



# Optical Fibre Cable Technical Specification

## **Micro duct Cable with HDPE Sheath for Installation by Blowing**

**G4 - G576**

**V8.2**

|   |   |   |   |   |
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## 1. General

This specification covers the design and performance of the single mode optical cables to be used in air blown micro duct application.

### 1.1 Cable Description

- 4/6/12/24/36/48/72/96/144/192/216/288 /432/576 G.652D/G.657A1/G.657A2 SM-fibers.
- Loose tubes SZ-stranded.
- Suitable for air blown installation in micro-duct .

### 1.2 Quality

YOFC ensures a continuing level of quality in our cable products through several programs including ISO 9001.

### 1.3 Reliability

YOFC ensures product reliability through rigorous qualification testing of each product family. Both initial and periodic qualification testing are performed to assure the cable's performance and durability in the field environment.

### 1.4 Reference

|                    |                                                                                                                                         |
|--------------------|-----------------------------------------------------------------------------------------------------------------------------------------|
| ITU-T G.652/ G.657 | Characteristics of a single-mode optical fiber                                                                                          |
| IEC 60794-1-1      | Optical fiber cables- part1-1-Generic specification-General                                                                             |
| IEC 60794-1-21     | Optical fiber cables- part1-2-Generic specification-Basic optical cable test procedure-Mechanical test methods                          |
| IEC 60794-1-22     | Optical fiber cables- part1-2-Generic specification-Basic optical cable test procedure-Environmental test methods                       |
| IEC 60794-3        | Optical fiber cables- part3-Sectional specification- Outdoor cables                                                                     |
| IEC 60794-5-10     | Optical fibre cables –Part 5-10 Family specification for outdoor microduct optical and protected microducts for installation by blowing |

### 1.5 Working Condition

Transportation and storage temperature:- 30°C ~ +70°C

Installation temperature: -10°C ~ +50°C

Operation temperature: -30°C ~ +70°C

### 1.6 Minimum Allowable Bending Radius

Static: 10D

Dynamic: 20D

D is the out diameter of the cable

### 1.7 Life Time

Optical fiber cables supplied in compliance with the specifications can be capable of withstanding the typical service condition for a period of twenty-five (25) years without detriment to the transmission or operation and maintenance characteristics of the cable.

## 2. Optical Fiber In Cable

Optical Fibres supplied in this specification meet the requirements of ITU-T G.652.D

| Category                    | Description                                                    | Specification                                         |                           |
|-----------------------------|----------------------------------------------------------------|-------------------------------------------------------|---------------------------|
|                             |                                                                | Before cable                                          | After cable               |
| Geometrical Characteristics | Cladding diameter                                              | $125.0 \pm 0.7 \mu\text{m}$                           |                           |
|                             | Cladding non-circularity                                       | $\leq 1.0 \%$                                         |                           |
|                             | Core concentricity error                                       | $\leq 0.6 \mu\text{m}$                                |                           |
|                             | Coating diameter                                               | 235~255 $\mu\text{m}$ (Before Colored)                |                           |
|                             |                                                                | 235~265 $\mu\text{m}$ (Colored)                       |                           |
|                             | Coating/cladding concentricity error                           | $\leq 12.0 \mu\text{m}$                               |                           |
| Optical Characteristics     | Mode field diameter at 1310 nm                                 | 8.7 ~ 9.5 $\mu\text{m}$                               |                           |
|                             | Attenuation at 1310 nm                                         | $\leq 0.34 \text{ dB/km}$                             | $\leq 0.35 \text{ dB/km}$ |
|                             | Attenuation at 1383 nm                                         | $\leq 0.34 \text{ dB/km}$                             | $\leq 0.35 \text{ dB/km}$ |
|                             | Attenuation at 1550 nm                                         | $\leq 0.20 \text{ dB/km}$                             | $\leq 0.21 \text{ dB/km}$ |
|                             | Point discontinuity at 1310nm and 1550nm                       | $\leq 0.05\text{dB}$                                  |                           |
|                             | Zero dispersion wavelength                                     | 1300 ~ 1324 nm                                        |                           |
|                             | Zero dispersion slope                                          | $\leq 0.092 \text{ ps}/(\text{nm}^2 \cdot \text{km})$ |                           |
|                             | Cable cut-off wavelength ( $\lambda_{cc}$ )                    | $\leq 1260 \text{ nm}$                                |                           |
|                             | Polarization mode dispersion individual fiber                  | $\leq 0.2 \text{ ps}/\sqrt{\text{km}}$                |                           |
|                             | Polarization mode dispersion design link value (M=20, Q=0.01%) | $\leq 0.1 \text{ ps}/\sqrt{\text{km}}$                |                           |
|                             | Macro-bend loss (100 turns, 30mm radius)                       | 1550&1625nm: $\leq 0.05 \text{ dB}$                   |                           |
| Mechanical Specification    | Proof stress level                                             | $\geq 100\text{kpsi}$ (0.69 GPa)                      |                           |
|                             | Coating strip force (peak value)                               | 1.3~8.9N                                              |                           |
|                             | Dynamic Fatigue Parameter (nd)                                 | $\geq 20$                                             |                           |
|                             | Fiber curl (Radius)                                            | $\geq 2 \text{ m}$                                    |                           |

Optical Fibres supplied in this specification meet the requirements of ITU-T G.657.A1

| Category                    | Description                          | Specification                          |                           |
|-----------------------------|--------------------------------------|----------------------------------------|---------------------------|
|                             |                                      | Before cable                           | After cable               |
| Geometrical Characteristics | Cladding diameter                    | $125.0 \pm 0.7 \mu\text{m}$            |                           |
|                             | Cladding non-circularity             | $\leq 0.7 \%$                          |                           |
|                             | Core concentricity error             | $\leq 0.5 \mu\text{m}$                 |                           |
|                             | Coating diameter                     | 235~255 $\mu\text{m}$ (Before Colored) |                           |
|                             |                                      | 235~265 $\mu\text{m}$ (Colored)        |                           |
|                             | Coating/cladding concentricity error | $\leq 12.0 \mu\text{m}$                |                           |
| Optical Characteristics     | Mode field diameter at 1310 nm       | 8.4 ~ 9.2 $\mu\text{m}$                |                           |
|                             | Attenuation at 1310 nm               | $\leq 0.35 \text{ dB/km}$              | $\leq 0.36 \text{ dB/km}$ |

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|                          |                                                                |                                                |                   |
|--------------------------|----------------------------------------------------------------|------------------------------------------------|-------------------|
|                          | Attenuation at 1383 nm                                         | $\leq 0.35$ dB/km                              | $\leq 0.36$ dB/km |
|                          | Attenuation at 1550 nm                                         | $\leq 0.21$ dB/km                              | $\leq 0.22$ dB/km |
|                          | Point discontinuity at 1310nm and 1550nm                       | $\leq 0.05$ dB                                 |                   |
|                          | Zero dispersion wavelength                                     | 1300 ~ 1324 nm                                 |                   |
|                          | Zero dispersion slope                                          | $\leq 0.092$ ps/(nm <sup>2</sup> ·km)          |                   |
|                          | Cable cut-off wavelength ( $\lambda_{cc}$ )                    | $\leq 1260$ nm                                 |                   |
|                          | Polarization mode dispersion individual fiber                  | $\leq 0.2$ ps/ $\sqrt{\text{km}}$              |                   |
|                          | Polarization mode dispersion design link value (M=20, Q=0.01%) | $\leq 0.1$ ps/ $\sqrt{\text{km}}$              |                   |
|                          | Macro-bend loss (10 turns, 15mm radius)                        | 1550nm: $\leq 0.25$ dB; 1625nm: $\leq 1.0$ dB; |                   |
|                          | Macro-bend loss (1 turn, 10mm radius)                          | 1550nm: $\leq 0.75$ dB; 1625nm: $\leq 1.5$ dB; |                   |
| Mechanical Specification | Proof stress level                                             | $\geq 100$ kpsi (0.69 GPa)                     |                   |
|                          | Coating strip force (peak value)                               | 1.3~8.9N                                       |                   |
|                          | Dynamic Fatigue Parameter (nd)                                 | $\geq 20$                                      |                   |
|                          | Fiber curl (Radius)                                            | $\geq 2$ m                                     |                   |

Optical Fibres supplied in this specification meet the requirements of ITU-T G.657.A2

| Category                    | Description                                                    | Specification                                  |                   |
|-----------------------------|----------------------------------------------------------------|------------------------------------------------|-------------------|
|                             |                                                                | Before cable                                   | After cable       |
| Geometrical Characteristics | Cladding diameter                                              | $125.0 \pm 0.7$ $\mu\text{m}$                  |                   |
|                             | Cladding non-circularity                                       | $\leq 0.7$ %                                   |                   |
|                             | Core concentricity error                                       | $\leq 0.5$ $\mu\text{m}$                       |                   |
|                             | Coating diameter                                               | 235~255 $\mu\text{m}$ (Before Colored)         |                   |
|                             |                                                                | 235~265 $\mu\text{m}$ (Colored)                |                   |
|                             | Coating/cladding concentricity error                           | $\leq 12.0$ $\mu\text{m}$                      |                   |
| Optical Characteristics     | Mode field diameter at 1310 nm                                 | 8.4 ~ 9.2 $\mu\text{m}$                        |                   |
|                             | Attenuation at 1310 nm                                         | $\leq 0.35$ dB/km                              | $\leq 0.36$ dB/km |
|                             | Attenuation at 1383 nm                                         | $\leq 0.35$ dB/km                              | $\leq 0.36$ dB/km |
|                             | Attenuation at 1550 nm                                         | $\leq 0.21$ dB/km                              | $\leq 0.22$ dB/km |
|                             | Point discontinuity at 1310nm and 1550nm                       | $\leq 0.05$ dB                                 |                   |
|                             | Zero dispersion wavelength                                     | 1300 ~ 1324 nm                                 |                   |
|                             | Zero dispersion slope                                          | $\leq 0.092$ ps/(nm <sup>2</sup> ·km)          |                   |
|                             | Cable cut-off wavelength ( $\lambda_{cc}$ )                    | $\leq 1260$ nm                                 |                   |
|                             | Polarization mode dispersion individual fiber                  | $\leq 0.2$ ps/ $\sqrt{\text{km}}$              |                   |
|                             | Polarization mode dispersion design link value (M=20, Q=0.01%) | $\leq 0.1$ ps/ $\sqrt{\text{km}}$              |                   |
|                             | Macro-bend loss (10 turns, 15mm radius)                        | 1550nm: $\leq 0.03$ dB; 1625nm: $\leq 0.1$ dB; |                   |
|                             | Macro-bend loss (1 turn, 10mm radius)                          | 1550nm: $\leq 0.1$ dB; 1625nm: $\leq 0.2$ dB;  |                   |
|                             | Macro-bend loss (1 turn, 7.5mm radius)                         | 1550nm: $\leq 0.5$ dB; 1625nm: $\leq 1.0$ dB;  |                   |

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|--------------------------|----------------------------------|----------------------------------|
| Mechanical Specification | Proof stress level               | $\geq 100\text{kpsi}$ (0.69 GPa) |
|                          | Coating strip force (peak value) | 1.3~8.9N                         |
|                          | Dynamic Fatigue Parameter (nd)   | $\geq 20$                        |
|                          | Fiber curl (Radius)              | $\geq 2\text{ m}$                |

3. Optic Cable

3.1 General Design

Optical fibers are housed in loose tubes that are made of high-modulus plastic and filled with waterproof compounds.

FRP is applied as central strength member.

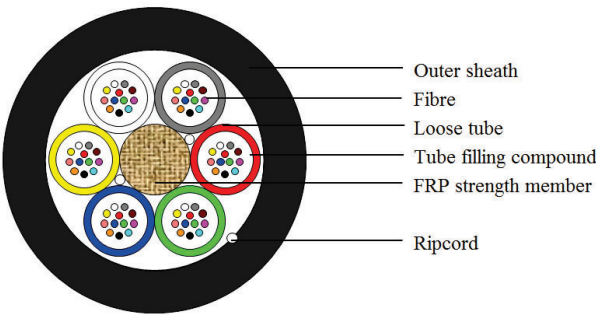
Loose tubes are SZ-stranded around the strength member.

Water blocking yarns are used in and over the cable core to prevent it from water ingress.

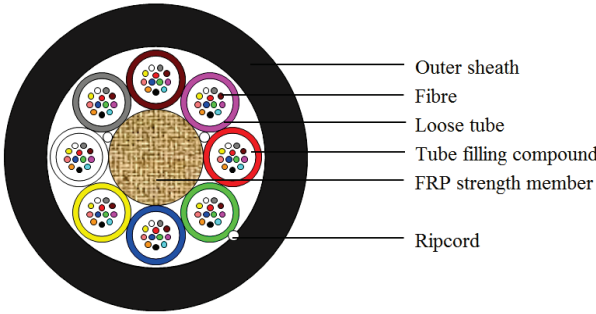
Polyethylene sheath is applied over the cable core as the outer sheath.

3.2 Construction

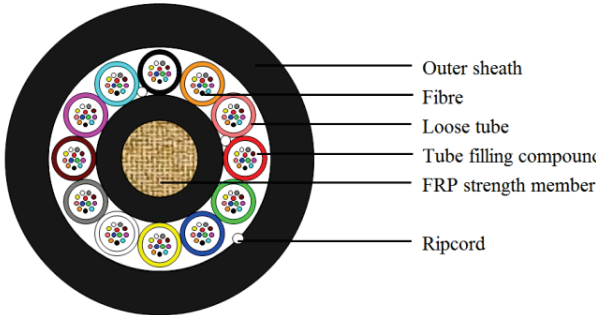
3.2.1 Cross Section of Cable



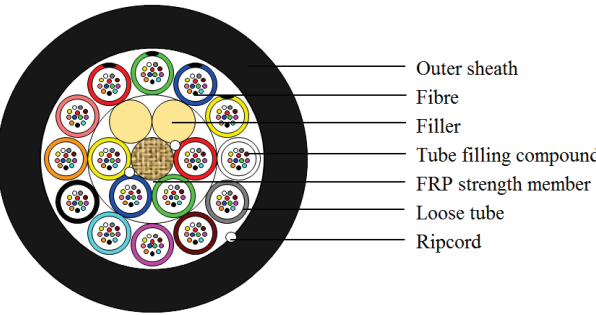
GCYFY-12~72B1.3



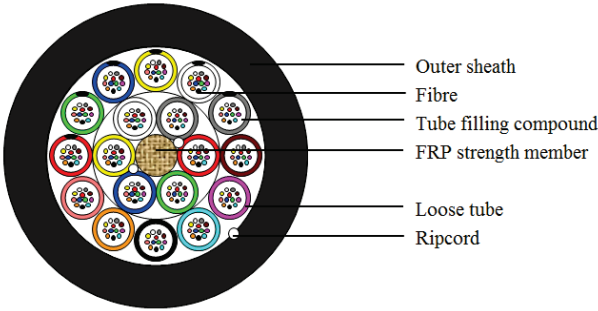
GCYFY-96 B1.3



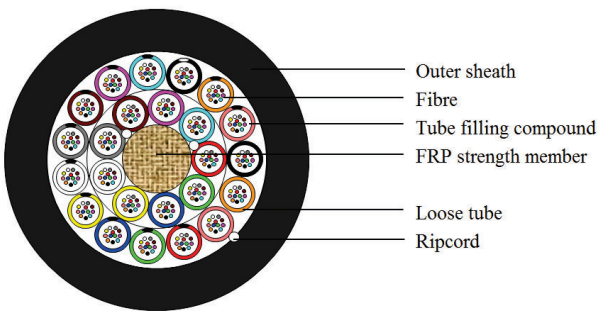
GCYFY-144 B1.3



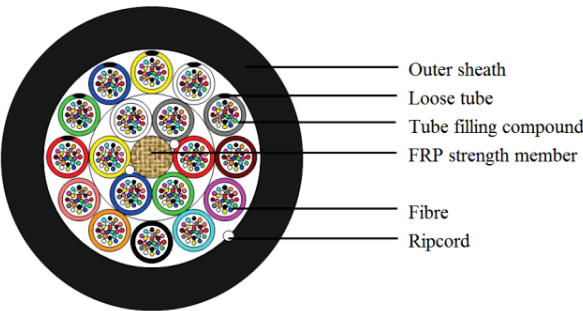
GCYFY-192 B1.3



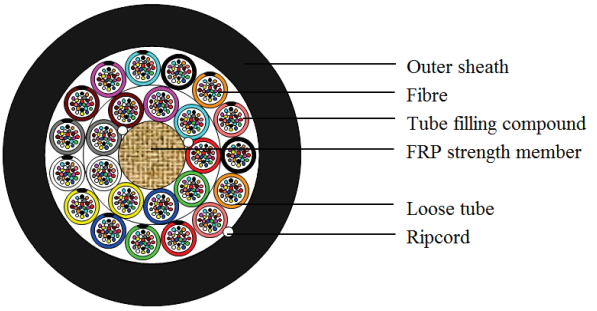
GCYFY-216 B1.3



GCYFY-288 B1.3



GCYFY-432 B1.3



GCYFY-576 B1.3

### 3.2.2 Dimensions and Descriptions of Cable Constructions

| Item                                | contents                 | Value                             |    |    |      |            |    |       |     |     |       |       |       |       |       |       |      |      |     |     |
|-------------------------------------|--------------------------|-----------------------------------|----|----|------|------------|----|-------|-----|-----|-------|-------|-------|-------|-------|-------|------|------|-----|-----|
|                                     |                          | 4/<br>6                           | 12 | 24 | 36   | 4/6/<br>12 | 24 | 36    | 48  | 72  | 96    | 144   | 192   | 216   | 288   | 144   | 192  | 288  | 432 | 576 |
| Loose tube                          | Material                 | PBT                               |    |    |      |            |    |       |     |     |       |       |       |       |       |       |      |      |     |     |
|                                     | Number                   | 1                                 | 2  | 4  | 6    | 1          | 2  | 3     | 4   | 6   | 8     | 12    | 16    | 18    | 24    | 6     | 8    | 12   | 18  | 24  |
|                                     | Max. Fiber counts / tube | 6                                 |    |    | 12   |            |    | 24    |     |     |       |       |       |       |       |       |      |      |     |     |
|                                     | Outer diameter (mm)      | 1.2                               |    |    | 1.45 |            |    | 2.1   |     |     |       |       |       |       |       |       |      |      |     |     |
|                                     | Number                   | 5                                 | 4  | 2  | 0    | 5          | 4  | 3     | 2   | 0   | 0     | 0     | 2     | 0     | 0     | 0     |      |      |     |     |
| Central strength member             | Material                 | FRP                               |    |    |      |            |    |       |     |     |       |       |       |       |       |       |      |      |     |     |
|                                     | Diameter (mm)            | 1.2                               |    |    | 1.6  |            |    | 2.4   | 2.4 | 1.6 | 2.8   | 2.25  | 2.8   | 2.8   | 2.25  | 2.8   | 2.8  | 2.25 | 2.8 |     |
|                                     | PE layer dia. (mm)       | /                                 |    |    | /    |            |    | /     | 4.1 | /   | /     | /     | /     | /     | /     | 3.5   | 6.1  | /    | 4.1 |     |
| Peripheral strength member          | Material                 | Aramid yarn                       |    |    |      |            |    |       |     |     |       |       |       |       |       |       |      |      |     |     |
| Outer sheath                        | Material                 | HDPE                              |    |    |      |            |    |       |     |     |       |       |       |       |       |       |      |      |     |     |
|                                     | Color                    | Black                             |    |    |      |            |    |       |     |     |       |       |       |       |       |       |      |      |     |     |
|                                     | Thickness (mm)           | Approx.0.5                        |    |    |      |            |    |       |     |     |       |       |       |       |       |       |      |      |     |     |
| Cable diameter (±0.3mm)             |                          | 4.5                               |    |    | 5.4  |            |    | 6.1   | 7.9 | 7.9 | 7.9   | 9.3   | 7.3   | 8.8   | 11.4  | 11.4  | 13.4 |      |     |     |
| Cable weight (kg/km) Approx.        |                          | 16                                |    |    | 26   |            |    | 36    | 52  | 52  | 52    | 80    | 42    | 76    | 110   | 105   | 140  |      |     |     |
| For micro-duct inside diameter (mm) |                          | 6~8                               |    |    | 8~12 |            |    | 10~14 |     |     | 12~14 | 10~14 | 12~14 | 14~16 | 14~16 | 16~20 |      |      |     |     |
| Max. tensile strength (N)           |                          | 200                               |    |    | 600  |            |    | 800   |     |     | 600   | 1000  | 800   | 1000  | 1200  | 1000  | 1200 |      |     |     |
| Crush(N/100mm)                      |                          | Short term: 500    Long term: 200 |    |    |      |            |    |       |     |     |       |       |       |       |       |       |      |      |     |     |

### 3.2.3 Color Code of the Fiber

Each fiber can be identifiable throughout the length of the cable in accordance with the following color sequence.

| Fiber color code   |                       |                         |                        |                       |                        |                      |
|--------------------|-----------------------|-------------------------|------------------------|-----------------------|------------------------|----------------------|
| 6 fibers per tube  | 1                     | 2                       | 3                      | 4                     | 5                      | 6                    |
|                    | White                 | Red                     | Yellow                 | Green                 | Blue                   | Grey                 |
| 12 fibers per tube | 1                     | 2                       | 3                      | 4                     | 5                      | 6                    |
|                    | White                 | Red                     | Yellow                 | Green                 | Blue                   | Grey                 |
|                    | 7                     | 8                       | 9                      | 10                    | 11                     | 12                   |
|                    | Brown                 | Black                   | Purple                 | Aqua                  | Orange                 | Pink                 |
| 24 fibers per tube | 1                     | 2                       | 3                      | 4                     | 5                      | 6                    |
|                    | White                 | Red                     | Yellow                 | Green                 | Blue                   | Grey                 |
|                    | 7                     | 8                       | 9                      | 10                    | 11                     | 12                   |
|                    | Brown                 | Black                   | Purple                 | Aqua                  | Orange                 | Pink                 |
|                    | 13                    | 14                      | 15                     | 16                    | 17                     | 18                   |
|                    | White with black ring | Red with black ring     | Yellow with black ring | Green with black ring | Blue with black ring   | Grey with black ring |
|                    | 19                    | 20                      | 21                     | 22                    | 23                     | 24                   |
|                    | Brown with black ring | Natural with black ring | Purple with black ring | Aqua with black ring  | Orange with black ring | Pink with black ring |

### 3.2.4 Color Code of the Loose Tube and Filler

The loose tubes will be identifiable in accordance with the following color sequence. The color of the fillers will be natural.

| Tube color code   |                         |                       |                          |                         |                          |                         |
|-------------------|-------------------------|-----------------------|--------------------------|-------------------------|--------------------------|-------------------------|
| 1~12 tubes        | 1                       | 2                     | 3                        | 4                       | 5                        | 6                       |
|                   | White                   | Red                   | Yellow                   | Green                   | Blue                     | Grey                    |
|                   | 7                       | 8                     | 9                        | 10                      | 11                       | 12                      |
|                   | Brown                   | Black                 | Purple                   | Aqua                    | Orange                   | Pink                    |
| 18 tubes          | Inner1                  | Inner 2               | Inner 3                  | Inner 4                 | Inner 5                  | Inner 6                 |
|                   | White                   | Red                   | Yellow                   | Green                   | Blue                     | Grey                    |
|                   | Outer 1                 | Outer 2               | Outer 3                  | Outer 4                 | Outer 5                  | Outer 6                 |
|                   | Brown                   | Black                 | Purple                   | Aqua                    | Orange                   | Pink                    |
|                   | Outer 7                 | Outer 8               | Outer 9                  | Outer 10                | Outer 11                 | Outer 12                |
|                   | White with black Stripe | Red with black Stripe | Yellow with black Stripe | Green with black Stripe | Blue with black Stripe   | Grey with black Stripe  |
| 16 tubes+2 Filler | Inner1                  | Inner 2               | Inner 3                  | Inner 4                 | Inner 5                  | Inner 6                 |
|                   | White                   | Red                   | Yellow                   | Green                   | Filler                   | Filler                  |
|                   | Outer 1                 | Outer 2               | Outer 3                  | Outer 4                 | Outer 5                  | Outer 6                 |
|                   | Blue                    | Grey                  | Brown                    | Black                   | Purple                   | Aqua                    |
|                   | Outer 7                 | Outer 8               | Outer 9                  | Outer 10                | Outer 11                 | Outer12                 |
|                   | Orange                  | Pink                  | White with black Stripe  | Red with black Stripe   | Yellow with black Stripe | Green with black Stripe |
| 24 tubes          | Inner 1                 | Inner 2               | Inner 3                  | Inner 4                 | Inner 5                  | Inner 6                 |
|                   | White                   | Red                   | Yellow                   | Green                   | Blue                     | Grey                    |
|                   | Inner 7                 | Inner 8               | Inner 9                  | Outer 1                 | Outer 2                  | Outer 3                 |
|                   | Brown                   | Black                 | Purple                   | Aqua                    | Orange                   | Pink                    |

|  |                         |                         |                          |                         |                          |                        |
|--|-------------------------|-------------------------|--------------------------|-------------------------|--------------------------|------------------------|
|  | Outer 4                 | Outer 5                 | Outer 6                  | Outer 7                 | Outer 8                  | Outer 9                |
|  | White with black Stripe | Red with black Stripe   | Yellow with black Stripe | Green with black Stripe | Blue with black Stripe   | Grey with black Stripe |
|  | Outer 10                | Outer 11                | Outer 12                 | Outer 13                | Outer 14                 | Outer 15               |
|  | Brown with black Stripe | Black with white Stripe | Purple with black Stripe | Aqua with black Stripe  | Orange with black Stripe | Pink with black Stripe |

### 3.3 Mechanical, Electrical and Environmental Test Characteristics

The finished cables can be subjected to the following mechanical, electrical and environmental conditions.

| Item                | Test Method                                                                                                                                                                                               | Requirements                                                                                                                                                                                                                                                                                             |
|---------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Tensile performance | IEC 60794-1-21-E1<br>Load: according to short term tensile described in 3.4<br>Cable length under tension: Not less than 50m.<br>Duration of load sustain: 1min.<br>Velocity of transfer device: 10mm/min | The maximum fiber strain less than 0.6% under maximum tensile short term load.<br>The maximum increase in attenuation less than 0.1dB.<br>No change in attenuation after test at 1550nm.<br>Under visual examination without magnification, no damage to the sheath or to the cable elements after test. |
| Crush               | IEC 60794-1-21-E3<br>Load: 500N<br>Duration of load: 1min                                                                                                                                                 | No change in attenuation after test at 1550nm.<br>Under visual examination without magnification, no damage to the sheath or to the cable elements. The imprint of the striking surface on the sheath is not considered mechanical damage.                                                               |
| Bend                | IEC 60794-1-21-E11A<br>Mandrel radius: 10 times cable diameter<br>Turns:10<br>Cycles:5                                                                                                                    | No change in attenuation at 1550nm after test.<br>Under visual examination without magnification, no damage to the sheath or to the cable elements.                                                                                                                                                      |

|                     |                                                                                                                                                                                   |                                                                                                                                                                                                                            |
|---------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Repeated bending    | IEC 60794-1-21-E6<br>Bending radius: 20 times cable diameter<br>Cycles: 25<br>Load: 25N<br>Duration of cycle: Approx. 2s.                                                         | No change in attenuation at 1550nm after test. Under visual examination without magnification, no damage to the sheath or to the cable elements.                                                                           |
| Torsion             | IEC 60794-1-21-E7<br>Cycles:5<br>Length under test: 1m<br>Turns: $\pm 180^\circ$<br>Load: 40N                                                                                     | The variation on attenuation for each fiber less than 0.05dB at 1550nm. Under visual examination without magnification, no damage to the sheath or to the cable elements.<br>No permanent change in attenuation after test |
| Temperature cycling | IEC 60794-1-22-F1<br>Sample length: at least 1000m<br>Temperature range: $-30^\circ\text{C} \sim +70^\circ\text{C}$<br>Cycles: 2<br>Temperature cycling test dwell time: 12 hours | There is no change in attenuation coefficient at 1550nm after the test.                                                                                                                                                    |
| Water Penetration   | IEC 60794-1-22-F5B<br>Time : 24 hours<br>Sample length : 3m<br>Water height : 1m                                                                                                  | No water leakage                                                                                                                                                                                                           |
| Compound flow       | IEC 60794-1-21-E14<br>Temperature: $70^\circ\text{C}$<br>Sample count:5<br>Sample length: $200 \pm 5$ mm,<br>Remove length: $100 \pm 2.5$ mm,<br>Time:24h                         | No filling compound dripped.                                                                                                                                                                                               |
| Other parameters    | According to IEC 60794                                                                                                                                                            |                                                                                                                                                                                                                            |

Remark: "No attenuation changes" is considered as the attenuation changes  $\leq 0.05$  dB.

#### 4. Cable Sheath Marking

Unless otherwise specified, the cable sheath marking shall be as follows:

- Color: white
- Contents: YOFC, the year of manufacture, the type of cable, length marking
- Interval: 1m

#### 5. Packaging and Shipping

##### 5.1 Reel Length

Standard reel length: 2/3/4/5/6 km/reel

##### 5.2 Cable Drum

The cables are packed in fumigated wooden drums

##### 5.3 Labeling

The direction of rotation of the color scheme is shown by marking the clockwise and anti-clockwise ends with red and green adhesive tape respectively.

The markings are on both sides of the flanges as follows:

- Cable Type/Size
- Cable Length
- Gross Weight.
- YOFC.
- Shipping mark.

#### 5.4 Cable Packing

Both cable ends are provided with protections against water penetration and firmly secured to the drum, so the cable cannot move and the turns cannot slide when it is moved, handled or laid. the inner end is available for testing.