage: 4,000 V AC
- Bending radius: during installation 12 x D
- Bending radius: fixed 8 x D

Temperature range

- Max. conductor temperature: +70°C
- Short circuit temperature: +160°C
- Lowest temp. at installation: -15°C
- Below 0°C exercise caution

Standard & Directive & Approval

Standard:

- SFS 4880
- HD 603-3F
- IEC 60502-1

Directive:

- Fulfills RoHS and REACH

Approval:

- CPR class: Eca

Construction

Conductor:

- Round copper wires
- Annealed
- 1.5-6 mm^2: solid
- 10-16 mm^2: stranded

Insulation:

- PVC compound
- Lead free

Core colours:

- 2-core: blue, brown
- 3-core: blue, brown, black
- 4-core: blue, brown, black, grey

Filler:

- Lead free compound

Screen:

- Helix of copper wires
- Counter helix of copper tape

Outer sheath:

- PVC compound
- Lead free
- Black

Material property

- Flame retardant: IEC 60332-1 & 3

Content is subject to changes acc. to current product development and or any changes to standards.

Conductor cross-section mm^2	Outer diameter mm	Weight kg/km	Current rating at 70°C in free air A	Standard length m	Prysmian article no.
2 x 1.5/1.5	12	170	15	1000 - K8	0602122
2 x 2.5/2.5	13	220	20	1000 - K8	0602123
2 x 6/6	17	400	34	500 - K8	0602125
2 x 10/10	20	610	67	500 - K9	0602126
3 x 1.5/1.5	12	190	14	1000 - K8	0602152
3 x 2.5/2.5	13	250	19	1000 - K8	0602153
3 x 6/6	17	470	31	500 - K5	0602155
3 x 10/10	20	710	63	500 - K9	0602156
3 x 16/16	23	1000	85	500 - K11	0602157
4 x 1.5/1.5	13	220	14	1000 - K8	0602172
4 x 2.5/2.5	14	290	19	1000 - K9	0602143
4 x 6/6	19	550	31	500 - K8	0602145
4 x 10/10	22	840	63	500 - K11	0602146
4 x 16/16	25	1,200	85	500 - K11	0602147

RAILWAY NETWORK SYSTEM

MCMK-HF C-PRO 0.6/1 kV

HALOGEN FREE & SCREENED - CPR CLASS C

Application

Halogen free, flame retardant and screened power cable for fixed installation indoors in buildings or outdoors directly in the ground, water or ploughed down. Also suitable for swtichgear and explosive areas. Not suitable for installations with severe electrical interference.

Technical data

- Rated voltage: 0,6/1 (1.2) kV
- Test voltage: 4,000 V AC
- Bending radius: fixed 8 x D
- Bending radius: during installation 12 x D
- Bending radius: ploughed down 8 x D

Temperature range

- Max. conductor temperature: +90°C
- Short circuit temperature: +250°C
- Lowest temp. at installation: -15°C
- Below 0°C exercise caution

Standard & Directive & Approval

Standard:

- SFS 5546
- EN 50575:2014 +A1:2016
- IEC 60502-1
- EN 13501-6

Directive:

- Fulfills RoHS and REACH

Approval:

- CPR class: Cca-s1,d1,a1

Construction

Conductor:

- Round copper wires
- Annealed and stranded
- 25-35 mm²: Round
- 50-300 mm²: Compacted and sector shaped

Insulation:

- XLPE
- UV resistant

Core colours:

- 4-core: brown, black, grey, blue

Filler:

- Halogen free, extruded

Screen:

- Helix of copper wires
- Counter helix of copper tape

Outer sheath:

- Polymer
- Halogen free
- Black

Material property

- Halogen free: IEC 60754
- Flame retardant: IEC 60332-1-2
- Flame retardant: IEC 60332-3
- Smoke density: EN 60134

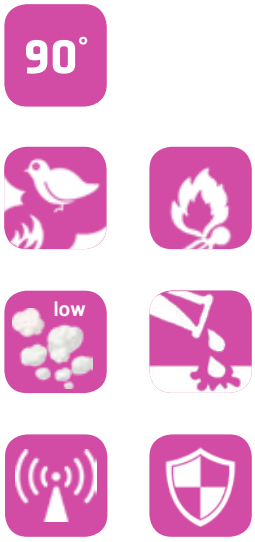
Content is subject to changes acc. to current product development and or any changes to standards.

Conductor cross-section mm²	Outer diameter mm	Weight kg/km	Current rating at 90°C in free air A	Standard length m	Prysmian article no.
4 x 25/16	24	1,400	135	500 - K11	0602021
4 x 35/16	26	1,800	165	500 - K12	0602023
4 x 50/25	29	2,400	200	500 - K12	0602024
4 x 70/35	33	3,300	250	500 - K14	0602025
4 x 95/50	38	4,500	310	500 - K16	0602026
4 x 120/70	42	5,700	360	500 - K20	0602016
4 x 150/70	47	6,850	410	500 - K20	0602017
4 x 185/95	52	8,650	470	500 - K24	0602018
4 x 240/120	57	11,500	560	500 - K24	0602020
4 x 300/150	63	13,900	640	500 - K26	0602022

RAILWAY NETWORK SYSTEM

AXQJ-EMC PURE 0.6/1 kV

HALOGEN FREE & EMC SCREENED - CPR CLASS D



Application

EMC shielded power cable with aluminum conductor. Halogen free, flame retardant and self-extinguishing in case of fire. For fixed installation indoors and outdoors, in pipes, soil or water. Also for explosive environments. Can be ploughed down with caution. The copper screen has 100% coverage with low coupling impedance that fulfills the EMC-Directive when properly installed.

Technical data

Rated voltage:
- 0.6/1 kV

Test voltage:
- 4,000 kV

Bending radius:
- During installation: 12 x D
- Fixed: 8 x D
- Ploughed down: 8 x D

Temperature range

- Max. conductor temperature: +90°C
- Short circuit temperature: +250°C
- Lowest temp. at installation: -20°C

Standard & Directive & Approval

Standard:
- Cenelec HD 604-5D

Directive:
- Fulfills RoHS & REACH

Approval:
- CPR class: Dca, s2d2a2

Construction

Conductor:
- Round annealed aluminium wires
- 25 mm^2: round.
- 50-240 mm^2: stranded, compacted and sector shaped

Insulation:
- XLPE

Core colouring:
- 3-core: brown, black, grey
- 4-core: brown, black, grey, blue

Wrapping:
- Tape
- Halogen free

Screen:
- Copper foil with overlap - 100% coverage
- Counter helix of copper wires

Outer sheath:
- Halogen free compound
- Black

Material property

- Flame retardant: IEC 60332
- Halogen free: IEC 60754-1
- Acidity: IEC 60754-2
- Smoke density: IEC 61034

Content is subject to changes acc. to current product development and or any changes to standards.

Conductor cross-section mm^2	Outer. diameter mm	Weight kg/km	Standard length m	Drum size	Prysmian article no.
3 x 25/10	23.0	550	500	K11	
3 x 50/15	26.0	855	500	K11	0022910
3 x 95/29	32.5	1,530	500	K14	0022930
3 x 150/41	39.5	2,225	500	K18	0022950
3 x 240/72	49.5	3,455	500	K20	0022970
4 x 25/10	25.0	670	500	K11	
4 x 50/15	28.5	1,020	500	K12	0023010
4 x 95/29	37.0	1,880	500	K16	0023030
4 x 150/41	43.5	2,705	500	K20	0023050
4 x 240/72	54.5	4,270	400	K20	0023070

RAILWAY NETWORK SYSTEM

FXQJ-EMC PURE 0.6/1 kV

HALOGEN FREE & EMC SCREENED - CPR CLASS C & D

Application

EMC shielded power cable with copper conductor. Halogen free, flame retardant and self-extinguishing in case of fire. Applicable as power cable for fixed installation indoors and outdoors, in pipes, ground or water as well as in switchgear and explosive environments. Can with caution be ploughed down.

Technical data

- Rated voltage: 0,6/1 kV
- Test voltage: 4,000 V

Bending radius:

- Fixed installation 8 x D
- During installation 12 x D
- Ploughed down: 8 x D

Temperature area

- Max. conductor temperature: +90°C
- Short circuit temperature: +250°C
- Lowest temp. at installation: -20°C
- Below 0°C exercise caution

Standard & Direktive & Approval

Standard:

- Cenelec HD 604-5D

Direktive:

- Fulfills RoHS & REACH

Approval:

- CPR: Cca-s1d1a1 ≤ 16 mm²
- CPR: Dca-s2d2a2 ≥ 25 mm²

Construction

Conductor:

- Round copper wires
- 1.5-35 mm²: round
- 50-240 mm²: stranded, compacted and sector shaped

Insulation:

- XLPE

Core colouring:

- 3-core: brown, black, grey
- 4-core: brown, black, grey, blue

Wrapping:

- Halogen free tape

Screen:

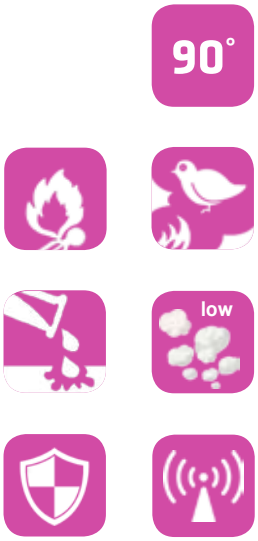
- Copper foil with overlap - 100% coverage
- Counter helix of copper wires

Outer sheath:

- Halogen free compound
- Black

Material characteristics

- Flame retardant: IEC 6332-1 & 3
- Halogen free: IEC 60754-1
- Smoke density: IEC 61034-1,-2
- Acidity: IEC 60754-2



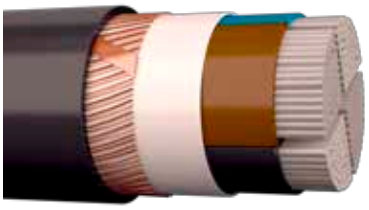
Conductor cross section mm²	Outer diameter mm	Weight Kg/km	Standard delivery m	Drum size	Prysmian EAN no.
3 x 4/4	14.8	340	500	K8	0058740
3 x 6/6	15.9	435	500	K8	0058750
3 x 10/10	18.4	945	500	K11	0058760
3 x 16/16	21.0	930	1000	K14	0058770
3 x 25/16	23.2	1063	500	K11	0058780
3 x 35/16	25.4	1337	500	K11	0058790
3 x 50/25	25.5	1795	500	K11	0058800
3 x 70/35	29.0	2477	500	K12	0058810
3 x 95/50	32.8	3386	500	K14	0058820
3 x 120/70	36.2	4258	500	K16	0058830
3 x 150/70	39.2	512	500	K18	0058840
3 x 185/95	45.3	6463	500	K20	0058850
3 x 240/120	49.9	8387	500	K22	0058860

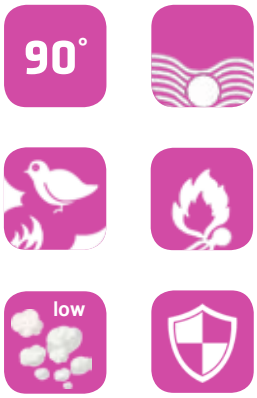
Prysmian Group

RAILWAY NETWORK SYSTEM

AXCMK-PLUS 0.6/1 kV

HALOGEN FREE & SCREENED - CPR CLASS E





Application

Halogen free and screened power cable for fixed installation indoors in buildings or outdoors directly in the ground or ploughed down. Can also temporary be installed in water. Not suitable for installations with severe electrical interference.

Technical data

Rated voltage:
- 0,6/1 (1.2) kV

Test voltage:
- 4,000 V AC

Bending radius:
- During installation 12 x D
- Fixed 8 x D

Temperature range

- Max. conductor temperature: +90°C
- Short circuit temperature: +250°C
- Lowest temp. at installation: -20°C
- Below 0°C exercise caution

Standard & Directive & Approval

- Standard: SFS 4879, IEC 60502-1
- Standard: HD 603-5D, IEC 60502-1
- Directive: Fulfills RoHS and REACH
- Approval: CPR class: Eca

Construction

Conductor:
- Round aluminium wires
- Annealed and stranded
- Compacted
- 25 mm²: Round
- 50-185 mm²: Sector shaped

Insulation:
- XLPE compound

Core colours:
- 4-core: blue, brown, black, grey

Wrapping:
- Plastic tape

Screen:
- Helix of copper wires
- Counter helix of copper tape

Outer sheath:
- Halogen free compound
- Flame retardant
- Black

Material property

- Halogen free: IEC 60754
- Flame retardant: IEC 60332-1
- Smoke density: EN 60134

Content is subject to changes acc. to current product development and or any changes to standards.

Conductor cross-section mm²	Outer diameter mm	Weight kg/km	Standard length m	Prysmian article no.
4 x 25/16	26	720	1000	0621800
4 x 50/16	29	1,100	1000	0621802
4 x 95/29	38	1,900	1000	0621804
4 x 150/41	47	2,900	1000	0621806
4 x 185/57	52	3,600	1000	0621807

Conductor cross-section mm²	Bending radius - fixed min. mm	DC resistance of PE-conductor at 20°C max. Ω/km	Current rating at 90°C in free air A	Short circuit current - conductor kA
4 x 25/16	0.22	1.15	105	2.3
4 x 50/16	0.23	1.15	165	4.7
4 x 95/29	0.30	0.641	245	8.9
4 x 150/41	0.37	0.443	320	14.1
4 x 185/57	0.42	0.320	365	17.4

RAILWAY NETWORK SYSTEM

AXCMK-HF C-PRO 0.6/1 kV

HALOGEN FREE & SCREENED - CPR CLASS C

Application

Halogen free and screened power cable for fixed installation indoors in buildings or out-doors directly in the ground or ploughed down. Can also temporary be installed in water. Not suitable for installations with severe electrical interference.

Technical data

Rated voltage:
- 0,6/1 (1.2) kV

Test voltage:
- 4,000 V AC

Bending radius:
- During installation 12 x D
- Fixed 8 x D

Temperature range

- Max. conductor temperature: +90°C
- Short circuit temperature: +250°C
- Lowest temp. at installation: -15°C
- Below 0°C exercise caution

Standard & Directive & Approval

Standard:
- SFS 5546
- EN 50575:2014 +A1:2016
- IEC 60502-1

Directive:
- Fulfills RoHS and REACH

Approval:
- CPR class: Cca-s1d1a1

Construction

Conductor:
- Round aluminium wires
- Annealed and stranded
- Compacted
- 25 mm²: Round
- 50 - 185 mm²: Sector shaped

Insulation:
- XLPE compound
- UV resistant

Core colours:
- 4-core: blue, brown, black, grey

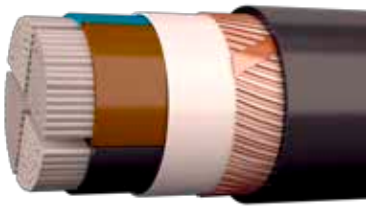
Wrapping:
- Plastic tape

Screen:
- Helix of copper wires
- Counter helix of copper tape

Outer sheath:
- Halogen free compound
- Flame retardant
- Black

Material property

- Halogen free: IEC 60754-1
- Flame retardant: IEC 60332-1 & 3
- Smoke density: EN 60134



Content is subject to changes acc. to current product development and or any changes to standards.

Conductor cross-section mm²	Outer diameter mm	Weight kg/km	Current rating at 90°C in free air A	Standard length m	Prysmian article no.
4 x 35/16	26	900	130	500 - K12	0601990
4 x 50/16	29	1,200	165	500 - K12	0601991
4 x 70/21	33	1,550	205	500 - K14	0601992
4 x 95/29	38	2,050	245	500 - K16	0601993
4 x 120/41	41	2,500	280	500 - K20	0601984
4 x 150/41	47	3,000	320	500 - K20	0601986
4 x 185/57	52	3,800	365	500 - K22	0601987
4 x 240/72	57	4,850	430	500 - K24	0601988
4 x 300/88	63	5,900	480	500 - K24	0601989

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RAILWAY NETWORK SYSTEM

AMCMK 0.6/1 kV

PVC INSULATED & SCREENED - CPR CLASS E

70°

Application

Halogen free, flame retardant and screened power cable for fixed installation indoors in buildings or outdoors directly in the ground, water or ploughed down. Also suitable for swtichgear and explosive areas. Not suitable for installations with severe electrical interference.

Technical data

- Rated voltage: 0,6/1 (1.2) kV
- Test voltage: 4,000 V AC
- Bending radius: during installation 12 x D
- Bending radius: fixed 8 x D

Temperature range

- Max. conductor temperature: +70°C
- Short circuit temperature: +160°C
- Lowest temp. at installation: -15°C
- Below 0°C exercise caution

Standard & Directive & Approval

Standard:

- SFS 4880
- HD 603-3F
- IEC 60502-1

Directive:

- Fulfills RoHS and REACH

Approval:

- CPR class: Eca

Construction

Conductor:

- Round aluminium wires
- 16 mm^2: solid
- 25 mm^2: Annealed, stranded and compacted
- 35-300 mm^2: Annealed, stranded, compacted and sector shaped

Insulation:

- PVC compound
- Lead free

Core colours:

- 3-core: brown, black, grey
- 4-core: blue, brown, black, grey

Filler:

- Lead free compound

Screen:

- Helix of copper wires
- Counter helix of copper tape

Outer sheath:

- PVC compound
- Lead free
- Black

Material property

- Flame retardant: IEC 60332-1 & 3

Content is subject to changes acc. to current product development and or any changes to standards.

Conductor cross-section mm^2	Outer diameter mm	Weight kg/km	Current rating at 70°C in free air A	Standard length m	Prysmian article no.
3 x 16/10	20	460	64	1000 - K12	0622157
3 x 25/16	24	680	83	1000 - K14	0622158
3 x 50/16	27	975	125	500 - K12	0622160
3 x 95/29	35	1,750	190	500 - K14	0622162
3 x 150/41	42	2,550	250	500 - K18	0622164
3 x 185/57	46	3,200	285	500 - K20	0622165
3 x 240/72	52	4,050	330	500 - K22	0622166
3 x 300/88	48	5,000	380	500 - K24	0622167
4 x 16/10	22	550	64	1000 - K14	0621854
4 x 25/16	27	820	83	1000 - K16	0621855
4 x 50/16	31	1,250	125	500 - K14	0621860
4 x 95/29	40	2,200	190	500 - K18	0621862
4 x 150/41	48	3,150	250	500 - K20	0621864
4 x 240/72	59	5,050	330	500 - K24	0621866
4 x 300/88	66	6,300	380	500 - K24	0621867

RAILWAY NETWORK SYSTEM

AXCK 0.6/1 kV

SCREENED & PVC INSULATION

Application

Single core screened and PVC insulated power cable for fixed installation indoors or outdoors directly in the ground or ploughed down.

Technical data

Rated voltage:
- 0.6/1 kV

Test voltage:
- 4,000 V

Bending radius:
- Min. 0,66 mm

Temperature range
- Max. conductor temperature: +70°C
- Short circuit temperature: +160°C
- Lowest temp. at installation: -15°C
- Below 0°C exercise caution

Standard
- IEC 60502-1

Construction

Conductor:
- Round aluminium wires
- Stranded and compacted

Insulation:
- XLPE compound
- Black

Seperation sheath:
- Extruded PVC
- Black

Screen:
- Layer of copper tape 0.1 mm
- Helically applied with overlap

Outer sheath:
- PVC compound
- Lead free
- Black

70°

Content is subject to changes acc. to current product development and or any changes to standards.

Conductor cross-section mm²	Outer diameter mm	Weight kg/km	Standard length m	Prysmian article no.
1 x 800	47.4	3,399		

RAILWAY NETWORK SYSTEM

NSGAFÖU 1.8/3 kV

OIL RESISTANT RUBBER CABLE

Application

Oil resistant rubber cable suitable for installation indoors and outdoors in piper, trays, inside walls, in closed electrical circuits or boards with up to 1000 V.

Technical data

Rated voltage:

- 1.8/3 kV

Test voltage:

- 6,000 V AC

Temperature range

- Max. conductor temperature: +90°C
- Short circuit temperature: +250°C
- Lowest temp. at installation: -40°C
- Below 0°C exercise caution

Standard & Approval

Standard:

- DIN VDE 0250-602
- EN 60228
- IEC 602811-2-1

Approval:

- VDE

Costruction

Conductor:

- Round
- Aluminium wires
- Tinned
- Multi-stranded
- Acc. to IEC 60228 class 5.

Insulation:

- ERP rubber
- Type 3G13 DIN VDE 0207
- Nom. thickness 2.2 mm
- White

Outer sheath:

- CPE rubber
- Type 5GM3 DIN VDE 0207
- Black

Material property

- Flame retardant: IEC 60332-1-2

Content is subject to changes acc. to current product development and or any changes to standards.

Conductor cross-section mm²	Outer diameter mm	Weight kg/km	Max. current rating in free air A	Prysmian EAN no.
1 x 1.5	1.5	47	30	5701498016270
1 x 2.5	1.9	59	41	5701498016287
1 x 4	2.5	77	55	5701498016294
1 x 6	3.2	97	70	5701498016300
1 x 10	4.1	153	98	5701498016317
1 x 16	5.6	214	132	5701498016324
1 x 25	6,8	324	176	5701498016331
1 x 35	8.1	421	218	5701498016348
1 x 50	9.6	564	276	5701498016355
1 x 70	11.2	758	347	5701498016362
1 x 95	13,2	995	416	5701498016379
1 x 120	14,9	1253	488	5701498016386
1 x 150	16,6	1540	566	5701498016393
1 x 240	21,2	2428	775	5701498016416
1 x 300	23.6	3006	898	5701498016423
1 x 400	26.5	3898	1050	5701498016430

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RAILWAY NETWORK SYSTEM

AXCMK 1.8/3 kV

SCREENED & PVC SHEATED

70°

Application

Single core screened and PVC insulated power cable for fixed installation indoors or outdoors directly in the ground or ploughed down.

Technical data

Rated voltage:

- 3 kV

Bendng radius:

- Min. 0.66 m

Temperature range

- Max. conductor temperature: +90°C
- Short circuit temperature: +250°C
- Lowest temp. at installation: -15°C
- Below 0°C exercise caution

Standard

- IEC 60228
- IEC 60502-1

Costruction

Conductor:

- Round aluminium wires
- Stranded and compacted

Insulation:

- XLPE compound
- Halogen free
- Nom. thickness 2.2 mm
- Black

Core colour:

- 1-core: black

Screen:

- Helix of copper wires
- Nom. cross-section area: 300 mm²
- DC resistance at 20°C: max. 0.06 Ω/km

Outer sheath:

- PVC compound
- Nom. thickness 2.1 mm
- Black

Conductor cross-section mm²	Outer diameter mm	Weight kg/km	DC resistance at +20°C Ω/km	Standard length m	Prysmian article no.
1 x 500/50	44	4,800	0.0605	500	20038090

TRACTION POWER NETWORK

AXCLJ-TT 12 kV

SCREENED & WATER PROOF

Application

3-core cable designed for replacement of bare overhead lines. Radial water sealed by a aluminum laminate bonded to outer sheath and axially water sealed with swellable tapes. The cable is primarily designed for ploughing down in ground, but can also handle installation in lakes without flowing water and of limited depth.

Technical data

Rated voltage:

- 6/10 (12) kV

Bending radius:

- During laying: 12 x D
- Fixed: 8 x D
- Ploughed down: 8 x D

Pulling force:

- With eye: Max. 30 x S (N)
- With grip: Max. 5 x D ^ 2 (N)

Temperature area

- Max. conductor temperature: +90°C
- Short-circuit temperature: +250°C
- Lowest temp. at installation: -20°C
- Below 0°C exercise caution

Standard

- SS 424 14 16
- Cenelec HD 620 part 10, section M

Construction

Conductor:

- Round aluminium wires
- Compacted and stranded
- Acc. to IEC 60228 class 2.
- Longitudinal watertight

Conductor screen:

- Extruded semi-conductive

Insulation:

- XLPE, min. thickness 2.96 mm

Insulation screen:

- Extruded
- Bonded

Longitudinal water blocking:

- Semi-conductive tape

Screen:

- Concentric layer of copper wires

Radial water blocking:

- Aluminium-PE laminate
- Bonded to sheath

Rip cord:

- Kevlar

Outer sheath:

- Composite PE
- Black

90°

Content is subject to changes acc. to current product development and or any changes to standards

Conductor cross-section mm²	Outer diameter mm	Weight Kg/km	Max. short circuit current on conductor at 90°C - kA	Current rating at 90°C in free air - A	Standard length m	Drum size
3 x 50/16	42.5	1.370	4.7	160	500	K18
3 x 70/16	46.0	1.660	6.6	190	500	K20
3 x 95/25	50.0	2.035	8.9	230	500	K20
3 x 120/25	54.0	2.320	11.3	265	500	K22
3 x 150/25	57.0	2.715	14.2	305	500	K24
3 x 185/290	61.0	3.225	17.5	340	500	K24
3 x 240/35	65.5	3.720	22.7	400	500	K24
3 x 300/35	71.5	4,615	28.3	460	500	K26

Prysmian Group

TRACTION POWER NETWORK

AXCLJ-TT 24 kV

SCREENED & WATER PROOF

90°

Application

3-core cable designed for replacement of bare overhead lines. Radial water sealed by a aluminum laminate bonded to outer sheath and axially water sealed with swellable tapes. The cable is primarily designed for ploughing down in ground, but can also handle installation in lakes without flowing water and of limited depth.

Technical data

Rated voltage:

- 12/20 (24) kV

Bending radius:

- During installation: 12 x D
- Fixed: 8 x D
- Ploughed down: 8 x D

Pulling force:

- With eye: Max. 30 x S (N)
- With grip: Max. 5 x D ^ 2 (N)

Temperature area

- Max. conductor temperature: +90°C
- Short-circuit temperature: +250°C
- Lowest temp. at installation: -20°C
- Below 0°C caution must be exercised

Standard

- SS 424 14 16
- Cenelec HD 620 part 10, section M

Construction

Conductor:

- Round aluminium wires
- Compacted and stranded
- Acc. to IEC 60228 class 2.
- Longitudinal watertight

Conductor screen:

- Extruded semi-conductive

Insulation:

- XLPE, min. thickness 4.85 mm

Insulation screen:

- Extruded
- Bonded

Longitudinal water blocking:

- SWater swellable tape
- Semi-conductive

Wrapping:

- Conductive tape

Screen:

- Concentric layer of copper wires

Radial water blocking:

- Aluminium-PE laminate
- Bonded to sheath

Rip cord:

- Kevlar

Outer sheath:

- Composite PE
- Black

Content is subject to changes acc. to current product development and or any changes to standards.

Conductor cross-section mm²	Outer diameter mm	Weight Kg/km	Max. short circuit current on conductor at 90°C - kA	Current rating at 90°C in free air - A	Standard length m	Drum size
3 x 50/16	54	1,920	4.7	160	500	K22
3 x 70/16	56	2,210	6.6	190	500	K22
3 x 95/25	60	2,690	8.9	230	500	K24
3 x 120/25	63.5	1,990	11.3	265	500	K24
3 x 150/25	66.5	3,400	14.2	305	500	K24
3 x 185/290	70.5	3,880	17.5	340	500	K26
3 x 240/35	76	4,610	22.7	400	500	K26
3 x 300/50	83	5,380	28.3	460	500	K26

Wikipedia.org: PESA 620M - Sodai

Prysmian Group

GROUNDING

HK

STRANDED ANNEALED COPPER CONDUCTOR

Application

Bare copper conductor for grounding of metal parts for different railway network systems.

Technical data

Bending radius:

- During installation: 15 x D
- Fixed: 10 x D

Pulling force:

- Using eye or grip: max. 50 N/mm²

Standard & Directive

Standard:

- IEC 60228

Directive:

- Fulfills RoHs

Construction

Conductor:

- Round copper wires
- Annealed
- Stranded
- Acc. to IEC 60228 class 2.

Content is subject to changes acc. to current product development and or any changes to standards.

Conductor cross-section mm²	Outer diameter mm	Weight kg/km	Standard length m	Prysmian EAN no.
1 x 50	9	430	1000 - K7	6410001053501
1 x 70	11	610	1000 - K9	6410001053709
1 x 95	13	850	1000 - K11	6410001053952
1 x 120	15	1,100	500 - K11	6410001053976
1 x 150	16	1,312	500 - K11	6410001050142

GROUNDING

KK

STRANDED HARD COPPER CONDUCTOR

Application

Bare copper conductor for grounding of metal parts for different railway network systems.

Technical data

Bending radius:

- During installation: 15 x D
- Fixed: 10 x D

Standard

- IEC 60228

Construction

Conductor:

- Round copper wires
- Hard drawn
- Right handed 'Z' stranded
- Acc. to IEC 60228 class 2.

Content is subject to changes acc. to current product development and or any changes to standards.

Conductor cross-section nom. mm^2	No. of wires x diameter of wires	Outer diameter nom. mm	Weight kg/km	Standard length m
1 x 25	7 x 2.1	6.3	218	1500 - K9
1 x 35	7 x 2.5	7.5	310	2000 - K10
1 x 50	7 x 3.0	9.0	446	500 -K7
1 x 70	19 x 2.1	10.5	596	750 - K9

Conductor cross-section nom. mm^2	Rated tensile strength kN	Final modulus of electricity GPa	Coefficient of linear expansion /°C	DC resistance at 20°C Ω/km
1 x 25	9.72	118	16.9×10^{-6}	0.746
1 x 35	13.77	113	17.0×10^{-6}	0.5267
1 x 50	19.84	113	17.0×10^{-6}	0.366
1 x 70	26.38	105	17.0×10^{-6}	0.276

Prysmian Group

GROUNDING

ML 450/750 V

PVC INSULATED & FLAME RETARDANT

70°

Application

Flame retardant PVC insulated wire for grounding of metal parts of different railway network systems.

Technical data

Rated voltage:
- 450/750 V

Test voltage:
- 2,500 V

Bending radius:
- During installation 8 x D
- Fixed: 3 x D

Pulling force:
- Max. 50 N/mm²

Temperature range

- Max. conductor temperature: +70°C
- Short circuit temperature: +160°C
- Lowest temp. at installation: -25°C
- Below 0°C exercise caution

Standard & Directive & Approval

Standard:
- SFS 5523
- EN 50525-2-31

Directive:
- Fulfills REACH and RoHS

Approval:
- CPR class: Eca
- DoP: 1002700

Construction

Conductor:
- Round copper wires
- Annealed
- Solid
- Acc. to IEC 60228 class 1.

Insulation:
- Linyl PVC
- Lead free

Core colouring:
- 1-core: green/yellow
- 3-core: green/yellow, blue, black
- 5-core: green/yellow, blue, brown, black, grey

Material property

- Flame retardant: IEC 60332-1

Content is subject to changes acc. to current product development and or any changes to standards.

Conductor cross-section mm²	Outer diameter mm	Weight kg/km	Current rating in ground A	DC resistance of conductor at 20°C Max. Ω/km	Standard length m	Prysmian article no.
1 G 1.5	2.8	20	14	12.1	200 Ring	0400808
1 G 2.5	3.5	32	19	7.41	200 Ring	0400808
3 G 1.5	6.2	60	15	12.1	150 ProPac	0400813
3 G 2.5	7.5	100	20	7.41	100 ProPac	0400814
5 G 1.5	7.6	100	14	12.1	100 ProPac	0400815
5 G 2.5	9.3	160	19	7.41	75 ProPac	0400816

GROUNDING

MKEM90 450/750 V

FLEXIBLE, PVC INSULATED & FLAME RETARDANT

Application

Flame retardant PVC insulated and multi-stranded wire for grounding of metal parts from different systems of railway networks.

Technical data

Rated voltage:
- 450/750 V

Test voltage:
- 2,500 V

Bending radius:
- During installation 8 x D
- Final installation: 3 x D

Temperature range
- Max. conductor temperature: +90°C
- Short circuit temperature: +160°C
- Lowest temp. at installation: -25°C

Standard & Approval

Standard:
- SFS 5523
- EN 50525-2-31

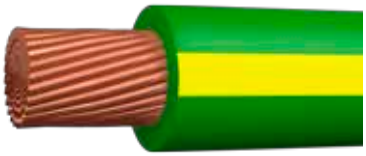
Approval:
- HAR
- CPR class: Eca

Construction

Conductor:
- Round copper wires
- Annealed
- Multi-stranded and flexible
- Acc. to IEC 60228 class 5.

Insulation:
- Linyl PVC
- Lead free
- Yellow/green

Material property
- Flame retardant: IEC 60332-1



90°

Content is subject to changes acc. to current product development and or any changes to standards.

Conductor cross-section mm²	Outer diameter mm	Weight kg/km	Current rating in free air A	Standard length m	Prysmian article no.
1 G 1.5	3.0	21	13.3	250	641000403108-7
1 G 2.5	3.6	32	7.98	200	64100 04 03128-5
1 G 4	4.1	45	4.95	100	641000403148-3
1 G 6	5.0	70	3.3	100	641000403168-1
1 G 10	6.5	115	1.91	100	641000403188-9
1 G 16	7.6	170	1.21	100	641000403208-9
1 G 25	9.4	270	0.78	100	641000403218-3
1 G 35	11.0	370	0.554	500 - 6C	641000453228-7
1 G 50	13.0	520	0.386	200 - 6C	641000453238-6
1 G 70	15.0	730	0.272	200 - 7E	6410004022 48-5

Prysmian Group

GROUNDING

MK90 450/750 V

PVC INSULATED & FLAME RETARDANT

90°

Application

Flame retardant and PVC insulated wire for grounding of metal parts of different railway network systems.

Technical data

Rated voltage:
- 450/750 V

Test voltage:
- 2,500 V

Bending radius:
- During installation 8 x D
- Fixed: 3 x D

Pulling force:
- Max. 50 N/mm²

Temperature range

- Max. conductor temperature: +90°C
- Short circuit temperature: +160°C
- Lowest temp. at installation: -25°C
- Below 0°C exercise caution

Standard & Approval

Standard:
- SFS 5523
- EN 50525-3-31

Approval:
- HAR
- CPR class: Eca
- DoP: 1002700

Construction

Conductor:
- Round copper wires
- Annealed
- Stranded
- Acc. to IEC 60228 class 2.

Insulation:
- Linyl PVC
- Lead free
- Yellow/green

Material property

- Flame retardant: IEC 60332-1

Content is subject to changes acc. to current product development and or any changes to standards.

Conductor cross-section mm²	Outer diameter mm	Weight kg/km	Direct current resistance of conductor at 20°C Ω/km	Standard length m	Prysmian EAN no.
1 G 6	4.8	70	4.61	100	641000401714-2
1 G 10	6.1	115	3.08	100	641000401718-0
1 G 16	7.2	175	1.83	100	641000401721-0
1 G 25	8.9	270	1.15	100	641000402216-0
1 G 35	10.0	370	0.727	500 - 6C	641000452227-1
1 G 50	11.7	510	0.387	200 - 6C	641000452238-7
1 G 70	13.4	710	0.268	200 -6C	641000402248-6
1 G 95	16.0	1,000	0.193	500 - 8E	641000402258-0
1 G 120	18.0	1,200	0.153	800 - 11G	641000402266-5

GROUNDING

H07V-K 450/750 V

PVC INSULATED & FLAME RETARDANT

Application

Flame retardant and PVC insulated wire for grounding of metal parts from different systems of railway networks.

Technical data

Rated voltage:
- 450/750 V

Test voltage:
- 2,500 V

Bending radius:
- During installation 8 x D
- Final installation: 3 x D

Temperature range
- Max. conductor temperature: +70°C
- Short circuit temperature: +160°C
- Lowest temp. at installation: -40°C

Standard & Approval

Standard:
- EN 50525-3-31

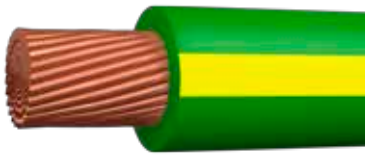
Approval:
- HAR, EZU
- CPR class: Eca

Construction

Conductor:
- Round copper wires
- Multi-stranded
- Acc. to IEC 60228 class 5.

Insulation:
- PVC
- Yellow/green

Material property
- Flame retardant: IEC 60332-1



70°

Content is subject to changes acc. to current product development and or any changes to standards.

Conductor cross-section mm²	Outer diameter mm	Weight kg/km	Current rating in free air A	Standard length m	Prysmian article no.
1 G 1.5	3.3	22	21		
1 G 2.5	3.9	35	28		
1 G 4	4.4	47	38		
1 G 6	4.9	70	49		
1 G 10	6.0	108	72		
1 G 16	7.3	160	100		
1 G 25	9.1	265	140		
1 G 35	10.2	357	175		
1 G 50	12.0	499	218		
1 G 70	13.6	694	266		
1 G 95	15.9	922	330		
1 G 120	17.8	1,168	384		
1 G 150	22.5	1,380	420		
1 G 185	24.9	1,700	462		
1 G 240	28.4	2,200	548		

Prysmian Group

GROUNDING

H07V-R 450/750 V

PVC INSULATED & FLAME RETARDANT

70°

Application

Flame retardant and PVC insulated wire for grounding of metal parts from different systems of railway networks.

Technical data

Rated voltage:
- 450/750 V

Test voltage:
- 2,500 V

Bending radius:
- During installation 8 x D
- Final installation: 3 x D

Temperature range

- Max. conductor temperature: +70°C
- Short circuit temperature: +160°C
- Lowest temp. at installation: -40°C

Standard & Approval

Standard:
- EN 50525-3-31

Approval:
- HAR, EZU
- CPR class: Eca

Construction

Conductor:
- Round copper wires
- Stranded
- Acc. to IEC 60228 class 2.

Insulation:
- PVC
- Yellow/green

Material property

- Flame retardant: IEC 60332-1

Content is subject to changes acc. to current product development and or any changes to standards.

Conductor cross-section mm²	Outer diameter mm	Weight kg/km	Current carrying capacity Max. A	Standard length m	Prysmian EAN no.
1 G 1.5	3.3	35	21		
1 G 2.5	3.9	41	28		
1 G 4	4.4	47	38		
1 G 6	4.9	62	49		
1 G 10	6.4	108	72		
1 G 16	7.3	165	100		

Wikipedia.org - Saue Station: Terje

ACCESSORY

FORMFIT MULTI-CONNECTOR

12-36 kV SEPARABLE WITH TEST POINT

Application

Watertight separable connector suitable for connecting polymer up to 36 kV cables to transformers, switchgear units, motors etc. Available as a straight FMCS-400, elbow FMCE-400 or tee FMCT-400 connector. For indoor and outdoor application of:

- Single core cables
- PE, XLPE and ERP insulation
- CU or AL conductor
- Semi-conducting screen
- Screen of metal, wire or tape
- Insulation voltage up to 36 kV
- From 25-240 (300) mm^2
- For continuous 400 A rms
- Overload 600 A rms
- Interface B

Installation features

- No need for special tools
- No need for heating, taping or filling
- Vertical, angled or inverted position
- No min. distance between phases
- Immediate energizing possible
- Individual clamping by steel brace

Construction

- Contact pin assembly
- Semi-conducting inner screen
- Semi-conducting outer jacket
- Insulating body of moulded EPDM
- Test point electrically protected by cap
- Adapter of EPDM moulding
- Locking brace of stainless steel
- Earthing cover of moulded EPDM
- Earthing eye

Standard

- VDE 0278-C 33-051, CC 33-001
- HD 629-1 og IEC 60502-4
- Cenelec EN 50180, EN 50181

Delivery

- Supplied as a kit of 3 single connectors containing all components.

Content is subject to changes acc. to current product development and or any changes to standards.

Diameter over insulation		Kit reference	Conductor size in mm (for guidance only)			
Min.	Max.		12 kV	17 kV	24 kV	36 kV
18.5	20.5	FMCE-400-Z	70	50	35	
19.9	21.9	FMCE-400-A	95	70	50	
21.4	2.5	FMCE-400-B	120	95	70	25
22.9	25.1	FMCE-400-C	150	120	95	35
24.4	26.6	FMCE-400-D	185	150	120	50
26.0	28.3	FMCE-400-E	240	185	150	70
27.8	30.4	FMCE-400-F	300	240	185	95
29.8	32.7	FMCE-400-G		300	240	120
31.8	35.3	FMCE-400-H			300	185
34.1	38.3	FMCE-400-J				240

ACCESSORY

ELASCON TEE CONNECTOR

12-36 kV SEPARABLE WITH MECHANICAL CONTACT

Application

Watertight connector type MSCT/EC-630-C suitable for connecting polymer MV cables to transformers, switchgear units, motors etc. For indoor and outdoor application of:

- Single core cables
- PE, XLPE and ERP insulation
- CU or AL conductor solid or stranded
- Semi-conducting screen
- Screen of metal, wire or tape
- Insulation voltage up to 18/30 (36) kV
- Conductor size: 25 - 300 mm²
- For continuous 630 A rms
- Overload 900 A rms

Installation features

- No need for special tools
- No need for heating, taping or filling
- Vertical, angled or inverted position
- No min. distance between phases
- Immediate energizing possible

Standard

- HD 629.1 S2
- IEC 60502-4 NF C 33-051 - NF C 33-001
- IEC 61238-1 class A - mechanical contact

Construction

- Mechanical conductor contact
- M16 clamping screw
- Semi-conducting inner screen
- Semi-conducting outer envelope
- Insulating body mould EPDM
- Test point electrically protected by cap
- Insulating plug epoxy component
- Cap of moulded semi-conducting EPDM
- Earthing eye
- Moulded high permittivity reducer

Standard

- Cenelec HD 629.1 S2
- IEC 60502-4 - NF C33-051 - NF C 33-001.
- Cenelec EN 50180, EN 50181
- IEC 61238-1 class A, HN 68-S-91

Versions available

- Elascon is available in versoin for 250, 400 and 630 continuous A rms.

Delivery

- Supplied as a kit of 3 single connectors containing all components.

Content is subject to changes acc. to current product development and or any changes to standards.

Voltage kV	Diameter over insulation		Conductor size in mm² (for guidance only)		Prysmian order no.
	Min.	Max.			
12	13.0	22.3	25	120	MSCEA/EC-630-C-12-rA-25/120
12	16.1	26.3	95	240	MSCEA/EC-630-C-12-rB-95/240
12	22.7	33.0	185	300	MSCEA/EC-630-C-12-rC-185/300
17	13.0	22.3	70	70	MSCEA/EC-630-C-17-rA-25/70
17	16.1	26.3	120	120	MSCEA/EC-630-C-17-rB-35/120
17	20.2	30.8	240	240	MSCEA/EC-630-C-17-rC-95/240
17	25.6	35.3	300	300	MSCEA/EC-630-C-17-rE-185/300
24	16.1	26.3	185	150	MSCEA/EC-630-C-24-rB-25/150
24	16.1	26.3	185	195	MSCEA/EC-630-C-24-rB-70/185
24	20.2	30.8	240	240	MSCEA/EC-630-C-24-rC-95/240
24	22.7	330.	240	240	MSCEA/EC-630-C-24-rD-95/240
24	25.6	35.3	300	300	MSCEA/EC-630-C-24-rE-185/300
36	20.2	30.8	95	95	MSCEA/EC-630-C-36-rC-25/95
36	22.7	33.1	120	120	MSCEA/EC-630-C-36-rD-35/120
36	25.6	35.3	240	240	MSCEA/EC-630-C-36-rE-70/240
36	30.5	40.6	150	300	MSCEA/EC-630-C-36-rF-150/300

ACCESSORY

SIXTY-SPEED JOINT 72.5 kV

ALL-IN-ONE FACTORY TESTED COLD SHRINK EPR

Description

- Factory pre-assembled
- Factory pre-tested
- Cold-shrink EPR joint
- All-in-one design
- Integrated link-devices
- Integrated elastic outer sheath
- Sectionalized version
- Non-sectionalized version
- Self-ejecting technology
- Shear bolts mechanical connector
- Tool free solution
- LEAN product - few components

Application

- Joint for single-core extruded cables (XLPE or EPR)
- Copper or aluminium conductor
- Copper wire screen or aluminium laminated sheath
- Cable sizes from 120 mm² (240 kcmil) up to 1000 mm² (2000 kcmil)
- Voltage: 36/69 (72.5 kV) (IEC)
- Voltage: 39.8/69 kV (BIL 350 kV crest) (IEEE)
- Suitable for buried installations also in presence of water table (1 m water-proof)

Installation features

- Easy to install: No special tools are required (tool-free solution).
- Quick assembling: Designed for reducing installation time. Main components are already expanded and placed in the correct position. Joint sealing simply done by removing supports from the outer sheath.
- Self-ejecting supports: No special skill required for the installation.
- 100% factory tested: Submitted to electrical test and partial discharges measurements before shipping.
- 2 years shelf-life.

Additional options

- Metallic casing as additional mechanical protection.
- Coffin-box filled with resin as additional water protection suitable for concentric cross-bonding cable.
- Heat-shrinkable outer protection instead of the integrated elastic outer sheath.

Qualification

- Qualified in accordance to IEC 60840 and IEEE-404.
- Short circuit tested (up to 40 kA/0.5 sec.)

Content is subject to changes acc. to current product development and or any changes to standards.

Product references	Rated voltage kV	Sixty-Speed model	Cross-section range mm²	Insulation range mm	Max. outer diameter mm
CSJ(-X) 1072	72.5 kV	1	120 - 240	39.0 - 53.0	77.0
CSJ(-X) 1072	72.5 kV	2	300 - 1000	52.0 - 71.0	89.0

ACCESSORY

COLDFIT TERMINATION 72.5 kV

FACTORY EXPANDED WITH MODULAR DESIGN

Application

Factory-expanded cold shrink silicone termination designed with factory-assembled moisture sealing components. Modular design allows for different creepage distances. Suitable for outdoor installation subject to severe climatic conditions. Installation without use of special tools.

- Single core extruded cables (XLPE or EPR)
- With CU or AL conductor
- With wire screen or aminated sheath
- Conductor size from 150-1,200 mm²

Technical data

- Rated voltage: 36/69 (72.5) kV
- Terminal body creepage: 2,100 mm
- Modular creepage: 600 mm
- Total creepage distance: 2,700 mm
- Acc. to IEC 60815

Installation features

- Easy to install - not tools needed
- Quick assemble - LEAN few items
- Extractable support - on platic carrier
- Vertical or angled position
- Shear bolts mechanical connector
- Excellent anti-tracking and hydrophobic
- 100% factory tested
- 2 year shelf-life

Construction

Insulation body:

- Cold shrink element
- Silicone rubber
- Expanded into a spiral support

Stress cone:

- Designed to ensure voltage control
- Suitable for all cables
- Semi-conducting silicone rubber

Sealing tube:

- Upper and lower (conductor/earth)
- Cold shrink silicone rubber
- Expanded into a spiral support

Tape:

- High permittivity tape
- Sealing mastic and silicone tape
- Ensures watertightness

Conductor lug:

- Suitable for copper or aluminium

Standard

- IEC 60840 / IEEE 404

Content is subject to changes acc. to current product development and or any changes to standards.

Rated voltage kV	Model type	Cross section mm²	Insulation thickness mm	Outer diamter mm	A mm	B mm	C mm	D mm	F creepage m
72.5 kV	1	150 - 500	33.5 - 48.8	57.0	750	146	186	1,000	> 2.25
72.5 kV	2	500 - 1,200	42.8 - 66.0	74.0	750	156	196	1,000	> 2.25

Prysmian Group

ACCESSORY

ECOSPEED JOINT 24-36 kV

STRAIGHT THROUGH JOINT, COLD SHRINK

Application

Suitable for jointing of polymeric insulated cables of different specifications, for example as transition joint between extruded and paper insulated cables. Joint can be laid underground in tunnels, on horizonal racks or directly buried.

Cable types

- Single core polymeric insulation
- Insulation voltage up to 36 kV (Um)
- Copper or aluminium conductor
- Conductor sizes 50 to 630 mm²
- Tape, wire or polylam metallic screen
- Non-armoured
- Semi-conducting screen

Selection guide

Select in the table below, the kit model corresponding to the insulation voltage Um (up to 24 kV or 36 kV), the diameter over insulation and over outer sheath.

Specify insulation voltage Um for 24 or 36 kV.

Select the screen continuity device according to the type of metallic screen of cable. T1 for polylam screen, T2 for tape screen and T3 for wire screen.

Construction

- Three layers sleeve
- Two layers sheath
- Copper mesh
- High permettivity tape
- PVC tape
- Sealing mastic tape
- Embassed copper tape
- PVC strip
- Identification label

Standard

- Fulfills IEC 60502-4
- Fulfills CENELEC HD 629-1-2

Installation characteristics

- All-in-one compact design
- Factory expanded onto a support
- No special skills or experience required
- Easy assembling
- No special tools or heating needed
- Wide cables size range
- Immediate energizing after jointing
- Great flexibility
- Suitable for compact insulated cables

Content is subject to changes acc. to current product development and or any changes to standards.

Rated voltage kV	Elaspeed model	Min. outer insulation diameter mm	Max. outer sheath diameter incl. screen mm	Conductor size range (for guidance only)
24 kv	Ecospeed 151556	19	40	50 - 240
24 kV	Ecospeed 162662	24	44	95 - 240
36 kV	Ecospeed 151656-0	23	40	50 - 120
36 kV	Ecospeed 202070-1	28	55	95 - 240
36 kV	Ecospeed 202070-3	34	55	300 - 630
36 kV	Ecospeed 252580-4	36	62	500 - 630

ACCESSORY

ELASPEED JOINT 12-36 kV

STRAIGHT THROUGH JOINT, ELASTIC

Application

For jointing of 1- or 3 core polymeric insulated cables of different specifications, conductor sizes, round or sector shaped. Joint has injected outer protection and integrated electrode. Suitable for jointing cables laid underground, in tunnels, on horizontal racks or aerial. Can be directly buried (after curing of resin). Supplied as a kit containing all the necessary components except the ferrules (supplied on request).

Elaspeed™ utilize cold shrink technology which doesn't require any special tools or torches for installation. The EPR rubber insulation is manufactured on a vertical extruder to ensure complete concentricity to the tightest tolerance possible.

Cable types

- 1- or 3-core polymeric insulation
- Copper or aluminium conductor
- Metallic screen of tape or wire
- Semi-conducting screen (extruded/taped)
- Insulation voltage up to 36 kV (Um)
- Conductor sizes from 25-500 mm²
- Non-armoured or armoured.

Construction

- Conductor ferrule, crimped
- Joint body, extruded EPR
- Removable carrier, pre-loaded
- Core screen, copper
- Outer protection, watertight

Installation features

- No need for special tools or heating.
- Injection of resin with disposable injection device can be supplied directly in the kit - in this case, letter "F" to be added at the end of kit reference.
- Energizing of cable 30 minutes after injecting.
- Polymerisation of synthetic resins at ambient temp. +5°C to +45°C

Standard

- C 33 001 - DIN 57 278
- IEEE 404 - IEC 60502-4
- ENEL DJ 4853 - C 33 050-AI
- CENELEC HD 629-1

Content is subject to changes acc. to current product development and or any changes to standards.

Rated voltage kV	1 core cable			3 core cable		
	Max. OD sheath mm	Max. conductor size mm²	Kit reference name	Max. OD sheath mm	Max. conductor size mm²	Kit reference name
12	38	95 - 150	EPJM - 1C-12 E	19.0	95 - 150	RTMJ - 3C-12 E
12	49	195 - 300	EPJM - 1C-12 F	23.1	185 - 300	RTMJ - 3C-12 F
12	50	240 - 400	EPJM - 1C-12 H	24.4	240 - 400	RTMJ - 3C-12 H
12	57	300 - 500	EPJM - 1C-12 IP	27.8	300 - 500	RTMJ - 3C-12 IP
17.5	34	70 - 120	EPJM - 1C-17 E	19.0	70 - 120	RTMJ - 3C-17 E
17.5	44	150 - 240	EPJM - 1C-17 F	23.1	150 - 240	RTMJ - 3C-17 F
17.5	46	195 - 300	EPJM - 1C-17 H	24.4	185 - 300	RTMJ - 3C-17 H
17.5	52	240 - 500	EPJM - 1C-17 IP	27.8	240 - 500	RTMJ - 3C-17 IP
24	39	50 - 95	EPJM - 1C-24 E	19.0	50 - 95	RTMJ - 3C-24 E
24	48	95 - 240	EPJM - 1C-24 F	23.1	95 - 240	RTMJ - 3C-24 F
24	50	120 - 300	EPJM - 1C-24 H	24.4	120 - 300	RTMJ - 3C-24 H
24	57	195 - 400	EPJM - 1C-24 IP	27.8	185 - 400	RTMJ - 3C-24 IP
36	50	50 - 150	EPJM - 1C-36 H	24.4	50 - 150	RTMJ - 3C-36 H
36	57	95 - 300	EPJM - 1C-36 IP	27.8	95 - 300	RTMJ - 3C-36 IP
36	67	195 - 630	EPJM - 1C-36 I			

CATENARY CONTACT WIRE

TRL

PURE COPPER CONDUCTOR

Application

Copper wire for power transmission to electric railway lines. Suitable as catenary wire for AC and DC systems.

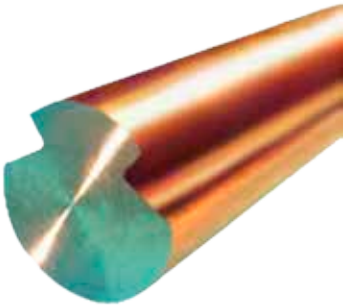
Standard

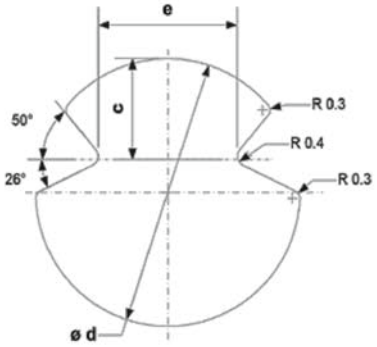
> EN 50149 type A

Construction

Conductor:

> Single strand
> Pure copper - ETP
> Hard drawn
> Grooved
> Identification marks acc. to EN 50149





Content is subject to changes acc. to current product development and or any changes to standards.

Conductor cross-section mm²	Conductor diameter mm	Weight kg/km	Standard length m	Prysmian article no.
80	10.6	710		0104008
100	12.0	890		0104010
120	13.2	1,067		

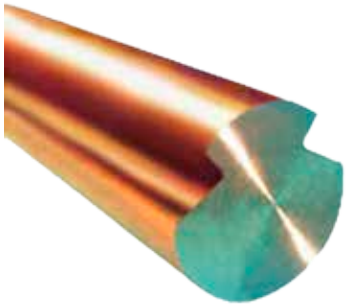
Conductor cross-section mm²	Rated tensile strength (RTS) kN	Coefficient of liniar expansion /°C	Final modulus of elasticity GPa	Thermal oxide resistance kA
80	28.4	17×10^{-6}	120	12
100	35.5	17.0×10^{-6}	120	15
120	42.0	17.0×10^{-6}	120	

Prysmian Group

CATENARY CONTACT WIRE

TRL CuAg

COPPER-SILVER ALLOYED CONDUCTOR



Application

Copper-silver alloyed wire for power transmission to electric railway lines. Suitable as catenary wire for AC and DC systems.

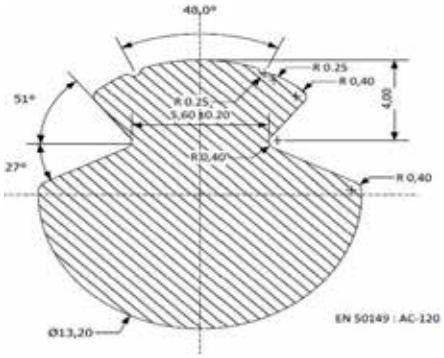
Standard

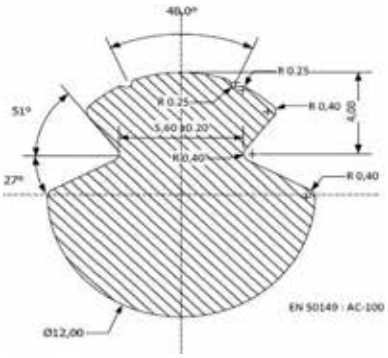
- EN 50149

Construction

Conductor:

- Single strand
- Silver alloyed copper
- Hard drawn
- Grooved
- Identification marks acc. to EN 50149





Content is subject to changes acc. to current product development and or any changes to standards.

Conductor cross-section mm²	Outer diameter mm	Weight kg/km	Standard length m	Prysmian EAN no.
80				
100	12.0	980		
120	13.2	1,067		

Conductor cross-section mm²	Rated tensile strength (RTS) kN	Coefficient of liniar expansion /°C	Final modulus of elasticity GPa	DC resistance at 20°C Ω/km
80				
100	36.0	17×10^{-6}	120	0.183
120	42.0	17×10^{-6}	120	0.153

CATENARY WIRE & DROPPER

KK Bz-II 10 mm² or 50 mm²

STRANDED BRONZE ALLOYED COPPER CONDUCTOR

Application

Stranded bronze alloyed 1,35 or 3,0 mm copper wire concentrically stranded acc. to DIN 48201 part 2.

KK Bz-II 10 mm² suitable as dropper wire and KK Bz-II 50 mm² suitable as catenary wire in railway appllications.

Technical data

Tensile strength:

- Min. 618 N/mm²

Resistivity:

- Max:. 27.78 n Ω m

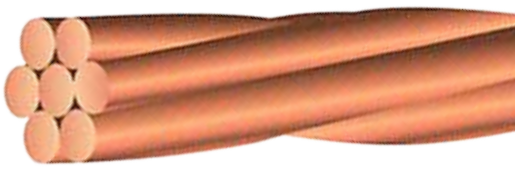
Standard

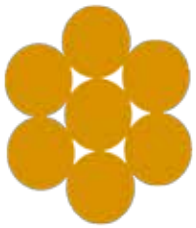
- DIN 48201 part 2.
- DIN 48200 part 2. Bz-II

Construction

Conductor:

- Round
- Bronze alloyed copper wires
- Hard drawn
- Nom. diameter 1.35 or 3.0 mm
- Outer layer "Z" stranded
- Acc. to IEC 60228 class 2.





Content is subject to changes acc. to current product development and or any changes to standards.

Conductor cross-section mm²	Outer diameter mm	Weight kg/km	Standard length m	Prysmian EAN no.
10 (7 x 1.35)	4.1	90		
50 (7 x 3.0)	9.0	446		

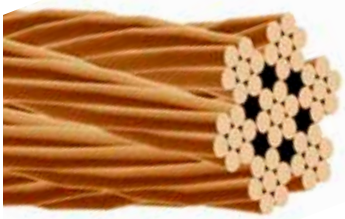
Conductor cross-section mm²	Rated tensile strength (RTS) kN	Coefficient of liniar expansion /°C	Final modulus of elasticity GPa	DC resistance at 20°C Ω/km
10 (7 x 1.35)	5.88	17×10^{-6}	113	2.8
50 (7 x 3.0)	28.58	17×10^{-6}	113	0.569

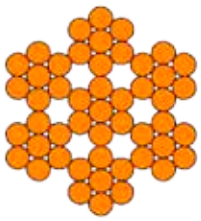
Prysmian Group

DROPPER

KKM Bz-II 10 mm²

MULTI-STRANDED COPPER ALLOYED CONDUCTOR





Application

Stranded bronze alloyed 0.5 mm copper wire concentrically bundled acc. to DIN 48201 part 2.

KKM Bz-II 10 mm² is suitable as dropper wire in railway applications.

Technical data

Tensile strength:

- Min. 618 N/mm²

Resistivity:

- Max:. 27.78 n Ω m

Standard

- DIN 48201 part 2.
- DIN 48200 part 2. Bz-II

Construction

Conductor:

- Round
- Multi-stranded
- Bronze alloyed copper wires
- Hard drawn
- Nom. diameter 0.5 mm
- Bunched sub-conductor 7 x 0.5 mm
- Outer layer "S" stranded

Content is subject to changes acc. to current product development and or any changes to standards.

Conductor cross-section mm²	Outer diameter mm	Sub-conductor diameter nom. mm	Weight kg/km	Standard length m
10 (7 x 7 x 0.5)	4.5	1.37	89	

Conductor cross-section mm²	Rated tensile strength (RTS) kN	Coefficient of liniar expansion /°C	Final modulus of elasticity GPa	DC resistance at 20°C Ω/km
10 (7 x 7 x 0.5)	589			2.98

RETURN WIRE

AAC

STRANDED ALUMINIUM CONDUCTOR

Application

Cable for energy transmission designed with concentric layers. Suitable for fixed installation as return wire for railway application outdoors.

Technical data

Bending radius:

- During installation: min. 0.2 m
- Fixed: min. 0.14 m

Conductor initial modulus:

- 41,000 N/mm²

Resistor module:

- 60,000 N/mm²

Temperature range

- Max. conductor temperature: +80°C
- Short circuit temperature: +160°C

Standard & Directive

Standard:

- EN 50182
- IEC 61089
- SFS 5701

Directive:

- Fultills REACH and RoHS

Construction

Conductor:

- Round
- Aluminium wires 4.42 mm
- Stranded
- Acc. to EN 50182
- Outer layer "Z" stranded

80°

Content is subject to changes acc. to current product development and or any changes to standards.

Conductor cross-section mm²	Number of wires	Outer diameter mm	Weight kg/km	Standard length m	Prysmian article no.
107	7	13.3	294	2100 - G13	0120250

Conductor cross-section mm²	Rated tensile strength (RTS) kN	Coefficient of liniar expansion /°C	Thermal oxide resistance kA	DC resistance at 20°C Ω/km
107	17.2	23 x 10^{-6}	9.6	0.267

Prysmian Group

RETURN WIRE

ACSR

STEEL REINFORCED ALUMINIUM CONDUCTOR

80°

Application

Cable for energy transmission designed with concentric layers of aluminium wires and inside of galvanized and fat enclosed steel wires. Suitable for fixed installation as return wire for railway application outdoors.

Temperature range

- Max. conductor temperature: +80°C
- Short circuit temperature: +160°C

Standard

- EN 50182
- IEC 61089
- SFS 5701

Construction

Conductor:

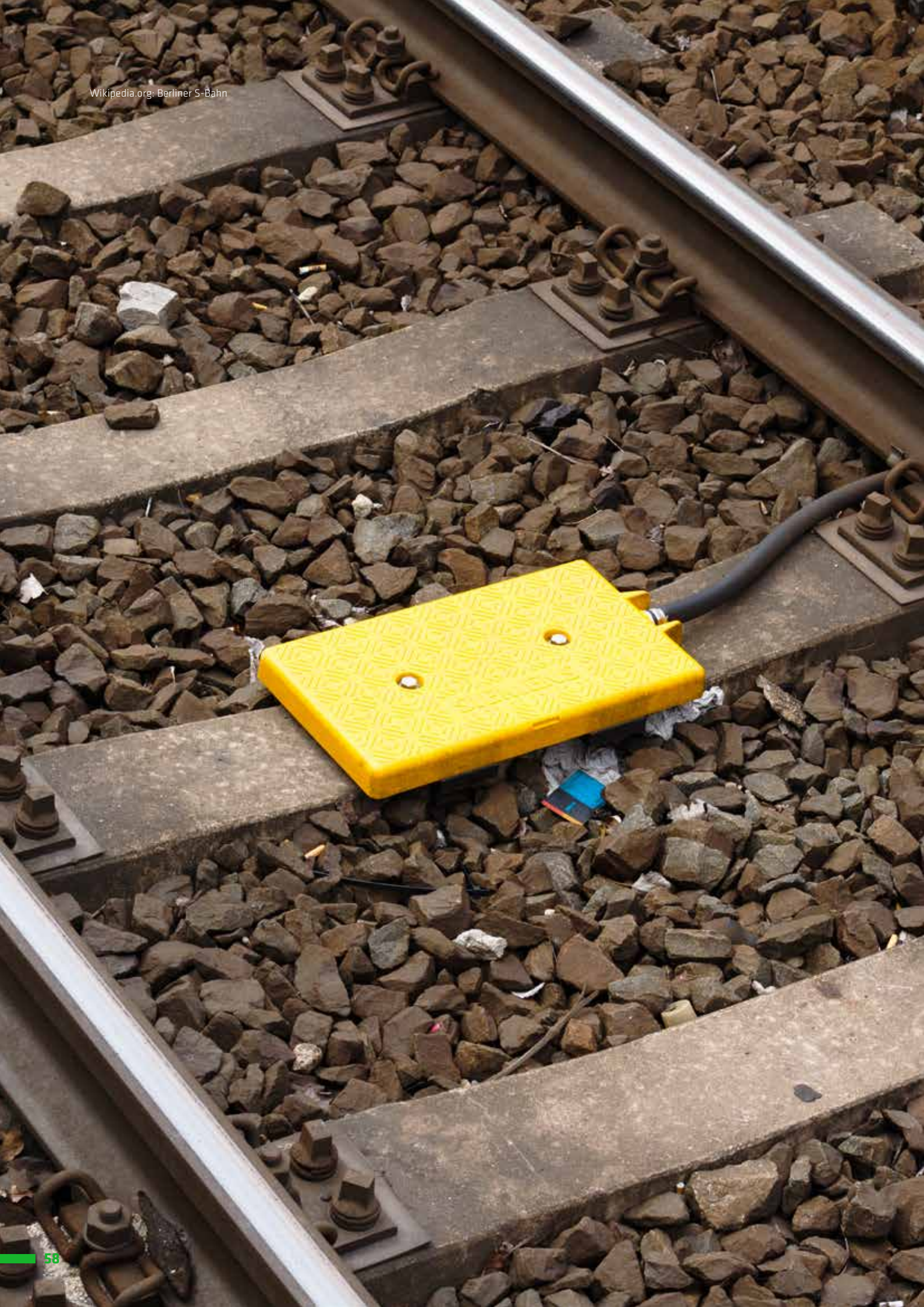
- Round
- Outer cores of aluminium wires
- Inner core of steel wires
- Stranded
- Acc. to IEC 60228 class 2.
- Outer layer right handed "Z"

Content is subject to changes acc. to current product development and or any changes to standards.

Conductor cross-section mm²	Number of AL wires	Number of steel wires	Outer diameter mm	Weight kg/km	Standard length m	Prysmian EAN no.
39.5 (34/6)	6	1	8.04	137	2500	6410001202022
67.1 (42/25)	12	7	10.6	310	2500	6410001202282
62.4 (54/9)	6	1	10.1	216	2200	6410001202053
99.3 (85/14)	6	1	12.8	344	2000	6410001202091
142 (89/52)	6	7	15.4	654	2500	6410001202132
177 (152/25)	26	7	17.3	613	2500	6410001202152
281 (242/39)	26	7	21.3	976	2500	6410001202183
344 (305/39)	54	7	24.1	1,151	2200	6410001202213
454.5 (402/52)	54	7	27.7	1,520	2300	6410001054072
637 (565/72)	54	19	32.9	2,123	1400	6410001202244

Conductor cross-section mm²	39.5	67.1	62.4	99.3	142	177	281	344	454.5	637
Rated tensile strength min. kN	12.2	13.52	17.11	24.13	33.37	54.8	84.9	96.8	123.75	174
Coefficient of liniar expansion /°C	$19.2x10^{-6}$	$15.6x10^{-6}$	$19.2x10^{-6}$	$19.2x10^{-6}$	$15.6x10^{-6}$	$19.2x10^{-6}$	$19.2x10^{-6}$	$19.3x10^{-6}$	$19.3x10^{-6}$	$19.3x10^{-6}$
Final modulus of elasticity GPa	78	102	78	78	102	76	76	67	68	63
DC resistance at 20°C Ω/km	0.848	0.682	0.536	0.337	0.323	0.190	0.120	0.0949	0.0719	0.0512
Short circuit current max kA	3.7	5.4	5.8	9.2	11.4	16.5	26.1	32.5	43.7	60.1


424
426



Wikipedia.org: Berliner S-Bahn

BALISE

A-2Y(L)2YB2Y

STAR QUAD STRANDED & STEEL TAPE ARMOURED

Application

For railway safety equipment, used for train detection according to ETCS (European Train Control System) technology. Maximum installation distance up to 2000 meters.

Technical data

Design:
- n x 4 x 1.4 (1.53 mm)

Bending radius:
- During installation: ≥ 10 x D
- Fixed: ≥ 7.5 x D

Resistance per 1.4 or 1.53 mm:
- Conductor: ≤ 23.4 or 19.8 Ω/km
- Insulation: ≥ 10 GΩxkm

Mutual capacitance per 1.4 or 1.53 mm:
- ≤ 52 or 43 nF/km

Capacitance unbalance per 1.4 or 1.53 mm:
- k_1:≤ 650 or 240 pF/500 m
- $e_{a½}$: ≤ 1,300 or 650 pF/500 m

Impedance:
- At 8 kHz: 147 Ω ± 15 %
- At 200-600 kHz: 120 Ω ± 10 %

Attenuation per 1.4 or 1.53 mm:
- At 8.8 kHz: ≤ 2 or 0.8 dB/km
- At 280 kHz: ≤ 5 or 3 dB/km
- At 560 kHz: ≤ 7 or 4.2 dB/km
- At 1,800 kHz: ≤ N/A or 8 dB/km

Near-end-crosstalk-attenuation at 1 MHz:
- For 1.4 mm: ≥ 55 dB/km
- For 1.53 mm: ≥ 60 dB/km

Test voltage at 50 Hz:
- Core/core: 2,500 V rms
- Core/screen: 2,500 V rms

Temperature range
- During installation: - 10°C to + 60°C
- In operations: - 40°C to + 60°C

Construction

Conductor:
- Solid copper wires
- Soft annealed
- Diameter 1.4 or 1.53 mm

Insulation:
- PE (2Y)

Quad colouring:
- Natural
- Black ring marking

Twisting:
- Star quads
- Concentric layers

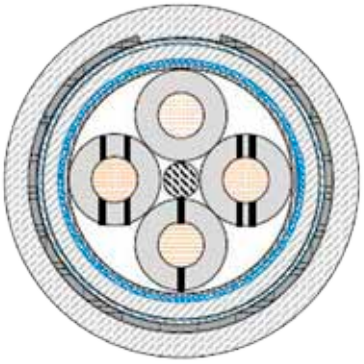
Moisture barrier sheath:
- Laminate of aluminium tape 0.15 mm
- Coated with copolymer on one side
- Bonded to inner sheath

Inner sheath:
- PE
- Black

Armouring:
- Galvanized steel tape
- One layer 0.2 mm
- Helically applied

Outer sheath:
- PE
- Black

Material property
- Smoke density: EN 60134



60°

low

Content is subject to changes acc. to current product development and or any changes to standards.

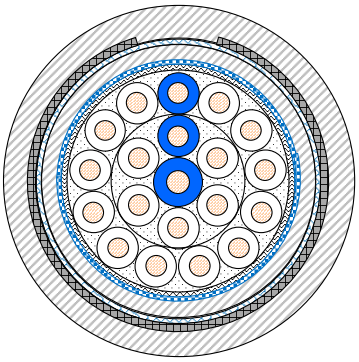
Conductor diameter mm	No. of quads	Outer diameter mm	Weight kg/km	Standard length m	Prysmian EAN no.
1.4	1	14	260	2000	
1.53	1	18	350	2000	

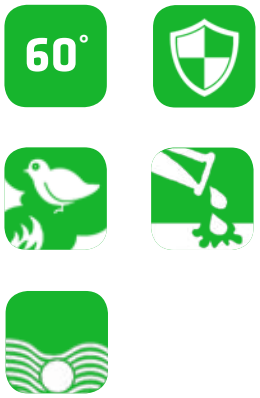
Prysmian Group

BALISE

A-2YOF(L)2YB2Y

HALOGEN FREE, WATERTIGHT & ARMOURED





Application

For railway signalling applications, such as wiring of light signals, point machines, balises, axle counters and similar wayside equipment, up to 420 V AC or 600 V DC. The cable is longitudinally watertight with stranded copper conductor and steel tape armouring.

Technical data

Design:
- n x 1 x diameter mm

Bending radius:
- Flexible: ≥ 20 x D
- Fixed: ≥ 15 x D

Temperature range

- During installation: - 10°C to + 60°C
- In operations: - 40°C to + 60°C

Standard

- PH 416.0113 V2.1

Material property

- Halogen free: IEC 60754-1 & 2

Construction

Conductor:
- Solid copper
- Soft annealed
- Diameter 0.9 or 1.4 or 1.8 mm

Insulation:
- PE (2Y)
- Naturally coloured
- Blue marking/tracer core in each layer

Twisting:
- Cores twised in concentric layers

Filling:
- Longitudinal watertight
- Low capacitance filling compound
- Drip point > 80 °C

Moisture barrier wrapping:
- Swellable material
- Longitudinally applied with overlap

Inner sheath:
- Laminated with AL tape 0.15 mm
- One side copolymer coated
- Bonded with PE sheath
- Black

Armouring:
- 1 or 2 layers of galvanized steel tape
- 0.2 or 0.3 mm
- Helically applied

Outer sheath:
- PE (2Y)
- Black

Characteristics	Unit	0.9 mm	1.4 mm	1.8 mm
Conductor resistance	Ω/km	≤ 28.9	≤ 11.9	≤ 7.2
Insulation resistance	GΩxkm	≥ 1.5	≥ 1.5	≥ 1.5
Mutual capacitance at 800 Hz	nF/km	≤ 115 [1)]	≤ 145 [2)]	≤ 145 [2)]
Operating voltage DC/AC	V	≤ 600/ ≤ 420	≤ 600/ ≤ 420	≤ 600/ ≤ 420
Test voltage at 50 Hz - 1 min				
core/core	V_{rms}	2500	2500	2500
core/screen	V_{rms}	2500	2500	2500

[1)] ≤ 120 nF/km for single core in center
[2)] ≤ 155 nF/km for single core in center

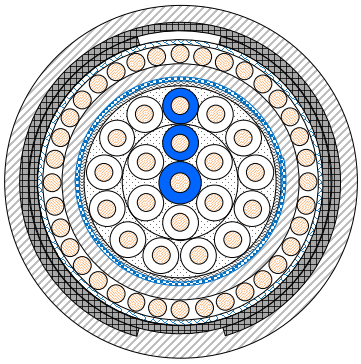
No. of cores	Outer diameter mm	Weight kg/km	Standard length m	Outer diameter mm	Weight kg/km	Standard length m	Outer diameter mm	Weight kg/km	Standard length m
	n x 1 x 0.9 mm			n x 1 x 1.4 mm			n x 1 x 1.8 mm		
2	13.0	160	1000	-	-	-	-	-	-
4	13.0	170	1000	14.0	240	1000	16.0	300	1000
7	14.0	220	1000	17.0	320	1000	19.0	430	1000
10	17.0	290	1000	18.0	410	1000	21.0	560	1000
14	17.0	300	1000	19.0	490	1000	22.0	680	1000
20	18.0	380	1000	22.0	630	1000	25.0	890	1000
24	20.0	460	1000	23.0	730	1000	27.0	1060	1000
30	20.0	490	1000	24.0	840	1000	29.0	1230	1000
40	21.0	590	1000	27.0	1050	1000	32.0	1560	1000
50	23.0	700	1000	29.0	1280	1000	36.0	1940	1000
60	25.0	800	1000	32.0	1490	1000	38.0	2280	1000
80	26.0	1000	1000	35.0	1920	1000	42.0	2920	1000
100	27.5	1250	1000	39.0	2350	1000	47.0	3630	500
120	32.0	1390	1000	41.0	2730	1000	49.0	4230	500
140	35.0	1650	1000	44.0	3140	1000	53.0	4890	500
160	36.0	1790	1000	46.0	3540	500	55.0	5490	500
180	39.0	2030	1000	49.0	3970	500	59.0	6160	500
200	39.0	2150	1000	50.0	4310	500	60.0	6710	500

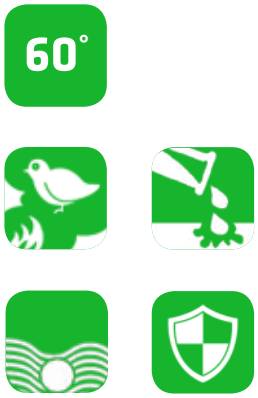
Prysmian Group

BALISE & AXLE COUNTER

AJ-2YOF(L)2YDB2Y

HALOGEN FREE & WATERTIGHT





Application

For railway signalling applications, such as wiring of light signals, point machines, balises and axle counters and similar wayside equipment, up to 420 V AC or 600 V DC. Protected against inductive interferences, for example on AC electrifed railroads. The cable is longitudinally watertight with stranded copper conductor and steel tape armouring.

Technical data

Design:
- n x 1 x diameter mm

Bending radius:
- Flexible: ≥ 20 x D
- Fixed: ≥ 15 x D

Temperature range
- During installation: - 10°C to + 60°C
- In operations: - 40°C to + 60°C

Material property
- Halogen free: IEC 60754-1 & 2

Construction

Conductor:
- Solid copper wires
- Soft annealed
- Diameter 0.9 or 1.4 or 1.8 mm

Insulation:
- PE (2Y)
- Naturally coloured
- Blue marking/tracer core in each layer

Twisting:
- Cores twisted in concentric layers

Filling:
- Longitudinal watertight
- Low capacitance filling compound
- Drip point > 80 °C

Moisture barrier wrapping:
- Water swellable material
- Longitudinally watertight
- Applied with overlap

Sheath:
- Laminated with AL tape 0.15 mm
- One side copolymer coated
- Bonded with PE sheath
- Black

Screen (inductive protection):
- Concentric screen of copper wires
- 0.9, 1.2, 1.4 or 1.8 mm
- 2 layers of galvanized steel tape
- 0.5 or 0.8 mm

Outer sheath:
- PE
- Black

Characteristics	Unit	0.9 mm	1.4 mm	1.8 mm
Conductor resistance	Ω/km	≤ 28.9	≤ 11.9	≤ 7.2
Insulation resistance	GΩxkm	≥ 1.5	≥ 1.5	≥ 1.5
Mutual capacitance at 800 Hz	nF/km	≤ 115 [1]	≤ 145 [2]	≤ 145 [2]
Operating voltage DC/AC	V	≤ 600/ ≤ 420	≤ 600/ ≤ 420	≤ 600/ ≤ 420
Test voltage at 50 Hz - 1 min				
core/core	V_{rms}	2500	2500	2500
core/screen	V_{rms}	2500	2500	2500

[1] ≤ 120 nF/km for single core in center
[2] ≤ 155 nF/km for single core in center

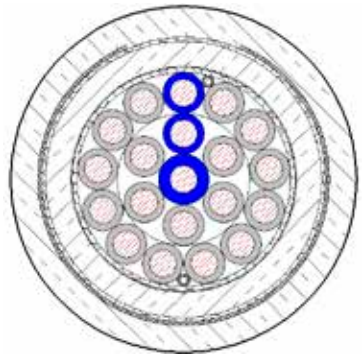
No. of cores	Reduction factor class r_k	Outer diameter mm	Weight kg/km	Standard length m	Outer diameter mm	Weight kg/km	Standard length m	Outer diameter mm	Weight kg/km	Standard length m
		n x 1 x 0.9 mm			n x 1 x 1.4 mm			n x 1 x 1.8 mm		
10	600	21.0	650	1000	22.0	790	1000	25.0	1010	1000
20	600	22.0	750	1000	26.0	1090	1000	29.0	1420	1000
30	600	24.0	900	1000	28.0	1350	1000	33.0	1840	1000
50	600	27.0	1190	1000	33.0	1890	1000	39.0	2670	1000
80	600	30.0	1560	1000	32.0	2630	1000	42.0	3770	500
120	600	35.0	2040	1000	44.0	3560	1000	52.0	5210	500
160	600	39.0	2500	1000	49.0	4460	500	58.0	6600	500
200	600	41.0	2930	1000	53.0	5290	500	63.0	7900	250
10	500	21.0	750	1000	22.0	920	1000	25.0	1150	1000
20	500	22.0	870	1000	26.0	1230	1000	29.0	1570	1000
30	500	24.0	1040	1000	28.0	1490	1000	33.0	2010	1000
50	500	27.0	1320	1000	33.0	2080	1000	32.0	2870	1000
80	500	30.0	1740	1000	38.0	2850	1000	46.0	4090	500
120	500	35.0	2230	1000	45.0	3380	500	53.0	5560	500
160	500	39.0	2720	1000	50.0	4790	500	59.0	6980	250
200	500	41.0	3160	1000	54.0	5650	500	64.0	8320	250
30	400	-	-	-	-	-	-	36.0	2690	1000
50	400	-	-	-	36.0	2770	1000	43.0	3800	500
80	400	-	-	-	42.0	3770	500	49.0	5100	500
120	400	-	-	-	48.0	4870	500	56.0	6730	500
160	400	-	-	-	53.0	5880	500	62.0	8290	250
200	400	-	-	-	57.0	6830	500	67.0	9730	250

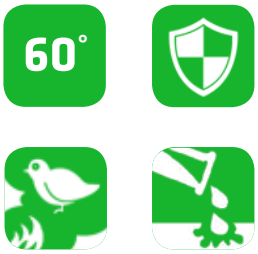
Prysmian Group

SIGNALLING

A-2Y2YB2Y

HALOGEN FREE & ARMOURED





Application

PE insulated and halogen free signalling cable, with cores in concentric layers and armouring. Suitable for railway application directly in the ground or in ducts.

Technical data

Design:

- n x 1 x diameter mm

Bending radius:

- ≥ 10 x D

Temperature range

- Drung installation: - 10°C to + 60°C
- In operations: - 40°C to + 60°C

Standard

- PH 416.0115 V1.1

Material property

- Halogen free: IEC 60754-1 & 2

Construction

Conductor:

- Solid copper wires
- Soft annealed
- Diameter 0.9 or 1.4 or 1.8 mm

Insulation:

- PE
- Natural coloured
- Blue marking/tracer core in each layer

Twisting:

- Cores twisted in concentric layers
- 2 perforated pilot cores if ≥ 14 cores
- 0.5 mm

Wrapping:

- Non-hygroscopic foil

Inner sheath:

- PE
- Black

Armouring:

- 1 layers of galvanized steel tape 0.2-3 mm
- 2 layers of galvanized steel tape 0.1 mm
- Helically applied

Outer sheath:

- PE
- Black

Characteristics	Unit	0.9 mm	1.4 mm	1.8 mm
Conductor resistance	Ω/km	≤ 28.9	≤ 11.9	≤ 7.2
Insulation resistance	GΩxkm	≥ 10	≥ 10	≥ 10
Mutual capacitance at 800 Hz	nF/km	≤ 115 [1]	≤ 145 [2]	≤ 145 [2]
Operating voltage DC/AC	V	≤ 600/ ≤ 420	≤ 600/ ≤ 420	≤ 600/ ≤ 420
Test voltage at 50 Hz - 1 min				
core/core	V_{rms}	2500	2500	2500
core/screen	V_{rms}	2500	2500	2500

[1] ≤ 120 nF/km for single core in center
[2] ≤ 155 nF/km for single core in center

No. of cores	Outer diameter mm	Weight kg/km	Standard length m	Outer diameter mm	Weight kg/km	Standard length m	Outer diameter mm	Weight kg/km	Standard length m
	n x 1 x 0.9 mm			n x 1 x 1.4 mm			n x 1 x 1.8 mm		
4	14.0	190	1000	14.0	190	1000	15.5	250	1000
7	15.5	260	1000	15.5	260	1000	17.0	350	1000
10	18.0	340	1000	180.	340	1000	20.0	470	1000
14	19.0	420	1000	19.0	420	1000	21.0	600	1000
20	21.0	550	1000	21.0	550	1000	24.0	800	1000
24	22.0	360	1000	22.0	630	1000	26.0	910	1000
30	23.0	750	1000	23.0	750	1000	27.0	1100	1000
40	25.0	940	1000	25.0	940	1000	30.0	1400	1000
50	28.0	1140	1000	28.0	1140	1000	-	-	-
60	30.0	1320	1000	30.0	1320	1000	-	-	-

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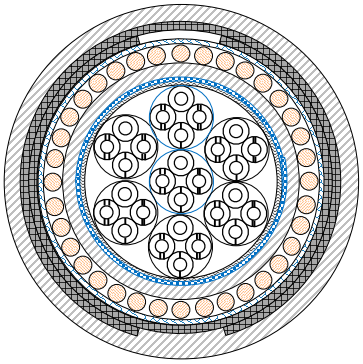
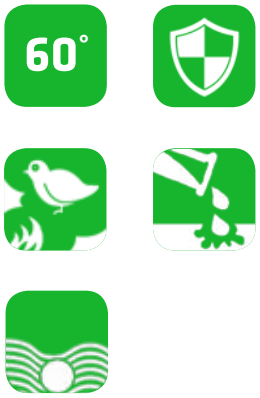
SIGNALLING

AJ-2Y(L)2YDB2Y

ARMOURED & INTERFERENCE PROTECTED





Application

For railway signalling application for transmission of low frequent signal through symmetric circuits, for example axle counter devices and similar wayside equipment. Protected against inductive interferences, for example on AC electrified railroads. The cable is star quad stranded with steel tape armouring.

Technical data

Design:

- n x 4 x diameter mm

Bending radius:

- ≥ 10 x D

Temperature range

- Upon installation: - 10°C to + 60°C
- In operations: - 40°C to + 60°C

Standard

- PH 416.0115 V1.1

Material property

- Halogen free: IEC 60754-1 & 2

Construction

Conductor:

- Solid copper wires
- Soft annealed
- Diameter 0.9 or 1.4 mm

Insulation:

- PE (2Y)
- Natural colour with black ring marketing
- Quad in each layer carry open blue helix

Twisting:

- Cores twisted to star quads
- Quads laid up in concentric layers
- 2 perforated pilot cores if ≥ 7 quads

Wrapping:

- Non-hygroscopic plastic tape

Moisture barrier:

- Laminated sheath
- Aluminium tape 0.15 mm
- One side copolymer coated
- Bonded with inner sheath

Inner sheath:

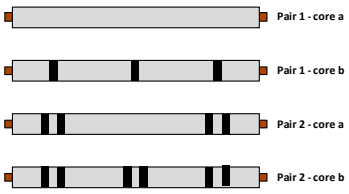
- PE
- Black

Armouring:

- Copper wires
- Helically applied

Outer sheath:

- PE (2Y)
- Black



Characteristics	Unit	0.9 mm	1.4 mm
Conductor loop resistance	Ω/km	≤ 56.6	≤ 23.4
Insulation resistance	GΩxkm	≥ 10	≥ 10
Mutual capacitance at 800 Hz	nF/km	≤ 45 [1)]	≤ 45 [1)]
Capacitance unbalance at 800 Hz			
k_1 (100 % / 50 % of all values)	pF/500 m	≤ 650 / ≤ 150	≤ 650 / -
k_{9-12} neighboured quads	pF/500 m	≤ 500 / ≤ 150	≤ 500 / -
k_{9-12} over-neighboured quads	pF/500 m	≤ 150	≤ 150
$e_{a1/2}$	pF/500 m	≤ 1300	≤ 1300
Far-end crosstalk attenuation at 90 kHz			
100 % / 80 % of all values	dB/km	≥ 58 / ≥ 62	≥ 33 / -
Attenuation at 90 kHz	dB/km	≤ 3.3	≤ 2.6
Test voltage at 50 Hz - 1 min			
core/core	V_{rms}	2500	2500
core/screen	V_{rms}	2500	2500

[1)] ≤ 52 nF/km for 1 x 4 x ø and for central quads, where 1st layer consist only of one quad, as well as in the outer layer of armoured cables.

No. of quads	Reduction factor class r_k	Outer diameter mm	Weight kg/km	Standard length m	Outer diameter mm	Weight kg/km	Standard length m
		n x 4 x 0.9 mm (H45)			n x 4 x 1.4 mm (H45)		
3	600	21.0	800	1000	-	-	-
5	600	23.0	1010	1000	-	-	-
10	600	28.0	1430	1000	-	-	-
20	600	35.0	2130	1000	-	-	-
30	600	40.0	2800	1000	-	-	-
40	600	45.0	3380	1000	-	-	-
3	500	-	-	-	25.0	1350	1000
5	500	-	-	-	29.0	1760	1000
10	500	-	-	-	37.0	2620	1000
20	500	-	-	-	47.0	4040	500
30	500	-	-	-	54.0	5330	500
40	500	-	-	-	61.0	6550	500
5	400	-	-	-	31.0	2470	1000
10	400	31.0	2250	1000	39.0	3610	1000
20	400	38.0	3240	1000	49.0	5260	500
30	400	43.0	4080	500	56.0	6690	500
40	400	48.0	4800	500	63.0	8070	250

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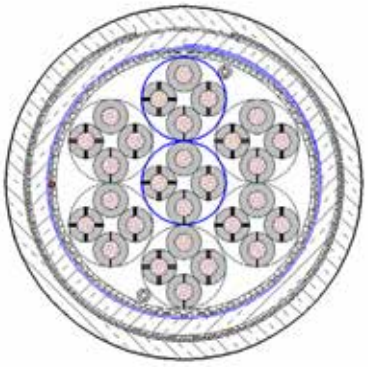
SIGNALLING

A-H(L)HV

HALOGEN FREE & STAR QUADS TWISTED



70°

low

Application

For railway signalling application for transmission of low frequent signal through symmetric circuits or for laying directly in the ground or ducts. Concentrically stranded into star quads and steel tape armoured.

Technical data

Design:

- n x 4 x diameter mm

Bending radius:

- ≥ 7.5 x D

Temperature range

- During installation: - 5°C to + 50°C
- In operations: - 30°C to + 70°C

Standard

- PH 416.0115

Material property

- Halogen free: IEC 60754-1
- Flame retardant: IEC 60332-3
- Smoke density: EN 60134

Construction

Conductor:

- Solid copper wires
- Soft annealed
- Diameter 0.9 or 1.4 mm

Insulation:

- PE, halogen free
- Natural colour with black ring marketing
- Quad in each layer carry open blue helix

Twisting:

- Cores twisted to star quads
- Quads laid up in concentric layers
- 2 perforated pilot cores if ≥ 7 quads

Wrapping:

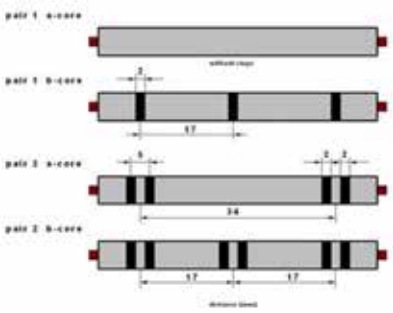
- Foil or plastic
- Flame retardant

Moisture barrier:

- Laminated sheath
- Aluminium tape 0.15 mm
- One side copolymer coated
- Bonded with sheath

Outer sheath:

- PE, flame retardant
- Black



Characteristics	Unit	0.9 mm	1.4 mm
Conductor loop resistance	Ω/km	≤ 56.6	≤ 23.4
Insulation resistance	GΩxkm	≥ 10	≥ 10
Mutual capacitance at 800 Hz	nF/km	≤ 45 [1)]	≤ 45 [1)]
Capacitance unbalance at 800 Hz			
k_1 (100 % / 50 % of all values)	pF/500 m	≤ 650 / ≤ 150	≤ 650 / -
k_{9-12} neighboured quads	pF/500 m	≤ 500 / ≤ 150	≤ 500 / -
k_{9-12} over-neighboured quads	pF/500 m	≤ 150	≤ 150
$e_{a1/2}$	pF/500 m	≤ 1300	≤ 1300
Far-end crosstalk attenuation at 90 kHz			
100 % / 80 % of all values	dB/km	≥ 58 / ≥ 62	≥ 33 / -
Attenuation at 90 kHz	dB/km	≤ 3.3	≤ 2.6
Test voltage at 50 Hz - 1 min			
core/core	V_{rms}	2500	2500
core/screen	V_{rms}	2500	2500

[1)] ≤ 52 nF/km for 1 x 4 x ø and for central quads, where 1st layer consist only of one quad, as well as in the outer layer of armoured cables.

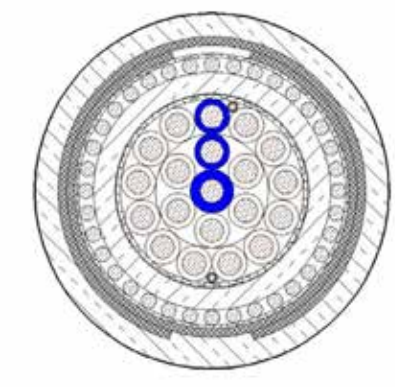
No. of quads	Outer diameter mm	Weight kg/km	Standard length m	Outer diameter mm	Weight kg/km	Standard length m
	n x 4 x 0.9 mm (H45)			n x 4 x 1.4 mm (H45)		
1	10.0	130	1000	12.0	200	1000
3	14.5	250	1000	19.0	430	1000
5	17.0	350	1000	22.5	630	1000
7	18.0	430	1000	24.5	800	1000
10	21.5	570	1000	29.5	1,080	1000
14	24.0	720	1000	33.5	1,450	1000
20	27.5	950	1000	39.5	1,960	1000
30	33.0	1,350	1000	46.5	2,780	1000
40	37.5	1,730	1000	53.0	3,590	1000

Prysmian Group

SIGNALLING

A-2Y2YDB2Y

HALOGEN FREE & INTERFERANCE PROTECTED



60°

Application

PE insulated and halogen free signalling cable, with cores in concentric layers and protected against inductive interferences. Suitable for railway application directly in the ground or in ducts.

Technical data

Design:

- n x 1 x diameter mm

Bending radius:

- ≥ 7.5 x D

Temperature range

- Drung installation: - 10°C to + 60°C
- In operations: - 40°C to + 60°C

Standard

- PH 416.0113 v 1.1

Material property

- Halogen free: IEC 60754

Construction

Conductor:

- Solid copper wires
- Soft annealed
- Diameter 0.9 or 1.4 or 1.8 mm

Insulation:

- PE (2Y)
- Natural coloured
- Blue marking/tracer core in each layer

Twisting:

- Cores twisted in concentric layers
- 2 perforated pilot cores if ≥ 14 cores
- 0.5 mm

Wrapping:

- Non-hygroscopic plastic tape

Inner sheath:

- PE (2Y)
- Black

Protective screen:

- Concentric layer of copper wires
- Diameter 0.9, 1.4 or 1.8 mm
- 2 layers of galvanized steel tape
- Diameter 0.5 or 0.8 mm

Outer sheath:

- PE (2Y)
- Black

Characteristics	Unit	0.9 mm	1.4 mm	1.8 mm
Conductor resistance	Ω/km	≤ 28.9	≤ 11.9	≤ 7.2
Insulation resistance	GΩxkm	≥ 10	≥ 10	≥ 10
Mutual capacitance at 800 Hz	nF/km	≤ 115 [1]	≤ 145 [2]	≤ 145 [2]
Operating voltage DC/AC	V	≤ 600/ ≤ 420	≤ 600/ ≤ 420	≤ 600/ ≤ 420
Test voltage at 50 Hz - 1 min				
core/core	V_{rms}	2500	2500	2500
core/screen	V_{rms}	2500	2500	2500

[1] ≤ 120 nF/km for single core in center
[2] ≤ 155 nF/km for single core in center

No. of cores	Outer diameter mm	Weight kg/km	Standard length m	Outer diameter mm	Weight kg/km	Standard length m	Outer diameter mm	Weight kg/km	Standard length m
	n x 1 x 0.9 mm			n x 1 x 1.4 mm			n x 1 x 1.8 mm		
8	16	470	1000	-	-	-	-	-	-
10	19	520	1000	21.0	670	1000	23	970	1000
20	20	650	1000	23.5	940	1000	27	1,410	1000
30	22	780	1000	27.0	1,180	1000	30	1,780	1000
50	25	1,010	1000	31.0	1,650	1000	36	2,520	1000
80	29	1,330	1000	35.0	2,270	1000	42	3,570	1000
120	32	1,740	1000	41.0	3,110	1000	49	5,950	1000
160	35	2,310	1000	46.0	3,900	1000	55	6,170	1000
200	38	2,520	1000	49.0	4,670	1000	59	7,380	1000

Prysmian Group

CONTROL

MCMO 450/750 V

FLAME RETARDANT & SCREENED

70°

Application

Cable for control, measuring and signal circuits of electrical equipment. Suitable for fixed surface and flush-mounted installations indoors and outdoors as well as for direct burial in the ground. The concentric copper conductor forms a good electromechanical protection and a moderate protection against electrical interference.

Technical data

Rated voltage:
- 450/750 V

Pulling force:
- Max. 50 N/mm²

Test voltage:
- 2,500 V

Capacitance at 20°C:
- Between 2 adjacent cores: 130-160 nF/km
- To earth for 1 core: 200-280 nF/km

Temperature range

- In operations: max. +70°C
- Short circuit temperature: +160°C
- Lowest temp. at installation: -15°C

Standard & Directive & Approval

Standard:
- SFS 3713
- HD 627S1: 4-D
- IEC 60228

Directive:
- Fulfills RoHS

Approval:
- CPR class: Eca

Construction

Conductor:
- Round copper wires
- Solid and annealed
- Acc. to IEC 60228 class 1.

Insulation:
- Lead free compound
- Black
- White numbering

Filling:
- Lead free compound

Screen:
- Helix of copper wires
- Counter helix of copper wires or tape
- Min. cross-section area 6 mm²

Outer sheath:
- PVC
- Lead free
- Black

Material property

- Flame retardant: IEC 60332-1

Content is subject to changes acc. to current product development and or any changes to standards.

Conductor cross-section mm²	Outer diameter mm	Weight kg/km	Current rating in free air A	Standard delivery m	Prysmian article no.
7 x 1.5	14	310	13	500 - K8	0601901
12 x 1.5	18	480	11	400 - K8	0601902
19 x 1.5	21	650	9	500 - K11	0601903
27 x 1.5	24	860	8	500 - K11	0601904
37 x 1.5	27	1,200	7	400 - K11	0601905
7 x 2.5	17	450	16	500 - K8	0601921
12 x 2.5	21	670	13	500 - K11	0601922
19 x 2.5	24	930	11	500 - K11	0601923
27 x 2.5	28	1,300	10	500 - K12	0601924

CONTROL

MCCMO-HF C-PRO 450/750 V

EMC SCREENED & FLAME RETRADANT

Application
EMC shielded control cable with copper conductors. Halogen free, flame retardant and self-extinguishing in the event of fire. For fixed installation, indoors, outdoors, in pipes, ground or water. Suitable for switchgear and potentially explosive areas. Can be plowed down with caution. The copper screen has 100% coverage and meets EMC Directive with appropriate installation.

Technical data
Rated voltage:
- 450/750 V

Test voltage:
- 2,500 V

Bending radius::
- During installation: 10 x D
- Fixed: 8 x D

Temperature range
- In operations: max. +90°C
- Short circuit temperature: +250°C
- Lowest temp. at installation: -15°C

Standard & Directive
Standard:
- HD 627 7B2

Directive:
- Fulfills RoHS and REACH

Approval:
- CPR class: Cca-s1d1a1

Construction
Conductor:
- Round copper wires
- Solid and annealed
- Acc. to IEC 60228 class 1.

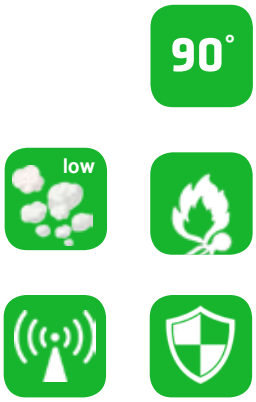
Insulation:
- HFFR
- White
- Black numbering

Filling:
- Halogen free

Screen:
- Helix of copper wires
- Counter helix of copper wires or tape
- Min. cross-section area 6 mm²

Outer sheath:
- Halogen free polymer
- Black

Material property
- Halogen free: IEC 60754-1
- Flame retardant: IEC 60332-1 & 3
- Smoke density: EN 60134



Content is subject to changes acc. to current product development and or any changes to standards.

Conductor cross-section mm²	Outer diameter mm	Weight kg/km	Standard delivery m	Prysmian EAN no.
7 x 1.5	14.1	340	1000 - K9	
12 x 1.5	15.9	449	500 - K8	
19 x 1.5	17.3	481	1000 - K11	
7 x 2.5	20.0	666	1000 - K12	
12 x 2.5	19.7	647	500 - K9	

Prysmian Group

CONTROL

MKMO-HF C-PRO 450/750 V

LOW SMOKE & HALOGEN FREE

70°

low

Application

Cable for the control, measuring and signal circuits of electrical equipment for fixed surface and flush-mounted installations. Suitable for indoors and outdoors installation especially in places where the cable is exposed to vibration. Not suitable for installation directly in the ground, vibrated concrete or exposed to electrical interference

Technical data

Rated voltage:
- 450/750 V

Pulling force:
- Max. 50 N/mm²

Test voltage:
- 2,500 V

Max. DC resistance at 20°C:
- 12 Ω/km

Capacitance at 20°C:
- Between 2 adjacent cores: 120-150 nF/km

Temperature range

- In operations: max. +70°C
- Short circuit temperature: +160°C
- Lowest temp. at installation: -20°C

Standard & Directive & Approval

Standard:
- EN 50363 and SFS 3714
- IEC / EN 60332-1-2
- IEC / EN 61034
- EN 50267

Directive:
- Fulfills REACH and RoHS

Approval:
- CPR class: Cca

Construction

Conductor:
- Round copper wires
- Stranded and annealed
- Acc. to IEC 60228 class 2.

Insulation:
- Halogen free compound
- Black

Core colouring/marking:
- Acc. to EN 50334
- 7-core(N): White numbering
- 7-core(S): Yellow/green, white numbering
- 12-37 core: White numbering

Wrapping:
- Plastic tape

Outer sheath:
- Halogen free compound
- White

Material property

- Halogen free: IEC 60754-1
- Smoke density: IEC 61034

Content is subject to changes acc. to current product development and or any changes to standards.

Conductor cross-section mm²	Outer diameter mm	Weight kg/km	Current rating in free air A	Standard delivery m	Prysmian article no.
7 x 1.5 (N)	13	210	13	500 - K8	043331
7 x 1.5 (S)	13	210	13	500 - K8	043330
12 x 1.5	16	320	11	500 - K8	043332
19 x 1.5	19	480	9	500 - K9	043333
37 x 1.5	25	880	7	500 - K11	043334

CONTROL

MCMOE-PE 450/750 V

SCREENED & PE SHEATED

Application

PE insulated and sheated control cable with concentric copper conductor especially for railway application.

Technical data

Rated voltage:
- 450/750 V

Test voltage:
- 2,500 V

Pulling force:
- Max. 50 N/mm²

Temperature range
- In operations: max. +70°C
- Short circuit temperature: +130°C

Standard & Directive

Standard:
- SFS 3713
- IEC 502
- IEC 60228
- IEC 60502-1

Directive:
- Fulfills RoHS

Construction

Conductor:
- Round copper wires
- Solid and annealed
- Acc. to IEC 60228 class 1.

Insulation:
- PE, extruded acc. to IEC 502
- Black
- White numbering

Filling:
- Extruded covering/seperation sheath

Screen:
- Helix of copper wires
- Counter helix of copper wires

Outer sheath:
- Extruded PE
- Type ST_3
- Acc. to IEC 60502-1
- Black

70°

Content is subject to changes acc. to current product development and or any changes to standards.

Conductor cross-section mm²	Outer diameter mm	Weight kg/km	Max. resistance of conductor Ω/km	Max. resistance of screen Ω/km	Prysmian EAN no.
12 x 1.5	20	440	21.1	3.08	
19 x 1.5	22	580	21.1	3.08	
27 x 1.5	25	770	21.1	3.08	
37 x 1.5	28	1,000	21.1	2.6	
48 x 1.5	32	1,300	21.1	2.6	
61 x 1.5	35	1,600	21.1	2.6	
12 x 2.5	23	630	7.41	3.08	
27 x 2.5	31	1,200	7.41	2.6	
37 x 2.5	34	1,550	7.41	2.6	

Prysmian Group

CONTROL

MMO 450/750 V

PVC INSULATED & FLAME RETARDED

70°

Application

Cable for control, measuring and signal circuits of electrical equipment. Suitable for fixed surface or flush-mounted installations, indoors and outdoors. Direct sunlight may change the colour of the sheath.

Technical data

Rated voltage:
- 450/750 V

Test voltage:
- 2,500 V

Bending radius:
- During installation:10 x D
- In operation: 3 x D

Temperature range

- In operations: max. +70°C
- Short circuit temperature: +160°C
- Lowest temp. at installation: -15°C

Standard & Approval

Standard:
- EN EVS 722
- SFS 3714
- HD 627

Approval:
- CPR class: Eca

Construction

Conductor:
- Round copper wires
- Aannealed
- Solid
- Acc. to IEC 60228 class 1.

Insulation:
- PVC
- Black
- White core numbering

Wrapping:
- Plastic tape

Outer sheath:
- HPVC
- White

Material property

- Flame retardant: IEC 60332-1

Content is subject to changes acc. to current product development and or any changes to standards.

Conductor cross-section mm²	Outer diameter mm	Weight kg/km	Current resistance of conductor at 20°C - max.Ω/km	Standard delivery m	Prysmian EAN no.
7 x 1.5	12	230	12.1	1000 - K8	6410011203-8
12 x 1.5	15	350	12.1	500 - K8	6410011205-2
19 x 1.5	18	500	12.1	500 - K9	6410011207-6
27 x 1.5	21	700	12.1	500 - K11	6410012025-5
37 x 1.5	24	950	12.1	500 - K11	6410012026-2
7 x 2.5	14	310	7.41	500 - K8	6410011213-7
12 x 2.5	18	500	7.41	500 - K8	6410011215-1
19 x 2.5	21	750	7.41	500 - K11	6410011217-5


324
326

Prysmian Group

ALONG THE TRACK

FZOMVDMU-SD

OUTDOOR & ARMOURED STRANDED LOOSE TUBE

70°

Application

Applications include outdoor data communication connections, telecom trunk lines, telecom access net connections and CATV trunk lines. The intended installation method for this cable is for direct burial under general conditions or with risk of severe rodent attack.

Technical data

Tensile strength:
- Max. installation: 5 kN
- Max. operation: 3.4 kN

Crush:
- 6,000 N, 100 mm, max 15 min.
- 2,000 N, 25 mm, max 15 min.

Impact:
- 40 J, 3 impacts, R=300 mm

Repeated bending:
- 30 reverse bends, R = 300 mm

Torsion:
- 100 N, ± 180°C, 10 cycles

Repeated bending:
- R=20 x D, 100 N, 35 cycles

Cable bend:
- R=20 x D, 4 turns, 3 cycles

Bending radius:
- Loaded:15 x D
- Unloaded: 20 x D

Water penetration:
- Sample=3 m, water column = 1 m
- No water leakage after 24 hours

Temperature range

- Storage: - 40°C to + 60°C
- Installation: - 30°C to + 60°C
- Operation: - 40°C to + 70°C

Construction

Central strength member CSM:
- Glass reinforced plastic rod - FRP
- Plastic oversheating when needed

Fibre colour code:
- 1 blue, 2 white, 3 yellow, 4 green 5 grey, 6 orange, 7 brown, 8 aqua 9 black, 10 violet, 11 pink, 12 red.

Loose tube:
- Thermoplastic material
- Watertight compound
- 12 fibers in each

Filler:
- Thermoplastic rods, when needed

Stranding:
- Loose tubes and filles
- SZ stranded around CSM

Water blocking:
- Longitudinal watertight
- Water swellable elements
- Dry core

Rip cord:
- 2 rip cords

Inner sheath:
- PE, 1.0 mm

Peripheral reinforcement:
- Aramid yarns

Rip cord:
- 2 rip cords

Armouring:
- Corrugated steel tape with overlap
- Both sides copolymer coated

Outer sheath:
- HDPE 1.5 mm
- Black

Standard

- IEC 60794-3-10

Content is subject to changes acc. to current product development and or any changes to standards.

Fibre count	No tubes x no. fibres	Loose tube diameter mm	CSM diameter m	CMS oversheat diameter m	Cable diameter m	Cable weight kg/km	Prysmain article no.
24	2 x 12	2.8	3.0	-	15.6	220	60022748
48	4 x 12	2.8	3.0	-	15.6	220	60022749
96	8 x 12	2.8	3.0	4.8	17.4	270	60022750
192	6 x 12 + 10 x 12	2.8	3.0	-	21.2	375	60022747

ALONG THE TRACK

FYOVD2PMU

ARMOURED & WATERTIGHT LOOSE TUBE

Application

Optical fibre cable with dry core and longitudinal watertight. Armoured with corragated steel tape for extra protection. Suitable for direct buried applications.

Technical data

Tensile strength:
- Max. installation: 5 kN

Crush:
- 6000 N per 100 mm

Impact:
- 30 Nm, 3 impacts, R=300 mm

Torsion:
- 100 N, ± 1 turn, 5 cycles

Repeated bending:
- R=15 x D, 100 N, 35 cycles

Cable bend:
- R=20 x D, 5 turns, 3 cycles

Bending radius:
- Loaded: 25 x D
- Unloaded: 20 x D

Water penetration:
- Sample=3 m, water column = 1 m
- No water leakage after 24 hours

Standard
- IEC 60794-3-10

Temperature range
- Storage: - 45°C to + 60°C
- Installation: - 15°C to + 40°C
- Operation: - 45°C to + 60°C

Construction

Central loose tube:
- Thermoplastic material
- Filled with water tightness compound
- 12 single-mode optical fibres

Fibre colour code:
- 1 blue, 2 white, 3 yellow, 4 green 5 grey, 6 orange, 7 brown, 8 aqua 9 black, 10 violet, 11 pink, 12 red.

Yarn colours:
- 1 blue, 2 white, 3 yellow, 4 green

Water blocking:
- Water swellable tape
- Longitudian watertight
- Dry core

Armouring:
- Corrugated steel tape with overlap
- 0.15 mm
- Copolymer coated
- 1 rip cord

Strength element:
- 2 steel wires
- Diametrically opposed
- Longitudinally applied
- Nom. diameter 1.6 mm

Outer sheath:
- PE
- Black

Content is subject to changes acc. to current product development and or any changes to standards.

Fibre count	No. of tubes x no. fibres	Loose tube diameter mm	Cable diameter mm	Cable weight kg/km	Standard length km	Prysmain article no.
6	1 x 6	5	12.5	170	2, 4 or 6	
12	1 x 12	5	12.5	170	2, 4 or 6	
24	2 x 12	5	12.5	170	2, 4 or 6	
48	4 x 12	6	13.5	195	2, 4 or 6	

Prysmian Group

ALONG THE TRACK

FTMVDMSU

UNIVERSAL, ARMOURED & WATERTIGHT

Application

Universal distribution or mini-break-out cable for indoor and outdoor application in LAN and WAN backbones, central office interconnections and backbones in data centres. Suitable for installation in ducts, on trays and directly buried. Designed with double sheathing where the outer one is both UV stabilised, water and moisture resistant. Between the two sheaths there is a steel tape armouring making the cable rodent proof.

Technical data

Impact:
- 20 Nm

Crush:
- 3,000 N / 100 mm

Torsion:
- 5 cycles ± 1 turn

Kink:
- No kink at bending radius 12 x D

Bending radius:
- For stranded fibres: min. 20 mm
- For MaxCap-BB-Omx fibres: min. 7.5 mm
- For BendBright XS fibres: min. 7.5 mm

Temperature range

- Storage: - 40°C to + 70°C
- Installation: - 20°C to + 70°C
- Operation: - 20°C to + 70°C

Material property

- Flame retardant: IEC 60332-1-2
- Acidity: IEC 60754-2
- Smoke density: IEC 61034

Construction

Fibre:
- 2-24 tight buffered fibres
- 900 µm ± 50 µm

Fibre colour code:
- 1 red, 2 green, 3 blue, 4 yellow, 5 white 6 grey, 7 brown, 8 violet, 9 turquoise, 10 black, 11 orange, 12 pink

Fibre colour code with mark every 70 mm
- 13 yellow, 14 white, 15 grey, 16 turquoise, 17 orange, 18 pink

Fibre colour code with mark every 35 mm
- 19 yellow, 20 white, 21 grey, 22 turquoise 23 orange, 24 pink

Strength member:
- Ultra-high modulus aramid yarns

Inner sheath:
- Thermoplastic sheating compound
- Acc. to EN 50290-2-27.
- Halogen free and flame retardant
- UV stabilised

Armouring:
- Corrugated steel tape 0,15 mm

Outer sheath:
- 1.5 mm FireBur® material
- Flame retardant and UV stabilised
- Acc. to EN 50290-2-27
- Blue

Standard & Approval

Standard:
- ISO 11801 2nd edition, EN 187 000
- IEC 60794-1 & 2, EN 50 173-1
- IEC 60794-2-20

Approval:
- CPR class: Eca

Content is subject to changes acc. to current product development and or any changes to standards.

Fibre count	Outer diameter mm	Weight kg/km	Installation load max. N	Tensile strength N		Bending radius	
				Short term	Permanent	Min.	Max.
2	8.5	90	1,000	560	280	130	170
4	8.5	90	1,000	560	280	130	170
6	11.0	130	1,000	560	280	170	220
8	11.0	130	1,000	560	280	170	220
12	11.0	130	1,200	680	340	170	220
16	11.0	230	1,200	680	340	170	220
24	14.0	230	2,000	1,000	500	200	260

ALONG THE TRACK

FTMRMSU

UNIVERSAL, WATERTIGHT & ROBUST

Application

Universal distribution or mini-break-out cable suited for indoor and outdoor applications such as LAN and WAN backbones, central office inter-connections, backbones in data centres and many other applications.
Suitable for installation on trays or directly buried in ducts that occacationally floods.
Designed with double sheathing that makes it UV stabilised, water and moisture resistant.
Between the two sheaths there is a layer of coated and water blocking glass yearns, giving the cable a very high tensile strength and a degree of rodent protection.

Technical data

Impact:
- 15 Nm

Crush:
- 2,000 N / 100 mm

Torsion:
- 5 cycles ± 1 turn

Bending radius:
- For stranded fibres: min. 20 mm
- For Max-Cap-BB-Omx fibres: min. 7.5 mm
- For BendBright XS fibres: min. 7.5 mm

Temperature range

- Storage: - 40°C to + 70°C
- Installation: - 20°C to + 70°C
- Operation: - 20°C to + 70°C

Material property

- Flame retardant: IEC 60332-1
- Acidity: IEC 60754-2
- Smoke density: IEC 61034

Construction

Fibre:
- 2-24 tight buffered fibres
- 900 µm ± 50 µm

Fibre colour code:
- 1 red, 2 green, 3 blue, 4 yellow, 5 white 6 grey, 7 brown, 8 violet, 9 turquoise, 10 black, 11 orange, 12 pink

Fibre colour code with mark every 70 mm
- 13 yellow, 14 white, 15 grey, 16 turquoise, 17 orange, 18 pink

Fibre colour code with mark every 35 mm
- 19 yellow, 20 whie, 21 grey, 22 turquoise 23 orange, 24 pink

Strength member:
- Ultra-high modulus aramid yarns

Inner sheath:
- LZSH compound
- Acc. to EN 50290-2-27.
- Halogen free and flame retardant
- UV stabilised

Reinforcement:
- Coated glass yarns

Ripcord:
- Polyester

Outer sheath:
- 1.2 mm FireBur® material
- Flame retardant and UV stabilised
- Acc. to EN 50290-2-27
- Blue

Standard

- ISO 11801 2nd edition
- EN 187 000
- IEC 60794-2
- EN 50 173-1
- IEC 60794-2-20

Content is subject to changes acc. to current product development and or any changes to standards.

Fibre count	Outer diameter nom. mm	Weight nom. kg/km	Tensile strength short term N	Tensile strength permanent N	Bending radius min. mm	Prysmian article no.
2	9	80	2,700	1,300	110	60033616
4	9.5	85	2,700	1,300	105	60033615
24	13	140	3,600	1,800	130	60036524
4	9,5	85	2,700	1,300	105	60041029
16	11	115	3,200	1,600	120	60042476
24	13	140	3,600	1,800	130	60047265

Prysmian Group

ALONG THE TRACK

FZORMU-SD

OUTDOOR STRANDED LOOSE TUBE

70°

Application

Outdoor cable for LAN, MAN and telecom backbone installations direct in the ground or in trenches using ploughing method. Designed with a layer of coated and water blocking glass yearns, giving the cable a very high tensile strength and a degree of rodent protection.

Technical data

Short term tensile strength:
- 5,000 N

Permanent tensile strength:
- 3,500 N

Crush:
- 3,000 N

Impact:
- 20 Nm

Torsion:
- 5 cycles ± 1 turn

Kink:
- No kink at bending radius 12 x D

Bending radius:
- For 72 fibres: min. 150 mm
- For 96 fibres: min. 175 mm

Water penetration:
- No water on free end

Temperature range

- Storage: - 40°C to + 70°C
- Installation: - 40°C to + 70°C
- Operation: - 40°C to + 70°C

Construction

Central strength member:
- 2.5 mm diameter, FPR rod

Loose tube:
- Gel filled loose tube
- 2.3 mm diameter
- 12 fibres in each
- Up to 18 tubes in to layers

Water blocking:
- Swellable tape and yarn

Wrapping:
- Swellable tape

Reinforcement:
- Heavy layer of glass yarns

Rip cord:
- Polyester

Outer sheath:
- MDPE 1.5 mm
- Black
- Acc. to IEC 60811 & 60708

Standard

- EN 187 000
- IEC 60794-3
- IEC 60794-3-10
- IEC 60794-3-12
- ISO 11801 2nd edition
- EN 50 173-1

Content is subject to changes acc. to current product development and or any changes to standards.

UC FIBRE O ST D DA PE 5.0 kN						
Cable type description	Fibre count no.	Outer diamter nom.mm	Weight nom. kg/km	Bending radius min. mm	Fibre type	Prysmian article no.
8 x 12 OM4B	96	13	140	175	MaxCap-BB-OM4	60027623
6 x 12 SM2D	72	11	105	150	OS2 Singlemode	60019579
8 x 12 SM2D	96	13	140	175	OS2 Singlemode	60019153
2 x 12 SM2D 4x12 MM61	72	11	105	150	Hybrid OS2 24 Singlemode + 48 OM1 62.5/125 multimode	60024964
4 x 12 SM2D 4 x 12 OM2B	96	13	140	175	Hybrid OS2 48 Singlemode + 48 MaxCap-BB-OM2	60031874

ALONG THE TRACK

FZOMVDMSU-SD

OUTDOOR & ARMOURED STRANDED LOOSE TUBE

Application

Armoured outdoor cable for data communication connections, CATV trunk lines, telecom trunk lines and telecom access net connections. For direct burial in general conditions or with risk of severe rodent attacks.

Technical data

Short term tensile strength:
- 1,800 N

Permanent tensile strength:
- 1,200 N

Crush:
- 3,000 N

Impact:
- 20 Nm

Repeated bending:
- 30 reverse bends, R = 300 mm

Torsion:
- 5 cycles ± 1 turn

Kink:
- No kink at bending radius 12 x D

Bending radius:
- Min. 290 mm

Water penetration:
- No water on free end (core only)

Temperature range
- Storage: - 60°C to + 60°C
- Installation: - 30°C to + 60°C
- Operation: - 60°C to + 70°C

Construction

Central strength member:
- 2.5 mm diameter, FPR rod

Fibre colour code:
- 1 red, 2 green, 3 blue, 4 yellow, 5 white 6 grey, 7 brown, 8 violet, 9 turquoise, 10 black, 11 orange, 12 pink.

Loose tube:
- Gel filled loose tubes
- 2.3 mm diameter
- 12 fibers in each

Water blocking:
- Swellable tape and yarn

Wrapping:
- Polyester tape

Rip cord:
- 1 rip cord

Inner sheath:
- Blue FireBur® acc. to EN 50290-2-27

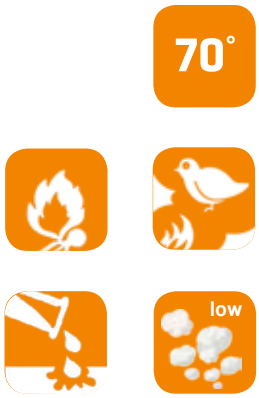
Rip cord:
- 1 rip cord

Armouring:
- Corrugated steel tape 0.155 mm

Outer sheath:
- Blue FireBur® 1.5 mm
- Ac. to EN 50290-2-27

Standard
- IEC 60794-3
- IEC 60794-3-10
- IEC 60794-3-12
- EN 50 173-1
- ISO 11801 2nd edition

Material property
- Flame retardant: IEC 60332-1
- Halogen free: IEC 60754-1
- Acidity: IEC 60754-2
- Smoke density: IEC 61034



Content is subject to changes acc. to current product development and or any changes to standards.

Fibre count	Outer diameter mm	Weight nom. kg/km	Tensile strength short term N	Bending radius min.mm	Fibre type	Product article no.
24	14.5	225	1800	290	OS2 Singlemode	
48	14.5	225	1800	290	OS2 Singlemode	60029965
72	14.5	225	1800	290	OS2 Singlemode	60020577
96	19.5	220	1800	290	OS2 Singlemode	

Prysmian Group

ALONG THE TRACK

FZOMU-SD

WEATHER PROOF & DRY CORE LOOSE TUBE

70°

Application

Outdoor weather proof and robust cable with HDPE sheath for blowing in pipes or direct installation in ducts. Both metal and halogen free. Core is dry with swellable materials and grease-filled fibre tubes to prevent longitudinal water penetration.

Technical data

Short term tensile strength:
- 2,700 N (24 -144 mm²)
- 2,000 N (192 mm²)

Permanent tensile strength:
- 1,000 N

Crush:
- 3,000 N

Impact:
- 15 Nm

Bending:
- < 0,05 dB no damage

Kink:
- < 0,05 dB no damage

Water penetration:
- < 3 m/24 hours

Temperature range

- Storage: - 40°C to + 70°C
- Installation: - 15°C to + 60°C
- Operation: - 40°C to + 70°C

Construction

Central strength member:
- 2.1 - 3.5 mm diameter, FPR rod

Loose tube:
- 2.5 or 3.0 mm diameter
- Grease filled
- SZ twisted around FPR rod

Water blocking:
- Swellable material
- Dry core

Rip cord:
- 1 rip cord

Outer sheath:
- HDPE 1.5 mm
- Black

Standard

- EN 187000, EN 1871000
- EN 187101, EN 188000
- EN 60793, IEC 60794
- ITU-T REC G650, REC G652

Material property

- Halogen free: IEC 60754-1

Content is subject to changes acc. to current product development and or any changes to standards.

Fibre count	Outer diameter nom.mm	Weight nom. kg/km	Number of tubes and fillers	Bending radius max.mm	Bending radius min.mm	Prysmian article no.
12	10.6	85	1 + 5	212	106	60046044
24	10.6	85	2 + 4	212	106	60046182
48	10.6	85	4 + 2	212	106	60046045
96	12.2	120	8 + 0	244	122	60046043
144	15.5	190	12 + 0	310	155	60046046
192	14.2	160	8 + 0	284	142	60046047

ALONG THE TRACK

FYORVDMU

OUTDOOR & ARMOURED CENTRAL LOOSE TUBE

Application

Suitable for LAN and WAN backbones, telecom access lines, fibre to business and fibre to the building drop connections as well as fibre to the home drop and access connections. MDPE sheathing ideal for outdoor installation and corrugated steel tape armouring makes it rodent proof. Applicable for installation in ducts and on trays as well as for direct burial with proper sand back filling.

Technical data

Short term tensile strength:
- 1,000 N

Permanent tensile strength:
- 500 N

Crush:
- 2,000 N

Impact:
- 10 Nm

Torsion:
- 5 cycles ± 1 turn

Kink:
- No kink at loop diameter of 100 mm

Bending radius:
- Min. unloaded: R=55 mm
- Min. loaded: R=110 mm

Temperature range

- Storage: - 40°C to + 70°C
- Installation: - 40°C to + 70°C
- Operation: - 40°C to + 70°C

Construction

Loose tube:
- 2.8 or 3.5 mm diameter
- Gel-filled
- 2-6 or 24 fibers in each

Fibre colour code:
- 1 red, 2 green, 3 blue, 4 yellow, 5 white 6 grey, 7 brown, 8 violet, 9 turquoise, 10 black, 11 orange, 12 pink

Fibre colour code with mark every 70 mm
- 13 yellow, 14 white, 15 grey 16 turquoise, 17 orange, 18 pink

Fibre colour code with mark every 35 mm
- 19 yellow, 20 white, 21 grey, 22 turquoise 23 orange, 24 pink

Strength member:
- E-glass yarns

Armouring:
- Corrugated steel tape 0.15 mm

Outer sheath:
- MDPE 1.5 mm
- Acc. to IEC 60811, IEC 60708
- Black

Standard

- IEC 60794-1
- EN 50 173-1
- ISO 11801 2nd edition

70°

Content is subject to changes acc. to current product development and or any changes to standards.

Fibre count	Outer diameter mm	Weight nom. kg/km	MaxCap-BB OM2 fibres	MaxCap-BB OM3 fibres	MaxCap OM4 fibres	OM1 62.5/125 multimode	OS2 singlemode
2	8.5	75	60024911			60019683	60018976
4	8.5	75	60011387	60018856		60018741	60018850
6	8.5	75	60018892	60019590		60018743	60018744
8	8.5	75	60018893	60019384	60043719	60018746	60018931
12	8.5	75	60018894	60011435	60019807	60018749	60018750
16	8.5	75		60019386		60011298	60011340
24	8.5	80	60018895	60019387	60043985	60011745	60018751

Prysmian Group

ALONG THE TRACK

FZOMSU-SD

INDOOR/OUTDOOR STRANDED LOOSE TUBE

Application

Indoor/outdoor backbone cable for LAN, WAN and telecom backbone installations. Robust dielectric design with a wide temperature range. The core is dry and water protected by dry water blocking technology.

Technical data

Short term tensile strength:
- 2,700 N

Tensile strength:
- 900 N

Crush:
- 3,000 N

Impact:
- 15 Nm, R=300

Torsion:
- 100 N, 10 cycles

Repeated bending:
- R=20 x D, 100 N, 35 cycles

Cable bend:
- R=20 x D, 4 turns, 3 cycles

Bending radius:
- Loaded: min. 20 x D
- Unloaded: min. 10 x D

Water penetration:
- 3 m/24 hours - no water leakage

Temperature range
- Storage: - 40°C to + 70°C
- Installation: - 30°C to + 60°C
- Operation: - 40°C to + 70°C

Standard
- IEC 60794-3-10

Construction

Central strength member (CSM):
- Glass fibre reinforced plastic rod, FPR
- Plastic oversheating when needed

Loose tube:
- Thermoplastic material
- Up to 12 fibres per tube
- Filled with watertight compound

Fibre colour code:
- 1 blue, 2 yellow, 3 red, 4 white, 5 green 6 violet, 7 orange, 8 grey, 9 aqua 10 black, 11 brown, 12 pink

Filler:
- Thermoplastic rods, where needed

Stranding:
- SZ stranded around the CSM rod

Water blocking:
- Longitudinal watertight
- Water swellable material
- Dry core

Strength member:
- Glass yarns, when needed

Rip cord:
- 2 rip cords

Outer sheath:
- HFFR compound
- Black

Material property
- Flame retardant: IEC 60332-1
- Halogen free: IEC 60754-1
- Acidity: IEC 60754-2
- Smoke density: IEC 61034

Content is subject to changes acc. to current product development and or any changes to standards.

No. of fibres	12	24	36	48
No. tubes x no. fibres	5 x 12	5 x 12	5 x 12	5 x 12
Loose tube/filler diameter mm	2.5	2.5	2.5	2.5
CSM diameter mm	2.1	2.1	2.1	2.1
CSM oversheathing diameter mm	-	-	-	-
Outer sheath thickness mm	1.5	1.5	1.5	1.5
Cable diameter mm	11.0	11.0	11.0	11.0
Cable weight kg/km	110	110	110	110

ALONG THE TRACK

FZOMSU-SD NANO

INDOOR/OUTDOOR STRANDED NANO CABLE

Application

Indoor/outdoor backbone cable for LAN, WAN and telecom backbone installations. Robust dielectric design with a wide temperature range. The core is dry and water protected by dry water blocking technology.

Technical data

Tensile strength:
- 750 N

Crush:
- 1,000 N

Impact:
- 1 Nm, 3 impacts, R=300 mm

Torsion:
- 45 N, ± 180°, 100 cycles

Repeated bending:
- 150 mm, 10 N, 100 cycles

Cable bend:
- 150 mm, 6 turns, 10 cycles

Bending radius:
- Loaded: min. 20 x D
- Unloaded: min. 10 x D

Water penetration:
- 3 m/24 hours - no water leakage

Temperature range
- Storage: - 40°C to + 70°C
- Installation: - 30°C to + 60°C
- Operation: - 30°C to + 70°C

Standard
- IEC 60794

Construction

Central strength member (CSM):
- Glass fibre reinforced plastic rod, FPR

Loose tube:
- Thermoplastic material
- Up to 12 fibres per tube
- Filled with water tightness compound

Fibre colour code:
- 1 white, 2 red, 3 yellow, 4 green, 5 blue, 6 grey, 7 brown, 8 black, 9 violet, 10 aqua, 11 orange, 12 pink

Filler:
- Thermoplastic rods, where needed

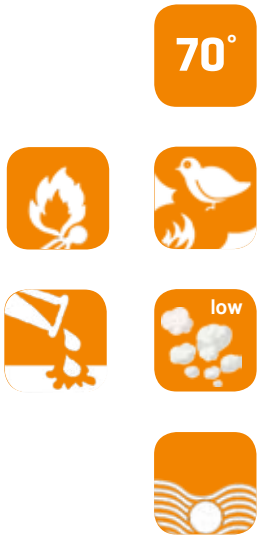
Stranding:
- Loose tubes (and filles)
- SZ stranded around the CSM rod

Water blocking:
- Longitudinal watertight
- Water swellable material
- Dry core

Rip cord:
- 1 rip cord

Outer sheath:
- HFFR compound
- Black

Material property
- Flame retardant: IEC 60332-1
- Halogen free: IEC 60754-1
- Acidity: IEC 60754-2
- Smoke density: IEC 61034



Content is subject to changes acc. to current product development and or any changes to standards.

No. of fibres	24	48	96
No. tubes x no. fibres	2 x 12	4 x 12	8 x 12
Loose tube/filler diameter mm	1.5	1.5	1.5
CSM diameter mm	1.6	1.6	2.0
Outer sheath thickness mm	1.0	1.0	1.0
Cable diameter mm	7.5	7.5	8.5
Cable weight kg/km	45	45	60
Suggested inner duct diameter mm	10	10	12

AERIAL

FZORMU-SD - CLASS A

OUTDOOR ADSS STANDED LOOSE TUBE

Application

Aerial outdoor ADSS (ADSS-All Dielectric Self Support design) cable for LAN, MAN and telecom backbone installations. The robust design include double sheathing, with a thick layer of aramid yarn in between. The cable is also suitable for duct installation. The core is dry and water protected by dry water blocking technology.

Technical data

Tensile strength:
- 15 kN

Crush:
- 2,200 N

Impact:
- 10 Nm

Bending radius:
- Loaded: min. 20 x D
- Unloaded: min. 10 x D

Modulus of electricity:
- 70.8 kN/mm^2

Effective area:
- 11.1 mm^2

Thermal expansion coefficient:
- 4-72 fibres: 11.6 10^{-6} C$^{\circ-1}$
- 96 fibres: 16.2 10^{-6} C$^{\circ-1}$

Tension in operation:
- Max. 7 kN

Installation span:
- 80 m, sag 0.6 m at 0°C

Water penetration:
- 3 m/24 hours - no water leakage

Temperature range

- Storage: - 45°C to + 70°C
- Installation: - 10°C to + 60°C
- Operation: - 45°C to + 70°C

Construction

Central strength member (CSM):
- Glass fiber reinforced plastic rod, FPR
- Plastic oversheating when needed

Loose tube:
- Thermoplastic material
- Up to 12 fibres per tube
- Filled with watertight compound

Fibre colour code:
- 1 blue, 2 white, 3 yellow, 4 green, 5 grey 6 orange, 7 brown, 8 aqua, 9 black 10 violet, 11 pink, 12 red.

Buffered tube colur code:
- 1 blue, 2 white, 3 yellow, 4 green 5 grey, 6 orange, 7 brown, 8 aqua.

Filler:
- Thermoplastic rods, where needed

Stranding:
- SZ stranded around the CSM rod

Water blocking:
- Longitudinal watertight
- Water swellable material
- Dry core

Peripheral reinforcement:
- Aramid yarns

Rip cord:
- 1 rip cord

Outer sheath:
- HDPE, 1.4 mm
- Black

Standard

- IEC 60794-1-2

Additional versions

- Class B with 50 m span and 4.5 kN

70°

Content is subject to changes acc. to current product development and or any changes to standards.

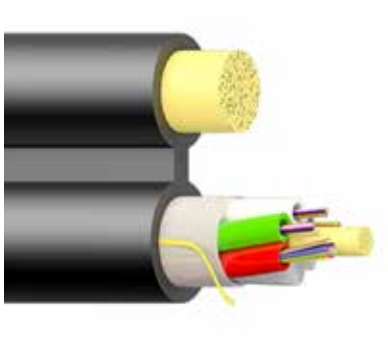
Fibre count	4 - 12	24	48	72	96
No. tubes x no. fibres	6 x 12	6 x 12	6 x 12	6 x 12	8 x 12
Loose tube diameter mm	2.8	2.8	2.8	2.8	2.8
CSM oversheathing diameter mm	3.0	3.0	3.0	3.0	4.8
Cable diameter mm	11.7	11.7	11.7	11.7	13.5
Cable weight kg/km	105	105	105	105	145

Prysmian Group

AERIAL

FZOMURK

OUTDOOR FIGURE 8 STRANDED LOOSE TUBE



70°

Application

Optical cable for aerial installation on poles. The outer sheath is made of abrasion resistant polyethylene. The cable has a non-metallic FRP messenger wire suitable for up to 250 m span lengths. Span length is dependent on ice load, wind load and installation sag. The figure-8 construction allows easy installation with cable grips attached to the messenger wire. The core is dry and water protected by dry water blocking technology . The cable is completely non-metallic to eliminate any problem with induced electrical currents.

Technical data

Short term tensile strength:
- 9,000 N

Permanent tensile strength:
- 9,000 N

Crush:
- 1,000 N

Impact:
- 15 Nm, 3 impacts, R=300 mm

Cable bend:
- R ≤ 250 mm with messenger
- R=10 x D, 4 turns, 3 cycles

Bending radius:
- Loaded: min. 15 x D
- Unloaded: min. 10 x D

Water penetration:
- 3 m/24 hours - no water leakage

Web dimensions(WxH):
- 2.5 ± 0.5 x 3.0 ± 1.0

Temperature range

- Storage: - 40°C to + 70°C
- Installation: - 15°C to + 60°C
- Operation: - 40°C to + 70°C

Standard

- IEC 60794-1-2

Construction

Messenger:
- Glass fibre reinforced plastic rod, FPR
- 7.0 mm

Central strength member (CSM):
- Glass fibre reinforced plastic rod, FPR
- Plastic oversheating when needed

Loose tube:
- Thermoplastic material
- Up to 24 fibres per tube
- Filled with watertight compound

Fibre colour code:
- 1 white, 2 red, 3 yellow, 4 green, 5 blue 6 grey, 7 brown, 8 black, 9 violet, 10 aqua 11 orange, 12 pink.

Tube colour code:
- 1 red, 2 green, 3-12 white

Stranding:
- SZ stranded around the CSM rod
- White-red identification thread

Water blocking:
- Longitudinal watertight
- Water swellable material
- Dry core

Rip cord:
- 2 rip cords

Outer sheath:
- HDPE, minimum 1.5 mm
- Black

Delivery

- Standard length: 2 or 4 km

Fibre count	12	24	48	72	96
No. tubes x no. fibres	1 x 12	2 x 12	4 x 12	6 x 12	8 x 12
Loose tube/filler diameter mm	2.5	2.5	2.5	2.5	2.5
CSM diameter mm	2.6	2.6	2.6	2.6	2.6
CSM oversheathing diameter mm	-	-	-	-	4.2
Cable diameter mm	10.8	10.8	10.8	10.8	12.4
Cable weight kg/km	215	215	215	220	250


KEILA
1401
1401

Prysmian Group

CONNECTIVITY

ORP 250 DISTRIBUTION PANEL

INDOOR UNIVERSAL 19" RACK WITH STORAGE

Application

Robust metallic ORP distribution panel designed for dry indoor termination and distribution of fibre optic cables in telecommunications, CATV and LAN networks. In a fibre optic network this panel works as a cross-connection and testing point between the optical cable network and the equipment.

Universal type of FO distribution panel for 19" racks. Contains a splicing section, patch panel and cover. Position of the panel can be adjusted freely.

ORP-250 also contains a storage shelf for excess lengths of patch cords

The constructions of the panel is simple and modular and independent of cable constructions. Easy to install, maintain and upgrade to higher capacity systems.

Entrance for two cables or multiple small size cables from the back of the panel. Fusion splice protection sleeve holders of rubber material attached to the bottom of the panel.

Additional materials such as adaptors, pigtails, slice protectors and grounding parts must be ordered seperately.

Construction

Distribution panel:
- For 19" racks
- Splicing section
- Patch panel, adjustable
- Protection sleeve holder
- Cover
- Storage shelf, adjustable
- Modular designed
- Powder painted and zink coated steel

Entry ports:
- On back
- For 2 large or several small cables

Splice section capacity:
- 48 - 96 fusion splices
- Double connector adaptors (SC-D)
- Heat shrinkable

Patch panel capacity:
- 24 connection adaptors
- SC, SC-D (SC duplex), LC duplex, LC Quad ST, FC*D or 12 RJ45

Grounding of metallic parts:
- Use part KT-1070 - order separately
- Use part FT-920- order separately

Dimensions (h x w x d):
- 60 (2U) x 440 (19") x 230 mm

Weight
- 2.9 kg

Product type and name	Prysmian part no.
ORP-250 SC ODF	XEXSC01664
ORP-250 SC-D ODF	XEXSC01665
ORP-250 LC ODF	XEXSC01923
ORP-250 ST/FC*D ODF	XEXSC01666
ORP-250 LC-Q ODF	XEXSC02051

CONNECTIVITY

ORP 260 DISTRIBUTION PANEL

INDOOR UNIVERSAL 19” METALLIC RACK

Application

Robust metallic ORP distribution panel designed for dry indoor termination and distribution of fibre optic cables in telecommunications, CATV and LAN networks. In a fibre optic network this panel works as a cross-connection and testing point between the optical cable network and the equipment.

Universal type of FO distribution panel for 19” racks. Contains a splicing section, patch panel and cover. Position of the panel can be adjusted freely.

The constructions of the panel is simple and modular and independent of cable constructions. Easy to install, maintain and upgrade to higher capacity systems.

Entrance for two cables or multiple small size cables from the back of the panel. Fusion splice protection sleeve holders of rubber material attached to the bottom of the panel.

Additional materials such as adaptors, pigtails, slice protectors and grounding parts must be ordered seperately.

Construction

Distribution panel:
- For 19” racks
- Splicing section
- Patch panel, adjustable
- Protection sleeve holder
- Cover
- Modular designed
- Powder painted and zink coated steel

Entry ports:
- On back
- For 2 large or several small cables

Splice section capacity:
- 48 - 96 fusion splices
- Double connector adaptors (SC-D)
- Heat shrinkable

Patch panel capacity:
- 24 connection adaptors
- SC, SC-D (SC duplex), LC duplex, LC Quad ST, FC*D or 12 RJ45

Grounding of metallic parts:
- Use part KT-1070 - order separately
- Use part FT-920- order separately

Dimensions (h x w x d):
- 45 (1U) x 440 (19”) x 230 mm

Weight
- 1.9 kg

Content is subject to changes acc. to current product development and or any changes to standards.

Product type and name	Prysmian part no.
ORP-260 SC ODF	XEXSC01664
ORP-260 12xRJ45 ODF	XEXSC01862
ORP-260 SC-D ODF	XEXSC01668
ORP-260 LC-Q O DF	XEXSC02052
ORP-260 LC ODF	XEXSC01924
FT-920 Guiding support	XEXSC01785
ORP-260 ST/FC*D ODF	XEXSC01669
KT-1070 Grounding partfor ORP-250/260	XEXSC02104

Prysmian Group

CONNECTIVITY

XOK JOINT CLOSURE

MULTIPLE OUTDOOR APPLICATION IP68

Application

Universal joint closure designed to provide water and pressure tight environmental protection for optical fibres and optical fibre splices, regardless of the cable design.

Application ranges from aerial pole or tower, duct to buried or manhole installations. The closure has anchoring points for strength members and facilities for earthing of metallic elements.

The splice organizer trays offer holders for heat shrink splice protectors and sufficient space for storage of spare fibres. The closure is easily assembled and re-entered.

The closure is available in seven basic configurations with two, three or four cable entrances. XOK A3/A4 branch joint closures and extension collars for more cable outlets are also available. Additional materials such as adaptors, pigtails, slice protectors and grounding parts must be ordered seperately.

Tecnical data

Impact resistance:
- 30 Nm acc. to IEC 60794-1-E4

Crush resistance:
- 1,000 N

Bending radius:
- For fibres: 30 mm

Cable retention:
- 1,000 N acc. to IEC 60794-1-E1

Water resistance:
- Rating IP68

Torsion resistance:
- <0.1 dB acc. to IEC 60794-1-E7

Temperature range
- Storage: - 40°C to + 50°C
- Installation: - 10°C to + 50°C
- Operation: - 45°C to + 80°C

Construction

Joint closure:
- Universally applicable
- Modular design - 3 sizes
- Stainless steel housing 1.5 mm
- Acid and weather resistant
- No additional protection needed

Entry ports:
- Several configurations
- From 2 to 4 cable entry ports
- Round or oval

Splice capacity:
- XOK 103: 4 trays x 48 splices = 192
- XOK 107: 7 trays x 48 splices = 336
- XOK A3: 4 trays x 48 splices = 1000 using extension collars or splice trays for fibre ribbons

Closure sealing:
- Mechanical entry port sealing
- Heat shrink entry port sealing
- Watertight seal, IP68
- High cable pull strength

Anchoring point:
- Anchor points for strength member

Storage tray:
- For spare fibres

Dimensions (h x w x d):
- XOK 103: 560 x 230 x 100 mm
- XOK 107: 560 x 230 x 140 mm
- XOK A3: 560 x 230 x 140 mm

Content is subject to changes acc. to current product development and or any changes to standards.

Joint closure model	Cable port placement	Splices max. numbers	Prysmian order no.
XOK 1030	2 ports on short end	24 splices	XJTSC00839
XOK 1030	2 ports on short end	48 splices	XJTSC00840
XOK 1030	2 ports on short end	96 splices	XJTSC00842
XOK 10304	2 port on both short ends	24 splices	XJTSC00843
XOK 10304	2 port on both short ends	48 splices	XJTSC00844
XOK 10304	2 port on both short ends	96 splices	XJTSC00845
XOK 10305	3 port on short end	24 splices	XJTSC00846
XOK 10305	3 port on short end	48 splices	XJTSC00847
XOK 10305	3 port on short end	72 splices	XJTSC00848
XOK 10305	3 port on short end	96 splices	XJTSC00849
XOK 10307	3 port on long end	24 splices	XJTSC00850
XOK 10307	3 port on long end	48 splices	XJTSC00851
XOK 10307	3 port on long end	96 splices	XJTSC00852
XOK 10707	3 port on long end	192 splices	XJTSC01064
XOK 10307A	3 port on long end	24 splices	XJTSC00853
XOK 10307A	3 port on long end	48 splices	XJTSC00854
XOK 10307A	3 port on long end	96 splices	XJTSC00855
XOK 10707A	3 port on long end	192 splices	XJTSC01065
XJTSC00919	3 port on long end	192 splices	XOK A3
XJTSC01247	4 ports on long end	192 splices	XOK A4

CONNECTIVITY

PK-300 TERMINATION BOX

INDOOR WALL MOUNTED METALLIC IP54

Application

Robust and dust-proof cabinet with lockable door for the termination, branching and distribution of fibre optic cables in telecommunication, CATV and LAN networks under dry indoor conditions.

Suitable for wall-mounted installations with small or intermediate numbers of fibres. The constructions of the box is clear and simple and independent of cable constructions and is easy to install, maintain and upgrade.

A patch panel divides the box into splicing and cross-connection sections. Cross-connection section has cable entrances to both up and down, directions. Two cable inlets on the top and on the bottom can be connected to one wide inlet that gives the possibility to bring in and take out the cable from the box without cutting all the fibres.

The cabinet is delivered with frame and cover, mounting and grounding bar, splice tray, entrance material for one outdoor cable, stress relief bars for 24 pcs. of diameter 2 mm patch cords of 2 pcs, cable ports and patch panel.

Additional materials such as adaptors, pigtails, slice protectors and grounding parts must be ordered seperately.

Construction

Termination box:
- Steel plate
- Powder painted
- Wall mountable
- Dust-proof
- Patch panel divider
- Splice section with separate door
- Cross-connection section

Entry ports to splicing section:
- 6 cable entry port in total
- 3 on top and 3 on bottom

Entry ports to cross-connection section:
- Entry plates
- In up and down direction

Splice section capacity:
- 5 trays x 24 splices = 120 splices

Patch panel capacity:
- 48 connection adapters
- SC, LC-D (LC-duplex) or ST/FC*D

Sealinge:
- Rating of IP54

Dimensions (h x w x d):
- 400 x 480 x 155 mm

Weight:
- 11 kg

Content is subject to changes acc. to current product development and or any changes to standards.

Product type	Special feature	Prysmian order no.
PK-300	SC	XCPSC01559
PK-300	ST/FC*D	XCPSC01560
Splice tray	KT-1412/24	XJTSC00884

Prysmian Group

CONNECTIVITY

PK-100 TERMINATION BOX

INDOOR WALL MOUNTED METALLIC

Application

Robust metallic termination box suitable for indoor installations with splicing, cable branching and cross connection functions.

Capacity for 48 splices and 12 SC, LC-D (LC-duplex), ST or FC*D (D-hole) adapters. In addition there is space for two more splice trays with holder for 24 splice protectors (heat shrinkable) per tray.

The box has three cable inlets on the bottom with maximum cable diameter of 20 mm. Metallic cables can be grounded with earthing screw on the outer surface of the bottom part.

The distribution box is delivered with metalilc box, bottom and cover, mounting and grounding bar, splice tray KT-1412 for 12/2 and entrance material KT-1016 with mechanical seal for one cable.

Additional materials such as adaptors, pigtails, slice protectors, additional splice trays and grounding parts must be ordered seperately.

Construction

Distribution box:
- Metal
- Powder painted
- Splicing section
- Splice tray - room for 2 more
- Cross-connection section
- Cable branching
- Cover
- Bottom

Entry ports:
- 3 on the bottom
- Max. cable diameter 20 mm

Splice section capacity:
- 48 fusion splices
- Space for 2 more splice trays
- Heat shrinkable

Cross-connection capacity:
- 12 connection adaptors
- SC, LC-D (LC-duplex), ST or FC*D (D-hole) adapters

Grounding:
- Earthing screws on the bottom

Dimensions (h x w x d):
- 350 x 210 x 66 mm

Weight
- 3.0 kg

Product type	Special feature	Prysmian order no.
Termination box	PK-100 SC	XCPSC01555
Termination box	PK-100 ST/FC*D	XCPSC01556
Splice tray	KT-1412/24	XJTSC00884
Entrance material	KT-1016 with mechanical seal for one cable	XJTSC00879

CONNECTIVITY

PK-100A TERMINATION BOX

INDOOR WALL MOUNTED METALLIC

Application

Robust metallic termination box suitable for indoor installations with splicing, cable branching and cross connection functions.

Capacity for 24 splices and 12 SC or LC-D (LC-duplex) adaptors.

The box has two cable inlets on the bottom with maximum cable diameter of 20 mm. Metallic cables can be grounded with earthing screw on the outer surface of the bottom part.

The distribution box is delivered with metalilc box, bottom and cover, mounting and grounding bar, splice protector holder for 24 splices and entrance material KT-1020 with mechanical seal for one cable.

Additional materials such as adaptors, pigtails, slice protectors, additional entry material and grounding parts must be ordered seperately.

Construction

Distribution box:
- Metal
- Powder painted
- Splicing section
- Cross-connection section
- Cable branching
- Cover
- Bottom

Entry ports:
- 2 on the bottom
- Max. cable diameter 20 mm

Splice section capacity:
- 24 fusion splices
- Heat shrinkable

Cross-connection capacity:
- 12 connection adaptors
- SC, LC-D (LC-duplex)adapters

Grounding:
- Earthing screws on the bottom

Dimensions (h x w x d):
- 160 x 360 x 50 mm

Weight
- 1.9 kg

Content is subject to changes acc. to current product development and or any changes to standards.

Product type	Special feature	Prysmian order no.
Termination box	PK-100A SC	XCPSC01555
Entrance material	KT-1020 with mechanical seal for one cable	XJTSC00880

Prysmian Group

CONNECTIVITY

PK-107 TERMINATION BOX

OUTDOOR SMALL METALLIC

Application

Robust metallic termination box suitable for outdoor installations with a small number of fibres. No need for extra protection of fibres when using central tube type optical cables.

Capacity for 12 splices and 2 SC-D or LC-Q (LC-quad) adapters. Suitable for installation inside traffic signs and display poles.

The box has three cable inlets on the bottom with maximum cable diameter of 11 or 16 mm. Metallic grounding of two cables is possible.

The distribution box is delivered as a metallic cabinet with a bottom and cover, adapter plate, wall fixing accessories, mounting and grounding bar, splice protector holder for twelve 12 splice protectors and entrance material for three cables and two heat shrinkable tubes and one mechanical seal.

Additional materials such as adaptors, pigtails, slice protectors and grounding parts must be ordered seperately.

Construction

Distribution box:

- Metal - aluminium
- Powder painted
- Adaptor plate
- Splice protector holder
- Cover
- Bottom
- Wall fixing accessory

Entry ports:

- 3 on the bottom
- Max. cable diameter 1 x 11 or 2 x 16 mm
- 2 heat shrinkable and 1 mechanical

Splice protection capacity:

- 12 splices protectors
- Heat shrinkable

Cross-connection capacity:

- 2 connection adaptors
- SC-D or LC-Q

Grounding:

- Possible for two metallic cables

Dimensions (h x w x d):

- 336 x 88 x 40 mm

Weight

- 0.7 kg

Product type	Special feature	Prysmian order no.
Termination box	PK-107	XJTSC00861

CONNECTIVITY

PK-200 TERMINATION BOX

INDOOR WALL MOUNTED METALLIC

Application

Robust metallic termination box suitable for indoor installations with splicing, cable branching and cross connection functions.

Capacity for 96 splices and 24 SC, LC-D (LC-duplex), ST or FC*D (D-hole) adapters.

The box has three cable inlets on the bottom with maximum cable diameter of 20 mm. Grounding of metallic cables is possible via earthing screws on the outer surface of the bottom part.

The termination box is delivered with bottom and cover, mounting and grounding bar, one splice tray KT-1412/24 for 24 splices and entrance material KT-1016 with mechanical seal for one cable.

Additional materials such as adaptors, pigtails, splice protectors, splice tray KT-1412, entrance material KT-1016 and grounding parts must be ordered seperately.

Construction

Distribution box:
- Metal
- Powder painted
- Mounting and grounding bar
- One splice tray (space for 2 in total)
- Cover
- Bottom

Entry ports:
- 3 on the bottom
- Max. cable diameter 20 mm
- Heat shrinkable

Splice tray capacity:
- Up to 4 splice trays
- Holder for 24 splice protectors per tray
- Heat shrinkable

Cross-connection capacity:
- 24 connection adaptors
- SC, LC-D (LC-duplex), ST or FC*D (D-hole)

Grounding:
- Possible to ground metallic cables
- Earthing screws on the bottom

Dimensions (h x w x d):
- 400 x 210 x 120 mm

Weight
- 3.5 kg

Product type	Special feature	Prysmian order no.
Termination box PK-200	SC	XCPSC01557
Termination box PK-200	ST/FC*D	XCPSC01558
Splice tray	KT-1412/24	XJTSC00884
Entrance material	KT-1016 with mechanical seal for one cable	XJTSC00879

Cables with reduction factor

Parallel laid railway cables on electrified tracks using alternating current or under high voltage power lines are exposed to the influence electromagnetic fields. These electromagnetic fields induce current in the cables, which can lead to disturbances and destruction of the equipment connected to them as well as present a hazard to life and limb. In order to reduce this influence to a non-hazardous level, the cables are provided with a metallic shield according to their cross-section. This shield has to be earthed on both sides of the cable.

The measure of quality used to shield cables in railway applications is referred to as the reduction factor. The reduction factor is the ratio of induced tension with shielding to the induced tension without shielding. A reduction factor of 1 would mean "no shielding effect". A reduction factor of 0.5, for example, would mean a reduction of the induced tension by one half.

The effect of shielding of the materials used (copper, steel, aluminium, etc.) is dependent on the conducting cross-section of shielding as well as the frequency of the interfering signal.

Depending upon the local circumstances, the cable design and hence the resultant reduction factor can be optimised to best match the expected field strength along the railway track. A typical description for the request for a cable protected against inductive interference shall include disturbing frequency and field intensity as well as the requested reduction factor. For example:

- Reduction factor < 0.5 at 16.7 Hz in the range of 80 – 150 V/km or
- Reduction factor < 0.3 at 50 Hz in the range of 80 – 250 V/km.

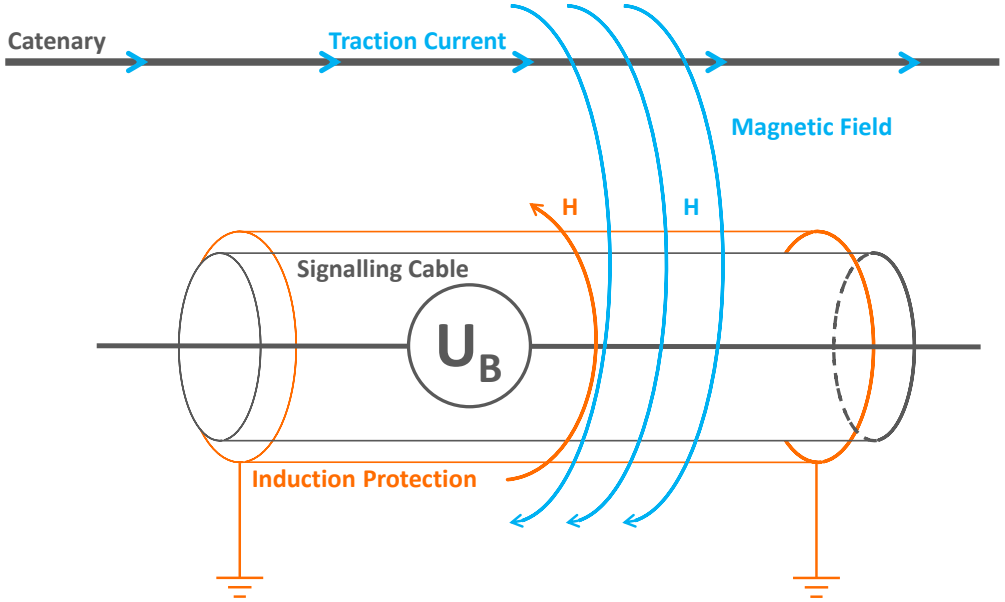
The tension induced in the cable increases with the length the cable is exposed to the electrical field. A cable which is exposed over a length of 2000 m to the field can require a lower (better) reduction factor than the same cable, which is only exposed to the induced field over a length of 1000 m.

The calculation of the actually required reduction factor is very complicated and depends on a multitude of different parameters:

- Distance of the cable to be shielded from the interfering cable (overhead line...),
- Type of installation (underground, in conduits, on the ground...),
- Characteristics of the ground,
- etc.

A respective calculation of the required reduction factor can only be carried out by experts. The cable manufacturer then develops the correct cable design based on the given factors.

As a supplier of cables for railway applications and development partners of well-known European railway operators of long standing, We are pleased to develop the right cable design for you according to your needs.



Picture: Magnetic field compensation by inductive protection

Picture: Cable AJ-2Y(L)2YDB2Y 10x4x1.4 mm S (H45) rk 600 of Deutsche Bahn with protection against inductive interference

Requirements for fire characteristics of cable installations in tunnels or stations

Prysmian provides a complete product range ofcables and circuits for the railway infrastructure sector. We also take into consideration the special requirements needed for laying cables in closed environments.

Most railway infrastructure operators specify cables with a black polyethylene (PE) outer sheath for use in the open air. PE is extremely robust and resistant, has very good UV resistance due to the black colouring and guarantees a cable life of about 35 years. PE is halogen-free and burns with low smoke emissions without releasing toxic gases.

In closed areas and narrow spaces, in applications such as tunnels or railway stations, the require-ments for the cables are very demanding.

Even though PE is halogen-free and burns with low smoke, it is not recommended for such applications. PE is not self- extinguishing and contributes to further propagation of fire. The fire can penetrate into adjacent rooms and cause more damage. Cables with PVC outer sheath are no alternative either. although PVC is flame retardant and usually self-extinguishing, it burns producing dark soot and releases toxic gases.

The ideal materials combine the advantages of PE and PVC, are halogen free, produce little smoke, and are flame retardant and self-extinguishing. Such materials are manufactured, refined and improved in Prysmian's material laboratories.

Known halogen-containing materials are, for example, chloroprene rubber (CR), ethylene tetrafluoroethylene (ETFE), perfluoroethylene propylene (FEP) or polyvinyl chloride (PVC). Halogen-free materials are, among others, silicone rubber (SIR), polyamide (PA), ethylene propylene polymers (EPR), thermoplastic elastomers (PE) or polyethylene (PE).

There are European and international standards regarding the unique and comparable classification of flammability properties of cables. We want to briefly introduce to you the most important test procedures.

Fire testing

EN/IEC 60332-1
(Tests on electric and optical fibre cables under fire conditions: test for vertical flame propagation for single insulated wire or cable)

The flame propagation is tested according to IEC 332-1 on a single cable. A vertical sample of cable about 600 mm in length is exposed to a flame for 60 s and/or 120 s in an area 100 mm above the lower end with a 1 kW Bunsen burner. After removing the burner, the flame must self-extinguish. The zones of the cable damaged by the flame should not reach to the upper end of the cable. The flaming time is dependant on the diameter of the cable.

Comparable tests are DIN VDE 0482-332-1-2, EN 50265-2-1, NF C 32-070 C2, BS 4066-1.

EN/IEC 60332-3
(Tests on electric and optical fibre cables under fire conditions: test for vertical flame spread of vertically mounted bunched wires or cables)

The test for the spread of the flame with an array of several cables, i.e. a bunch of cables, is normally carried out according to IEC 332-3 (EN 50266-2, test method A, B, C or D – for use of different volumes of non-metallic materials).

The test specimens, mounted in a vertical frame, are exposed to a flame over a length of 3600 mm starting in the lower section using a special burner with a high output. During and/or after exposure to the intensive flame for 20 and/or 40 minutes, the cables may not continue to burn to their upper end.

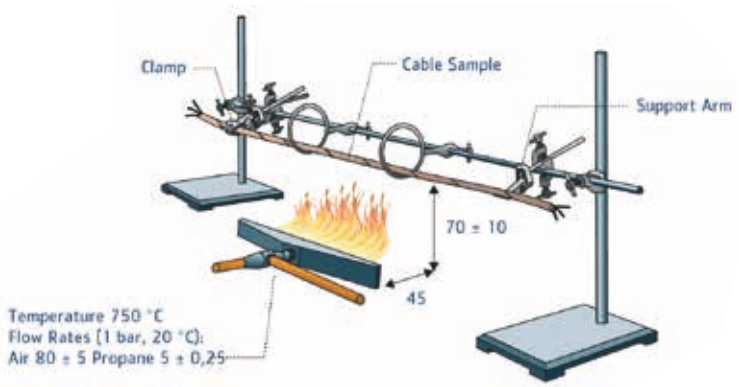
Comparable tests are DIN VDE 0482-266-2-4, EN 50266, NBN C30-004 Cat. F2, BS 4066-3.

Railway Main Line Cables

IEC 331
(Cable with insulation integrity)

A horizontal cable sample is exposed to a flame over a width of 1200 mm with a flame temperature of at least 750 °C for a recommended duration of at least 90 minutes. The cable is connected up electrically and under tension. During flaming and a cooling down time of an additional 15 minutes, no short circuiting or interruption of the current may arise.

Comparable tests are EN 50200, EN 50263, NF C 32070 CR1, BS 6287.



DIN 4102 part 12
(Cable with functional integrity – system testing of cable and the cable mounting system)

This test is very extensive. As it is a test of the system which includes the cable and the cable mounting system, the product to be tested is completely walled into a closed space. The cables are connected up electrically and are kept under tension during the test. The entire room is set alight with a defined temperature unit curve. After at least 30 minutes flame exposure, neither short-circuiting or interruption of circuit may arise. It is extremely difficult to pass the test, as the cable mounting system has a considerable influence on the result. Cable clips, ducts or conductors exert mechanical loads on the cable, as the material changes during flaming: cable ducts start to bend through the load exerted by the cable and the originally smooth cable suddenly hangs down at several points. This mechanical change of position of the burned cable can lead to interruption or short-circuiting.

IEC 61034
(Measurement of smoke density of cables burning under defined conditions)

A plastic sample is burned under controlled conditions. In this way, the light transmission through the combustion gases which arise is measured.

Comparable tests are DIN VDE 0482-286-1 and -2, NFX 10702, BS 7622-2.

IEC 60754-1
(Test on halogen acid gases evolved during combustion of materials from cables)

A plastic sample is burned under controlled conditions. In this way, the smoke gases are measured for their halogen content.

Comparable tests are DIN VDE 0482-267-2-1 and EN 50267-2, NF C 20454, BS 6425-1.

IEC 60754-2
(Test on acidity of gases evolved during combustion of materials from cables)

A plastic sample is burned under controlled conditions. In this way, the pH-value and the conductivity of the smoke gases are measured.

A comparable test is DIN VDE 0276-604.

With the exception of the small fire test according to EN/IEC 60332-1, the cable is normally destroyed during the flame test. Although no short-circuiting or interruptions should arise, it is difficult to speak about defined electrical values such as operating capacity or characteristic impedance. In this case we are talking about either: current flowing or not. This may in reality be adequate for loudspeaker announcements or sprinkler systems. Control and safety technology using electronic interlocking is during or after a cable fire, if at all, hardly still sensible and feasible. Under these circumstances, the need to maintain fire testing standards according to EN/IEC 60331 (insulation integrity) and/or DIN 4102 part 12 (functional integrity) makes little sense for railway signalling cables for electronic interlocking.

Construction Product Regulation

Since 01/07/2013, the "Construction Product Directive" (CPD) in the EU has been replaced by the "Construction Product Regulation" (CPR) and is thus valid law in all member states of the EU. The CPR and/or the building product directive (BPVo) affects all cables which are intended for permanent installation in a building. Products have to fulfil requirements in terms of behaviour and/or resistance in the case of fire.

CPR itself does not define any performance requirements regarding the affected products. The definition of safety requirements remains the responsibility of the national authorities.

CPR has introduced binding performance requirements (Declaration of Performance, DoP) and the corresponding CE-mark for labelling the products. The cable's fire characteristics shall be marked in the future with a combination of different classes (The index "ca" stands for "cable"):

CPR classes are:	A_{ca}, $B1_{ca}$, $B2_{ca}$, C_{ca}, D_{ca}, E_{ca}, F_{ca}	(see table to the right)
Smoke classes are:	s1, s1a, s1b, s2, s3	(EN 50399/EN 61034-2)
Acidity classes are:	a1, a2, a3	(EN 60754-2)
Flaming droplets classes are:	d0, d1, d2	(EN 50399)

The CPR has no class or guideline for railway cables laid in exposed outdoor areas. These cables may continue to be designed, produced and installed as previously. For railway cables in tunnels or train stations, the relevant cable manufacturers associations recommend a classification according to the EU regulation (1303/2014), clause 4.2.2.4: "In case of fire, exposed cables shall have the characteristics of low flammability, low fire spread, low toxicity and low smoke density. These requirements are fulfilled when the cables fulfil as a minimum the requirements of classification $B2_{ca}$, s1a, a1, as per Commission Decision 2006/751/EC."

Prysmian Group will observe these obligations and, as far as they do not satisfy existing cable designs, will provide cables and products to the market with the corresponding properties.

Class	Test method(s)	Classification criteria	Additional classification
A_{CA}	EN ISO 1716	PCS ≤ 2,0 MJ/kg and PCS ≤ 2,0 MJ/kg and	
$B1_{CA}$	EN 50399 and	FS ≤ 1.75 m and THR1200s ≤ 10 MJ and Peak HRR ≤ 20 kW and FIGRA ≤ 120 Ws-1	Smoke production and Flaming droplets/particles and Acidity
	EN 50265-2-1	H ≤ 425 mm	
$B2_{CA}$	EN 50399 and	FS ≤ 1.5 m; and THR1200s ≤ 15 MJ; and Peak HRR ≤ 30 kW; and FIGRA ≤ 150 Ws-1	Smoke production and Flaming droplets/particles and Acidity
	EN 50265-2-1	H ≤ 425 mm	
C_{CA}	EN 50399 and	FS ≤ 2.0 m; and THR1200s ≤ 30 MJ; and Peak HRR ≤ 60 kW; and FIGRA ≤ 300 Ws-	Smoke production and Flaming droplets/particles and Acidity
	EN 50265-2-1	H ≤ 425 mm	
D_{CA}	EN 50399 and	THR1200s ≤ 70 MJ; and Peak HRR ≤ 400 kW; and FIGRA ≤ 1300 Ws-1	
	EN 50265-2-1	H ≤ 425 mm	
E_{CA}	EN 50265-2-1	H ≤ 425 mm	
F_{CA}	no performance determined		

Table: Overview of the CPR classifications

Transport and storage of cable drums

Even if cable and drum look very strong, there are certain rules to follow to avoid damage of the cable and an accompanying impairment of mechanical and electrical characteristics.

Transport and storage of cable drum
It is possible to store cable drums outdoors. When storage has occurred in heated rooms, a minimum 24-hour acclimatisation period must be observed before installation (possible condensation build-up in the cable!).

For outdoor storage the ground must be even and clean. Stones or bumps in the ground should be removed or smoothed out. Damage to the wound goods/cable should be avoided at all costs.

Cables should be secured against accidental rolling away. Under no circumstances should the drum flange of neighbouring cables touch any wound goods.

Cable drums should always be stored and transported standing on both flanges.

They should not be pushed along the ground standing on the flanges. It is possible that the strength of the cable drum would then no longer be guaranteed.

Observe the rolling direction. The arrow printed on the drum flange indicates the rolling direction so that the wound goods do not become loose.

Always uncoil the cable at a tangent, never over the flange, since the torsion thus resulting would damage the cable and laying would not be possible.

Cable ends
Finally it remains for us to point out the necessity of having faultless cable ends. Pressure-tight and impermeable cable ends are particularly essential for cables which are not longitudinally water-proof, as well as for cables which are insulated with paper, cellular-PE and foam-skin-PE. Carelessness in this area can lead to moisture penetration which is accompanied by a drastic deterioration in the electrical transmission rate. Power failures and expensive replacement work are the result. Pressure-tight and impermeable cable ends can be achieved, for example, through the use of synthetic sealing resin or compressed air sealing stoppers.

Important physical characteristics

Temperature range
The temperature range of the cable is of great importance for both the user and fitter. After all the cable is meant to function equally well in cold and hot temperatures. It is particularly during the fitting process that powerful mechanical forces act on the cable. The plastic used serves as the limiting element for the possible temperature range. At overly warm temperatures the plastic becomes very soft and can change into a thermoplastic state (up to melting point), which causes irreversible changes in the cable.

At very cold temperatures, however, the material stiffens and becomes hard and inflexible. Here, too, irreparable damage can occur.

Tears in the sheath allow dampness and moisture in and impair the transmission rate. Details about the permissible temperature range during laying and use (following successful fitting) can be found in the information sheets of the cable manufacturer. Since the mechanical strain on the cable in its laid form is significantly less, the permissible temperature range is greater than the range valid for the installation period.

Bending radius
Regarding the bending radius we distinguish between multiple and single bending (shaping into the final position).

Multiple bending occurs mainly during the laying process. Cables are laid under tension around deflector rolls. The particular stress of multiple bending lies in the alternating stress on the materials, which can be stretched several times as well as compressed during the laying process.

To prevent permanent damage there are prescribed minimum bending radii of, for example, 10 x cable external diameter for multiple bending.

The stress on the material during final bending is not characterised by alternating stress. The cable is bent into form a final time and stays in this position for the duration of its use. The minimum bending radius in this case is, for example, 7.5 x cable external diameter. During final bending the cable can, therefore, be bent more tightly.

Exact minimum bending radii for specific cables can be found in the information sheets of the cable manufacturer.

Tension
During laying of the cable particular attention must be paid to the maximum possible tension. The cable is very quickly damaged by the use of too much force and must then be replaced. The maximum possible tension depends in the first place on the overall cross section and the tensile strength of the conducting materials used.

For cables with steel tape or copper wire spiral armouring it is the internal copper conductors alone which determine the maximum tension! The armouring has no influence on the maximum tension or can possibly reduce it through additional weight. For armouring with steel or steel profile wires, however, the tension is determined solely by the steel and steel profile wires.

Cable weight
The cable weight of larger cable dimensions can take weights of up to more than 10 t/km (without the reel!).

Certifications and compliance

Certifications of Railway and Infrastructure Authorities

Being a very complex system with a high safety integrity level, railway products are subject to detailed requirements and strong supervision. Many railway infrastructure operators issued dedicated cable specifications which require homologation and frequent auditing. Prysmian Railway Cables are designed and produced according to a number of railway cables standards, like DB, SBB, ÖBB, SNCF, TCDD, ADIF/ RENFE, RFI, RATP and many more in Europe and around the globe. High quality manufacturing processes, many decades of experience in cable design and engineering as well as intense testing procedures guarantee state-of-the-art cable products and satisfied customers worldwide.

REACH (Registration, Evaluation and Authorisation of Chemicals)

Adopted on December 18th, 2006, the Regulation of the European Parliament and the European Union Council, modernized the European legislation regarding chemical substances, and set up a unique integrated system of chemical substances in the European Union. Its objective is to improve the protection of the human health and of the environment, while maintaining the European chemical industry's competitiveness and strengthening its spirit of innovation. All Prysmian railway cables are REACH compliant.

RoHS (Restriction of the use of certain Hazardous Substances in Electrical and Electronic Equipment)

The RoHS directive aims at restricting the use of certain dangerous substances commonly used in electric and electronic equipment (EEE). Cables concerned by this directive are any cables rated below 250V, which function is the connection or the extension of an EEE to electrical outlet or the connection of two or more EEE to each other. All Prysmian railway cables are RoHS compliant.

Management Systems

- Quality Management System EN ISO 9001:2008
- Environmental Management System EN ISO 14001:2005
- Energy Management System EN ISO 50001:2011

Our responsibilities

Social Responsibility

Within the social dimension of its business, the Prysmian Group recognises its commitment and responsibility towards the persons who work as part of the Organisation, as well as those who form the local communities in the territories in which the Group is active. Accordingly, consistent with its values, Prysmian constantly seeks to ensure the personal and professional satisfaction of its human resources, and to communicate with and involve local populations, in order to generate value for these important categories of stakeholder.

Environmental responsibility

The Group's commitment to safeguarding the environment and conserving natural resources is expressed not only by the intrinsic characteristics of our products, but also by how our production systems are managed. In particular, the prevention and reduction of their environmental impact is achieved, for example, by the efficient use of natural resources, the optimisation of logistics flows and the responsible management of waste.

During 2015, HSE further consolidated its activities at various levels within the Group (corporate, country or geographical area, business unit, production unit), centralising activities and coordinating the work of the local HSE functions. Group policies for Health, Safety and Environment, as well as the related Operating Procedures and Technical Standards, have been adopted and applied at operating unit level. The HSE function, with support from the Group audit team, periodically checks the effectiveness and proper application of the HSE rules at local level.

The aspects monitored by HSE using indicators include compliance with health and safety at work standards, energy consumption, waste management, water usage and greenhouse gas emissions. In particular, with reference to the greenhouse gas emissions, the Group has begun to collect energy consumption data in order to track both "direct" emissions (deriving from production processes) and "indirect" emissions (deriving from the energy purchased). This system of monitoring and reporting enabled the Group to participate in 2015, once again, in the Carbon Disclosure Project (CDP), which seeks to contribute to the pursuit of the objectives agreed in the Kyoto Protocol regarding the global reduction of greenhouse gas emissions

Product responsibility

Quality and innovation are the hallmarks of Prysmian's approach, both in sectors where the level of technology, the ability to innovate constantly and the commitment to offering high value-added services together establish a differentiated competitive positioning, and in those sectors where products are more standardised, such as medium and low-voltage cables. The Group applies a customer-centric approach, reflecting an ability to anticipate and satisfy the needs of customers with the maximum possible attention.

References

Prysmian Group has been supplying the railway industry for many decades. We supply all renowned European railway infrastructure companies, often as part of long-term master agreements. Many important projects have been completed in the recent years all around the world, even more are yet to come. There is always our office close to you.

The following excerpt of our success records shall give you an idea about our local and global presence.

North Europe:

- Denmark: ERTMS Signalling Program, Electrification of Danish Railways, Renewal of Danish Rail Infrastructure, Copenhagen Metro and S-Bane, Aarhus Tram
- Finland: Länsi Metro, Helsinki Metro, Rail Safety Project, Electrification of Jyväskylä-Äänekoski Line
- Norway: LKAB Narvik-Kiruna Line, InterCity Project, GSM-R Network for the ERTMS Signalling Program
- Sweden: Renewal of Stockholm Metro
- Latvia: Modernization of LZD-infrastructure

Rest of the world:

- Australia: QueenslandRail, conversion to axle counter detection technology
- Egypt: Cairo – Alexandria line
- Bulgaria: Plovdiv-Bourgas line
- Chile: Rancagua project
- Germany: Framework contract and development partner of Deutsche Bahn
- Israel: Ashkelon – Netivot line
- Canada: Toronto Transit Authority
- Croatia: Zagreb Central Station
- Malaysia: Thomson Line project
- Morocco: Casablanca – Tanger line
- Mexico: Metro Monterey
- Saudi Arabia: North-South-Rail project, Mecca Metro
- Switzerland: Framework contract with SBB
- Singapore: Singapore Metro Subaqua Cable
- Spain: Vandellos-Tarragona line, Madrid – Leon – Burgos high speed Line
- Turkey: Ankara-Konya high speed line, Eskisehir – Balikesir line, Metro Istanbul, Metro Ankara
- USA: JFK Air Train, New York City Transit, Oakland Bay Area Rapid Transit

Wikipedia.org: Vilnius Station - Michael Day

We are here for you

You are always welcome to contact us directly with technical questions or sales enquires.

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