



QFCI / QFOI

Loose tube
Fire resistant
Armoured
SHF1, UV
DNV

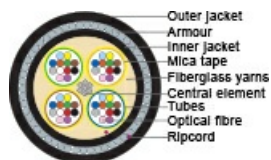
Application

Fiberoptical cable for the oil- and offshore industry, commercial marine wessels and other harsh environments. The cable has excellent communication properties and is tested to be operative in at least 90 min. at 1000°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 |
| 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 |
| Colorcode fiber tube | (acc. TIA 598) 1 - Blue 2 - Orange 3 - Green 4 - Brown Passive tubes - Black |
| Strength member | Reinforced fibreglass yarns (WB) (water blocking) |
| Inner jacket | LSZH compound Ø = 11.0 [mm] |
| Fire resistant barrier | Mica tape , each tube |
| Armour | QFCI: Galvanized steel wire braid QFOI: Tinned Cu-wire braid |
| Jacket | Black LSZH compound SHF1 |
| Diameter | 15,0 ± 0,5 [mm] |





Specifications fiber

| | |
|---------------------------|---|
| Temperature range | -40 – +70 [°C] |
| Temperaturerange at inst. | -10 – +70 [°C] |
| Temperaturrange storage | -40 – +70 [C°] |
| Tensile strength | 500 [N] (operation) 2000 [N] (installation) (IEC 60794-1-21 E1) |
| Crush resistance | 3000 [N/10cm] , (IEC 60749-1-21 E3) |
| Impact resistance | 5 [J] , (IEC 60749-21 E4) |
| Bending radius | 20 [x outer diam] , (IEC 60749-1-21 E11) |

Norms

| | |
|--|--|
| Halogenfree, max content corrosive and toxic gases | IEC 60754-1 & IEC 60754-2 |
| Material properties, insulation and sheath | NEK TS 606 F1 NEK 606 F1 |
| Flame resistance | IEC 60332-3-22 |
| Flame retardant | IEC 60332-1 |
| Fire resistant | IEC 60331-25 (PH 120 @ 830°C) |
| Smoke emission | IEC 61034-1 & 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 | ISO 4892-2-A: 720hours |
| Certification | DNV |





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-SR4/100BaseRS10 | 274 m | 600 m | 1000 m | 1100 m |
| Fibre cap. 40GBase-SR4/100BaseRS10 | - | - | 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 | 9,0±0,4 µm | 8,90±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 ₀) | 1300-1322 µm | 1300-1322 µm | 1300-1324 µm | ≤ 1440 nm |
| Dispersion slope (S ₀) @ (λ ₀) | ≤ 0,090 ps/(nm ² * km) | ≤ 0,090 ps/(nm ² * km) | ≤ 0,092 ps/(nm ² * 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 @ 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 |



| Number of fibers | Number of fiber per tube | Weight [kg/km] | Part no. |
|--------------------|--------------------------|----------------|----------|
| 4 - 9/125 | 4 | 290 | 1042410 |
| 8 - 9/125 | 8 | 291 | 1042411 |
| 12 - 9/125 | 12 | 291 | 1042412 |
| 24 - 9/125 | 12 | 305 | 1042413 |
| 48 - 9/125 | 12 | 331 | 1042414 |
| 4 - 62,5/12572 OM1 | 4 | 290 | 1042415 |
| 8 - 62,5/125 OM1 | 8 | 291 | 1042416 |
| 12 - 62,5/125 OM1 | 12 | 291 | 1042417 |
| 24 - 62,5/125 OM1 | 12 | 305 | 1042418 |
| 48 - 62,5/125 OM1 | 12 | 331 | 1042419 |
| 4 - 50/125 OM3 | 4 | 290 | 1042420 |
| 8 - 50/125 OM3 | 8 | 291 | 1042421 |
| 12 - 50/125 OM3 | 12 | 291 | 1042422 |
| 24 - 50/125 OM3 | 12 | 305 | 1042423 |
| 48 - 50/125 OM3 | 12 | 331 | 1042424 |
| 4 - 50/125 OM2 | 4 | 290 | 1091195 |
| 8 - 50/125 OM2 | 8 | 291 | 1091196 |
| 12 - 50/125 OM2 | 12 | 291 | 1091197 |
| 24 - 50/125 OM2 | 12 | 305 | 1091198 |
| 4 - 50/125 OM4 | 4 | 290 | 1032422 |
| 8 - 50/125 OM4 | 8 | 291 | 1032423 |
| 12 - 50/125 OM4 | 12 | 291 | 1032424 |
| 24 - 50/125 OM4 | 12 | 305 | 1032425 |
| 12 - 9/125 | 6 | 291 | 1091091 |
| 24 - 9/125 | 6 | 305 | 1091092 |
| 48 - 9/125 | 12 | 331 | 1091093 |

Updated

| Date | Rev. | Description |
|------------|------|-----------------|
| 04.12.2019 | 1 | Rev. |
| 17.11.2023 | 2 | Tensil strength |
| 13.12.2024 | 3 | Additional info |