



QFCI-I/O/RM-JM

Armoured SHF1 or SHF2

Indoor and outdoor, loose tube

4, 8, 12, 24 or 48 fibers

Application:

Optical cable for indoor and outdoor use in vital communication and emergency systems that need to be operational during fire. The cable is designed to ensure operation for more than 3 hours in fires up to 1000°C. The cable is halogen free and flame retardant to protect against secondary damage to electronic equipment during and after fire. Outer sheath is made from black or orange UV-stabilized and weather resistant material and may be exposed for shorter periods to fluids such as diesel, petrol, glycol, ethanol, white spirit and ASTM oil 2. The resistance to these fluids is according to DOD-STD-1678, method 8030. The cable is reinforced with a steel wire braiding. The fibres are protected in jelly filled loose tubes stranded around a central strength member to ensure optimum performance and long life. Each fiber and loose tube is color coded for easy identification during splicing and termination. The outer sheath is marked to show fibre type and cable type.

Specifications:

Temperature installed:	-40 to +70 [°C]
Temperature @ installation:	-10 to +60 [°C]
Tensile installed (IEC 60794-1-2E1):	500 [N]
Tensile @ installation:	1500 [N]
Crush (IEC 60794-1-2E3):	3000 [N/10cm]
Impact (IEC 60794-1-2E4):	30 [J]
Torsion (IEC 60794-1-2E7):	±1 [turn/m]
Min. bending diam. fixed:	15 x outer diam
Min. bending diam. flexible:	20 x outer diam

Norms SHF1 and SHF2:

Chemical resistance:	IEC 60811-2-1 (Mineral oils)
Fire and smoke:	IEC 60331-25, BP-236, IEC 61034 IEC 60332-3 catA and C, IEC 60754-1, IEC 60754/2

Norms SHF2 only:

Oil resistant:	IRM 902 (IEC 60811-404)
Ozone resistant:	IRV 902 (IEC 60811-403)

Construction:

No. of fiber:	2	1-Red (with 2-OF)	4-Filler
		2-Filler	5-Filler
		3-Filler	6-Filler
4	1-Red (with 2-OF)	4-Filler	
	2-Green (with 2-OF)	5-Filler	
	3-Filler	6-Filler	
8	1-Red (with 4-OF)	4-Filler	
	2-Green (with 4-OF)	5-Filler	
	3-Filler	6-Filler	
12	1-Red (with 4-OF)	4-Filler	
	2-Green (with 4-OF)	5-Filler	
	3-Natural (with 4-OF)	6-Filler	
24	1-Red (with 6-OF)	4-Nat. (with 6-OF)	
	2-Green (with 6-OF)	5-Filler	
	3-Natural (with 6-OF)	6-Filler	
48	1-Red (with 12-OF)	4-Nat. (with 12-OF)	
	2-Green (with 12-OF)	5-Filler	
	3-Natural (with 12-OF)	6-Filler	

Loose tube diam.: 2.2mm

Color of fiber

1-white	4-green	7-brown	10-turquoise
2-red	5-blue	8-black	11-orange
3-yellow	6-grey	9-violet	12-pink

Inner Jacket:

Black SHF1 Ø=10,1mm

Armour alt. 1:

Galvanised steel wire braid

Armour alt. 2:

Tinned copper wire braid

Armour alt. 3:

Bronze wire braid

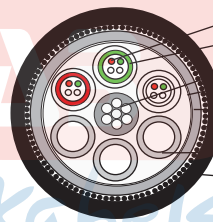
Outer Jacket:

Black or orange SHF1 or SHF2

Ø=13.5mm

Weight:

260 kg/km



- Optical fiber
- Loose tube
- Steel strength element
- Mica tape
- Inner sheath SHF1
- Armour
- Filler, dummies
- Black or orange outer sheath,
- UV-resistant SHF1 or SHF2



Approval: DNV CERTIFICATE NO. E-11775

Date	Rev.	
16.03.2015	1	Armour

Multimode fibres			MM 62.5 IEC 60793-2-10 Type A1b Telecordia GR-20-core	MM 62.5 OM1+ HiCap	MM50 ITU-T G651.1 IEC 60793-2-10 Type A1a.1 Telecordia GR-20-core	MM50-OM3 ISO/IEC 11801 IEC 60793-2-10 Type A1a.2 Telecordia GR-20-core	MM50-OM4 ISO/IEC 11801 IEC 60793-2-10 Type A1a.2 Telecordia GR-20-core
ITU-T type			-	-	G 651	-	-
Core Diameter		µm	62.5 ± 2	62.5 ± 2	50 ± 2	50 ± 2	50 ± 2
Core non-circularity		%	≤ 5	≤ 5	≤ 5	≤ 5	≤ 5
Cladding Diameter		µm	125 ± 1,0	125 ± 1,0	125 ± 1,0	125 ± 1,0	125 ± 1,0
Coating Diameter		µm	245 ± 5	245 ± 5	242 ± 5	242 ± 5	242 ± 5
Cladding non-circularity		%	0,7	0,7	0,7	0,7	0,7
Core/cladding concentricity error		µm	≤ 1,0	≤ 1,0	≤ 1,0	≤ 1,0	≤ 1,0
Coating/cladding concentricity error		µm	≤ 10	≤ 10	≤ 6	≤ 6	≤ 6
Numerical Aperture		µm	0.275 ± 0.015	0.275 ± 0.015	0.200 ± 0.015	0.200 ± 0.015	0.200 ± 0.015
Proof test		kpsi	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100
Attenuation	at 850 nm	db/km (max)	≤ 3,5	≤ 2,8	≤ 2,8	≤ 2,8	≤ 2,8
	at 1300 nm	db/km (max)	≤ 1,0	≤ 0,7	≤ 0,8	≤ 0,8	≤ 0,8
Bandwidth	at 850 nm	MHz x km	≥ 200	≥ 250	≥ 500	≥ 1500	≥ 3500
	at 1300 nm	MHz x km	≥ 500	≥ 1000	≥ 500	≥ 500	≥ 500
1 G BASE Ethernet	SX 850 nm	m	275	500	600	1000	1100
1 G BASE Ethernet	LX 1300 nm	m	550	1000	550	550	600
1 G BASE	SR 850nm	m	35	65	86	300	550
1 G BASE	LX4 1300 nm	m	300	450	300	300	300

Single mode fibres			Single mode SMR 9/125/250	Single mode SMR LWP 9/125/250	Non-zero Dispersion	Single mode
ITU-T type			G652.B	G652.D	G655	G654
Mode Field diameter (MDF)	at 1310 nm	µm	9.2 ± 0.4	9.2 ± 0.4	-	-
	at 1550 nm	µm	-	-	9.2 ± 0.5	12 ± 0.5
Cladding Diameter		µm	125 ± 1	125 ± 0.7	125 ± 1	125 ± 1
Coating Diameter		µm	245 ± 10	245 ± 5	245 ± 10	245 ± 10
Attenuation	at 1310 nm	db/km (max)	≤ 0.38	≤ 0.35	-	-
	at 1383 nm	db/km (max)	≤ 0.38	≤ 0.33	-	-
	at 1550 nm	db/km (max)	≤ 0.25	≤ 0.25	≤ 0.25	≤ 0.19
	at 1625 nm	db/km (max)	-	≤ 0.28	≤ 0.28	≤ 0.21
Zero dispersion wavelength		λ0	1302 - 1322	1302 - 1322	-	-
Chromatic Disper- sion	at 1285 - 1330nm	ps/nm x km	≤ 0.35	≤ 0.35	-	-
	at 1550 nm	ps/nm x km	≤ 18.0	≤ 18.0	-	-
	at 1530 - 1565 nm	ps/nm x km	-	-	5.5 to 10.0	22
	at 1565 - 1625 nm	ps/nm x km	-	-	7.5 to 13.0	-
PDM	at 1550 nm	ps/vkm	-	-	≤ 0.20	≤ 0.20
1 G BASE Ethernet	SX 1310 nm	m	10000	10000		
1 G BASE Ethernet	LX 1550 nm	m	40000	40000		
1 G BASE	SR 1310nm	m	10000	10000		
1 G BASE	LX 1550 nm	m	40000	40000		