

# OPGW Cable P/N F90480431A

## OPG-9-TXFF-187(10ACS+26AA2.57)-D34-48

Product Specification No. OPG-001

Revision: B

Date: 11.1.2010

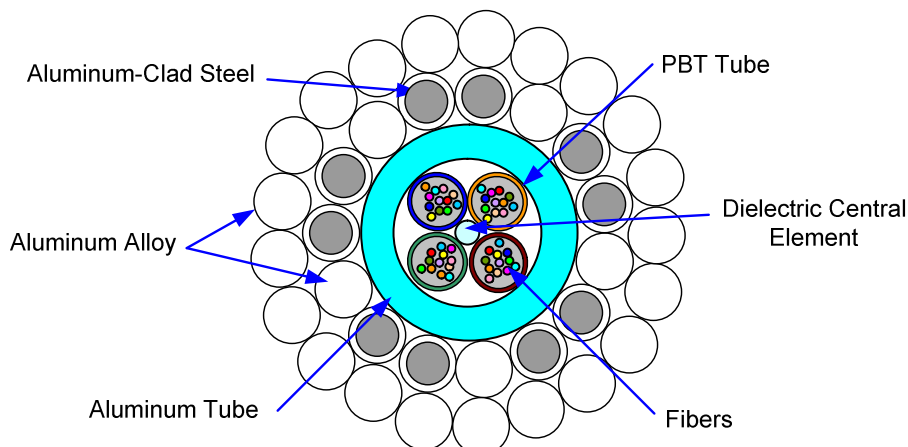
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### 1. Scope

This document specifies an Optical Ground Wire (OPGW) cable. The cable design is based on four loose PBT tubes containing up to 12 fibers each enclosed in a seamless aluminum tube. The electrical wire is made in two layers containing 10 aluminum clad steel support wires and 26 aluminum alloy conductors.

### 2. Cable Description

- Up to 48 single mode fibers are used. The fibers meet or exceed the specifications in ITU-T G.652.D and IEC 60793-2-50 (B1.3 fibers).
- Up to Twelve single mode fibers are enclosed in each PBT tube. The nominal tube outer diameter is 2.5 mm.
- The tubes and fibers are color coded for easy identification (see Par. 5 for details).
- The tubes are filled with a thixotropic gel to prevent water penetration.
- Four tubes are SZ stranded around a dielectric central element.
- The stranded tubes are enclosed in a seamless, continuously cast aluminum tube having an outside diameter of 10.3 mm and an inner diameter of 7.9 mm.
- All interstices in the tube are filled with a thixotropic gel to prevent water penetration.
- Two metal layers are contra-helically laid around the fiber-containing aluminum tube.
  - inner layer: 10 ACS (aluminum-clad steel) support wires  
5 AA (aluminum alloy) conductor wires  
lay length – 229, left hand direction
  - outer layer: 21 AA (aluminum alloy) conductor wires  
lay length – 255, right hand direction
- The outer diameter of the wires is 2.57 mm.
- The cable structure is shown below.



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### 3. Nominal Dimensions and Weight

Diameters	
Araweld (aluminum-clad steel) wires	10 x 2.57 mm
Aluminum alloy wires	26 x 2.57 mm
Aluminum tube (outside/inside diameters)	10.3/7.9 mm
Cross Sections	
Araweld cross section area	51.87 mm <sup>2</sup>
Aluminum alloy cross section area	134.87 mm <sup>2</sup>
Aluminum tube cross section area	34.31 mm <sup>2</sup>
Total cross section area	221.06 mm <sup>2</sup>
General	
Overall diameter	20.58 m
Weight	852 kg/km

### 4. Electrical, Mechanical and Environmental Properties

Property	Specification	Standard
Electrical		
Maximum cable DC resistance @ 20°C	0.1688 Ω/km	
Minimum I <sup>2</sup> t	400 kA <sup>2</sup> s	
Al-clad steel wire resistivity	≤0.0848 Ωmm <sup>2</sup> /mm	
Al alloy wire resistivity	≤0.03253 Ωmm <sup>2</sup> /mm	
Mechanical – Cable		
Cable rated tensile strength (RTS)	107,900 N	IEC 61089
Cable modulus of elasticity	8300 kg/mm <sup>2</sup> (Typical)	IEC 61089
Cable coefficient of linear expansion	18.5x10 <sup>-6</sup> (Typical)	
Minimum long-term bending radius	41 cm	IEC 60794-1-2-E11
Tensile performance	Fiber attenuation change ≤0.05 dB @ 30% of RTS	IEC 60794-1-2-E1
Sheave test	No visual damage to cable elements	IEC 60794-1-2-E18
Aeolian vibrations	No visual damage to cable elements	IEC 60794-1-2-E19
Creep (after 10 years) at 20% of RTS	≤520 mm/km	IEC 61935
Short circuit Test	20 kA/sec	IEC 60794-1-2-H1
Lightning Test	Meets Class 0 definition	IEC 60794-1-2-H2
Mechanical - Al-Clad wires		
Al-clad steel wire tensile strength	≥1340 MPa	ASTM B-415
Al-clad steel wire elongation at break	≥1.5 %	ASTM B-415
Aluminum thickness	≥129 μm	ASTM B-415
Al-clad steel wire torsion	≥20 turns	ASTM B-415

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Property	Specification	Standard
<b>Mechanical – Al Alloy wires</b>		
Al alloy wire tensile strength	295 MPa	IEC 60104
Al alloy elongation at break	≥3.5 %	IEC 60104
Wrapping test	No wire break	IEC 60104
<b>Environmental</b>		
Temperature cycling	2 cycles, -20°C to 70°C	IEC 60794-1-2-F1
Water penetration	1 m water head, 1 m cable length, 24 hours	IEC 60794-1-2-F5A

## 5. Optical Properties

The SM fibers meet or exceed the requirements of ITU-T G.652D. The maximum fiber attenuation in any cable section is:

- @ 1310 nm ≤ 0.35 dB/km
- @ 1550 nm ≤ 0.22 dB/km

Detailed fiber specifications are available on request.  
 The fibers do not contain splices.

## 6. Tube and Fiber Color-Code

The standard color code of the fibers and the tubes is per TIA/EIA 598 as detailed below.

Tube/Fiber Number	Color
1	Blue
2	Orange
3	Green
4	Brown

Fiber Number	Color
5	Grey
6	White
7	Red
8	Black

Fiber Number	Color
9	Yellow
10	Violet
11	Pink
12	Turquoise

