



TECHNICAL DATA SHEET
FOR
Single Mode Optical Fibre Cable
Duct Application
(SM 24, 36, 48, 64, 96 Fibers)

Product: Single Mode Optical Fiber Cable

Producer: **XCOM LTD . / Bulgairia**

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Write by: Petar Georgiev / technical engineer



XCOM LTD. BUGARIA

Екском ЕООД, гр. Пловдив, ул. Братя Бъкстон 134

Tel: +359 899 993 063; +359 32 399 565

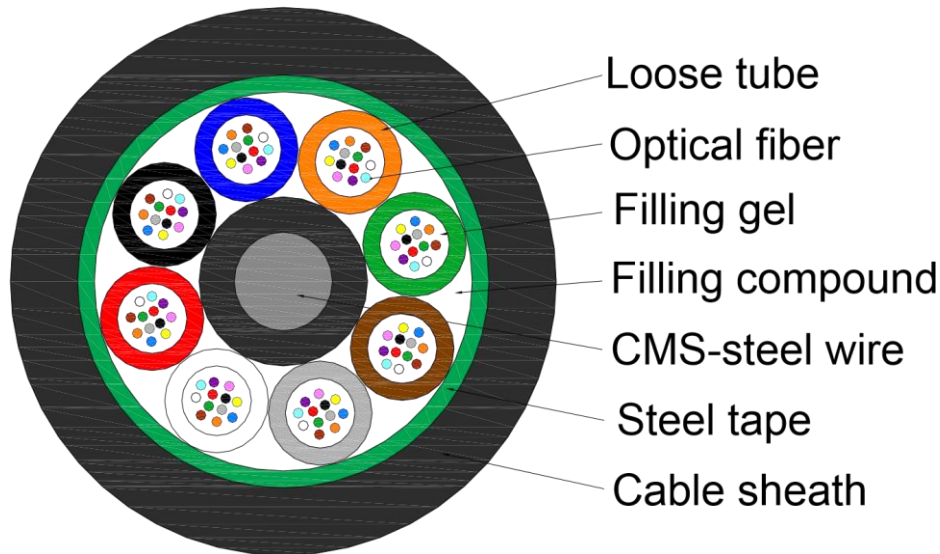
<http://www.xcombg.com>

office@xcombg.com



1. Cable Construction

1.1 Cable cross-section



2. Cable Specification

2.1 Sheath marking

2012	GYTS	XXB1.3 (G.652D)	XXXXm
XCOM	: Manufacturer's brand		
2012	: Manufacture year		
GYTS	: Cable type		
XXB1.3 (G.652D)	: XX cores single-mode optical fiber (ITU-T Rec. G.652D)		
XXXXm	: Mark of meters		
<p><i>* The marking is printed every 1 meter;</i></p> <p><i>**"G.652D" means ITU-T Rec. Low Water Peak (LWP) G.652 Single Mode Optical Fiber.</i></p>			

2.2 The color of marking is white, but if the remarking is necessary, the **yellow color** marking shall be printed newly on a different position.

2.3 An occasional unclear of length marking is permitted if both of the neighboring markings are clear;

2.4 The both cable ends are sealed with heat shrinkable end caps to prevent water ingress.



2.5 Fiber color code

No.	1	2	3	4	5	6
Color	Blue	Orange	Green	Brown	Gray	White
No.	7	8	9	10	11	12
Color	Red	Black	Yellow	Violet	Pink	Aqua

2.6 Color Code for Loose Tube (LT) and Filler Rod (FR)

Fiber number	Element no.							
	1	2	3	4	5	6	7	8
24	LT	LT	LT	LT	FR	-	-	-
36	LT	LT	LT	LT	LT	LT	-	-
48	LT	LT	LT	LT	FR	-	-	-
64	LT	LT	LT	LT	LT	LT	-	-
96	LT	LT	LT	LT	LT	LT	LT	LT

2.7 Cable structure and parameter

Fiber number	Max. fiber number per tube	Total unit number (LT + FR)	Cable sheath thickness (nominal*)	Overall diameter (nominal**)	Weight (approx.)
			mm	mm	kg/km
24	6	5 (4LT + 1FR)	1.8	10.0	115
36	6	6 LT	1.8	10.5	126
48	12	5 (4LT + 1FR)	1.8	11.3	138
64	12	6 LT	1.8	12.0	168
96	12	8 LT	1.8	13.6	198

* The nominal sheath thickness may vary by ± 0.2 mm.

** The nominal outer diameter and height may vary by ± 0.2 mm.



3. Fiber Properties

3.1 The properties of single mode optical fiber (ITU-T Rec. G.652D)

Item	Specification
Fiber type	Single mode
Fiber material	Doped silica
Attenuation coefficient @ 1310 nm @ 1383 nm @ 1550 nm @ 1625 nm	≤ 0.36 dB/km ≤ 0.32 dB/km ≤ 0.22 dB/km ≤ 0.30 dB/km
Point discontinuity	≤ 0.05 dB
Cable cut-off wavelength	≤ 1260 nm
Zero-dispersion wavelength	1300 ~ 1324 nm
Zero-dispersion slope	≤ 0.093 ps/(nm ² .km)
Chromatic dispersion @ 1288 ~ 1339nm @ 1271 ~ 1360nm @ 1550 nm @ 1625 nm	≤ 3.5 ps/(nm. km) ≤ 5.3 ps/(nm. km) ≤ 18 ps/(nm. km) ≤ 22 ps/(nm. km)
PMD _Q (Quadrature average*)	≤ 0.2 ps/km ^{1/2}
Mode field diameter @ 1310 nm	9.2 ± 0.4 μm
Core / Clad concentricity error	≤ 0.5 μm
Cladding diameter	125.0 ± 0.7 μm
Cladding non-circularity	≤ 1.0%
Primary coating diameter	245 ± 10 μm
Proof test level	100 kpsi (=0.69 Gpa), 1%
Temperature dependence 0°C~ +70°C @ 1310 & 1550nm	≤ 0.1 dB/km

* PMD_Q is a link of 20 cable sections (M) and a probability level of 0.01% (Q).

4. Characteristic of Optical Cable

4.1 Mechanical & environmental characteristics

4.1.1 Cable bending radius: 10 x cable diameter (during operation)
20 x cable diameter (during installation)

4.1.2 Temperature range

Operating temperature range	-40°C to +60°C
Storage / Transport temperature range	-50°C to +70°C
Installation temperature range	-20°C to +50°C



4.2 Main mechanical & environmental characteristics test

NO	ITEM	TEST METHOD	ACCEPTANCE REQUIREMENTS
1	Tensile Strength IEC 794-1-E1	- Load: 1, 500 N - Length of cable under load: 50m	- Loss change \leq 0.1 dB @1550 nm - No fiber break and no sheath damage.
2	Crush Test IEC 60794-1-E3	- Load: 1, 000 N/100mm - Load time: \geq 1min	- Loss change \leq 0.1 dB @1550 nm - No fiber break and no sheath damage.
3	Impact Test IEC 60794-1-E4	- Points of impact: 5 - Times of per point: 5 - Impact energy: 4.5Nm - Radius of hammer head: 12.5mm - Impact rate: 2sec/cycle	- Loss change \leq 0.1 dB @1550 nm - No fiber break and no sheath damage.
4	Repeated Bending IEC 60794-1-E6	- Bending Dia.: 20 x OD - Load: 150N - Flexing rate: 3sec/cycle - No. of cycle: 30	- Loss change \leq 0.1 dB @1550 nm - No fiber break and no sheath damage.
5	Torsion IEC 60794-1-E7	- Length: 1m - Load: 150N - Twist rate: 1min/cycle - Twist angle: $\pm 180^\circ$ - No. of cycle: 10	- Loss change \leq 0.1 dB @1550 nm - No fiber break and no sheath damage.
6	Water Penetration IEC 60794-1-F5B	- Height of water: 1m - Sample length: 3 m - Time: 24 hour	- No water shall have leaked from the opposite end of cable
7	Temperature Cycling IEC 60794-1-F1	- Temperature step: +20°C \rightarrow -40°C \rightarrow +60°C \rightarrow +20°C - Time per each step: 12 hrs - Number of cycle: 2	- Loss change \leq 0.1 dB @1550 nm - No fiber break and no sheath damage.
8	Compound Flow IEC 60794-1-E14	- Sample length: 30 cm - Temp: 70°C \pm 2°C - Time: 24 hours	- No compound flow
9	Sheath High Voltage Test	- On line test - 9t KV (t-sheath thickness)	- No sheath breakdown



5. Packing and Marking

5.1 Packing

5.1.1 Each single length of cable shall be reeled on **Non-fumigated Iron-wooden Drum** suitable for long distance shipment.

5.1.2 Covered by plastic buffer sheet.

5.1.3 Sealed by strong wooden battens.

5.1.4 At least 1 m of inside end of cable will be reserved for testing.

5.1.5 Drum length

5.1.5.1 Standard drum length is **4000m±3%**;

5.1.5.2 Single length not less than 95% of standard length per drum shall be permitted for quantity not exceeding 10% of the total supply;

5.1.5.3 Total quantity is at least the ordered quantity.

5.2 Drum Marking

5.2.1 Cable drum

- Manufacturer brand;
- Roll-direction arrow;
- Cable outer end position indicating arrow;
- The word "**OPTICAL FIBER CABLE**";
- Origin, The word "**MADE IN CHINA**";
- Caution plate indicating the correct method for loading, unloading and convey the cable;
- *Other customer information such as contract no., project no., and delivery destination. (if needed)*

5.2.2 Marking plate

- Product name;
- Cable type and size;
- Drum length;
- Gross / Net weight in kilograms;
- Drum number in meters;
- Manufacturer's name;
- Manufacturing year and month;
- *Project number, contract number or purchasing order number (if needed).*

5.3 Cable identification documents – Test report.

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