

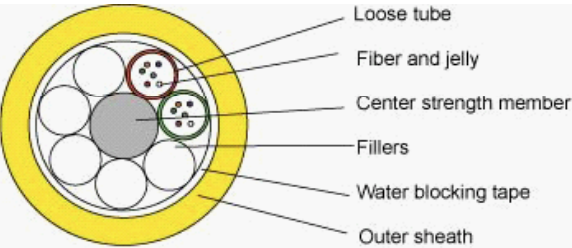
## Statement of Compliance

Specifications' Item Statement	Detailed Technical Description	Compliance	Deviation	Comments
<b>1.1 Compliance</b>	The single mode optical fiber cable shall comply with requirements of this specification and meet latest relevant ITU-T recommendations and reports and in particular comply with recommendation G.652 D .The requirements of IEC standards 793, 794 and 304 shall also apply.	FULLY COMPLIANT		IEC 60304 IEC60793 & IEC 60794
<b>1.2 Cable Fiber Core Capacities</b>	The cables employed have the following fibre core capacities. 96 Fiber Cores	FULLY COMPLIANT		
<b>1.3 Application Areas</b>	The cables shall be suitable for duct installation	FULLY COMPLIANT		
<b>2 Optical Fibre Characteristics</b>				
<b>2.1 Operating System</b>	The optical fiber installation shall be capable of supporting SDH systems with optical interfaces acc. to ITU-T recommendation G.957, i.e. support line systems operating at 622 Mbit/s (STM-4) and to support 10Gbit/s (STM-64) line systems and WDM, and DWDM systems (≥40ch)	FULLY COMPLIANT		Long Haul close channel spacing DWDM typically utilises ITU-T G.655 optical fibre
<b>2.2 Operating Wavelength</b>	The fibre shall be optimised for operation at the second and the third windows wavelengths (1310nm. Window and in the 1550nm window).	FULLY COMPLIANT		
<b>2.2 Operating Wavelength</b>	The fibre shall be optimised for operation at the second and the third windows wavelengths (1310nm. Window and in the 1550nm window).	FULLY COMPLIANT		Repeated clause 2.2
<b>2.3 Mode Field Diameter</b>	The nominal value of the mode field diameter at 1310nm shall be $9.2\mu\text{m} + 0.4\%$ , and at 1550nm shall be $10.4\mu\text{m} + 0.5\%$ .	Alternative Solution		The MFD of the fibre is $9.1\pm 0.5\mu\text{m}$ @ 1310 and $10.3\pm 0.6\mu\text{m}$ . It is normal to express mfd tolerance as a unit of measure not a percentage
<b>2.4 Cladding Diameter</b>	The nominal value of the cladding diameter shall be $125 + 1\mu\text{m}$	FULLY COMPLIANT		
<b>2.5 Mode Field Concentric Error</b>	The mode field diameter concentricity error shall be $< 0.8\mu\text{m}$ .	FULLY COMPLIANT		
<b>2.6 Cladding Non-circularity</b>	The cladding non-circularity shall be $\leq 1\%$	FULLY COMPLIANT		
<b>2.7 Cut-off Wavelength</b>	The cut-off wavelength shall $< 1260\text{nm}$ . According to ITU-T Rec. G.652 there are three different types of cut-off wavelength shall be considered : Cable cut-off wavelength ( $\mu\text{cc}$ ) Fibre cut-off wavelength ( $\mu\text{c}$ ) Jumper cable cut-off wavelength ( $\mu\text{cj}$ )	FULLY COMPLIANT		
<b>2.8 Attenuation</b>	The average attenuation at the 1310 nm wavelength region shall be $\leq 0.34\text{dB/km}$ and shall be constant at the temperature range of $-10^\circ\text{C}$ to $+55^\circ\text{C}$ according to the Syrian ambient and environmental conditions. The average attenuation at the 1550nm wavelength region shall be $\leq 0.21\text{dB/km}$ .	FULLY COMPLIANT	Maximum attenuation values of $0.36\text{dB/km}$ @ 1310nm and $0.23\text{dB/km}$ @1550nm shall be allowed	

## Statement of Compliance

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<b>2.9 Material Chromatic Dispersion</b>	The maximum value of the total dispersion at the 1310 nm wavelength region shall be $\leq 3.2$ ps/(nm x km) and the maximum at 1550nm wavelength region shall also be $\leq 18$ ps/(nm x km).	FULLY COMPLIANT		
<b>2.10 Refractive Index</b>	Group refractive index at : 1330nm 1.467 1550nm 1.468			The group refractive index will be in the range 1.4660 to 1.4667 @ 1310nm and 1.4670 to 1.4682 @ 1550nm
<b>2.11 Macrobending loss</b>	Macrobending loss varies with wavelength, bend radius and number of turns about a mandrel with a specified radius. Macrobending loss shall not exceed the maximum given in clause 7 of the ITU-T Rec. G.652 D for the specified wavelength(s), bend radius, and number of turns.	FULLY COMPLIANT		100 turns 60mm diameter 1310nm and 1550nm attenuation increase $\leq 0.05$ dB
<b>2.12 roof stress level</b>	The specified proof stress $\mu p$ shall be according to the relevant ITU-T Rec. not less than 0.69GPa.	FULLY COMPLIANT		
<b>2.13 PMD :</b>	PMD value should be stated ,Maximum value of PMD shall be $\leq 0.1$ ps/ $\sqrt{km}$			
<b>2.14 Material Properties of the Fibre</b>		Non Compliant	The low PMD fibre on offer is $\leq 0.2$ ps/(km) $1/2$ this is based on a source fibre PMD $\leq 0.05$ ps/(km) $1/2$	
<b>2.14.1 Fibre Material</b>	The fibre shall be made from high grade silica, compound silica glasses or equivalent material.	FULLY COMPLIANT		The fibre core shall be Germanium doped silica
<b>2.14.2 Protective Material</b>	Primary and secondary coating shall be applied over fibres for protection. The coating shall protect the transmission and mechanical properties of the fibres from the forces to which the fiber may be exposed during manufacture, installation and operation. The size of the coated fiber shall take into account ease of handling and jointing and also the fiber identification and coating removal for jointing purposes. The primary protective coating shall be made from colored UV curable acrylate UV curable urethane, epoxy acrylate or any approved equivalent material. The bidder shall provide full detail regarding physical, mechanical and transmission performance, as well as thickness of the coatings, whereas, the color coding employed shall be given in the offer. Removal of the primary coating for jointing shall be achieved. Without the use of chemicals. A simple mechanical operation shall be sufficient to prepare the fibre for jointing. The secondary coating shall be of UV cured acrylate. When secondary coated, there shall be no change in the fibre attenuation at 60°C from the attenuation at 20°C. The bidder shall quote for loose buffer tube fitting secondary coated fibers.	FULLY COMPLIANT		

## Statement of Compliance

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<b>3 Cable Structure</b>	Note: Cable with structure described in this section may be considered for application in the STE network. However, such cables must comply with all physical and mechanical tests described in this specification. It is the responsibility of the bidder to present sufficient documentation on the offered cable to show full compliance with the tests contained in this specification. Glass yarn	FULLY COMPLIANT		E-glass has been utilised to achieve the tensile rating
				
		FULLY COMPLIANT		
<b>3.1. Central Strength Member</b>	The strength member shall be incorporated into cable to carry the tensile loads associated with the installation of the cable. The strength member shall be sufficiently flexible to facilitate easy handling during installation. Strength member shall be made from non metallic material - dielectric and located centrally within the cable core.	FULLY COMPLIANT		
<b>3.2. Stranding</b>	The fiber in the loose buffer tubes shall be stranded around the strength member into a cable core, where necessary, filler elements are to be incorporated in the strand.	FULLY COMPLIANT		
<b>3.3. Loose Tube Buffer</b>	The fibre shall be surrounded by a loose tube buffer. Each fibre and loose tube shall be colour coded for fibre identification. The colour code used shall be stated by Bidder. Buffers shall be filled with jelly compound. The filling compound shall be free from dirt, metallic particles and other foreign matter and shall not obscure the colour identification of the fibres. The filling compound shall be non-toxic. The drop point of the filling compound shall be at least 70 c . The filling compound shall be easily removed from the fibres by wiping. It shall be free from unpleasant odour and shall be dermatological safe. Buffers shall be colour coded to identify the individual buffer.	FULLY COMPLIANT		
<b>3.4 wrapping :</b>	A layer of water swellable tape shall be applied over loose tubes.	FULLY COMPLIANT		
<b>3.5 intermediate strength element and rodent protection :</b>	For providing the necessary protection against force in traditional duct installation eglass yarn should be inserted over wrapping layer, rodent protection is required.	FULLY COMPLIANT		E-glass yarn is offered for rodent resistance
<b>3.5. Sheath</b>	The outer sheath (jacket) shall be made of HDPE. The cable sheath shall protect the cable from external mechanical forces and environmental damage. The sheath shall be circular in cross section, free from pinholes, joints, mended places and other defects.	FULLY COMPLIANT		

## Statement of Compliance

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<b>3.6. Identification Marker</b>	Each cable shall have the following information clearly marked on the outer sheath at approximately 100 cm intervals. The following markings shall preferably embossed on the outer sheath in white colour: Manufacturer name – cable type- LOT production – year of production – metric marking – customer name . The printing process shall not reduce the sheath dimensions. The paint used shall be clearly visible, adhesive with the sheath and resistive to environmental conditions during and after installation. The sheath of each cable shall have sequentially numbered length markers at regular intervals of one meter. The colour of these markings shall preferably be white.	FULLY COMPLIANT		
<b>3.7 Pre-Fitted Pulling Eye</b>	If so required the cables shall be equipped with a pulling eye. The pulling eye shall be fitted so that ingress of moisture and escape of filling compound is prevented and such that no strain is transmitted to the fibre. The maximum length of the rigid section of the pulling eye shall not exceed 300mm.	Noted		
<b>4. Mechanical Characteristics</b>				
<b>4.1 Technical Characteristic</b>	Diameter : 96 fibres mm 13 Min. Bending radius: during installation/installed 96 fibres mm 250/180 Tensile strength: during installation/installed: N 2500/1300 Compressive stress/crush: N/10 cm $\geq 2000$ Impact resistance (E=30N, r = 300mm): Impacts 30 Operating temperature range Co -30 – 70 Installation temperature rage Co -10 - 50	FULLY COMPLIANT		See product datasheet
<b>4.2 Bidder shall submit full details of the mechanical characteristics of cable offered.</b>				
<b>4.3 Full details of test methods, and the results obtained shall besupplied. Tests to establish the mechanical properties of the cables shall have no detrimental effect on the transmission properties of the cables</b>		Noted		See product datasheet
<b>4.4 List of Tests</b>				
<b>4.4.1 Impact Test (IEC 60794-1-2 E4)</b>	A piece of cable at ambient temperature shall be subjected to a number of impacts from a hammer head On completion of the test the transmission characteristics shall still meat the specification. Bidders shall state : a . Number of impact b . Force of impact c. Diameter of hammer head	FULLY COMPLIANT		See product datasheet

## Statement of Compliance

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<b>4.4.2 Flexibility Bending Test (IEC 60794-1-2E11)</b>	A piece of cable shall repeatedly wound and unwound for a number of turns around a mandril. No damage to the fibres or the sheath shall occur. Bidder shall state : a. Number of turns b. Number of cycles of wind/unwinding c. Diameter of mandril	FULLY COMPLIANT		See product datasheet
<b>4.4.3 Compressive Stress (IEC 60794-1-2E3)</b>	A piece of cable shall be subjected to a compressive load applied between two flat plates. This test shall not cause any damage to the sheath or fibres. Bidders shall state : a. Load applied b. Dimension of plates c. Time for which load is applied	FULLY COMPLIANT		See product datasheet
<b>4.4.4 Strength Test (IEC 60794-1-2E1)</b>	A piece of cable shall be subjected to a load test by application of a mass dependent upon the mass of the cable (defined as the mass of 1 km of cable in kg). The load shall be applied for a specific time and the strain on the fibres monitored. The short time maximum permissible load shall exceed double the weight of one kilometre of cable. Bidder shall state : a. The load value applied and its relationship to the mass of the cable b. The time for which the load is applied c. The strain imposed on the fibres	FULLY COMPLIANT		See product datasheet
<b>4.4.5 Water Penetration Test (IEC 60794-1-2F5)</b>	A piece of cable of 3 meters shall be subjected to a water penetration test by application of continuous water source within a temperature of 26°C for a period of 48 hours.	FULLY COMPLIANT		See product datasheet
<b>5. Quality Assurance and Factory Testing</b>	5.1 Bidder shall submit full details of their Quality Assurance procedures which shall ensure that the cable fully comply with the requirement of the specification.	Noted		
	5.2 Bidder shall guarantee that the materials used for production of the fibres and coatings shall be of the same origin for all cables. Combination of fibres and coatings from different suppliers is not acceptable. The bidder shall state country of origin, source, manufacturing date and service life of the coated fiber.	Noted		
	5.3 Fibres shall be tested geometrically, optically, and for their transmission characteristics.	FULLY COMPLIANT		
	5.3.1 Geometric tests shall include the following : - Mode field diameter - Cladding diameter - Mode field non-circularity - Core cladding eccentricity - Cladding non-circularity - primary coating diameter (measuring method :microscope)	FULLY COMPLIANT		
	5.3.2 Optical properties of the fibre shall include tests such as: - Refractive index profile - Maximum theoretical numerical aperture - The refractive index difference - Cut-off wavelength	FULLY COMPLIANT		
	5.3.3 Transmission tests shall include the following for each production length : - Attenuation - Chromatic dispersion	FULLY COMPLIANT		

## Statement of Compliance

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	5.4 Independently certified test records of specified materials and components and assembled cable parameters shall be submitted to the STE if so requested.	Noted		
	5.5 Bidder shall submit to the STE, on or before the delivery of cables, detailed test reports for every delivered length and for each production batch of a given size and type of cable.	FULLY COMPLIANT		
	5.6 Upon request the contractor shall facilitate factory inspection containing any selection of tests specified to be carried out in the presence of STE representative.	FULLY COMPLIANT		
<b>6. Packing and Marking</b>				
<b>6.1. Packing - Cable drum</b>	The cables shall be supplied on drum in lengths as specified at the time of contract. The standard reel shall be equal to, or greater than 4000m . Each length of cable shall be wound on a separate drum unless otherwise specified or agreed to by STE. The diameter of the drum barrel shall be large enough to prevent damage to the cables during reeling or unreeling. In no event shall the diameter of the barrel be less than 40 times the outside diameter of the cable. The drum shall be substantial and constructed so as to prevent damage to the cables during shipment and handling. Boards or other suitable means of protection shall be applied to the drum to prevent damage to the cables during shipment and storage. Nails and staples used in the construction of the drum must not be placed in a position where they can damage the cable. The drums shall be non-returnable. The spindle hole shall allow use of a 75 mm spindle without bending. For testing purposes, the inner end of the cable shall be recessed into a slot in the drum flange and protected by a metal cover firmly secured to the flange. Alternatively, the inner end may protrude through the inside of a drum via a suitably constructed outlet on the inside of a drum flange. A minimum length of 1 m of the inner end shall be accessible. The cable ends shall be securely fastened so as not to protrude beyond any portion of the drum and to prevent the cable from becoming loose during transport. A protective wrap shall be applied over the outer layer of the cable on each reel. The wrap shall be weather resistant and shall remain in place until the cable is installed.	FULLY COMPLIANT		
<b>6.2. Marking</b>				
<b>6.2.1 Cable Drums</b>	Details given below shall be distinctly marked on a weather proof material on both outer sides of the drum flange : a. STE , Syria b. Arrow showing the direction the drum shall be rolled c. Country of origin d. The label "CAUTION - OPTICAL FIBRE CABLE NOT TO BE LAID FLAT" E. Manufacturer's name or trademark f A mark indicating the location of the inner end of the cable if located internally.	FULLY COMPLIANT		

## Statement of Compliance

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<b>6.2.2 Marking Plates</b>	<p>Marking plates constraining the following information shall be securely attached to the outer side of each drum flange. The letters and numbers shall be punched as following</p> <ul style="list-style-type: none"> <li>a. Material specification (according to the outer sheath type).</li> <li>b. Number of fibres and size : e.g. OF-96</li> <li>c. Cable length in meters</li> <li>d. Gross weight in kilograms</li> <li>e. Cable Number &amp; Drum Number</li> <li>f. Manufacturer's name</li> <li>g. Year of manufacture h. Project identification data</li> </ul> <p>The plates shall be made of a non-corrosive material</p>	FULLY COMPLIANT		