

Version	1
Date	08.04.2019

Optical Fibre Cable Technical Specification

Duct Cable

LTC-RP 2,5KN nxG652D(B1.3)

NextraCom Optical Fibre Cable

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1. General

1.1 Scope

This specification covers the design requirements and performance standard for the supply of optical fibre cable in the industry. NextraCom ensures a stable quality control system for our products through several programs including ISO 9001, ISO 14001 and OHS.

Cable type	Application
LTC-RP 2,5KN nxG652D(B1.3)	Duct installation

n represents the fibre counts of the cable

1.2 Reference

The cable offered by NextraCom are designed, manufactured and tested according to the standards as follows:

ITU-T G.652D	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

1.3 Life Time

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

1.4 Application

Item	Value
Operation temperature	-40°C ~ +70°C
Installation temperature	-40°C ~ +70°C
Storage temperature	-40°C ~ +70°C
Static bending radius	10 times the cable diameter
Dynamic bending radius	20 times the cable diameter

2. Optical Fiber

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

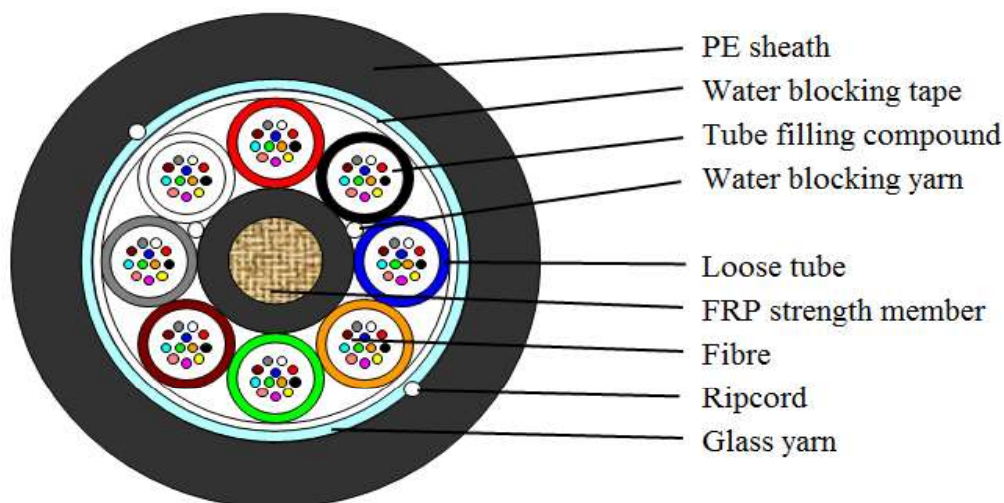
Parameters	Specification
MFD (1310nm)	9.1+/-0.4um
MFD (1550nm)	10.4+/-0.5um
Cladding diameter	125+/-1.0um
Fiber diameter	245+/-7um, with UV coating, and colored to : 250+/-15um
Core/cladding concentricity error	$\leq 0.6\mu\text{m}$
Coating/cladding concentricity error	$\leq 12.0\mu\text{m}$
Cladding non circularity	$\leq 1.0\%$
Cable Cut off wavelength	$\lambda_{cc} \leq 1260\text{nm}$
Attenuation coefficient	1310nm: 0.35dB/km max after cabling
	1550nm: 0.21dB/km max after cabling
Bending-loss performance of optical fiber @1550nm&1625nm	$\leq 0.05\text{dB}$ (100 turns around a mandrel of 60mm diameter)
Polarization mode dispersion link value	$\leq 0.1\text{ps/km-}1/2$
Zero-dispersion wavelength	1300~1324nm
Zero-dispersion slope	$\leq 0.092\text{ps/nm}^2\cdot\text{km}$

3. Optical Cable

3.1. Technical Characteristics

- The unique second coating and stranding technology provide the fibres with enough space and bending endurance, which ensure good optical property of the fibres in the cable
- Accurate process control ensures good mechanical and temperature performance
- High quality raw material guarantees the long service life of cable
- Capacity of rodent protection and UV resistance

3.2 Cross Section of Cable



LTC-RP 2,5KN 96G652D(B1.3)

Structure of other fibre counts refer to 3.4

Schematic for reference only

3.3 Fibre and Loose Tube Identification

The color code of fibre and loose tube will be identification in accordance with the following color sequence, other sequence is also available. The color of fillers will be natural.

Color Code	1	2	3	4	5	6
	Blue	Orange	Green	Brown	Grey	White
	7	8	9	10	11	12
	Red	Black	Yellow	Violet	Pink	Aqua

3.4 Dimensions and Descriptions

The standard structure of the cable is shown in the following table, other structure and fibre count are also available according to customer requirements.

Item	Contents	Value					
		6/12	24	48	72	96	144
Loose tube	Number	3/6	6	4	6	8	12
	Outer diameter	1.8	1.8	2.1	2.1	2.1	2.1
Filler	Number	3/0	0	2	0	0	0
Max. fiber count per tube	G.652D	2	4	12	12	12	12
Central strength member	Material	FRP					
	Diameter (mm)	2.0	2.0	2.25	2.25	2.25	2.6
	PE layer diameter (mm)	-	-	-	-	3,5	6,1
Water barrier	Material	Water blocking yarn & tape					
Peripheral strength member	Material	Glass yarn					
Sheath	Material	MDPE					
	Color	Black					
	Thickness (mm)	Nominal: 1.5					
Ripcord	Number	2					
	Color	White					
Cable diameter(mm) Approx.		9.4	9.4	10.2	10.2	11.4	14.0
Cable weight(kg/km) Approx.		75	75	85	85	110	155

3.5 Main Mechanical and Environmental Performance

Item	Tension (N)	Crush (N/100mm)	
		Short term	Long term
12	2500	2000	1000
24	2500	2000	1000
48	2500	2000	1000
72	2500	2000	1000
96	2500	2000	1000
144	2500	2000	1000

4. Mechanical, Physical 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

Items	Test Method	Requirements
Tension	IEC 60794-1-2-E1 Load: According to 3.5 Sample length: Not less than 50m. Duration time: 1min.	Additional attenuation: $\leq 0.05\text{dB}$ after test No damage to outer jacket and inner elements
Crush	IEC 60794-1-2-E3 Load: According to 3.5 Duration of load: 1min	Additional attenuation: $\leq 0.05\text{dB}$ after test No damage to outer jacket and inner elements
Impact	IEC 60794-1-2-E4 Radius: 300 mm Impact energy: 10 J Impact number: 1 Impact points: 3	Additional attenuation: $\leq 0.1\text{dB}$ No damage to outer jacket and inner elements
Repeated bending	IEC 60794-1-2-E6 Bending radius: $20 \times D$ Cycles: 25 Load: 150N	Additional attenuation: $\leq 0.05\text{dB}$ No damage to outer jacket and inner elements
Torsion	IEC 60794-1-2-E7 Cycles: 10 Length under test: 1m turns: $\pm 180^\circ$ Load: 150N	Additional attenuation: $\leq 0.1\text{dB}$ No damage to outer jacket and inner elements
Water Penetration	IEC 60794-1-2-F5B Time : 24 hours Sample length : 3m Water height : 1m	No water leakage.
Temperature cycling	IEC 60794-1-2-F1 Sample length: at least 1000m Temperature range: $-40 \sim +70^\circ\text{C}$ Cycles: 2 Temperature cycling test dwell time: 12 hours	The change in attenuation coefficient shall be less than 0.05 dB/km .
Other parameters	IEC 60794-1	

5. Packaging and Drum

5.1 Cable Sheath Marking

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

- ☐ Color: white
- ☐ Contents: NEXTRA OPTICAL CABLE, the type of cable, the year of manufacture, length marking
- ☐ Interval: 1m

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

5.2 Reel Length

Standard reel length: 2/4 km/reel, other length is also available

5.3 Cable Drum

The cables are packed in fumigated wooden drum

5.4 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