# 船用光缆 Marine Fiber Optic cable

HF Flame Oil Cold UV

## QFOI-FL

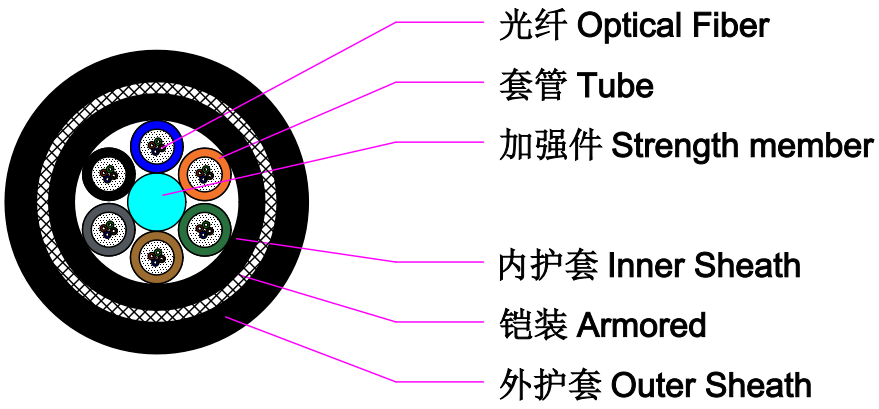


## 应用 Application

本规范涵盖了船舶和移动海上平台通信和设备中使用的阻燃光缆的要求。

This specification covers the requirements for flame retardant optical cables used in communication and equipment of ships and mobile offshore platforms.

## 结构 Construction




| | | |
|---|---|---|
| 光纤 Fiber | 松套光纤 | Loose tube fiber |
| 套管 Tube | PBT | PBT |
| 加强件 Strength Member | 钢丝 | Steel wire |
| 内护套 Inner Sheath | SHF1 | SHF1 |
| 铠装 Armored | 镀锡铜丝编织，覆盖率≥90% | Tinned Copper Wire Braiding，coverage≥90% |
| 外护套 Outer Sheath | SHF1<br>颜色：黑色或定制 | SHF1<br>Color ： Black or as customer's request |
| 印字 Marking | Hysin □MARINE □Cable □QFOI □FL □ （Number of Fibers） □(Fiber type) □ IEC60332-3-22□****m□xxxxxx□WW/YY<br>注：□ 表示空格；****m 表示计米；xxxxxx 表示批号;WW/YY 表示周数/年份<br>Note：□ means blank；****m means meters；xxxxxx means batch number；WW/YY means week/year | |

## 光纤性能 Optical Characteristics

| 光纤类型 Fiber Type | | SM 9/125 OS2 B1.3 | MM 62.5/125 OM 1 A1b | MM 50/125 OM 2 A1a | MM 50/125 OM 3 A1a.2 | MM 50/125 OM 4 A1a.3 | MM 50/125 OM 5 A1a.4 |
|---|---|---|---|---|---|---|---|
| 纤芯直径 Core Diameter(μm) | | 9.2 ±.0.4 | 62.5 ± 2.5 | 50 ± 2.5 | 50 ± 2.5 | 50 ± 2.5 | 50 ± 2.5 |
| 衰减系数 Attenuation (dB/km) | @1310 nm | <0.40 | - | - | - | - | - |
| | @1550 nm | <0.30 | - | - | - | - | - |
| | @ 850 nm | - | <3.00 | <3.00 | <3.00 | <3.00 | <3.00 |
| | @ 1300 nm | - | <1.00 | <1.00 | <1.00 | <1.00 | <0.70 |
| 带宽 Bandwidth ( MHz*km) | @ 850 nm | - | >200 | >500 | >1500 | >3500 | >3500 |
| | @ 1300 nm | - | >500 | >500 | >500 | >500 | >500 |
| 光纤容量 Fiber capacity 1GBase | SR 1310nm | 10000m | - | - | - | - | - |
| | LX 1550nm | 40000m | - | - | - | - | - |
| | SX 850nm | - | 275 m | 550 m | 1000 m | 1100 m | - |
| 光纤容量 Fiber capacity 10GBase | SR 850nm | - | 33 m | 82 m | 300 m | 550 m | 550 m |
| 光纤容量 Fiber capacity 40GBase | SR 850nm | - | - | - | 100 m | 150 m | 440m |
| 光纤容量 Fiber capacity 100GBase | SR 850nm | - | - | - | - | - | 150 m |
| Proof test(kpsi) | | >100 | >100 | >100 | >100 | >100 | >100 |

## 性能 Performances

| | | |
|---|---|---|
| 存储/工作温度 | Storage/Operating Temperature | -40℃ to + 85℃ |
| 衰减 | Attenuation | IEC60793-1-40 & IEC60794-2 |
| 机械物理性能 | Mechanical and particular characteristic | IEC60092-360 |
| 抗拉强度 | Tensile strength | IEC60794-1-2 E1 |
| 抗压 | Crush | IEC60794-1-2 E3 |
| 冲击 | Impact | IEC60794-1-2 E4 |
| 扭转 | Torsion | IEC60794-1-2 E7 |
| 弯曲 | Cable bend | IEC60794-1-2 E11 |
| 阻燃性 | Flame resistance | IEC 60332-3-22 Cat A |
| 耐油 | Oil resistance (SHF1) | IRM902, 70℃×4H |
| 卤酸气体 | Acid Gas Release Mounts | ≤5mg/g （IEC 60754-1） |
| 燃烧气体 PH 值 | Burning Occur Gas Acidity | PH≥4.3 （IEC 60754-2） |
| 抗紫外线 | UV resistance | UL1581 |
| 燃烧气体导电率 | Burning Occur Gas conductivity | <10 μS/mm (IEC 60754-2) |
| 烟密度 | Smoke density | ≥60%（IEC 61034-2） |
| 抗张强度 长期/短期 | Tensile Strength Long/Short Term | 600/1500 N |
| 抗压性 长期/短期 | Crush Resistance Long/Short Term | 1000/3000 N/100mm |

## 光纤套管 Fiber tube

光纤套管材料为 PBT 复合挤出层，套管内填充有阻水填充化合物。

The tube material is PBT compound extrusion layer，The tube are filled with a water-resistant filling compound.

| 光纤芯数<br>Fiber cores | 2 | 4 | 6 | 8 | 12 | 16 | 24 | 48 | 60 | 72 | 84 | 96 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 每管中芯数<br>Number of fibers in each tube | 2 | 2 | 2 | 2 | 2 | 4 | 4 | 8 | 12 | 12 | 12 | 12 |
| 光纤颜色<br>Color of fibers | BL<br>OR | BL<br>OR | BL<br>OR | BL<br>OR | BL<br>OR | BL<br>OR<br>GR<br>BR | BL<br>OR<br>GR<br>BR | BL/OR<br>GR/BR<br>SL/WH<br>RD/BK | BL/OR<br>GR/BR<br>SL/WH<br>RD/BK<br>YL/VI<br>RS/AQ | BL/OR<br>GR/BR<br>SL/WH<br>RD/BK<br>YL/VI<br>RS/AQ | BL/OR<br>GR/BR<br>SL/WH<br>RD/BK<br>YL/VI<br>RS/AQ | BL/OR<br>GR/BR<br>SL/WH<br>RD/BK<br>YL/VI<br>RS/AQ |
| 套管颜色<br>Color of tubes | BL | BL<br>OR | BL/OR<br>GR | BL/OR<br>GR/BR | BL/OR<br>GR/BR<br>SL/WH | BL/OR<br>GR/BR | BL/OR<br>GR/BR<br>SL/WH | BL/OR<br>GR/BR<br>SL/WH | BL/OR<br>GR/BR<br>SL | BL/OR<br>GR/BR<br>SL/WH | BL/OR<br>GR/BR<br>SL/WH<br>RD | BL/OR<br>GR/BR<br>SL/WH<br>RD/BK |

※ The color comply with TIA-568/TIA-598

BL-Blue,OR-Orange,GR-Green,BR-Brown,SL-Slate,WH-White,RD-Red,BK-Black,YL-Yellow,VI-Violet,RS-Rose,AQ-Aqua

※The other color of fiber may be applicable when purchaser required.

## 技术参数 Technical Parameters

| Type<br>型号 | Fiber Count<br>光纤芯数 | Inner sheath thickness<br>内护套厚度<br>（mm） | Inner sheath Diameter<br>内护套外径<br>（mm） | Bending Radius Static/Dynamic<br>弯曲半径<br>静态/动态<br>(mm) | Outer sheath thickness<br>外护套厚度<br>（mm） | Outer Diameter<br>外护套外径<br>（mm） |
|---|---|---|---|---|---|---|
| QFOI-FL | 2~10、16 | ≥1.0 | 7.0±0.8 | 10D/20D | ≥1.0 | 10.0±1.0 |
| | 12~48 | ≥1.0 | 7.5±0.8 | 10D/20D | ≥1.0 | 10.5±1.0 |
| | 50~72 | ≥1.0 | 8.5±0.8 | 10D/20D | ≥1.0 | 11.5±1.0 |
| | 74~96 | ≥1.0 | 10.0±0.8 | 10D/20D | ≥1.0 | 13.5±1.0 |

FL means Flame retardant.