



## QFCI-I/O/RM-JM

4 – 48 fibers Armoured

Loose tube, jelly filled

Fire resistant, SHF1, UV

DNV / ABS

### Application

Fiberoptical cable for the oil- and offshore industry and other harsh environments. The cable has excellent communication properties and is tested to be operative in at least 180 min. at 1,000°C which means that it can maintain vital communication in case of a fire situation. The fibers 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.



### Construction Fiber

Fibertype	MM or SM
Sub unit sheath	PBTP with jelly
Colorcode fiber	TIA 598 1 - Blue    5 - Grey    9 - Yellow 2 - Orange    6 - White    10 - Violet 3 - Green    7 - Red    11 - Pink 4 - Brown    8 - Black    12 - Turquoise
Fiber tube	Loose tube Ø = 2,2 [mm]
Fire resistant barrier	Mica tape
Strength member	Centre steel wire
Inner jacket	Black SHF1 10,1 [mm]
Armour	Alt. 1 - Galvanised steel wire braid: QFCI Alt. 2 - Tinned Cu-braid : QFOI Alt. 3 - Bronze wire braid : QFBI
Jacket	Black SHF1
Diameter	13,5 [mm]
Weight	260 [kg/km]
Jacket marking	NEK Kabel – QFCI – Fiber optic Cable – IEC 60331-25 – IEC 60332-3-22 – date – meter marked

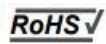
### Specifications

Operating temperature normal	-40 – +70 [°C]
Temperature @ installation	-10 to +60 [°C]
Tensile strength installed	500 [N]
Tensile strength	3000 N ( $\Delta\alpha$ reversible) acc. to IEC 60794-1-21 (E1)
Crush test	3000 [N/10cm] acc. to IEC 60794-1-21 (E3)
Impact	30 [J] acc. to IEC 60794-1-21 (E4)
Torsion	±1 [turn/m]
Min. bending radius	15 [x outer diam]
Min. bending radius flexible	20 [x outer diam]



## Norms

Halogenfree, max content corrosive and toxic gases	IEC 60754-1 & IEC 60754-2
Material properties, insulation and sheath	IEC 60092-360 (359) SHF1
Flame resistance	IEC 60332-3-22 Cat.A
Fire resistant	IEC 60331-25 180 min. 750°C
Smoke emission	IEC 61034-1 & IEC 61034-2
Certification	DNV / ABS





## Table Fiber

Number of fibers	Number of fibers per tube	Number of fibers and tubes	Weight [kg/km]	Part no.
4 - 9/125	2	2 + 4	260	1042410
8 - 9/125	4	2 + 4	260	1042411
12 - 9/125	4	3 + 3	260	1042412
24 - 9/125	6	4 + 2	260	1042413
48 - 9/125	12	4 + 2	260	1042414
72 - 9/125	12	6	260	6200110
4 - 62.5/125 OM1	2	2 + 4	260	1042415
8 - 62.5/125 OM1	4	2 + 4	260	1042416
12 - 62.5/125 OM1	4	3 + 3	260	1042417
24 - 62.5/125 OM1	6	4 + 2	260	1042418
48 - 62.5/125 OM1	12	4 + 2	260	1042419
4 - 50/125 OM3	2	2 + 4	260	1042420
8 - 50/125 OM3	4	2 + 4	260	1042421
12 - 50/125 OM3	4	3 + 3	260	1042422
24 - 50/125 OM3	6	4 + 2	260	1042423
48 - 50/125 OM3	12	4 + 2	260	1042424
4 - 50/125 OM2	2	2 + 4	260	1091195
8 - 50/125 OM2	4	2 + 4	260	1091196
12 - 50/125 OM2	4	3 + 3	260	1091197
24 - 50/125 OM2	6	4 + 2	260	1091198
8 - 50/125 OM4	4	2 + 4	260	1032422
12 - 50/125 OM4	4	3 + 3	260	1032423
24 - 50/125 OM4	6	4 + 2	260	1032424
48 - 50/125 OM4	12	4 + 2	260	1032425
12 - 9/125	6	3 + 3	260	1091091
24 - 9/125	6	4 + 2	260	1091092
48 - 9/125	12	4 + 2	260	1091093



## Fiber data

Properties	MM 62.5 OM1	MM 50 OM2	MM 50 OM3	MM 50 OM4
Core Diameter	62.5 ± 2.5 µm	50 ± 2.5 µm	50 ± 2.5 µm	50 ± 2.5 µm
Core non-circularity	< 5%	< 5%	< 5%	< 5%
Cladding diameter	125 ± 1.0 µm	125 ± 1.0 µm	125 ± 1.0 µm	125 ± 1.0 µm
Coating diameter	242 ± 5 µm	242 ± 5 µm	242 ± 5 µm	242 ± 5 µm
Cladding non-circularity	<0.7%	<0.7%	<0.7%	<0.7%
Core/Cladding concentricity error	<1 µm	<1 µm	<1 µm	<1 µm
Coating/cladding concentricity error	<10 µm	<6 µm	<6 µm	<6 µm
Numerical Aperture	0.275 ± 0.015 µm	0.200 ± 0.015 µm	0.200 ± 0.015 µm	0.200 ± 0.015 µm
Attenuation @ 850 nm	<3.50 db/km	<2.89 dB/km	<2.89 dB/km	<2.89 dB/km
Attenuation @1300 nm	<1.00 dB/km	<0.80 dB/km	<0.80 dB/km	<0.80 dB/km
Bandwidth @ 850 nm	>200 MHz*km	>500 MHz*km	>1500 MHz*km	>3500 MHz*km
Bandwidth @ 1300 nm	>500 MHz*km	>500 MHz*km	>500 MHz*km	>500 MHz*km
Effective Modal Bandwidth (EMB)@ 850 nm			>2000 MHz*km	>4700 MHz*km
Fibre capacity 10GBase-SR	33 m	83 m	300 m	550 m
Fibre cap. 40GBase-SR4/100Base-RS10	274 m	600 m	1000 m	1100 m
Fibre cap. 40GBase-SR4/100Base-RS10			140 m	170 m
Proof test	>100kpsi	>100kpsi	>100kpsi	>100kpsi



Properties	SMR ITU-T G652D	SMR ITU-T G657A	SMR ITU-T G657B / - B2	SMR NZD ITU-T G655.E
Mode field Diameter @ 1310 nm	9,0±0,4 μm	9,2±0,4μm	8,9±0,4 μm	-
Mode field Diameter @ 1550 nm	10,1±0,5μm	10,1±0,5μm	9,9±0,5μm	9,2±0,5μm
Cladding diameter	125±0,7μm	125±0,7μm	125±0,7μm	125±1,0μm
Coating diameter	242±7 μm	242±7 μm	242±7 μm	242±7 μm
Cladding non-circularity	≤ 0,7 %	≤ 0,7 %	≤ 0,7 %	≤ 0,7 %
Core/Cladding concentricity error	≤ 0,5 μm	≤ 0,5 μm	≤ 0,5 μm	≤ 0,5 μm
Coating/cladding concentricity error	≤ 12 μm	≤ 12 μm	≤ 12 μm	≤ 12 μm
Cable Cut off wavelength	≤ 1260 nm	≤ 1260 nm	≤ 1260 nm	≤ 1300 nm
Zero dispersion wavelength (λ <sub>0</sub> )	1300-1322 μm	1300-1322 μm	1300-1324 μm-	≤ 1440 nm
Dispersion slope (S <sub>0</sub> ) @ (λ <sub>0</sub> )	≤ 0,090 ps/(nm <sup>2</sup> * km)	≤ 0,090 ps/(nm <sup>2</sup> * km)	≤ 0,092 ps/(nm <sup>2</sup> * km)	-
Chromatic dispersion @ 1285 – 1330 nm	≤ 3,5 ps/(nm * km)	≤ 3,5 ps/(nm * km)	-	-
Chromatic dispersion @ 1550 nm	≤ 18 ps / (nm * km)	≤ 18 ps / (nm * km)	-	-
Chromatic dispersion @ 1625 nm	≤ 22 ps/(nm * km)	≤ 22 ps/(nm * km)	-	-
Chromatic dispersion @ 1530 – 1565 nm	-	-	-	5,5 ÷ 10 ps/(nm * km)
Chromatic dispersion @ 1565 – 1625 nm	-	-	-	7,5 ÷ 13,8 ps/(nm * km)
PMD @ 1550 nm	≤ 0,1 ps/√ km	≤ 0,1 ps/√ km	≤ 0,1 ps/√ km	≤ 0,2 ps/√ km
Attenuation @ 1310 nm	≤ 0,35 dB/km	≤ 0,35 dB/km	≤ 0,35 dB/km	≤ 0,40 dB/km
Attenuation @ 1383nm	≤ 0,35 dB/km	≤ 0,35 dB/km	≤ 0,35 dB/km	≤ 1,00 dB/km
Attenuation @ 1550 nm	≤ 0,25 dB/km	≤ 0,25 dB/km	≤ 0,25 dB/km	≤ 0,25 dB/km
Attenuation @ 1625 nm	≤ 0,28 dB/km	≤ 0,28 dB/km	≤ 0,28 dB/km	≤ 0,28 dB/km
Attenuation with bending:				
Mandreal Radius 15mm @1550 10 turns	-	≤ 0,25 dB	≤ 0,03 dB	-
Mandreal Radius 15mm @1625 10 turns	-	≤ 1,0 dB	≤ 1,0 dB	-
Mandreal Radius 10mm @1550 1 turn	-	≤ 0,75 dB	≤ 0,1 dB	-
Mandreal Radius 10mm @1625 1 turn	-	≤ 1,5 dB	≤ 0,2 dB	-
Mandreal Radius 7,5mm @1550 1 turn	-	-	≤ 0,5dB	-
Mandreal Radius 7,5mm @1625 1 turn	-	-	≤ 01,0dB	-
Proof test	≥ 100 kpsi	≥ 100 kpsi	≥ 100 kpsi	≥ 100 kpsi



## Updated

Date	Rev.	Description
16.03.2015	1	Armour
14.12.2015	2	Norms and Part no.
23.01.2017	3	Fiber data
11.01.2018	4	Updated Norms
06.06.2019	5	Colour code
04.12.2019	6	Product name
23.06.2020	7	Tensile strenght
16.03.2021	8	Norms
01.03.2023	9	Colour code to TIA 598