Technical Specification
Optical Fibre Cable

1. General

1.1 Scope

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

Cable type	Application
GYGY-24/48/96/144B1.3	Duct installation

1.2 Reference

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

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

1.3 Life Time

Optical fibre cables supplied in compliance with this specifications is capable to withstand the typical service condition for a period of twenty-five (25) years without detriment to the operation characteristics of the cable.

1.4 Application

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

2. Optical Fibre

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

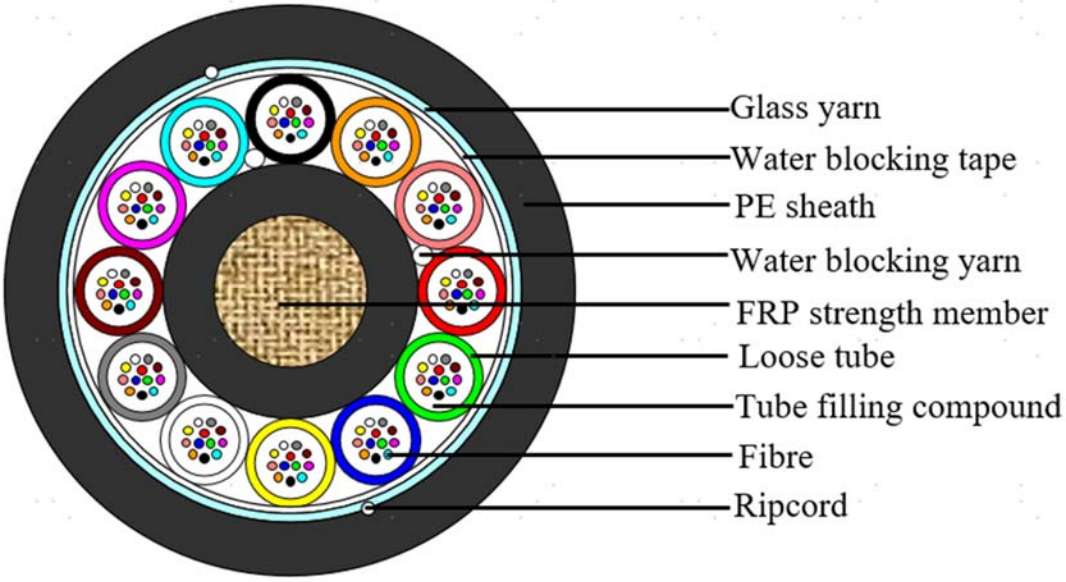
Category	Description	Specification	
		Before cable	After cable
Geometrical Characteristics	Cladding diameter	125.0 ± 0.7 μm	
	Cladding non-circularity	≤ 1.0 %	
	Core concentricity error	≤ 0.6 μm	
	Coating diameter	235~255 μm (Before Colored)	
		250+/-15 μm (Colored)	
	Coating/cladding concentricity error	≤ 12.0 μm	
Optical Characteristics	Mode field diameter at 1310 nm	8.7 ~ 9.5 μm	
	Attenuation at 1310 nm	≤0.34 dB/km	≤ 0.35 dB/km
	Attenuation at 1383 nm	≤0.34 dB/km	≤ 0.35 dB/km
	Attenuation at 1550 nm	≤0.20 dB/km	≤ 0.21 dB/km
	Point discontinuity at 1310nm and 1550nm	≤ 0.05dB	
	Zero dispersion wavelength	1300 ~ 1324 nm	
	Zero dispersion slope	≤0.092 ps/(nm^2·km)	
	Cable cut-off wavelength (λcc)	≤ 1260 nm	
	Polarization mode dispersion individual fiber	≤ 0.2 ps/√km	
	Polarization mode dispersion design link value (M=20, Q=0.01%)	≤ 0.1 ps/√km	
	Macro-bend loss (100 turns, 30mm radius)	1550&1625nm: ≤ 0.05 dB	
Mechanical Specification	Proof stress level	≥100kpsi (0.69 GPa)	
	Coating strip force (peak value)	1.3~8.9N	
	Dynamic Fatigue Parameter（nd）	≥20	
	Fiber curl (Radius)	≥2 m	

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

3.2 Cross Section of Cable



GYGY-144B1.3
Schematic for reference only

3.3 Fibre and Loose Tube Identification

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

Fiber color code	1	2	3	4	5	6
	Red	Green	Blue	Yellow	White	Grey
	7	8	9	10	11	12
	Brown	Purple	Aqua	Black	Orange	Pink

3.4 Dimensions and Descriptions

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

Item	Contents	Value		
		24/48	**96**	**144**
Structure	Type	1+6	1+8	1+12
Loose tube	Fiber counts/tube	12		
	Outer diameter (mm)	2.0		
Central strength member	Material	FRP		
	Diameter (mm)	2.25	2.6	3.0
	PE layer diameter (mm)	/	3.5	5.8
Water blocking	Material	Water blocking yarn & tape		
Peripheral strength member	Material	Glass yarn		
Sheath	Material	HDPE		
	Color	Black		
	Thickness (mm)	Nominal: 1.5		
Ripcord	Number	2		
Cable diameter (mm) Approx.		9.8	11.0	13.0
Cable weight (kg/km) Approx.		80	105	140

3.5 Main Mechanical Performance

Item	Tension(N)	Crush(N/100mm)
24/48	1500	1000
96	1800	
144	2000	

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 60794-1-21-E1** Load: According to 3.5 Sample length: Not less than 50m. Duration time: 1min.	Additional attenuation: ≤0.05dB after test No damage to outer jacket and inner elements
Crush	**IEC 60794-1-21-E3A** Load: According to 3.5 Duration of load: 1min	Additional attenuation: ≤0.05dB after test No damage to outer jacket and inner elements
Impact	**IEC 60794-1-21-E4** Radius: 300 mm Impact energy: 10 J Impact number: 1 Impact points: 3	Additional attenuation: ≤0.1dB No damage to outer jacket and inner elements
Repeated bending	**IEC 60794-1-21-E6** Bending radius: 20*D Cycles: 25 Load: 150N	Additional attenuation: ≤0.05dB No damage to outer jacket and inner elements
Torsion	**IEC 60794-1-21-E7** Cycles:10 Length under test: 1m Turns: ±180° Load:150N	Additional attenuation: ≤0.1dB No damage to outer jacket and inner elements
Water Penetration	**IEC 60794-1-22-F5B** Time : 24 hours Sample length : 3m Water height : 1m	No water leakage.
Temperature cycling	**IEC 60794-1-22-F1** Sample length: at least 1000m Temperature range:-40 ºC~+70 ºC Cycles:2 Temperature cycling test dwell time: 12 hours	The change in attenuation coefficient shall be less than 0.05 dB/km.
Other parameters	According to **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: Netcom, the year of manufacture, the type of cable, cable number, length marking
- Interval: 1 m

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

5.2 Reel Length

Standard reel length: 2/3 km/reel, other length is also available.

5.3 Cable Drum

The cables are packed in fumigated wooden drums.

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.