



# Caledonian

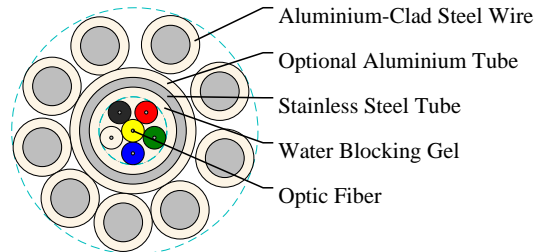
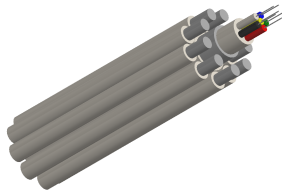
## Fiber Optic Cables

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### Overhead Power Ground Wire (OPGW) FIBER CABLE

#### Central Loose Tube Type



### APPLICATIONS

OPGW is a dual functioning cable performing the duties of a ground wire and also providing a path for the transmission of voice, video or data signals. The fibers are protected from environmental conditions (lightning, short circuit, loading) to ensure reliability and longevity. The cable is designed to be installed on transmission and distribution lines to carry voice, data and video communications, especially in lightning waveform monitoring system, an observation system for overhead test line, maintenance data information system, power line protection system, power line operation system, and unmanned substation monitoring.

#### Features:

Colored coded fibers and binders for quick and easy identification during installation

Compact design results in excellent sag tension performance of the cable

Aluminium-clad steel wires and Aluminium alloy wires provides mechanical strength to withstand the installation and operating conditions, while achieving conductivity required to control temperature rise, during the short circuit fault condition

Optical unit placed inside the Aluminium tube provides exceptional mechanical and thermal protection for the fiber against severe environments and external lateral force

Thick walled Aluminium tubes provide hermetic seal for optical units, providing excellent crush resistance and low resistivity

Unique design has maximum allowable tension to control fiber strain

Stranded wires used for optimizing the mechanical and electrical properties of the cables

High load, long span capability

### PRODUCT DESCRIPTION

OPGW cable has two constructions:

Central loose tube type---The fibers are placed loosely in a sealed and water resistant stainless steel tube filled with water blocking gel. This tube provides protection to the fibers during installation and operation under severe environmental conditions. Aluminium layer over the tube is optional. The stainless optical tube is located at the center of the cable protected by single or multiple layers of aluminium clad steel and aluminium alloy wires. The Aluminium-clad steel wires are shaped trapezoidally around the optical unit to provide compact construction. The metallic wires provide mechanical strength to withstand severe installation and operating conditions, while achieving conductivity to control temperature rise during short circuit conditions.



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This type can accommodate up to 48 fibers in a cable. Despite such a high fiber count in a single tube, each optical fiber is clearly distinguishable utilizing a fiber identification system consisting of coloring and the number of ring marks on it. This compact design features high mechanical strength and fault current rating within a smaller diameter. The smaller diameter also results in excellent sag tension performance.

**Multi loose tube type---** The fibers are placed loosely in a sealed and water resistant stainless steel tube filled with water blocking gel. Two or three stainless steel optical tubes are helically stranded in the inner layer of a multiple-layer cable. The multi loose tube type is designed mostly for very high fiber count requirement over 48 with the maximum fiber count reaching 144. The multi loose tube type can meet the requirement of huge cross and large current capacity.

### STANDARDS

IEC60794-1-2

IEEE 1138-1994

### PHYSICAL AND THERMAL PROPERTIES

The effective sectional area of the single-layer design ranges from 50mm<sup>2</sup> to 83mm<sup>2</sup>, suitable for rated voltages of 66kV, 115kV, 150kV, 250kV and 275kV.

The effective sectional area of the double-layer design ranges from 90mm<sup>2</sup> to 200mm<sup>2</sup>, suitable for rated voltages of 150kV, 250kV, 275kV, 380kV and 500kV.

The effective sectional area of the three-layer design ranges from 200mm<sup>2</sup> to 400mm<sup>2</sup>, suitable for rated voltages of 380kV, 420kV and 500kV in European markets.

### MECHANICAL PROPERTIES

Minimum Bending Radius:

Under installation: 20XOD

During operation: 10XOD for unarmoured cables

20XOD for armoured cables

Temperature Range:

Operating Temperature Range: -40°C(-40°F) to +70°C(+158°F)

Storage Temperature Range: -45°C(-58°F) to +70°C(+158°F)

Maximum Compressive Load: 4000N for unarmoured cables

6000N for armoured cables

Repeated Impact: 4.4 N.m (J)

Twist (Torsion): 180X10 times, 125XOD

Cyclic Flexing: 25 cycles for armoured cables;

100 cycles for unarmoured cables.

Crush Resistance: 220N/cm (125lb/in)

### DIMENSION AND PARAMETERS

Nominal Cross-sectional Area	Approx. Overall Diameter	Approx. Overall Diameter	Max. DC Resistance at 20°C	Cable Weight	Cable Weight	Max. Working Tension	Modulus of elasticity	Heat expansion coefficient (10-6/°C)	Short-circuit current capacity
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mm <sup>2</sup>	in	mm	$\Omega$ /km	Lbs./Kft	kg/km	N/lb	kN/mm <sup>2</sup>		kA2s
90	0.492	12.5	0.473	246.98	368	58.2	94.1	17.3	72.7