

FIBER OPTIC CABLE PRODUCT

ADSS FIBER OPTIC SINGLE JACKET FRP CABLE



PRODUCT DESCRIPTION

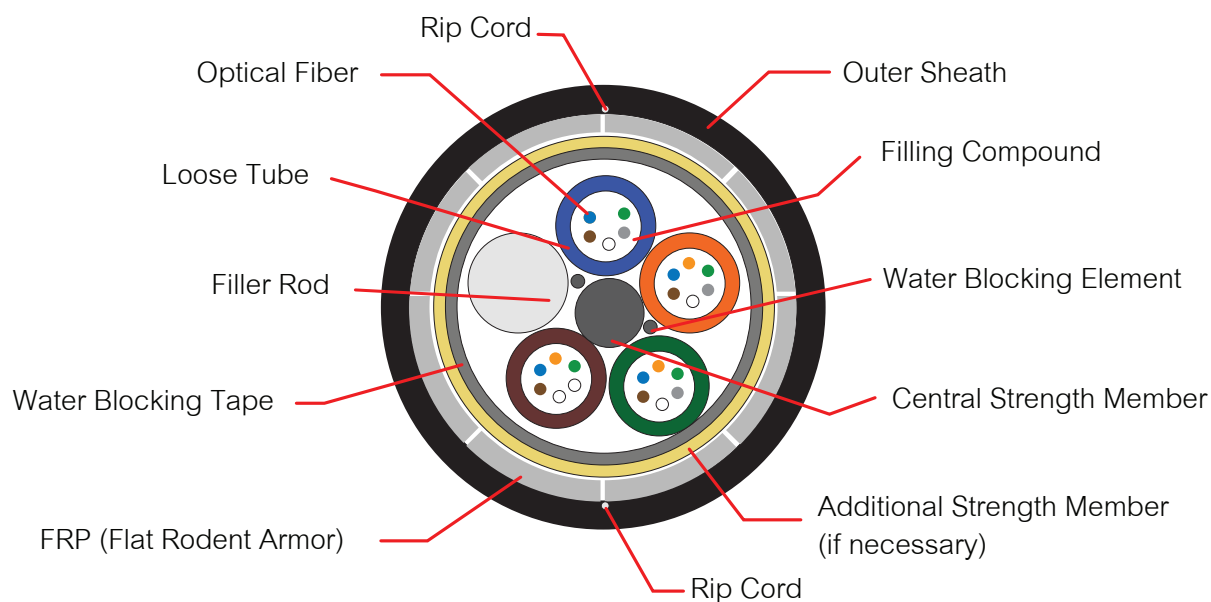
- Provide additional mechanical protection
- low friction installation
- Excellent protection from environmental hazards
- Code colour fiber and loose tube
- The cable shall be used for duct or aerial installed

APPLICATION

- Environment with high electric field strength in the Power communication system and the area where frequent thunder happens.
- Ethernet LAN Network, CCTV, Network Camera, PLC

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, ICEA 696, IEC 61034-2, IEC 60754-2, IEC 60793, IEC 60794-1-2
- ITU G.652D, ITU-TG 657A2, IEC 60794-1-2E4, TIA-455-25C
- TIA/EIA-598-C (Rev. TIA/EIA-598-A), EIA-359-A.
- IEEE 802.3z, IEEE 802.3ae, IEEE 802.3 (LAN, Ethernet Fast Ethernet, Gigabit Ethernet and 10 Gigabit Ethernet 40-100 Gbps)
- RoHS compliant
- TIS 2166-2548,
- Made in Thailand : MiT



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CONSTRUCTION CABLE

Cable type		ADSS
Element	-	5
Fiber Optic	Material	Silica High Grade / Compound Glass
Central strength member	Material	FRP 1.8 ± 0.2 mm
Loose tube	Material	PBT
	Outer Diameter	2.0 ± 0.2 mm
	Inner Diameter	1.5 ± 0.2 mm
	-	6 fiber per tube, Thixotropic Jelly Compound
Protective tape	Material	Water -blocking tape, Water blocking yarn
Strength member	Material	Aramid yarns
Rodent Protection Armor	Material	Flat FRP Non-Metallic type (FRP: Fiber Reinforced Plastics) Nominal thickness 1.0 ± 0.2 mm
Outer Sheath	Material	Black HDPE (non Rodent Repellent/Rodent Repellent) The cables sheath shall be made of UV-Proof Flame Retardant Polyethylene (FRPE) and containing a suitable antioxidant to offer maximum protection in hostile environment (detail as show in Table 3 Cable Sheath specification). Do not reuse material or mixed
	Thickness	1.8 ± 0.2 mm
Rip Cord	Material	Polyester
	No.	2
Filler Rod	Material	Polyethylene, natural Color
	Diameter	2.2 mm ± 0.2 mm
Stranding method	-	Reverse oscillating lay (ROL) technique (SZ Direction)
	-	Lay -length 75 mm ± 5 mm
Tensile Load	Short term	3600 N
	Long term	2500 N
	Pressure	≥ 3400 N / 10 cm
Overall diameter	Diameter	12 mm
Cable diameter	Diameter (24/48 core)	10.5 ± 1mm / 11.5 ± 1mm.
Weight	(24/48 core)	Approx. 85 / 100 ± 10 kg/km
Span Length		40-100m
Water Blocking Element		Dry-core technology
Width		≥ 126 km/hr
Temperature Range	Operation Temperature	-40°C to +70 °C
	Installation Temperature	-40°C to +70 °C
	Storage/Shipping Temperature	-40°C to +75°C
Color Stripe		3 mm ± 0.5mm

NO. OF FIBER IN EACH TUBE (TIA/EIA-598-A)

No. of fiber	No. of tube	Tube color	1	2	3	4	5
24	4	Tube color	Blue	Orange	Green	Brown	F
		No. of fiber	6	6	6	6	
48	4	Tube color	Blue	Orange	Green	Brown	F
		No. of fiber	12	12	12	12	

OPTICAL FIBER CHARACTERISTICS

CATEGORY	DESCRIPTION	SPECIFICATIONS
Optical Specifications		ITU-T G.652D(Singlemode OS2) 9/125 μm (OS2) ITU-T G651 (Multimode) 62.5/125 μm , 50/125 μm
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	$\leq 0.23/\leq 0.20\text{dB/km}$
*at this wavelength represents post hydrogen aging performance according to IEC 60793-2-50 regarding the B1.3 fiber category. *		
Attenuation discontinuity		$\leq 0.05\text{ dB}$
Attenuation vs. Wavelength	1285 -1330	$\leq 0.05\text{ dB/km}$
	1525 -1575	$\leq 0.05\text{ dB/km}$
Zero dispersion wavelength		1300 -1324 nm
Zero dispersion slope		$\leq 0.092\text{ ps}/(\text{nm}^2.\text{km})$
Dispersion	@1310nm	$\leq 3.5\text{ ps/nm.km}$
	@1550nm	$\leq 18\text{ ps/nm.km}$
Polarization mode dispersion(PMD)		$\leq 0.2\text{ ps/km } \frac{1}{2}$
Cable cutoff wavelength (λ_{cc})		$\leq 1260\text{ nm}$ (Refer to TIA/EIA-455-170)
Effective group index of reaction	@1310nm	1.4675
	@1550nm	1.4681
Geometric Specifications		
Mode field diameter	@1310nm	$9.2 \pm 0.6\text{ }\mu\text{m}$
	@1550nm	$10.4 \pm 0.8\text{ }\mu\text{m}$
Cladding diameter		$125 \pm 1\text{ }\mu\text{m}$
Cladding non -circularity		$\leq 1.0\%$
Mode field diameter	Material	UV curable acrylate
	Diameter	$245 \pm 5\mu\text{m}$ (uncolored) , $250 \pm 15\mu\text{m}$ (Colored) (Refer to EIA/TIA-455-173)
Coating/Cladding concentricity error		$\leq 12\text{ }\mu\text{m}$
Core/Cladding concentricity error		$\leq 0.5\mu\text{m}$
Color Fiber Diameter		$250\text{ }\mu\text{m} \pm 15\text{ }\mu\text{m}$ (Colored)
Fiber proof-tested		0.69 GPa (1.0%, 100kpsi) in accordance with the optical fiber proof test by IEC 60793-1-30
PMD Coefficient	@ 1550 nm.	$250\text{ }\mu\text{m} \pm 15\text{ }\mu\text{m}$ (Colored)
Maximum attenuation with macrobending of fiber 100 turns 30 mm. radius	@ 1550 nm.	$\leq 0.10\text{ dB}$

OPTICAL FIBER CHARACTERISTICS

CATEGORY	DESCRIPTION	SPECIFICATIONS
Mechanical Specifications		
Proof test level		$\geq 1.0 \%$
Fiber curl radius		$\geq 4.0 \text{ m}$
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	3,600 N. for 6-96 Cores
	Operation	2,500 N. for 6-96 Cores
Maximum Crush resistance		3,400 N./10 cm.
Minimum bending Radius	Installation	20 x Diameter of Cable
	Operation	10 x Diameter of Cable
Thermal oxidative stability (OIT-Test)		OIT at 200 °C > 40 min (IEC 60811-410)
Initial Sag		1% of span length 80 m.
Relative humidity		Up to 90%, no frost

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
13-16	-	Color 1-4 with a black tracer

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
- Cable length
- Manufacturer name
- Logo and Thai word
- Month and Year of Manufacture

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

Cable Sheath Test

The procedure for testing fiber cable sheath for compliance with clause shall be as follows or by equivalent method:

Test Parameter	Test Standard Method
1. Carbon Black	ISO 6964, ASTM D1603 Standard Test Method for Carbon Black in Olefin Plastics.
2. Tensile strength	ASTM D638
3. Elongation	ASTM D638
4. Environmental stress cracking	ASTM D1693
5. Shrinkback Slab	cut from the cable sheaths 5 cm.(2 in.) long, 13 mm.(1/2 in.) wide, and the same thickness as the cable sheath. The slab specimens shall be placed in a convection type circulating air oven operating at a temperature of $100 \pm 1^{\circ}\text{C}$ for 4 hours period for inner sheath and $115 \pm 1^{\circ}\text{C}$ for 4 hours period for outer sheath
6. Thermal Oxidation Stability	ASTM D3895

Flame Propagation

Test Standard	IEC 60332-1 Test of the fire behaviour on a single Cable (Flame retardancy)
Sample Length	600 ± 25 mm.
Overall diameter of test piece	$D \leq 25$ mm.
Time for flame application (s)	60 sec
Test result	The cable shall pass the test, if the distance between the lower edge of the top support and the onset of charring is greater than 50 mm. All soot is to be ignored. Softening or any deformation of the non-metallic is also to be ignored.

TEST REQUIREMENTS

Item	Method	Acceptance criteria
Tensile test	- Max. tensile strength: 3600 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 ≤ 0.1 dB
Crush or Compression test	- Load: 4400 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 = $20 \times$ 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 ≤ 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: $+20^\circ\text{C} -40^\circ\text{C} +70^\circ\text{C} -40^\circ\text{C}$	-Attenuation variation for reference
IEC 60794-1-2-F1	$+70^\circ\text{C} +20^\circ\text{C}$	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 $+70^\circ\text{C}$	

ORDER INFORMATION

