REAL OPTIC

Technical Data Sheet

Cable Description	**12F/24F/36F/48F/72F/96F/144F/192F/216F/288F/ FIBER SINGLE SHEATH OFC**
Type of Fibre	**Single Mode, G.652D**

Introduction

Outdoor, (Steel Armoured) optic cable containing LWP - SMF in full compliance with ITU-T G.652D. The offered cables are fully compliant to the relevant IEC specifications.

Cable Design

* Single mode fibres in full compliance with ITU-T G.652D
* Non-metallic and anti-buckling element FRP rod used as Central Strength Member.
* Loose buffer tubes fully filled with Thixotropic Jelly and fibre.
* Loose buffer tubes S-Z Stranded
* Cable core is Dry (Water Swellable Yarn over CSM)
* Cable core is wrapped with Water Swellable Tape.
* Chrome coated corrugated steel tape armouring.
* UV Stablized LSZH Outer sheath, Black
* Rip cord to open the sheath

Application

* Suitable for duct/Burial Installation

Special Features

* Flexible buffer tubes provide easy fibre routing inside closure
* corrugated steel tape acts as protection against rodents and mechanical damage

Cable Physical Characteristics

Fibre Count	**12**	**24**	**12**	**24**	**36**	**48**	**72**	**96**	**144**	**192**	**216**	**288**	**288**
Number of Fibres in each Loose Tube	6		12										24
Number of Loose Tube in each cable	2	4	1	2	3	4	6	8	12	16	18	24	12
Number of Filler (if Required)	4	2	5	4	3	2	0			2	0		
Number of SZ	1									2			1
Cable Diameter (mm)	10.7							12.0	14.6	15.0		17.0	17.2
Tolerance ± (mm)	0.5												
Nominal Cable Weight (kg/km)	110							142	200			254	270
Standard Length (meters)	4000 ± 5%												

Cable Mechanical & Environmental Characteristics

Test	Standard	Product Performance
Temperature Range (°C)	[IEC 60794-1-22-F1]	Installation -5°C to +70°C, Operation -30°C to +70°C, Storage -40°C to +70°C
Cable Bending Radius (mm)	[IEC 60794-1-21-E11 A & B]	20 X D , D= Cable diameter
Tensile Force (N)	[IEC 60794-1-21-E1]	**12F to 72F - 1500 N** **96F to 288F - 2500 N**
Impact Resistance (Nm)	[IEC 60794-1-21-E4]	15 Nm
Crush Resistance (N)	[IEC 60794-1-21-E3]	2500 N (100 X 100 mm)
Torsion Resistance	[IEC 60794-1-21-E7]	± 180°, L= 2 Mtr
Water Penetration	[IEC 60794-1-22-F5 B]	1 Meter Water Head, 3 Meters Cable Sample, 24 Hours

Cable Transmission Characteristics

Fibre Type		**Attenuation Coefficient (dB/Km)**					**PMD**	**Cable Cut-Off**	**MFD**
		850	**1300**	**1310**	**1550**		**ps/sqrt.km**	**nm**	**µm**
Single Mode	G.652D	-	-	≤ 0.36	≤ 0.22		≤ 0.2	≤ 1260	9.2 ± 0.4

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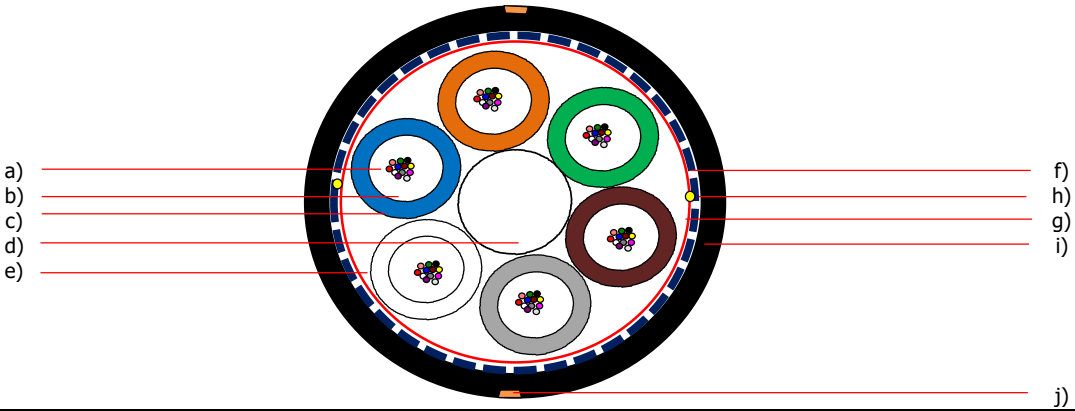
Cable Constructional Details

Cable Cross Sectional Diagram of 288F Cable [Drawing not to scale]

a)	Primary Coated Fibre	Single Mode - G652D **(8/12 Fibres Per Tube)**
b)	Tube Filling Compound	Thixotropic Jelly
c)	Loose Tubes	PBTP
d)	Central Strength Member	FRP Rod-2.1mm
e)	Core Flooding Compound	Thixotropic Jelly
f)	Armour	ECCS Tape
g)	Core Wrapping over S-Z core & Water Blocking	Polyster Tape & Water Swellable Tape
h)	Rip cord	2no.s suitable to rip open Armour & outer sheath
i)	Outer Sheath **(T = 1.8 mm Nom)**	UV stabilized black LSZH
j)	Strip Marking	2no. Diagonally opposite 3mm width in orange clr



Indentification Fibre & Loose Tube Colour

Fibre Colour	1F - 12F WITHOUT RING MARK	Blue	Orange	Green	Brown	Slate	White	Red	Black	Yellow	Violet	Pink	Aqua
	13F - 24F WITH RING MARK	Blue	Orange	Green	Brown	Slate	White	Red	Natural	Yellow	Violet	Pink	Aqua
Loose Tube Colour	Up to 144F & 288F(12T/24F)	Blue	Orange	Green	Brown	Slate	White	Red	Black	Yellow	Violet	Pink	Aqua
	For 192F & 216F 1st Layer	Blue	Orange	Green	Brown	Slate	White						
	For 192F & 216F 2st Layer	Blue	Orange	Green	Brown	Slate	White	Red	Black	Yellow	Violet	Pink	Aqua
	For 288F Layer I	Blue	Orange	Green	Brown	Slate	White	Red	Black	Yellow			
	For 288F Layer II	Blue	Orange	Green	Brown	Slate	White	Red	Black	Yellow	Violet	Pink	Aqua
		Blue	Orange	Green									

Note:- 288F Layer II Last Three Tube (blue, orange & Green) with Black Stripe mark

Filler Colour	Black

Proposed Printing Details & Method at every meters

Printing Method & Colour	Hot Foil & Contrast	CABLE ID Customer/Project Name Telephone Symbol, Laser Symbol, Number of Fibres, Type of Fibre Type of Cable YYYY Manufacturer Name Sequential Meter Marking

Proposed Stencling on Drum

Every length will be delivered on non-returnable wooden drums. Generally the cable drum flange will be marked with following: (These details can also be customised.)	* Arrow showing the direction, the drum can be rolled. * Country of origin. * The manufacturer's name * Number of fibers. * Nominal cable length in meters * Net and gross weight. * Drum number * Customer's/Project name and destination

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Specification of Single Mode Matched Clad Type Optical fibre Conforming to ITU - T Rec. G.652D

Properties	Unit	Values
Transmission		
Attenuation at 1310 nm	dB/km	≤ 0.34
Attenuation at 1550 nm	dB/km	≤ 0.20
Attenuation at 1625 nm	dB/km	≤ 0.23
Point discontinuity at 1310 & 1550 nm	dB	≤ 0.05
Difference in maximum attenuation in the range from		
1285 to 1330 nm w.r.t attenuation at 1310 nm	dB/km	≤ 0.03
1530 to 1570 nm w.r.t attenuation at 1550 nm	dB/km	≤ 0.02
Maximum chromatic dispersion at		
1285 - 1330 nm wavelength range	ps/nm.km	≤ 3.5
1270 - 1340 nm wavelength range	ps/nm.km	≤ 5.3
1550 nm	ps/nm.km	≤ 18.0
1625 nm	ps/nm.km	≤ 22.0
Zero dispersion wavelength	nm	1302 to 1322
Zero dispersion slope	nm².km	≤ 0.092
PMD at 1310 & 1550 nm	ps/sqrt.km	≤ 0.15
PMD Link Design Value at 1310 & 1550 nm**	ps/sqrt.km	≤ 0.06
Fibre cut-off wavelength	nm	≤ 1320
Cable cut-off wavelength	nm	≤ 1260
Mode field diameter range at 1310 nm	µm	9.2 ± 0.4
Mode field diameter range at 1550 nm	µm	10.4 ± 0.5
Geometrical		
Cladding Diameter	µm	125 ± 0.7
Cladding noncircularity	%	≤ 0.7
Primary Coating Diameter (uncoloured)	µm	242 ± 5
Coating Diameter (coloured)	µm	252 ± 10
Core/Clad or Mode Field concentricity error	µm	≤ 0.5
Coating / Cladding Concentricity error	µm	≤ 12
Numerical Aperature**		0.14
Refractive Index at 1310 & 1550 nm**		1.467 & 1.468
Mechanical**		
Proof Test for minimum strain level	kpsi, Gpa, %	≥ 100, ≥ 0.69, ≥ 1
Change in Attenuation with Bending		
100 Turns on 60 mm Diameter Mandrel		
at 1310	dB	≤ 0.05
at 1550	dB	≤ 0.05
1 Turn on 32 mm Diameter Mandrel		
at 1310	dB	≤ 0.5
at 1550	dB	≤ 0.5
Strippability force to remove primary coating of fibre	Newton	1.3 ≤ F ≤ 8.9
Fibre Curl	radius of curve.	≥ 4 mtrs
Dynamic tensile strength (unaged)	kpsi	≥ 550
Dynamic tensile strength (Aged)	kpsi	≥ 440
Dynamic Fatigue		≥ 20
Environmental**		
Induced attenuation at 1310 nm, 1550 nm & 1625 nm for		
Temperature & Humidity cycle from -10°C to +85°C at 98 % humidity (min), Reference Temperature 23°C	dB/km	≤ 0.05
Temperature cycle from -60°C to +85°C, Reference Temperature 23°C	dB/km	≤ 0.05
Water Immersion at 23 ± 2°C	dB/km	≤ 0.05
Accelerated Ageing (Temperature) at 85 ± 2°C, Reference Temperature 23°	dB/km	≤ 0.05

**** Fibre Manufacturer Certificate will be provided**

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