

HEADROW® Subaqua & FrostLink

Fiber optic cables for underwater
and extreme cold environments



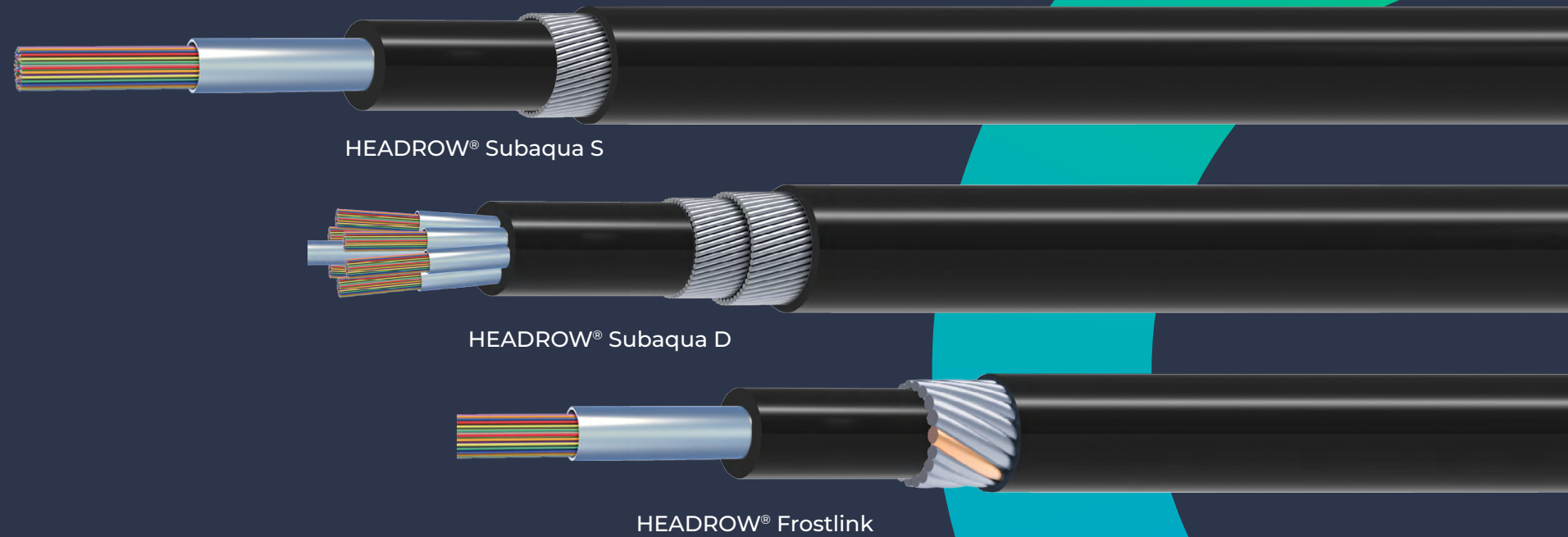
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INTRODUCTION

Prysmian provides advanced fiber optic cable solutions engineered to ensure reliable performance in complex and demanding environments.

The HEADROW® Subaqua and HEADROW® FrostLink product families deliver lightweight, robust, and easy-to-install cable solutions designed for both permanent and temporary underwater installations, as well as for extreme cold-weather conditions.



WHY HEADROW®

 Lightweight, easy-to-handle design compared to traditional submarine cables

 High fiber capacity, with configurations of up to 432 fibers

 Optimized balance between mechanical strength and reduced cable weight and size

 Suitable for both temporary and permanent underwater deployments

 Hermetically sealed stainless steel tube ensuring complete water blocking and long-term reliability

 Proven performance in harsh, remote, and environmentally challenging conditions

 Steel wire armouring providing enhanced mechanical protection

 Reduced operational maintenance cost compared to conventional submarine cables

 Reinforced construction providing enhanced resistance to vandalism and unauthorized tampering

 FrostLink variants available with optional copper conductors for tone injection or active heating

Fiber optic cables for underwater and extreme cold environments



PRODUCT FAMILIES OVERVIEW

The HEADROW® portfolio is structured into two main product families, designed to address specific environmental and mechanical requirements:

Together, these product families ensure reliable fiber optic connectivity across subsea, terrestrial, and extreme cold environments. Each family includes multiple configurations to meet different installation conditions, mechanical requirements, and environmental challenges.

HEADROW® Subaqua

Lightweight submarine cables designed for underwater and land-to-water transition applications, offering an optimized balance between mechanical strength and ease of installation, and suitable for both subsea and terrestrial deployments

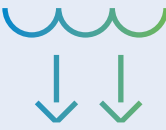


HEADROW® FrostLink

Specialized solutions for extreme cold-weather environments, designed for reliable operation at temperatures as low as -60 °C, with optional copper conductors for additional functionalities such as tone injection or heating.



APPLICATIONS



HEADROW® Subaqua – Light Submarine Cables



Bay, river, and lake crossings



Island interconnections



Navigable waterways



Coastal surveillance and monitoring systems



Subsea DFOS Sensors (Intrusion, Seismic, Environmental)



Port and harbor telecom networks



Naval and defense communication systems



Hydropower infrastructures



Aquaculture and fish farming installations

Challenging environments, including mangroves, monsoon-prone regions, canals, sewer systems, and flood-prone areas



HEADROW® FrostLink – Extreme Cold-Weather Cables



Permafrost and tundra environments



Frozen lakes and seasonal ice conditions



Land-to-water transition zones



Arctic and subarctic telecom networks



Remote community connectivity



Mining operations in extreme cold climates



Temporary winter roads and ice road installations



Wildlife-exposed areas



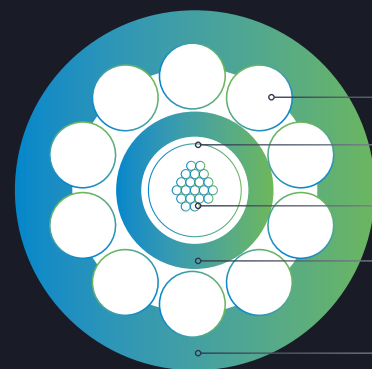
Redundancy land backbones for Submarine networks

CABLE CONSTRUCTION

HEADROW® cables are based on a hermetically sealed stainless steel tube design, ensuring complete water blocking and long-term reliability.

The typical structure includes:

- Optical fibers (single-mode and multimode, compliant with relevant ITU-T/IEC standards).
- Stainless steel loose tube filled with water-blocking compound.
- Steel wire armouring (single or double layer).
- Durable outer sheath for mechanical and environmental protection, with optional resistance to biological and environmental aggressors.



Galvanized steel wires
Stainless steel tube
Optical fibers
Inner sheath
Outer sheath

Designed to perform where conventional cable technologies fail.

DESIGN ADVANTAGES

HEADROW® cable solutions are specifically engineered to deliver reliable performance in harsh environments, including permafrost, tundra, and demanding subsea conditions.

ROBUST MECHANICAL PERFORMANCE

Stainless steel tube and armoured design provide high resistance to crush, impact, and installation stresses reducing the risk of damage when handling with heavy machinery.

OUTSTANDING THERMAL STABILITY

Metallic components maintain structural integrity at very low temperatures, unlike conventional plastic designs.

SUPERIOR WATER BLOCKING

Hermetically sealed steel tube prevents water ingress and protects fiber integrity ensuring longer operational life.

ENHANCED ENVIRONMENTAL PROTECTION

Steel armouring protects the cable against rodents, wildlife, and other external aggressions.

RELIABLE LONG-TERM OPTICAL PERFORMANCE

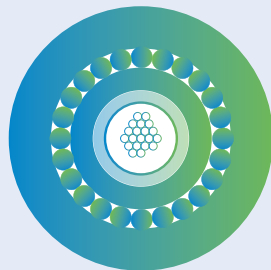
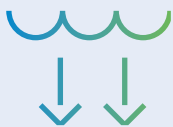
Reduced risk of microbending and attenuation caused by mechanical and thermal stress.



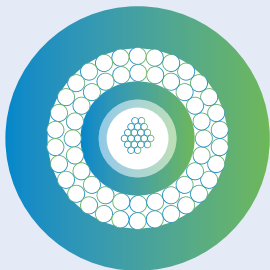
PORTFOLIO TABLES

HEADROW® cables are available in a wide range of strength classes, from lightweight designs to heavy-duty configurations. Supporting up to 432 optical fibers, each cable can be customized to meet specific mechanical, environmental, operational, and installation length requirements.

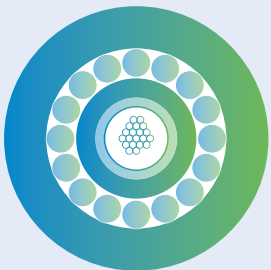
HEADROW® Subaqua Portfolio



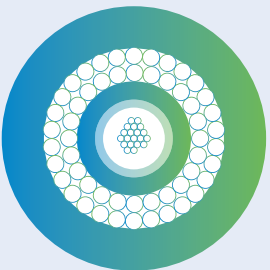
Subaqua S-Lite
NTTS - 7 kN



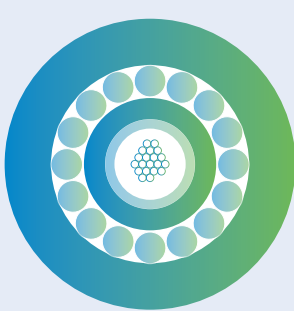
Subaqua D-Lite
NTTS - 16 kN



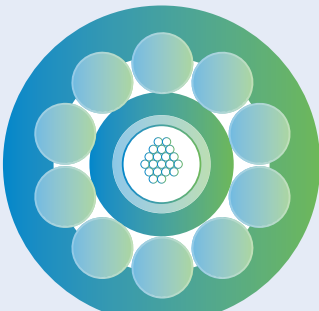
Subaqua S-Lake
NTTS - 26 kN



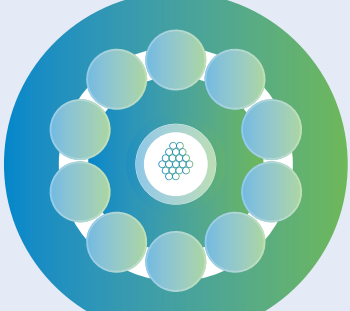
Subaqua D-Lake
NTTS - 27 kN



Subaqua S40
NTTS - 40 kN



Subaqua S60
NTTS - 60 kN

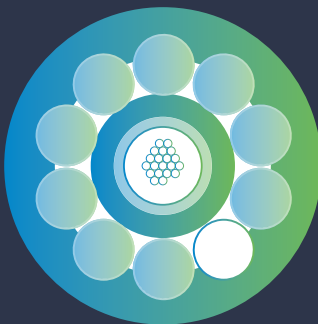


Subaqua S100
NTTS - 100 kN

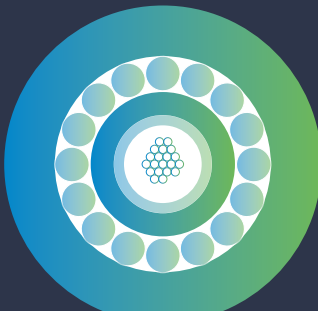
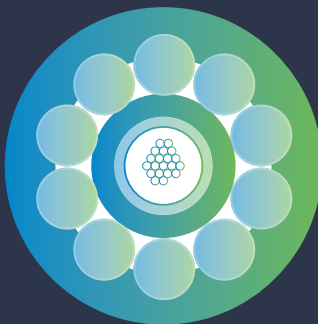
* Cross-sectional view examples (not to scale)



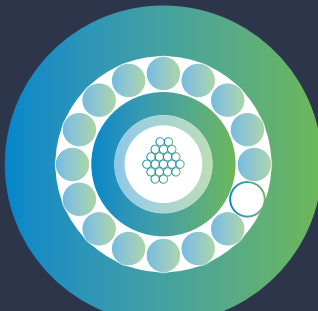
HEADROW® FrostLink Portfolio



FrostLink 48FO
NTTS - 35 kN



FrostLink 96FO
NTTS - 40 kN

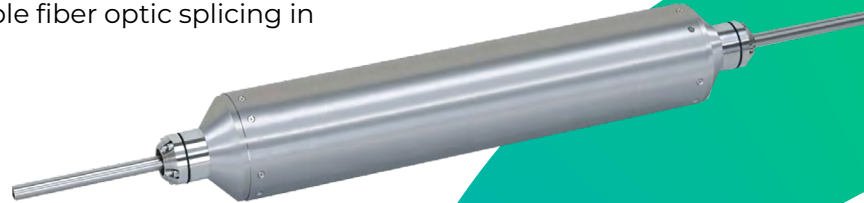


ACCESSORIES & SERVICES

Prysmian offers a comprehensive range of accessories and support services to ensure reliable installation and long-term performance of HEADROW® cable systems:

Stainless steel underwater Joint Closure – XOK2020

Designed for secure and reliable fiber optic splicing in submerged environments.



Stainless steel Land Joint Closure - XOK 10307

Suitable for terrestrial applications, providing robust protection for fiber jointing.



Jointing Training and Certification

Professional training programs and certification to ensure high-quality installation and operational reliability..



SUSTAINABLE INNOVATION

Sustainability as a genuine commitment to future generations

Innovation and sustainability are two of Prysmian's strategic pillars and an integral part of our DNA. Every decision and action we take is guided by a firm commitment to leading the market toward sustainable development — the only viable path forward. For Prysmian, sustainability is more than a business management approach; it represents a genuine commitment to future generations.

CONTINUOUS R&D&I

Prysmian continuously researches and develops new designs, materials, and processes to strengthen its technological offering. These innovations support the energy transition, reduce the environmental impact of solutions, and enable cleaner and more efficient energy systems.



Prysmian is committed to reducing environmental impact by acting directly on the design and configuration of its products and solutions, supporting decarbonisation across the entire value chain.



We have circular programs for returning, repairing, and reusing wooden drums. All Wooden drums are manufactured using PEFC-certified sustainable wood, reinforcing Prysmian's commitment to responsible forestry.





For further information, technical support,
or commercial inquiries, please contact:

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