**Version 2018**

Optical Fibre Cable Specification

# DUCT Cable

## CTC 1,6KN – nG652D

NextraCom Optical Fibre Cable

# 1. General

This specification covers the design requirements and performance standard for the supply of optical fibre cable in the industry. It also includes NextraCom premium designed cable with optical, mechanical and geometrical characteristics.

| Cable type | Application |
|---|---|
| CTC 1,6KN – nG652D | Suitable for duct installation |

n represent the number of fibres in the cable.

## 1.1 Cable Description

NextraCom cable has excellent optical transmission and physical performance, to meet customer requirements.

## 1.2 Quality

Nextra Com ensures a stable quality control system for our cable products through several programs including ISO 9001, ISO 14001 and OHS.

## 1.3 Reliability

Initial and periodic qualification tests for raw material and cable product are performed to assure the cable's performance and durability in the field environment.

## 1.4 Reference

| | |
|---|---|
| ITU-T G.652 | Characteristics of a single-mode optical fibre |
| IEC 60794-1-1 | Optical fibre cables-part 1-1: Generic specification-General |
| IEC 60794-1-2 | Optical fibre cables-part 1-2: Generic specification-Basic optical cable test procedure |
| IEC 60794-3 | Optical fibre cables-part 3: Sectional specification-Outdoor cables |
| IEC 60794-3-10 | Optical fibre cables-part 3-10: Outdoor cables-Family specification for duct and direct buried optical communication cables |
| IEC 60794-3-11 | Optical fibre cables-Part 3-11: Outdoor cables-Detailed specification for duct and directly buried single-mode optical fibre telecommunication cables |

## 1.5 Life Time

Optical fibre cables supplied in compliance with this specifications is capable to withstand the typical service condition for a period of thirty (30) years without detriment to the operation characteristics of the cable.

## 2. Optical Fibre

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

| Parameters | Specification |
|---|---|
| MFD（1310nm） | 9.2+/-0.4um |
| MFD（1550nm） | 10.4+/-0.5um |
| Cladding diameter | 125μm±1.0μm |
| Fiber diameter | 245+/-7um, with UV coating, and colored to : 250+/-15um |
| Core/cladding concentricity error | ≤ 0.6um |
| Coating/cladding concentricity error | ≤ 12.0um |
| Cladding non circularity | ≤ 1.0% |
| Cut off wavelength | λcc ≤1260nm |
| Attenuation coefficient | 1310nm: 0.36dB/km max after cabling |
| | 1550nm: 0.22dB/km max after cabling |
| Bending-loss performance of optical fiber @1310nm&1550nm | ≤0.05dB (100 turns around amandrel of 50mm diameter) |
| Polarization mode dispersion link value | ≤0.1ps/√km |
| Zero-dispersion wavelength | 1312+/-12nm |
| Zero-dispersion slope | ≤0.091ps/nm$^2$.km |

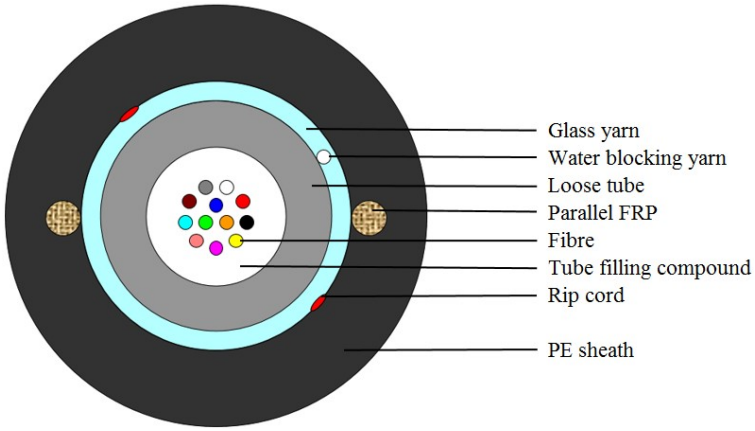
## 3. Optical Cable

### 3.1 General Design

- Optical fibers are housed in loose tubes that are made of high-modulus plastic and filled with waterproof compounds.
- Loose tubes is in the central of the cable .
- Glass yarns and FRP are applied as peripheral strength element.
- The cable have Rodent Protection
- Polyethylene sheath is applied over the cable core and it does not contain halogen.
- The Cable is UV resistent

### 3.2 Construction

#### 3.2.1 Cross Section of Cable




CTC 1,6KN 12xG652D

Structure of other fibre counts referto 3.2.2

### 3.2.2 Dimensions and Descriptions of Cable Constructions

| Item | Contents | Value | |
|---|---|---|---|
| | | **2~12** | **14~24** |
| Loose tube diameter(mm) | Material | PBT | |
| | Diameter(mm) | 2.5 | 3.0 |
| Water blocking | Material | Water blocking yarn | |
| Parallel strength member | Material | FRP | |
| Additional strength member | Material | Glass yarns | |
| Ripcord | Number | 2 | |
| Outer sheath | Material | HDPE | |
| | Color | BLACK | |
| | Thickness(mm) | 1.8 | |
| Cable diameter(mm) | | 7.0±0.4 | 7.4±0.4 |
| Cable weight(kg/km) Approx. | | 47 | 52 |

### 3.2.3 Mechanical Performance of Cable

| Tensile performance(N) | | Crush(N/100mm) | | Bending Radius(mm) | |
|---|---|---|---|---|---|
| Short term | Long term | Short term | Long term | Static | Dynamic |
| 1600 | 500 | 1500 | 300 | 10D | 20D |

Transportation and storage temperature: -40□～+70□

Installation temperature:-5□～+60□

Operation temperature: -40□～+70□

### 3.2.4 Color Code of the Fibreand the Loose tube

Each fibre can be identifiable throughout the length of the cable in accordance with the following color sequence. Fibre color starts from No. 1 Blue. The color of the loose tube is natural .

| Fiber color | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|

| code | Blue | Orange | Green | Brown | Slate | White |
|---|---|---|---|---|---|---|
| | 7 | 8 | 9 | 10 | 11 | 12 |
| | Red | Black | Yellow | Purple | Pink | Aqua |
| | 13 | 14 | 15 | 16 | 17 | 18 |
| | Blue with black ring | Orange with black ring | Green with black ring | Brown with black ring | Slate with black ring | White with black ring |
| | 19 | 20 | 21 | 22 | 23 | 24 |
| | Red with black ring | Nature | Yellow with black ring | Purple with black ring | Pink with black ring | Aqua with black ring |

## 3.3 Mechanical, Electrical and Environmental Test Characteristics

The mechanical and environmental performance of the cable are in accordance with the following table. Unless otherwise specified, all attenuation measurements required in this section shall be performed at 1550nm.

| Item | Test Method | Requirements |
|---|---|---|
| **Tension** | **IEC 60794-1-2-E1**<br>Load:According to 3.2.3<br>Sample length: Not less than 50m.<br>Duration time: 1min. | Additional attenuation: ≤0.1dB after test<br>No damage to outer jacket and inner elements |
| **Crush** | **IEC 60794-1-2-E3**<br>Load: According to 3.2.3<br>Duration of load: 1min | Additional attenuation: ≤0.1dB after test<br>No damage to outer jacket and inner elements |
| **Impact** | **IEC 60794-1-2-E4**<br>Radius:300mm<br>Impact energy:3J<br>Impact number: 1<br>Impact points: 3 | Additional attenuation: ≤0.1dB<br>No damage to outer jacket and inner elements |
| **Bend** | **IEC 60794-1-2-E11A**<br>Mandrel radius: 10*D<br>Turns:10<br>Cycles:5 | Additional attenuation: ≤0.1dB<br>No damage to outer jacket and inner elements |
| **Repeated bending** | **IEC 60794-1-2-E6**<br>Bending radius: 20*D<br>Cycles: 25<br>Load:20N | Additional attenuation: ≤0.1dB<br>No damage to outer jacket and inner elements |
| **Torsion** | **IEC 60794-1-2-E7**<br>Cycles:10<br>Length under test: 1m<br>Turns: ±90°<br>Load:150N | Additional attenuation: ≤0.1dB<br>No damage to outer jacket and inner elements |
| **Temperature cycling** | **IEC 60794-1-2-F1**<br>Sample length: at least 1000m<br>Temperature range:<br>+20℃→-40℃→+70℃→-40℃→+70℃→+20℃<br>Cycles:2 | The change in attenuation coefficient shall beless than 0.1 dB/km at 1310 and 1550nm. |

| | | |
|---|---|---|
| | Temperature cycling test dwell time: 12 hours | |
| **Water Penetration** | **IEC 60794-1-2-F5B**<br>Time : 24 hours<br>Sample length : 3m<br>Water height : 1m | No water leakage. |
| **Other parameters** | According to **IEC 60794 -1** | |

# 4. Packaging and Drum

## 4.1 Cable Sheath Marking

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

- Contents: NEXTRA OPTICAL CABLE, the type of cable, the year of manufacture, length marking
- Interval: 1±0.2% m

Outer sheath marking legend can be changed according to user's requests.

## 4.2 Reel Length

Standard reel length: 4km/reel, other length is also available.

## 4.3 Cable Drum

The cables are packed infumigated wooden drums.

## 4.4 Cable Packing

Both ends of the cable will be sealed with suitable plastic caps to prevent the entry of moisture during shipping, handling and storage. The inner end is available for testing.