TECHNICAL DATA SHEET

FOR

Uni-tube Single Mode Optical Fibre Cable

Aerial or Duct Applications

(SM 2~24 Fibers)

Product: Single Mode Optical Fiber Cable
Producer: **XCOM LTD. / Bulgaira**
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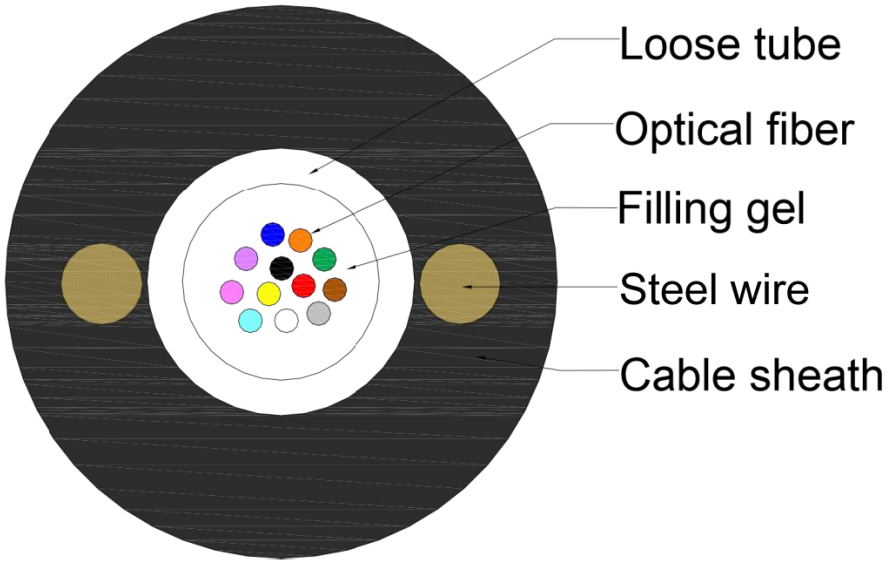
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1 Cable Construction
1.1 Cable cross-section



2. Cable Specification
2.1 Sheath marking

XCOM 2012 UT01 XXB1.3 (G.652D) XXXXm	
XCOM	: Manufacturer's brand
2012	: Manufacture year
UT01	: Cable type
XXB1.3 (G.652D)	: XX cores single-mode optical fiber (ITU-T Rec. G.652 D)
XXXXm	: Mark of meters

**The marking is printed every 1 meter;*
***"G.652D" means ITU-T Rec. Low Water Peak (LWP) G.652 Single Mode Optical Fiber.*

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
No.	13	14	15	16	17	18
Color	Blue+R	Orange+R	Green+R	Brown+R	Gray+R	White+ R
No.	19	20	21	22	23	24
Color	Red+R	Natural+R	Yellow+R	Violet+R	Pink+R	Aqua+ R

** "R" means ring mark.*

2.6 Cable structure and parameter

Fiber number	Tube diameter	Copper wire diameter	Sheath thickness (nominal*)	Overall diameter (nominal**)	Weight (approx.)
	mm	mm	mm	mm	kg/km
2~6	2.5	1.4	2.9	8.3	77
8~12	3.0	1.4	2.9	8.8	83
14~24	3.6	1.4	2.9	9.4	92

* 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 ~ 1339 nm @ 1271 ~ 1360 nm @ 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 $\pm$ 0.4 um
Core / Clad concentricity error	0.5 um
Cladding diameter	125.0 0.7 um
Cladding non-circularity	1.0%
Primary coating diameter	245 10 um
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	-10°C to +60°C
Storage / Transport temperature range	-10°C to +70°C
Installation temperature range	0°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: 600 N - Length of cable under load: 50m	- Loss change 0.1 dB @1550 nm - No fiber break and no sheath damage.
2	Crush Test IEC 60794-1-E3	- Load: 300 N/100mm - Load time: ⩾1min	- Loss change 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: 1.0Nm - Radius of hammer head: 12.5mm - Impact rate: 2sec/cycle	- Loss change 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 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: ±180° - No. of cycle: 10	- Loss change 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: 1 hour	- No water shall have leaked from the opposite end of cable
7	Temperature Cycling IEC 60794-1-F1	- Temperature step: +20ºC→-10ºC→ +60ºC→+20ºC - Time per each step: 12 hrs - Number of cycle: 2	- Loss change 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 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).*

5.2.2 Cable identification documents

- Test report.

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