

## Composite fiber optic overhead ground wire (OPG W-95)

### Definition of OPGW

OPGW (optical ground wire) is a type of conductor that is used in the construction of electric power transmission lines. Here the conductor combines both the functions of grounding and communications. OPGW contains a tubular structure with one or more optical fibers in it, surrounded by layers of galvanized steel and aluminium alloy wire. In the OPGW system, the conductor serves as a normal ground wire, protecting the phase conductors against the lightning strikes. The optical fibers are integrated in a stainless steel tube filled with a thixotropic jelly and hermetically sealed to provide best protection of enclosed fibers at any stage of the installation or operation.

### Optical Fibers

The optical fiber of the OPGW is manufactured and designed to provide optimum transmission services. These fibers are used primarily in telecommunications networks characterised by long distance links and high capacity.

### TECHNICAL SPECIFICATIONS

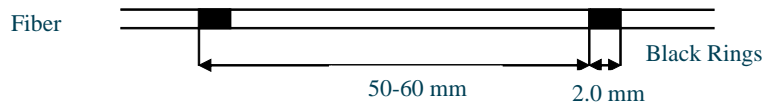
Aluminium Alloy Wire Diameter	mm	2.60 ± 0.03
Aluminium Clad Steel Wire Diameter	mm	2.60 ± 0.05
O/F Stainless Steel Tube Diameter	mm	2.60 ± 0.05
OPGW Conductor Diameter	mm	13.00 ± 0.5
Number of Aluminium Clad Steel Wire	center	1
Number of Aluminium Clad Steel Wire	1 st Layer	5
Number of Stainless Steel Tube	1 st Layer	1
Number of Aluminium Alloy (AAA) Wire	2 nd Layer	8
Number of Aluminium Clad Steel Wire	2 nd Layer	4
Lay Direction	1 st Layer	Left-Hand (S-twist)
Lay Direction	2 nd Layer	Right-Hand (Z-twist)
Total OPGW Cross-Section	mm <sup>2</sup>	95.6
Aluminium Alloy Unit Weight	kg/km	115
Aluminium Clad Steel Wire Unit Weight	kg/km	350
O/F Tube and Jelly Unit Weight	kg/km	16
Total OPGW Unit Weight	kg/km	485
OPGW Rated Tensile Strength (RTS)	daN	8200
Final Modulus Elasticity of OPGW	daN/mm <sup>2</sup>	11844
Thermal Expansion Coefficient of OPGW	10 <sup>-6</sup> /°C	15.1
Permissible Max. Working Stress	daN	3280
Medium High Tension	daN	1312 - 2050
Endurance Tensile Strength (ETS)	daN	5740
Short Time Overcurrent (0.5 second) (40-180°C)	A	14000
Temperature After Short Time Overcurrent	°C	180
Working Temperature (Max.)	°C	80
Resistance at 20 °C (Max.)	ohm/km	0.540
O/F Stainless Steel Tube Diameter (Inner/Outer)	mm	2.2/2.6
Fiber Count	-	12-24
Working Temperature	°C	-40 to 80

Die obigen Werte entsprechen den Angaben des Herstellers und können nicht garantiert werden.  
Wir behalten uns das Recht vor, Änderungen ohne vorherige Ankündigung vorzunehmen.  
Alle anderen Größen oder andere Ausführungen auf Anfrage

The above values correspond to the manufacturer's specifications and are not guaranteed.  
We reserve the right to change details without notice.  
Any other sizes or any other designs available on request.

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12 FIBER TUBE COLORS	FIBER NO	24 FIBER TUBE COLORS
RED	1	RED
YELLOW	2	YELLOW
GREEN	3	GREEN
BLUE	4	BLUE
VIOLET	5	VIOLET
BROWN	6	BROWN
BLACK or GRAY	7	BLACK or GRAY
ORANGE	8	ORANGE
PINK	9	PINK
GRAY or AQUA	10	GRAY or AQUA
LIGHT GREEN or WHITE	11	LIGHT GREEN or WHITE
NATURAL	12	NATURAL
	13	RED with BLACK RINGS
	14	YELLOW with BLACK RINGS
	15	GREEN with BLACK RINGS
	16	BLUE with BLACK RINGS
	17	VIOLET with BLACK RINGS
	18	BROWN with BLACK RINGS
	19	WHITE with BLACK RINGS
	20	ORANGE with BLACK RINGS
	21	PINK with BLACK RINGS
	22	GRAY with BLACK RINGS LIGHT
	23	GREEN with BLACK RINGS
	24	NATURAL with BLACK RINGS



General application of single mode fibers

Both G.652 and G.655 are called as single mode fibers which are optimized for OPGW network. The most important advantageous are,

- They have lowest PMD (polarization mode dispersion) value
- Better joining performance
- They are characterized with high wavelength rates (up to 1625 nm)

NZDS(non-zero dispersion shifted)

Fiber designed for DWDM applications. It is characterised by very low dispersion from 1530 to 1625 nm and a high effective area, which prevents the non-linear effects of high speed in this type of transmission, offering improved service in comparison to the previous fibers.

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## FIBER TECHNICAL SPECIFICATIONS (ITU-T G.652D)

		1310 nm	1550 nm
Attenuation	dB/km	≤ 0.36	≤ 0.22
Macrobend Loss	dB	≤ 0.05	≤ 0.05
Fiber Cut-off Wavelength ( $c_{\lambda}$ )	nm	≤ 1260	
Cable Cut-off Wavelength ( $c_{\lambda}$ )	nm	≤ 1260	
Mode Field Diameter	μm	9.2 ± 0.4	10.4 ± 0.5

## DISPERSION

Zero Dispersion Wavelength ( $\lambda_0$ )	nm	$\lambda_0 \leq 1324$	
Chromatic Dispersion [ ps/(nm x km) ]	nm	≤ 3.5	≤ 18

## STRUCTURAL SPECIFICATIONS

Cladding Diameter	μm	125.0 ± 0.7
Core Concentricity Error	μm	≤ 0.6
Cladding Non-circularity	(%)	≤ 1.0
Coating Diameter	μm	245 ± 5

## FIBER TECHNICAL SPECIFICATIONS (ITU-T G.655 NZDS)

		1550 nm	1625 nm
Attenuation	dB/km	≤ 0.25	≤ 0.27
Macrobend Loss	dB	≤ 0.05	≤ 0.05
Fiber Cut-off Wavelength ( $c_{\lambda}$ )	nm	≤ 1450	
Cable Cut-off Wavelength ( $c_{\lambda}$ )	nm	≤ 1450	
Mode Field Diameter	μm	9.6 ± 0.4	-

## DISPERSION

Zero Dispersion Wavelength ( $\lambda_0$ )	nm	≤ 1520
Chromatic Dispersion [ ps/(nm x km) ]	at 1530-1565	≤ 2.0-6.0
	at 1565-1625	≤ 4.5-11.2

## STRUCTURAL SPECIFICATIONS

Cladding Diameter	μm	125.0 ± 0.7
Core Concentricity Error	μm	≤ 0.5
Cladding Non-circularity	(%)	≤ 0.7
Coating Diameter	μm	245 ± 5