



ALE

ASSET LIFE EXTENTION

LINE MATERIALS





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Asset Life Extension - ALE

Utility grids face a host of asset management challenges as a result of the environment in which they operate. The question is always how we can mitigate the impact of these environmental conditions or events, be they planned or unplanned.

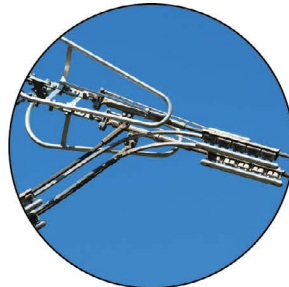
Themes arise from these issues including Network Resilience, System Hardening and Asset Life Extension. All have a particular narrative and commonality among utilities, and all are intertwined in the operation of a utility system.

TEN continues to lead and innovate this space working with global manufacturers on technologies that allow utilities to integrate these proven systems and solutions into their asset management framework. These products can be broadly considered as:

- **System Hardening** – Polywater duct sealants, Reliaguard & Greenjacket wildlife protection, Genics wood preservative and fire barriers
- **Network Resilience** – Polywater lubricants, La Granja Insulators and Tykoflex OPGW Enclosures
- **Asset Life Extension** – Leak repair for oil filled and SF6 Equipment, Induron corrosion protection and Clampstar connector correctors Pole Life Systems & LWS Pole Enforcer



GREENJACKET®
WILDLIFE COVERS



Clamp Star
THE CONNECTOR CORRECTOR
CONNECTOR CORRECTOR



Polywater®
Solutions at work.
CONNECTOR CORRECTOR



Pole Life systems
WOOD POLE PRESERVATION



genics
Wherever Wood Is Used™
FIRE MESH



RELIAGUARD®
WILDLIFE COVERS



LWS
LAMINATED WOOD SYSTEMS
POLE ENFORCER



genics
Wherever Wood Is Used™
COBRA RODS



INDURON
PROTECTIVE COATINGS
PROTECTIVE COATINGS



Connector Corrector - Clampstar

ClampStar® is an Engineered Electrical & Mechanical Shunt also known as a Connector Corrector that is intended to correct and reinforce the deteriorated electrical and mechanical performance of hot, aged or degraded midspan joints and other connectors, clamps and fittings.

A popular use of ClampStar® is to increase the performance rating of existing midspan joints and other connectors, clamps and fittings for the purpose of increasing line ampacity that may be presently limited by current connections.

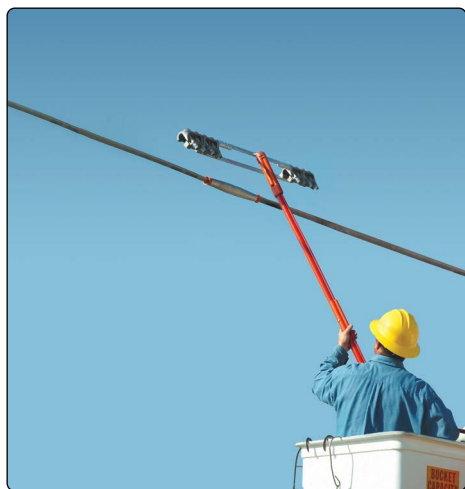
ClampStar® eliminates risk and prevents catastrophic connector failures before they happen, and are installed in just minutes.

Failing connectors are repaired with NO power interruption

Distribution class

Available in both standard and light configuration. Light is suitable for slack strung and lightly tension spans. Can be supplied with nickel plated keepers for copper conductors.

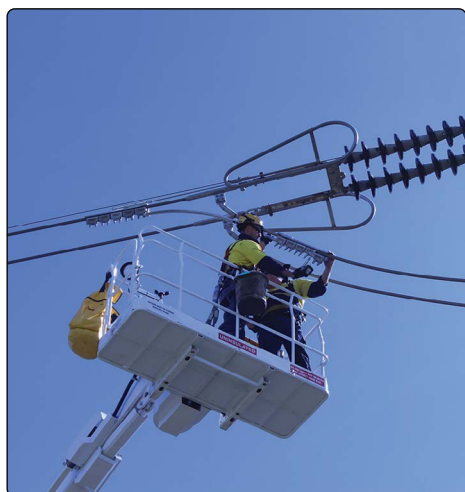
Install by:



Transmission class

Available in standard, heavy and full tension configurations. Designed with an integral fastening assembly containing a specially designed, captive keeper assemblage that provides a high conductivity path and incorporates flat and Belleville washers to maintain compressive force regardless of temperature induced contraction and expansion. Integrated corona shield means no extra items required to complete your installation.

ClampStar Connector Corrector selection matrix
SCAN or CLICK the QR-Code



ClampStar® provides great benefit to the utility:

- Lightweight design installs in less than 10 minutes!
- Permanent installation for damaged conductors, deadends, midspan joints & suspension clamps on Aluminium, ACSR & Copper conductors, OPGW, Overhead Earth or Shield Wires.
- Easily installs over existing connectors or suspension points
- No additional rigging equipment required such as special mechanical grips, Come-Alongs, jumpers or cutters
- Can be installed with hot stick or barehand methods
- Available for copper, ACSR and all aluminium stranded conductors

SCAN or CLICK QR-Code for a variety of ClampsStar instalation videos



Connector Correctors are available for all common conductors and applications. Bespoke designs available, contact TEN with your connector challenge



Quality Tools, Equipment & Line Materials for the Energy Industry.



Fire Mesh - GENICS

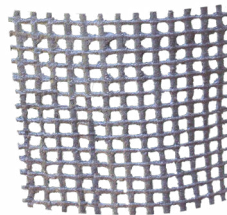
Genics fire mesh is a protective barrier designed to protect wood structures from burning and minimise scorching!

Fire Mesh

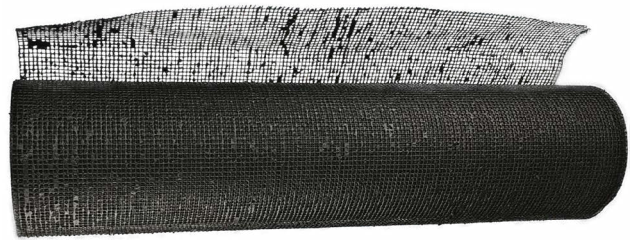
- Made up of an intumescent grid that is coated with a durable double layered intumescent polymer
- Fire mesh is breathable and allows the pole to maintain its homeostatic state
- The fibreglass mesh substrate is extremely light weight and durable and can be applied to new poles before transport
- Favourable environmental and safety profile, animal safe, there is no leaching of chemicals and it is safe to handle
- Heavily tested to the proposed ASTM Wood Pole Fire Test Standard
- Accelerated weathering testing to determine UV performance
- Intertek tested and listed
- Work practice available (included with all purchases) for easy installation
- In stock at TEN



Durable for Pre-wrapping prior to transport



Fire Mesh Patch



Fire Mesh Roll



PREVENT FIRE DAMAGE AND KEEP ALL OF YOUR WOOD ASSETS PROTECTED WITH FIRE MESH PATENTED FIRE PROTECTION SYSTEM

For a detailed presentation on how fire mesh can prevent pole and power loss in a bushfire event, contact TEN

SCAN or CLICK the QR-Code for further information





Test and Treat - GENICS

Genics TEST & TREAT address each of the mould and decay degradation issues facing your wood pole network. Cobra Rods, CuB Liquid, Cobra Wrap and Cobra Cap are just some of the products in the range. If we look at combining these products for protecting and treating affected areas, this system maximises efficacy and extends the life of wood pole assets.



Cobra Rods

- Internal Co-Biocidal Diffusible Rod for remedial and preventative treatment of timber utility poles and other wood structures
- Boron and Copper complex, raw ingredients fused into an amorphous glass rod
- Product is hydrophilic and will seek out moisture
- Suitable for treatment of Basidiomycetes (Brown and White rots) and Ascomycetes (soft rot fungi)
- Safe chemical profile requiring minimal PPE



Cobra Wrap

- External Pole wrap with hydrophobic pads that are immersed in Copper Naphthenate (CuNap) solution
- Acts as a physical barrier to the soil and provides the elemental treatment of copper to the face of the pole impeding soft rot
- Long lasting plastic wrap with rechargeable pads, offering a long lasting, low cost external treatment solution
- Available option: Tough wearing tape applied in exposed areas to provide protection for the wrap against power garden tools



CuB Liquid

- Copper-borate water based liquid preservative made from the glass rod
- Contains no harmful VOC's
- Shock treatment designed to be applied to poles exhibiting active rot
- Ideal for dry environments where very little moisture content is available for rod activation
- Ideal for above ground applications
- Available option: CuB liquid applicator
- Use in combination with Cobra Rods for effective remedial treatment



Cobra Cap

- Protection against rot at the pole top
- Includes 2 x Cobra rods for treatment
- Easy to install
- Easy to replace treatment when required
- Hard durable long lasting plastic





Pole Life systems

Pole Life Systems

Pole Life Systems are specifically designed for pole top restoration creating "pole prosthetics", the first asset life extension products for the industry. Pole Life Systems is a lightweight, non-conductive, fire retardant, low cost and structurally sound system that reinforces wood pole tops.

Features and Benefits

- Poly Fibre Resin Composite (PFRC) material that is strong, lightweight and durable with integrated UV protection, fire retardancy and immunity to rot, corrosion and insects.
- Resin-rich barrier
- High performing compressive strength of 2,273kg
- Long-term weather and UV resistance
- Retention of properties for decades
- Protection from surface erosion and abrasion vs. painted coatings



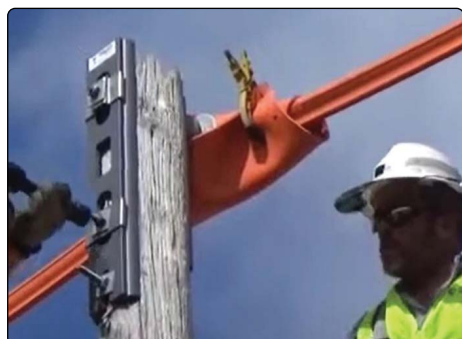
Insulator Support

- Reinforces and supports horizontal mounted insulators
- Use in conjunction with Vertical support or stand alone
- Simple to install



Cross Arm Reinforcement

- Simple and extremely sturdy crossarm pole top support system
- Provides structural reinforcement to degraded wood poles with cross-arms
- Suits timber, steel or fibreglass cross arms
- Flanges to support the cross arm
- Custom applications also available



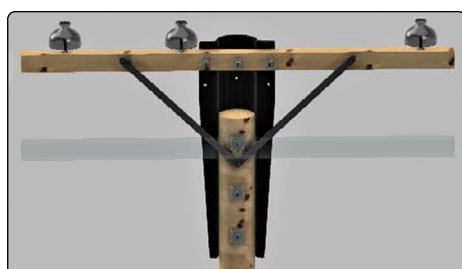
Pole Top Reinforcement - Vertical

- Easily installed system that lowers the structural attachment point in all decayed pole tops
- Maintains conductors in their current position
- Can be used for any wood pole damage caused by deterioration, cracking or storm damage
- Two sizes cover LV and HV poles
- System requires Insulator supports and backing plate
- Also available for pole top pin reinforcement



Cross Arm Extension

- Bracket lifts the cross arm from the original height, up to 450mm higher
- Perfect for Conductor-to-Ground (CTG) and Conductor-to-Structure (CTS) issues
- The CA50 provides a new vertical height clearance without needing to change the pole





LWS

LAMINATED WOOD SYSTEMS



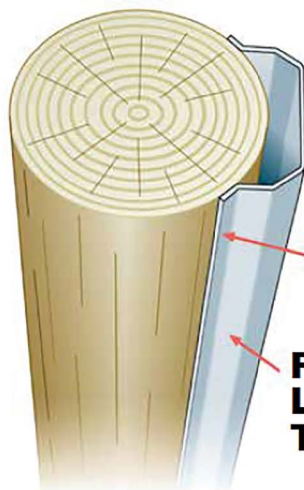
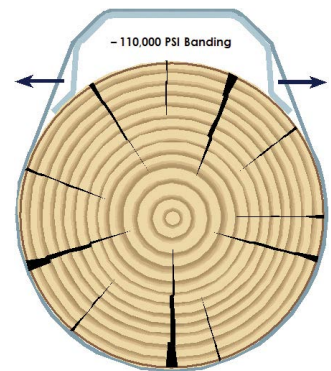
Laminated Wood Systems

Pole Enforcer by LWS

The patented PoleEnforcer® proves that "all steel is NOT created equal"

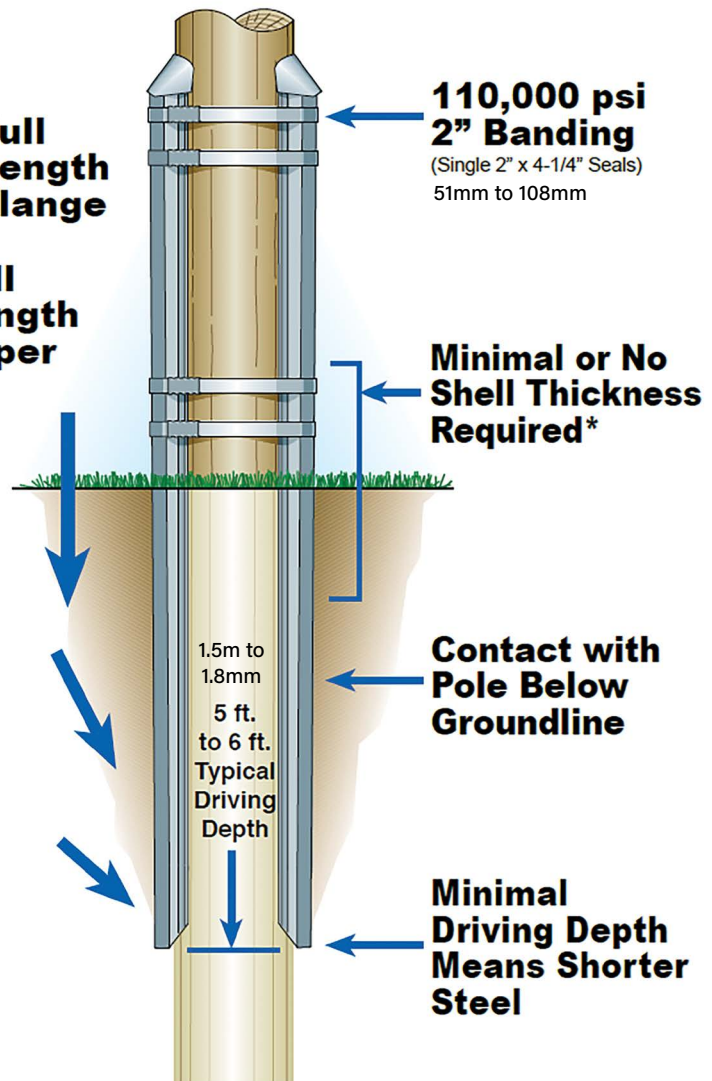
The PoleEnforcer's patented design ensures positive contact with the pole below the ground-line - thus bridging the decayed area and transferring the load to the pole butt - that is TRUE POLE REINFORCEMENT. Other reinforcement systems in the market can be considered "pole stubs" and not true reinforcement systems.

- The full length flange increases load bearing surface and eliminates "knife edge" contact with the pole
- Steel Unit acts as a "spring" once bands are installed following the expansion and contraction of the wood
- Contained tension keeps the bands/unit secure even if pole diameter changes.



Full Length Flange

Full Length Taper



How does the Patented design work?

As the PoleEnforcer® steel members are driven into the ground, the full length taper design forces the flanges to maintain positive contact with the pole below the ground-line. This eliminates the need to drive the steel below the pole butt



Quality Tools, Equipment & Line Materials for the Energy Industry.

GREENJACKET®

Power Outage Protection - Greenjacket

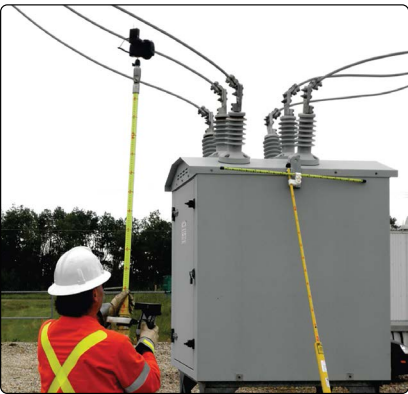


Greenjacket is a precise-fit custom made-to-order product that has an exacting fit to within 1/8th of an inch accuracy to the underlying equipment.

The precise-fit is what differentiates Greenjacket and makes it the gold standard for wildlife mitigation.

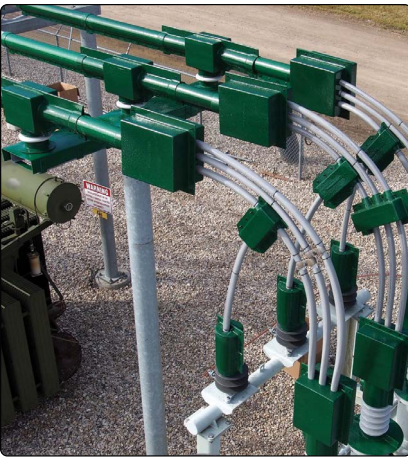
The exacting fit is achieved through a team of line-workers who image customer substation equipment; designers who plot the equipment and design the cover; a patented made-to-order manufacturing process and shipping in a turnkey boxed solution complete with a Site Protection Plan for installation.

The Greenjacket material is a fast set polymer that meets specific test criteria of the IEEE 1656-2010 Guide.



How We Work

When we set out to create an innovative solution to preventing animal outages, we knew the product was only part of the puzzle. We also needed to create a process that would allow us to assess needs, identify risks and create a complete engineered solution for preventing animal outages.

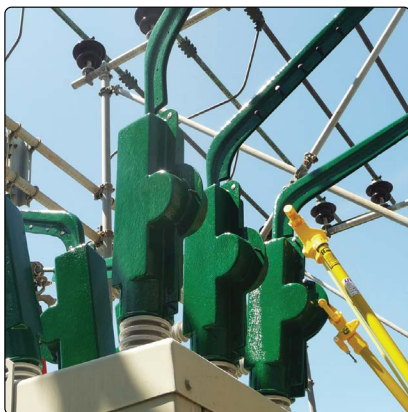


Understanding Your Needs

- Step 1. Budgetary Assessment
- Step 2. On-Site Assessment/Desktop evaluation based on diagram and photos

Building Your Greenjacket Solution

- Step 3. Design and Manufacturing



Getting Your Solution in Place

- Step 4. Installation

*The information given above is representative data obtained from tests commissioned by Greenjacket. Although the data is, to Greenjacket's knowledge, reliable, Greenjacket cannot assume any liability relate to the data provided, or to decisions made based on the data provided.



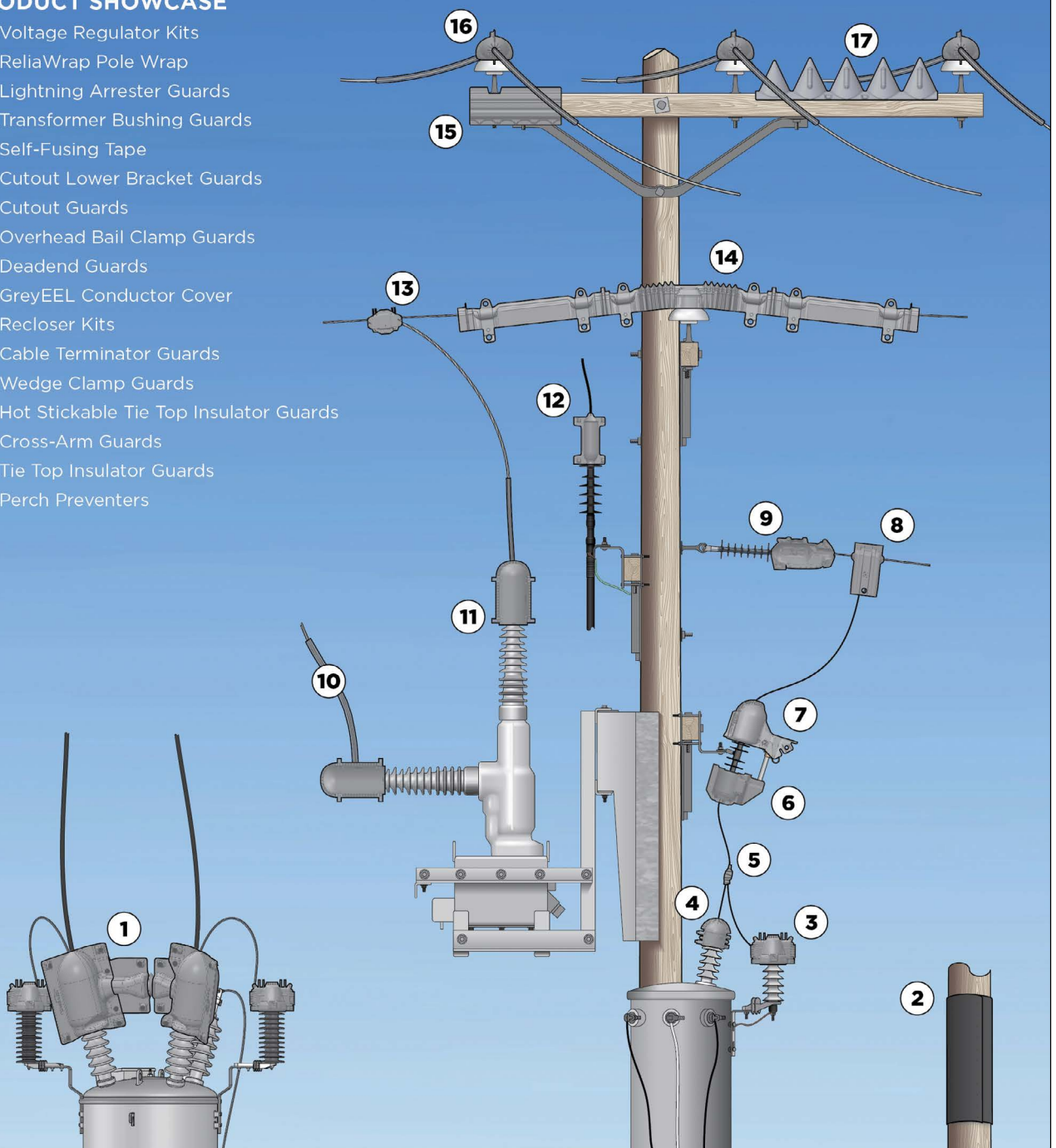
Wildlife Mitigation Products - Reliaguard

Reliaguard manufactures guards for common powerline equipment to prevent animal and bird caused outages. The Reliaguard parts are designed to have a superior fit for the underlying equipment to prevent gaps in coverage which can lead to an animal or bird accessing equipment. Reliaguard parts are made from a proprietary material known as Reliatanium. Reliaguard recommends that all of it's guards be installed with GreyEEL conductor cover to extend the area of coverage.

- **Effective materials and coverage**, to mitigate contact risk between energized phases or phase to ground, taking into consideration animal reach or wingspan.
- **Easy application**, taking into consideration linemen glove wear, methods and tools.
- **Robust Retention Features**, so guards stay where they are installed and do not dislodge.

PRODUCT SHOWCASE

1. Voltage Regulator Kits
2. ReliaWrap Pole Wrap
3. Lightning Arrester Guards
4. Transformer Bushing Guards
5. Self-Fusing Tape
6. Cutout Lower Bracket Guards
7. Cutout Guards
8. Overhead Bail Clamp Guards
9. Deadend Guards
10. GreyEEL Conductor Cover
11. Recloser Kits
12. Cable Terminator Guards
13. Wedge Clamp Guards
14. Hot Stickable Tie Top Insulator Guards
15. Cross-Arm Guards
16. Tie Top Insulator Guards
17. Perch Preventers





Quality Tools, Equipment & Line Materials for the Energy Industry.

Polywater®

Solutions at work.

Conduit / Duct Sealant Systems - Polywater

AFT Sealant System

Polywater® AFT closed-cell sealant provides 10 feet of water-blocking performance in electrical and telecommunication environments. The two-part, closed-cell AFT Sealant is durable and easy to install. AFT has excellent adhesion to a variety of conduits. AFT seals conduits with quicker installation and higher performance compared to duct putty or single-part insulating hardware store foams. The two-part aerosol foam seals any size void and cures without exposure to air. AFT expands and cures to a rigid, closed-cell structure in minutes.

AFT creates an airtight, watertight seal. AFT can be used to seal service entrances, conduit, innerducts, inverters and combiners for solar installations, and riser poles for the electrical grid. AFT protects against insects, rodents, moisture, dust, and gases. The package is reusable, and the fire-retardant seal is self-extinguishing.



AFT Features

- Quick Installation: 2-minute application time or less.
- Multiple-Use Can: Creates numerous seals in all types of ducts.
- Reliable: Holds 10 feet of continuous water head pressure.
- Durable: Withstands cold temperature applications.
- Removable: Product can easily be removed to replace cable.



To Watch the AFT Application Video SCAN or CLICK the QR-Code

FST Sealing System

FST™ Duct Seal is a “closed cell foam”, with high density properties, this keeps water, acids, greases, gases, insects and rodents out of the conduit.

The foam has good wetting and adhesion to metals, plastics, and concrete.



FST Features

- FST Duct Sealant™ has 98% closed-cell content for increased strength and resiliency
- FST Duct Sealant™ resists 6.7m of water-head pressure
- FST Duct Sealant™ is compatible with cable and duct materials
- FST Duct Sealant™ is chemically resistant to gasoline, oils, dilute acids and bases, and most unsaturated hydrocarbons
- Prevents the passage of gas; does not sag; will not dry out; and is re-alterable
- Quick: Foam expands and cures quickly even when water is present
- Multi-Use: Packages are resealable



To Watch the FST Application Video SCAN or CLICK the QR-Code





Quality Tools, Equipment & Line Materials for the Energy Industry.

Polywater[®]
Solutions at work.

PowerPatch™ Leak Repair Kit - Polywater

The PowerPatch® Sealant is provided in a kit containing the surface preparation and patching materials necessary to repair leaks in oil filled transformers, SF6 Gas, sealing lead-sheathed cables, potheads and other oil-filled electrical equipment.

Features

- Quick plugging action** - A fast-cure putty that stops oil
- Permanent seal** - A 2-part paste overcoat forms a permanent seal
- Durable** - Finished seal is impervious to water, oil and weather
- Fast** - System can plug and seal active leaks in minutes
- Saves money** - Faster than welding. Transformer may stay in service
- Simple** - Eliminates "bagging" or removal from field and unexpected outages
- Convenient** - Kit contains all materials needed to fix leak while in the field

SIMPLE TO APPLY

Use the PowerPatch® System's putty stick to block oil and SF6 leaks. Then make a permanent patch with the fast cure, 2-part paste overcoat. Ensure optimal mix and performance with pre-measured packaging. It is non-conductive and has a dielectric strength of 43KV (ASTM D149).

Fixes leaks fast. At 21 °C, the putty and sealant harden in about 10 minutes. The finished patch is resistant to transformer oil and SF6 and has held oil pressures in excess of 100 psi. Product is able to be stored and reused multiple times please refer to the SDS for shelf life information. Preparation is extremely important, and the kit provides everything needed to do the job, although in instances of excessive oil leakage or dirt accumulation, separate scrubbing rags such as Grime-Away™ Cleaning Wipes are helpful.

Contact TEN for advice on your leaking equipment



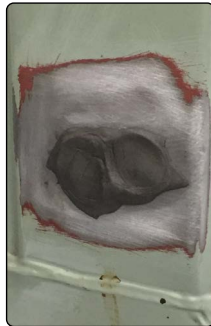
Non-conductive with a dielectric strength of 43kV (ASTM D149)

**Ideal for: Transformers
SF6 Gas Equipment
Oil-filled equipment
Potheads (UG-HO)**

Repair active leaks



Active Leak



Putty Stick Blocks Oil



Repaired Leak



SCAN or CLICK to view PowerPatch application video



Also suitable for use with battery powered caulking guns



INDURON

PROTECTIVE COATINGS

Induraguard 9200 - INDURON

What is Induraguard 9200?

Induraguard 9200 is a one-coat solution for weathered galvanized and previously-painted structures. As a high solids, high-build, single-component, self-priming coating, Induraguard 9200 is extremely surface-tolerant and provides excellent wetting. The linseed oil within the coating sinks into areas where it is needed, such as bolt heads, fayed surfaces, and hard-to-reach crevices, while the barrier pigments provide maximum corrosion protection over minimal surface preparation.



Extends the life of aging infrastructure

Designed for maximum forgiveness of marginally-prepared substrates with remains of tightly-adhered rust and old coatings, Induraguard 9200 extends the service life of aging infrastructure. It seals and holds old coatings in place, puts very low stress on aged coatings, and creates a hydrophobic surface that resists water penetration to prevent further substrate deterioration. Though utilities have used other coating options, they seem to return to the tried and true technology Induraguard 9200 offers.

- Proven Protection
- Low applied cost
- Streamlined application
- Environmentally friendly



This 50-year-old rusty carbon steel pole was protected with an Induron coating system consisting of a SP-2 Hand Tool Cleaning, one coat of E-Bond 100 Penetrating Sealer, and 1 brush applied coat of Induraguard 9200.

Best wetting-out of substrate

- Excellent penetration
- High SBV
- Low VOC
- High film build
- Easy to apply



Induron wetting



vs competitor



Line Materials

TRANSMISSION & DISTRIBUTION LINE HARDWARE



HELIXON HELICAL FITTINGS



- Dead Ends
- Armour Rods
- Splices
- Top Ties
- Guy Guards
- Guy Locks

VIBRATION CONTROL



- Spiral Dampers
- Stockbridge Vibration Dampers
- Spacer Dampers
- Spreader Rods

STRAIN & SUSPENSION CLAMPS



- Suspension clamps
- Pivot Suspension Clamps
- Cast Iron Clamps
- Strain Clamps
- Helixon Suspension Clamps

FABRICATED FITTINGS



- Shackle Straps
- Cross Arm Braces
- Saglinks
- Yoke Plates
- Link Plates
- Guy Thimbles
- Eye Bolts
- Pole Steps
- Pins and Hooks

LINE HARDWARE



- Insulator Fittings
- PG Clamps
- Compression Dead-ends
- Compression Mid-span joints
- Compression Non-Tension
- High Temperature Fittings
- Split Bolts



TYKO FLEX

OPGW JOINT CLOSURE

T240 SYSTEM

- ▶ IP69K environment proof rating
- ▶ Pole or tower mount
- ▶ A reliable and ruggedised connection
- ▶ Resistant to rodent activity
- ▶ Fast mounting via TEN supplied BAND-IT grade 316 s/s strap

INSULATORS



LaGranja Insulators

- Glass Disc Insulators
- Polymer Suspension
- Porcelain Line Post
- Polymer Line Post
- Porcelain Pin Type
- Porcelain Disc
- Porcelain Strain
- Porcelain Pin Type
- Polymer Distribution
- Porcelain Station Post



- Combines toughened glass with hydrophobic properties of polymers
- Available fully coated or undercoated shell
- Suitable in severely polluted areas where washing was previously required
- Si-Coat® RTV Silicone HVIC Technologies by CSL





TEN Group

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