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QFAI UNI

Fire resistant

4 – 24 optical fibres, loose tube

Nonmetallic, SHF1

DNV-GL, ABS

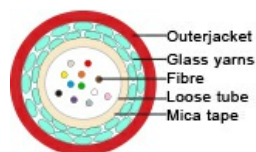
Application

A robust fibre cable suited for harsh ship- and offshore environment. It has no metal content, which leaves it immune to electric and electromagnetic shockwaves. For LAN and WAN installations as well as telecommunication and data transmission on board. UV resistant and rodent protected, SHF1 outer jacket. Fire resistant; operational for 90 min. if exposed to fire.



Construction

| | | |
|------------------------|---|--|
| Fibers | Loose tube Jelly filled PBTP tube 2,8 mm up to 12 fibres 3,5 mm above 12 fibres | |
| Colour code | 1- Natural 2- Red 3- Green 4- Yellow 5- Brown 6- Blue 7- Violet 8- Orange 9- Grey 10- White 11- Black 12- Pink | 13- Turquoise 14- Red (with black rings) 15- Green (with black rings) 16- Yellow (with black rings) 17- Brown (with black rings) 18- Blue (with black rings) 19- Violet (with black rings) 20- Orange (with black rings) 21- Grey (with black rings) 22- White (with black rings) 23- Pink (with black rings) 24-Turquoise (with black rings) |
| Fire resistant barrier | Mica tape | |
| Armour | Glass yarn | |
| Jacket | Red SHF1 | |
| Outer diam | ≤ 12 fibres, 7,5 [mm] > 12 fibres, 8,5 [mm] | |
| Weight | ≤ 12 fibres, 60 [kg/km] > 12 fibres, 70 [kg/km] | |



Specifications

| | |
|------------------------------|--------------------------------------|
| Operating temperature | -40 – 70 [°C] |
| Temperature @ installation | -5 – +50 [°C] |
| Tensile strength | 2,500 [N] IEC 60794-1-2 E1 |
| Crush test | 3,000 [N/10cm] IEC 60794-1-2 E3 |
| Impact | 10 [J] |
| Min. bending radius | 10 [x outer diam] IEC 60794-1-2 E11A |
| Min. bending radius flexible | 15 [x outer diam] |



Norms

| | |
|--|---|
| Halogenfree, max content corrosive and toxic gases | <0.3% when measured according to IEC 60754-1, -2 |
| Sheathing material | IEC 60092-360 (359) |
| Flame retardant | IEC 60332-1-2 |
| Fire retardant | IEC 60332-3-22 |
| Fire resistant | IEC 60331-25 |
| Smoke emission | IEC 61034-1, -2 |
| Test and material | Circuit integrity test IEC 60331-11 / IEC 60331-25 (750°C, 90 min.) max change of attenuation 2,0 dB Circuit integrity test EN 50200 (842°C, 90 min.) max change of attenuation 2,0 dB Fire load: 1,03 MJ/m |
| UV-resistant | ASTM G 154 IEC 60068-2-5 |
| Certification | DNV-GL, ABS |



Specifications and properties for available fibre types can be found at nek-sealine.com under Multimode or Singlemode optical fibres.

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-SR4/100Base-RS10 | | | 140 m | 170 m |
| Proof test | >100kpsi | >100kpsi | >100kpsi | >100kpsi |



| Properties | SMR ITU-T G652D | SMR ITU-T G657A | SMR ITU-T G657B | SMR NZD ITU-T G655.E |
|--|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------|
| Mode field Diameter @ 1310 nm | 9,0±0,4 µm | 9,0±0,4 µm | 9,0±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 µm |
| 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 | - | - | - | 5,5 - 10 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 | ≤ 0,40 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 | - | - | ≤ 0,5 dB | - |
| Mandreal Radius 7,5mm @1625 1 turn | - | - | ≤ 1,0 dB | - |
| Proof test | ≥ 100 kpsi | ≥ 100 kpsi | ≥ 100 kpsi | ≥ 100 kpsi |

Table

| Number of fibers | Weight [kg/km] | Part.no. |
|-------------------------|----------------|----------|
| G4 50/125 SHF1 - OM4 | 60 | 1028778 |
| G6 50/125 SHF1 - OM4 | 60 | 1028779 |
| G8 50/125 SHF1 - OM4 | 60 | 1028780 |
| G12 50/125 SHF1 - OM4 | 60 | 1028781 |
| G24 50/12 SHF15 - OM4 | 70 | 1028782 |
| G4 9/125 SHF1 - OS2 | 60 | 1028783 |
| G6 9/125 SHF1 - OS2 | 60 | 1028784 |
| G8 9/125 SHF -1 OS2 | 60 | 1028785 |
| G12 9/125 SHF -1 OS2 | 60 | 1028786 |
| G24 9/125 SHF1 - OS2 | 70 | 1028787 |
| G4 50/125 SHF1 - OM2 | 60 | 1028788 |
| G6 50/125 SHF1 - OM2 | 60 | 1028789 |
| G8 50/125 SHF1 - OM2 | 60 | 1028790 |
| G12 50/125 SHF1 - OM2 | 60 | 1028791 |
| G24 50/125 SHF1 - OM2 | 70 | 1028792 |
| G4 62,5/125 SHF1 - OM1 | 60 | 1028793 |
| G6 62,5/125 SHF1 - OM1 | 60 | 1028794 |
| G8 62,5/125 SHF1 - OM1 | 60 | 1028795 |
| G12 62,5/125 SHF1 - OM1 | 60 | 1028796 |
| G24 62,5/125 SHF1 - OM1 | 70 | 1028797 |
| G4 50/125 SHF1 - OM3 | 60 | 1091149 |
| G6 50/125 SHF1 - OM3 | 60 | 1091148 |
| G8 50/125 SHF1 - OM3 | 60 | 1091151 |
| G12 50/125 SHF1 - OM3 | 60 | 1028776 |
| G24 50/12 SHF15 - OM3 | 70 | 1028777 |



Updated

| Date | Rev. | Description |
|------------|------|------------------------|
| 6.12.2016 | 1 | Construction |
| 10.12.2016 | 2 | Minor dimension change |
| 28.11.2017 | 3 | Jacket/drawing |
| 06.02.2018 | 4 | Colour code fibers |