# ROLLABLE RIBBON FA-KZX167

## Description

Specification for Central Core Rollable Ribbon Cable (3456 Fibers, G.657.A1, 250µm fiber, 144f unit)

Optical Fiber Cable for duct application. The Optical Fiber used in this cable complies with fiber attributes of ITU-T G.657.A1 and allows smaller bending radius in comparison with conventional optical fiber.

## Optical Fiber

Table 1 - Construction of the Optical Fiber

| Item | | | Specification |
|---|---|---|---|
| Fiber Type | | | Step Index, Matched Clad type, Single Mode Optical Fiber |
| Core | | Material | Doped silica |
| Cladding | | Material | Silica |
| Primary Coating | Inner Layer | Material | UV curable acrylate |
| Primary Coating | Outer Layer | Material | UV curable acrylate |
| Mode field diameter (at 1310 nm) | | Nominal Value | 8.6 - 8.9 µm |
| | | Tolerance | ± 0.4 µm |
| Cladding diameter | | | 125 µm ± 1 µm |
| Core concentricity error | | | Max. 0.5 µm |
| Cladding non-circularity | | | Max. 1 % |
| Cable cut-off wavelength | | | Max. 1260 nm |
| Proof stress | | | Min. 0.69 GPa (equivalent to 1 % fiber strain) |
| Zero dispersion wavelength | | | 1300 nm - 1324 nm |
| Slope at zero dispersion wavelength | | | Max. 0.092 ps/(nm².km) |
| Bending characteristics (R=15mm, 10 turns) | | | ≤0.25 dB at 1550 nm<br>≤1 dB at 1625 nm |
| Colored coating fiber diameter | | | 250 µm ± 15 µm |
| Identification | | | Color coding |

## Rollable Ribbon

Table 2 - Construction of Optical Fiber Rollable Ribbon

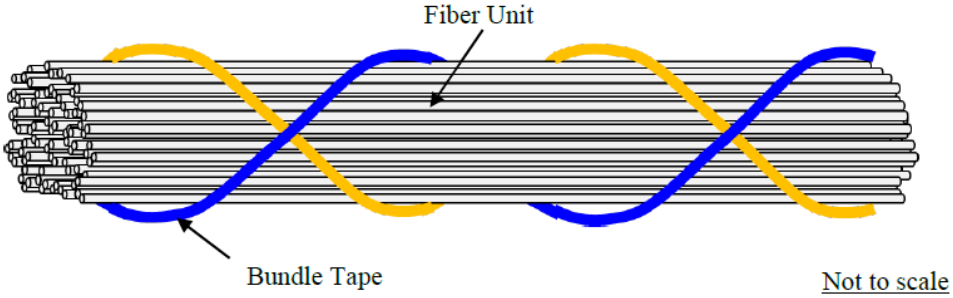
| Item | | Specification |
|---|---|---|
| Optical fiber | Spec. | Same as Table 1 |
| | Number | 12 |
| Coupling | Material | UV curable acrylate |
| Ribbon dimensions | Thickness | Nominal 0.26 mm |
| | Width | Nominal 3.1 mm |
| Ribbon type | | Intermittently coupled |
| Identification | | Color code shown in Table 5 |
| | | Printing on ribbon shown in Table 6 |

## Fiber Unit

Table 3 - Construction of 144 fibers Unit

| Item | | Specification |
|---|---|---|
| Optical Fiber Ribbon | Spec. | Same as Table 2 |
| | Number | 12<br>Total 144 fibers |
| Bundle tape | Material | Plastic, colored |
| Identification | | Color code shown in Table 7 |

Fig 1 - Side view of the 144 fibers ribbon unit

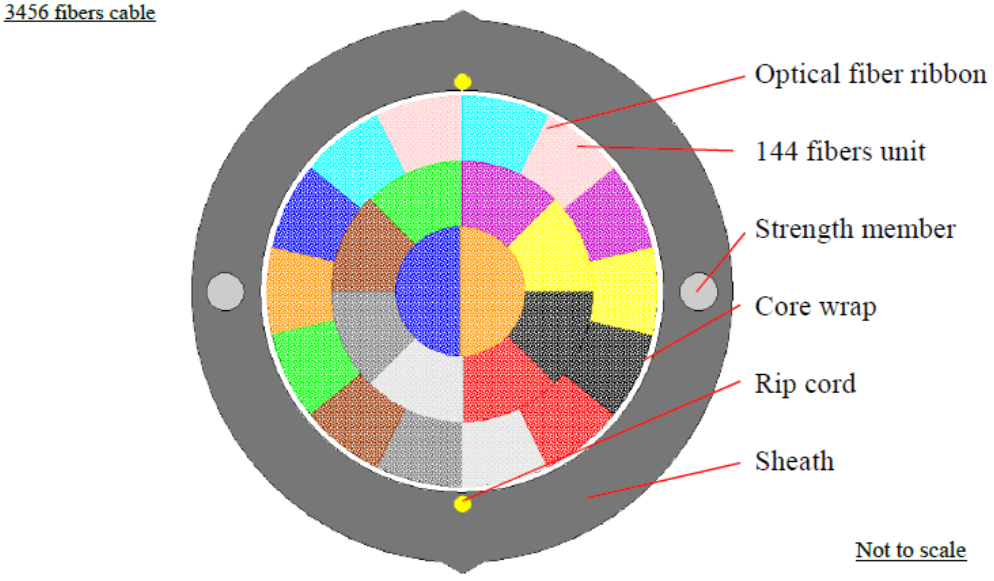


## Optical Fiber Cable Construction

Table 4 - Construction of Optical Fiber Cable (3456 fibers)

| Item | | Description |
|---|---|---|
| Fiber count | | 3456 |
| Fiber ribbon | Spec. | The same as Table 2 |
| | Number | 144 |
| 144 fibers unit | Spec. | The same as Table 3 |
| | Number | 24 |
| Core wrap | Material | Water Blocking tape |
| Strength member | Material | FRP |
| | Number | 2 |
| Sheath | Material | Polyethylene, black color |
| Cable dimension (Approx.) | | 27 mm |
| Cable weight (Approx.) | | 500 kg/km |
| Structure | | Fig. 2 |

Fig 2 - Cross sectional view of the Cable



## Optical Fiber Rollable Ribbon Identification

Table 5 - Color code of optical fiber ribbon

| Fiber No. | Color |
|---|---|
| 1 | Blue |
| 2 | Orange |
| 3 | Green |
| 4 | Brown |
| 5 | Slate |
| 6 | White |
| 7 | Red |
| 8 | Black |
| 9 | Yellow |
| 10 | Violet |
| 11 | Rose |
| 12 | Aqua |

Table 6 - Printing of optical fiber ribbon

| Ribbon No. | Printing | Ribbon No. | Printing | Ribbon No. | Printing |
|---|---|---|---|---|---|
| 1 | ▌ | 6 | ▉▌ | 11 | ▉▉▌ |
| 2 | ▌▌ | 7 | ▉▌▌ | 12 | ▉▉▌▌ |
| 3 | ▌▌▌ | 8 | ▉▌▌▌ | - | - |
| 4 | ▌▌▌▌ | 9 | ▉▌▌▌▌ | - | - |
| 5 | ▉ | 10 | ▉▉ | - | - |

## Fiber Unit Identification

Table 7 - Color code of optical fiber unit

| No. | Color 1 | Color 2 |
|---|---|---|
| 1 | Blue | Red |
| 2 | Orange | Red |
| 3 | Green | Red |
| 4 | Brown | Red |
| 5 | Slate | Red |
| 6 | White | Red |
| 7 | Blue | Black |
| 8 | Orange | Black |
| 9 | Green | Black |
| 10 | Brown | Black |
| 11 | Slate | Black |
| 12 | White | Black |
| 13 | Blue | Yellow |
| 14 | Orange | Yellow |
| 15 | Green | Yellow |
| 16 | Brown | Yellow |
| 17 | Slate | Yellow |
| 18 | White | Yellow |
| 19 | Blue | Violet |
| 20 | Orange | Violet |
| 21 | Green | Violet |
| 22 | Brown | Violet |
| 23 | Slate | Violet |
| 24 | White | Violet |

## Optical Characteristics

Table 8 - Optical Properties of Cable

| Wavelength | Attenuation | | |
|---|---|---|---|
| | L < 0.2 km | 0.2 km ≤ L < 1 km | 1 km ≤ L |
| 1310nm | ≤ 0.2 dB | ≤ 0.25L + 0.15 dB | ≤ 0.4L dB |
| 1383nm* | ≤ 0.2 dB | ≤ 0.25L + 0.15 dB | ≤ 0.4L dB |
| 1550nm | ≤ 0.2 dB | ≤ 0.125L + 0.175 dB | ≤ 0.3L dB |

*After hydrogen aging according to IEC 60793-2 regarding the B1.3 fibre category.

## Physical Characteristics

Table 9 - Technical information of the cable

| Item | Specification |
|---|---|
| Minimum Bending Radius (for dynamic) | 20 x D |
| Minimum Bending Radius (for static) | 10 x D |
| Maximum pulling tension (short term) | 2700 N |
| Maximum pulling tension (long term) | 810 N |
| Temperature range | Storage: -30 °C - +70 °C<br>Installation : 0 °C - +60 °C<br>Operation : -30 °C - +70 °C |

Note: Furukawa Electric reserves the right to improve, enhance and modify the features and specification of this product without prior notification.

## Mechanical and Environmental Characteristics

Table 10 - Environmental and Mechanical characteristics of cable

| Test | Test Method | Test Conditions |
|---|---|---|
| Tensile Performance Test | IEC 60794-1-21-E1<br>Long term | Specimen length: Suitable length<br>Sheave diameter: Suitable sheave<br>Load: 2700 N x 10 min |
| | IEC 60794-1-21-E1<br>Short term | Specimen length: Suitable length<br>Sheave diameter: Suitable sheave<br>Load: 810 N x 10 min |
| Crush Test | IEC 60794-1-21-E3 | Specimen length: Suitable length<br>Load: 2200 N/100 mm<br>Duration: 1 minute |
| Impact Test | IEC 60794-1-21-E4<br>(7a) | Specimen length: Suitable length<br>Impact energy: 1 kg.m<br>Striking surface: Flat<br>Number of strike: 3 (different place) |
| Repeated Bending Test | IEC 60794-1-21-E6 | Specimen length: Suitable length<br>Mandrel: Minimum bending radius<br>Number of Cycles: 10 |
| Torsion Test | IEC 60794-1-21-E7 | Specimen length: 1 m<br>Rotation: ±90°<br>Cycles: 3 |
| Temperature Cycling Test | IEC 60974-1-22-F1 | Temperature range: -30 °C to 70 °C<br>Time at temperature: At least 6 hr. each temp. |

| | | |
|---|---|---|
| | | Number of cycles: Not less than 3 cycle |
| Water Penetration Test | IEC 60794-1-22-F5C | Specimen length: 40 m<br>Height of water: 1 m<br>Duration: 240 h |

| | |
|---|---|
| Marking | The following information shall be printed by suitable method on the outer sheath of the cable with white color in one-meter intervals:<br>Name of Manufacturer<br>Number of fiber-fiber size: “3456F-250”<br>Number of unit: “144U”<br>Year of manufacture<br>Length marking |
| Package | Drum: the cable shall be delivered at the required length on a non-returnable wooden drum. The drum is designed to prevent damage to the cable during shipment and installation<br>Cable end: the both end of the cable shall be fitted with a suitable cap. |