

# FIBER OPTIC CABLE PRODUCT

MULTI TUBE, OUTDOOR, ARMORED SINGLE JACKET SM



## PRODUCT DESCRIPTION

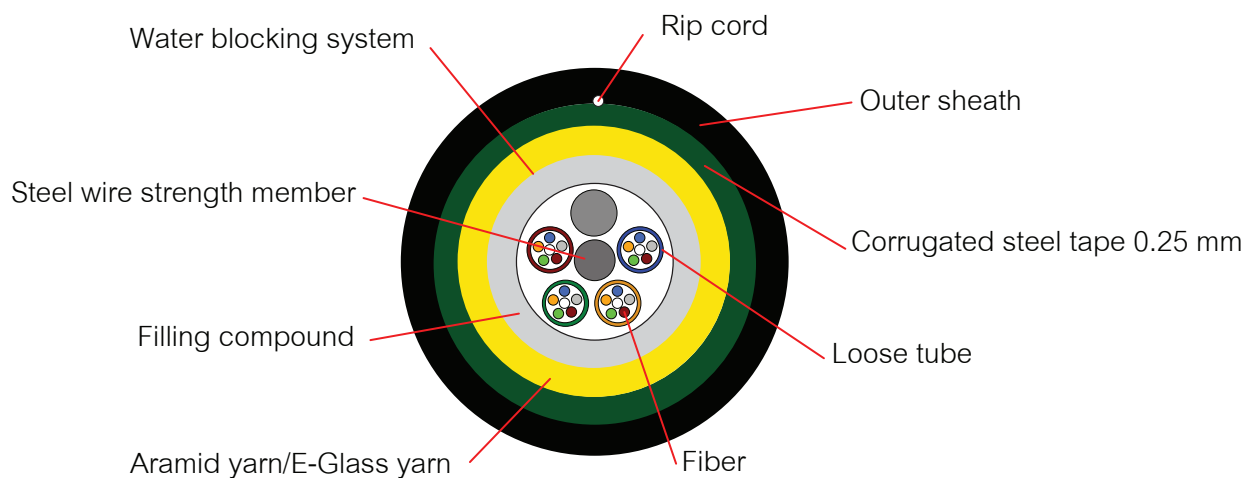
- Low attenuation, dispersion and special control of excess fiber length ensure excellent mechanical and envelopment properties.
- Filling compound and water block material validly prevent water penetration.
- Aramid yarns increase the tensile strength of cable

## APPLICATION

- Special design for used together with outdoor and indoor
- All dielectric construction
- Duct or Lash Aerial install
- Multi-mode or single-mode fiber optic
- IEEE802.3 (LAN, Ethernet fast Ethernet)
- ATM, FDDI, CATV, FTTH, communication

## STANDARD

- ATM, FDDI, FTTH, 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	6/12/24	48	96
Cores of per tube	--	6	12	12
Loose tube	Multi Tube	φ1.8 mm	φ2.1	φ2.1
Element	--	5	5	5
Cable diameter	mm	9.6	10.3	12.3
Cable sheath thickness	Material	Outer Jacket	HDPE (non Rodent Repellent/Rodent Repellent(LS2))	
		Aarmor	Corrugated steel tape coated with polymer on both sides	
	Cable core	mm	1.5 ± 0.2 mm	
Cable height		mm	Approx.16.7	Approx.17.4
		N	3000	
Crush resistance	Short term		1000N/mm	
	Long term		100N/mm	
Bending radius	Dynamic	mm	20H	
	Static	mm	10H	
Operating temperature		Storage	-40-+75°c	
		Installing	-40-+80°c	
Max. tensile load	Installing		3600N	
	Long term		1800N	
Rip Cord	Material		Polyester cords	
	Number		One	

## 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	3,600 N.
	Operation	1,800 N.
Maximum Crush resistance		1,000 N./10 cm.
Minimum bending Radius	Installation	20 x Diameter of Cable
	Operation	10 x Diameter of Cable

## OPTICAL FIBER CHARACTERISTICS

CATEGORY	DESCRIPTION	SPECIFICATIONS
<b>Optical Specifications</b>		ITU-T G.652D(Singlemode OS2) 9/125 $\mu\text{m}$ (OS2) ITU-T G651(Multimode) 62.5/125 $\mu\text{m}$ , 50/125 $\mu\text{m}$
Attenuation	@1310nm	$\leq 0.35/\leq 0.33\text{dB/km}$
	@1383nm	$\leq 0.35/\leq 0.31\text{dB/km}$
	@1490nm	$\leq 0.24\text{dB/km}$
	@1550nm	$\leq 0.21/\leq 0.19\text{dB/km}$
	@1625nm	$\leq 0.23/\leq 0.20\text{dB/km}$
Attenuation discontinuity		$\leq 0.05\text{ dB}$
Attenuation vs. Wavelength	1285 -1330 @1310nm	$\leq 0.05\text{ dB/km}$
	1525 -1575@1550nm	$\leq 0.05\text{ dB/km}$
Zero dispersion wavelength		1300 -1324 nm
Zero dispersion slope		$\leq 0.092\text{ ps}/(\text{nm}^2.\text{km})$
Dispersion	@1310nm	$\leq 3.5\text{ ps}/\text{nm.km}$
	@1550nm	$\leq 18\text{ ps}/\text{nm.km}$
Polarization mode dispersion(PMD)		$\leq 0.2\text{ ps}/\text{km}^{1/2}$
Cable cutoff wavelength ( $\lambda_{cc}$ )		$\leq 1260\text{ nm}$
Effective group index of reaction	@1310nm	1.4675
	@1550nm	1.4681
<b>Geometric Specifications</b>		
Mode field diameter	@1310nm	$9.2 \pm 0.6\ \mu\text{m}$
	@1550nm	$10.4 \pm 0.8\ \mu\text{m}$
Cladding diameter		$125 \pm 1\ \mu\text{m}$
Cladding non -circularity		$\leq 1.0\%$
Coating Material	Material	UV curable acrylate
	Diameter	$250 \pm 5\ \mu\text{m}$
Coating/Cladding concentricity error		$\leq 12\ \mu\text{m}$
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 with the optical fiber proof test by IEC 60793-1-30

## 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  $\pm$  1%

## TEST REQUIREMENTS

Item	Method	Acceptance criteria
Tensile test	- Max. tensile strength: 3000 N	-Fiber strain at maximum
IEC 60794-1-2-E1A	- Sample length: 100 meters	-Load max. 0.33 %
TIA/EIA-455-33A	- Times: 1 hour	-Attenuation increase $\leq 0.1$ dB
Crush or Compression test	- Load: 1000 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 × 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

