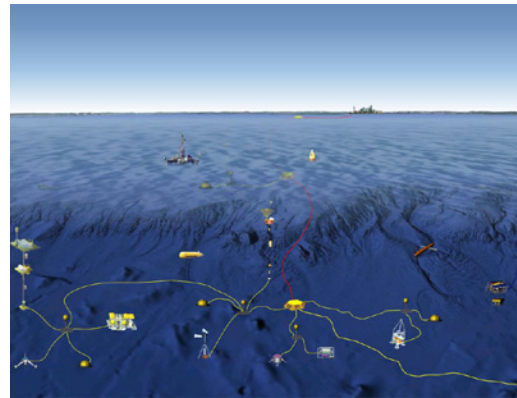


ZTT Submarine Optical Fiber Cable





ZTT GROUP

Jiangsu Zhongtian Technology Co., Ltd (ZTT), is a large scale, global cable and wire manufacturing entity established since 1992. ZTT enters the cable and wire industry with a core product of fiber optic cable and has since been famed as the “pioneer” in the industry. ZTT has always focus on high-value cable production. With its fame as “the first special optical fiber cable company

listed in China”, it was offered a listing on the Shanghai Stock Exchange on Oct 24, 2002. (stock code: 600522)

Progressive accumulation on production experience and constant upgrading in quality management system has led to rapid growth and plant expansion. ZTT now has 3 complete production chain for cables and wires.





ZTT sees its business as providing and conforming to industry standard for the many products it produces. To enhance each cable products' superiority, ZTT uses premium grade raw material and produces its own accessories for cable installation, protection and termination. Two (2) strategic subsidiary company were formed to focus on fitting designing, developing and manufacturing including an onsite service team.

ZTT has been labelled the "Cable factory with most active R&D" in China; Seven (7) numbers in total: Strategic Development Research Center, Optic Equipment Research Center, Submarine Cable Research Center, Material Research Center, Up-rating Conductor Research Center, Fiber Optics Research Center and New Energy Research Center. These centers has been the continuing source of ZTT's sustainable growth for innovation development and has now been considered an integral arm of the ZTT Group.

Compelling industrial growth and speed of commercial and construction requirements has caused ZTT's rapid expansion to 42 oversea offices and 2 manufacturing entities. One in India and another in Brazil.

Strong and resilient amidst global challenges, she has risen among the best in the industry for its excellent commitment to deliver global standard products.

With over 7000 staffs, ZTT products is now available globally to telecom operators, power grid, oil & gas and the renewable green energy sectors.

I.Optic fiber chain:

Preform, Optic Fiber, Optic Fiber Cable (duct, buried, aerial, FTTx, submarine), and generic product such as: ADSS, OPGW, Down Well Fiber Optic Cable, Air Blown Fiber Optic Cable etc.

II.Aluminium conductor chain:

AAC, AAAC, ACSR, AVCSR.AW, ACAR, AACSR and generic product such as: Thermal-resistant Aluminium Alloy Conductor, Invar Core Conductor, GAP Type Conductor and Annealed Aluminium Conductor.

III.Copper cable chain:

Radio Frequency Cable, Marine Cable, Offshore Cable, Power Cable and Submarine Power Cable.





Submarine Cable Plant

Largest and most comprehensive manufacturing base for submarine cable in ASIA.

Zhongtian Technology Submarine Cable Co., Ltd (ZTTSC) is a 100% owned subsidiary of the ZTT group. It is also by far the largest and most comprehensive manufacturing base for submarine cable in ASIA. It produces MV and HV Submarine Power or Composite Cable as well as Submarine Fiber Optic Cable.

ZTTSC was set up in 1999 with both R&D and world class manufacturing facilities and thus earned the “Pioneer” in Chinese submarine cable manufacturing history.

With heritage knowledge of fiber optic from ZTT, extensive research and analysis was carried out on cable mechanic performance with stimulated installation process. Soon, we developed our own technology for submarine fiber optic cable manufacturing. With the exception of traditional telecommunication operator market. ZTTSC submarine fiber optic cable has been sold globally and widely used for seismic and oceanographic survey system.

Adding knowledge on cable mechanical performance and expert installation, together with matured technology of XLPE insulation extrusion, advance manufacturing



ZTTSC was invited and participated in almost all significant submarine cable projects in Chinese water. Her contribution to the submarine cable system in China can be found in most industries, which includes: offshore oil & gas, offshore green energy, submarine telecommunication system, seismic and oceanographic survey system. In China, ZTTSC is famed for being:

- The first subsea cable manufacturer to obtain the UJ certificate for submarine FO cable for repeater system
- The first subsea cable manufacturer to obtain the UQJ certificate for submarine FO cable for unrepeater system
- The first subsea cable manufacturer to supply 3cores, 110kv AC submarine cable
- The first subsea cable manufacturer to supply +/- 210kV DC submarine cable
- The biggest manufacturer to make export of submarine cable to international market

ZTT and ZTTSC plays more than just a significant role in the local market, together with other star development of China heavy industry; both contributes to the world an economical and yet stable solution of submarine cable system.

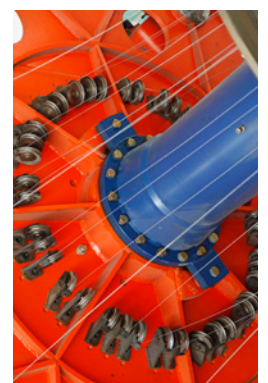
facilities and super clean compound from international acclaimed supplier; ZTTSC was soon accepted by local and international market for supply of submarine power and composite cable not only to oil & gas but electric grid companies as well.

Riding the benefits of the 2010 boom and offshore green energy demand, ZTTSC escalated its expansion plan and built the gigantic cable processing tower with 2nos VCV lines; a new cabling and armoring line and set up a huge multiple turntable and expanded our exclusive wharf to suit international berthing vessel. HVAC, HVDC and other customized multiple function submarine cable was also developed.



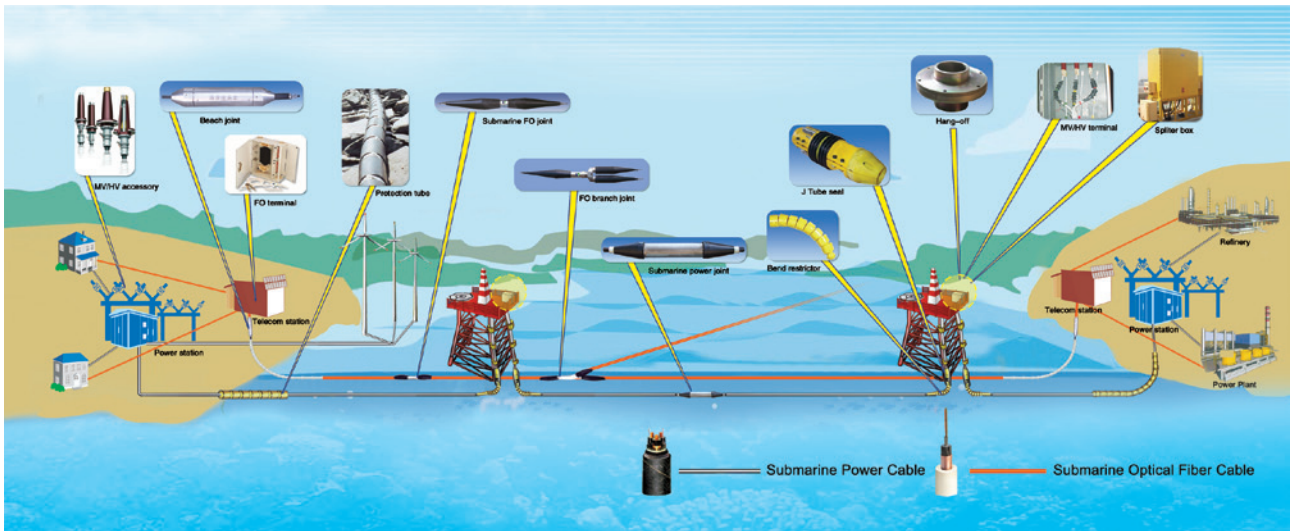


Armoring Lines





Complete Submarine Solutions

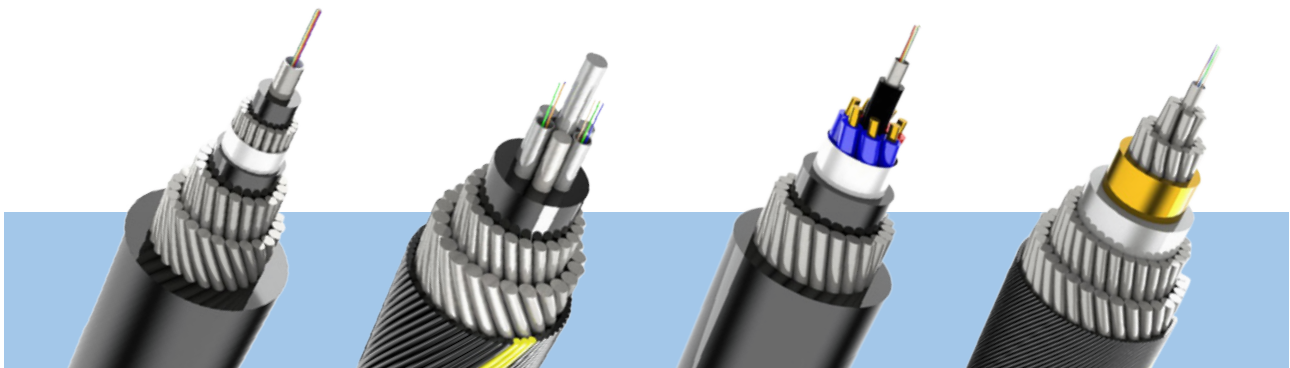


Application

- Telecom industry
- Offshore oil and gas industry
- Ocean observation network

Product Range

- Submarine optical fiber cables
- Submarine composite cables used in Ocean observatory network
- Accessories





ZTT Submarine Optical Fiber Cable Generic Series S17 and Q10.

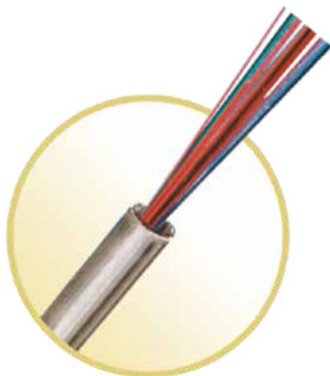
ZTT is proud to develop its own technic for manufacturing submarine optical fiber cable and own its wharf facilities and leads the industry in being:

- the first to be certified by UJ consortium in China
- the largest manufacturing plant for submarine optical fiber cable in China
- the first to export submarine optical fiber cable to the USA market from China
- the biggest exporter within China

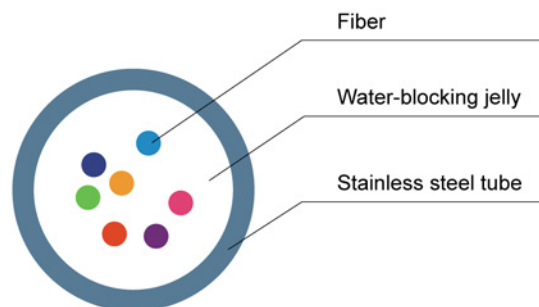
Design Reference standards

EIA/TIA 598	Color code of fiber optic cables
IEC 60793-1	Optical fiber Part 1: Generic specifications
IEC 60793-2	Optical fiber Part 2: Product specifications
IEC 60794-1-2	Generic specification-Basic optical cable test procedures
ITU-T G971	General features of optical fiber submarine cable system
ITU-T G972	Definition of terms relevant to optical fiber submarine cable system
ITU-T G976	Test methods applicable to optical fiber submarine cable systems
ITU-T G978	Characteristics of optical fiber submarine cables

Fiber unit design



Drawing of Fiber unit





Characteristics

- High strength fiber — ensure stable signal transmission and effective operation life.
- Special water blocking jelly — prevent the ingress of water or hydrogen gas.
- On-line fiber excess control — exact fiber excess in finished cable
- Stainless steel tube — avoid external damages to optic fiber.

Cable protection

The optical fiber submarine cable should provide protection against the environmental hazards at its depth of utilization: protection against marine life, fish-bite and abrasion, and armoring against aggression and ship activities. Different types of protected cable are defined in [G.972], in particular:

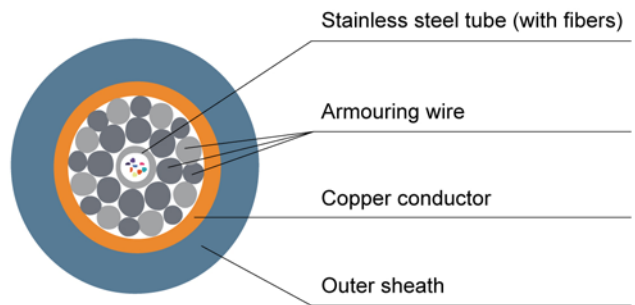
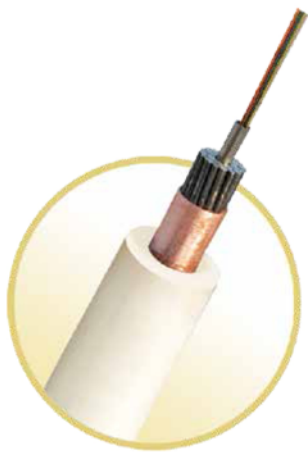
- The lightweight cable (LW cable);
Cable suitable for laying, recovery and operation, where no special protection is required.
- The lightweight protected cable (LWP cable).
Cable suitable for laying, recovery and operation, where special protection is required.
- The single armoured cable (SA cable).
Cable suitable for laying, burial, recovery and operation, and suitably protected for specific area in shallow water.
- The double armoured cable (DA cable).
Cable suitable for laying, burial, recovery and operation, and suitably protected for specific area in shallow water.
- The rock armoured cable (RA cable).
Cable suitable for laying, recovery and operation, and suitably protected for specific area in shallow water.



Typical structure of SOFC(S17-for Repeater System)

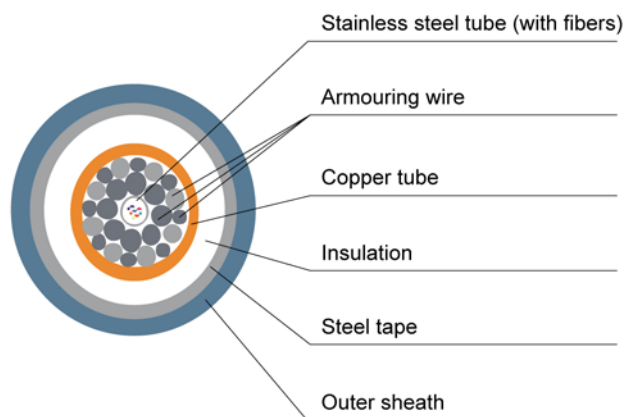
Light weight

Model : SOFC-S17-LW



Light weight protection

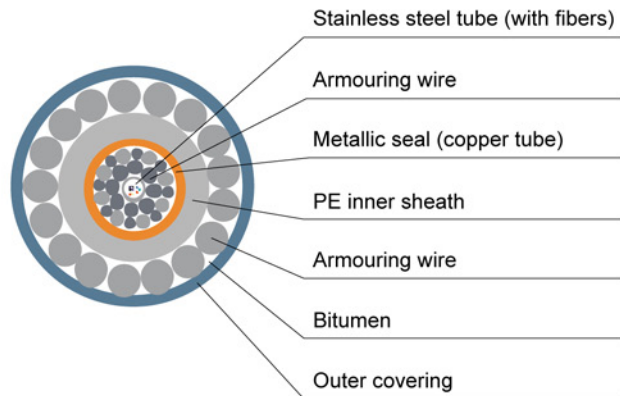
Model : SOFC-S17-LWP





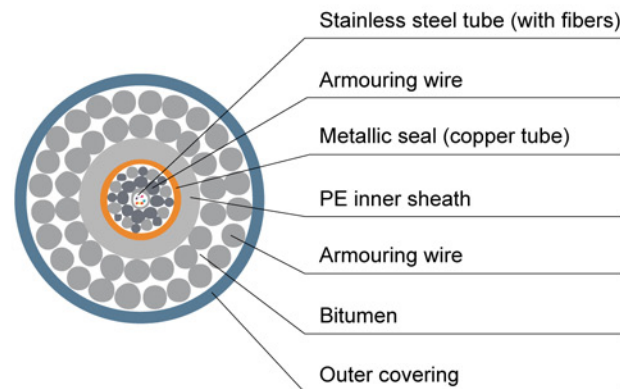
Single armor

Model : SOFC-S17-SA



Double armor

Model: SOFC-S17-DA



Technical parameter for SOFC (S17 Repeater system)

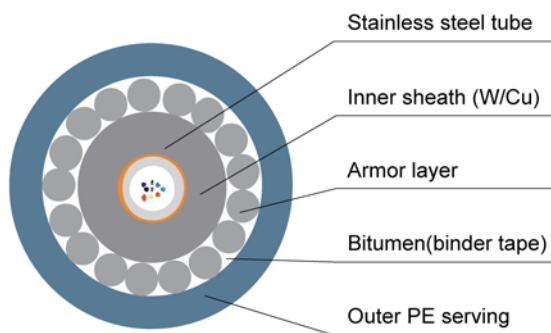
Type	CBL (kN)	NTTS (kN)	NOTS (kN)	NPTS (kN)	Unloaded min.bending radius(m)	Operational temp(°C)	Storage temp(°C)
SOFC-S17-LW	80	55	32	20	0.50	-20 ~ +50	-30 ~ +60
SOFC-S17-LWP	80	55	32	20	0.50	-20 ~ +50	-30 ~ +60
SOFC-S17-SA	265	172	105	80	1.00	-20 ~ +50	-30 ~ +60
SOFC-S17-DA	540	350	220	135	1.00	-20 ~ +50	-30 ~ +60



Typical structure of SOFC (Q10-for Unrepeater System)

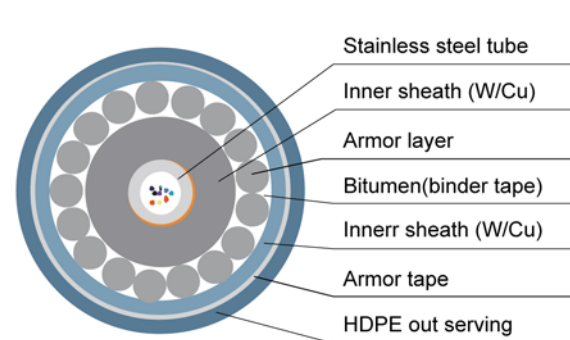
Light weight

Model : SOFC-Q10-LW



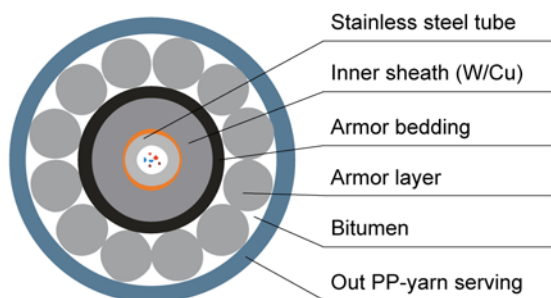
Light weight protection

Model : SOFC-Q10-LWP



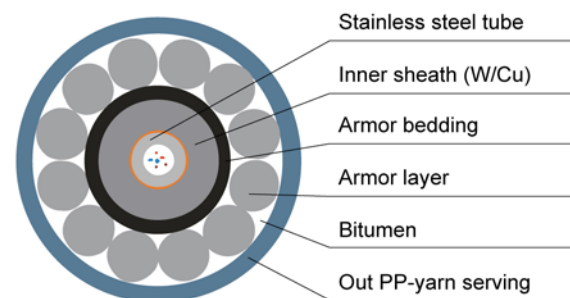
Single armor 1

Model : SOFC-Q10-SA1



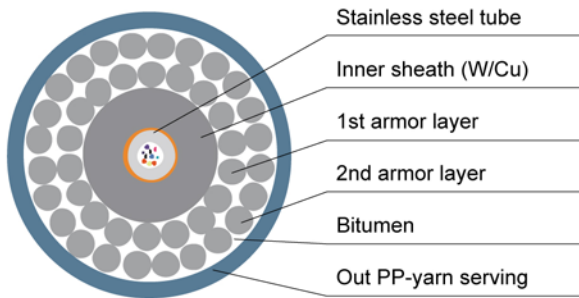
Single armor 2

Model : SOFC-Q10-SA2

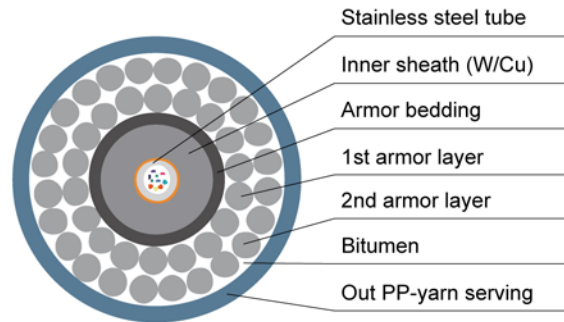




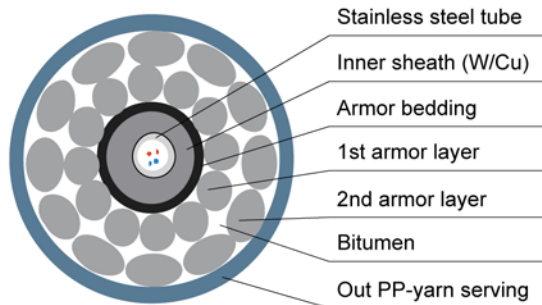
Double armor 1
Model : SOFC-Q10-DA1



Double armor 2
Model : SOFC-Q10-DA2



Rock armor
Model : SOFC-Q10-RA



Technical parameter for SOFC (Q10 Unrepeater system)

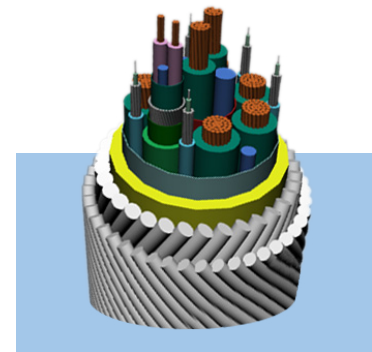
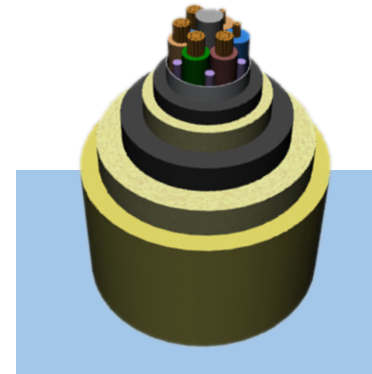
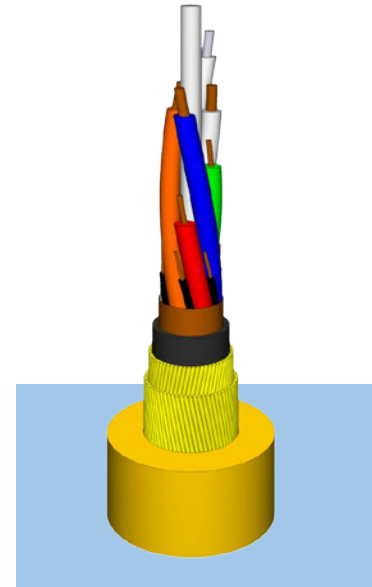
Type	CBL (kN)	NTTS (kN)	NOTS (kN)	NPTS (kN)	Unloaded min.bending radius(m)	Operational temp(°C)	Storage temp(°C)
SOFC-Q10-LW	80	60	40	25	0.50	-20 ~ +45	-30 ~ +60
SOFC-Q10-LWP	80	60	40	25	0.70	-20 ~ +45	-30 ~ +60
SOFC-Q10-SA1	200	160	110	70	0.65	-20 ~ +45	-30 ~ +60
SOFC-Q10-SA2	280	200	150	120	0.85	-20 ~ +45	-30 ~ +60
SOFC-Q10-DA1	420	300	210	150	0.80	-20 ~ +45	-30 ~ +60
SOFC-Q10-DA2	650	400	280	200	1.00	-20 ~ +45	-30 ~ +60
SOFC-Q10-RA	400	200	120	100	1.00	-20 ~ +45	-30 ~ +60



ROV Cable

ZTT has successfully developed ROV cable for National Development plan. Our design offers the compact electrical and fiber optic assembly and can be strengthened with either high strength synthetic fibers or multiple layers of armor wires to support the weight of ROV, handling and withstand vessel motion and tidal forces.

As with the ROC cable, ZTT has also developed and manufactured our own gimbal and wet connector.

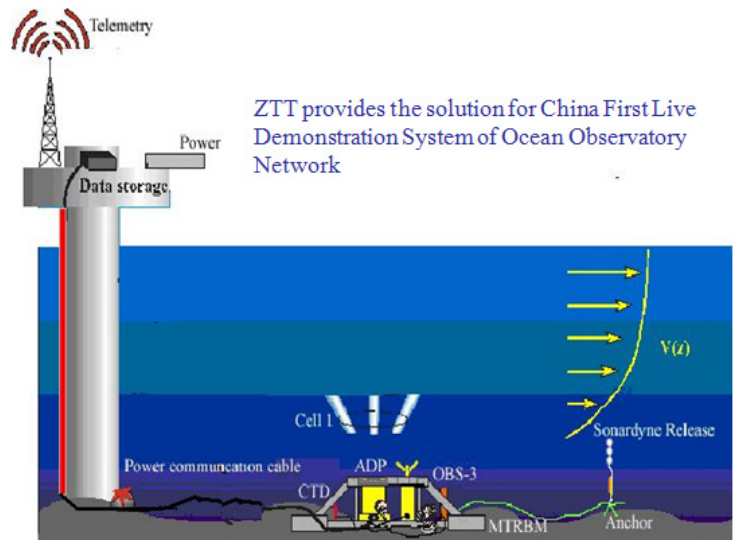




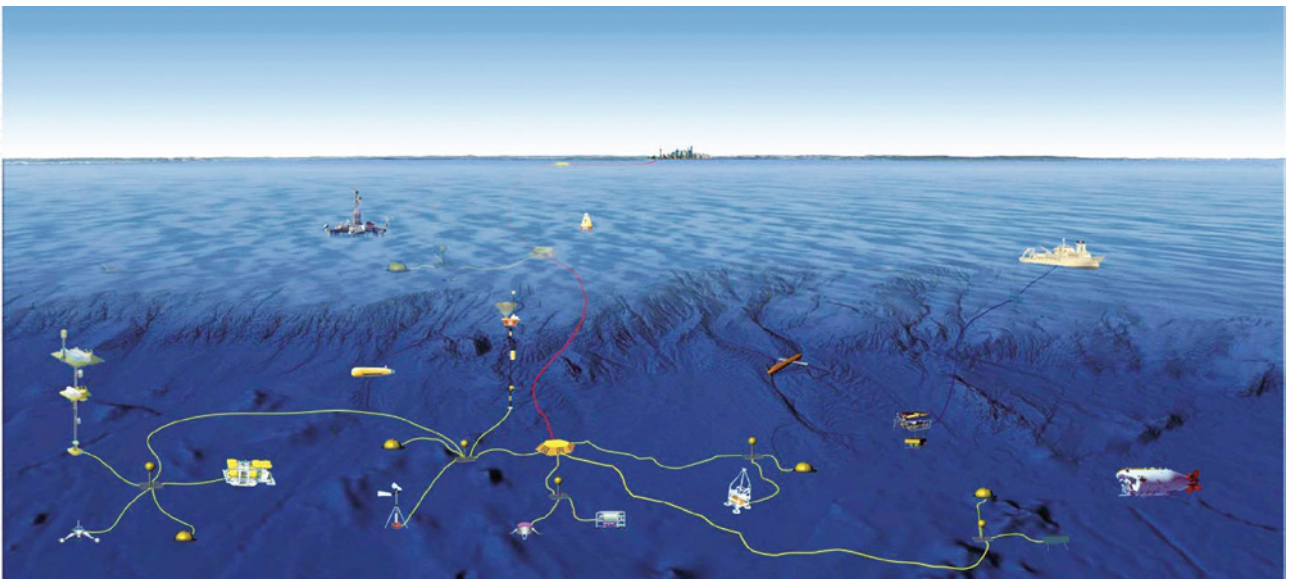
Multiple Oceanographic Applications

ZTT has been a pioneer in the submarine cable industry. We could manufacture a wide range of cable products and possess great number of manufacturing and wharf facilities. Thanks to our capacity for submarine cable manufacturing and short processing time, we have been the first choice for our customers on any special qualified submarine cable products.

Typical use in Ocean Observatory Network



Submarine composite cables used in ocean observatory network





ZTT is continuously focusing on providing the complete installation and operation accessories to our customers.

Accessories

Submarine FO joints suitable for cable jointing and repair

Branching units connect one cable to 2 cables

Beach joints suitable to connect submarine cable with land FO cable at beach manhole

Topside splice Box is used to splice submarine FO cable directly with the platform FO cable

Optical Distribution Frames used for termination FO cable

Cable Hang-off used to fix the cable at the platform

J-tube Seals provide sealing of the annulus between cable outer diameter and the J-tube internal diameter

Urduct is used to protect the cable

Pull-in head is designed for safe pulling the cable

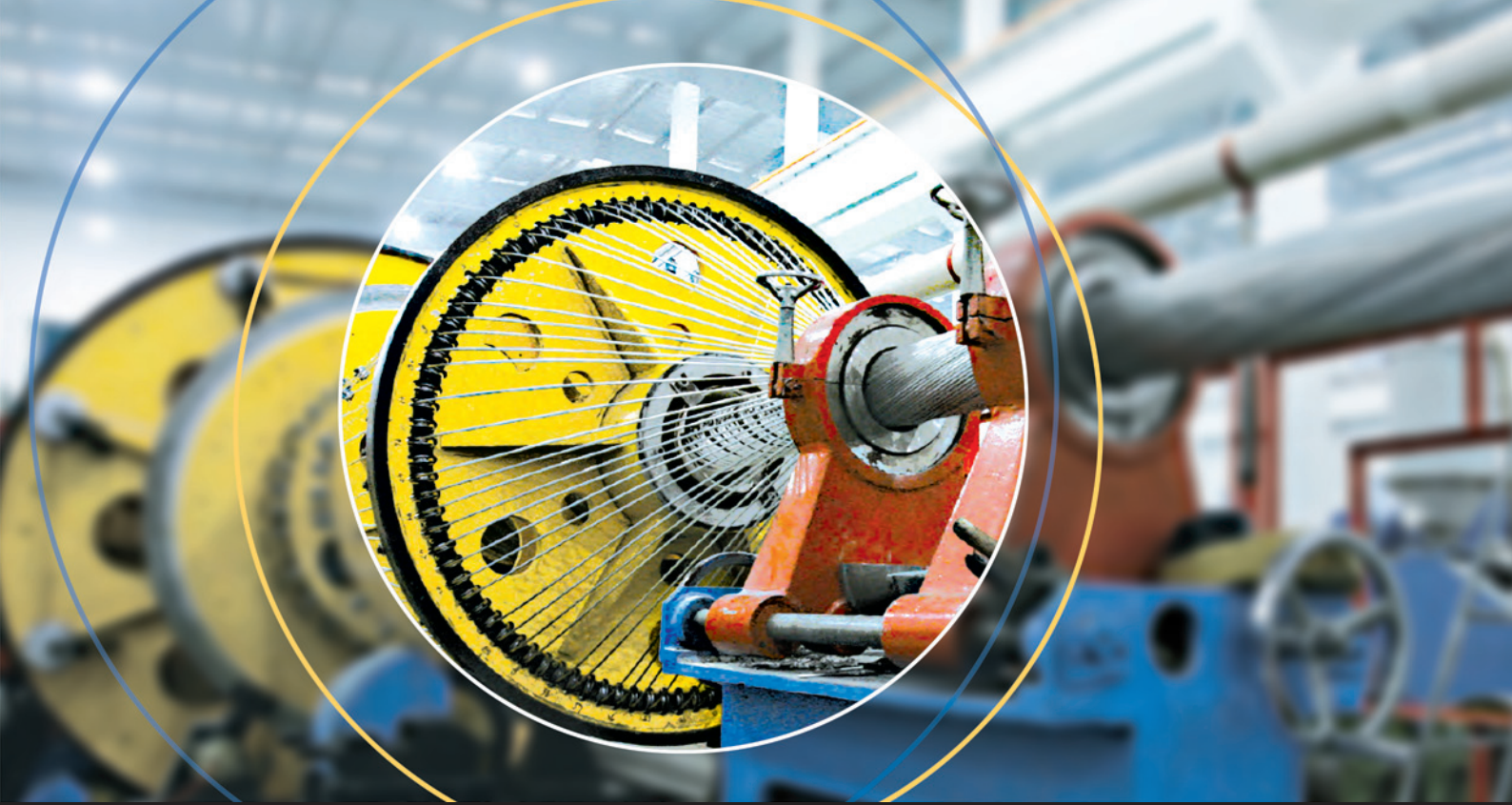
Abandonment Kit used in an emergency situation during installation

Services

ZTT has a team of highly trained product specialist for offshore jobs, providing the services in combination with the supply of submarine optical fiber cables, which include:

- Site supervision
- Cable jointing
- Training





Quality Assurance System

<p>Certificate DNV3281M</p> <p>The management system of</p> <p>Zhongtian Technology Submarine Cable Co., Ltd. Xinshu Road, Nantong Economic & Technological Development Zone, Jiangsu Province, P.R. China</p> <p>has been assessed and certified as conforming to the requirements of</p> <p>ISO 14001:2004</p> <p>for the following activities:</p> <p>Design and manufacture of submarine power cables, submarine optical fibre cables, submarine optical fibre composite power cables, power cables, aerial insulated cables, plastic insulated control cables, overhead conductors, cable attachment</p> <p>This certificate is valid from 15 May 2012 until 15 May 2015 and remains valid subject to satisfactory surveillance audits. The certificate shall be valid until 15 March 2012, Issue 1. Certified since 2 May 2012</p> <p>Authorised by:</p> <p>SGS</p>	<p>Certificate</p> <p>The management system of</p> <p>Zhongtian Technology Submarine Cable Co., Ltd. Xinshu Road, Nantong Economic & Technological Development Zone, Jiangsu Province, P.R. China</p> <p>has been assessed and certified as conforming to the requirements of</p> <p>OHSAS 18000</p> <p>for the following activities:</p> <p>Design and manufacture of submarine power cables, submarine optical fibre cables, submarine optical fibre composite power cables, power cables, aerial insulated cables, plastic insulated control cables, overhead conductors, cable attachment</p> <p>This certificate is valid from 2 May 2012 and remains valid subject to satisfactory surveillance audits. The certificate shall be valid until 15 March 2012, Issue 1. Certified since 2 May 2012</p> <p>Authorised by:</p> <p>SGS</p>	<p>DNV</p> <p>DET NORSKE VERITAS</p> <p>MANAGEMENT SYSTEM CERTIFICATE</p> <p>Certificate No. 3199-2006-AQ-8002-01A</p> <p>This is to certify that</p> <p>Zhongtian Technology Submarine Cable Co., Ltd. Xinshu Road, Nantong Economic & Technological Development Zone, Jiangsu Province, P.R. China</p> <p>has been found to conform to the Management System Standard</p> <p>ISO 9001:2008</p> <p>This Certificate is valid for the following product or service range:</p> <p>Design, Manufacture and Service of Cables (Submarine Power Cables, Submarine Optical Fibre Cables, Submarine Composite Power Cables, Power Cables, Aerial Insulated Cables, Control Cables, Overhead Conductors)</p> <p>Initial certification audit: August 14th, 2008</p> <p>This certificate was re-audited: January 26th, 2011</p> <p>The audit has been performed under the supervision of:</p> <p>Zhang Jian Wen Lead Auditor</p> <p>Lack of fulfillment of conditions set out in the Certificate, Suspension may render this Certificate invalid in accordance with the provisions of the International Rules, No. 12.10.000-000</p>	<p>UJ Consortium</p> <p>Universal Joint Qualification Test Certificate 200/537</p> <p>This Certificate confirms Universal Quick Joint (UQJ) Qualification</p> <p>ZTT SOFC Q10 DA650</p> <p>to</p> <p>ZTT SOFC Q10 DA650</p> <p>to a cable NTTS of 300kN, maximum Ø3m sheave tension of 200kN to a design depth of 1200metre</p> <p>Applicant: Jiangsu Zhongtian Technology Co., Ltd Manufacturer: Zhongtian Technology Submarine Cable Co., Ltd</p> <p>Certified on behalf of the UJ Consortium by Global Marine Systems Ltd.</p> <p>SIGNED: [Signature] DATE: December 2011</p>	<p>UJ Consortium</p> <p>Universal Joint Qualification Test Certificate 200/472</p> <p>This Certificate confirms Universal Joint (UJ) Qualification</p> <p>ZTT SOFC S17 DA</p> <p>to</p> <p>ZTT SOFC S17 DA</p> <p>to a maximal operational Tension of 350kN (sheave tension 200kN)</p> <p>Applicant: Jiangsu Zhongtian Technology Co., Ltd Manufacturer: Zhongtian Technology Submarine Cable Co., Ltd</p> <p>Certified on behalf of the UJ Consortium by Global Marine Systems Ltd.</p> <p>SIGNED: [Signature] DATE: July 2009</p>
---	--	---	--	---





Cable storage, transporting and delivery

Cable transit storage areas

- 9 dug-in ground pools
- 2 turntables for storage



Cable transporting by cable tank or direct bulk cargo ship loading





Private cable loading out harbor

80m short distant cable load out from factory
Convenient for installation ship to call at!



Add:NO.5 Zhongtian Road, Nantong Economic&Technological Development Zone,Nantong,Jiangsu, China

P.C.:226009 Tel:86-513-83599774 Fax:86-513-83599722

E-mail:international@zttcable.com [Http://www.zttcable.com](http://www.zttcable.com)
