



# QFCU Mica (QFCI MUD)

Loose tube, jelly filled

Mica

Armoured

SHF2 MUD, UV

DNV

## Application

Fiberoptical cable with Mica-tape for use in vital communication and emergency systems, which needs to be operational during a fire situation (90 min. 1000°C). For use in emergency systems, marine and offshore applications, commercial marine vessels, in harsh environments. The fibers are protected in jelly filled loose tubes stranded around a central strength member to ensure high performance and long endurance. Individual colours for each fiber. 62.5, 50 and 9 µm fibers. MUD resistant jacket.



## Construction Fiber

Fibertype	MM 62.5 and 50, SM 9
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 PBTP with jelly Mica tape on each loose tube
Colorcode fiber tube	TIA 598 1 - Blue    3 - Green 2 - Orange    4 - Brown
Strength member	Reinforced fibreglass yarns (WB)
Inner jacket	Black LSZH compound
Armour	Galvanized steel wire braid (alternative: QFOU with tinned Cu-wire braid)
Outer Jacket	Black - SHF2, MUD- and oil resistant
Diameter	15.0 ± 0.5 [mm]

## Specifications

Operating temperature normal	-40 – +70 [°C]
Temperature @ installation	-10 – +60 [°C]
Tensile strength	500 [N] @ operation 1500 [N] @ installation (acc. to IEC 60794-1-21 E1)
Crush test	3000 [N/10cm] (acc. to IEC 60794-1-21 E3)
Impact	5 [J] (acc. to IEC 60794-1-21 E4)
Min. bending radius	20 [x outer diam] (IEC 60794-1-21 E11)



## Norms

Halogenfree, max content corrosive and toxic gases	IEC 60754-1 & IEC 60754-2
Material properties, insulation and sheath	IEC 60092-360
Design and testing standards	IEC 60794-1-21 & IEC 60794-1-22
Flame resistance	IEC 60332-3
Flame retardant	IEC 60332-1-2
Fire resistant	IEC 60331-25 EN 50200 – 90 min. @ 830°C
Weather resistant	IEC 60794-1
Ozone resistant	IEC 60811-2-1 IEC 60811-403
Smoke emission	IEC 61034-1 & IEC 61034-2
Oil and fuel resistant	IEC 60811-2-1 EN 60811-404 IRM 903 UIC 895/OR
Test and material	Emergency Circuits acc. to EN 50200 - PH120
MUD resistant	NEK TS 606 F5
UV-resistant	ISO 4892-2-A: 720hours
Certification	DNV

## Table Fiber

Number of fibers	Number of fibers per tube	Number of fibers and tubes	Weight [kg/km]
4	4	4 / 1	290
8	8	4 / 1	291
12	12	4 / 1	291
24	12	4 / 2	305
36	12	4 / 3	318
48	12	4 / 4	331



## 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 capacity 1GBase-SR	274 m	600 m	1000 m	1100 m
Fibre cap. 40GBase-SR4/100BaseRS10	274 m	600 m	1000 m	1100 m
Fibre cap. 40GBase-SR4/100BaseRS10	-	-	140 m	1740 m
Proof test	> 100 kpsi	> 100 kpsi	> 100 kpsi	> 100 kpsi



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	9.0 ± 0.4 μm	8.9 ± 0.5 μm	-
Mode field Diameter @ 1550 nm	10.1 ± 0.5 μm	10.1 ± 0.5 μm	9.9 ± 0.5 μm	9.2 ± 0.5 μm
Cladding diameter	125 ± 0.7 μm	125 ± 0.7 μm	125 ± 0.7 μm	125 ± 1.0 μm
Coating diameter	242 ± 7 μm	242 ± 7 μm	242 ± 7 μm	242 ± 7 μm
Cladding non-circularity	≤ 0.7 %	≤ 0.7 %	≤ 0.7 %	≤ 1.0 %
Core/Cladding concentricity error	≤ 0.5 μm	≤ 0.5 μm	≤ 0.5 μm	≤ 0.6 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 - 1322 μm	1440 μm
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	≤ 1.0 dB/km
Attenuation @ 1550 nm	≤ 0.25 dB/km	≤ 0.25 dB/km	≤ 0.25 dB/km	≤ 0.25 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	≤ 0.1 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	-	-	≤ 0.5 dB	-
Mandreal Radius 7,5mm @1625 1 turn	-	-	≤ 1.0 dB	-
Proof test	≥ 100 kpsi	≥ 100 kpsi	≥ 100 kpsi	≥ 100 kpsi



## Updated

Date	Rev.	Description
13.12.2024	1	Additional info