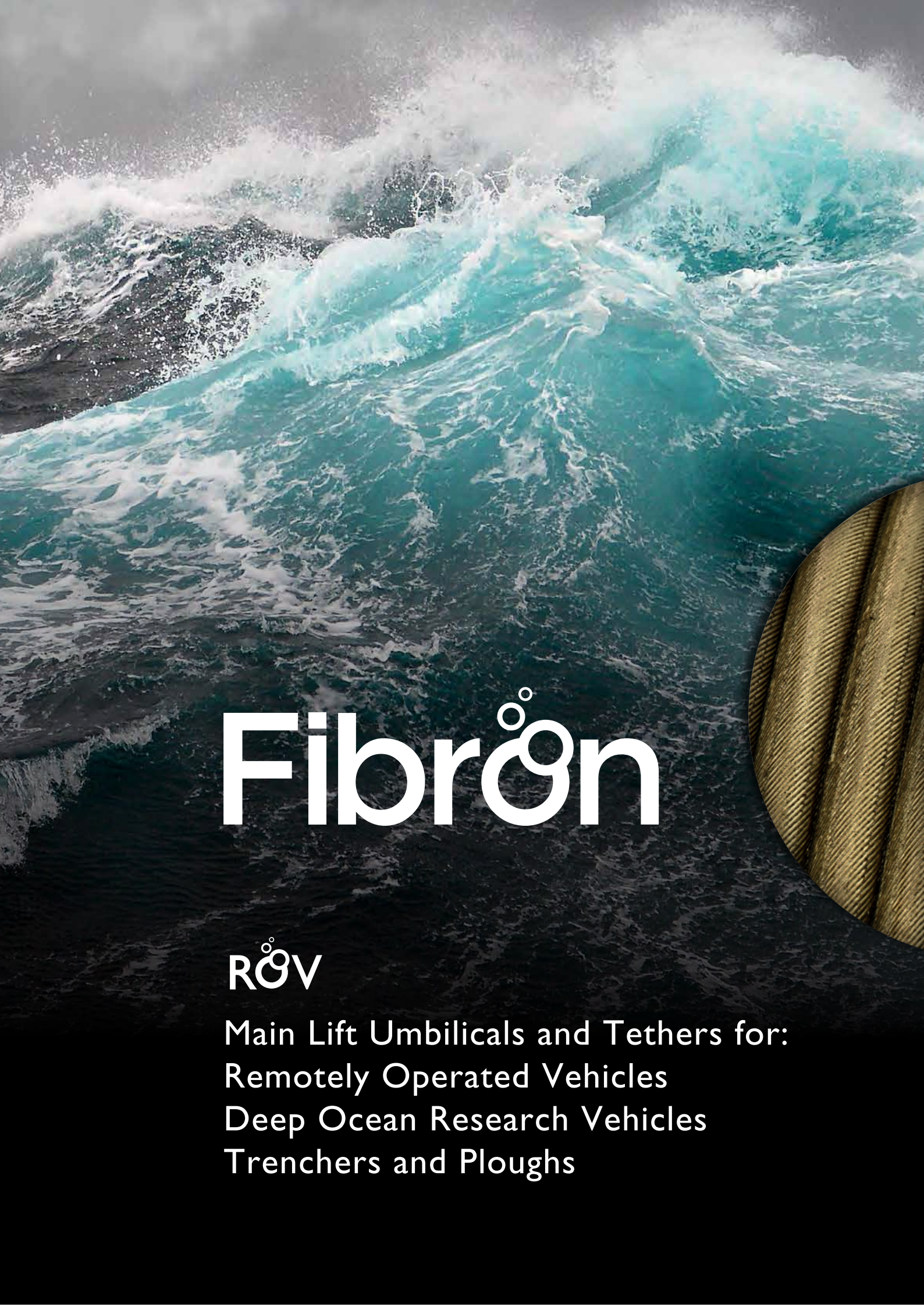


Fibrøn

ROV

Main Lift Umbilicals and Tethers for:
Remotely Operated Vehicles
Deep Ocean Research Vehicles
Trenchers and Ploughs

FIBRON'S GOAL IS TO PROVIDE THE MOST RELIABLE SOLUTIONS IN TODAY'S EXPLORATORY SUBSEA INDUSTRY

Fibron provides an industry-leading range of subsea cables and umbilicals for all diving, ROV and intervention needs.

We are all explorers with the spirit of adventure at heart. For some it's about pushing the boundaries of human endeavour, while for others it's about overcoming the everyday challenges.

We believe passionately in the power of change. Together, let's go deeper and further, changing attitudes and shaping the future of our industry.

CLASS-LEADING ARMOURING PACKAGES

Fibron have many years of field-proven experience and expertise in the design and manufacture of armouring packages, ensuring superior strength and reliability.

THIN-WALL INSULATION

Fibron's Thin-Wall Insulation technology allows for the design of cables with smaller diameters to suit your specific requirements, saving space and weight.

Our ROV umbilicals are designed and manufactured at a purpose-built facility in the UK. Fibron design and production processes are ISO 9001 certified.

What can we do for you?

Whatever your challenge, Fibron welcomes the opportunity to solve it.

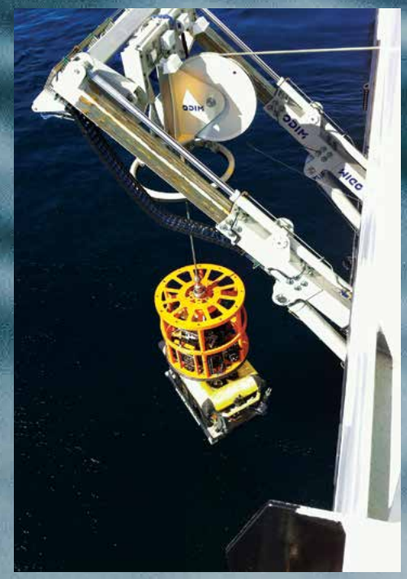
We have unique experience to help you lower costs, save time, increase safety and gain better efficiencies. Plus our service doesn't end with product delivery.

You can expect Fibron to back you up with industry-leading customer support and technical advice on product use in the field. Our trained service engineers are available to support field installation and maintenance, to give you full peace of mind throughout the life of the product.

Applications

- ROV Main Lift Umbilicals including
  - Observation
  - Inspection
  - Light / Medium / Heavy Work Class
- ROV Tethers
- Deep Ocean Research Umbilicals
- Trencher Umbilicals
- Oceanographic Cables
- Diamond Mining Umbilicals
- Subsea Pile Hammer Umbilicals

ROV SPECIALISTS



ROV MAIN LIFT UMBILICALS

Fibron ROV Main Lift Umbilicals are custom-designed and manufactured to meet your specific requirements.

Armour packages utilise in-house field-proven technology, ensuring stable, balanced constructions. Products with load-bearing capabilities based on high tensile galvanised steel, in continuous lengths of 10 km and beyond, allow you to go deeper for more dives.

With an enviable track record in Main Lift Umbilical supply to many major system builders and operators, Fibron designs are the result of years of expertise, experience and extensive testing.

Cross-section example (To scale)

RM0015

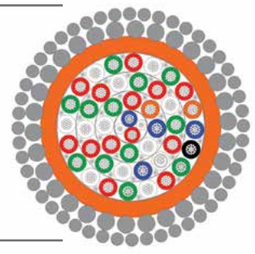
Overall Diameter:	35.1 mm
Weight in Air:	4,200 kg/km
Weight in Sea-water:	3,200 kg/km
Minimum Dynamic Bend Radius:	480 mm
Minimum Breaking Load:	680 kN
Contents:	1 x 0.6 mm² STQ 8 x 1.5 mm² conductors 11 x 4.0 mm² conductors 2 x (2 SM + 2 MM) FIST units

RM0035

Overall Diameter:	28.5 mm
Weight in Air:	2,910 kg/km
Weight in Sea-water:	2,260 kg/km
Minimum Dynamic Bend Radius:	400 mm
Minimum Breaking Load:	480 kN
Contents:	6 x 6.5 mm² conductors 4 x 1.2 mm² conductors 1 x 6 SM FIST unit

RM0042

Overall Diameter:	39.8 mm
Weight in Air:	4,960 kg/km
Weight in Sea-water:	3,700 kg/km
Minimum Dynamic Bend Radius:	600 mm
Minimum Breaking Load:	720 kN
Contents:	1 x 1.5 mm² STP 41 x 2 mm² conductors 1 x 12 SM FIST unit



RM0045

Overall Diameter:	33.2 mm
Weight in Air:	4,100 kg/km
Weight in Sea-water:	3,270 kg/km
Minimum Dynamic Bend Radius:	750 mm
Minimum Breaking Load:	659 kN
Contents:	13 x 18 AWG conductors 9 x 10 AWG conductors 1 x 7 SM FIST unit

RM0053

Overall Diameter:	34.1 mm
Weight in Air:	4,100 kg/km
Weight in Sea-water:	3,150 kg/km
Minimum Dynamic Bend Radius:	750 mm
Minimum Breaking Load:	695 kN
Contents:	2 x 1.34 mm² STPs 3 x 8.4 mm² conductors 1 x 6 SM FIST unit

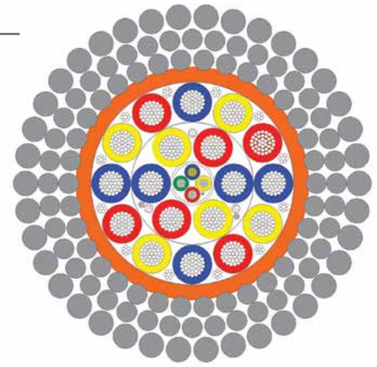
Products shown are examples of previous supply. Contact us for a design to meet your specific requirements.

TRENCHER UMBILICALS

Combining requirements for high voltage, performance at depth and high load-bearing capability, Fibron have the technology to deliver trencher umbilicals suitable for extreme applications.

RM0005

Overall Diameter:	58.0 mm
Weight in Air:	12,650 kg/km
Weight in Sea-water:	9,950 kg/km
Minimum Dynamic Bend Radius:	800 mm
Minimum Breaking Load:	1,975 kN
Contents:	1 x 1.34 mm² STQs 18 x 10.0 mm² conductors 3 x 4 SM FIST unit



DEEP OCEAN RESEARCH UMBILICALS

Working with world-leading organisations, Fibron have a strong history in the supply of umbilicals for Deep Ocean Research based on our superior armouring technology and ability to transmit high voltages in small diameter cables.

Having supplied up to 10,000m continuous lengths, successfully tested at independent test houses, you can be sure of the survivability of Fibron products even in the deepest, harshest environments.

RM0049

Overall Diameter:	17.3 mm
Weight in Air:	1,060 kg/km
Weight in Sea-water:	815 kg/km
Minimum Dynamic Bend Radius:	355 mm
Minimum Breaking Load:	185 kN
Contents:	3 x 5 mm² conductors 1 x 6 SM FIST unit

RM0026

Overall Diameter:	19.1 mm
Weight in Air:	1,220 kg/km
Weight in Sea-water:	920 kg/km
Minimum Dynamic Bend Radius:	260 mm
Minimum Breaking Load:	200 kN
Contents:	2 x 2.5 mm² conductors 3 x 4.0 mm² conductors 1 x [5 x SM & 1 x MM] FIST units

RM0029

Overall Diameter:	17.3 mm
Weight in Air:	1,050 kg/km
Weight in Sea-water:	810 kg/km
Minimum Dynamic Bend Radius:	280 mm
Minimum Breaking Load:	140 kN
Contents:	1 x 0.22 mm² STQs 5 x 4 mm² conductors 1 x 6 SM FIST unit

ABBREVIATIONS:

FIST: Fibre (Optic) in Steel Tube
STP: Screened twisted pair
STQ: Screened twisted quad
SM: Single mode
MM: Multi-mode

ROV TETHER CABLES

Fibron ROV tethers are individually designed and built to meet your specifications. Whether your application has demanding requirements for voltage, buoyancy, size, length or strength, our ability to process Vectran™ fibre and a range of polymeric materials on state-of-the-art machinery means we can work with you to deliver a cable to suit your specific needs.

RT0084

Overall Diameter:	28.0 mm
Weight in Air:	665 kg/km
Weight in Sea-water:	39 kg /km
Minimum Dynamic Bend Radius:	250 mm
Minimum Breaking Load:	70 kN
Contents:	3 x 4 mm² conductors 2 x 0.88 mm² conductors 1 x 6 SM FIST unit

RT0127

Overall Diameter:	24.5 mm
Weight in Air:	450 kg/km
Weight in Sea-water:	-20 kg/km
Minimum Dynamic Bend Radius:	240 mm
Minimum Breaking Load:	25.0 kN
Contents:	2 x 0.5 mm² conductors 2 x 2 mm² conductors 1 x 2 SM FIST unit Dedicated buoyancy layer

RT0133

Overall Diameter:	27.0 mm
Weight in Air:	850 kg/km
Weight in Sea-water:	265 kg/km
Minimum Dynamic Bend Radius:	400 mm
Minimum Breaking Load:	100 kN
Contents:	3 x 0.34 mm² conductors 6 x 4 mm² conductors 1 x 8 SM FIST unit

RT0136

Overall Diameter:	35.0 mm
Weight in Air:	1,200 kg/km
Weight in Sea-water:	205 kg/km
Minimum Dynamic Bend Radius:	400 mm
Minimum Breaking Load:	130 kN
Contents:	1 x 0.5 mm² STQ 2 x 2.5 mm² conductors 3 x 6 mm² conductors 1 x [6 SM & 6 MM] FIST unit Dedicated buoyancy layer

RT0137

Overall Diameter:	27.0 mm
Weight in Air:	760 kg/km
Weight in Sea-water:	170 kg/km
Minimum Dynamic Bend Radius:	300 mm
Minimum Breaking Load:	80.0 kN
Contents:	2 x 0.22 mm² conductors 2 x 0.88 mm² conductors 3 x 6 mm² conductors 1 x 4 SM FIST unit

MARKET-LEADING TECHNOLOGY

WORLD-CLASS ARMOURING

Fibron armour packages are based on armouring technology developed in conjunction with industry leader Bridon™, ensuring class-leading strength and rotational stability.

Fibron's ability to source armour wire in over 100 diameters from a range of tensile strengths allows us to design an armour package tailored to suit your exact requirements.

THIN-WALL INSULATION, BACKED BY RESEARCH

Fibron uses a state-of-the-art, processor-controlled, dual-head extruder to apply selected polymers to insulate our conductors. This process allows Fibron to manufacture cores with an optimised diameter for voltage stress, saving weight and deck space.

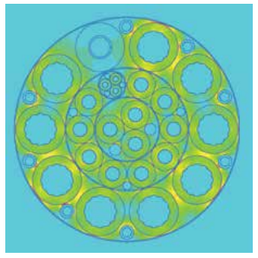
This technology is supported by voltage endurance testing conducted at a leading UK-based university, at voltages up to 7.4 kV.

SUPPORT SERVICES

MECHANICAL TESTING

Fibron has extensive test facilities, providing you with cost-effective product validation and research. When independent testing is required, our close relationships with industry-leading test houses enable us to project manage external testing that gives you that extra assurance of the highest quality product.

- o Cyclic-bend-over-sheave testing
- o Break load testing
- o Torque / rotation testing



ELECTRICAL TESTING

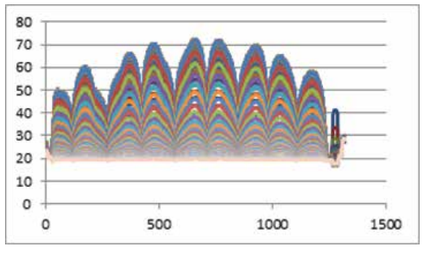
Fibron has the capability to conduct scientific evaluation of the electrical characteristics of our products including:

- o High voltage testing
- o Partial discharge evaluation
- o Voltage breakdown testing

THEORETICAL ANALYSIS

Cutting-edge theoretical analysis you can trust, including in-house FEA capability and current rating analysis based on research backed by leading UK based research institutions. Using both commercially available and proprietary software, our experienced engineers can conduct theoretical analysis to enable prediction of in-service performance prior to manufacture including:

- o Electrical stress FEA
- o Weibull analysis to IEC 61251:2015
- o Failure probability analysis
- o Current rating and winch temperature analysis



We design and implement umbilical and cable solutions from the surface to the seabed for the Energy (Oil & Gas), ROV, Diving, Seismic and Defence industries.
We use a keen knowledge of our environment, combined with innovative thinking, materials testing and analysis to provide products that meet any challenge.

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Ref 'ROV-Brochure-20'