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**TECHNICAL DATA SHEET  
CABLE CONSTRUCTION**

**SM-MLT-SA-SJ-A 12FO**

**12 CORES AERIAL**

**SINGLE MODE FIBER OPTIC CABLES with SINGLE JACKET and STEEL ARMOR**

| Characteristics  | Offered by the Tenders   |
|--|--|
| 1. No of tubes / No of Fibers per tube<br>12 FO                                      | Fiber and Tube colors are according to Customer's technical specification.<br>(3Tx4F) (3 Filler)   |
| 2. Central Strength member<br>-Material<br>-Diameter                                 | - Reinforced Glass Fiber<br>-2,2 mm  |
| 3. Loose tubes<br>-Material<br>-Type of filling compound<br>- Diameter<br>-Thickness | - Polybuteneterephteleta (PBT)<br>- Thixotropic<br>- 2,06 mm<br>-0.4 ± 0.05 mm   |
| 4. Tube assembly<br>-Tube layout<br>-Stranding type                                  | -Tubes will be stranded around Cent. Strength Member with symmetrically<br>- Tubes will strand with SZ stranding method                            |
| 5. Flooding compound<br>-Material  | - Jelly Filling  |
| 6. Core wrapping<br>-Material  | Core covering tape<br>- Polyester Tape   |
| 7. Dielectric Tensile Strength Member  | - Aramid Yarn  |
| 8. Rip cords   | Rip cord will be applied longitudinally to open cable easily   |
| 9. Identification tape   | - Tape will be applied underneath corrugated steel tape longitudinally. Printings: "Company Name, production month year, Cable Type, TÜRKSAT A.Ş." |
| 10. Armoring<br>-Material<br>-Thickness (nom.)                                       | - Copolymer coated Corrugated steel tape<br>- 0,155 micron   |
| 11. Messenger Wire   | 7x1.75 messenger wire  |
| 12. Outer Sheath<br>-Material<br>-Thickness<br>-Color                                | - MDPE (UV RESISTANCE )<br>- Approx. 2,2±0,2 mm<br>- ORANGE COLOR (RAL 2008)   |
| 13. Length marking   | BLACK, Hot Stamping<br>"Meter, telephone symbol, Drum Core Number, TÜRKSAT A.Ş., 12 FO-H Optical Cable , ETK Kablo, phone symbol, Meter"           |
| 14. Drum Length  | 2000 meters ± 5 %  |
| 15. Cable weight (kg/km)<br>12 FO  | Approx. 355 kg/km  |
| 16. Outer Diameter of cable<br>12 FO   | Approx. 12.2 X 24 mm   |





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**16. Test results of Mechanical characteristics**

| Test                              | Test Standard         | Specified Value                        | Acceptance Criteria  |
|-----------------------------------|-----------------------|--|--|
| -Tensile Strength Short Term      | IEC 60794-1-2-E1(A-B) | Min $\geq 2700$ N                      | $\Delta\alpha$ reversible, fiber strain $\leq 0.33\%$<br>no fiber strain,<br>$\Delta\alpha \leq 0.05$ dB |
| Max. Instalation Tensile Strength | IEC 60794-1-2-E1(A-B) | Min $\geq 1000$ N                      | $\Delta\alpha$ reversible, fiber strain $\leq 0\%$<br>no fiber strain,<br>$\Delta\alpha \leq 0.05$ dB    |
| Crush                             | IEC 60794-1-2-E3      | 4000 N / 100 mm                        | $\Delta\alpha \leq 0.05$ dB, no damage   |
| Impact                            | IEC 60794-1-2-E4      | 30 Nm, 3 impacts, R= 300 mm            | $\Delta\alpha \leq 0.05$ dB after the test   |
| Torsion                           | IEC 60794-1-2-E7      | 100N, +/- 180°, 10 cycles              | $\Delta\alpha \leq 0.05$ dB, no damage   |
| Cable Bend                        | IEC 60794-1-2-E11     | R=20x D, 4 turns                       | $\Delta\alpha \leq 0.05$ dB, no damage   |
| Repeat Cable Bend                 | IEC 60794-1-2-E6      | R=20x D, 100N,35 turns                 | no damage  |
| Temperature Cycling               | IEC 60794-1-2-F1      | -40°C to +70°C<br>36 hours, two period | Max. %10 dB/km   |
| Water Penetration                 | IEC 60794-1-2-F5B     | Sample=1m, water column=1m             | no water leakage in 24h  |

Transport & Stok : -40°C to +70°C

Instalations : -20°C to +60°C

Working : -40°C to +70°C

**TECHNICAL DATA SHEET**

**SECTION 2**

Attenuation for cable

| Ref (nm) | Max.       |
|----------|------------|
| 1310     | 0,36 dB/km |
| 1550     | 0,22 dB/km |

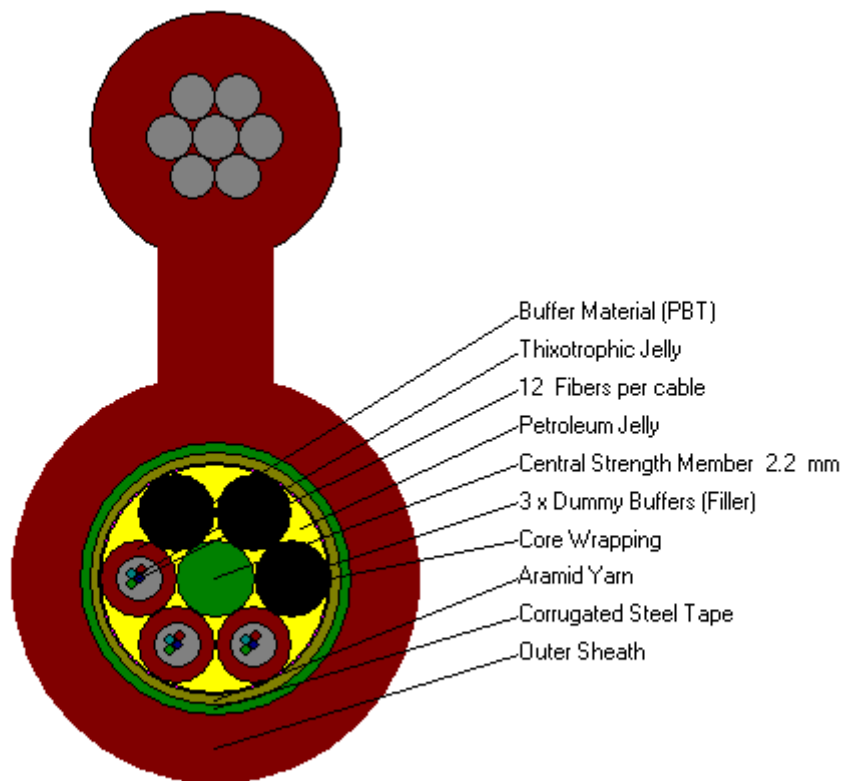




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**TECHNICAL DATA SHEET**  
**SECTION 3**  
**TECHNICAL DRAWING**

**12 F0**



- 1 Outer Sheath
- 2 Corrugated Steel Tape\*
- 3 Aramid Yarn
- 4 Core Wrapping (Polyester)
- 5 Central Strength Member
- 6 Jelly Filling
- 7 Buffer Material (PBT)
- 8 Thixotropic Jelly
- 9 12 Fibers per Cable

\*Two (2) ripcords will be applied longitudinally.



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**TECHNICAL DATA SHEET**  
**SECTION 4**  
**OPTICAL FIBERS and TUBES COLORS\***

| Tube Color Scheme |        |
|-------------------|--------|
| Tube No.          | Color  |
| 1                 | Red    |
| 2                 | Yellow |
| 3                 | Green  |
| 4                 | Filler |
| 5                 | Filler |
| 6                 | Filler |

| Fiber Color Scheme |         |
|--------------------|---------|
| Fiber No.          | Color   |
| 1                  | Red     |
| 2                  | Yellow  |
| 3                  | Green   |
| 4                  | Naturel |



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**TECHNICAL DATA SHEET  
SECTION 5**

**OPTICAL FIBER CORE SPECIFICATIONS G.652.D**

| <b>Full Length Average Attenuation:</b>   |                          |               |
|---|--------------------------|---------------|
| @ 1310 nm   | dB/km                    | ≤0.34         |
| @ 1550 nm   | dB/km                    | ≤0.21         |
| @ 1625 nm   | dB/km                    | ≤0.22         |
| <b>Macro Bending – additional induced bending:</b>  |                          |               |
| 32 mm dia./ 1 turn /@1550 nm  | dB                       | ≤0.05         |
| 50 mm dia. /100 turns/ @ 1310 nm and 1550nm   | dB                       | ≤0.05         |
| 60 mm dia. /100 turns/ @ 1550 nm and 1625nm   | dB                       | ≤0.05         |
| <b>Other Optical Properties:</b>  |                          |               |
| Zero dispersion wavelength $-(\lambda_0)$   | nm                       | 1300 to 1322  |
| Dispersion slope $(S_0)$ @ $\lambda_0$  | ps/(nm <sup>2</sup> *km) | ≤0.089        |
| Chromatic Dispersion @1285-1330 nm;<br>@1550 nm;<br>@1625 nm;   | ps/nm.km                 | ≤3.2          |
|   | ps/nm.km                 | ≤17.0         |
|   | ps/nm.km                 | ≤22.0         |
| Mode field diameter @1310 nm<br>@1550 nm  | μm                       | 9.2±0.4       |
|   | μm                       | 10.4±0.5      |
| Cut-off wavelength $\lambda_{cc}$ – cable   | nm                       | ≤1260         |
| Fiber Polarization Mode Dispersion (PMD),<br>Link Design Value PMD <sub>q</sub><br>Tension free conditions for uncabled fiber | ps/√km<br>ps/√km         | ≤0.08<br>≤0.2 |
| Change in attenuation vs. wavelength<br>1285 – 1330nm, ref. $\lambda$ of 1310nm<br>1525 – 1575nm, ref. $\lambda$ of 1550nm    | dB/km                    | ≤0.03         |
|   | dB/km                    | ≤0.02         |
| <b>Geometrical Properties:</b>  |                          |               |
| Cladding diameter   | μm                       | 125.0±0.7     |
| Cladding non-circularity  | %                        | ≤0.6          |
| Core/Cladding Concentricity err.  | μm                       | ≤0.5          |
| Coating diameter  | μm                       | 245±10        |
| Coating/Cladding concentricity err.   | μm                       | ≤12           |
| <b>Mechanical Specifications</b>  |                          |               |
| Proof Test IEC 60793-1-30   | 0.7 GPa or 8.4N Load     | ≥ 1%          |

