

FIBER OPTIC Cables

Cable for Indoor and Outdoor & Hybrid
& Marine fiber optic cables



ENTERPRISE WITH DREAM, HOPE, AND FUTURE

TMC Co., Ltd has been pursuing innovation in technology and products for Ship and Information & Telecommunication industry.

For twenty decade years TMC has a single-minded focus on delivering superior customer services with specialized in FTTx and shipboard fiber optic cable solution.

The operational excellence of TMC is underpinned by its products with the best quality and the flexibility to meet specific requirements that makes us the world's most experienced marine and offshore cable manufacturer.

Company History

- 1991** Establishment of Seojin Industry Co.,Ltd.
- 1998** ISO 9001 Certification by LRQA (Quality)
- 2001** Obtain UL Certification for optical fiber cables
- 2004** ISO 14001 Certification by LRQA (Environment & Quality)
- 2005** Changed the name of company to TMC Co.,Ltd.
- 2006** Won the 30 million USD Export Tower Award granted by the Ministry of Knowledge Economy
- 2007** Won the 70 million USD Export Tower Award granted by the Ministry of Knowledge Economy
- 2007** Achieved Korean world-class product award 2007
- 2008** Won the 100 million USD Export Tower Award granted by the Ministry of Knowledge Economy
- 2008** OHSAS 18001 Certification by LRQA (for Health, Safety and Environment)
- 2009** Certification of product type approval by DNV for marine fiber optic cables
- 2009** Certification of product type approval by ABS for marine fiber optic cables
- 2010** Obtain Gost-R certification for marine fiber optic cables
- 2011** KEPIC Certification by KEA (Manufacture of Class 1E cable)
- 2011** Launched new product of Hybrid(Electrical + Optical) cable
- 2012** Won the 200 million USD Export Tower Award granted by the Ministry of Knowledge Economy
- 2012** Designated as a 'Good-to-work Company in Our region by Ministry of Knowledge Economy
- 2013** TL 9000 / ISO 9001 Certification by SGS (Telecommunication division)

Certificates for Optical Fiber Cables

- ABS and DNV for Marine Optical cable
- Gost-R
- UL&cUL





Optical Fibers

Single Mode Fiber

Attribute	Detail	Unit	Specification			
			SM G.652D	SM G.657A1	SM G.657 A2&B2	SM G.657B3
Attenuation Coefficient	at 1310nm	dB/km	≤ 0.40	≤ 0.40	≤ 0.40	≤ 0.40
	at 1550nm		≤ 0.30	≤ 0.30	≤ 0.30	≤ 0.30
Chromatic Dispersion	at 1290nm ~ 1330nm	ps/nm.km	≤ 2.8	≤ 2.8	≤ 2.8	≤ 2.8
	at 1550 nm		≤ 18	≤ 18	≤ 18	≤ 18
Zero Dispersion Wavelength		nm	1300 ~ 1324	1300 ~ 1324	1300 ~ 1324	1300 ~ 1324
Zero Dispersion Slope		ps/nm ² .km	≤ 0.095	≤ 0.095	≤ 0.095	≤ 0.095
PMD Coefficient		ps/√ km	≤ 0.4	≤ 0.4	≤ 0.4	≤ 0.4
Cut-off Wavelength		nm	≤ 1260	≤ 1260	≤ 1260	≤ 1260
Mode Field Diameter	at 1310nm	μm	9.2 ± 0.5	8.6 ± 0.5	8.6 ± 0.5	8.6 ± 0.5
Cladding Diameter		μm	125 ± 1	125 ± 1	125 ± 1	125 ± 1
Core/Clad concentricity error		μm	≤ 0.8	≤ 0.8	≤ 0.8	≤ 0.8
Cladding Non-circularity		%	≤ 1	≤ 1	≤ 1	≤ 1
Coating Diameter		μm	245 ± 15	245 ± 15	245 ± 15	245 ± 15

Multi-Mode Fiber

Attribute	Detail	Unit	Specification			
			MM62.5 (OM1)	MM50 (OM2)	MM50 (OM3)	MM50 (OM4)
Attenuation Coefficient	at 850nm	dB/km	≤ 3.5	≤ 3.0	≤ 3.0	≤ 3.0
	at 1300nm		≤ 1.5	≤ 1.0	≤ 1.0	≤ 1.0
Bandwidth	at 850nm	MHz.km	≥ 200	≥ 500	≥ 1500	≥ 3500
	at 1300 nm		≥ 500	≥ 500	≥ 500	≥ 500
Numerical Aperture		-	0.275 ± 0.015	0.20 ± 0.015	0.20 ± 0.015	0.20 ± 0.015
Core Diameter		μm	62.5 ± 3.0	50 ± 3.0	50 ± 3.0	50 ± 3.0
Cladding Diameter		μm	125 ± 2.0	125 ± 2.0	125 ± 2.0	125 ± 2.0
Cladding Non-circularity		%	≤ 2.0	≤ 2.0	≤ 2.0	≤ 1.0
Core/Cladding Concentricity Error		μm	≤ 3.0	≤ 3.0	≤ 3.0	≤ 3.0
Coating Diameter		μm	245 ± 15	245 ± 15	245 ± 15	245 ± 15



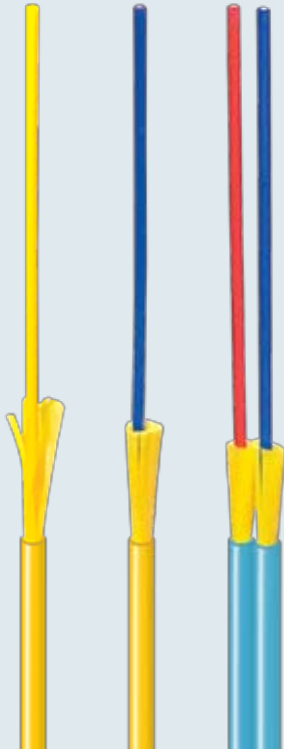
OPTICAL Cable



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Patch Cord Cables



Description

- Available Single-mode and Multi-mode fibers
- Flame retardant and Tight buffered cable
- 1.6mm to 3.0mm diameter
- Alternative outer jacket material and colors available

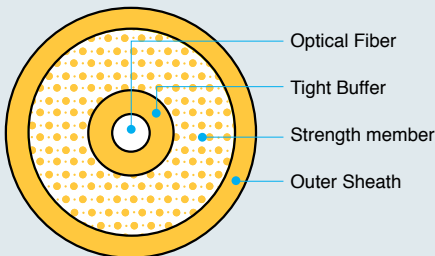
Application

- Indoor communication system
- Jumpers, Pigtails, Patch cords
- All dielectric application

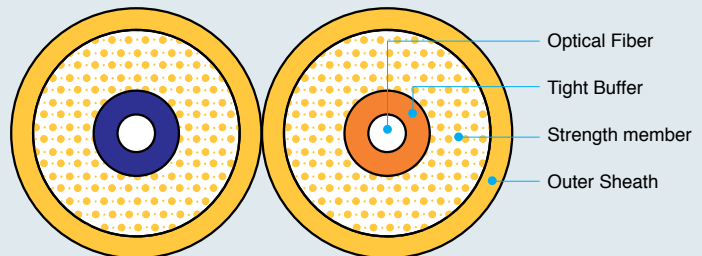
Features

- Highly flexible and light weight for easy handling
- RoHS compliance
- UL listed OFNR

Cable Cross Section



[Simplex Cable]



[Duplex ZIP Cable]

Standard Cable Information

Type	Number of Fiber	Buffer Diameter (μm)	Cable Diameter (mm)	Cable Weight (kg/km)	Min. Bending Radius (mm)	Tensile Load	
						Installation (N)	Operation (N)
Simplex	1	600 ± 50	1.6	3.0	24	90	50
			1.8	3.5	27	100	60
		900 ± 50	2.0	4.0	30	150	70
			2.4	6.5	36	190	90
			3.0	9.0	45	200	100
Duplex ZIP	2	600 ± 50	1.6*3.2	6.5	24	180	80
			1.8*3.6	7.5	27	200	100
		900 ± 50	2.0*4.0	8.0	30	300	140
			2.4*4.8	12.5	36	380	180
			3.0*6.0	18.5	45	400	200

Distribution Cables



Description

- Available Single-mode and Multi-mode fibers
- Flame retardant and Tight buffered cable
- 2C to 48C single or multi units
- Alternative outer jacket material and colors available

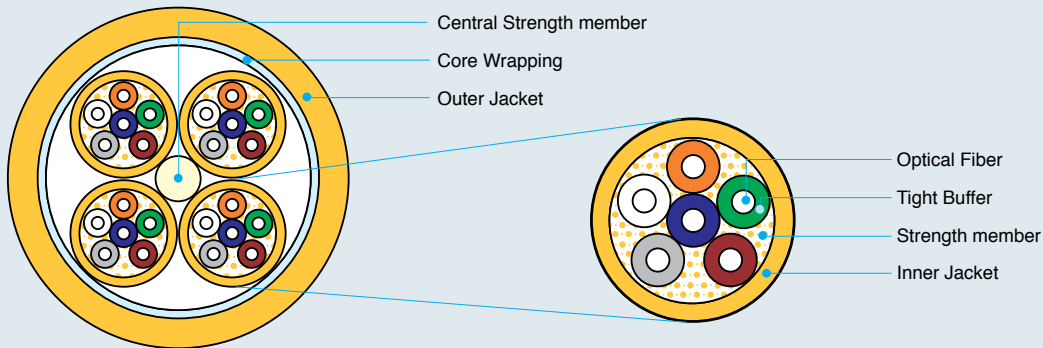
Application

- Inner building Backbone application
- All dielectric application

Features

- Compact design to save duct or conduit space
- RoHS compliance
- UL listed OFNR

Cable Cross Section



Standard Cable Information

No. of Fiber	Units	Tight Buffer Diameter (μm)	Cable Diameter (mm)	Approx. Cable Weight (kg/km)	Min. Bending Radius (mm)	Tensile Load	
						Installation (N)	Operation (N)
2	F x 1U	600 ± 50	4.3	18	450	450	250
4	4F x 1U		4.7	22	450	450	250
6	6F x 1U		5.5	28	450	450	250
8	8F x 1U	900 ± 50	6.1	34	600	600	300
12	12F x 1U		6.5	41	65	600	300
24	24F x 1U	900 ± 50	9.0	72	90	1000	500
24	6F x 4U		12.8	146	192	1400	800
36	6F x 6U		15.5	220	230	1600	900
48	8F x 6U		17.0	280	250	1800	1000

Note 1. F: fibers, U: units Note 2. This table is calculated with 900μm tight buffer.

Breakout Cables



Description

- Available Single-mode and Multi-mode fibers
- Flame retardant and Tight buffered cable
- 2C to 16C è 2C to 24C
- Alternative outer jacket material and colors available

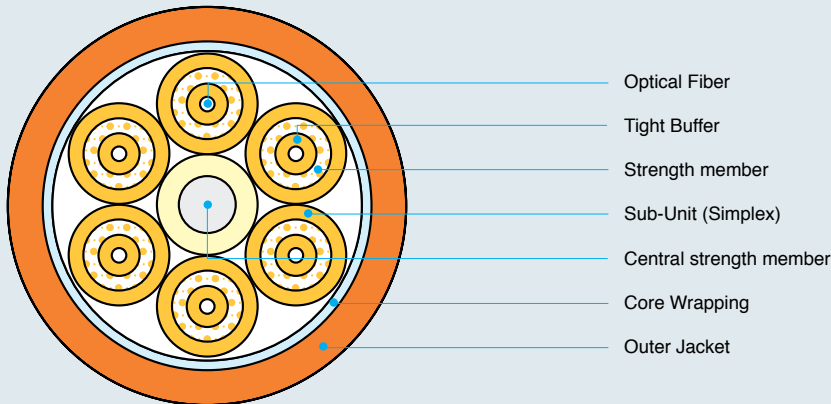
Application

- Inner building Backbone application
- All dielectric application

Features

- Excellent mechanical and environmental characteristics
- Compact design to save duct or conduit space
- Easy stripping for quick splicing
- RoHS compliance
- UL listed OFNR

Cable Cross Section



- Optical Fiber
- Tight Buffer
- Strength member
- Sub-Unit (Simplex)
- Central strength member
- Core Wrapping
- Outer Jacket

Standard Cable Information

No. of Fibers	Tight Buffer Diameter (µm)	Sub-unit Diameter (mm)	Cable Diameter (mm)	Approx. Cable Weight (kg/km)	Min. Bending Radius (mm)	Tensile Load	
						Installation (N)	Operation (N)
2	600 ± 50 or 900 ± 50	1.6, 2.0, 2.4, 3.0	6.5	43	90	400	200
4			7.2	50	100	700	400
6			8.2	72	120	900	600
8			10.0	95	150	1500	700
12			12.0	150	170	1500	900
16			13.0	170	200	1400	800
24			16.0	190	240	1500	1000

Note 1. This table is calculated with 2.0mm sub-unit.

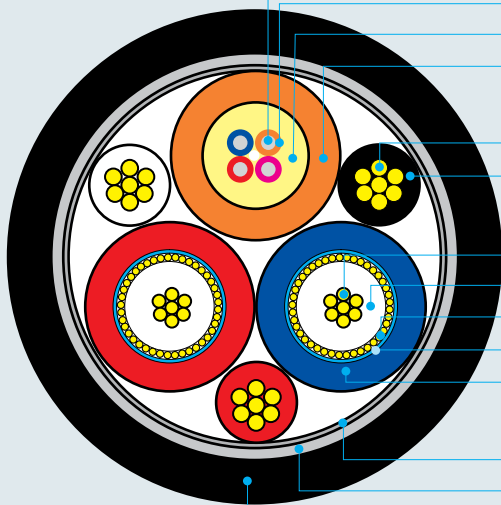
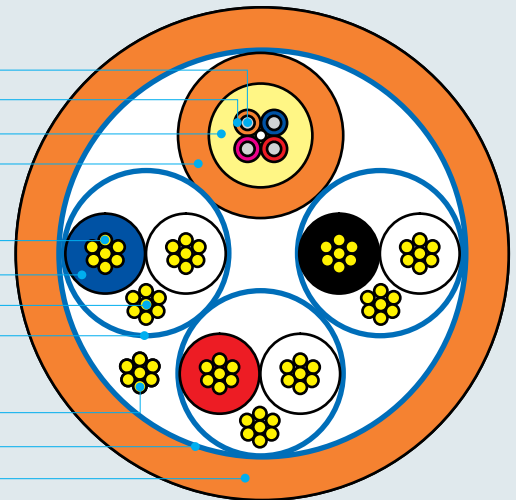
Composition Cables



- Optical Cable**
- ① MMF(62.5/125) Fiber à Optical Fiber
 - ② Buffer
 - ③ Aramid yarn
 - ④ Jacket(OR) à Jacket

- STP Cable**
- ① Tinned Conductor 24AWG(0.203/7)
 - ② Insulation(1.0mm)
 - ③ Drain Wires 0.203/7 24AWG
 - ④ Screen Shield

- Cabled**
- ① Drain Wires 0.203/7 24AWG
 - ② Screen Shield
 - ③ Outer Jacket



- Optical Cable**
- ① MMF(62.5/125) Fiber à Optical Fiber
 - ② Buffer
 - ③ Aramid yarn
 - ④ Jacket(OR) à Jacket

- Power Cable**
- ① Tinned Conductor Copper(0.20/7)
 - ② Jacket

- CATV Cable**
- ① Tinned Conductor Copper(0.127/7)
 - ② Polyethylen Expanded Form
 - ③ Shield Wires Copper
 - ④ Screen Shield
 - ⑤ Jacket

- Cabled**
- ① Core Wrapping
 - ② Tinned Copper Wire Braid
 - ③ Sheath(Gy) à Sheath



Hybrid Fanout Cables(Optic & Copper)



Description

- Available Single-mode and Multi-mode fibers
- Flame retardant, up to 36C of loose tube fiber optic cable
- 2C to 8C number of insulated conductor
- According to UL1277, UL83 or UL44

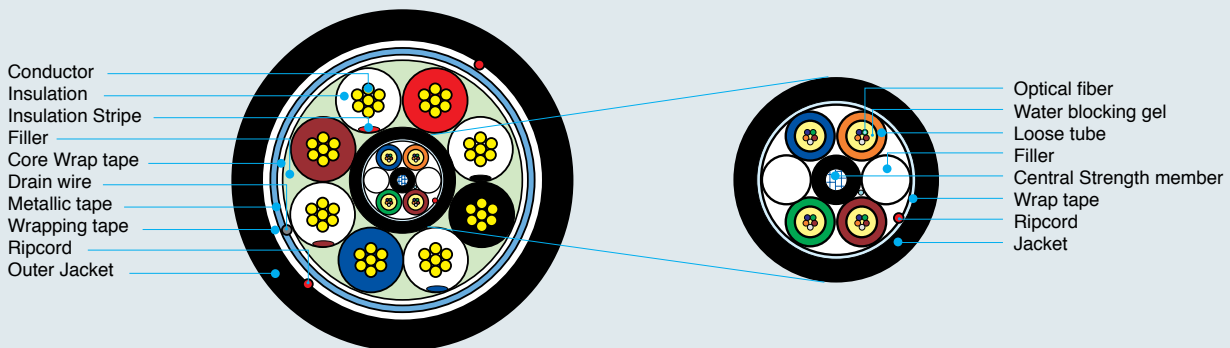
Application

- For Indoor and outdoor application
- Transfer electrical power with Optical signal in a cable
- Antenna or FTTH system (3G, LTE etc.)

Features

- Excellent mechanical and environmental characteristics
- RoHS compliance
- UL listed

Cable Cross Section

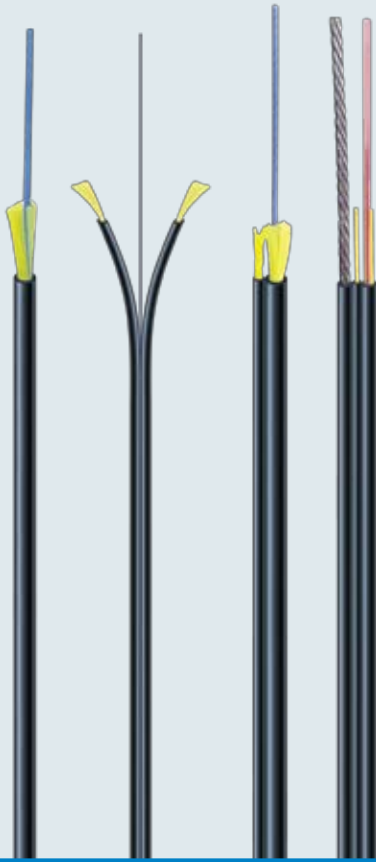


Standard Cable Information

No.	Cable Type	Cable Diameter (mm)	Approx. Cable Weight (kg/km)	Conductor Resistance (Ω/km)
1	10AWGx2C + 12AWGx6C + Optical fiber x 20F	25	786	12AWG: 5.35
2	8AWGx2C + 10AWGx6C + Optical Fiber x 20F	27	1,010	10AWG: 3.36
3	6AWGx2C + 8AWGx2C+10AWGx4C + Optical Fiber x 20F	30	1,230	8AWG: 2.12
4	6AWGx2C + 8AWGx6C + Optical Fiber x 20F	30	1,400	6AWG: 1.33
5	4AWGx2C + 6AWGx2C+8AWGx4C + Optical Fiber x 20F	32	1,720	4AWG: 0.84

Note. Cable construction and performance available on customer request

FTTH Cables



Description

- Available Single-mode and Multi-mode fibers
- Flame retardant tight buffer or bare fiber

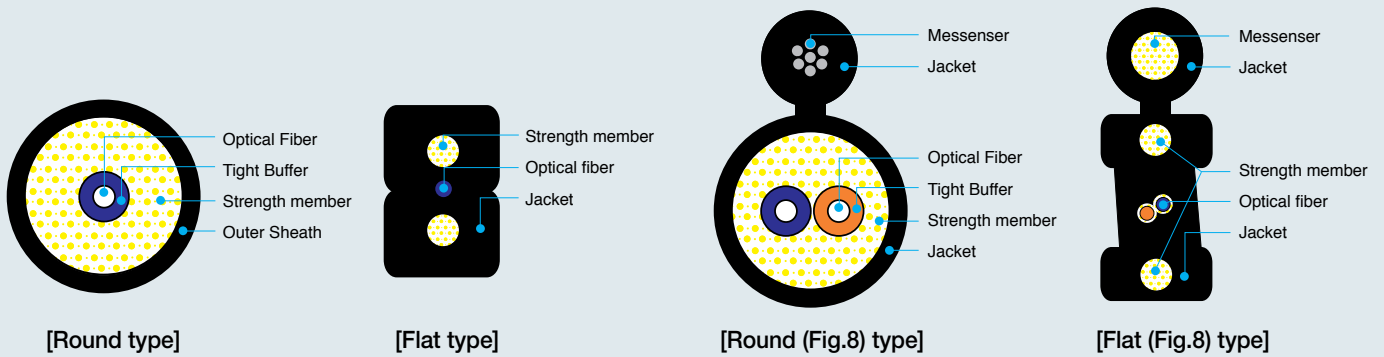
Application

- For Indoor/outdoor use

Features

- Excellent mechanical and environmental characteristics
- RoHS compliance
- Light weight and compact size and easy handling

Cable Cross Section



Standard Cable Information

Type	Number of Fiber	Buffer Diameter (μm)	Sheath Material	Strength member Material	Messenger member Material
Round, Round(Fig), Flat, Flat(Fig)	1, 2, 4	600 ± 50 650 ± 50 900 ± 50	LSZH or TPU	Steel wire or Aramid yarn or Glass yarn	Steel wire or Aramid yarn or Glass yarn

Note. Cable construction and performance available on customer request.

AICI for Marine Fiber Optic Cable



Description

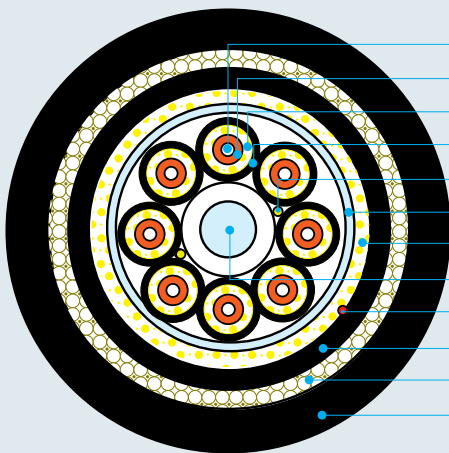
- Low-Smoke Zero-Halogen
- Flame retardant, Breakout type Cable
- Armored, Tight-buffer, 2 ~ 24C
- NEK606, IEC 60092-353

Application

- Marine vessels, offshore platforms, oil platform, oil rigs, FPSOs, drill ship and others

Features

- Suitable for use in shipboard, fixed or floating platform & MODU's
- Breakout type cable
- Galvanized steel armor for increased mechanical protection
- Operating temperature: -40°C ~ 70°C
- LSZH thermoset UV-resistant, oil-resistant, sunlight-resistant, sheath
- Gigabit Ethernet compliant
- ABS Approval Certificate 05-SE60505-X
- DNV Type Approval Certificate E-9401



- Optical Fiber
- Tight Buffer Coating
- Aramid Yarn
- Sub-unit(Simplex)
- Swellable Yarn
- Swellable Tape
- W/B Aramid Yarn
- C.S.M
- Ripcord
- Inner Sheath
- Armour
- Outer Sheath

Cable properties

Tensile strength (IEC 60794-1-2 E1)	
installation	600 N
operation	500 N
Crush (IEC 60794-1-2 E3)	2000 N/10cm
Impact (IEC 60794-1-2 E4)	15 J
Torsion (IEC 60794-1-2 E7)	±1turn/1m
Cable bend (IEC 60794-1-2 E11)	x10D
Cold bend	-40°C
Temperature	
installation	-10°C ~ +60°C
operation	-40°C ~ +70°C
Flame characteristic IEC 60332-1&3	Flame retardant
Smoke density IEC 61034	≥ 60%
Halogen contents IEC 60754-1&2	≤ 0.5%

QFCI for Marine Fiber Optic Cable



Description

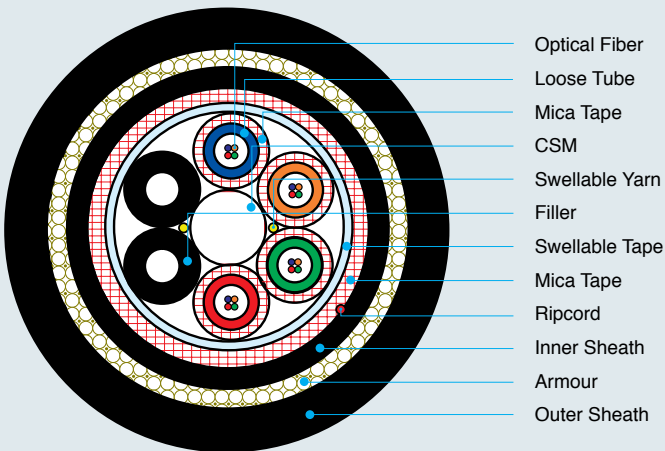
- Low-Smoke Zero-Halogen
- Flame retardant, Fire resistance Cable
- Armored, Loose tube with mica, 4 ~ 48C
- NEK606, IEC 60092-353

Application

- Marine vessels, offshore platforms, oil platform, oil rigs, FPSOs, drill ship and others

Features

- Suitable for use in shipboard, fixed or floating platform & MODU's
- Loose tube type cable
- Galvanized steel armor for increased mechanical protection
- Operating temperature: -40°C ~ 70°C
- LSZH thermoset UV-resistant, oil-resistant, sunlight-resistant, sheath
- Gigabit Ethernet compliant
- ABS Approval Certificate 05-SE60505-X
- DNV Type Approval Certificate E-9401



Cable properties	
Tensile strength (IEC 60794-1-2 E1)	
installation	1500 N
operation	500 N
Crush (IEC 60794-1-2 E3)	3000 N/10cm
Impact (IEC 60794-1-2 E4)	30 J
Torsion (IEC 60794-1-2 E7)	±1turn/1m
Cable bend (IEC 60794-1-2 E11)	x10D
Cold bend	-40°C
Temperature	
installation	-10°C ~ +60°C
operation	-40°C ~ +70°C
Flame and fire characteristics	
IEC 60331-25 1000°C 180min.	≤ 1.5dB
IEC 60332-1&3	Flame retardant
Smoke density	
IEC 61034	≥ 60%
Halogen contents	
IEC 60754-1&2	≤ 0.5%

QFCU for Marine Fiber Optic Cable



Description

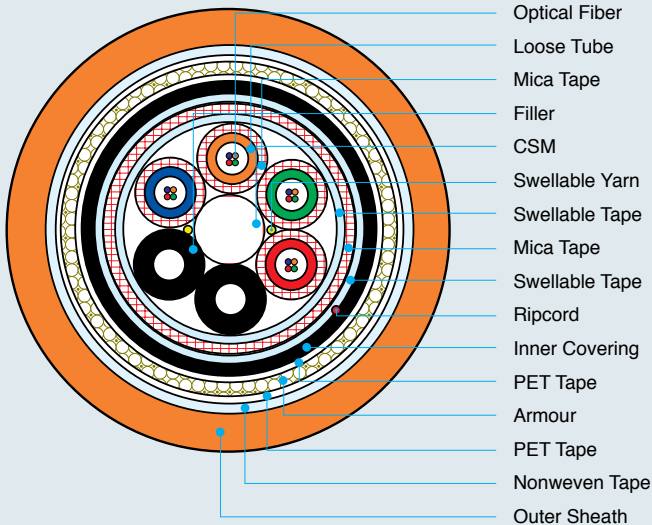
- Low-Smoke Zero-Halogen Mud resistance
- Flame retardant, Fire resistance Cable
- Armored, Loose tube with mica, 4 ~ 48C
- NEK606, IEC 60092-353

Application

- Marine vessels, offshore platforms, oil platform, oil rigs, FPSOs, drill ship and others

Features

- Suitable for use in shipboard, fixed or floating platform & MODU's
- Loose tube type cable
- Galvanized steel armor for increased mechanical protection
- Operating temperature: -40°C ~ 70°C
- LSZH thermoset UV-resistant, oil-resistant, sunlight-resistant, mud-resistant sheath
- Gigabit Ethernet compliant
- ABS Approval Certificate 05-SE60505-X
- DNV Type Approval Certificate E-9401



Cable properties	
Tensile strength (IEC 60794-1-2 E1)	
installation	1500 N
operation	500 N
Crush (IEC 60794-1-2 E3)	3000 N/10cm
Impact (IEC 60794-1-2 E4)	30 J
Torsion (IEC 60794-1-2 E7)	±1turn/1m
Cable bend (IEC 60794-1-2 E11)	x10D
Cold bend	-40°C
Temperature	
installation	-10°C ~ +60°C
operation	-40°C ~ +70°C
Mud resistance	
Diesel IRM 903	100°C 7days
Calsium Bromide Brine	70°C 56days
Carbo Sea	70°C 56days
Flame and fire characteristics	
IEC 60331-25 1000°C 180min.	≤ 1.5dB
IEC 60332-1&3	Flame retardant
Smoke density	
IEC 61034	≥ 60%
Halogen contents	
IEC 60754-1&2	≤ 0.5%

Certifications



Cert. of ISO 9001



Cert. of ISO 14001



Cert. of OHSAS 18001

Class Type Approval



DNV



GOST-R



ABS



UL & cUL



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