

Optical fiber / Loose tube / Gel free / Corrugated steel tape / PE outer jacket

Standards

ITU-T G.652, 657, IEC 60793, 60794-1-2
 ISO 9001:2015, 14001:2015, TIA 598-C, 598-D
 ANSI/ICEA S-87-640-2016
 RUS 7 CFR 1755
 GR 20 Core compliant glass



Application

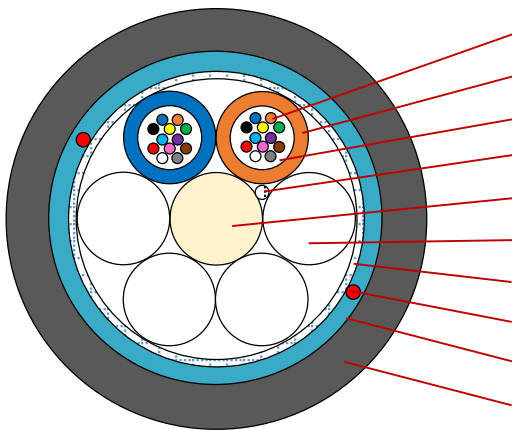
Direct buried
 Local area network
 Long haul communication system
 Junction communication system
 Communication link

Features

Easy installation
 Robustness & Flexibility
 Distinguishable by color of fiber & Loose tube
 Essential for moisture protection
 UV-resistant outer jacket

Cable Cross Section

In case of 24C fiber cable



- Optical fiber**
- Loose tube:** PBT or PP
- Dry block(s):** Water blocking yarn in tube
- Dry block(s):** Water blocking yarn in core
- Central strength member:** FRP (PE coated, if necessary)
- Filler:** Natural color
- Water blocking tape**
- Ripcord(s)**
- Armor:** Corrugated steel tape
- Outer jacket:** Black color MDPE or HDPE

Cable Construction

| Fiber count | Unit position | Active tube | Fibers per tube | Nominal cable outer diameter | | Nominal cable weight | |
|-------------|---------------|-------------|-----------------|------------------------------|------|----------------------|-------|
| | | | | inch | mm | lbs/kft | kg/km |
| 12 ~ 72 | 6 | 1 ~ 6 | 12 | 0.480 | 12.2 | 91 | 135 |
| 96 | 8 | 8 | 12 | 0.539 | 13.7 | 114 | 170 |
| 144 | 12 | 12 | 12 | 0.669 | 17.0 | 161 | 240 |
| 192 ~ 216 | 18 (6+12) | 16 ~ 18 | 12 | 0.689 | 17.5 | 161 | 240 |
| 288 | 24 (9+15) | 24 | 12 | 0.787 | 20.0 | 208 | 310 |
| 432 | 18 (6+12) | 18 | 24 | 0.846 | 21.5 | 229 | 340 |
| 576 | 24 (9+15) | 24 | 24 | 0.965 | 24.5 | 292 | 435 |

Fiber Characteristics for Single Mode Fiber

| Fiber type | | ITU-T G.652D | ITU-T G.657A1 |
|--------------------------------|-------------|--|--|
| Mode field diameter (MFD) | | 9.2 $\mu\text{m} \pm 0.4 \mu\text{m}$ @1310 nm | 8.9 $\mu\text{m} \pm 0.4 \mu\text{m}$ @1310 nm |
| Mode field concentricity error | | $\leq 0.8 \mu\text{m}$ | |
| Cladding diameter | | 125 $\mu\text{m} \pm 1 \mu\text{m}$ | |
| Cladding non-circularity | | $\leq 1.0 \%$ | |
| Coating diameter | | 245 $\mu\text{m} \pm 15 \mu\text{m}$ | |
| Attenuation | Up to 288 F | $\leq 0.35 \text{ dB/km}$ @ 1310 nm $\leq 0.25 \text{ dB/km}$ @ 1550 nm | |
| | Up to 576 F | $\leq 0.40 \text{ dB/km}$ @ 1310 nm $\leq 0.30 \text{ dB/km}$ @ 1550 nm | |
| Chromatic dispersion | | $\leq 3.5 \text{ ps/(nm.km)}$ @ 1285 ~ 1330 nm $\leq 18 \text{ ps/(nm.km)}$ @ 1550 nm | |
| Cable cut-off wavelength | | $\leq 1260 \text{ nm}$ | |
| Zero dispersion wavelength | | 1300 nm ~ 1324 nm | |
| Zero dispersion slope | | $\leq 0.092 \text{ ps/nm}^2.\text{km}$ | |
| Proof test | | Nom. 100 kpsi | |

Fiber & Tube Identification

| Color code | #1 ~ #12 | Blue | Orange | Green | Brown | Grey | White | Red | Black | Yellow | Violet | Pink | Aqua |
|------------|-----------|--------|----------|---------|---------|--------|---------|-------|-------|----------|----------|--------|--------|
| | #13 ~ #24 | Blue * | Orange * | Green * | Brown * | Grey * | White * | Red * | #20 | Yellow * | Violet * | Pink * | Aqua * |

*: Fiber with black color dots, Tube with a black color stripe

#20: Natural color fiber with black color dots, Black color tube with a white or yellow color stripe

Temperature Range

| | |
|-------------------------------|--------------------------------------|
| Installation | - 22 °F ~ 140 °F (- 30 °C ~ + 60 °C) |
| Operation, Storage, Transport | - 40 °F ~ 158 °F (- 40 °C ~ + 70 °C) |

Cable Bend radius & Marking & Packing

| | |
|--------------|---------------------|
| With load | 20 X Cable diameter |
| Without load | 10 X Cable diameter |

Jacket Marking & Packing

| | | |
|---------|----------|---|
| Marking | Sequence | Customer (Upon request), Part number, Serial number (4~5 digits), Fiber type, Fiber count, Manufacturer, Manufacture year (YYYY), Length marking (Every 2 feet or 1mtrs), |
| | Example | BU-9E-24-P-A-SS-MD-F-0 00001 G652D 24F GAON CABLE 2022 00002FT |
| | Method | Hot foil indent (White color) |
| Packing | Length | Standard 15,000 ft |

Mechanical & Environmental Tests (Based on GR-20 core & ICEA S-87-640)

| Test items | Test method | Description | Acceptance criteria ¹⁾ |
|---------------------|-----------------|--|-----------------------------------|
| Tensile strength | IEC 794-1-2 E1 | ≥ 90 m, 40 D ²⁾ , 2,700 N, 60 min | Δ ≤ 0.15 dB, after test |
| Crush resistance | IEC 794-1-2 E3 | 2,200 N / 100 mm plate, 10 min | Δ ≤ 0.15 dB, after test |
| Impact resistance | IEC 794-1-2 E4 | 9.8 N.m, 3 different points | Δ ≤ 0.15 dB, after test |
| Cable bend | IEC 794-1-2 E11 | 20 D, 4 turns | Δ ≤ 0.15 dB, after test |
| Torsion | IEC 794-1-2 E7 | 2m sample, 50N, 10 cycles, ± 180° | Δ ≤ 0.15 dB, after test |
| Water penetration | IEC 794-1-2 F5 | 3m sample, 1m height, 24 h | No leakage |
| Temperature cycling | IEC 794-1-2 F1 | ≥ 500 m sample, soak: 12 h, 2 cycles, + 23 °C, - 40 °C, + 70 °C, + 23 °C | Δ ≤ 0.15 dB/km, after test |

¹⁾ It shall be measured at 1550nm for single mode fiber. The acceptance measurement equipment error is 0.02dB.

²⁾ Cable diameter

Part number

| Description | | BU – P1 – P2 – P3 – P4 – P5 – P6 – P7 – P8 | |
|----------------------|-----------|--|--------------------|
| Fiber type | <u>P1</u> | 9E: G.652D | A1: G.657A1 |
| Fiber count | <u>P2</u> | 12 ~ 576 | |
| Tube material | <u>P3</u> | P: PBT | Y: PP |
| Fibers per tube | <u>P4</u> | A: 12 | B: 24 |
| Construction | <u>P5</u> | SS: Single jacket single armor | |
| Jacket material | <u>P6</u> | MD: MDPE | HD: HDPE |
| Length unit | <u>P7</u> | F: Feet | M: Meter |
| Special requirements | <u>P8</u> | 0: No special requirement | |

Example (SJSA, 652D, 24F cable, PBT tube, MDPE jacket, FT unit): **BU-9E-24-P-A-SS-MD-F-0**

Revised Record

| Revised number | Date | Description |
|----------------|---------------|---|
| 5 | Oct, 15, 2020 | Modify Mechanical & Environmental Performance & Tests |
| 6 | Feb, 19, 2021 | Remove characteristics of multi-mode fiber, G.657A2 |
| 7 | Sep, 14, 2021 | Add standards (ICEA, RUS), Application, zero dispersion wavelength, marking method, part number |
| 8 | Aug. 24, 2022 | Unit is changed for chromatic dispersion |