

## QFNB (QFNI + MUD)

7 – 72 fibers

Armoured SHF2, UV

Fire resistant

Loose tube

DNV

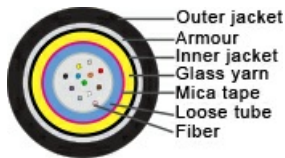
### Application

Fiber optic cable for use in vital communication and emergency systems that must be operational during a fire situation (90 min. 950 – 1000°C). The fibers are protected in jelly filled loose tubes stranded around a central strength member to ensure high performance and long endurance. Individual colors for each fiber. 62.5, 50 and 9 µm fibers, MUD resistant jacket. The cable can be used outdoor and indoor, excellent rodent resistance.



### Construction Fiber

Fibertype	MM or SM 62.5, 50 or 9µm
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
Colorcode fiber tube	1 - Blue 2 - Orange 3 - Green 4 - Brown passive tubes black
Strength member	Reinforced fibreglass yarns (WB) (Waterblocking)
Inner jacket	Black LSZH compound
Fire barrier	Mica tape over each active tube
Armour	Corrugated steel
Jacket	Black LSZH compound MUD-resistant
Diameter	15.5 [mm]



## Specifications fiber

Temperature range	-40 – +90 [°C] According to IEC 60794-1-22 F1
Temperaturerange at inst.	-10 – +50 [°C] According to IEC 60794-1-22 F1
Tensile strength	Installed: 1000 [N] @ installation: 1800 [N] (according to IEC 60794-1-21 E1)
Crush resistance	3000 [N/10cm] (according to IEC 60794-1-21 E3)
Impact resistance	5 [ J ] (according to IEC 60794-1-21 E4)
Water penetration	According to IEC 60794-1-22 F5B (3m, 1m. 24h)
Bending radius flexible	20 [x outer diam.]
Bending radius installed	15 [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 NEK TS 606 F1
Flame retardant	IEC 60332-1 and IEC 60332-3
Fire resistant	IEC 60331-25 (90min @ 950 – 1000°C)
Smoke emission	IEC 61034-2
Oil and fuel resistant	Mineral oils: IRM 902 (IEC60811-2-1) 4h @ 70°C Diesel: IRM 903 (IEC60811-2-1) 4h @ 70°C
UV-resistant	ASTM G 154
Certification	DNV

## Dimension

No. of fibres	Fibre per tube	Total / Active tubes	Outer diam. [mm]	Weight
12	12	6 / 1	15.5	247
16	8	6 / 2	15.5	248
24	12	6 / 2	15.5	248
32	8	6 / 4	15.5	249
36	12	6 / 3	15.5	249
48	12	6 / 4	15.5	250

## Fiber data-3

Optical fiber	MM62/OM1	MM50/OM2 – MM50/OM3	MM50/OM4	SM10/G652.D
Core diameter	62.5 ± 2.5 µm	50 ± 2.5 µm	50 ± 2.5 µm	-
Core non-circularity	≤ 6%	≤ 5%	≤ 5%	-
Core/Cladding concentricity error	≤ 1 µm	≤ 1 µm	≤ 1 µm	≤ 0.5 µm

Optical fiber	MM62/OM1	MM50/OM2 – MM50/OM3	MM50/OM4	SM10/G652.D
Cladding diameter	125 ± 2.0 µm	125 ± 1.0 µm	125 ± 1.0 µm	125 ± 0.7 µm
Cladding non-circularity	≤ 1 %	≤ 0.7 %	≤ 0.7 %	≤ 0.7 %
Primary coating diameter	242 ± 10 µm	242 ± 5 µm	242 ± 5 µm	242 ± 7 µm
Core non-circularity	≤ 6 %	≤ 5 %	≤ 5 %	≤ 5 %
Coating concentricity error	≤ 10 %	≤ 6 %	≤ 6 %	≤ 6 %
Proof test	≥ 8.8 N / ≥ 1 % / 100 Kpsi	≥ 8.8 N / ≥ 1 % / 100 Kpsi	≥ 8.8 N / ≥ 1 % / 100 Kpsi	≥ 8.8 N / ≥ 1 % / 100 Kpsi
Mode field Diameter @ 1310 nm	-	-	-	9.0 ± 0.4
Mode field Diameter @ 1550 nm	-	-	-	10.1 ± 0.5
Att. coefficient (dB/km) 850 nm	≤ 2.7	≤ 2.5 – 250	≤ 2.89	-
Att. coefficient (dB/km) 1300 nm	≤ 0.7	≤ 0.7 – 0.7	≤ 0.80	-
Att. coefficient (dB/km) 1310 nm	-	-	-	≤ 0.35
Att. coefficient (dB/km)	-	-	-	≤ 0.35
Att.n coefficient (dB/km)	-	-	-	≤ 0.25
Att. coefficient (dB/km)	-	-	-	≤ 0.21
Att. coefficient (dB/km)	-	-	-	< 0.23
Bandwidth (Mhz/km) 850nm	≥ 200	≥ 700 – ≥ 1500	≥ 3500	-
Bandwidth (Mhz/km) 1300nm	≥ 500	≥ 500 – ≥ 500	≥ 500	-
Effective Modal Bandwidth (EMB) @ 850 nm	-	- – >2000 Mhz*km	-	-
Numerical aperture	0.275 ± 0.015	0.200 ± 0.015 – -	0.200 ± 0.015	-
Group index of refraction 850 nm	-	-	-	-
Group index of refraction 1300 nm	-	-	-	-
Group index of refraction 1310 nm	-	-	-	1.467
Group index of refraction 1550 nm	-	-	-	1.468
Chromatic Dispersion Coefficient (ps/nm.km)				
CDC (ps/nm.km) 1285 – 1330 nm	-	-	-	≤ 3
CDC (ps/nm.km) 1550 nm	-	-	-	≤ 18
CDC (ps/nm.km) 1625 nm	-	-	-	≤ 22
Zero Dispersion Wavelength (nm)	-	-	-	1300 – 1322
Zero Dispersion Slope (ps/nm²km)	-	-	-	≤ 0.090

Optical fiber	MM62/OM1	MM50/OM2 – MM50/OM3	MM50/OM4	SM10/G652.D
Cable Cut-off Wavelength (nm)	-	-	-	≤ 1260
PMD (ps/√ km) 1550 nm	-	-	-	< 0.1