

# FIBER OPTIC CABLE PRODUCT

SINGLE TUBE, OUTDOOR ARMORED SM/MM



## PRODUCT DESCRIPTION

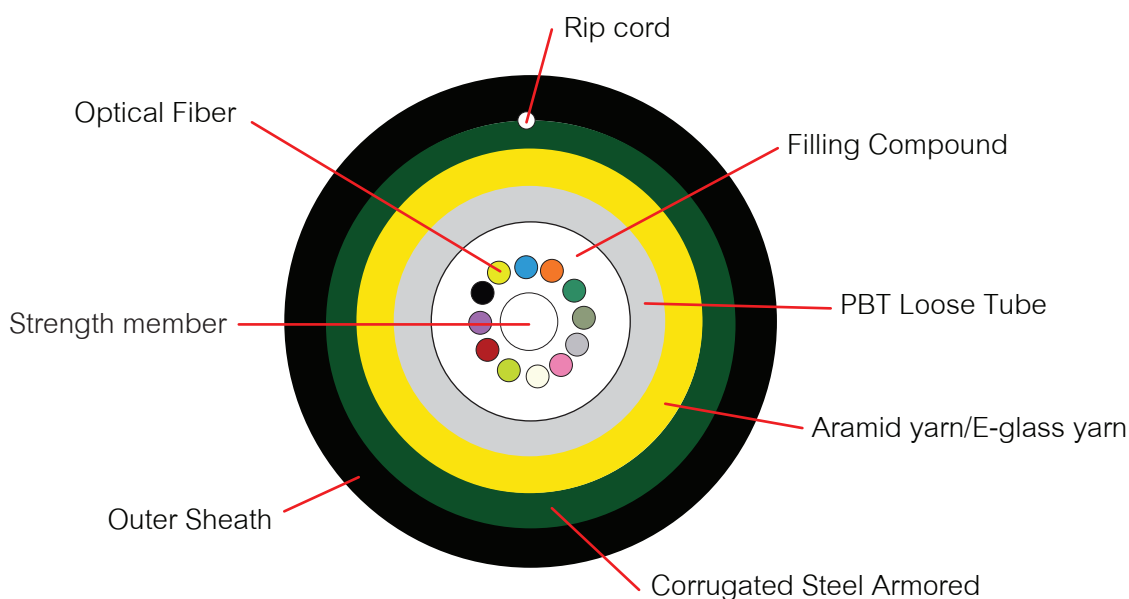
- Low attenuation, dispersion and special control of excess fiber length ensure excellent mechanical and environment properties.
- Filling compound validity prevent water penetration
- Aramid yarn/E-glass yarn increase the tensile strength of cable
- Small outer diameter, lightness and refined structure

## APPLICATION

Special design to use with. All dielectric construction, Multimode or single mode fiberoptic. Duct or Lash aerial install. IEEE802.3 (LAN, Ethernet and 10 Gigabit Ethernet) ATM, FDDI, CATV, FTTX, communication.

## STANDARD

- ATM, FDDI, FTTX, Fiber Channel, CATV, Communication
- ISO/IEC 11801:2007, ISO/IEC 11801:2011(Ed.2.2)
- ANSI/TIA/EIA-568-B.3, ANSI/TIA-568-C.3, ANSI/TIA-568.3-D, ANSI/ICEA 640
- Telcordia (Bellcore) GR-20CORE, GR-409-CORE
- ANSI/ICEA 596, ICEA696, IEC61034-2, IEC60754-2, IEC60793, IEC60794-1-2
- ITU G.652D, ITU-TG 657A2
- TIA/EIA-598-C (Rev. TIA/EIA-598-A), EIA-359-A.
- IEEE802.3z, IEEE802.3ae, IEEE802.3 (LAN, Ethernet Fast Ethernet, Gigabit Ethernet and 10 Gigabit Ethernet 40-100 Gbps)
- RoHS compliant
- TISI-2165
- Made in Thailand : MIT



## CONSTRUCTION

Structure		Parameter
Fiber count	Fibers	6/12
Loose tube	Material	PBT
	No. fiber per tube	6/12
	Diameter	Approx. 2.5
	Water blocking tape	NWF
	Rip cord	PEY
Strength member	Material	Aramid yarn/E-Glass yarn
Cable sheath	Material	Black HDPE (Protection UV compliance to ASTM / IEC ) with Rodent Repellent (LS2)
	Thickness	1.5 ± 0.2 mm
Core Diameter (µm)	Single mode / Multi mode	Single mode 9 / Multi mode 50
Cladding Diameter (µm)	9/125 µm (OS2)	125 ± 1µm
Coating Diameter (µm)		250 ± 5µm
Cable diameter overall		Approx.4.5
Cable Weight		Approx.9.6±1.0
Core-Cladding Offset		≤ 0.5 µm
Max tensile strength (N)	Short term	2700N Compliance to IEC-60794-1-2E1, TIA/EIA-455 FOTP No.33
	Long term	1000 N
Max crush resistance (N/100mm)	Short term	4400 N
	Long term	2000 N
Min bending radius	Dynamic	20 x External Cable Diameter
	Static	10 x External Cable Diameter
Operation Temperate	Storage	-20-+75°C
	Installation	-40-+80°C

## OPTICAL CHARACTERISTICS

Optical Transmission Performance	Single Mode	Multi Mode			
	1310/1383/1550/1625 nm	850/1300 nm			
	9/125 µm (OS2)	62.5/125 µm (OS1)	50/125 µm(OS2)	50/125 µm (OS3)	50/125 µm (OS4)
Max Attenuation (dB/km)	0.35/0.35/0.21/0.23	3.0/0.8	2.7/0.8	2.7/0.8	2.7/0.8
Type Attenuation (dB/km)	0.33/0.31/0.19/0.20	2.7/0.6	2.5/0.7	2.3/0.6	2.3/0.6
Bandwidth (MHz/km)	N/A	200/600	500/500	1500/500	3500/500
850nm Laser bandwidth (MHz/km)	N/A	N/A	N/A	2000	4700
Numerical	0.13 ± 0.01	0.275 ± 0.015	0.200 ± 0.015	0.200 ± 0.015	0.200 ± 0.015

## OPTICAL FIBER CHARACTERISTICS

CATEGORY	DESCRIPTION	SPECIFICATIONS
<b>Optical Specifications</b>		ITU-T G.652D(SinglemodeOS2) 9/125 μm (OS2) ITU-T G651(Multimode) 62.5/125 μm , 50/125 μm
Attenuation	@1310nm	≤0.35/≤0.33dB/km
	@1383nm	≤0.35/≤0.31dB/km
	@1490nm	≤0.24db/km
	@1550nm	≤0.21/≤0.19dB/km
	@1625nm	≤0.23/≤0.20dB/km
Attenuation discontinuity		≤0.05 dB
Attenuation vs. Wavelength	1285 -1330 @1310nm	≤0.05 dB/km
	1525 -1575@1550nm	≤0.05 dB/km
Zero dispersion wavelength		1300 -1324 nm
Zero dispersion slope		≤0.092 ps/(nm <sup>2</sup> .km)
Dispersion	@1310nm	≤3.5 ps/nm.km
	@1550nm	≤18 ps/nm.km
Polarization mode dispersion(PMD)		≤0.2 ps/km ½
Cable cutoff wavelength (λ <sub>cc</sub> )		≤1260 nm
Effective group index of reaction	@1310nm	1.4675
	@1550nm	1.4681
<b>Geometric Specifications</b>		
Mode field diameter	@1310nm	9.2 ± 0.6 μm
	@1550nm	10.4 ± 0.8 μm
Cladding diameter		125 ± 1 μm
Cladding non -circularity		≤1.0 %
Coating Material	Material	UV curable acrylate
	Diameter	250 ± 5μm
Coating/Cladding concentricity error		≤12 μm
Core/Cladding concentricity error		≤0.5μm
Color Fiber Diameter		250 μm ± 15 μm (Colored)
Fiber proof-tested		0.69 GPa ( 1.0%, 100kpsi) in accordance with the optical fiber proof test by IEC 60793-1-30

## OPTICAL FIBER CHARACTERISTICS

CATEGORY	DESCRIPTION	SPECIFICATIONS
<b>Mechanical Specifications</b>		
Proof test level		≥1.0 %
Fiber curl radius		≥4.0 m
Peak coating strip force		1.3 - 8.9N
Relative humidity		Up to 90%, no frost
Maximum Span Length	Sag 0.5%	-
	Sag 1.0%	-
Maximum Wind Velocity		126 km./hr.
Max. Tensile load	Installation	2700 N.
	Operation	1000 N.
Maximum Crush resistance		4,400 N./10 cm.
Minimum bending Radius	Installation	20 x Diameter of Cable
	Operation	10 x Diameter of Cable

## IDENTIFICATION COLOR CODE OF FIBER AND LOOSE TUBE

The color code of the loose tubes and the individual fibers within each loose tube shall be in accordance TIA/EIA-598-C (Rev.TIA/EIA-598-A) and EIA-359-A

NO.	FIBER COLOR	LOOSE TUBE COLOR
1	Blue	Blue
2	Orange	Orange
3	Green	Green
4	Brown	Brown
5	Slate	Slate
6	White	White
7	Red	Red
8	Black	Black
9	Yellow	Yellow
10	Violet	Violet
11	Rose	Rose
12	Aqua	Aqua

## PACKING AND DRUM

The cable is rounded on a non-returnable wooden drum. Cable Packing 4000m/reel. Both ends of cable are securely fastened to drum and sealed with a shrinkable cap to prevent ingress of moisture. The following information shall be marked on the outer sheath of the cable at an interval of about 1 meter.

- Cable type and number of optical fiber
- Manufacturer name
- Month and Year of Manufacture
- Cable length
- Logo and Thai word

The sequential number of the cable length shall be marked on the outer sheath of the cable at an interval of 1meter ± 1%

## TEST REQUIREMENTS

Item	Method	Acceptance criteria
Tensile test	- Max. tensile strength: 1200 N	-Fiber strain at maximum
IEC 60794-1-2-E1A	- Sample length: 50 meters	-Load max. 0.33 %
TIA/EIA-455-33A	- Times: 1 hour	-Attenuation increase $\leq 0.1$ dB
Crush or Compression test	- Load: 500 N	-No splits or cracks in the outer jacket
IEC 60794-1-2-E3	- Time: 10 minutes	-Attenuation increase $\leq 0.10$ dB
TIA/EIA-455-41A	- Length: 100 mm	
Impact test	- Impact energy: 450 g	- No splits or cracks in the outer jacket
IEC 60794-1-2-E4	- Height: 1 meter	-Attenuation increase $\leq 0.10$ dB (after the test)
TIA/EIA-455-25C	- Impact points: min.1	
	- Number of impacts: 5	
Torsion or Twist test	- 1 m cable length with 150 N weight	- No splits or cracks in the outer jacket
IEC 60794-1-2-E7	- $\pm 180^\circ$ ,10 cycles	-Attenuation increase $\leq 0.10$ dB (after the test)
TIA/EIA-455-85A		
Repeated bending	- Radius = 20 $\times$ cable outer diameter	- No splits or cracks in the outer jacket
Cable bending Test	- 1m cable length with 150 N weight, 30 cycles	-Attenuation increase $\leq 0.10$ dB (after the test)
IEC 60794-1-2-E6,		
TIA/EIA-455-104A		
IEC 60794-1-2-E11B		
Temperature cycling test	- Temperature step: +20 °C -40 °C+70 °C-40 °C	-Attenuation variation for reference
IEC 60794-1-2-F1	+70 °C+20 °C	value(the attenuation to be measured before
TIA/EIA-455-3A	- Time per each step: 16 hrs.	test at +20 $\pm$ 3 ) $\leq 0.10$ dB/km
	- Number of cycles: 2 cycles	
Water penetration test	- Water height: 1m	-No water leakage at the end of the sample
IEC 60794-1-2-F5	- Sample length:3m	
TIA/EIA-455-82B	- Duration of test: 24hrs	
Drip test	- Five 0.3m samples suspended vertically in a climate	-No filling compound shall drip from tubes after 24 hrs.
IEC 60794-1-2-E14	chamber, raised temperature to +70°C	

## ORDER INFORMATION

