# TECHNICAL SPECIFICATION

## Fig 8 Cable with HDPE Sheath

### （GYFTC8Y-12 24 48 Fibers)

## 1. Cable structure

1.Stranded loose tube
2.FRP strength member
3.Core filler compound
4.Fillers
5. Galvanized steel wire
6.HDPE sheath

## 2. Characteristic

Good mechanical and temperature performance
High strength loose tube that is hydrolysis resistant
Special tube filling compound ensure a critical protection of fiber
Crush resistance and flexibility

2.1 Reference

The cable which ZP offered are designed, manufactured and tested according to international

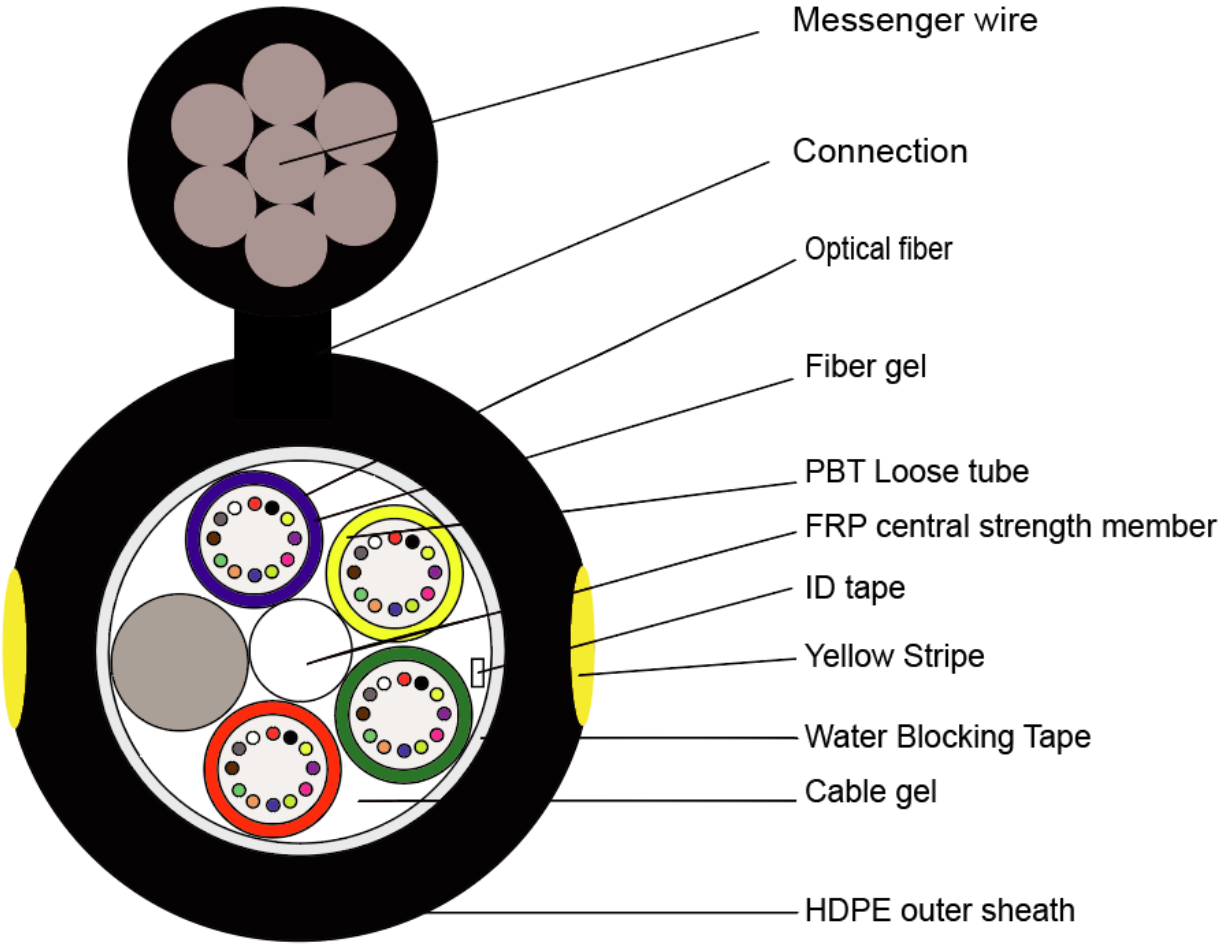
| | |
|---|---|
| IEC60793-1 | Optical fiber Part 1: Generic specifications |
| IEC60793-2 | Optical fiber Part 2: Product specifications |
| EIA/TIA598 B | Color code of fiber optic cables |
| ITU-T G.650 | Definition and test methods for the relevant parameters of single-mode fibers |
| ITU-T G.652 | Characteristics of a single-mode optical fiber cable |

## 3. Optical Fiber

The optical fiber is made of high pure silica and germanium doped silica. UV curable acrylate material is applied over fiber cladding as optical fiber primary protective coating. The detail data of optical fiber performance are shown in the following table.

| Category | Description | | Specifications |
|---|---|---|---|
| Type | | | G.652D |
| Optical Specifications | Attenuation | @1310nm | ≤0.35dB/km |
| | | @1383nm | ≤0.35dB/km |
| | | @1550nm | ≤0.22dB/km |
| | | @1625nm | ≤0.25dB/km |
| | Attenuation Non-uniformity | | ≤0.03 dB |
| | Point Discontinuity @1310nm,1550nm | | ≤0.03 dB |
| | Attenuation vs. Wavelength | @1285~1330nm | ≤0.05 dB/km |
| | | @1525~1575nm | ≤0.05 dB/km |
| | Zero Dispersion Wavelength | | 1300~1324 |
| | Zero Dispersion Slope | | ≤0.092ps/nm.km |
| | Dispersion | @1310nm | ≤3.5 ps/nm.km |
| | | @1550nm | ≤18 ps/nm.km |
| | Polarization Mode Dispersion(PMD) | | ≤0.2ps/km1/2 |
| | PMD Link value | | ≤0.2ps/km1/2 |
| | Cable Cutoff Wavelength(λcc) | | ≤1260nm |
| | Macro bending Loss (100 turns;Φ60mm) @1625nm | | ≤0.10 dB |
| | Mode Field Diameter | @1310nm | 9.2±0.6μm |
| | | @1550nm | 10.4±0.8μm |
| | Effective Group Index of Refraction | @1310nm | 1.4675 |
| | | @1550nm | 1.4681 |
| Dimensional Specifications | Fiber Curl Radius | | ≥4.0m |
| | Cladding Diameter | | 125±0.8μm |
| | Mode field Core/clad concentricity | | ≤0.5μm |
| | Cladding Non-Circularity | | ≤1.0% |
| | Coating Diameter | | 245±5μm |
| | Coating/Cladding Concentricity | | ≤8μm |
| | Coating Non-Circularity | | ≤6.0% |
| Mechanical Specifications | Proof Test | | ≥1.0% |
| | Peak Coating Strip Force | | 1.0~8.9N |
| Environmental Specifications | Temperature Cycling Induced Attenuation @1310nm,1550nm,1625nm(-60℃ to+85℃ ) | | ≤0.05 dB/km |

## 4. Cable structure




| Structure | Unit | Parameter | | |
|---|---|---|---|---|
| Fiber count | Fibers | 12 | 24 | 48 |
| Loose tube | Material | PBT | | |
| | Fiber per Tube | 6 | 12 | 12 |
| Center Strength Member | Material | FRP+(PE Sheath) | | |
| Messenger wire | Material | Galvanized steel strand | | |
| | Diameter (mm) | 7*1.6 | | |
| | Zinc coating | ≥153g/m² | | |
| Sheath of messenger wire | Material | HDPE | | |
| | Color | Black | | |
| | Thickness(mm) | Min 1.0 | | |

| | | | | | |
|---|---|---|---|---|---|
| Outer Sheath | | Material | HDPE | | |
| | | Thickness (nominal*) | 1.6mm | | |
| Rip cord | | Number | 2 | | |
| | | Color | White | | |
| Cable diameter (nominal**) | | mm | 9.2*18.4 | 9.4*18.6 | 9.4*18.6 |
| Cable Weight (Approx.) | | Kg/km | 220 | 225 | 225 |
| Bending Radius | Dynamic | -- | ≥20×Cable Diameter | | |
| | Static | -- | ≥10×Cable Diameter | | |
| Operation temperature range | | ℃ | -40 --- +70 | | |
| Installation temperature range | | ℃ | -20 --- +70 | | |
| Transport and storage temperature range | | ℃ | -50 --- +80 | | |
| Span | | M | 100 | | |
| Max. tensile load | | N | 2000 | | |
| Crush resistance | | N | 1500/10cm | | |

Loose tube and Fiber Color Code

| | | | | | | |
|---|---|---|---|---|---|---|
| Color Code | 1 | 2 | 3 | 4 | 5 | 6 |
| | Blue RAL5015 | Yellow RAL1021 | Green RAL6018 | Red RAL3000 | Violet RAL4005 | Brown RAL8003 |
| | 7 | 8 | 9 | 10 | 11 | 12 |
| | Pink RAL3015 | Grey RAL7035 | Black RAL9004 | Orange RAL2008 | White RAL9001 | Aqua RAL6027 |

## 5. Test Requirements

The cable is in accordance with applicable standard of cable and requirement of customer. The following test items are carried out according to corresponding reference.

### 5.1 Tension Loading Test

| | |
|---|---|
| Test standard | IEC 60794-1-2-E1 |
| Sample length | No less than 50 meters |
| Loading | 2000N |
| Duration time | 10 minutes |
| Test results | Loss change ≤ 0.1dB @1550nm |
| | Fiber strain at max. load: max.0.33% |
| | No fiber break and no sheath damage. |

### 5.2 Crush Test

| | |
|---|---|
| Test standard | IEC 60794-1-2-E3 |
| Loading | 1500N |
| Sample length | 100mm |
| Duration time | 5 minutes |

| | |
|---|---|
| Test number | 3 points at 3 places |
| Test results | Loss change ≤ 0.1dB @1550 nm |
| | No fiber break and no sheath damage. |

### 5.3 Impact Test

| | |
|---|---|
| Test standard | IEC 60794-1-2-E4 |
| Loading | 1KG,1m,Radius of hammer head: 12.5mm |
| Points of impact | 5 |
| Times of per point | 5 |
| Impact rate: | 2 sec/cycle |
| Test results | Loss change ≤ 0.1dB @1550 nm |
| | No fiber break and no sheath damage. |

### 5.4 Repeated Bending

| | |
|---|---|
| Test standard | IEC 60794-1-2-E6 |
| Bending radius | 20 x cable diameter |
| Load | 150N |
| No. of cycle | 30 |
| Flexing rate: | 3 sec/cycle |
| Test results | Loss change ≤ 0.1dB @1550 nm |
| | No fiber break and no sheath damage. |

### 5.5 Torsion/Twist Test

| | |
|---|---|
| Test standard | IEC 60794-1-2-E7 |
| Sample length | 2m |
| Load: | 150N |
| Twist rate | 1 min/cycle |
| Twist angle | ±180° |
| No. of cycle | 10 |
| Test results | Loss change ≤ 0.1dB @1550 nm |
| | No fiber break and no sheath damage. |

### 5.6 Bending Test

| | |
|---|---|
| Test standard | IEC 60794-1-2-E11B |
| Bending diameter | 20 x cable diameter |
| Number of cycles | 5 |
| Test results | Loss change ≤ 0.1dB @1550 nm |
| | No fiber break and no sheath damage. |

### 5.7 Temperature cycling Test

| | |
|---|---|
| Test standard | IEC 60794-1-2-F1 |
| Temperature step | +20℃ →-40℃ →+60℃ →-40℃ →+60℃ →+20℃ |
| Time per each step: | 12 hrs |
| Number of cycles | 2 cycles |
| Test results | Attenuation variation for reference value(the attenuation to be measured before test at +20±3℃ ) ≤0.05dB, reversible |

### 5.8 Water penetration Test

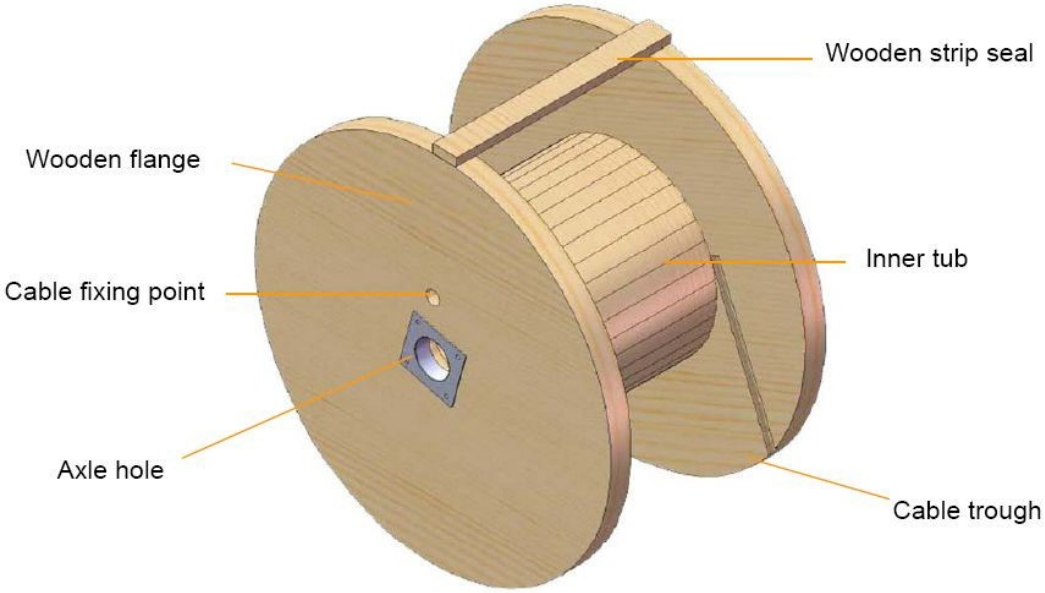
| | |
|---|---|
| Test standard | IEC 60794-1-2-F5 |
| Water height | 1m |
| Sample length | 3m |
| Duration of test | 24 hrs |
| Test results | No water leakage at the end of the sample |

### 5.9 Drip Test

| | |
|---|---|
| Test standard | IEC 60794-1-2-E14 |
| Sample length | 0.3m |
| Temperature | +70℃ |
| Duration of test | 24 hrs |
| Test results | No filling compound shall drip from tubes |

## 6. Packing and Marking

6.1 Cable is coiled on Bakelite & wooden drum. 2000meters sequential length in one reel.




6.2 The color of cable marking is white. (The printing shall be carried out at interval of 1 meter on the outer sheath of cable) The inner end of cable is then sealed with heat shrinkable end
cap to prevent ingress of water and is made available for testing. The outer end of cable is equipped with heat shrinkable end cap. Outer sheath marking legend can be changed according to user's requests.