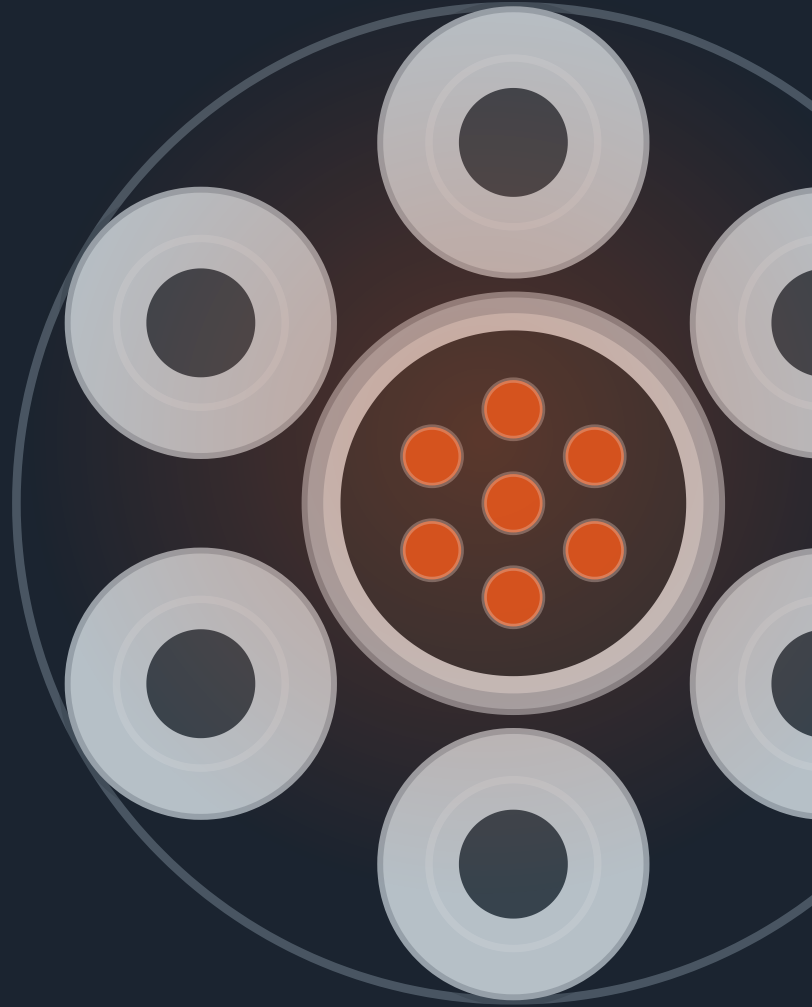




07

OPGW — optical ground wire

سیم محافظ نوری

IEEE 1138

ASTM B415

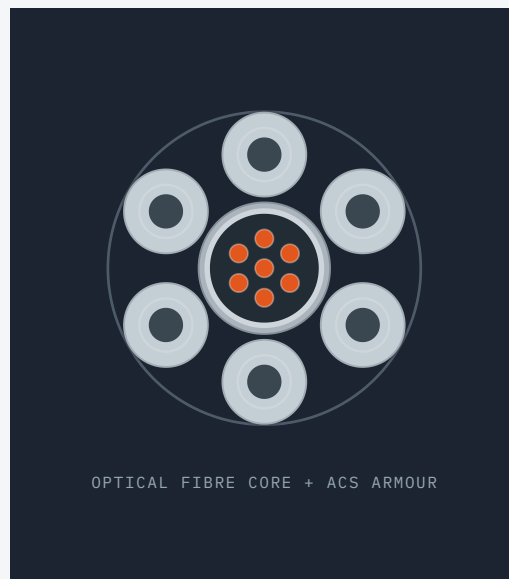
ITU-T G.655

OVERVIEW

Earth wire and fibre, in one cable.

A composite earth-wire / optical cable: aluminium-clad-steel armour around a central stainless-steel tube carrying up to 24 single-mode fibres — lightning shielding and fault-current capability plus a fibre path on the same line.

Two centre-tube designations — OPGW 10.5 mm and OPGW 12.0 mm — to IEEE 1138, with NZDSF fibre (ITU-T G.655, Class A) and ASTM B415 aluminium-clad-steel wire.



APPLICATIONS

Transmission earth wire

Utility fibre backbone

Lightning shielding

Fault-current path

STANDARDS

IEEE 1138

ASTM B415

ITU-T G.655

7.1 · Optical fibre properties

NZDSF · ITU-T G.655 (2003), Class A.

Property	Unit	OPGW 10.5	OPGW 12.0
Type of optical fibre	—	NZDSF	NZDSF
Applicable standard	—	ITU-T G.655	ITU-T G.655
Class of optical fibre	—	A	A
Mode-field dia. @1550 nm	µm	9.6 ±0.4	9.6 ±0.4
Cladding diameter	µm	125 ±1	125 ±1
Coating diameter	µm	250 ±5	250 ±5
Core concentricity error (max)	µm	0.6	0.6
Cladding non-circularity (max)	%	1.0	1.0
Max attenuation @1550 nm	dB/km	0.22	0.22
Attenuation discontinuities	dB	≤ 0.05	≤ 0.05
Cut-off wavelength (max)	nm	1450	1450
Chromatic dispersion @1550 nm	ps/(nm·km)	2–6	2–6
Zero-dispersion wavelength	nm	1520	1520
Zero-dispersion slope	ps/(nm ² ·km)	0.09	0.09
PMD coefficient (max)	ps/√km	0.2	0.2
Macrobend loss (30 mm, 100 turns)	dB	0.1	0.1
Proof stress (min)	GPa	0.69	0.69
Backscatter coeff. @1550 nm	dB	–80...–82	–80...–82

7.2 · Complete cable properties

Centre-tube construction · 24 fibres · IEEE 1138.

Property	Unit	OPGW 10.5	OPGW 12.0
Number of fibres	—	24	24
Stainless-steel loose tube	No./mm	1 / 3.5	1 / 4.00
Aluminium-clad-steel wire	No./mm	6 / 3.5	6 / 4.00
Outer stranding direction	—	Left	Left
Lay ratio (lay / outer Ø)	×	10–16	10–16
Overall diameter	mm	10.5	12.0
Cross-section — SS tube	mm ²	2.07	2.39
Cross-section — ACS wire	mm ²	57.7	75.4
Cross-section — total	mm ²	59.8	77.8
Weight — ACS wire	kg/km	388	494
Weight — SS tube	kg/km	15	25
Weight — grease	kg/km	4	6
Weight — total (max)	kg/km	407	530
Calculated breaking load (min)	kN	69.6	82.1
Modulus — initial	kgf/mm ²	15500	15500
Modulus — final	kgf/mm ²	15800	15800
Linear expansion coefficient	10 ⁻⁶ /°C	13	13
Maximum tensile stress	N/mm ²	499	490
Everyday stress	N/mm ²	190.1	190
DC resistance @20°C (max)	Ω/km	1.499	1.135
Short-circuit current (0.5 s)	kA	6.5	7.5
Min. bending radius	mm	158	180

7.3 · Individual wire (before stranding)

Aluminium-clad-steel wire · ASTM B415.

Property	Unit	OPGW 10.5	OPGW 12.0
Standard diameter	mm	3.5	4.0
Diameter tolerance	mm	±1.5	±1.5
Min. tensile strength	MPa	1310	1210
Min. elongation at fracture	%	1.5	1.5
Min. conductivity @20°C	%IACS	20	20
Min. number of twists	—	20	20
Min. aluminium thickness	mm	0.175	0.200
OPGW reel length	m	5000 ±3%	5000 ±3%
Max temp. — continuous	°C	80	80
Max temp. — instantaneous	°C	200	200

EXPLORE THE FULL RANGE

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