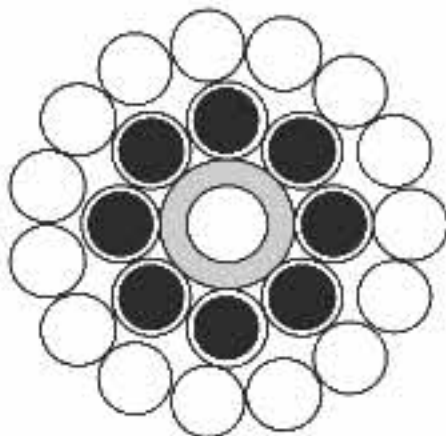


## OPGW-DABB 24E9 (AA/ACS 153/96)

### Cross Section



### Cable Design

Central-Element: 6.5 mm filled Aluminum Tube

1st Layer: 8 x 3.9 mm Aluminum Clad Steel Wire (Left Hand Lay)

2nd Layer: 15 x 3.6 mm Aluminum Alloy Wire (Right Hand Lay)

### Technical Characteristics

Ultimate Tensile Strength (UTS)	165	kN
Diameter (approx.)	21.5	mm
Weight of Cable (approx.)	1140	kg/km
Modulus of Elasticity	97	kN/mm <sup>2</sup>
Cross Section AA Wire / Cross Section ACS Wire	153 / 96	mm <sup>2</sup>
Total Metallic Cross Section	269	mm <sup>2</sup>
Pt (T initial = 20°C) calculated with 23 kA / 1 sec	530	kA <sup>2</sup> s
DC Resistance (T = 20°C)	0.16	Ohm/km
Coefficient of Linear Expansion	16.6	10 <sup>-6</sup> /K
Bending Radius; During Installation / After Installation	> 430 / > 325	mm
Standard Delivery Length	3 - 5	km
Temperature Range for Installation	-10 to +50	°C
Temperature Range for Transportation and Operation	-50 to +80	°C
Max. Attenuation SMF E9 at 1310 nm / at 1550 nm	0.36 / 0.22	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: Double Layer Armoring**

A double 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.

**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 ("Telcordia 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:

Fiber Color Coding:												Group / Binder
1	2	3	4	5	6	7	8	9	10	11	12	
blue,	orange,	green,	brown,	slate,	white,	red,	black,	yellow,	violet,	rose,	aqua	1 / blue
blue,	orange,	green,	brown,	slate,	white,	red,	black,	yellow,	violet,	rose,	aqua	2 / orange

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

- IEEE Std 1138-1994: IEEE Standard Construction of Composite Fiber Optic Overhead Groundwire (OPGW) for use on Electric Utility Power Lines
- 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