OPGW Offerings

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India's only fully integrated OPGW manufacturer & solution provider

Live line installation on BOOM basis 138 kV line MTCIL (JV with MSETCL)

Building over 3200 Km of OPGW Network on BOOM basis in Maharashtra

Solution deployment in dense forest 110 kV line, TAN TRANSCO

Over 8000 Km of OPGW cable & hardware supplied globally for upto 765 kV lines

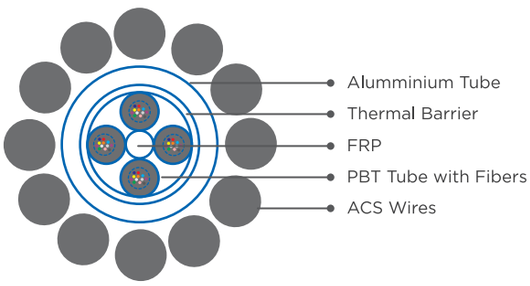
Live line installation 220 kV line, GETCO

Approved by all major State Utilities in India

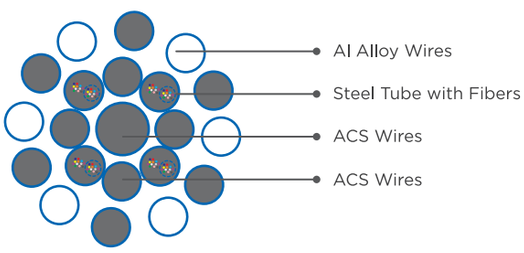
Customer Centric Innovation

Due to its steadfast focus on innovation and constant outlook towards the future, Sterlite Power has also developed expertise in optic fiber and energy efficient bare overhead conductors. Sterlite Power has integrated its core capabilities to bring comprehensive OPGW solutions that include Optical Ground Wire and related hardware. Sterlite Power possesses the planning, application & design engineering and execution capabilities to meet the requirement of Power Systems/Utilities for communication, protection and commercial purposes. Sterlite delivers end-to-end services for communication networks on overhead systems used to transmit power.

Design A - Central Steel Tube Design
Effective on lines below 400 kV
Low wind load areas



PBT-Central Core Aluminium Sheathed Tube Design
Effective for 400 kV and above
Hog wind load areas
Effective design for fiber management



Design B/D-High Strength Design
Extremely high spans like river crossing, high ice and galloping conditions
High fault current design in desert regions

Design Considerations

OPGW cables are required to withstand the effects of installation and long-term in-service exposure to mechanical, electrical and environmental loads without significant degradation in performance. OPGW cable fulfils the following key performance indicators for selection in appropriate designs:

Electrical Performance

- Fault current performance to overcome the line-to-tower short circuits or system imbalances
- Lightning performance to ensure lightning arc does not impair long-term functionality of the cable

Mechanical Performance

- Sag and tension
- Vibration
- Galloping and Sheave

Environmental Performance

- Range of temperatures and wind zones
- Corrosion levels at installation sites including pollution level between 1-4
- Salinity levels

Packing

The end-user needs to determine the length per reel on the basis of:

- Terrain of the installation site
- Type of installation to be carried out (‘Live Line’ or ‘On Outage’)
- Capacity of unreeling facility with installer

*Additionally, considerations should be noted for excessive contact pressure under hardware, the current transfer capability of the connection of hardware with the OPGW cable and contact between dissimilar materials that may cause excessive corrosion in some environments

Supply Length

- Maximum length per reel is 4 km
- Length per reel available as per customer request

Quality and Reliability

Sterlite undertakes tests on all products to ensure quality and reliability. Below is an overview of the results:

Test Parameters	Reference Standards	Sterlite Products' Performance
Stress-Strain	1EEE-1138 Ch.5.1.1.11 IEC 61089, Annexure B	No visual damage to the cable; fiber showed no significant strain or induced attenuation.
Tensile Strength	IEEE-1138 Ch 4.2.2.3 IEC 60794-1-2, Method E1	Cable breaking strength ≥ 95% RTS and no single wire was broken.
Sheave	IEEE-1138 Annexure D IEC 60794-1-2, Method E9	No significant damage to any component of the cable; fiber attenuation ≤ 0.1 dB/Km at 1550 nm.
Aeolian Vibration	IEEE-1138 Annexure B IEC 60794-1-2, Method E19	No significant damage to any component of the cable; fiber attenuation ≤ 0.1 dB/Km at 1550 nm.
Galloping	IEEE-1138 Annexure C	No significant damage to any component of the cable; fiber attenuation ≤ 0.12 dB/Km at 1550 nm.
Creep	EIA/TIA 455-25A-1989 and EIA 455-41-1985 IEC 61395	Fiber attenuation ≤ 0.02 dB/Km at 1550 nm. Cable elongation ratio: 0.02%.
Temperature Cycling	EIA/TIA 455-3A-1989, using a modified version of temperature cycling Test Condition B, -40°C to +85°C two cycles. IEC 60794-1-2, Method F1	Fiber attenuation ≤ 0.03 dB/Km at 1550 nm.
Seepage of Flooding Compound	FOTP EIA/TIA 455-81A-1991 IEC 60794-1-2, Method E15	The compound did not flow or drip
Short Circuit	IEEE-1138 Annexure A IEC 60794-1-2, Method H1	No significant damage to any component of the cable; fiber attenuation = 0.05 dB/Km at 1550 nm.
Lightning Arc	1EEE-1138 Ch.6.4.3.4 IEC 60794-1-2, Method H2	Fiber attenuation < 0.05 dB/Km at 1550 nm. Remaining RTS >75% of Cable RTS

Continuous improvements may result in specification changes without prior notice. Any warranty relating to any products is only contained in the form of a written agreement between SPTL and the direct purchasee of such product(s).

Sterlite's OPGW Installation Projects

COASTS - Coastal region of Tamil Nadu, India (230 kV)

DESERTS - Desert region of Gujarat, India (220 kV)

FORESTS - Dense forest of Valparai, India (110 kV)

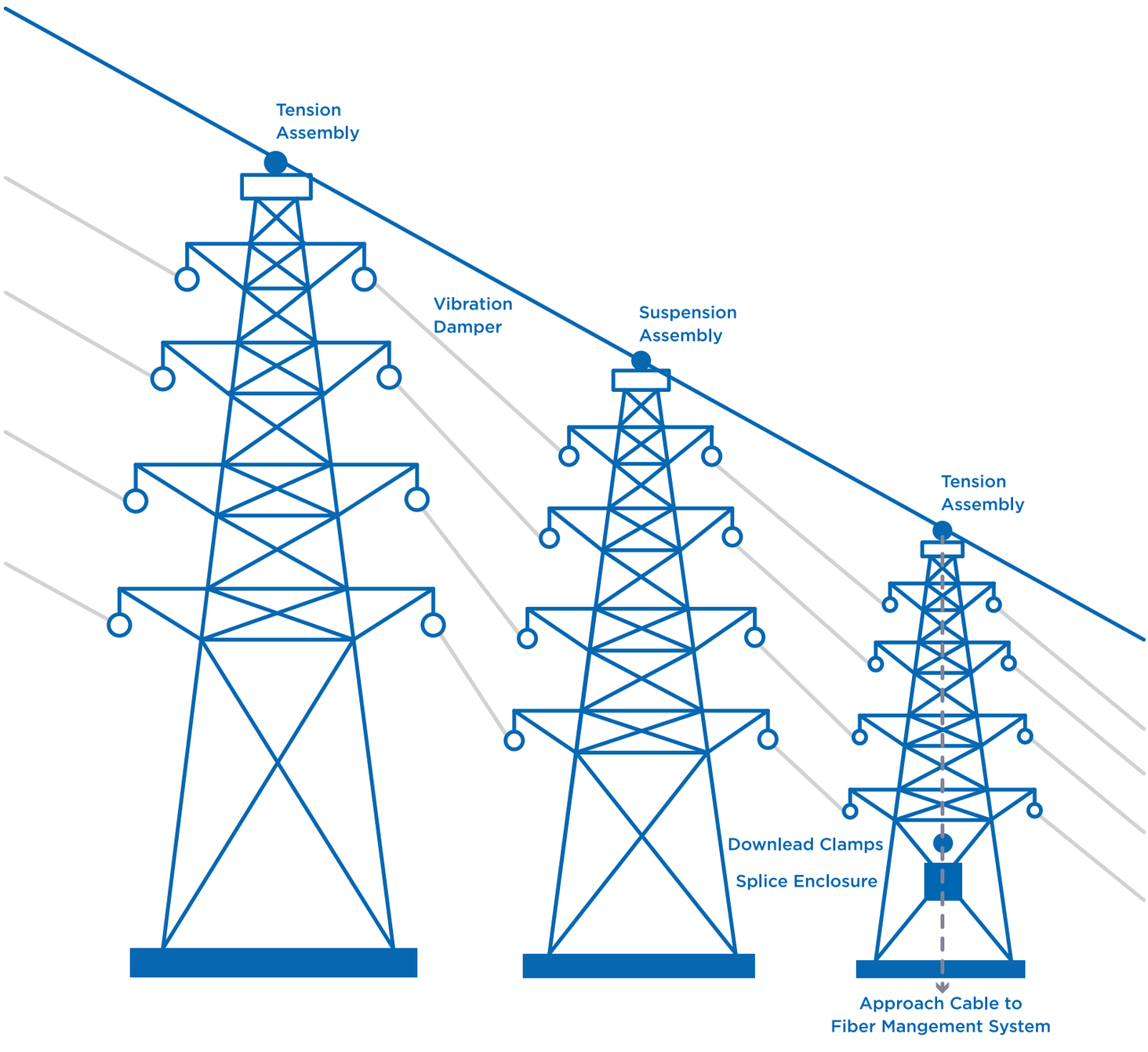
RESIDENTIAL AREAS - Residential area in Jaipur, India (132 kV)

MULTIPLE LINE CROSSING - Multiple line crossing in Orissa, India (132 kV)

Installation Hardware

World class cable products need high quality hardware support. Sterlite Power's portfolio extends to include the following hardware essentials:

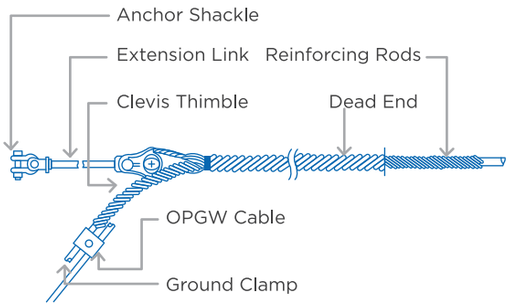
- TENSION ASSEMBLY
- VIBRATION DAMPER
- SUSPENSION ASSEMBLY
- DOWNLEAD CLAMPS
- SPLICE ENCLOSURE

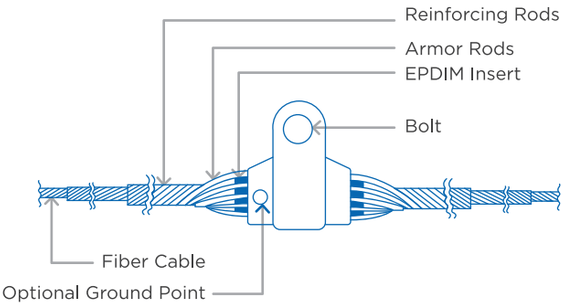


Sterlite OPGW Accessories

Tension Assembly

Tension assemblies are designed for use with OPGW cable at termination, section and joint tower positions. They can hold up to 95% of the OPGW RTS & maintain optical integrity over the operating load range.



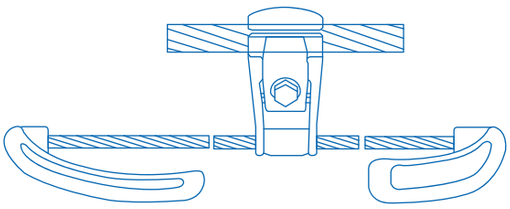


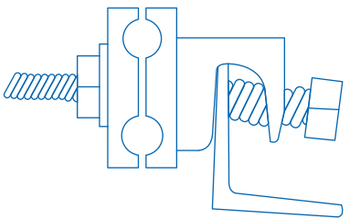
Suspension Assembly

Suspension assemblies are designed for use with OPGW cable at suspension tower positions. They reduce static compressive stresses at the support point and cushion the OPGW cable against the dynamic stress of Aeolian vibration.

Vibration Damper

Vibration Dampers effectively reduce the level of Aeolian vibrations on Optical Ground Wire (OPGW) cables. They respond to wind induced line vibrations that are characterized by high frequency, low amplitude motion.



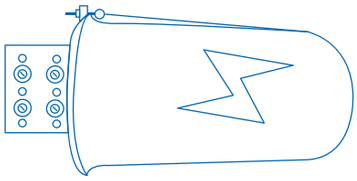


Down Lead Clamps

Fixing clamps are used to guide OPGW cables from the top of the structure to the splice box for grounding the cable. They provide proper spacing and holding strength without damaging the cable.

Splice Enclosure

Splice enclosure is used for the storage of spliced fiber & storing the same on the transmission tower. Hence, it is specifically made with an armour of metal on the outside to protect the enclosure from electrical fields.



Sterlite Power

Client Endorsement

"STERLITE DELIVERS ON ITS COMMITMENT TO SUPERIOR PRODUCT QUALITY. THEIR MANUFACTURING PLANTS FOR CONDUCTOR AND OPGW ARE STATE OF THE ART FACILITIES WITH THE LATEST TECHNOLOGY. THE QUALITY ASSURANCE LABORATORIES ARE ALSO OF HIGH STANDARDS."

- Lakshmi Narayana P, Adani

"WE ARE MORE THAN SATISFIED WITH THE PRODUCT THAT STERLITE HAS SUPPLIED."

- Gary Stewart, Lines Acquisition Specialist, Powerlink Queensland

"STERLITE SUPPLIED ACSR MOOSE CONDUCTOR ON AN IMMEDIATE BASIS FOR OUR 400KV MADHUGIRI – BIDADI TRANSMISSION LINE. THEIR SUPPORT HELPED US IN GETTING OUR SUBJECT LINE SUCCESSFULLY INSPECTED BY CEA AS PER SCHEDULE."

- P G Suresh Kumar, Director, Kudgi Transmission Limited (A wholly owned subsidiary of L&T IDPL)