

FIBER OPTIC CABLE PRODUCT

SINGLE TUBE, OUTDOOR ARMORED SM/MM



PRODUCT DESCRIPTION

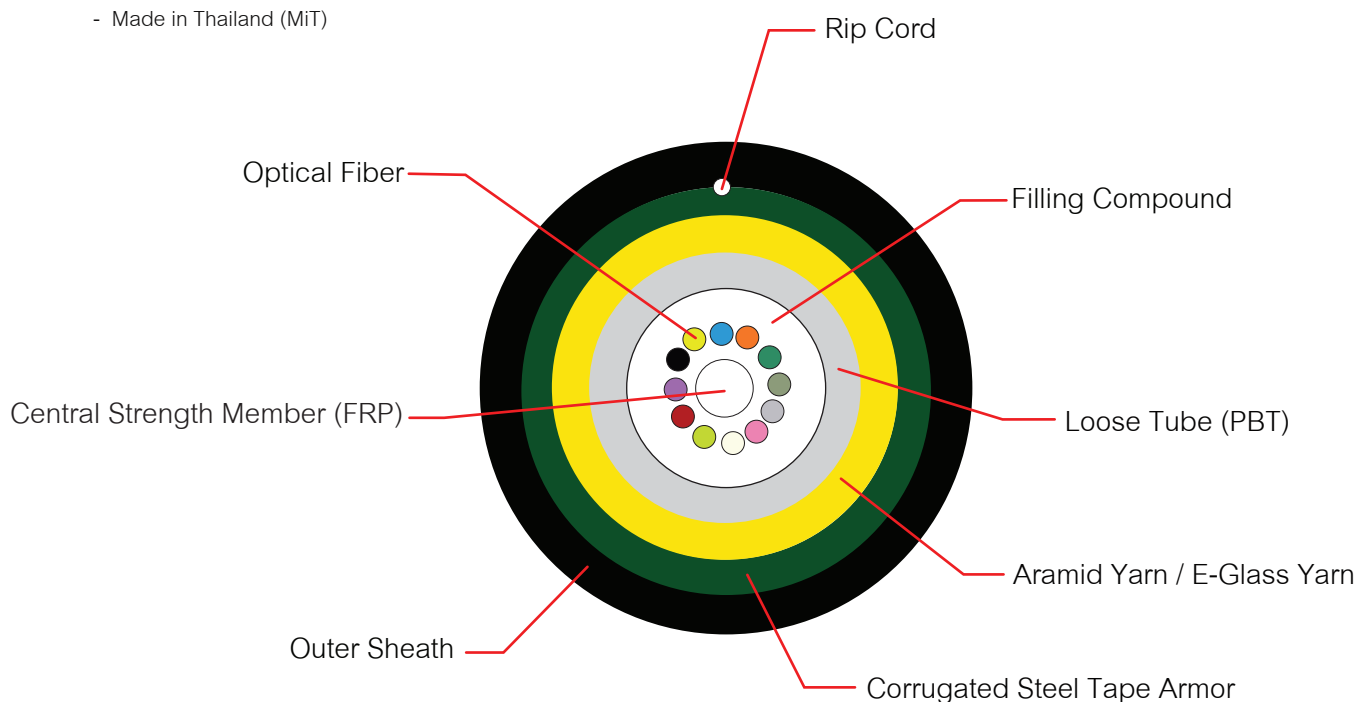
- Low attenuation and dispersion. Controlled excess fiber length ensures excellent mechanical and environmental performance.
- The filling compound effectively prevents water ingress.
- Aramid yarn/E-glass yarn increase the tensile strength of the cable.
- Small outer diameter, lightweight design, and compact structure.

APPLICATION

- Designed for use in all-dielectric construction. Compatible with both multimode and single-mode fiber optic systems. Suitable for duct or lash aerial installation.
- 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-D.3, ANSI/ICEA 640
- Telcordia (Bellcore) GR-20-CORE, 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
- TIS 2165
- Made in Thailand (MIT)



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CONSTRUCTION

Structure Field		Specification
Fiber Count	Fibers	6 / 12
Loose Tube	Material	PBT
	No. fiber per tube	6/12
	Diameter	Approx. 2.5 mm
	Water-Blocking Tape	NWF (Non-Woven Fabric)
	Rip Cord	Polyester (PET)
Strength Member	Material	Aramid yarn / E-Glass yarn
Cable Sheath	Material	Black HDPE (UV-resistant HDPE) with Rodent Repellent (LS2)
	Thickness	1.5 ± 0.2 mm
Core Diameter (μm)	Single mode / Multi mode	Single mode 9 / Multi mode 5
Cladding Diameter (μm)	9/125 μm (OS2)	125 ± 1μm
Coating Diameter (μm)		250 ± 5μm
Overall Cable Diameter		Approx 4.5 mm
Cable Weight		Approx 9.6 ±1.0 kg/km
Core-Cladding Offset		≤ 0.5 μm
Max Tensile Strength (N)	Short term	2700N Complies with IEC 60794-1-2 TIA/EIA-455 Series (FOTP)
Max Crush Resistance (N / 100 mm)	Long term	1000 N
	Short term	4400 N
	Long term	2000 N
Min Bending Radius	Dynamic	20 x External Cable Diameter
	Static	10 x External Cable Diameter
Operating Temperature	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
Typical 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)	-	200 / 600	500 / 500	1500 / 500	3500 / 500
Bandwidth (MHz/km) @ 850/1300 nm	-	-	-	2000	4700
Numerical Aperture	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	Specification
Optical Specifications		ITU-T G.652D (Singlemode OS2) 9/125 μm (OS2) ITU-T G.651 (Multimode) 62.5/125 μm , 50/125 μm
Attenuation	@1310nm	$\leq 0.35 / \leq 0.33$ dB/km
	@1383nm	$\leq 0.35 / \leq 0.31$ dB/km
	@1490nm	≤ 0.24 dB/km
	@1550nm	$\leq 0.21 / \leq 0.19$ dB/km
	@1625nm	$\leq 0.23 / \leq 0.20$ dB/km
(*Post-hydrogen aging performance according to IEC 60793-2-50 for B1.3 category)		
Attenuation Discontinuity		≤ 0.05 dB
Attenuation vs. Wavelength	1285 -1330	@ 1310nm ≤ 0.03 dB/km
	1525 -1575	@ 1550nm ≤ 0.02 dB/km
Zero Dispersion Wavelength		1300–1324 nm
Zero Dispersion Slope		≤ 0.092 ps / (nm ² .km)
Chromatic Dispersion Coefficient	@1310 nm	≤ 3.5 ps / (nm.km)
	@1550 nm	≤ 18 ps / (nm.km)
	@1625 nm	≤ 22 ps /(nm.km)
Polarization mode dispersion (PMD)		≤ 0.2 ps/km ^{1/2}
Cable Cutoff Wavelength (λ_{cc})		≤ 1260 nm (TIA/EIA-455-170)
Effective Group Index of Refraction	@1310 nm	1.4676
	@1550 nm	1.4682
Geometric Specifications		
Mode Field Diameter	@1310 nm	9.2 ± 0.6 μm
	@1550 nm	10.4 ± 0.8 μm
Cladding Diameter		125 ± 1 μm
Cladding Non-Circularity		$\leq 1\%$
Protective Coating Material	Material	UV curable acrylate
	Diameter	245 ± 5 μm (uncolored) , 250 ± 15 μm (Colored) (Refer to EIA/TIA-455-173)
Coating / Cladding Concentricity Error		≤ 12 μm
Core / Cladding Concentricity Error		$\leq 0.5\mu\text{m}$
Color Fiber Diameter		$250 \mu\text{m} \pm 15 \mu\text{m}$ (Colored)
Fiber proof-tested		0.69 GPa (1.0%, 100kpsi) in accordance IEC 60793-1-30
PMD Coefficient	@ 1550 nm	$250 \mu\text{m} \pm 15 \mu\text{m}$ (Colored)
Maximum attenuation with Macrobending loss (100 turns @ 30 mm radius)	@ 1550 nm	≤ 0.10 dB

OPTICAL FIBER CHARACTERISTICS

CATEGORY	DESCRIPTION	SPECIFICATIONS
Mechanical Specifications		
Proof Test Level		≥ 1.0 %
Minimum Fiber Curl Radius		≥ 4.0 m
Peak Coating Strip Force		1.3 - 8.9 N
Relative Humidity		Up to 90%, no frost
Maximum Span Length	0.5% Sag	-
	1.0% Sag	-
Maximum Wind Velocity		80 m and wind force 126 Km/hr
Maximum Tensile Load	Installation	2700 N
	Operation	1000 N
Maximum Crush Resistance		4400 N / 10 cm
Minimum Bending Radius	Installation	20x Cable Diameter
	Operation	10x Cable Diameter
Thermal Oxidative Stability (OIT Test)		OIT @ 200°C > 40 minutes (IEC 60811-410)
Initial Sag		1% of span length 80 m.

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 (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

- Cable is packed on a non-returnable wooden reel, with a length of 4000 m per reel.
- Both ends shall be sealed with a shrinkable cap to prevent moisture ingress.
- The following information shall be printed on the outer sheath of the cable at approximately 1-meter intervals:
 - Cable type and number of optical fibers
 - Cable length
 - Manufacturer name
 - Logo and Thai language text
 - Month and Year of Manufacture
- The sequential meter marking shall have a tolerance of ±1% per meter.

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 ≤ 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 ≤ 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 ≤ 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 ≤ 0.10 dB (after the test)
TIA/EIA-455-85A		
Repeated bending	- Radius = 20 × 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 ≤ 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) ≤ 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

