OPTIC PROTECTION GROUND WIRE OPGW

TRATOS

CAVI

OPTIC PROTECTION GROUND WIRE OPGW

Tratos Cavi

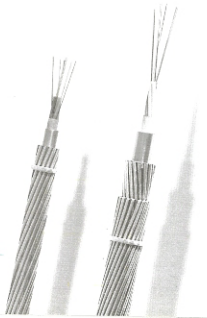
is a private company that has been producing power, telephone and optic-fibre cables for over 35 years. The production cycle is organised through 5 factories located in Italy, a distributor located in England and many agencies all over the world.

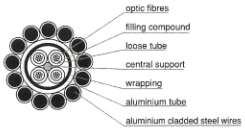
Constant attention to technological developments in fields of different activities sees Tratos Cavi involved in projects for cables with performances of an increasing quality level to meet the needs of any kind of plant.

The presence on the territory of High Tension electric energy networks and the spreading of telecommunications services have created the opportunity for installing telephone lines by using pre-existing carrying infrastructures. Electric energy providers and railways companies have launched the planning and creation of telephone links to meet their own requirements or hire them to telephone services' operators of the newest generation. OPGWs are habitually employed to protect electric lines against lightning discharges. At the same time they are a fantastic device for the transmission of signals, images and data, via the optic fibres inside them. The use of OPGWs reduces costs and effects on the environment remarkably.

What to take in consideration for the project

- Operating voltage of the power line
- Maximun short circuit current
- Short circuit time
- Supporting structure type
- OPGW istallation system
- Span pole and hang loose conductor
- Range of temperature for storage, installation and oparation
- Ground profile
- General weather condition
- Lightining frequency
- Maximum wind speed
- Maximum ice load





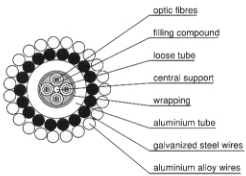
GENERAL DATA TRATOS code SP26198

Number of fibres 24

Aluminium cladded steel wires	n°	13
Wires diameter	mm	2.10
Aluminium tube outer diameter	mm	6.7
Max overall outer diameter	mm	10.9
Total weight	Kg/km	375

ELECTRIC AND MECHANICAL CHARACTERISTICS

Electrical resistance @20°C	Ohm/km	<10
Linear expansion coefficient	1/°C x 106	14
Elastic modulus	MPa	130.000
Load at break	daN	>5.200
Short circuit current – 0.5 secs	KA	>7.0



GENERAL DATA TRATOS code SP26200

Number of fibres 24

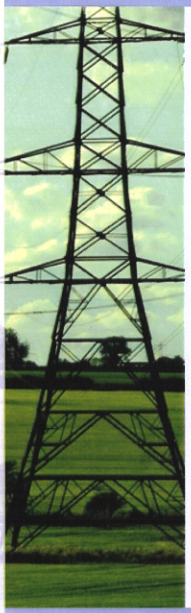
Inner layer :		
Galvanised steel wires min.	n°	14
Wires diameter	mm	2.02
Outer layer :		
Aluminium alloy wires	n°	23
Wires diameter	mm	2.02
Aluminium tube outer diameter	mm	9.8
Overall outer diameter	mm	17.9
Total weight	Kg/km	815

ELECTRIC AND MECHANICAL CHARACTERISTICS

Electrical resistance @20°C	Ohm/km	<0.23
Linear expansion coefficient	1/°C x 106	<17
Elastic modulus	Mpa	99.000
Load at break	daN	>10.600
Short circuit current – 0.5 secs	KA	>20

OPGW

OPTIC PROTECTION GROUND WIRE OPGW



The handling of OPGWs and the installation methods do not differ greatly from those of "traditional" safety ropes. The presence in OPGWs of particularly delicate elements such as optic fibres does not require particular care thanks to the protection. Optic fibres are generally inserted in extruded aluminium tubes that guarantee extremely high quality performances and total protection. OPGWs outer layer or layers, made of aluminium cladded steel wires, guarantee an easy stretching and high electric conductivity. Planning is always harmonised with the mechanical, electric and transmission characteristics required by clients. Hence projects are subject to and oriented towards changes that are devised each time to meet special needs.

TRATOS

Optic Fibre SM-R ITU.T G652

OPTIC CHARACTERISTICS		
Max attenuation at 1310 nm	dB/Km	0.4
Max attenuation at 1550 nm	dB/Km	0.25
Max variation at 1530-1560 nm	dB/Km	0.03
Spectral attenuation between 1285-1330 nm and 1310 nm	dB/Km	≤ 0.1
Attenuation at 1393 ± 3 nm	dB/Km	≤ 2
Chromatic dispersion coefficient:		
between 1285 nm and 1330 nm	ps/(nm.km)	≤ 3.5
at 1550 mn	ps/(nm.km)	≤ 20
Zero dispersion wavelength for fibre cabled	nm	1315 ± 10
Dispersion slope	ps/(nm.km)	≤ 0.092
Mode field diameter at 1310 nm (Peterman II)	µm	9.4 ± 0.3
Cut-off wavelength	nm	1150 ÷ 1280
Cut-off wave length for fibre cabled	nm	1280

PHYSICAL CHARACTERISTICS		
Cladding diameter	µm	125 ± 2
Mode field on/ cladding concentricity error	µm	≤ 1
Cladding non circularity	%	≤ 2
Coating diameter	µm	245 ± 10

GENERAL CHARACTERISTICS		
Proof test	%	≥ 1
Effective group index of refraction:		
at 1310 nm		1,467
at 1550 nm		1,468
Numerical aperture (indicative value)		0.11
Young modulus	Gpa	71
Coating stripability	N	1 ÷ 5
Macrobending test additional loss at 1550 nm (100 turns on 75 mm mandrel)	dB	≤ 0.3

Optic Fibre NZD ITU.T G655 (NON ZERO DISPERSION)

TRASMISSION CHARACTERISTICS		
Maximum attenuation at 1550 nm	dB/Km	0.25
Maximum attenuation at 1600 nm	dB/Km	0.25
Typicla attenuation at 1310 nm	dB/Km	≤ 0.4
Attenuation increase rispect to 1550nm(1525÷1625 nm)	dB/Km	≤ 0.05

MACROBENDING ATTENUATION		
1 turn on d = 32mm at 1550 nm	dB	≤ 0.5
1 turn on d = 32mm at 1625 nm	dB	≤ 0.5
100 turns on d =75mm at 1550 nm	dB	≤ 0.05
100 turns on d =75mm at 1625 nm	dB	≤ 0.05

POINT DISCONTINUITIES at 1550 nm	dB	≤ 0.1

CHROMATIC DISPERSION		
3a window 1530÷1565 nm	ps/(nm.km)	2,6 ÷ 6,0
mode field diameter at 1550 nm	µm	8,1 ± 0,65
mode fiesl diameter (typical value) at 1625 nm	µm	8,9 ± 0,6
polarization mode dispersion at 1550 nm	ps/ √km	≤ 0,1
effective group index of refraction at 1310 nm		1,470
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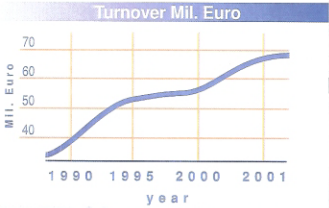
GEOMETRICAL CHARACTERISTICS		
Cladding diameter	µm	125 ± 1,0
Core/clad concentricity error	µm	≤ 0,6
Cladding non circularity	%	≤ 1
Coating geometry :		
coating diameter	µm	245 ±10
coating/cladding concentricity error	µm	≤ 12

ENVIRONMENTAL CHARACTERISTICS		
Operating temperature	°C	-60 +85
Temperature dependance of attenuation from -60 to +85 °C at 1550 nm	dB	≤ 0.05
Temperatura-humidity cycling from -10 to +85 °C (relative humidity 85%) at 1550 nm	dB	≤ 0.05
Water immersion at 23°C at 1550 nm	dB	≤ 0.05
Aging accellerate 85 ± 2°C at 1550 nm	dB	≤ 0.05

OTHERS		
Weight per unit lenght	g/km	64
Mechanical characteristics proof test	kpsi	≥ 100
Mechanical characteristics proof test	GPa	≥ 0.7
Dynamic tensile strength	kpsi	≥ 550
Dynamic tensile strength	GPa	≥ 3,8
Coating strip force (force to strip the dual coatings)	N	1,3 ÷ 8,9
Pullout force (adhesion of coating to glass surface)	N	8,2 ÷ 22,2
Fiber curl	m	< 2



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