



# Sales Catalog of HNK Telecommunication Products

## Fiber Optic Cable

### Optical Characteristics

The difference between single mode and multimode fiber mainly lies in fiber core diameter, wavelength, light source and bandwidth. Single mode fiber typical core diameter is 9µm. And multimode fiber core diameter is 50µm and 62.5µm typically. Due to the large core size if multimode fiber, some low-cost light sources like LEDs and VCSELs that works at the 850nm and 1310nm wavelength are used in multimode fiber cables. While the single mode often uses a laser or laser diodes to produce light injected into the cable. And the commonly used single mode fiber wavelength is 1310nm and 1550nm.

Single mode was for high-speed long-distance transmission and multimode was used for lower speed short-distance applications. The smaller the core diameter, the higher the fiber's bandwidth and the lower the attenuation (loss in dB per kilometer). The fiber's attenuation and bandwidth are also dependent on wavelength. Multimode 50 µm fiber had a lower cost and higher modal bandwidth than multimode 62.5 µm core fiber. A higher bandwidth fiber carries more data. Multimode fiber bandwidth is limited by its light mode and the maximum bandwidth at present is 28000MHz\*km of OM5 fiber. OM5 optical fiber can transmit multiple wavelengths using Short Wavelength Division Multiplexing (SWDM) technology, while maintaining OM4 backward compatibility. If the network's transmission distances dictate the use of single-mode optical fiber, consider specifying bend-insensitive, zero water peak (ZWP), full spectrum fibers. See table below.

| Fiber Type     | Max. Attenuation (dB/km) |        |        |        | Min. Overfill Launch Bandwidth (Mhz.km) |        | Min. Link Distance (m) |             |                        |
|----------------|--------------------------|--------|--------|--------|---|--------|------------------------|-------------|------------------------|
|                |                          |        |        |        |   |        | 1000 BASE-SX           | 10G BASE-SR | 40&100Gigabit Ethernet |
|                | 850nm                    | 1300nm | 1310nm | 1550nm | 850nm                                   | 1300nm | 850nm                  | 850nm       | 850nm                  |
| OM1 62.5/125µm | ≤2.7                     | ≤0.6   | -      | -      | ≥200                                    | ≥600   | 500                    | -           | -                      |
| OM2 50/125µm   | ≤2.4                     | ≤0.6   | -      | -      | ≥700                                    | ≥500   | 750                    | 150         | -                      |
| OM3 50/125µm   | ≤2.4                     | ≤0.6   | -      | -      | ≥1500                                   | ≥500   | 1000                   | 300         | 100                    |
| OM4 50/125µm   | ≤2.4                     | ≤0.6   | -      | -      | ≥3500                                   | ≥500   | 1100                   | 550         | 150                    |
| OM5 50/125µm   | ≤2.4                     | ≤0.6   | -      | -      | ≥3500                                   | ≥500   | 1100                   | 600         | 200                    |
| G652D 9/125µm  | -                        | -      | ≤0.34  | ≤0.20  | -                                       | -      | -                      | -           | -                      |
| G655 9/125µm   | -                        | -      | -      | ≤0.22  | -                                       | -      | -                      | -           | -                      |
| G657A1 9/125µm | -                        | -      | ≤0.35  | ≤0.21  | -                                       | -      | -                      | -           | -                      |
| G657A2 9/125µm | -                        | -      | ≤0.35  | ≤0.21  | -                                       | -      | -                      | -           | -                      |
| G657B3 9/125µm | -                        | -      | ≤0.35  | ≤0.21  | -                                       | -      | -                      | -           | -                      |

### ANSI/TIA/EIA-598-B Standard Fiber Color Code

|              |             |              |             |
|--------------|-------------|--------------|-------------|
| Fiber Number | Fiber Color | Fiber Number | Fiber Color |
| Fiber 1      | Blue        | Fiber 7      | Red         |
| Fiber 2      | Orange      | Fiber 8      | Black       |
| Fiber 3      | Green       | Fiber 9      | Yellow      |
| Fiber 4      | Brown       | Fiber 10     | Purple      |
| Fiber 5      | Gray        | Fiber 11     | Pink        |
| Fiber 6      | White       | Fiber 12     | Aqua        |

Fiber 13 and higher the color code is repeated with added black stripe or dash  
 Note: Fiber Tube color will be followed with same order.

### Ordering Information

Part Number: OC-XX-A(B)CDCL

### Ordering Guide

| XX                             | A                       | B   | C                          | D   | CL                           |
|--------------------------------|-------------------------|---|----------------------------|---|------------------------------|
| Cable Type Code                | Jacket                  | Fiber/Per Loose Tube or Fiber/Per Sub Unit  | Fiber Count                | Fiber Type  | Jacket Color(CL)             |
| please see the reference below | 1=PVC<br>2=LSZH<br>3=PE | 2=2 Fibers/Loose Tube<br>12=12 Fibers/Loose Tube<br>.....<br>2=2 Fibers/Sub Unit<br>12=12 Fibers/Sub Unit | No. Of Fiber<br>004F, 048F | OM1=62.5/125 OM1, OM2=50/125 OM2<br>OM3=50/125 OM3, OM4=50/125 OM4<br>OM5=50/125 OM5, G652D=9/125 G652D<br>G655=9/125 G655, G657A1=9/125 G657A1<br>G657A2=9/125 G657A2, G657B3=9/125 G657B3 | As noted in Color code chart |

### Color Code

|           |           |          |          |
|-----------|-----------|----------|----------|
| BL-Blue   | OR-Orange | GR-Green | BR-Brown |
| GY-Grey   | WH-White  | RE-Red   | BK-Black |
| YE-Yellow | PU-Purple | PI-Pink  | AQ-Aqua  |

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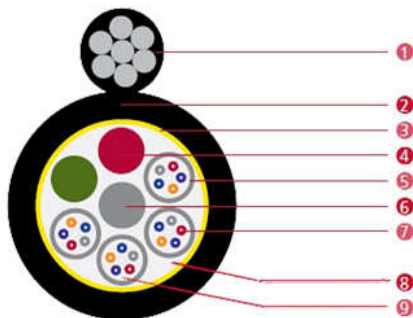
## Dielectric Self-Supporting Figure - 8 Aerial Cable (GYFTC8Y)

Figure 8 Aerial self-support cables are designed medium span aerial installations, they have ultraviolet and harsh outdoor environment protection. Up to 12 fibers are there in each jelly filled plastic compound tube, which are stranded around an FRP strength member, water blocking tape and covered by a PE outer sheath. The cable core is fully dielectric so gives lightning protection. The upper part of figure 8 has seven number messenger wires made of stranded galvanized steel wire with PE outer sheath.



They have small diameter, light weight, good bend resistance performance. The messenger cables support the fiber cables to withstand the tensile force for aerial installations. The PE outer sheath gives excellent environment and ultraviolet protection to the cable.

### Cable Cross Section



|                      |                    |                     |                  |                |
|----------------------|--------------------|---------------------|------------------|----------------|
| 1                    | 2                  | 3                   | 4                | 5              |
| Steel Wire Messenger | Outer Jacket       | Water Blocking Tape | Possible Filler  | Loose Tube     |
|                      | 6                  | 7                   | 8                | 9              |
|                      | Non Metal Strength | Optical Fiber       | Filling Compound | Jelly Compound |

### Complied with or Exceeds Standard

- IEC 60793-2-10 type A1b, TIA/EIA-492AAAA-A.
- IEC 60793-2-10 type A1a.2, ISO/IEC 11801 OM-3, TIA/EIA-492AAAC.
- IEC 60793-2-10 type A1a.3, ISO/IEC 11801 OM-4, TIA/EIA-492AAAD.
- IEC 60793-2-10 type A1a.4, ISO/IEC 11801 OM5, TIA/EIA-492AAAE.
- ITU-T Recommendation G.652.D/G.655/G.657.A1/G.657.A2/G.657.B2/G.657.B3
- IEC 60793-2-50 type B1.3/B6.a1/B6.a2/B6.b2/ B6.b3 Optical Fiber Specification.
- ANSI/TIA/EIA 568C.3
- IEC 60793-2-10 type A1a.1, TIA/EIA-492AAAB-A.
- IEEE 802.3z Gigabit Ethernet
- IEEE 802.3ae 10 Gigabit Ethernet
- IEEE 802.3ba 40&100 Gigabit Ethernet
- ROHS Compliant Directive 2011/65/EU(ROHS2.0)

### Mechanical & Environmental Characteristics

|                                |   |                               |                |
|--------------------------------|---|-------------------------------|----------------|
| Min. Tensile Load (Short Term) | 7000N   | Min. Tensile Load (Long Term) | 3500N          |
| Min. Crush Load (Short Term)   | 1000N/100mm   | Min. Crush Load (Long Term)   | 300N/100mm     |
| Bend Radius-Dynamic (mm)       | 20D   | Bend Radius-Static (mm)       | 10D            |
| UL Fire Rated                  | OFNR  | Loose Tube Material           | PBT            |
| Outer Diameter (mm)            | 9.8*18.8mm (4~12 F), 10.2*19.3mm (24~36 F), 10.7*19.7mm (48 F), 11.3*20.3mm (72 F), 12.9*21.9mm (96 F), 16.3*22.7mm (144 F) |                               |                |
| Outer Jacket Material          | Standard: PE Optional: LSZH or other  |                               |                |
| Operating Temperature          | -40°C to +70°C  | Storage Temperature           | -40°C to +70°C |

Note: "D" is Cable Outer Diameter.

### Ordering Sample

| Part Number              | Description   |
|--------------------------|---|
| OC-GYFTC8Y-312144G652DBK | 144 Cores Singlemode G652D GYFTC8Y Fiber Optic Cable, 12 Fibers/Per Loose Tube, PE Jacket, Black Color. |