

# The future is a train, get on board!

Cable solutions for the Rolling Stock industry



# CONNECTING THE WORLD. TODAY AND IN THE FUTURE

**Prysmian Group is world leader in the energy and telecom cables and systems industry.**

**With 140 years' experience, the Group is strongly positioned in high-tech markets and offers the widest possible range of products, services, technologies and know-how.**

**140**  
YEARS OF  
EXPERIENCE

**25**  
R&D CENTRES  
AROUND  
THE WORLD



**We specialise in underground and submarine cables and systems** for power transmission and distribution, special cables for applications in many different industries, and medium and low voltage cables for the construction and infrastructure sectors.



**For the telecommunications industry, the Group is the world's largest provider** of cutting-edge cables and accessories for voice, video and data transmission, offering a comprehensive range of optical fibres, optical and copper cables and connectivity systems.



**We are committed to environmental responsibility** in our production processes, the protection of the global environment, and the responsible management of relations with the local communities in which we work.



**For us, innovation means meeting the needs of our customers and communities** by understanding their business drivers as quickly as they do. To do that, our team of over 900 Research & Development professionals is constantly looking to the future, predicting and identifying emerging trends in each of our industries and sectors. Acting on this intelligence from 25 R&D centres around the world, we're constantly close to our customers in their own local markets.

# Rolling Stock Cables

**The Railway industry is constantly evolving in terms of new market requests. Increasingly demanding customer expectations, fierce competition and rapid technological change are the main challenges for the whole Rolling Stock supply chain. With the goal of maximizing passengers' comfort, operational efficiency, safety and speed, the train manufacturing industry is looking for reliable suppliers to support them in facing these ever-growing challenges.**

Enhanced data and power transmission and advanced technology requirements translate into increased amounts of cabling on trains. This has an impact on all types of rolling stock vehicles and carriages. Prysmian Group promotes and drives product development and innovation to meet these requirements, by minimizing the size and weight of cables and reducing the wall thickness of insulation and outer sheath, whilst maintaining or even enhancing performances.

Prysmian Group offers a full range of products from High and Medium Voltage to Instrumentation cables, from High Temperature to Thin Wall designs, to harnessing solutions according to specific customer needs. Advanced technologies and materials used have been specially developed to withstand the harsh environment of rolling stock and improve electrical, mechanical and thermal properties, fire performance and life expectancy of products.

All Prysmian Group Rolling Stock cables are Reach and RoHs compliant and all manufacturing facilities are certified according to ISO/TS 22163 (IRIS).

## **OUTSTANDING AND COMPLETE PRODUCT RANGE**

A comprehensive product range of covering all different market needs in terms of geography and technical specifications (either according to or based on EN standards or according to or based on AAR RP- 585).

## **ADVANCED TECHNOLOGY AND PERFORMANCE**

The most technologically advanced and high-performing compounds, specially designed by our laboratories allow: bending radius up to 3 times the cable outer diameter; smallest dimensions possible; higher working temperature with scaled-down conductor cross-sections; higher physical and mechanical resistance for properties such as abrasion, cut-through, notch propagation, repeated bending and vibrations; easy peeling and low friction properties; compliance with industry-specific EMC requirements.

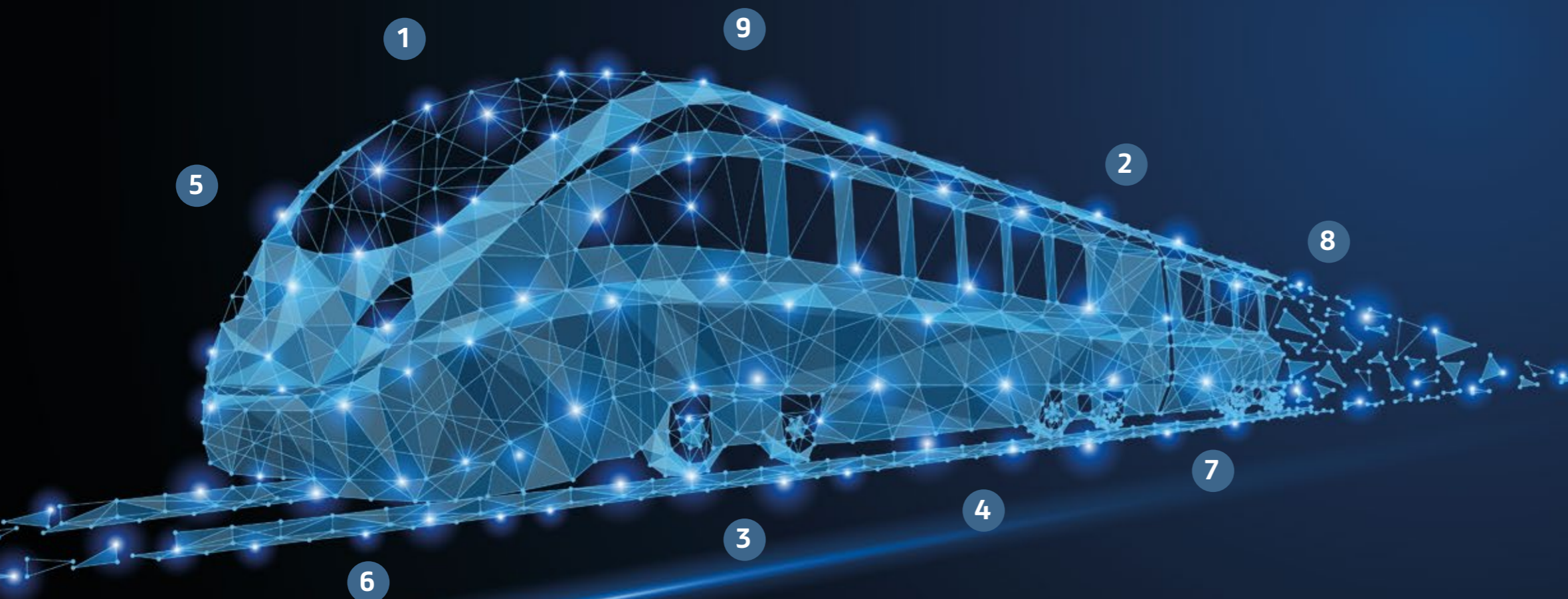
## **UNIQUE SAFETY IN FIRE HAZARDS**

Prysmian Group has always focused on ensuring both human and material safety in any working condition. Our Rolling Stock cable solutions minimize fire hazards related to cables. Self-extinguishing properties, no toxic and corrosive gases released, and reduced smoke emission prevent the cables from contributing to fire propagation and related consequences to people safety and to equipment integrity.

## **TAILOR-MADE SOLUTIONS**










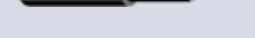


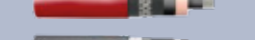







Any special customer issue can be addressed by Prysmian Group's technicians thanks to extended technological capabilities to manufacture a broad range of specifically developed compounds and cable designs e.g. formulation, compounding and manufacturing cables and harnessing solutions according to customer needs.

# Product Families at a Glance



- 1 Control cables**  
EN 50306; TW 600 V.
- 2 Power cables  
(300/500 V up to 3,6/6 kV)**  
EN 50264-3; EN 50264-2; Reduced wall.
- 3 High temperature  
(1,8/3 kV and 3,6/6 kV)**  
EN 50382-2 (120 °C, 150 °C or 180 °C).
- 4 Power and Control (US market)**  
AAR RP-585 and ICEA S-95-658 single  
and multi-conductors; Reduced wall  
single and multi-conductors
- 5 Datacables**  
Cat5e, 6, 7; Bus cables 120 Ohm;  
others
- 6 DLO**  
Up to 2000 V
- 7 Jumper cables**
- 8 Composite cables**
- 9 Pantograph**  
45 kV power cable

# Product Mapping

		cable name	description	voltage	constructions		single/multicore	dimensions	operating temperature	screened version available	additional abrasion resistance	FR version availability	fire and smoke
Instrumentation and Control cables EN 50306		TEROL TW	Control cables for equipment control and monitoring circuits, internal wiring of equipment, interlocking circuits, indicating circuits	300/500 V	0.5-2.5 mm <sup>2</sup>		single/multicore, pairs	according to EN 50306	-40 °C to +90 °C (105 °C single core)	Multicores screened available, individual or overall screen available on multipair	Y	Y	EN 45545+ NFPA 130 (*)
		TEROL TW 600 V		0,6/1 kV	0.5-2.5 mm <sup>2</sup>		single core	according to EN 50306	-40 °C to +105 °C	-	Y	-	EN 45545
Power cables EN 50264		TEROL MW	Power cables for lighting circuits powered by accumulators, equipment control and monitoring circuits, auxiliary and electric heating circuits, auxiliary circuits at line voltage, traction circuits, electric heating fed at line voltage in protected (or exposed - if cable is sheathed) areas, internal safe circuits	300/500 up to 3,6/6 kV	0.5-400 mm <sup>2</sup>		single/multicores	according to EN 50264-3	-40 °C to +90 °C	Y	Y	Y	EN 45545+NFPA 130(*)
		TEROL SW		300/500 up to 3,6/6 kV	0.5-400 mm <sup>2</sup>		single/multicores	according to EN 50264-3	-40 °C to +90 °C	Y	Y	Y	EN 45545+NFPA 130(*)
		SIENOPYR (120)		300/500 up to 3,6/6 kV	0.5-400 mm <sup>2</sup>		single/multicores	similar to EN 50264-3	-40 °C to +120 °C	Y	-	Y	EN 45545+NFPA 130(*)
		Afumex Z, DZ or DOZ		300/500 up to 3,6/6 kV	0.5-400 mm <sup>2</sup>		single/multicores	according to EN 50264-3	-40 °C to +90 °C	Y	-	Y	EN 45545
		MOVIS (2GKW, 3GKW, 4GKW, 9GKW)		300/500 up to 3,6/6 kV	0.5-400 mm <sup>2</sup>		single/multicores	reduced - based on EN 50264-3	-40 °C to +120 °C	Y	-	Y	EN 45545+NFPA 130(*)
High Temperature cables EN 50382		TEROL HT	Power cable with high temperature properties for use in auxiliary circuits at line voltage, traction circuits, electric heating fed at line voltage in protected (or exposed - if cable is sheathed) areas	1,8/3 kV up to 3,6/6 kV	1.5-400 mm <sup>2</sup>		single core	according to EN 50382-2	-40 °C to +120 °C or 150 °C	-	-	-	EN 45545+NFPA 130(*)
		SIENOPYR (180)		1,8/3 kV up to 3,6/6 kV	1.5-400 mm <sup>2</sup>		single core	similar to EN 50382-2	-50 °C to +180 °C	Y	-	-	EN 45545
		Afumex HTS		1,8/3 kV up to 3,6/6 kV	1.5-400 mm <sup>2</sup>		single core	according to EN 50382-2	-40 °C to +120 °C or 150 °C	Y	-	Y	EN 45545
		Afumex HTS - Hard		1,8/3 kV up to 3,6/6 kV	1.5-400 mm <sup>2</sup>		single core	according to EN 50382-2	-40 °C to +120 °C or 150 °C	-	Y	-	EN 45545
High Voltage		TENAX TRAIN Plus-(N)TMCW0EU	High Voltage cable for connection of pantographs in locomotives and trains	26/45 kV	50-630 mm <sup>2</sup>		single core	reduced	-40 °C to +90 °C	copper wire screen for roof application, copper braid screen for jumper application	-	-	EN 45545+NFPA 130 (*)
		PROTOLON(HMK)		26/45 kV	50-630 mm <sup>2</sup>		single core	reduced	-50 °C to +90 °C		-	EN 45545+GOST	
Databus		MOVIS	Data transmission cables for all usages on Rolling Stock vehicles	Data transmission values according to relevant standards	Cat5e, Cat6, Cat7, Databus 1200hm, Coaxial, special designs		multicore, pairs	-	-25 °C up to 90 °C	NA	-	-	EN 45545
American Range AAR RP-585 and ICEA S-95-658		Polyrad XT	Power and control cables manufactured for on-car applications, according to AAR RP-585 and ICEA S-95-658	600 V and 2000 V	20 AWG thru 1111 kcmil for single core 20 AWG thru 4/0 AWG for multicore		single/multicore	according to AAR RP 585 and ICEA S-95-658	Dual temperature rating at 125 °C/110 °C	Y	-	-	NFPA 130, IEEE 1202 (70,000 BTU/hr), IEEE 383 (70,000 BTU/hr), VW-1
American Range Reduced Wall		Polyrad Ultra	Reduced weight and smaller diameter, ideal for on-car, high density cabling applications	600 V	22 AWG thru 10 AWG		single/multicore	reduced wall	+125 °C	Y	-	-	NFPA 130, IEEE 1202 (70,000 BTU/hr), IEEE 383 (70,000 BTU/hr), VW-1
American Range New York City Transit approved		Polyrad XT - TX	Cables according to New York City Transit (NYCT) TX Cable Specification	600 V and 2000 V	20 AWG thru 4/0 AWG for 600 V 20 AWG thru 535 kcmil for 2000 V		single/multicore	according to AAR RP 585 and ICEA S-95-658	+110 °C	-	-	-	NFPA 130, IEEE 1202 (70,000 BTU/hr), IEEE 383 (70,000 BTU/hr), VW-1
American Range Data Communication cables			NFPA 130 rated, UL Listed Type CMG-LS, according to ANSI/TIA 568-C.2 Patch	Data transmission values according to relevant standards	4 pair 24awg Category 5e 2 Pair 22awg Category 5e 4 Pair 24awg Category 6		multicore, pairs	-	-55 °C to +75 °C	-	-	-	IEEE 1202 (70,000 BTU/hr), IEEE 383 (70,000 BTU/hr), VW-1
Electronically Controlled Pneumatic (ECP) Brake Cable		Electronically Controlled Pneumatic (ECP) Brake Cable	Specialty design for installation both under and between freight cars, available with interlocked armor or non armored design	600 V	2x8AWG		2 conductors	-	-45 °C to +100 °C	-	-	-	NFPA 130
DLO cables		Diesel Locomotive Cable 2000 V	For use in Diesel Electric Locomotives, UL Type RHH/RHW-2, c(UL) Type RW90	2000 V	14 AWG thru 1111.1 kcmil		single core	-	+90 °C	-	-	-	UL 2556 VW-1, IEEE 1202/CSA FT4 for sizes 1/0 AWG and larger

(\*) please contact us for further information

# Product & Brands

## EUROPEAN RANGE

**TEROL.** According to EN 50306, EN 50264 and EN 50382 with special fire performances. Usable on rolling stock with hazard level HL3 according to EN 45545. Tested against NFPA 130.

**MOVIS Power and Control cables.** Halogen-free, single core, with special fire performance, increased heat resistance (120 °C) and reduced dimensions. For use as fixed wiring or where limited flexing in operation is encountered. Usable on rolling stock with hazard level HL3 acc. to EN 45545. Fire resistant (EN 50200) available.

**MOVIS Data and Communication cables.** Halogen-free data cables with special fire performance and increased heat resistance. Usable on rolling stock with hazard level HL3 according to EN 45545.

**Siempyr (120).** Power and control cables according to EN with increased heat resistance (120 °C), fulfilling EN 45545 fire and smoke properties. Fire resistant (EN 50200) versions available.

**Siempyr (180).** High temperature cables based on EN 50382-2 with increased heat resistance (180 °C), fulfilling EN 45545.

**Afumex Z, DZ and DOZ.** Mainstream power and control cables acc. to EN 50264-3 fulfilling EN 45545 fire and smoke properties.

**Afumex HTS.** Mainstream high temperature cables according to EN 50382-2 fulfilling EN 45545 fire and smoke properties.

**Afumex HTS – Hard.** High temperature cables according to EN 50382-2 with enhanced performance to mechanical stress, fulfilling EN 45545 fire and smoke properties.

**TENAX TRAIN Plus and PROTON (HMK).** Halogen-free single-core HD flexible cables with special fire performance and reduced dimensions. Used for connection of **pantographs in locomotives and trains**. Special design also for flexible connections to distribute power along the train.



## AMERICAN RANGE

**Polyrad XT** wire and cables meet all performance requirements of AAR RP-585, ICEA S-95-658 and transit industry specifications. Superior electrical properties and performance for advanced rapid transit, locomotive and off-road equipment applications. Dual 125 °C/110 °C temperature rating for long life. Maximum flame retardance as per VW-1, IEEE 383 and IEEE 1202. Excellent oil and chemical resistance. Maximum dependability and mechanical toughness. Smaller outside diameter and flexible stranding and insulation simplify installation.

**Polyrad ULTRA**, designed to meet the increasing demand for the reduction of both size and weight of cabling systems. Polyrad ULTRA wire offers better performance, reduced weight and smaller diameters and can be designed into multiconductor constructions that are 600 Volt and rated 125 °C. Ideal for high-density cabling applications.

**Polyrad XT- NYCT TX.** Cables according to New York City Transit (NYCT) TX Cable Specification, approved for future Capital Programs, and Maintenance, Repair and Operational (MRO) requirements.

### Transit Data Communications Cables.

NFPA 130 rated, UL Listed Type CMG-LS, according to ANSI/TIA 568-C.2 Patch.  
4 pair 24 AWG Category 5e; 2 Pair 22 AWG Category 5e; 4 Pair 24 AWG Category 6.

### Electronically Controlled Pneumatic (ECP) Brake Cable.

Specialty design for installation both under and between freight cars, available with interlocked armor or non-armored design, meets AAR S-4210.

### Diesel Locomotive (DLO) Cable.

UL Type RHH/RHW-2; c(UL) Type RW90.

**Prysmian Group Rolling Stock cable solutions are used by all major train manufacturers in state-of-the-art projects worldwide.**

**Prysmian**  
Group

Linking  
the Future

**Prysmian**  
**Draka**  
**General Cable**

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