

# FIBER OPTIC CABLE PRODUCT

SINGLE TUBE, INDOOR/OUTDOOR CABLE SM/MM



## PRODUCT DESCRIPTION

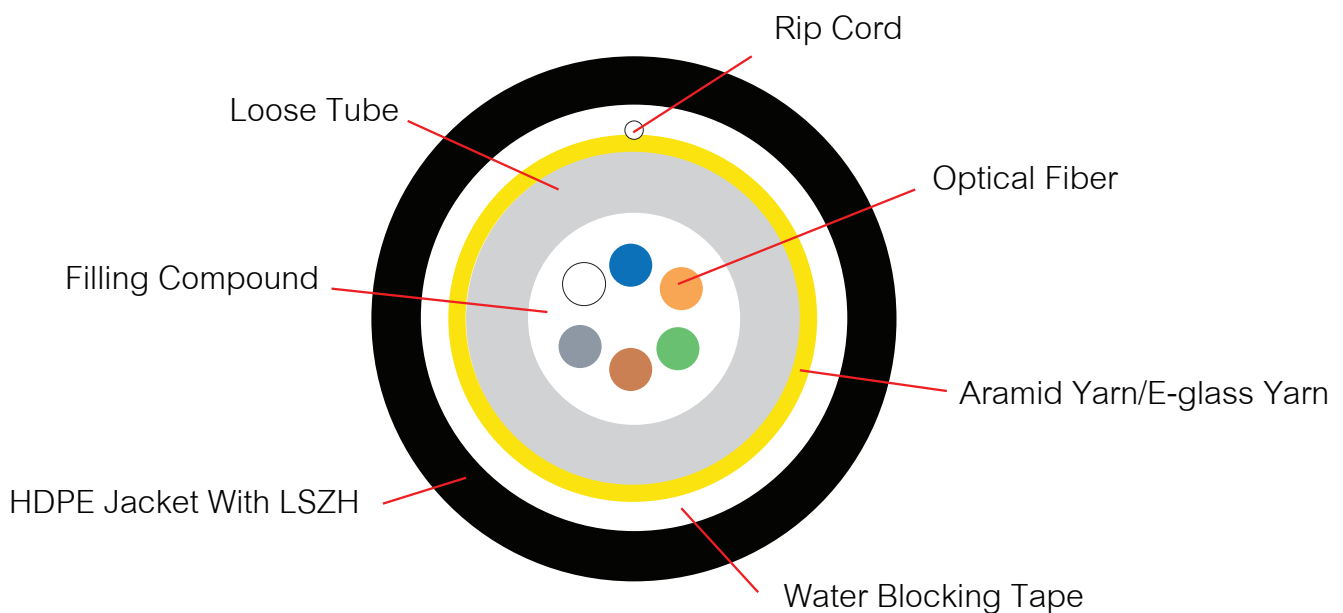
- Low attenuation, dispersion and special control of excess fiber length ensure excellent mechanical and envelopment properties.
- Filling compound and water block material validly prevent water penetration.

## APPLICATION

- Optical transmission cables for transmission equipment, data processing equipment also suitable for general cabling.
- Laying method : Conduit, aerial, direct buried, shelf
- Temperature range -40 °C - +70 °C

## 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 0.3mm
	Rip cord	PEY
Strength member	Material	Aramid yarn/E-Glass yarn
Cable sheath	Material	HDPE with LSZH 1.6 ± 0.2 mm, with Rodent Repellent (LS2)
Core Diameter (µm)	Single mode / Multi mode	Single mode 9 / Multi mode 50
Cladding Diameter (µm)	9/125 µm (OS2)	125
Coating Diameter (µm)		250
Cable diameter overall		Approx.4.5
Cable Weight		Approx.9.6±1.0
Max tensile strength (N)	Short term	2700 N
	Long term	600 N
Max crush resistance (N/100mm)	Short term	2000 N
	Long term	1000 N
Min bending radius	Dynamic	15D
	Static	10D
Operation Temperate	Storage	-20-+75°C
	Installation	-40-+80°C
Rip Cord	Material	Polyester cords

## 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(Singlemode OS2)
Attenuation	@1310nm	$\leq 0.35/\leq 0.33$ dB/km
	@1383nm	$\leq 0.35/\leq 0.31$ dB/km
	@1490nm	$\leq 0.24$ dB/km
	@1550nm	$\leq 0.21/\leq 0.19$ dB/km
	@1625nm	$\leq 0.23/\leq 0.20$ dB/km
Attenuation discontinuity		$\leq 0.05$ dB
Attenuation vs. Wavelength	1285 -1330 @1310nm	$\leq 0.05$ dB/km
	1525 -1575@1550nm	$\leq 0.05$ dB/km
Zero dispersion wavelength		1300 -1324 nm
Zero dispersion slope		$\leq 0.092$ ps/(nm <sup>2</sup> .km)
Dispersion	@1310nm	$\leq 3.5$ ps/nm.km
	@1550nm	$\leq 18$ ps/nm.km
Polarization mode dispersion(PMD)		$\leq 0.2$ ps/km <sup>1/2</sup>
Cable cutoff wavelength ( $\lambda_{cc}$ )		$\leq 1260$ nm
Effective group index of reaction	@1310nm	1.4675
	@1550nm	1.4681
<b>Geometric Specifications</b>		
Mode field diameter	@1310nm	9.2 ± 0.6 $\mu$ m
	@1550nm	10.4 ± 0.8 $\mu$ m
Cladding diameter		125 ± 1 $\mu$ m
Cladding non -circularity		$\leq 1.0$ %
Coating Material	Material	UV curable acrylate
	Diameter	250 ± 5 $\mu$ m
Coating/Cladding concentricity error		$\leq 12$ $\mu$ m
Core/Cladding concentricity error		$\leq 0.5$ $\mu$ m
Color Fiber Diameter		250 $\mu$ m ± 15 $\mu$ m (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%	40 m.
	Sag 1.0%	80 m.
Maximum Wind Velocity		126 km./hr.
Max. Tensile load	Installation	2700 N.
	Operation	600 N.
Maximum Crush resistance		2000 N./10 cm.
Minimum bending Radius	Installation	15 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 $\leq$ 0.1dB
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 $^\circ$ C -40 $^\circ$ C+70 $^\circ$ C-40 $^\circ$ C	-Attenuation variation for reference
IEC 60794-1-2-F1	+70 $^\circ$ C+20 $^\circ$ C	value(the attenuation to be measured before
TIA/EIA-455-3A	- Time per each step: 16 hrs.	test at +20 $\pm$ 3 ) $\leq$ 0.10dB/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 $^\circ$ C	

## ORDER INFORMATION

