MARINE & SHIPBOARD CABLE SOLUTIONS

High-Performance Cables for Harsh Environments

prysmian

The planet's pathways

About Prysmian

Prysmian is a global cabling solutions provider leading the energy transition and digital transformation. By leveraging its wide geographical footprint and extensive product range, its track record of technological leadership and innovation, and a strong customer base, the company is well-placed to capitalise on its leading positions and win in new, growing markets. Prysmian's business strategy perfectly matches key market drivers by developing resilient, high-performing, sustainable and innovative cable solutions in the segments of Transmission, Power Grid, Electrification and Digital Solutions. Prysmian is a public company listed on the Italian Stock Exchange, with almost 150 years of experience, about 30,000 employees, 108 plants and 26 R&D centres in over 50 countries, and sales of over €15 billion in 2023.

World-Leading Cable Solutions

The widest range of products, services, technologies and know-how.

The Group's activities are divided into four business divisions, as follows:

Transmission
which includes the Submarine Power and Land HVDC

Power Grid
which includes the HVAC business unit and Power Distribution and Overhead Lines

Electrification
which includes the Industrial & Construction and Specialties

Digital Solutions
which includes the following business units: Fiber and Optical Cables, Connectivity, Multimedia & Inside Plant cables (MMS).

Digital Solutions

Bridge The Digital Divide With Premium Data Solutions

Connecting Communities To A New World

The world is in the midst of a data explosion. Across the globe, people are sharing, purchasing, downloading, streaming, connecting and communicating in the digital sphere. Living and working digitally is the new normal. And for network operators, this means managing an exponential increase in bandwidth to meet the world's rising demand. At Prysmian, our Digital Solutions business unit is building modern day networks that provide robust physical infrastructure, trusted IT security and long-term reliability.

Our commitment to the digital transformation

At Prysmian, our Digital Solutions are realising the infrastructure of today and tomorrow, helping the world to meet its most pressing challenges. By pushing the boundaries of digitalisation, we will seize the opportunities offered by this new market trend and lead the digital transformation that is happening worldwide.

Digitalisation

Data networks must support the exponential demands of IoT, 5G, connected buildings, Industry 4.0 and more. Ensuring high-speed connectivity in the core network, within data centres or at the edge.

Network congestion

As the world demands more speed, our networks become increasingly overcrowded.

Fast-paced, competitive markets

Our customers often work in markets that shift rapidly, and need to set themselves apart from the competition.

Energy transition

The world needs cleaner and 'greener' energy supplies and telecoms networks. Fibre networks are the most sustainable of technologies.

Main Specials Environments

Industrial (factory floor)

Here the focus is to have a robust cable, to be installed among or within machines, conecting sensors and/or actuators (motors, valves, etc). Exposition to UV can be small to moderated, but oil and mechanical stress are to be expected.

Tunnel, metro, underground

In this case, the cables will be laid on the route of metro tunnels or similar, on J-hooks, trails, ladder, trays. The LSHF feature is a must, and not rare, some hard flame reaction grade (like CPR Cca or higher, and frequently, droplets) For some models, we even have certificate from LUL (London Underground)

Marine/Shipboard/Offshore

On these environments, it is expected to have presence of Oil, UV /sunlight, mechanical stress and safety (low smoke, fire retardant), installed in platforms, ships, port and heavy structures related. We have LSZH or MUD jackets, with good resistance to oil/chemical compounds. Often requires certification from DNV/GL or ABS.

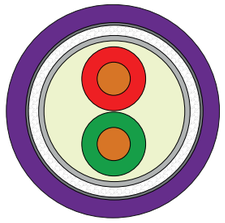
Outdoor

To connect devices using external trays or galleries, direct buried or other applications exposed to weather conditions direcly. Here UV, moisture or rodent / thermite protetion is necessary. Fire protection is typically not required. Jackets with polyethylene (PE) are best, but PVC and PUR can be used in some cases. Solar park cables (PV automation) are in this family.

Fire resistant

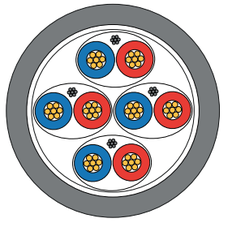
The cable in this case must keep the lines integer (nor open, nor short circuit) during the fire. It is not the same thing as fire retardant, where the insulation is not evaluated during the fire, only the damage in cable after the fire (safety). Special compounds are used in the insulation and jacket.

Main product lines



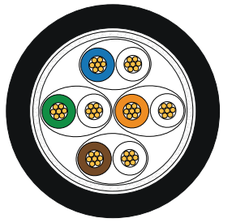
BUS cables

RS485, RS232, Profibus, CANBUS, MODBUS, AI-S, Devicenet, Fieldbus Foundation, etc Normally with few pairs (mostly 1P), slow transmission speed (typical <10Mbps), most used to connect sensors, motor driver, PLCs, things that need to communicate status, in a simple architecture, using digital signal. The frequencies are normally lower (compared to datacom), with range from some kHz to few MHz. Most important parameters: pair capacitance, resistance, AWG copper size/area, protocol to be used.



Command Cables

NOMAK, JAMAK, LiYCY, Li-02Y, Tray Cables (TC) Those are used to send electrical commands to some valves, automatic doors, dry contacts and other hard equipments in analog automation.This means the most important aspects to identify are copper size, capacitance and voltage rating, once this signal is very low frequency.



Cables for high speed special networks

Profinet, Ethernet/IP, EtherCAT, ToughCAT, SuperCAT, Industrial Ethernet (IE) Cables for links of higher speed (100Mbps ou mais), connecting machinery controllers one to another, or to higher levels like SAP, SCADA systems, it is the use of category cables in the factory floor. In general, they are Cat 5E, Cat 6 (100M-1Gbps) ou Cat 7 (for 10Gbps). Here the agressors are more severe than office applications, with oil, abrasion, UV, so regular office cables are not recommended. We have a good set of category cables specially rated for industrial stress.

Hybrids

Cables that groups at least 2 or more elements of : twited pair, optical fiber, power elements, coaxial, command copper wires. Those cables are mainly project-driven, and the application and installation need to be very clear to us before offering. Those cables are designed by customers to simplify the infrastructure and/or installation. One example is FTTA application, with DC elements + Optical cable altogether.

Symbols in this catalogue

Here you will find some symbols to help identifying the suitability of cable models to environment aggressors - like chemicals, UV, flame, etc. They are ranked as None, Limited, Basic, Good and Super. For more details, please refer to the specific cable datasheet.

No
Not protected and will deteriorate quickly

Basic
Can stay for short time, but not recommended

Good
Suitable for most cases, good lifespan

Super
Excellent protection and great lifespan, support severe cases

Fire Protection

We are able to provide IEC 60332-1 and IEC 60332-3, and also UL FT2 and FT4. For some models, we have a CPR grades like E_{ca}, D_{ca} and C_{ca}.

Chemical Resistance

For chemical resistance, we have different jackets that can withstand oils like IRM901, 902 or 903. The best chemical resistance is with our MUD jacket, which is even up to NEK 606 SHF2 stress limits (e.g. mining residuals).

Sunlight

We have different jackets for different UV exposition instensity, from 300h to 4000h accelerated aging, we can deliver a realiable product to face the outdoor environment. We recommend for higher exposure, to use black sheath to ensure maximum endurance.

Water Contact

A radial water protection might be possible to be offered when longitudinal is not, preventing the income of moisture in case of damage to jacket during the installation.

Mechanical Strength

For higher mechanical stress, we recommend the application of SWB (steel wire braid) and SWA (Steel wire armour), or thick jackets (e.g. Yv PVC).

Mechanical Strength

Our models are not gas/vapour tight, but according to IEC 60079-14, they can be used with proper sealing elements and proper connectors (continuous jacket acc. UL1277).

Certifications

Some environments might require specific certifications, so we list below the most relevant ones.

Industrial Application

In some cases, it can be requestedthat cable complies with some UL AWM Style. Those styles are related to UL 758, which is focused on industrial components (that normally are part of a bigger assembly or machine). Normally it is mentioned a Style ” like AWM Style 21238 or another 4 or 5 digits number. This Style dictates the cable construction, dimensional limits and environmental rating (flame, temperature, voltage). This UL 758 is different from traditional UL444, used in data cables for office cabling, with flame ratings like CM, CMP, CMR, etc. Nevertheless, we also have some models in our ICS Specials that have UL 444 certification (FT4). Most of our UL 758 and 444 cables are in Industrial Ethernet portfolio.

Marine/Offshore

Here the most relevant certifications required are DNVDNV-GL and ABS. The cable is submitted to some flame, transmission and physical tests to proof whether it is wappropriate to marine/offshore environments. We have some category cables (Ethernet), Optical cables and coaxial cables with such labels.

Tunnel, Mining, Subway (Metro)

For those environments, a specific CPR level might be required or a certification like LUL (London Underground) which is very hard to obtain and it is very respected in the market. It follows the standard LUL S S-11-085.

Marine & Shipboard

Installing cables in offshore and marine environments means having the cable prepared to endure environment stresses and the right raw materials to stand in long term. We have SHF1 cables in copper (category cables) and optical fiber with our Oceanline product family.

Marine & Shipboard

ToughCAT

From the many category cables in our portfolio, the Toughcat are the ones with high mechanical and environmental resistance resistance— in the LSHF jacket and even more in MUD jacket version. Our jackets are SHF1.

ToughCAT 5e

Feature	Description
Conductor	Stranded AWG24/7
Insulation	Foam Skin PE, Ø 1.4mm
Layup	4 shielded pairs + Braid
Screen	Individual + Overall (S/FTP)
Jacket	LSHF-FR, Ø6.2mm

ToughCAT 7

Feature	Description
Conductor	Stranded AWG23/7
Insulation	Foam Skin PE, Ø 1.6mm
Layup	4 shielded pairs + Braid
Screen	Individual + Overall (S/FTP)
Jacket	LSHF-FR, Ø6.6mm

ToughCAT 7S

Feature	Description
Conductor	Solid AWG23
Insulation	Foam Skin PE, Ø 1.4mm
Layup	4 shielded pairs + Braid
Screen	Individual + Overall (S/FTP)
Jacket	LSHF-FR, Ø7.6mm

ToughCAT 7A

Feature	Description
Conductor	Solid AWG23
Insulation	Foam Skin PE, Ø 1.4mm
Layup	4 shielded pairs + Braid
Screen	Individual + Overall (S/FTP)
Jacket	LSHF-FR, Ø7.8mm

Marine & Shipboard

ToughCAT MUD

From the many category cables in our portfolio, the Toughcat are the ones with high mechanical and environmental resistance — in the LSHF jacket and even more in MUD jacket version. Our jackets are SHF1.

ToughCAT 5e MUD

Feature	Description
Conductor	Stranded AWG24/7
Insulation	Foam Skin PE, Ø 1.4mm
Layup	4 shielded pairs + Braid
Screen	Individual + Overall (S/FTP)
Jacket	LSHF Ø7.6mm+ MUD jacket, Ø9.6mm

ToughCAT 7 MUD

Feature	Description
Conductor	Stranded AWG23/7
Insulation	Foam Skin PE, Ø 1.6mm
Layup	4 shielded pairs + Braid
Screen	Individual + Overall (S/FTP)
Jacket	LSHF Ø8.0mm+ MUD jacket, Ø10.1mm

ToughCAT 7S MUD

Feature	Description
Conductor	Solid AWG23/1
Insulation	Foam Skin PE, Ø 1.4mm
Layup	4 shielded pairs + Braid
Screen	Individual + Overall (S/FTP)
Jacket	LSHF Ø7.6mm+ MUD jacket, Ø9.6mm

ToughCAT 7AS MUD

Feature	Description
Conductor	Solid AWG23/1
Insulation	Foam Skin PE, Ø 1.4mm
Layup	4 shielded pairs + Braid
Screen	Individual + Overall (S/FTP)
Jacket	LSHF Ø7.8mm+ MUD jacket, Ø9.8mm

Marine & Shipboard

Oceanline

We also have Category cables for marine applications with SHF1 single jacket, as part of our Oceanline portfolio, according to IEC 61156 and ISO/IEC 11801 standards.
Our **Oceanline 5e PUR** double jacket can be used for months directly submerse in seawater, for IP monitoring cameras underwater, typically used in sea farming like shrimp and salmon cultures. Its glossy jacket can avoid formation of algae and the waterblock tape prevents radial water income.

Oceanline 5e PUR

Sea water submerse

Feature	Description
Conductor	Stranded AWG24/7
Insulation	Foam Skin PE, Ø 1.4mm
Layup	4 shielded pairs + Braid
Screen	Individual + Overall (S/FTP)
Jacket	LSHF Ø8.3mm
Protection	Water block (swellable) tape
Outer jacket	PUR, black, Ø 11.3mm

*not DNV certified

N/A Good Basic Good Good -40/+80

Oceanline 300

Feature	Description
Conductor	Bare, solid AWG24
Insulation	PE, Ø 1.1mm
Layup	4 twisted pairs + screen
Screen	Overall (SF/UTP) foil + braid
Jacket	LSHF Ø 6.6mm

60332-3 Good Good None Basic -20/+60 Dca CPR

DNV

Oceanline 900

Cat 7 SHF1

Feature	Description
Conductor	Bare, solid AWG23
Insulation	Foam-Skin PE, Ø 1.4mm
Layup	4 shielded pairs + Braid
Screen	Individual + Overall (S/FTP)
Jacket	LSHF Ø 7.5mm

60332-3 Good None None Basic -20/+60

DNV

Oceanline 10G

Feature	Description
Conductor	Bare, solid AWG23
Insulation	Foam-Skin PE, Ø 1.4mm
Layup	4 shielded pairs + Braid
Screen	Individual + Overall (S/FTP)
Jacket	LSHF—SHF1, Ø 7.3mm

60332-3 Good Basic None Basic -20/+60

DNV

Oceanline - Optical Fiber for Marine

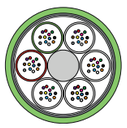
We have four optical cables for marine and shipboard installation, being two based on tight buffer element and two based on loose tube.

Oceanline OLF01

Feature	Description
Buffer	Tight (0.9mm)
Strength member	Aramid yarns
Outer Sheath	LSHF-FR, SHF1, Ø4.5-8.0mm
Max Tension	1000N
Crush	1000N

60332-3 Good Good Good Good -40/+70

DNV



Oceanline OLF03

Feature	Description
Buffer	Stranded Loose Tubes
Strength member	Fiber Glass yarns
Outer Sheath	LSHF-FR, SHF1, Ø 11.2mm
Max Tension	5000N
Crush	2500N

60332-3 Good Good Good Good -20/+60

DNV

Oceanline OLF02

Feature	Description
Buffer	Tight (0.9mm) inside 2.0mm subunits (breakout)
Strength member	Aramid yarns
Outer Sheath	LSHF-FR, SHF1, Ø7.5-12mm
Max Tension	1300N

60332-3 Good Good None Good -40/+70

DNV

Oceanline OLF04

Feature	Description
Buffer	Central Loose Tube
Strength member	Fiber Glass yarns
Outer Sheath	LSHF-FR, SHF1, Ø7.5-12mm
Max Tension	3000N
Crush	3000N

60332-3 Good Good Good Good -20/+60

DNV

Marine & Shipboard

Marine Coaxial cables

Our RF cables are based on MIL-C-17G standard, regarding electrical properties.

RG213

Feature	Description
Conductor	Stranded, 7x0.75, Ø 2.25mm
Insulation	PE, Ø 7.25mm
Braid	Bare copper, 96% cover
Attenuation	24.7 dB/100m @ 1GHz
Jacket	LSHF-FR, Ø10.3mm
Impedance	50 Ω (for RF)
Capacitance	100 pF/m

DNV

RG214

Feature	Description
Conductor	Silver plated, 7x0.75, Ø 2.25mm
Insulation	PE, Ø 7.25mm
Braid	1st: silvered 94%, 2nd: silvered 97%
Attenuation	28.4dB/100m @ 1GHz
Jacket	LSHF-FR, Ø10.8mm
Impedance	50 Ω (for RF)
Capacitance	100 pF/m

DNV

RG223

Feature	Description
Conductor	Silver plated, Ø 0.9mm
Insulation	PE, Ø 2.95mm
Braid	1st: silvered 96%, 2nd: silvered 96%
Attenuation	45.9dB/100m @ 1GHz
Jacket	LSHF-FR, Ø 5.4mm
Impedance	50 Ω (for RF)
Capacitance	100 pF/m

DNV

Oceanline 2.7/7.3 AF

Feature	Description
Conductor	Bare Copper, Ø 2.71mm
Insulation	PE, Ø 7.25mm
Braid	AL-PET-AL foil + tinned copper braid
Attenuation	13.6 dB/100m @ 1GHz
Jacket	LSHF-FR, Ø 10.3mm
Impedance	50 Ω (for RF)
Capacitance	100 pF/m

DNV

draka

A Prysmian Brand