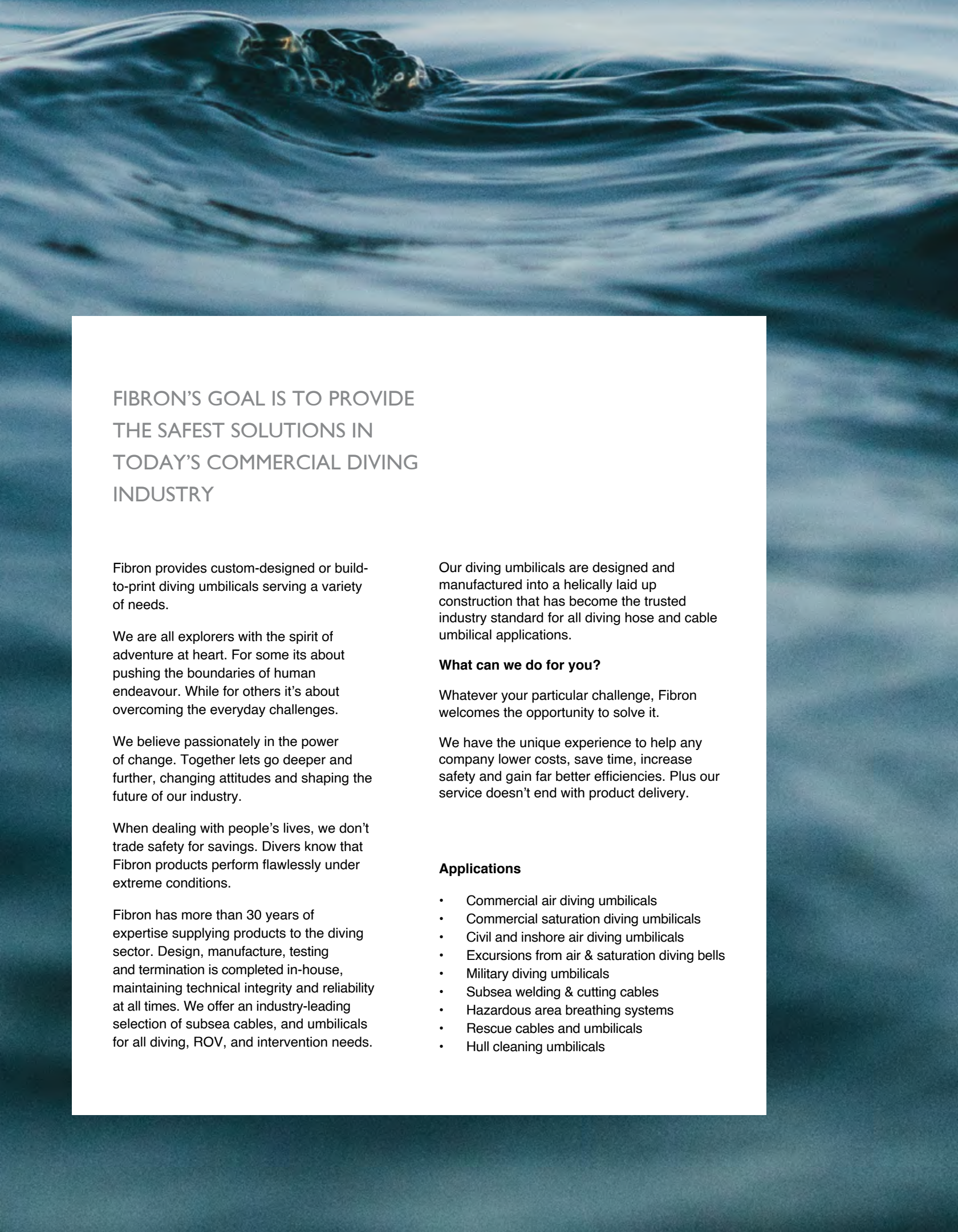




Fibrón

DIVING

Main Services, Saturation
and Air Diver's Umbilicals



FIBRON'S GOAL IS TO PROVIDE THE SAFEST SOLUTIONS IN TODAY'S COMMERCIAL DIVING INDUSTRY

Fibron provides custom-designed or build-to-print diving umbilicals serving a variety of 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.

When dealing with people's lives, we don't trade safety for savings. Divers know that Fibron products perform flawlessly under extreme conditions.

Fibron has more than 30 years of expertise supplying products to the diving sector. Design, manufacture, testing and termination is completed in-house, maintaining technical integrity and reliability at all times. We offer an industry-leading selection of subsea cables, and umbilicals for all diving, ROV, and intervention needs.

Our diving umbilicals are designed and manufactured into a helically laid up construction that has become the trusted industry standard for all diving hose and cable umbilical applications.

What can we do for you?

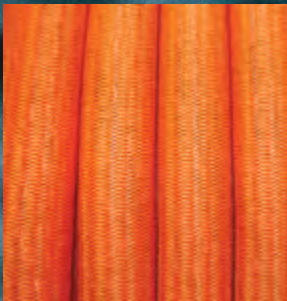
Whatever your particular challenge, Fibron welcomes the opportunity to solve it.

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

Applications

- Commercial air diving umbilicals
- Commercial saturation diving umbilicals
- Civil and inshore air diving umbilicals
- Excursions from air & saturation diving bells
- Military diving umbilicals
- Subsea welding & cutting cables
- Hazardous area breathing systems
- Rescue cables and umbilicals
- Hull cleaning umbilicals

DIVING SPECIALISTS



IMPROVE DIVER EFFICIENCY AND PROTECT THE PERSON AT THE END OF THE LIFELINE



Main Bell Umbilicals

Fibron's main bell umbilicals can be built to customer requirements for main bell, wet bell, habitat and welding system end use.

Laid up in a helical format, components and strength members can, if required, be manufactured with either a polyethylene monofilament overbraid or an extruded thermoplastic sheath. Hoses and cables are incorporated to provide services for gas, hot water, gas reclaim, depth monitoring, power supply, signal, video transmission and communications.

For your peace of mind, all design, manufacture, testing and termination is undertaken in-house to our proven high standards. Third party approval and the required back-up certification and documentation is available to all main industry standards including Lloyds Register of Shipping (LRS), Det Norske Veritas (DNV), American Bureau of Shipping (ABS) and Bureau Veritas (BV).

Excursion Umbilicals (Saturation Diving)

Fibron's range of diver excursion umbilicals for saturation diving bells offer excellent abrasion resistance and flexibility. Twisted up into "rope like" constructions and designed to suit all end uses, these lightweight umbilicals are easy to handle and store.

Surface Demand Umbilicals (Air Diving)

Whether it's for civil, commercial or hazardous end uses, Fibron offers a complete range of diver umbilicals twisted up into "rope like" constructions for surface demand. Fibrolite and Fibrolite hoses have a smooth polyurethane cover for excellent abrasion resistance, while providing superior flexibility.

Hose ends

Fibron offers marine phosphor bronze end fittings for our diving umbilical hoses. These fittings are available in three female thread types JIC, Oxy / Lenz or BSP. Part of Fibron's bespoke problem solving services, we can provide these fittings in other materials.

Electrical Connectors

We can terminate & test umbilicals with most industry standard connectors, such as Souriau, SubConn, Impulse, Seacon & Crouse Hinds.

Mechanical Terminations

D-rings, D-ring/snap shackles, hose bend restrictors & cable grips can also be attached as required.

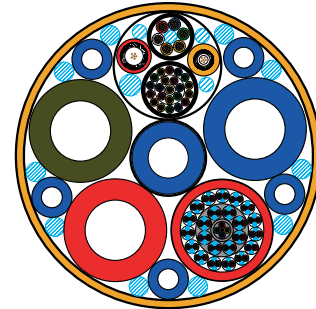
Oil or Water Stops

Power, signal, and video cable components included in main services umbilicals can have the subsea (bell) ends terminated with oil or water stops. This offers an enclosed resin block with double ended contacts to provide continuity. Each side is epoxy back-potted and the complete unit over moulded with polyurethane. The oil stops are typically sited half way along the tail length.

FIBROFLEX HIGH PRESSURE HOSES

Fibroxflex is a highly flexible braided high pressure diving hose for use in Main Bell, Wet Bell and Excursion umbilicals. These hoses are designed specifically to withstand the rigorous of everyday use in a hyperbaric dive system. All common hose sizes in the Fibroxflex range of hoses are Lloyds Register of Shipping (LRS) & Det Norske Veritas (DNV) approved.

Services include gas and hot water supply, gas reclaim, and pneumo monitoring hoses. Fibroxflex gas and hot water hoses, plus wire armoured and lightweight reclaim hoses for mixed gas (saturation) diving allocations, can only be fitted with phosphor bronze swageable type hose ends.



FIBROFLEX HOSE DATA

Hose Type		Collapse and Recover Hose					Gas Reclaim Hose	
Specification Number		FRH 06	FRH 08	FRH 10	FRH 12	FRH 16	FXH 10	FXH 12
Hose Dash Size	UOM	-06	-08	-10	-12	-16	-10	-12
Max. working pressure	psi / bar	100 / 7	100 / 7	100 / 7	100 / 7	100 / 7	1,000 / 69	1,000 / 69
Min. burst pressure	psi / bar	400 / 28	400 / 28	400 / 28	400 / 28	400 / 28	6,000 / 414	6,000 / 414
Nominal bore	in / mm	3/8 / 9.53	1/2 / 12.70	5/8 / 15.80	3/4 / 19.00	1 / 25.40	5/8 / 15.80	3/4 / 19.00
Outside diameter	mm	19.10	22.25	27.95	32.75	39.55	30.00	33.50
Weight in air	kg / km	249	304	483	633	796	939	1,083
Weight in seawater	kg / km	-45	-95	-174	-231	-464	214	179
Min. bend radius	mm	190	225	280	330	395	300	335
External collapse pressure	psi / bar	N/A	N/A	N/A	N/A	N/A	1,000 / 69	750 / 53
Standard colour*		Black	Black	Black	Black	Black	Black	Black

HOSE TYPE

		Gas Hose Specification						
Specification Number		FDH 03	FDH 04	FDH 06G	FDH 08G	FDH 10G	FDH 12G	FDH 16G
Hose Dash Size	UOM	-03	-04	-06	-08	-10	-12	-16
Max. working pressure	psi / bar	1,000 / 69	1,000 / 69	1,000 / 69	1,000 / 69	1,000 / 69	1,000 / 69	1,000 / 69
Min. burst pressure	psi / bar	6,000 / 414	8,000 / 552	8,000 / 552	8,000 / 552	8,000 / 552	8,000 / 552	8,000 / 552
Nominal bore	in / mm	3/16 / 4.76	1/4 / 6.35	3/8 / 9.53	1/2 / 12.70	5/8 / 15.80	3/4 / 19.00	1 / 25.40
Outside diameter	mm	9.7	11.9	18.25	22.7	27.1	32.05	39.4
Weight in air	kg / km	67	99	219	324	439	580	777
Weight in seawater	kg / km	-9	-15	-49	-91	-153	-247	-473
Min. bend radius	mm	100	120	180	230	270	320	395
Standard colour*		Green	Blue	Blue	Blue	Blue	Blue	Blue

HOSE TYPE

		Hot Water Hose Specification						
Specification Number		FDH 03H**	FDH 04H**	FDH 06H	FDH 08H	FDH 10H	FDH 12H	FDH 16H
Hose Dash Size	UOM	-03	-04	-06	-08	-10	-12	-16
Max. working pressure	psi / bar	1,000 / 69	1,000 / 69	1,000 / 69	1,000 / 69	1,000 / 69	1,000 / 69	1,000 / 69
Min. burst pressure	psi / bar	6,000 / 414	8,000 / 552	8,000 / 552	8,000 / 552	8,000 / 552	8,000 / 552	8,000 / 552
Nominal bore	in / mm	3/16 / 4.76	1/4 / 6.35	3/8 / 9.53	1/2 / 12.70	5/8 / 15.80	3/4 / 19.00	1 / 25.40
Outside diameter	mm	9.7	11.9	18.25	22.7	27.1	32.05	39.4
Weight in air: hose / hose full of water	kg / km	62 / 80	93 / 125	203 / 274	304 / 431	414 / 610	550 / 834	738 / 1,245
Weight in seawater (hose full of water)	kg / km	4	11	6	10	19	6	-6
Min. bend radius	mm	100	120	180	230	270	320	395
Standard colour*		Red	Red	Red	Red	Red	Red	Red

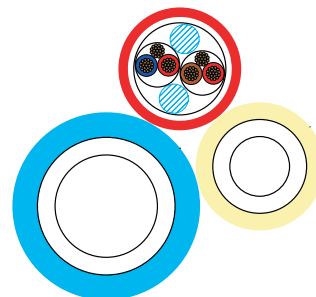
* Other colours available to order

** Non standard sizes

FIBROLITE AND FIBROLINE HOSES

The Fibrolite and Fibroline range of sheathed lower pressure diving hoses are designed for use in surface dive applications where kink and abrasion resistance are high priorities and is particularly suited to jacket maintenance and salvage type operations. Other applications include use in breathing apparatus for gas tank inspections and other hazardous environments.

Fibrolite & Fibroline air dive gas and hot water hoses can be fitted with marine phosphor bronze swageable hose ends.



FIBROLINE HOSE DATA

Hose Type		Hot Water Hose Specification					
Specification Number		FBL 03H	FBL 04H	FBL 06H	FBL 08H	FBL 10H	FBL 12H
Hose Dash Size	UOM	-03	-04	-06	-08	-10	-12
Max. working pressure	psi / bar	500 / 35	500 / 35	500 / 35	500 / 35	500 / 35	500 / 70
Min. burst pressure	psi / bar	5,000 / 345	2,500 / 172	4,000 / 276	4,000 / 276	4,000 / 276	6,000 / 414
Nominal bore	in / mm	3/16 / 5.10	1/4 / 6.35	3/8 / 9.53	1/2 / 12.70	5/8 / 15.80	3/4 / 19.30
Outside diameter	mm	11.00	12.50	18.50	21.50	24.25	30.60
Min. bend radius (operational)	mm	72	82	121	140	158	199
Weight in air: hose / hose full of water	kg / km	81 / 101	101 / 133	227 / 298	270 / 397	303 / 499	502 / 786
Weight in seawater (hose full of water)	kg / km	4	7	23	24	25	31
Standard colour*		Red	Red	Red	Red	Red	Red

HOSE TYPE

		Gas Hose Specification					
Specification Number		FBL 03T	FBL 04P	FBL 06G	FBL 08G	FBL 10G	FBL 12G
Hose Dash Size	UOM	-03	-04	-06	-08	-10	-12
Max. working pressure	psi / bar	500 / 35	500 / 35	500 / 35	500 / 35	500 / 35	500 / 70
Min. burst pressure	psi / bar	5,000 / 345	2,500 / 172	4,000 / 276	4,000 / 276	4,000 / 276	6,000 / 414
Nominal bore	in / mm	3/16 / 5.10	1/4 / 6.35	3/8 / 9.53	1/2 / 12.70	5/8 / 15.80	3/4 / 19.30
Outside diameter	mm	11.00	12.50	18.50	21.50	24.25	30.60
Min. bend radius (operational)	mm	72	82	121	140	158	199
Weight in air	kg / km	81	101	227	270	303	502
Weight in seawater	kg / km	-16	-25	-49	-102	-171	-252
Standard colour*		Green	Yellow	Blue	Blue	Blue	Blue

FIBROLITE HOSE DATA

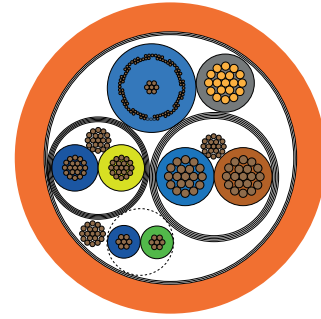
Specification Number		Pneumo Hose FLT04	Gas Hose FLT06/R	Hot Water Hose FLT08
Hose Dash Size	UOM	-04	-06	-08
Max. working pressure	psi / bar	400 / 27.5	500 / 35	400 / 27.5
Min. burst pressure	psi / bar	1,600 / 110	2,000 / 140	1,600 / 110
Nominal bore	in / mm	1/4 / 6.35	3/8 / 9.5	1/2 / 12.5
Outside diameter	mm	11.5	17.5	18.5
Weight in air	kg / km	82	194	167
Weight in sea water	kg / km	-25	-53	-109
Min. bend radius (operational)	mm	75	115	120
Standard colour*		Yellow	Blue	Red

* Other colours available; minimum order quantities apply

DIVING CABLES

The chart below illustrates common cable types, frequently used and available off-the-shelf. These cables are regularly used within bell excursion and surface dive umbilicals. Beyond these, however, Fibron has the ability to custom-design and custom-build cables for a variety of situations and solutions.

Contact us at london@fibron.com for an initial discussion of your project needs.



STANDARD DIVING CABLES

Part Number	Description	Weight in air kg / km	Weight in seawater kg / km	O.D. mm
DCS0001	Communication cable – c/w strength braid 2 x 0.5mm ² screened pairs Polyester strength braid (500kg minimum break strength) RED polyurethane outer sheath (1.7mm nominal thickness)	120	25	11.0
DCS0012	Communication / Diver monitoring cable 2 x 0.5mm ² screened pairs, 2 x 0.5mm ² cores RED polyurethane outer sheath (1.8mm nominal thickness)	120	30	10.5
DCS0014	Combined communication / video cable 1 x 1.34mm ² twisted pair, 2 x 1.0mm ² screened pairs 1 x 0.5mm ² screened pair, 2 x 1.0mm ² cores 1 x 75Ω mini coax, void filled assembly RED polyurethane outer sheath (1.6mm nominal thickness)	270	115	14.0
DCS0013	STP video / comms cable 3 x 1.0mm ² screened pairs , 2 x 1.0mm ² cores Overall screen + drain wire YELLOW polyurethane outer sheath (1.8mm nominal thickness)	205	90	12.5
DC0340	Video Cable 1 x screened 0.34mm ² twisted quad. 1 x 75 ohm co-axial pair. 2 x 1.34mm ² single cores. ORANGE polyurethane sheath, (1.2 mm RT)	110	40	9.2
DCS0005	Mini TV cable (NC08) 1 x 1.34mm ² screened pair, 1 x 0.5mm ² screened pair 1 x 0.22mm ² twisted pair, 1 x 1.34mm ² core 1 x 75Ω mini coax, void filled assembly, overall screen + drain wire ORANGE polyurethane outer sheath (1.4mm nominal thickness)	170	75	11.0
DCS0015	Mini TV cable (NC08) – c/w strength braid 1 x 1.34mm ² screened pair, 1 x 0.5mm ² screened pair, 1 x 0.22mm ² twisted pair, 1 x 1.34mm sq core 1 x 75Ω mini coax, void filled assembly, Overall screen + drain wire Polyester strength braid (500kg minimum break strength) ORANGE polyurethane outer sheath (1.5mm nominal thickness)	190	70	12.0
DCS0016	Mini TV cable (NC08) – c/w cut protection braid 1 x 1.34mm ² screened pair, 1 x 0.5mm ² screened pair 1 x 0.22mm ² twisted pair, 1 x 1.34mm ² core 1 x 75Ω mini coax, void filled assembly, overall screen + drain wire, Inner polyurethane sheath, Stainless steel braid ORANGE polyurethane outer sheath (1.7mm nominal thickness)	310	120	15.5
DCS0011	Video cable (NC13) 2 x 1.34mm ² twisted pairs, 1 x 0.5mm ² screened pair 1 x 0.22mm ² screened quad, 2 x 1.00mm ² cores 1 x 75Ω mini coax, void filled assembly, Overall screen + drain wire ORANGE polyurethane outer sheath (1.8mm nominal thickness)	265	95	14.5
DCS0004	Power cable 3 x 1.5mm ² cores (440V rated) RED polyurethane outer sheath (1.9mm nominal thickness)	115	35	10.0
DCS0017	Power cable 4 x 2.5mm ² cores (1000V rated) RED polyurethane outer sheath (1.8mm nominal thickness)	195	75	12.0
DCS0018	Signal / Diver monitoring cable 1 x 1.0mm ² screened pair RED polyurethane outer sheath (1.17mm nominal thickness)	55	19	6.7



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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