Cross Section

Cable Design

Central-Element: 5,5 mm filled Aluminum Tube
1st Layer: 4 x 3,3 mm Aluminum Alloy Wire + 4 x 3,3 mm Aluminum Clad Steel Wire (Right Hand Lay)

Technical Characteristics

Rated Tensile Strength (RTS) 54 kN
Diameter (approx.) 12,1 mm
Weight of Cable (approx.) 375 kg/km
Modulus of Elasticity 110 kN/mm²
Cross Section AA Wire / Cross Section ACS Wire 34 / 34 mm²
Total Metallic Cross Section 82 mm²
Iₚ (T initial = 20°C) calculated with 7,6 kA / 1 sec 58 kA²s

DC Resistance (T = 20°C) 0,526 Ohm/km
Coefficient of Linear Expansion 15,6 10⁻⁶/K
Bending Radius; During Installation / After Installation > 245 / > 185 mm
Standard Delivery Length / Extended Delivery Length 3 - 7 / on request km
Temperature Range for Installation -30 to +50 °C
Temperature Range for Transportation and Operation -40 to +80 °C

Max. Attenuation SMF E9 at 1310 nm / at 1550 nm 0,36 / 0,2 dB/km
Max. Dispersion SMF E9; 1288 nm to 1339 nm / at 1550 nm 3,5 / 18 ps/(nm·km)
Fiber Standard: SMF E9 fibers according to ITU-T G 652.D
**Armoring: Single Layer Armoring**

A single layer of armoring wires is stranded around an aluminum central buffer tube. The specific wire materials are given in the enclosed cross section drawing. This design provides excellent lightning protection under mechanical load and prevents the fiber from thermal stress under fault current conditions.

Before stranding the wires are pre-formed. This allows the wires to remain in position, even when the cable is cut. Thus simple cable termination and field operations are ensured. The standard lay direction of the outer armoring is right-hand lay, left-hand lay is available on request.

**Optical Unit: Aluminum Central Buffer Tube**

A hermetically sealed optical unit is formed by a central aluminum buffer tube. Fibers are enclosed in the tube with a defined excess length in order to ensure a suitable operating window. This means, even if a tensile load is applied to the cable causing cable elongation, there will be no fiber strain and no increase in fiber attenuation. Central Buffer Technology provides excellent thermal and mechanical protection of the fibers. The tube is filled with a water blocking filling compound in order to avoid water penetration and migration. As a result, the optical fibers will not be affected by external influences.

**Fiber Identification: Groups of Bundled Fibers**

The fibers are colored with UV-cured ink. 12 different colors according to TIA/EIA-598 ("Teldcordia Code") are available. Customized coloring is available on request. The central buffer tube contains 24 fibers.

To allow identification, the fibers are divided in 2 groups of 12 fibers. These groups are held together by colored binders. The following color code is used:

<table>
<thead>
<tr>
<th>Fiber Color Coding</th>
<th>Group / Binder</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 blue, orange, green, brown, slate, white, red, black, yellow, violet, rose, aqua</td>
<td>1 / blue</td>
</tr>
<tr>
<td>2 blue, orange, green, brown, slate, white, red, black, yellow, violet, rose, aqua</td>
<td>2 / orange</td>
</tr>
</tbody>
</table>

**General: Applicable Standards for Cable and Wire**

- IEC 60794-4-1: Optical Fibre Cables – Part 4-1: Aerial Optical Cables for High-Voltage Power Lines
- European Standard (EN) 50182: Conductors for overhead lines, Round wire concentric lay stranded conductors
- IEC 60104 Aluminium-Magnesium-Silicon Alloy Wire for Overhead Line Conductors
- IEC 61232 Aluminium-Clad Steel Wires for Electrical Purposes