

# FIBER OPTIC CABLE PRODUCT

ADSS FIBER OPTIC DOUBLE JACKET FRP.



## PRODUCT DESCRIPTION

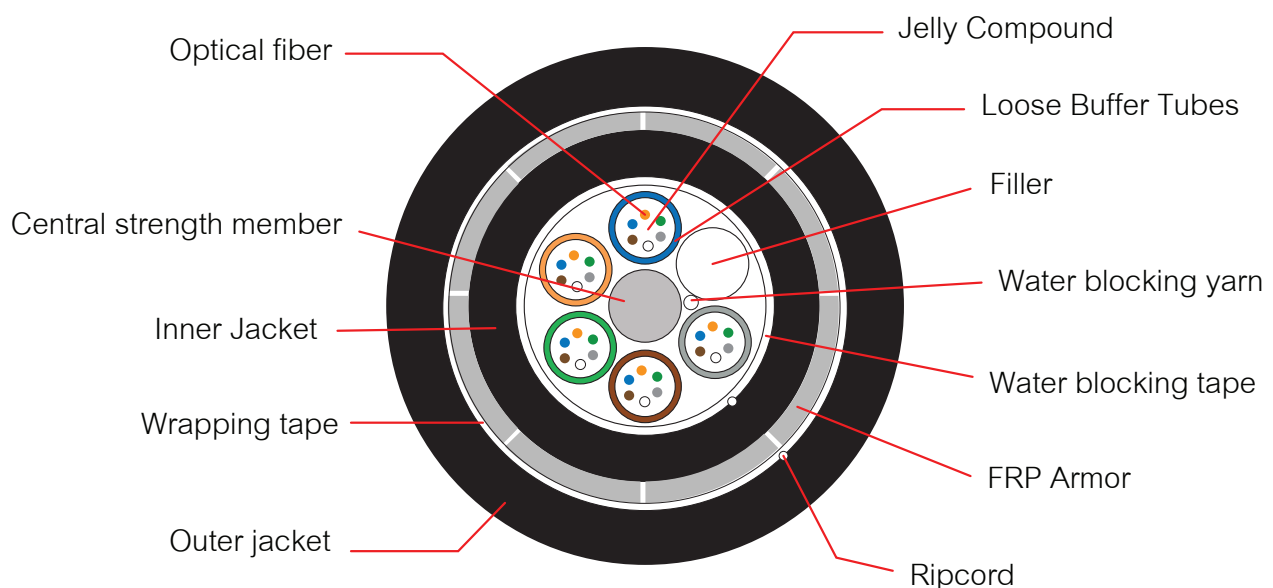
- Provide additional mechanical protection
- low friction installation
- Excellent protection from environmental hazards
- Code colour fiber and loose tube
- The cable shall be used for duct or aerial installed

## 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, 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
- TIS 2166
- Made in Thailand : MiT



## 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   |
|                         | Diameter                     | 2.0 ± 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 ± 0.2mm                               |
| Inner Sheath            | Thickness                    | 1.0 ± 0.2 mm  |
|                         | Material                     | High Density Polyethylene (HDPE)                            |
| Outer Sheath            | Material                     | UV-Proof Black HDPE (non Rodent Repellent/Rodent Repellent) |
|                         | Thickness                    | 1.8 ± 0.2 mm  |
| Rip Cord                | Material                     | Polyester   |
|                         | No.                          | 2   |
| Filler Rod              | Material                     | Polyethylene, natural Color                                 |
|                         | Diameter                     | 2.2mm±0.2mm   |
| Stranding method        | -                            | Reverse oscillating lay (ROL) technique (SZ Direction)      |
|                         | -                            | Lay-length 75mm±5mm   |
| Tensile Load            | Short term                   | 7000N   |
|                         | Long term                    | 3600N   |
|                         | Pressure                     | ≥ 3400 N/10cm   |
| Overall diameter        | Diameter                     | 12.0-13.0 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

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

## OPTICAL FIBER CHARACTERISTICS

| CATEGORY                                   | DESCRIPTION        | SPECIFICATIONS   |
|--|--------------------|--|
| <b>Optical Specifications</b>              |                    | ITU-T G.652D(Singlemode OS2)<br>9/125 μm (OS2)<br>ITU-T G651(Multimode)<br>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)          |                    | ≤0.1 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%     | 40 m.                  |
|                                  | Sag 1.0%     | 80 m.                  |
| Maximum Wind Velocity            |              | 126 km./hr.            |
| Max. Tensile load                | Installation | 7000 N.                |
|                                  | Operation    | 3600 N.                |
| Maximum Crush resistance         |              | 3,400 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: 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 $\leq$ 0.1dB                       |
| Crush or Compression test | - Load: 2200 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

