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TECHNICAL DATA SHEET
FOR
Single Mode Optical Fibre Cable
All-Dielectric Self-Supporting (ADSS)
Aerial Application

(SM 6, 8, 12, 24 Fibers) 100m span

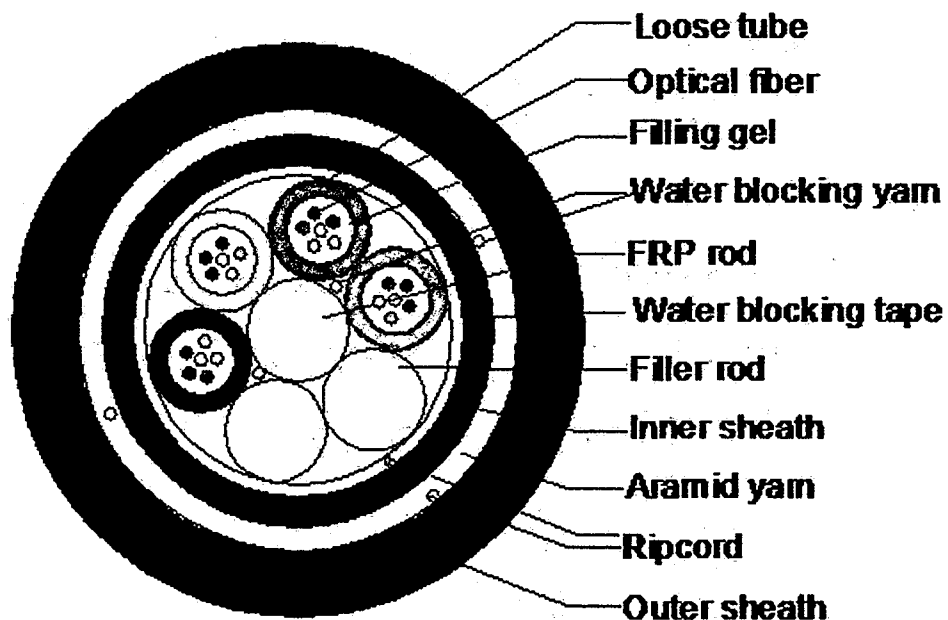
Product: Single Mode Optical Fiber
Cable Customer: KROTON S.A.C.
Date: January 16, 2015



KROTON

1. Cable Construction

1.1 Cable cross-section



2. Cable Specification

2.1 Sheath marking

MULTI PLAY	2013	ADSS	XXB1.3 (G.652.D)	XXXXm
MULTI PLAY	: Manufacturer's brand			
2013	: Manufacture year			
ADSS	: Cable type			
XXB1.3 (G.652D)	: XX cores single-mode optical fiber (ITU-T Rec. G.652D)			
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		Orange			Gray	White
No.	7	8	9	10	11	12
Color	Red	Black	Yellow	Violet	Pink	Aqua

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

Fiber count	Element no.					
	1	2	3	4	5	6
6		FR	FR	FR	FR	FR
8		LT	FR	FR	FR	FR
12		LT	FR	FR	FR	FR
24		LT			FR	FR

* "LT" means Loose Tube;

"FR" means Filler Rod.

2.7 Cable structure and parameter

Fiber count	Max. fiber count per tube	Total unit count (LT + FR)	I / O sheath thickness (nominal*)	Overall diameter (nominal**)	Weight (approx.)
			mm		
6	6	6 (1LT+5FR)	0.8 / 1.7	12.1	113
8	4	6 (2LT+4FR)	0.8 / 1.7	12.1	113
12	6	6 (2LT+4FR)	0.8 / 1.7	12.1	113
24	6	6 (4LT+2FR)	0.8 / 1.7	12.1	113

* The nominal sheath thickness may vary by 0.2mm.

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



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±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 Cable bending radius: 10 x cable diameter (during operation)

20 x cable diameter (during installation)

4.2 Temperature range

Operating temperature range	-40°C to +60°C
Storage / Transport temperature range	-50°C to +70°C
Installation temperature range	-30°C to +50°C

4.3 Main mechanical & environmental characteristics test

NO	ITEM	TEST METHOD	ACCEPTANCE REQUIREMENTS
1	Tensile Strength IEC 794-1-E1	<ul style="list-style-type: none"> - Load: 3, 000 N - Length of cable under load: 50m - Load time: ≥1min. 	<ul style="list-style-type: none"> - Loss change 0.1 dB @1550 nm - No fiber break and no sheath damage.
2	Crush Test IEC 60794-1-E3	<ul style="list-style-type: none"> - Load: 1, 000 N/100mm - Load time: ≥1min 	<ul style="list-style-type: none"> - Loss change 0.1 dB @1550 nm - No fiber break and no sheath damage.
3	Impact Test IEC 60794-1-E4	<ul style="list-style-type: none"> - Points of impact: 5 - Times of per point: 5 - Impact energy: 4.5Nm - Radius of hammer head: 12.5mm - Impact rate: 2sec/cycle 	<ul style="list-style-type: none"> - Loss change 0.1 dB @1550 nm - No fiber break and no sheath damage.
4	Repeated Bending IEC 60794-1-E6	<ul style="list-style-type: none"> - Bending Dia.: 20 x OD - Load: 150N - Flexing rate: 3sec/cycle - No. of cycle: 30 	<ul style="list-style-type: none"> - Loss change 0.1 dB @1550 nm - No fiber break and no sheath damage.
5	Torsion IEC 60794-1-E7	<ul style="list-style-type: none"> - Length: 1m - Load: 150N - Twist rate: 1min/cycle - Twist angle: ±180° - No. of cycle: 10 	<ul style="list-style-type: none"> - Loss change 0.1 dB @1550 nm - No fiber break and no sheath damage.
6	Water Penetration IEC 60794-1-F5B	<ul style="list-style-type: none"> - Height of water: 1m - Sample length: 3 m - Time: 24 hour 	<ul style="list-style-type: none"> - No water shall have leaked from the opposite end of cable
7	Temperature Cycling IEC 60794-1-F1	<ul style="list-style-type: none"> - Temperature step: +20°C→-40°C→+60°C→+20°C - Time per each step: 12 hrs - Number of cycle: 2 	<ul style="list-style-type: none"> - Loss change 0.1 dB @1550 nm - No fiber break and no sheath damage.
8	Compound Flow IEC 60794-1-E14	<ul style="list-style-type: none"> - Sample length: 30 cm - Temp: 70°C 2°C - Time: 24 hours 	<ul style="list-style-type: none"> - No compound flow

5. Packing and Marking

5.1 Packing

5.1.1 Each single length of cable shall be reeled on **Non-fumigated 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 **2000m±5%**;

5.1.5.2 Single length not less than 90% 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. 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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