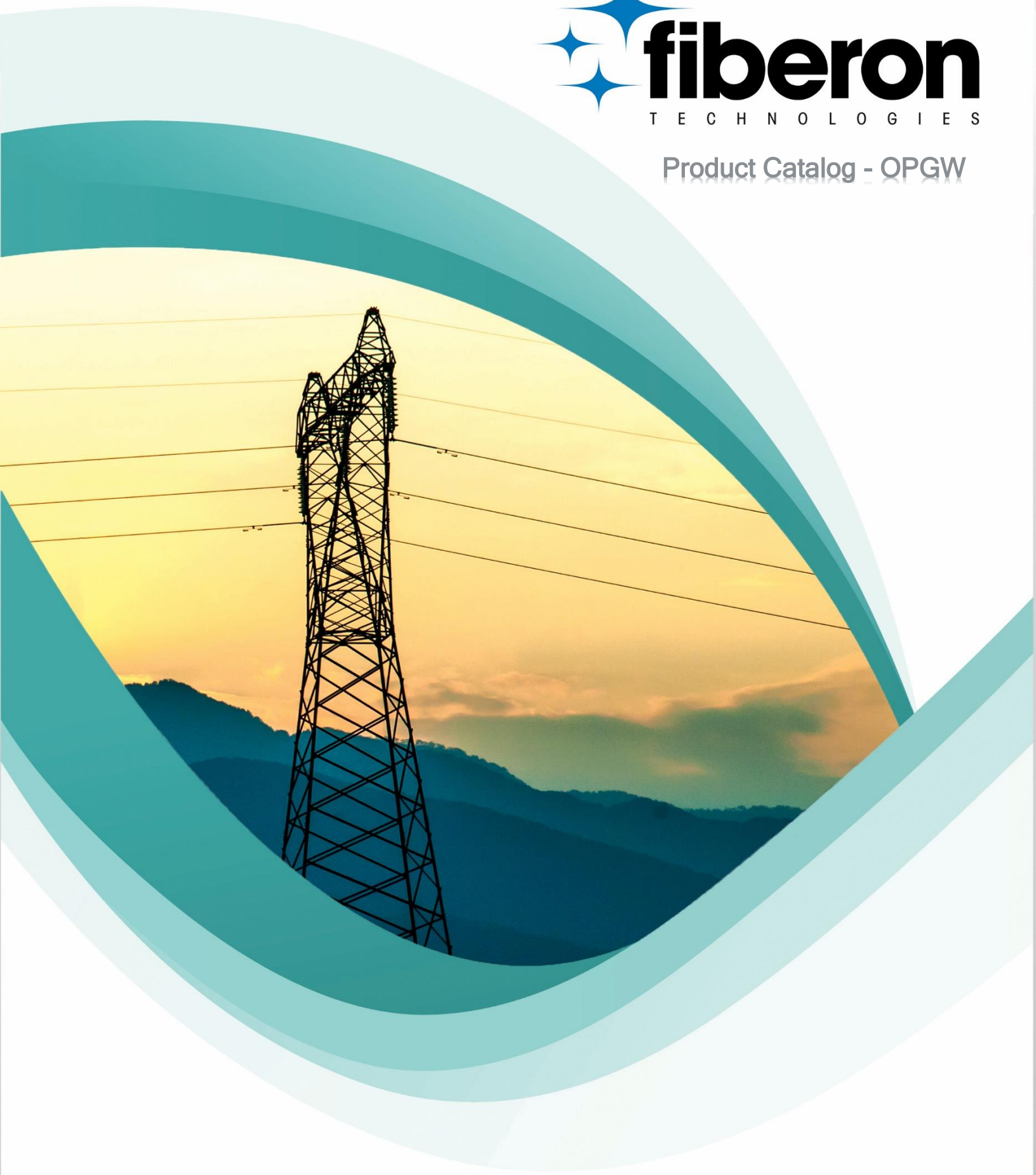




Product Catalog - OPGW



Optical Ground Wire (OPGW) Cable

Fiberon OPGW is one of the most reliable fiber optic mediums for the telecom service providers, ISPs, Cable TVs, or other organizations who are involved in the transmission of one or more form of voice, data, video, text, messages, conferencing and telemetering kind of things. Installation became widespread in the year 1980. In 2000, around 35,000 miles OPGW was installed worldwide.

Many electric utilities are installing high capacity fiber optic cables and wires on their high voltage lines to satisfy their own internal communication needs and to gain additional revenues by leasing excess capacity to telecommunication network providers.

Overhead transmission power line corridors provide the telecommunications industry with cost-effective alternative routes and at the same time benefit the electric utilities by generating additional revenues using existing facilities. The inherent advantage of fiber optic technology as a means of communication is that fiber optics provides fixed link, point to point communications with a remarkably high capacity for carrying data.

Fiberon has developed technical expertise in fiber optic cables and proven its capabilities in manufacture of energy efficient bare overhead power conductors. Fiberon has integrated these core strengths in its comprehensive OPGW solution that includes Optical Fiber Composite Ground Wire and related hardware.



Features

- Fiber optic communication cables are neither subject to electromagnetic interference nor do they cause any interference.
- Aerial fiber optic cables and any related equipment can be electrically insulated from system components.
- The technology offers very long information transmission distances of up to 50 miles (80 km) without requiring the use of repeaters.

Fiber optic technology offers extremely high transmission capacity which can result in data transfer of information at rates of up to 3 gigabytes per second (Gbps)

An Optical fiber is composed of a light guiding core surrounded by cladding. Both the core and the cladding are typically made of high purity glass typically derived from doped germanium or pure silica. The core and the cladding are then surrounded by one or two protective coatings of Acrylate that improves the strength characteristics of the Optical fibers.

Two main types of Optical fiber exist: a) single mode; b) multi-mode. In a single mode Optical fiber, the fiber core is small enough that only one mode of light can travel through the core at any one time. In a multi-mode fiber, the fiber core is large enough that multiple modes of light can travel through the core at different paths and lengths. It should be noted that the attenuation of the signal in single mode is significantly lower than in multi-mode fibers.

When combined with a method of construction suitable to the high strength, high voltage environment of utility corridors, aerial fiber optic cables and wires provide superior performance and reliability in communication networks.



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Specifications

		Unit	G 652 (DWSM-A, B, C, D)	G 655 (Non-zero dispersion shifted fibers)
Cladding diameter		µm	125 ± 1	125 ± 0.7
Cladding non-circularity		%	≤ 1.0	≤ 0.7
Mode field diameter	@ 1310nm	µm	9.2± 0.4	-
	@ 1550nm	µm	10.4 ± 0.8	9.6 ± 0.4
Attenuation	@ 1310nm	dB/km	≤ 0.35	-
	@ 1550nm	dB/km	≤ 0.20	≤ 0.22
	@ 1625nm	dB/km	-	≤ 0.24
Chromatic Dispersion (from 1285 to 1330 nm)	@ 1550nm	ps/ (nm.km)	≤ 3.5	2.80 to 6.20
	@ 1460nm	ps/ (nm.km)	≤ 18	4.20 to 3.29
	@ 1625nm	ps/ (nm.km)	-	5.77 to 11.26
PMD (Polarization Mode Dispersion)		ps/√km	< 0.2	≤ 0.2
Cable cut -off Wavelength		nm	≤ 1260	≤ 1450

OPGW Cable with Central Core Aluminum Sheathed Tube

OPGW cable with central core aluminum sheathed tube is made of polymer loose tubes and the outer layer can be a suitable combination of ACS and AA wires for the right ratings as required by the end-user.

Single Layer Construction



In composite conductors a fiber cable unit containing the Optical fibers is either integrated or embedded into a conductor or ground wire. In voltages below 138-kV the composite conductor can also be a phase wire. However, usually the fiber unit containing the Optical fibers is placed inside the ground wire. OPGW can be a light weight ground wire designed to be used as a static wire replacement or it can be installed in addition to conventional ground wire. Currently, the number of Optical fibers that can be readily fitted into an OPGW aerial wire construction can reach up to 144 fibers. The metallic wires have to give the OPGW aerial cable enough conductivity to carry fault currents, and the strength to withstand mechanical stresses.



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Double Layer Construction



The Fiberon OPGW Double Layer cables are used when the requirements are for a high ultimate load and/or high short-circuit current.

Hydrogen-absorbent optical core is constructed with required number of optical fibers covered with tubes with loose fiber protection and sealed with moisture-proof gel and whole setup is protected with thermal protection tape to absorb the increased temperature.

With choice of aluminum clad steel, aluminum alloy, galvanized steel wires Hydrogen-absorbent optical core is protected with extruded aluminum tube and surrounded with first layer with choice of aluminum clad steel, aluminum alloy, galvanized steel wires. Further surrounded with second layer with choice of aluminum clad steel, aluminum alloy, galvanized steel wires for additional high ultimate load and/or high short-circuit current.

OPGW Cable with Stainless Steel Tube & Aluminum Clad Steel Tube



OPGW cable with stainless Steel and aluminum clad steel tube is available in fiber counts up to 48. The cable can be designed into single or dual layered construction in accordance to the mechanical and electrical requirements as per application needs of the end-user.

Due to its unique small size this becomes the perfect solution for overloaded towers with its small diameter and light weight construction. The fibers are protected from environmental conditions to ensure reliability and long life.

High Strength OPGW Cable

High strength OPGW cable is available up to 96 fibers making it suitable for application is high fiber count and super-high-voltage power lines. Steel tubes are stranded with Hi-strain steel wires to create a dual-layer design suitable for a range of high strength applications. The layer of Aluminum gives this product a high fault rating current value.



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Typical Designs of Single Layer Construction Cable:

Product Range	Fiber count (Max)	Diameter (mm)	Weight (kg/Km)	UTS (KN)	Short Circuit (KA ² Sec)
OPGW 12[55,20]	12	10.0	349	55	20
OPGW 12[64,35]	12	11.6	412	64	35
OPGW 16[91,58]	16	12.8	580	91	58
OPGW 24[53,23]	24	10.3	347	53	23
OPGW 24[74,26]	24	10.9	416	74	26
OPGW 24[63,30]	24	11.2	386	63	30
OPGW 24[78,37]	24	11.6	498	79	38
OPGW 24[65,40]	24	11.9	409	65	40
OPGW 24[81,41]	24	12.0	500	81	41
OPGW 24[77,43]	24	12.5	467	77	43
OPGW 24[64,68]	24	13.2	475	64	68
OPGW 24[100,40]	24	13.5	572	100	40
OPGW 24[62,91]	24	14.0	490	62	91
OPGW 24[65,116]	24	14.6	523	65	116
OPGW 24[97,110]	24	15.0	670	97	110
OPGW 36[79,36]	36	11.8	484	79	36
OPGW 36[72,67]	36	12.7	503	72	67
OPGW 48[41,29]	48	11.0	316	41	29
OPGW 48[74,35]	48	11.7	471	74	35
OPGW 48[63,44]	48	12.4	429	63	44
OPGW 48[59,77]	48	13.3	450	59	77
OPGW 48[99,83]	48	13.7	610	90	83
OPGW 48[89,151]	48	16.0	696	89	151
OPGW 64[98,76]	64	15.1	650	98	76
OPGW 96[103,138]	96	16.2	719	103	138
OPGW 288[82,198]	288	20.8	789	82	198

PS: Contact us for customized cable specifications.



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Typical Designs of Double Layer Construction Cable:

Product Range	Fiber count (Max)	Diameter (mm)	Weight (kg/Km)	UTS (KN)	Short Circuit (KA ² Sec)
OPGW 12[82,111]	12	15.3	600	82	111
OPGW 24[93,151]	24	15.9	645	93	151
OPGW 24[74,175]	24	16.6	585	74	175
OPGW 24[118,400]	24	19.0	860	118	400
OPGW 24[101,247]	24	17.7	744	101	247
OPGW 24[141,479]	24	20.7	1030	141	479
OPGW 32[102,237]	32	19.4	812	102	237
OPGW 36[188,212]	36	18.7	1161	188	212
OPGW 36[305,386]	36	22.0	1716	305	386
OPGW 48[92,122]	48	15.6	642	92	122
OPGW 48[88,278]	48	18.6	729	88	278
OPGW 48[147,201]	48	21.1	1065	147	501
OPGW 48[121,348]	48	19.4	892	121	348
OPGW 60[135,441]	60	20.6	999	135	441
OPGW 72[166,675]	72	22.9	1246	166	675
OPGW 96[158,826]	96	24.0	1277	158	826
OPGW 144[120,430]	144	22.4	1000	120	430

PS: Contact us for customized cable specifications.

Type Testing

All types of OPGW cable are type tested and validated from internationally acknowledged independent test laboratory according to IEC 60794 and IEEE 1138 Standards.

Routine Testing

- Optical fiber attenuation coefficient.
- Inspection of Wires before stranding.
- Quality of Surface.
- Direction of Outer layer.
- Diameter of Cable.
- Weight of Cable.
- Packing Inspection.

Factory Acceptance Testing

- Design Verification.
- Optical fiber attenuation coefficient.
- Mode Field Diameter of optical fiber.
- Cladding Diameter of optical fiber.
- Cladding non circularity of optical fiber.
- Visual inspection of the cable elements.
- Lay length of Outer layer.
- Diameter of cable.
- Weight of cable.
- Breaking Strength of cable.



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OPGW Metal Closures

Fiberon Metal Splice Closure is used to connect the distribution cable and the incoming cable is widely applied in communication, network systems, CATV cable TV and so on. It adopts scientifically formulated engineering plastic and be shaped by injection molding, anti-aging, anti-corrosion, flame retardant, waterproof, anti-vibration and anti-shock effects. It can effectively prevent optic fibers from the influence of the outdoor environment.

Dome-to-base design; up to 8 pieces splice trays with excessive loose buffer storage basket, hinge for access of any splice without disturbing others trays; Fast and reliable sealing performance, easy to package multiple times. With a lightning protection grounding device, it can be applied in overhead, pole/ wall mounting or directly buried.



Features

- Supports, organize, and protects the optical fibers.
- Ensures that the optical fiber minimum-bending radius is not exceeded.
- The splice tray has no sharp edges or protrusions that may damage the optical fiber cable.
- Closure is rated to IP68 in accordance with IEC 60529.
- Junction boxes provide entry for all cables Include number tags for tube and fiber identification.
- The Closure is lockable.
- Closure is mounted on a wall or pedestal at a conveniently accessible height.

This is designed for splicing ADSS, OPGW cables and the normal cables to house the fiber core splices to outdoor intermediate optical cable leading to the patch panel in the control room. It includes 2 - 4 sleeves for input and output.

Loose storage space makes storage more conveniently, quickly and cable bending radius big enough. It avoiding fiber optics extra loss and ensuring transmission performances. The double sealed designs make Splice Closure more reliable. Easy to install and fixed on towers, poles or tubes.

Cable Splice Closure comes with cable storage and fix clamps, which is needed when installed on the tower. A cable storage and three stainless steel bands are needed when installed on the pole.



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Specifications

Size: 680 x 305mm.

Entry Ports: 1 oval port, 5 round ports.

Max. Tray No.: 8 Trays.

Tray Capacity: 72 F.

Max. Closure Splice: 576 F.

Material: -

Dome, Clamp, Base: Modified PP + GF.

Tray: ABS.

Metal Parts: Stainless Steel.

Available Cable Dia.: -

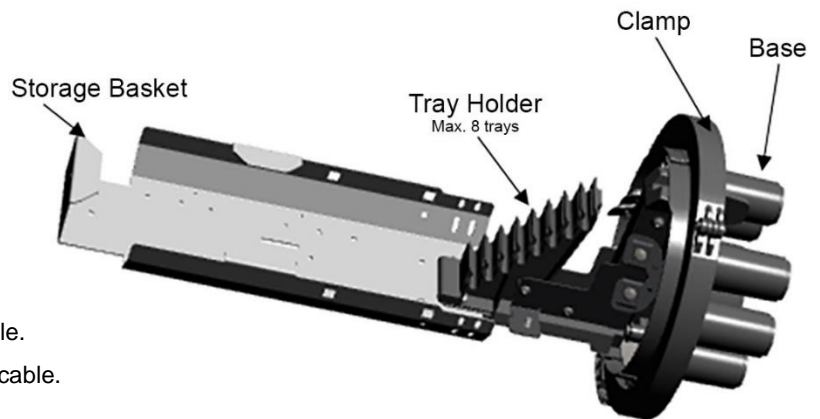
Oval Ports: Available for 2 pcs, 10~33mm cable.

Round Ports: Each available for 1pc 6-33mm cable.

Base Sealing Method: Heat Shrink.

Applications: Aerial, Pole Mounting, Directly Buried, Wall Mounting.

IP Grade: 68.



Technical Parameters

Working Temperature: -40°C to +65°C.

Atmospheric Pressure: 62 ~ 106Kpa.

Axial Tension: >1000N / 1min.

Flatten Resistance: 2000N / 100mm (1min)

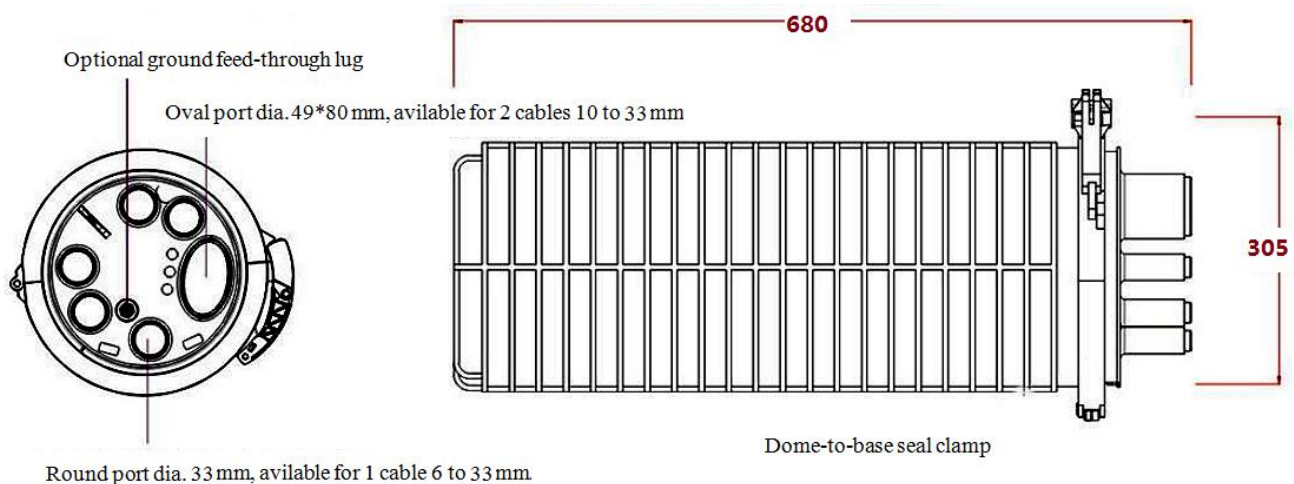
Insulation resistance: >2 x 10⁴MΩ

Voltage Strength: 15KV(DC)/1min, no arc over or breakdown.

Temperature recycles: Under -40°C~+65°C, with 60(+5) Kpa inner pressure, in 10cycles;

Inner pressure shall decrease less than 5 Kpa when closure turns to normal temperature.

Durability : 25 years



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OPGW Hardware Accessories

OPGW accessories perform an important role in the communication transmission and tower or pole line construction.

Fiberon has successfully developed unique designs of ADSS / OPGW accessories, which replace the old suspension clamp, NLL tension clamp, and UT &NX clamp.

Fiberon OPGW accessories can be used either on ADSS or OPGW cable according to their specification.

OPGW Hardware Accessories are mainly used to support and protect the OPGW cable against damage and accomplish the information transmission. Hardware includes preformed tension clamp, armor grip suspension, Thimble Clevis, Armor Rod, Downlead Clamp and so on.

Tension Assembly

Preformed tension especially designed for OPGW cable Includes grounding clamps for tower connection, when the distance between two anchor towers is greater than maximum length of OPGW cable drums, there are special tension assemblies for installation in suspension towers, allowing a cable joint to be included.

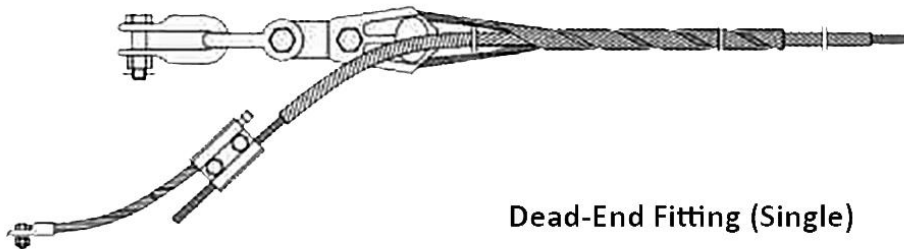
Structure

- Straight Shackle: Galvanized fogged steel
- Extension Link: Galvanized laminated steel
- Dead End: Compression aluminum clad steel
- Thimble: Cast galvanized steel
- Protection Splice: Compression aluminum clad steel
- Ground Clamp: Aluminum

Specifications

There are three types of assemblies for installation in tension towers: -

- Passing Tension Assembly: for intermediate towers.
- Splicing Tension Assembly: for towers with joint boxes.
- Final Tension Assembly: for final towers.



Dead-End Fitting (Single)



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Dampers

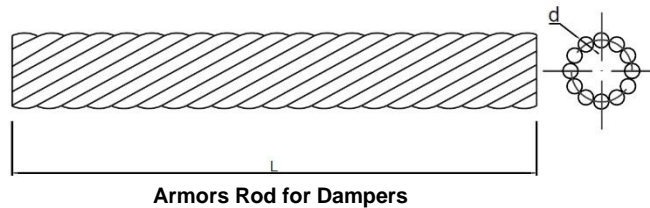
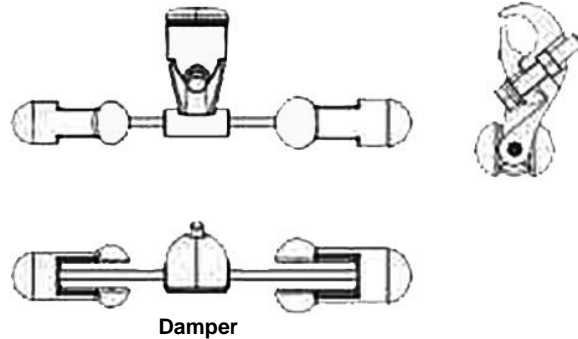
The dampers are used to absorb the cable vibrations. The number of dampers is determined by the environmental conditions, the distance between towers and the type of OPGW cable and the installation parameters.

The armor rods are made of aluminum alloy. Generally, the parameter of length 400mm and diameter 3.0mm of rods are sufficient for vibration damper installation. The dimensions could be adjusted according to customer's requirement.

To avoid the surface of OPGW damaged by vibration damper clamp, the armor rods are assembled together with damper on OPGW.

Structure

- Securing Clamp: Aluminum alloy
- Messenger Cable: Galvanized steel wire
- Counter Weights: Galvanized forged steel



Specifications

- The weights of 4D series damper are different, small one and large one. This type damper has 4 resonant frequencies from 6HZ to 120HZ, allowing the dampers to be effective across a much wider frequency range than standard Stockbridge dampers.
- Connection weights with messenger cable by glue, offering better damper effectiveness and working life. The 4D series dampers are suitable for use on all conductor and earth wire constructions including ACSR, AAC, AAAC and galvanized steel wire, aluminum-clad steel wire with covering the range of sizes from 7.5mm to 34mm.
- The maximum recommended line angle for a single suspension set is 30°. Double one is recommended for OPGW line angle between 30°and 60°.
- The standard products are suitable for Right-hand lay OPGW (outer layer). If the outer layer of OPGW is Lefthand lay, please specify.
- Once installed, do not reuse the rod components. The hardware components may be reused as desired as long as they are in good condition. Do not modify any components.
- Dampers must be adapted to the conductor. If not, damper can cause destruction to the cable or be destroyed by itself.
- For optimal effectiveness of damper, it is necessary to -choose the right damper type -install at the exact locations - install the reasonable quantity of dampers. In general, the installing direction of dampers will not influence damper's efficiency. Usually, large weight of the damper is installed on the tower side.

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Suspension Clamp

Assembly with reinforced suspension clamp and neoprene inner covering, especially designed for OPGW cables includes grounding clamps for tower connection.

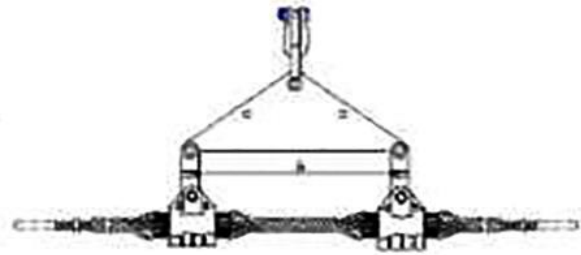
The suspension set provides superior cable and fiber protection at the support point. The combination of Structural reinforcing rods, Outer rods, boltless housing and resilient Insert reduces compression, clamping and bending stresses on cable. Negative weather related cable motion, such as Aeolian vibration, galloping, and wind sway are also minimized.

The insert for resistance to ozone attack, weathering, extreme high and low temperature variations. An aluminum alloy reinforcement is molded into the elastomer.

The slip load of suspension set can reach approximate 14-20% of OPGW rated strength to offer sufficient holding strength for OPGW.



Suspension Clamp - Single



Suspension Clamp - Double

Structure

- Securing Clamp: Aluminum alloy.
- Messenger Cable: Galvanized steel wire.
- Counter Weights: Galvanized forged steel.
- U shackle: Galvanized forging steel.
- Eye link: Galvanized forging steel.
- Housing: Aluminum alloy.
- Insert: EPDM.
- Structural reinforcing rods: Aluminum-clad steel.
- Outer rods: High strength aluminum alloy.
- Parallel groove clamp: Aluminum alloy.
- Ground wire set: Aluminum.

Specifications

- The maximum recommended line angle for a single suspension set is 30°. Double one is recommended for OPGW line angle between 30° and 60°.
- The standard products are suitable for Right-hand lay OPGW (outer layer). If the outer layer of OPGW is left hand lay, specification available upon request.
- Once installed, do not reuse the rod components. The hardware components may be reused as desired as long as they are in good condition. Do not modify any components.
- Double suspension clamp mainly used in long span rivers and valleys with large drop in level. Used on poles or tower which turning corner is from 30 degree to 60 degrees.

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Downlead Clamp

The down-lead clamp clamps are used to fix the cable to the tower in the down lead to the joint box. According to the application, the OPGW downlead clamp includes downlead clamp for tower & downlead clamp for pole.

Downlead clamp for tower consists of a stainless steel band and a rubber part. The stainless steel band is used to fix the rubber clamp onto the pole. At the same time, the rubber part secures the optical fiber. This way, the optical fiber will not shake, while decreasing damages due to friction.

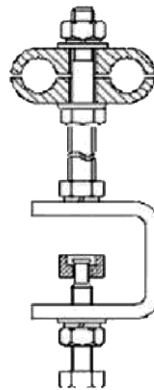
The downlead clamp for tower has a different construction from the downlead clamp for pole. The downlead clamp consists of a steel bracket, bolt and nut, and rubber part. The bolts will fasten the downlead clamp to the tower.

Compared to other downlead clamp manufacturers, Fiberon delivers end-users with a large variety of downlead clamp design choices. Fiberon downlead clamp can be custom manufactured with broad cable range, material, and different attachment options.

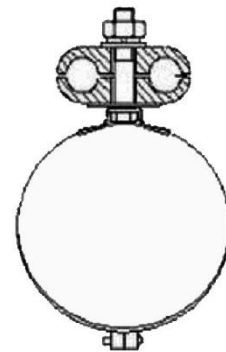
Fiberon downlead clamp provides outstanding durability and reliable performance across a variety of transmission lines and communication applications. Fiberon downlead clamp features include board cable range, quick installation and smooth surface.

Structure

- Clamp: Aluminum.
- M-12-rod: Galvanized steel.
- Support Body: Galvanized steel.
- Lock Screw: Stainless steel.



Downlead Clamp for Tower



Downlead Clamp for Pole

Specifications

- Downlead for tower could be adjusted 90° in direction.
- It has been designed to come with slip strength
- There is a steel tower guide clamp that comes with adapters to get rid of drilling issues. This makes it simple and easy to install.
- Lattice adapters are made available with break-away bolts for specific torque during installations.
- Downlead clamps are very easy and quick to install.
- They provide the right spacing and hold strength to prevent cable damages.
- From towers to poles, downlead clamps offer a complete line of optical ground wire from the highest level to the splice boxes.



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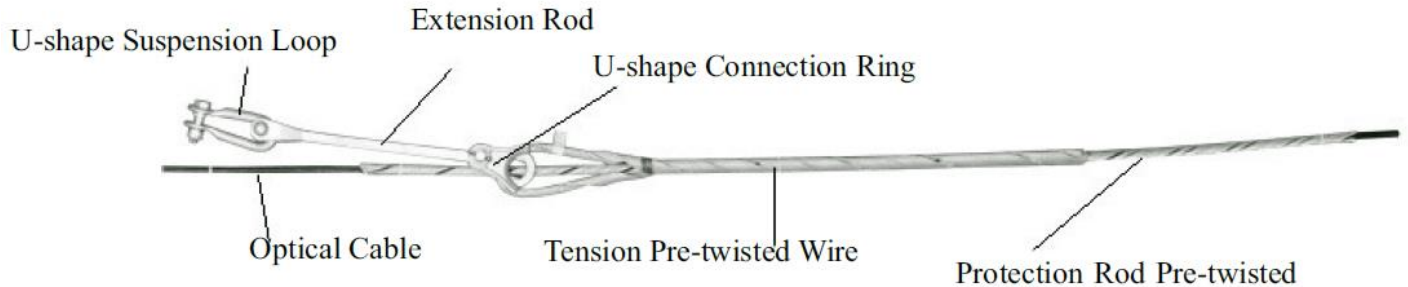
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OPGW Hardware Accessories Installation

I. OPGW Tension Clamp:



Materials

Outer Layer Tension Pre-Twisted Wire: Preformed by al-clad steel wire. It has high grip so it will not extrude the optical cable. Pre-twisted wire has color mark to avoid installation error and it's convenient for quick installation and exchange of pre-twisted wires.

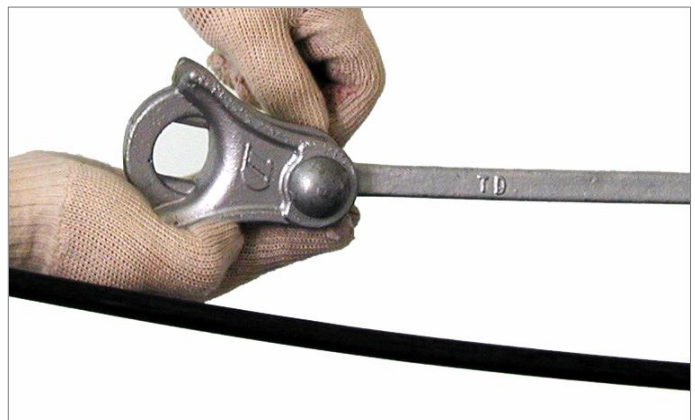
Protection Rod Pre-Twisted: Preformed by al-clad steel wire. It protects the optical cable and reduces vibration. Pre-twisted wire's end must be slightly bended outward following the radial direction to avoid extruding optical cable. Pre-twisted wire is preformed into four sub-bundles to avoid installation error and for quick installation. Pre-twisted wire's two ends are painted by color marks for exchanging pre-twisted wire.

U-Shape Connection Ring: Hot galvanized precise cast steel U-shape connection ring is nipped and embedded in the U-shape bending head of tension clamp to protect it and extension rod's connection. Break loads are 20kN and 170kN.

Extension Rod: Hot galvanized precise cast steel extension rod can connect U-shape connection ring with U-shape suspension loop. Break loads are 80kN and 170kN. U-shape Suspension Loop — hot galvanized steel U-shape connection ring can connect with pole tower fasteners. Break loads are: 69kN for UL-7, 98kN for UL-10 and 157kN for UL-16.

Installation Method

- i. Install U-shape connection ring on the extension rod.



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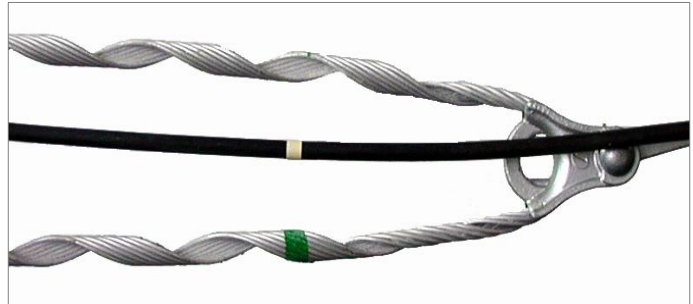
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- ii. Insert one end of tension pre-twisted wire into U-shape connection ring.



- iii. Make two ends of tension pre-twisted wire parallel with optical cable. Use adhesive tape to make a mark on the optical cable according to the color mark positions on tension pre-twisted wires. Consider the marks as the reference of installing protection rod pre-twisted wire.



- iv. Lay one sub-bundle of protection rod pre-twisted wire parallel with optical cable and align the end's color mark with the reference mark on optical cable in last step.



- v. Start wrapping protection rod pre-twisted wire from sub-bundle center color mark but keep the end of protection rod loose.



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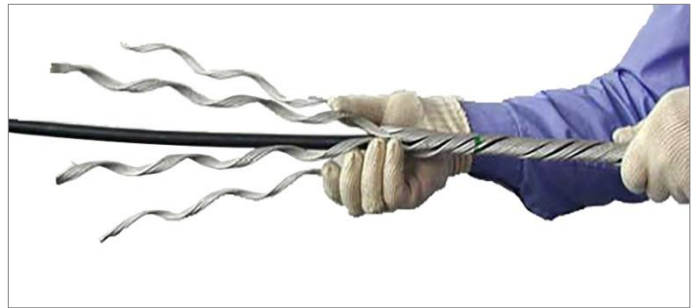
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- vi. Repeat the operation in last step. Ensure that all the protection rods installations are flat, natural and have no folds.



- vii. After all the protection rod pre-twisted wires are installed (as described in 5), wrap the end flat by hand. (Don't use any tools to avoid damaging or scratching optical cable.)



- viii. Align the color mark of tension pre-twisted wire with color mark on protection rod pre-twisted wire's end.



- ix. Wrap one end of tension pre-twisted wire for one to two loops first.



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- x. Starting from identifying color mark, wrap tension pre-twisted wire's another end for one to two loops.



- xi. Finish wrapping tension pre-twisted wire's two ends simultaneously. Ensure that its ends are bended outward following the radial direction to avoid extruding protection rod pre-twisted wire. Finishing wrapping one end once is forbidden.



- xii. For convenient installation, tension pre-twisted wire's end of about 20cm can be divided into several smaller sub-bundles. Don't use any tools to avoid damaging or scratching optical cable. Ensure that all the pre-twisted wire are wrapped flatly, naturally and averagely.



- xiii. Fix U-shape ring on the corresponding fasten clamps on the pole tower. The installation is finished.



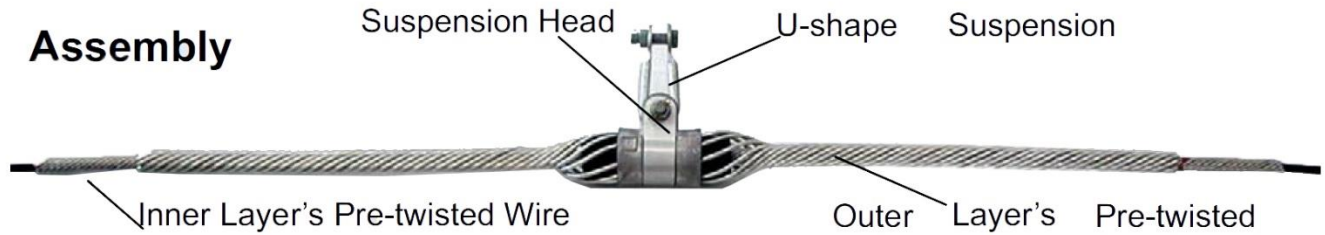
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II. OPGW Suspension Clamp:



Materials

Rubber Clamp: It consists of high-quality rubber and center reinforced component. It has ozone resistance, chemical change resistance, weather aging resistance, high & low temperature performance, high strength & elasticity and minor compressed deformation.

Aluminum Cleat: It is made of corrosion-resistant al-alloy by method of pressure casting. It has steady chemical performance, good atmosphere corrosion resistance and excellent mechanical performance.

U-Shape Jacket: Al-alloy extruding component. It is used for fixing aluminum cleat. It has high strength and good corrosion resistance.

Inner Layer Pre-Twisted Wire Armor Rod: Special al-alloy wire. It has super high tensile strength & rigidity, good elasticity and excellent rust resistance. It can be used in severe environment for a long time.

Outer Layer Pre-Twisted Wire Armor Rod: The same as inner layer pre-twisted wire.

Installation Method

- i. Use a thin adhesive tape to make a mark on the center position of optical cable suspension point.



- ii. Pre-twisted the single wire into groups of sub-bundles (2~3 per group). Align mark in the center of sub-bundle with installation mark in Step 1. Coil 3~4 rounds of sub-bundles on the optical cable.



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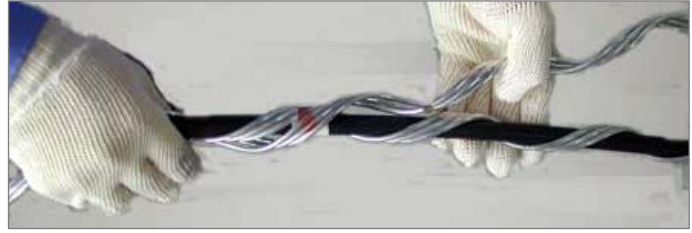
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- iii. Repeat the operation in Step 2. Finish coiling left sub-bundles. Align the center color mark.



- iv. Finish coiling two ends of every sub-bundle once by hand. Don't use any tools to avoid damaging or scratching optical cable.



- v. Keep coiled pre-twisted wire's center color mark as a center. Close upper and lower halves of rubber clamp around pre-twisted wire and fix it with a thin adhesive tape.



- vi. Keep the middle of upper half as a center and align it with outer layer pre-twisted wire's center color mark. Ensure that outer layer pre-twisted wire's curve conforms with rubber clamp's curved surface. Coil 2~3 rounds of outer layer pre-twisted wire on every side of rubber clamp. Ensure that there's no gap between pre-twisted wire and rubber clamp.



Proper Installation

Don't coil outer layer pre-twisted wire on rubber clamp like this.



Improper Installation



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- vii. Install an outer layer pre-twisted wire on lower half of rubber clamp according to operation in Step 6.



- viii. Install all the outer layer pre-twisted wire. Ensure that twisted wires have average gaps and no cross.



- ix. Coil two ends of pre-twisted wire flatly and naturally by hand. Don't use any tools to avoid damaging or scratching optical cable.



- x. Keep the middle of suspension clamp as a center. Close front and back aluminum cleats around



- xi. Fix bolts.



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- xii. Fix U-shape suspension loop on the support fastener.

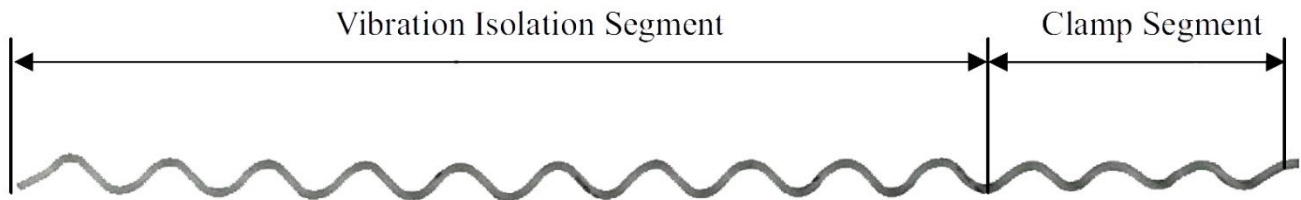


- xiii. Installation is finished.



III. Vibration Dampers:

a. Spiral Vibration Dampers



Application: Install spiral vibration isolator on the optical cable to make damp function to wind vibration and reduce the cable's vibration energy. Thereby, optical cable and fittings can be protected.

Structure: Spiral vibration isolator is made of special plastic with high strength, aging-resistant and high elasticity. It consists of spiral clamp segment and vibration isolation segment.

Installation: Before installing spiral vibration isolator on the support, check whether it matches with optical cable.



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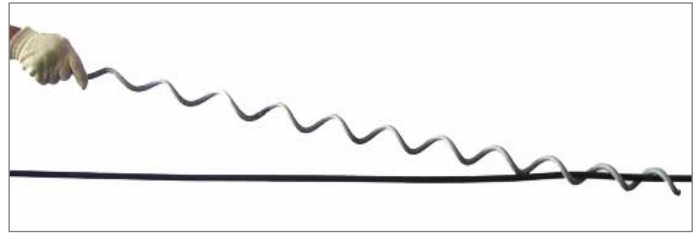
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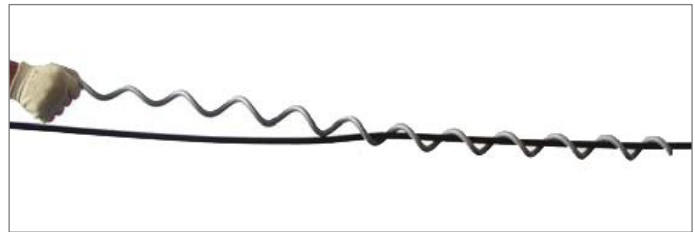
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Installation Method - Single Spiral Vibration Damper

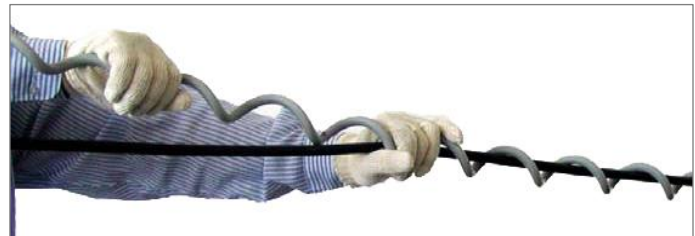
- i. Wrap optical cable with one round of vibration isolation segment, as photo shows.



- ii. Coil / rotate and push forward spiral vibration isolator on the optical cable till clamp segment.



- iii. As photo shows, slide spiral vibration vibrator on the conductor to keep the distance between spiral vibration isolator's end and tension /suspension clamp's end as 12cm. (about a hand's width)



- iv. Wrap clamp segment till accomplishment.



- v. Check whether the distance between clamp segment's end and tension/suspension fittings is 12cm (about a hand's width).



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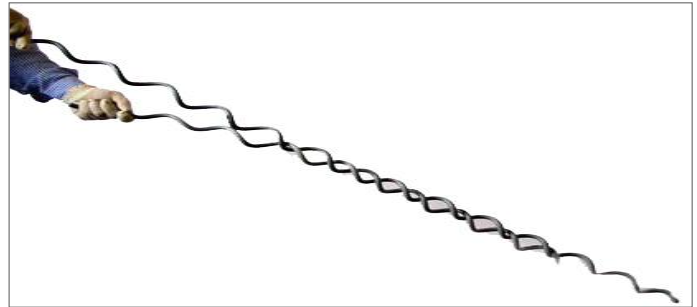
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vi. Installation is finished.

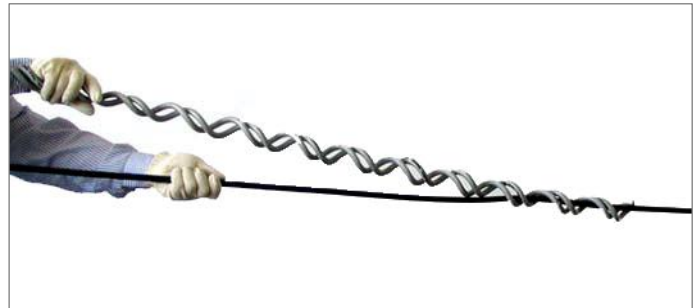


Installation Method - Double Spiral Vibration Damper

i. Twist two spiral vibration isolators in parallel.



ii. Wrap the optical cable with one round of vibration isolation segment, as photo shows.



iii. Coil/rotate and push forward spiral vibration isolator on the optical cable till clamp segment to keep the distance between its clamp segment and tension/suspension clamp's end as 12cm (about a hand's width).



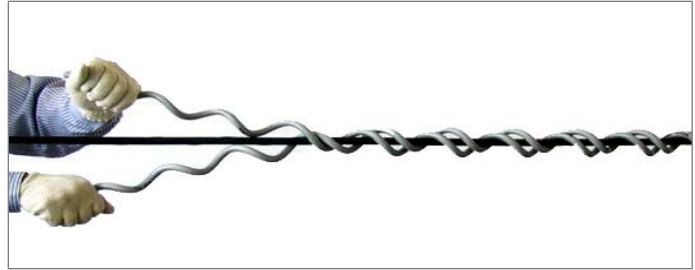
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- iv. For easy installation, separate clamp segment of spiral vibration isolator, as photo shows.



- v. Coil one spiral vibration isolator around optical cable, then coil another one by the same method.



- vi. Check whether the distance between clamp segment's end and tension/suspension fittings is 12cm (about a hand's width).



- vii. Installation is finished.



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IV. Downlead Clamp:

Application: This product is applied to optical cable down leading on the termination/joint support and fixing cable arc part on tension/angle support. It can be also used where needs fixing optical cable.



Galvanized Steel Downlead Clamp



Regular Form Downlead Clamp



Al-alloy Downlead Clamp

Materials:

- Pedestal: Al-alloy (al-alloy downlead clamp), galvanized steel (galvanized steel downlead clamp)
- Clamp Board: Special rubber and reinforced component.

Installation Method - Main Member

- Decide installation position of downlead clamp on the tower.
- Fix downlead clamp on the tower: loosen M12 tighten bolts on its pedestal, nip downlead clamp to the main material on the chosen installation position and screw down M12 tighten bolts and nuts in turn.



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- iii. Fix optical cable: loosen M12 nuts on the inner side of clamp board, open clamp board, embed optical cable into clamp board's parallel grooves, adjust cable, cover clamp board and screw down M12 nuts on inner and outer sides of clamp board in turn.



- iv. Installation is finished.



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Installation Method - Diagonal Member

- i. Decide installation position of downlead clamp on the tower.
- ii. Fix downlead clamp on the tower: loosen M12 tighten bolts on its pedestal, nip downlead clamp to the diagonal member on fixed installation position and screw down M12 tighten bolts and nuts in turn.



- iii. Fix optical cable: Loose M12 bolts on the inner side of clamp board, open clamp board, embed optical cable into clamp board's parallel grooves, adjust optical cable, cover clamp board and screw down M12 nuts on inner and outer sides of clamp board in turn.



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iv. Installation is finished.



Note:

- This product is applied to OPGW / ADSS.
- This product is applied to steel tower.
- This product's collocation: generally, for optical cable downloading, one set is supplied every 1.5 meters; for fixing optical cable and arc wire, one set is supplied every pole/tower.
- During using in optical cable downloading, this product is installed from upper to lower.
- Galvanized steel download clamp's main member installation form is the regular form of consignment.
- Al-alloy download clamp is installed by main member installation method. Two forms of galvanized steel download clamp can be interchanged.

For further details, Contact us.



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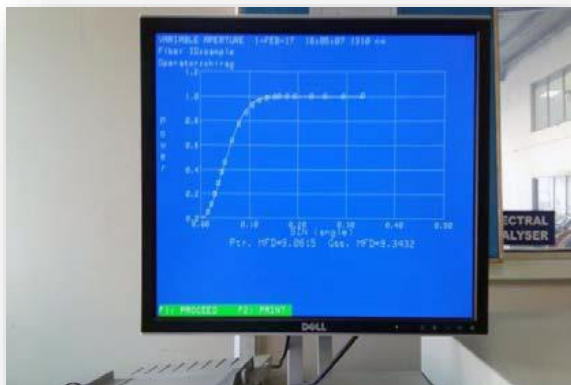
Inhouse OPGW Test Facilities



FIBER GEOMETRY



SPLICER



MFD



SPECTRAL ANALYZER + MFD



OTDR



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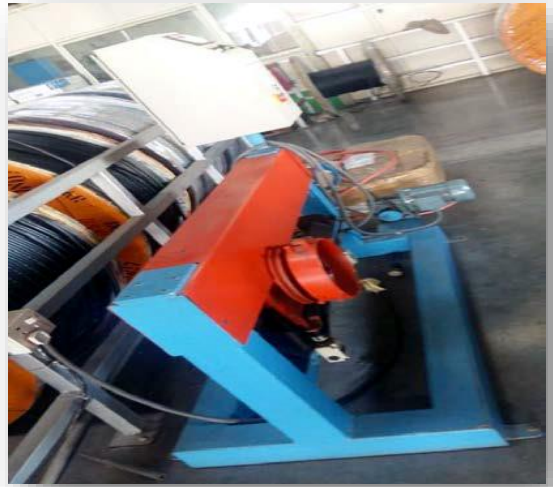
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SHEAVE TEST



TENSILE TESTING MACHINE



REPEATED BEND TEST



VIBRATION TEST



TORSION TEST



CRUSH TEST



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GALLOPING TEST



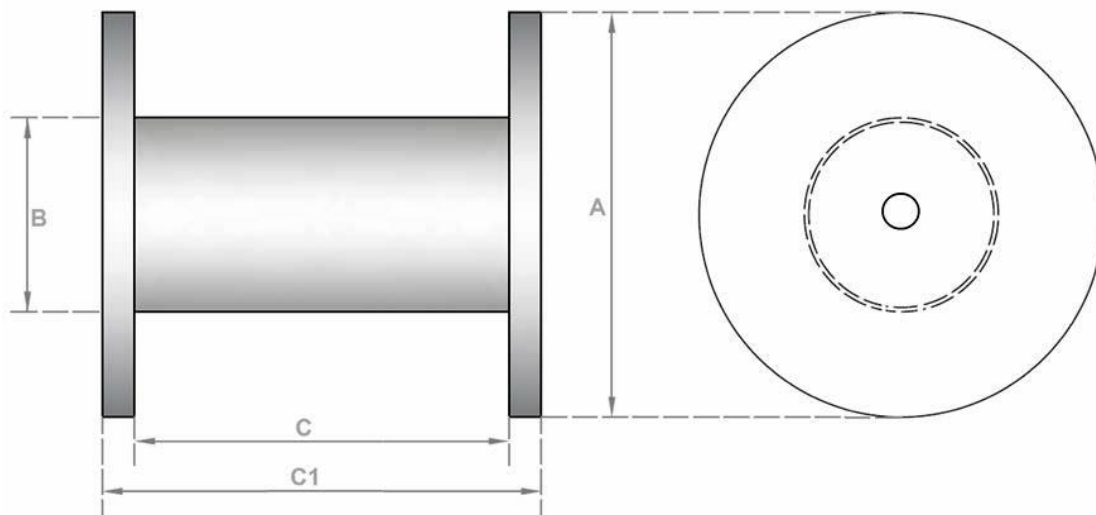
IMPACT TEST

In order to ensure that the OPGW cables will operate successfully in a high voltage network, all aspects associated with the implementation of this technology must be correctly analyzed.

- Maintenance, providing the material required (instruments, repair units, etc.)
- Optimized design of cables.
- Project support (calculation of spans, drum lengths, etc.)
- Definition of optical fiber
- Supervision of installation, to ensure correct cable stringing and splicing
- Test certificates (measurement of fiber attenuation)

Fiberon has designed global pre-sales and after-sales services to optimize the installation, operation and maintenance of these networks.

OPGW Cables can be supplied in Wooden, Steel and Hybrid drums (Steel frame & HDPE plastic). Both ends of cable shall be securely fastened to drum and sealed with a shrinkable sleeve. The required marking shall be printed with a laminated paper on the outsides of drum according to customer's requirement.



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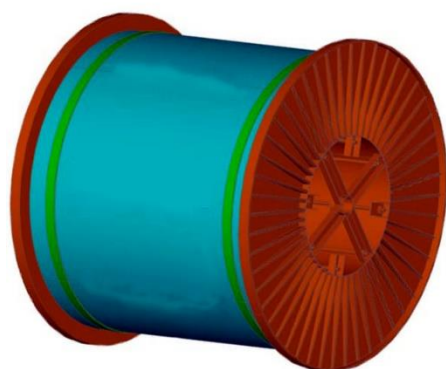
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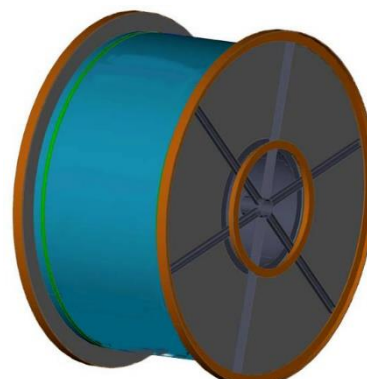
Typical Drum Dimensions:

Cable Diameter (mm)	Standard length of Conductor (m)	Tolerance on Standard length (%)	Drum Dimensions			Volume in m ³
			Flange "A" (mm)	Barrel "B" (mm)	Traverse "C" (mm)	
10.0	3000	± 2%	1120	550	600	0.591
	5000	± 2%	1270	550	600	0.760
	6000	± 2%	1220	550	915	1.069
11.0	3000	± 2%	1220	550	600	0.701
	5000	± 2%	1370	550	600	0.884
	6000	± 2%	1320	550	915	1.252
12.0	3000	± 2%	1220	600	915	1.069
	5000	± 2%	1320	600	915	1.252
	6000	± 2%	1425	600	915	1.459
13.0	3000	± 2%	1220	600	915	1.069
	5000	± 2%	1400	600	915	1.408
	6000	± 2%	1500	600	915	1.616
14.0	3000	± 2%	1320	650	915	1.252
	5000	± 2%	1500	650	915	1.616
15.0	3000	± 2%	1425	800	915	1.459
	4000	± 2%	1525	800	915	1.670
16.0	3000	± 2%	1500	800	915	1.616
	4000	± 2%	1600	800	915	1.839
17.0	3000	± 2%	1550	800	915	1.726
18.0	3000	± 2%	1600	800	915	1.839
19.0	3000	± 2%	1650	900	915	1.956
20.0	3000	± 2%	1725	900	915	2.137
21.0	3000	± 2%	1800	1000	915	2.327
22.0	3000	± 2%	1850	1000	915	2.458

Photograph of Packed Drum for Reference



Steel Drums



**Hybrid Drums
(Steel frame & HDPE plastic)**



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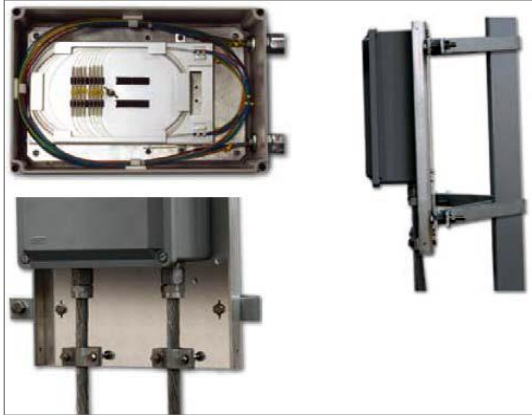
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Joint Boxes, up to 96 splices
Joint Boxes, up to 240 splices



Suspension assembly



Stockbridge Damper



Spiral Vibration Damper



Download clamp



Tension assembly



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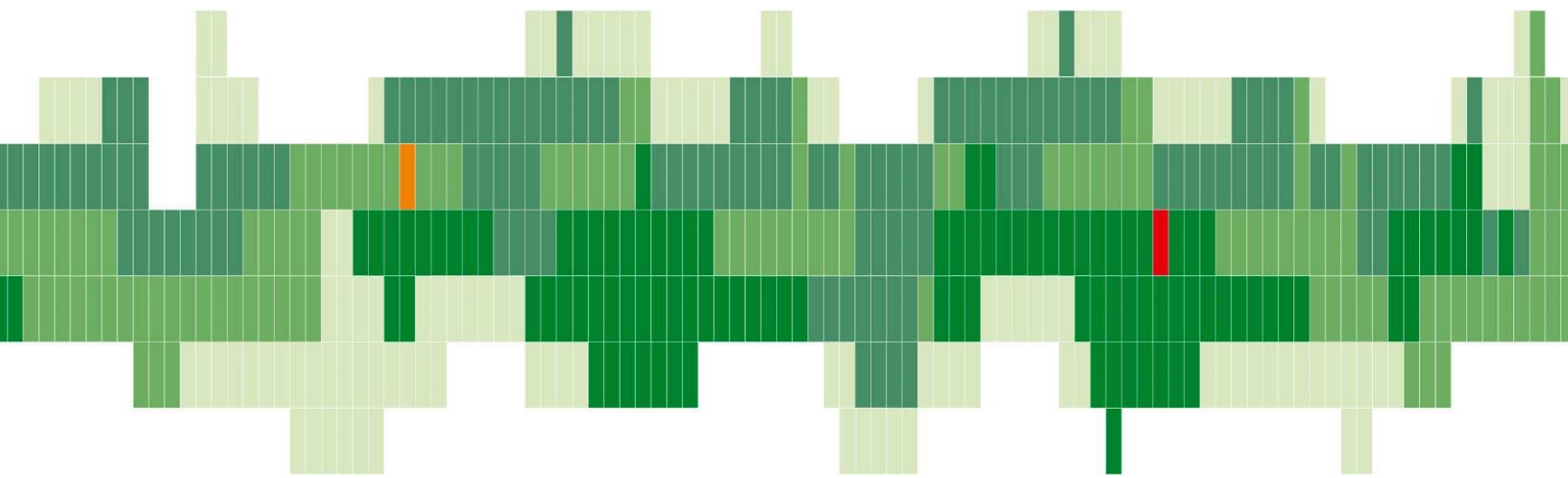
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