

TEN offers a comprehensive range of Line Materials and Asset Life Extension (ALE) products for Transmission and Distribution networks.

- ▶ Transmission & Distribution Line Hardware
- ▶ Power Anchors and Anchor installation Equipment
- ▶ Insulators
- ▶ CPI Wedge connectors
- ▶ Genics Test & Treat and Fire Mesh
- ▶ ClampStar Connector Corrector
- ▶ Pole Life Systems
- ▶ Polywater products
- ▶ Reliaguard equipment and Conductor covers







LINE MATERIALS - TABLE OF CONTENTS

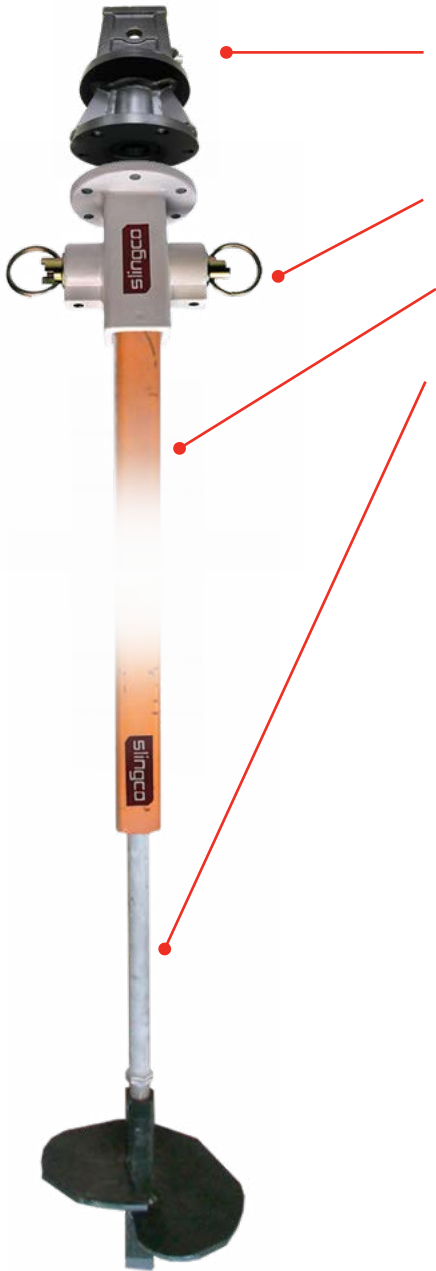
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Power Driven Anchors and Installation Equipment

Anatomy of a Utility Power Driven Anchor



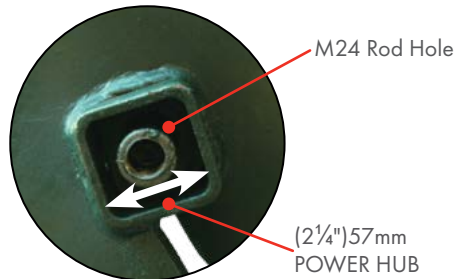
Kelly Bar Adapter engages the entire installation assembly to the torque motor output shaft of the Lifter Borer's driving equipment (typically 75mm x 75mm in Australia)
A torque limiting device can be installed between the Kelly Bar Adapter and Locking Dog assembly to monitor and control maximum torque values to prevent anchor failure

Locking dog assembly is bolted to the Kelly bar adapter. A pair of spring loaded dogs secure the Drive End Assembly and Anchor Rod

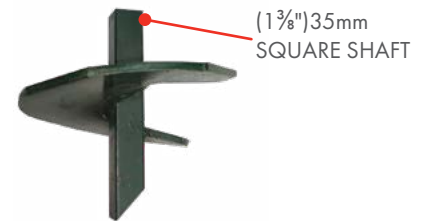
Drive End Assembly/Torque Tube engages the anchor hub & drives the anchor into the ground, either internally or externally depending on the anchor type

Anchor Rod connects the anchor to the eye and stay-wire, it is installed from within the drive end assembly.

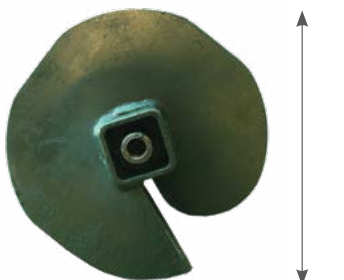
There are two common anchor types used in Australian Utilities



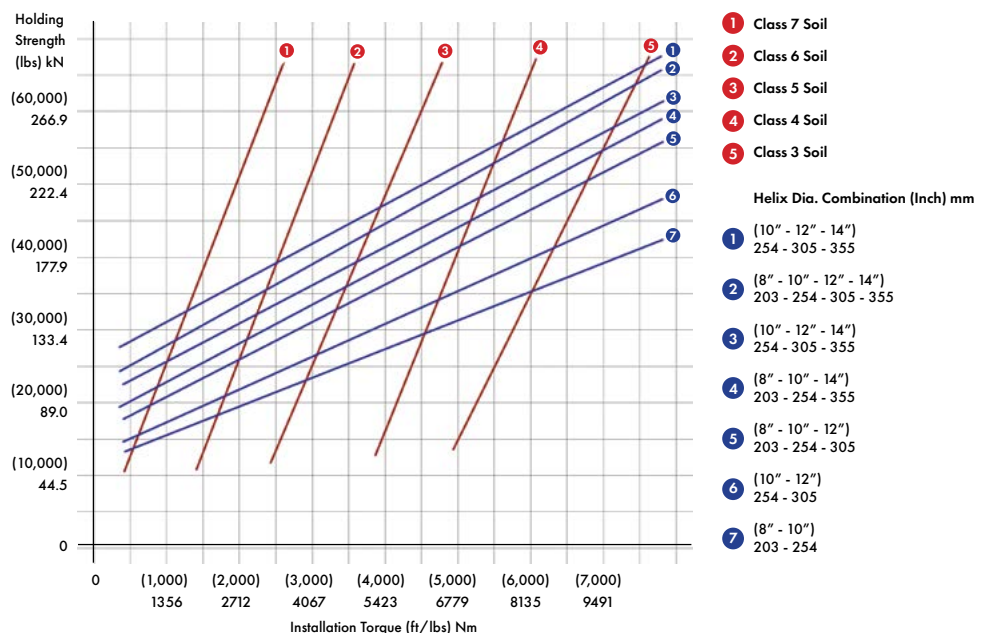
**Drive End/
Torque Tube seats internally**
These anchors have a 13,558Nm
Ultimate Torque Capacity
Designed for Tough Terrain e.g. Rocky
Ground



**Drive End/
Torque Tube seats externally**
These anchors have an 8,135Nm
Ultimate Torque Capacity
Designed for Normal Ground
Conditions



Holding Capacity for Multiple - Helix Power Shaft Anchors





Anchor Rods, Eye Nuts and Couplers

Part No.	Description/Type	OAL (mm)	Thread	Wt (kg)
AR-242140-GS	Anchor Rod with M24 Threaded Ends	2140	M24	7.0
ENT-24	Single Thimble Eye Nut for M24 Anchor Rods	115	M24	0.8
D-354	Coupler, 102kN UTS	51	M24	0.2

Stainless Steel Rods and longer rods also available

Square Shaft - Anchors 35mm (1 3/8")

Part No.	Type	UTS Torque (Nm)	Helix Size (mm)	Thread	External Hub (mm)	Wt (kg)
D-104-6-M24	Single	8135	250	M24	35	5.9
D-114-6-M24			300			7.3
D-44-2-6-M24	Twin		100			7.7
D-104-2-6-M24L			250			15.9
D-114-2-6-M24			300			16.8
D-134-2-6-M24			355			20.3

Single

Twin

Power Hub - Heavy Duty Anchors 57mm (2 1/4")

Part No.	Type	UTS Torque (Nm)	Helix Size (mm)	Helix Thickness (mm)	Thread	Internal Hub (mm)	Wt (kg)
TD225-64M24	Single	13558	150	9.5	M24	57	3.7
TD225-84M24			200	9.5			5.1
TD225-104M24			250	9.5			6.4
TDH225-114M24			300	12.7			9.8
TDH225-134M24			355	12.7			12.2

Swamp Anchors 38mm (1 1/2")

Used in soft ground areas where additional helices are required

Part No.	UTS Torque (Nm)	Length (m)	Helix Size (mm)	External Hub (mm)	Wt (kg)
D-6634	7457	1.0	250 & 300	38	21.8
D-6636		1.7	200, 250 & 300		29.5
D-6625-U	8100	2.13	Extension Shaft		25.8
D6602US		0.43	Single Guy Attachment		4.2
D6606US		0.43	Triple Guy Attachment		4.2

Anchor Installation Tools

Part No.	Description	Details
C303-0075	Kelly Bar Adapter	Suit 75mm x 75mm Drive - 6 hole configuration
SAE10425	Locking Dog Assembly	For 133mm 5 1/4" Bolt Circle - 6 hole configuration (Formerly C303-0069HD)
SAE09639	Drive End Wrench (Standard)	2.1m OAL, Used for both 35mm (1 3/8") Square Shaft & 57mm (2 1/4") Socket Power Hub Anchors (Formerly C102-1583)
SAE08666	Drive End Wrench (Hybrid)	2.1m OAL, Used for both 38mm (1 1/2") Square Shaft Swamp Anchors & 63mm (2 1/2") Socket Power Hub Anchors (Formerly C303-1064)





Distribution and Transmission 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
- Helixon Suspension Clamps
- Cast Iron Clamps
- Strain Clamps

Fabricated Fittings

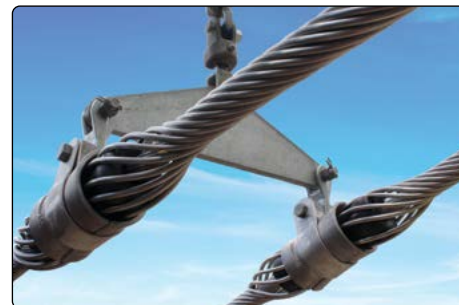
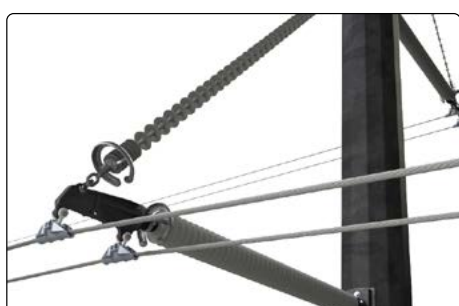
- Shackle Straps
- Cross Arm Braces
- Saglinks
- Yoke Plates
- Link Plates
- Guy Thimbles
- Eye Bolts
- Pole Steps
- Pins and Hooks

Line Hardware

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

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



Distribution and Transmission Line Hardware

Insulated Systems

- LV ABC Bolted Clamps
- LV ABC Hardware
- Installation Tools
- HV ABC Bundle Restraints
- HV ABC Suspension Assemblies
- HV ABC Brackets, Hooks and Clamps
- HV ABC Installation Rollers

Anchor

- Anchor Rods
- PowerHub Anchors
- Socket Drive Anchors
- Expanding and Cross-Plate Anchors
- Installation Tools

Automatics

- Automatic Deadends
- Automatic Splices (Pop-up insertion verification tab)

Anchor Rod Pulling Eye

Part No: SPP-PE1

- Designed to assist in tensioning guy wires
- Offset eye for 3 tonne hook or shackle, allows easy dead end attachment
- Adjustable wedge allows for maximum rod diameter
- Body and wedge made from ductile iron with high strength bolt
- WLL 5:1 - 26kN
- Breaking Load 133kN
- Suits Anchor Rods 13mm - 32mm Diameter
- Weight 2.3kg

Tower and Pole Steps

Tower Step - BuckBolt with Anchor Point

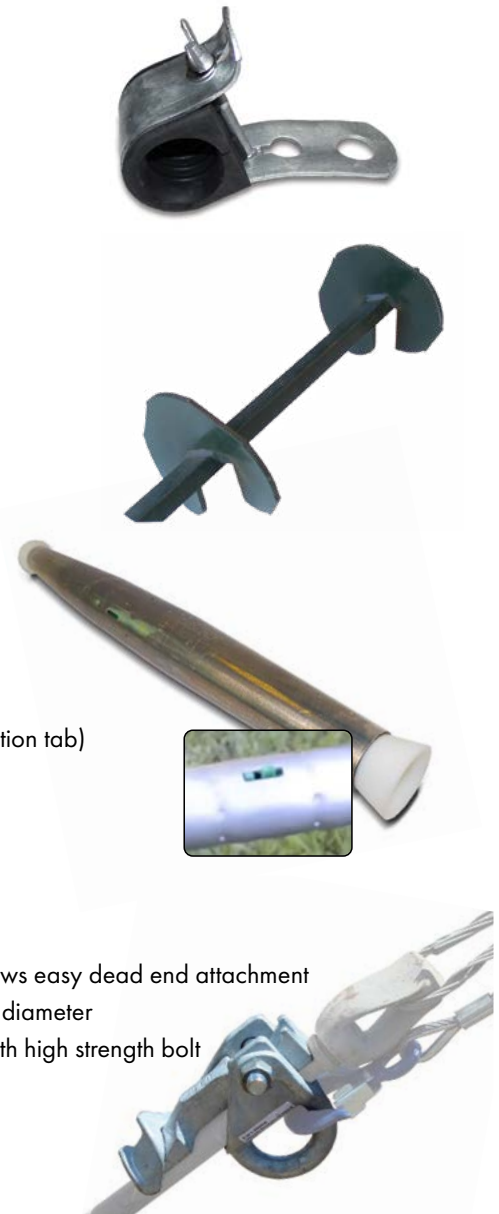
- Safe method for climbing towers
- Available in 16mm ($\frac{5}{8}$ "), 19mm ($\frac{3}{4}$ ") 22mm ($\frac{7}{8}$ ") & 25mm (1")
- BuckBolt & Flanges are a 2,270kg rated Anchor point
- Optional Left & Right hand Flange
- Designed for Steel Tower

BUCKINGHAM
BUCK
1896

Pole Step - Removable

- "Non Slip" Step
- Captured Safety Pin
- Easy to Install 25mm Expansion Anchor Bolt
- Designed for Steel and Composite poles

VAF
INDUSTRIES





Insulators

Polymer Insulators - MacLean Power Systems

Silicone Rubber

MPS uses a Silicone formulation that has been unchanged since the early 80's. The Si-O molecular bonds (inorganic backbone of Silicone) are very stable and have bond strengths higher than sunlight, making the silicone resistant to UV degradation. In addition to providing protection against the effects of ultraviolet radiation, electrical aging, and corona effect, silicone exhibits hydrophobic properties; which provide excellent recovery characteristics to control leakage currents in highly polluted or coastal environments.

The MPS silicone rubber formation has consistently outperformed other silicone formulations in its hydrophobicity, its hydrophobicity recovery rate, and enhanced electrical properties in contaminated environments.

P-S-T End Fitting Seal

The P-S-T sealing system is a triple seal design with built-in redundancies.

Primary Seal - rubber sheath compressed into chamfer of end fitting.

Secondary seal - RTV silicone applied to core / end fitting interface.

Tertiary seal - final external RTV seal applied to sheath / end fitting interface. The P-S-T system has clearly shown its superiority to withstand moisture penetration.

CR E-Glass Core

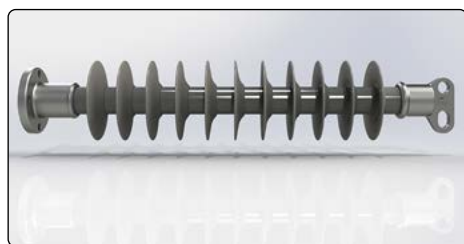
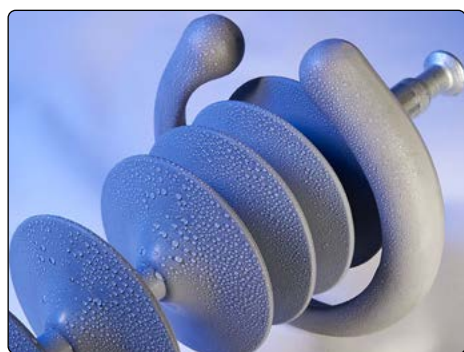
MPS uses "Boron Free" Corrosion Resistant E-Glass on all its insulators for its High Electrical Integrity & High Resistance to acid corrosion. The boron free formulation of the fiberglass core makes it resistant to nitric acid attacks and stress corrosion. There has never been a brittle fracture of a CR E-glass Insulator in over 30 years of use.

Stacked Shed

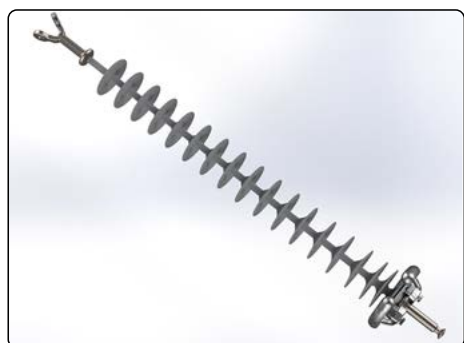
The MPS Stacked Shed configuration offers inherent protection against material aging in critical areas of the sheath and resists the resultant material erosion when installed in highly contaminated environments (resistance to Water Droplet Corona). In addition, stacked shed profiles enhance the ability of the insulator to resist mechanical damage in these most critical areas during transportation and installation.

Dual Manufacturing Processes

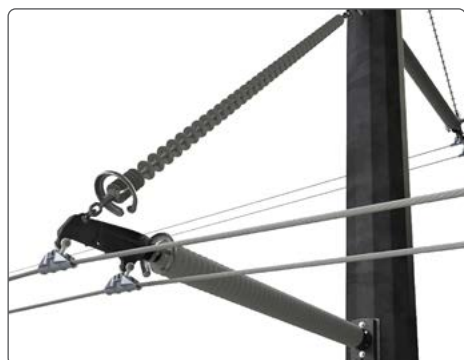
MPS offers suspension insulators made using two unique manufacturing processes, Molded and Modular, to meet the various needs of the transmission market. Both designs use the same features and materials; MPS Silicone, PST Seal, CR E-Glass, Stacked Sheds, & Smart Fit Corona Rings.



Line Post Insulators



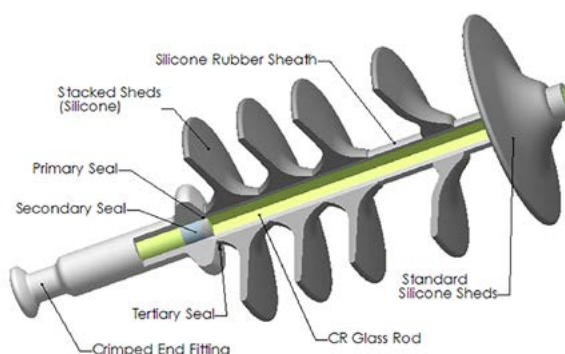
Suspension Insulators



Braced Post Insulators



V-String Assemblies



**MADE IN
THE USA**

Quality Toughened Glass Disc Insulators - LaGranja



LaGranja Insulators

Progressive asset managers recognise glass discs as providing the most cost effective transmission insulation technology when considering safety, reliability and resilience. LaGranja differentiates quality through:

- Glass shells undergoing three thermal shock cycles followed by a soak test
- Automation incorporated with cap and pin assembly and using alumina cement - hot cured
- Cap flocking (polyamide fibres) incorporated in caps reducing Corona and RIV
- Approvals for use with the most demanding utilities in the world
- Almost 90 years of manufacturing, headquartered in Spain

Product Range



Capacity (kN)	STANDARD	ANTI POLLUTION	OPEN PROFILE
	Part No.	Part No.	Part No.
70	E-70-127 E-70Z-146*	E-70PPZ-146*	E-70D-146
120	E-120Z-146*	E-120PPZ-146*	E-120D-127 E-120D-146
160	E-160Z-146* E-160Z-170*	E-160PZ-146* E-160PZ-170*	E-160D-146 E-160GD-146
210	E-210Z-170*	E-210PZ-170*	E-210GD-170
240	E-240Z-170*	E-240PZ-170*	-
300	E-300-195	E-300P-195	-

*Z = Anti-corrosion zinc sleeve collar on pin

Factory Applied RTV Silicone Coating

SILGLASS®

THE SMARTVALUE SOLUTION



- 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



SILGLASS® Insulators are made using SiCOAT® RTV Silicone HVIC Technologies by CSL



Ground Rod Driver

Ground Rod Driver - iTOOLco

Part No. GRD-1

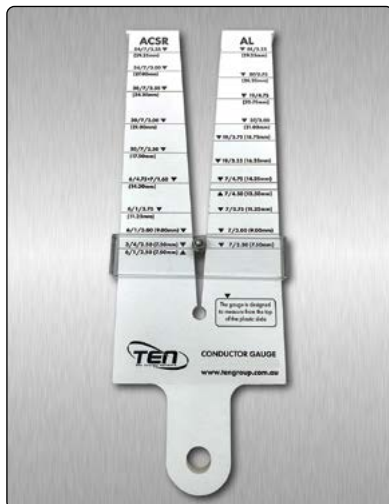
Drive ground rods safely in seconds

- Safely drive 9.5mm, 12.7mm, 14mm, 16mm and 19mm rods from the ground in under a minute with iTOOLco's Earth Rod Driver.
- Once the rod is driven down far enough the DRIVER can then be used from the top to finish the driving.

Features

- Drive earthing rods faster and safer
- Hardened tool steel construction for long life
- Multiple size rods can be driven
- SDS Max driver bit for positive connection and secure driving of rods

Never drive earth rods from a ladder again



Conductor Diameter Gauges

Conductor Gauge - TEN

Part No. CG-430-AU

HDPE slide gauge quickly & easily identify conductor OD

- Designed for Australian AL, CU & ACSR conductors
- Measure Live Conductors
- For conductors 4.0 - 30mm Ø
- Fits universal sunrise fitting

Reduce Incorrect Conductor Identification

Part No.	Dimensions (mm)	Wt (kg)
CG-430-AU	287 (L) x 104 (W) x 10 (D)	0.26

Conductor Diameter Gauge - AL, CU & ACSR

Part No. CG-EQL-Series

Quickly & easily identify common overhead electrical distribution conductor or wire sizes in AL, CU & ACSR. Markings include conductor name, stranding and overall Diameter.

- Hole in base for use with a shotgun stick and hanging storage
- Imperial and metric sizes included
- Precision machined from lightweight aluminium alloy

Part No.	Conductor Range	Dimensions (mm)	Wt (kg)
CG-EQL-ALCU	Copper 7/.064 - 4.87mm to 19/2.75 - 13.8mm Aluminium Locust - 7/.093 - 7.08mm to Taurus - 19/4.75 - 23.80mm	257 (L) x 91 (W) x 14 (D)	0.75
CG-EQL-ACSR	ACSR Quince - 5.25mm to Wolf - 18.13mm	209 (L) x 91 (W) x 14 (D)	0.65





DBWB-1



FRWB-1



BB-2S



Conductor Brushes and Cleaning

Scratch Brush - "Dog-bone and Flat Round" - Madi

- Designed to encourage linemen to brush with a more convenient and ergonomic design making it more convenient than ever before
- Replaceable brush inserts make a cost effective solution
- Suitable for use up to 45mm conductor
- Made from Non-conductive materials
- Minimise open neutrals and bad connections by brushing conductors properly

Part No. DBWB-1

- Dog-bone design, colour and marking for copper one end and aluminium the other

Part No. FRWB-1

- Designed for both flat and round connection such as palms
- Replaceable brush inserts suitable for both flat and round ends

Part No.	Description	Wt (kg)
DBWB-1	Dog-bone Scratch Brush (includes one set of inserts)	0.25
FRWB-1	Flat Round Scratch Brush (includes one set of inserts)	0.25
LWB-1	Replacement Wire Brush for DBWB-1	0.10

Scratch Brush and Safety Knife - Madi

Part No. BB-2S

- Integrated wire brush for cleaning conductors to make better connections
- Replaceable brush inserts make a cost effective solution
- Suitable for use up to 25mm conductor
- Blunt Tipped fold-away blade for added safety
- Stainless steel blade for maximum durability and sharpness

Part No.	Description	Wt (kg)
BB-2S	Fold-away Safety Knife and Round Scratch Brush	0.23
WB-1	Replacement Wire Brush for BB-2S	0.10

Conductor Scratch Brushes

Part No. SB-3 & SB-4

- Used for preparing the surface of conductor prior to applying a connector/splice
- Tough stainless steel bristles resist rust
- Copper or aluminium available - use only on specified conductor to prevent cross contamination

Part No.	Colour	Conductor Type	Wt (kg)
SB-3	White	Aluminium	0.10
SB-4	Black	Copper	0.10

Stick Scratch Brushes - Hastings

Part No. Various

Part No.	10-178	10-180	10-179
Description	Complete "V" Brush unit with Handle for Gloved Hands, Shotgun Ring, Replaceable Brushes (10-179)	Complete "V" Brush unit with Universal Head Attachment, Replaceable Brushes	Pack of 10 Replacement Brushes
Material	Thermoplastic Handle & S/S Bristles	Al Alloy Body & S/S Bristles	S/S Bristles



Wedge Connectors

Wedge Clamps - CPI

Wedge Clamp Connectors consist of a spring "C"-Body and wedge combined with a "shear-head" bolt offering a high performance permanent connection that is low resistance, durable and easy to install.

Replaces fired on connectors

MAINTAINS LOW RESISTANCE CONNECTIONS AT ALL TIMES

The spring body of the connector will flex and maintain a constant force as thermal cycling causes conductors expand and contract.

SIMPLE AND SAFE INSTALLATION

During installation, when proper spring tension is achieved, the shear head bolt will break off giving the installer a positive indication of a correctly completed connection. No special tooling required.



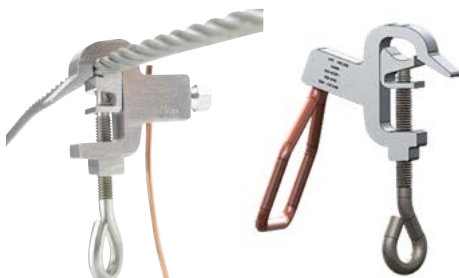
Aluminium with Bail

- Can be installed liveline with hot-sticks
- Al-Al, Cu-Cu and Bi-Metal (Al-Cu) available
- For use in all applications including critical high load areas and on overloaded circuits
- May be used in highly corrosive environments including salt laden areas to connect copper conductors
- High-conductivity grit type corrosion inhibitor is factory applied for long life
- Removable and reusable with no damage to conductor
- Remains permanently locked through fault current or power surges
- Meets or exceeds the current carrying capacity of the conductors being connected
- Complies with AS/NZS1154



Also available from Connector Products Inc

HTC SERIES HOTLINE TAP CONNECTOR



HTC SERIES HOTLINE PAD CONNECTOR



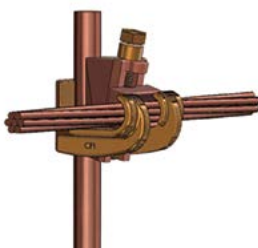
OPGW BOLTED DEAD END FIBRE OPTIC



OPGW DOWN LEAD CLAMPS FIBRE OPTIC



EARTH GRID CONNECTOR



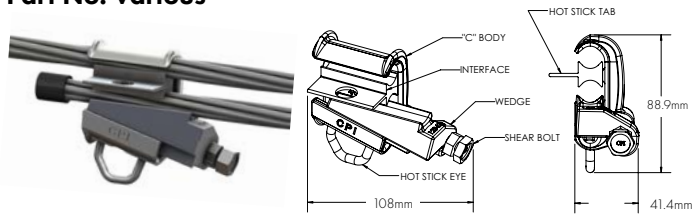
RUNNING RAIL CONNECTOR





Shear Bolt Wedge Clamp Tap Connector

Part No. Various

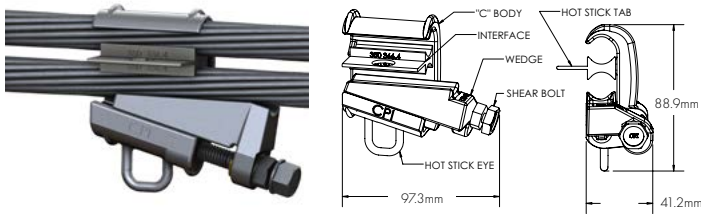


Description	Main Conductor Range (mm)	Tap Conductor Range (mm)
4 Series AL Tap Connector	4.11 to 14.57	4.11 to 14.57

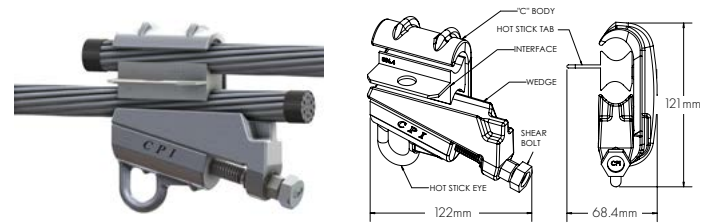
Available with Hot Stick Eyes



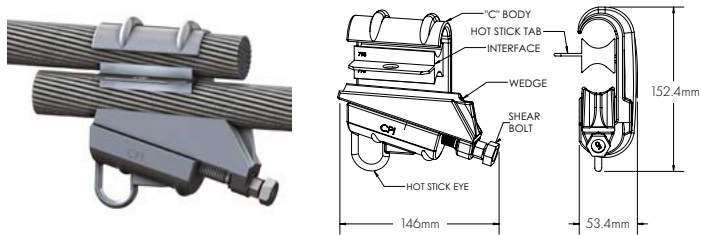
Description	Main Conductor Range (mm)	Tap Conductor Range (mm)
4 Series CU Tap Connector	5.89 to 13.46	4.11 to 13.46



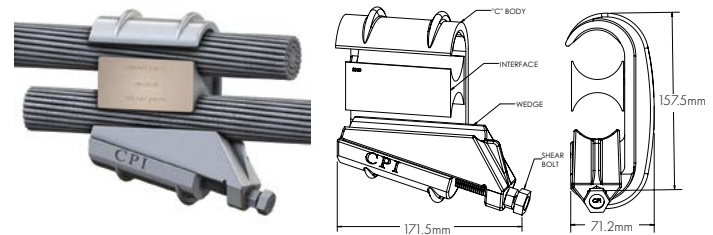
Description	Main Conductor Range (mm)	Tap Conductor Range (mm)
350 Series AL Tap Connector	14.56 to 17.37	4.11 to 17.37



Description	Main Conductor Range (mm)	Tap Conductor Range (mm)
336 Series AL Tap Connector	16.91 to 24.20	4.11 to 24.20



Description	Main Conductor Range (mm)	Tap Conductor Range (mm)
795 Series AL Tap Connector	24.71 to 33.02	4.11 to 33.02



Description	Main Conductor Range (mm)	Tap Conductor Range (mm)
1272 Series CU Tap Connector	34.16 to 46.32	8.02 to 46.32

Contact TEN for customised Conductor Charts for your network and Crossover to Ampacts

Stirrups

Connectors and Splices - CPI

Piggy Back Clamp



Part No.	Range (mm)	Feature
102011	4.11 - 7.42	550amp bail rating
102010	7.42 - 10.11	
102009	10.52 - 13.26	
264124	12.75 - 14.56	
336915-1	14.88 - 18.39	



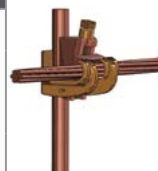
Part No.	Range (mm)	Feature
6002248	5.2 - 28.0	Shotgun Ring

Automatic Splices

Earth Grid Connectors



Part No.	Range (mm)	Feature
S750	6.35 - 8.02	Lock Wedges
S1000	7.41 - 10.51	
S2000	11.78 - 14.88	
S3000	15.46 - 18.87	
S4000	18.87 - 21.79	



Part No.	Main Range (mm)	Tap Range (mm)
900102	Stranded 13.26-14.61 Rod 14.12 (5/8)	Stranded 9.35-10.64
	Rod 12 (1/2)	Stranded 10.64
900103	Stranded 9.35- 0.64	Stranded 9.35-10.64
	Stranded 13.26 Rod 12 (1/2) - 14.12 (5/8)	Stranded 7.42



Tykoflex OPGW Joint Enclosure

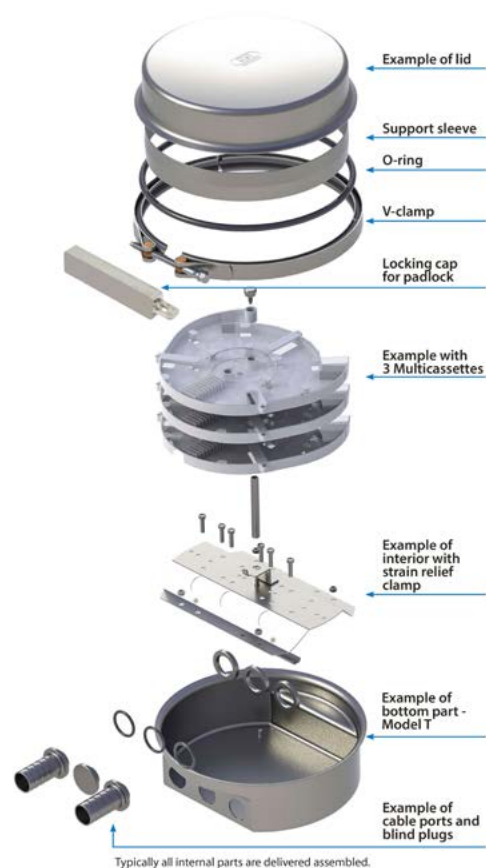
The T240 Joint Closure is part of a modular system of lockable closures made of acid proof stainless steel. The main benefits of the system are superior flexibility, easy handling, and tightness against overpressure as well as vacuum. The closures are designed for use in demanding environments. Together with desiccator the closure remains free of humidity even under extreme conditions.

The closure is suitable for use above ground attached to high voltage towers, poles, walls or other support structures. The Tykoflex closure can be tailored to almost any required configuration. It is designed to provide water and pressure-tight environmental protection for optical fibres and optical fibre splices for all cable designs. The closure is therefore suitable for ground installations in manholes, tunnel systems and sewage lines.

Joint Closure

Part No. T240

- IP69/K Rated
- 316L Acid Proof stainless steel closure
- Modular design with few parts
- Splicing in Multicassette fibre organizers
- V-clamp and EPDM rubber O-ring sealing
- Rugged design
- Quick and easy installation
- High fibre count capacity
- Suitable for use in harsh environments
- Lockable with optional locking cap and padlock

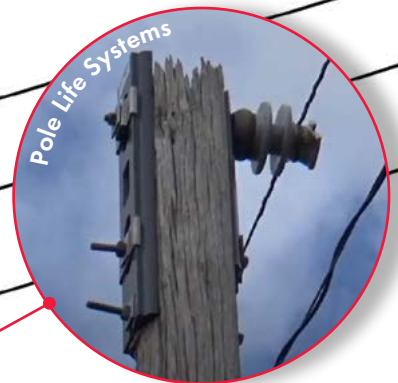
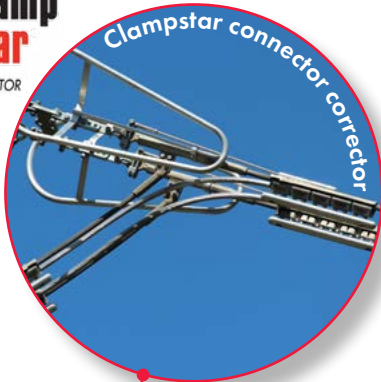


For more information or a quote on your OPGW project contact TEN with your cable specifications

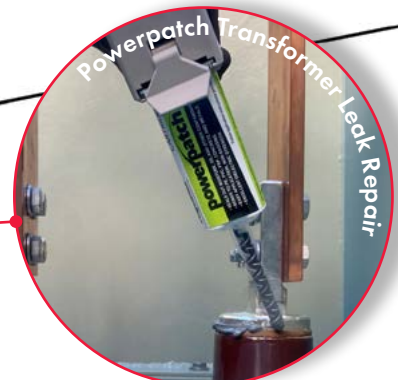




ASSET LIFE EXTENSION - ALE



ALE





**Failing connectors are repaired
with NO power interruption**

Install by:



Clampstar

Connector Corrector

ClampStar® is an Engineered 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.

ClampStar® provides great benefit to the utility:

- Lightweight design installs in less than 10 minutes!
- Permanent installation for deadends, midspan joints, suspension clamps, OPGW and damaged conductor
- Easily installs over existing connectors or suspension points
- No 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



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



ClampStar Applications

Failing Mid-Span Joints

- Failing midspan joints are repaired with NO power interruption and splice replacement is no longer necessary
- The electrical and mechanical integrity is restored to the joint and ampacity is increased
- The units are pre-shipped with a proprietary high performing inhibitor ensuring the best possible connection at the interface
- The units are simply placed over the damaged midspan joint and the shear off bolts tightened with a battery impact drill or podger



Damage at Suspension Clamps

- ClampStar® provides an elegant, economical and easily installed solution for restoring the electrical and mechanical integrity of conductor damage at the suspension clamp, without the need for costly re-stringing
- Safe-T-Link Tether assemblies are available for suspension clamp applications requiring additional mechanical support where the tensile strengths of the conductor have been compromised.



Failing Dead-Ends

- The ClampStar® dead end assemblies can be installed from a helicopter or basket, working live, in as little 15-30 minutes
- The restoration of mechanical integrity is accomplished with the Safe-T-Link tether. The purpose of the tether is to "arrest" any possible elongation of the original deadend
- Deadend solutions can be custom designed to meet your construction



Conductor Repair

- Classic Connectors ClampStar® Repair Units are a cost effective and time efficient solution to repairing damaged conductors including OPGW outer strands damaged by lightning strikes
- Installation takes less than 10 minutes and units can be installed without power disruption barehand or by hot stick.
- The units are simply placed over the damaged section of conductor/OPGW and the shear off bolts tightened with a battery impact drill or podger.

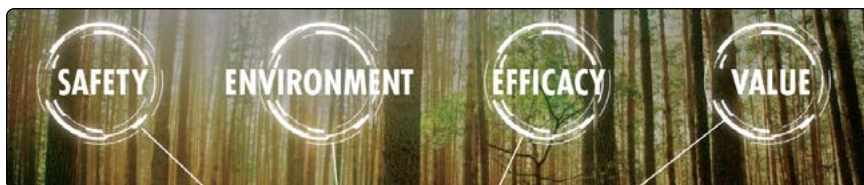


SCAN or CLICK
QR-Code for installation



Genics Test and Treat

The preservation of wood poles should be considered as a system. Genics has a solution that 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
- Contact TEN for information on load rate calculators for prevention and remedial treatment



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





Genics Fire Mesh

Power grids face an increased risk from bushfires and the devastating impacts on supply and infrastructure damage. Whilst there has been a lot of excellent development in the prevention and mitigation of bushfires resulting from network faults, TEN has sought product solutions to hardening the network and creating pole resilience in the event of a bushfire.



Durable for Pre-wrapping prior to transport



Fire Mesh

Part No. 53175

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



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



PREVENT THIS

BY APPLYING THIS





Pole Life Systems

Strong, Lightweight Material

Pole Life Systems Inc. was established to solve a major problem that electrical utilities are currently experiencing in their wood pole asset management programs world-wide.

Pole Life's patented technologies have revolutionised pole top restoration creating "pole prosthetics", the first life extension products for the industry. Pole Life Systems have developed a lightweight, non-conductive, fire retardant, low cost and structurally sound system that reinforces wood pole tops

A selection of Pole Life Systems Asset Life Extension solutions can be found below:

- 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.
- Integral fabric surfacing veil
- High performing compressive strength of 2,273kg
- Resin-rich barrier
- Long-term weather and UV resistance
- Retention of properties for decades
- Protection from surface erosion and abrasion vs. painted coatings

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
- Installed for a fraction of the cost of pole replacement
- System requires Insulator supports and backing plate
- Also available for pole top pin reinforcement
- Custom applications also available

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

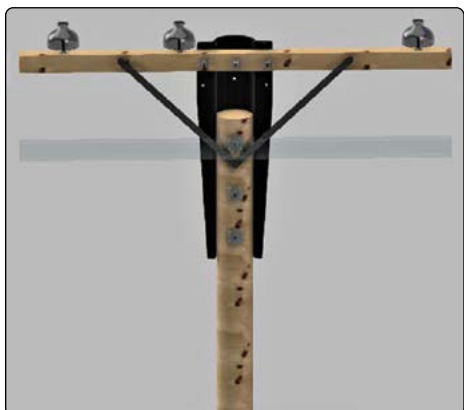
**Addressing CTG
and CTS issues**

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

Pole Life Systems have over 40 years of construction and utility engineering design experience and hold 11 patents on pole restoration solutions.

Contact TEN for more information on the Pole Life System range.





Laminated Wood Systems

Pole Enforcer by LWS

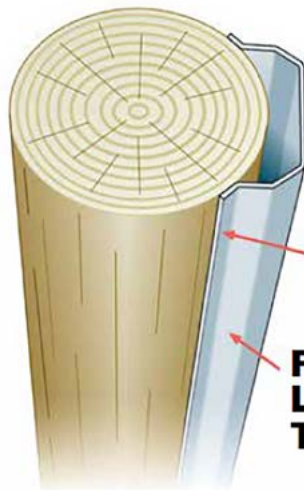
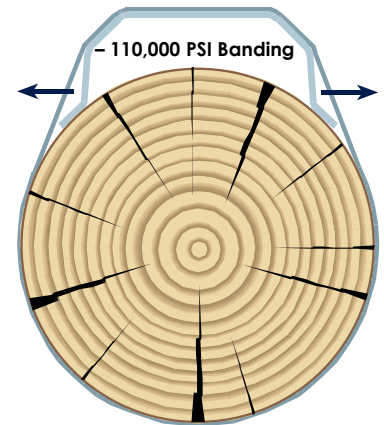
The patented PoleEnforcer® proves that **"all steel is NOT created equal"**

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.



PoleEnforcer®
PATENT NO. 5,385,148



Full Length Flange

Full Length Taper

**110,000 psi
2" Banding**
(Single 2" x 4-1/4" Seals)
51mm to 108mm

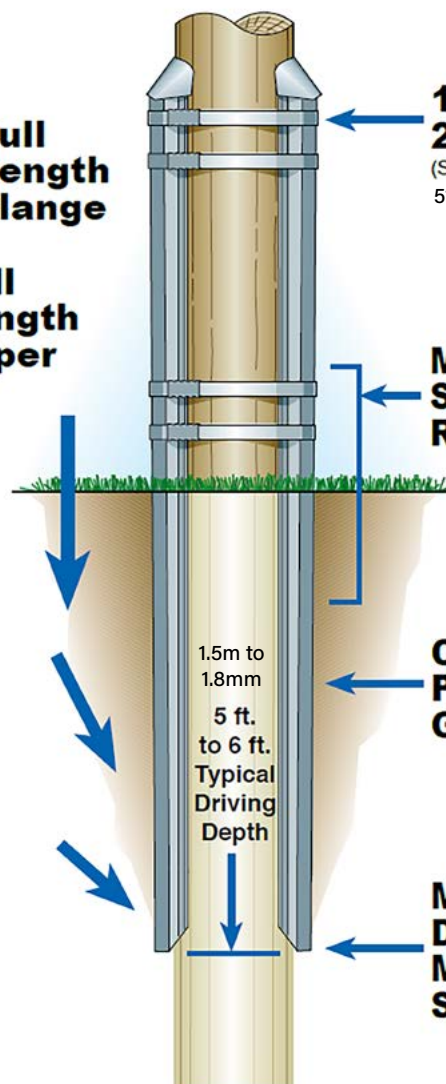
**Minimal or No
Shell Thickness
Required***

**Contact with
Pole Below
Groundline**

**Minimal
Driving Depth
Means Shorter
Steel**

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





Conductor Covers

'GreyEEL' - Reliaguard

Prevent animal and bird related outages

Protecting conductors is an essential component in conjunction with effective guards to prevent animal and bird caused outages.

Reliaguard's GreyEEL Conductor Cover helps prevent contacts by eliminating gaps in coverage.

The product's improved protection is achieved with a significantly overlapped seam design and material memory technology that supports exceptional closure performance.

- Silicone rubber tubing that is highly flexible and makes application easy
- Will not burn or drip
- Does not require further derating of conductors as it has been proven to aid in dissipating heat from cables rather than trapping it once applied.

Part No.	Conductor Size Range (mm)	Length (m) per box
EL-02503750-50-Y	5.1 - 9.4	15
EL-03750500-50-Y	9.5 - 12.6	
EL-05000750-50-Y	12.7 - 18.9	
EL-07501000-50-Y	19 - 25.4	
EL-10001250-50-Y	25.5 - 32.9	
EL-12501500-50-Y	33 - 36.8	7.5
EL-15001750-25-Y	38.1 - 44.4	
EL-17502000-25-Y	45.7 - 50.8	

The EEL Slider

Comprehensive coverage with Grey EEL and EEL Slider

- With the EEL Slider™, GreyEEL™ Conductor Cover slides onto conductors easily in a matter of seconds
- No fumbling around trying to pry conductor covers open or closing it back together
- The EEL Slider is made from a dielectric material



Also available from Reliaguard - contact TEN for detailed line information

TRANSFORMER BUSHING GUARD



SUSPENSION CLAMP GUARD



REGULATOR KITS



WILDLIFE HOT STICK DISC



PIN INSULATOR GUARD



For more information about Reliaguard, its testing to IEEE1656 or to view the range of wildlife mitigation solutions, SCAN or CLICK the QR Code to download a copy of their catalogue or contact TEN



SALISBURY

by Honeywell



Stinger Covers - Salisbury

Part No. Various

Stinger Covers protect against phase to phase and phase to earth wildlife contacts. The stinger cover can be installed over wire without the need to disconnect the lead wire from the bushing. Available in two diameters, it is easily cut in the field to the needed length.

Stinger covers are track resistant and made from Ozone and UV resistant SALCOR® elastomer in a grey color. The covers are proven to provide years of reliable service either independently or when used with bushing covers.



Part No.	I.D. (mm)	Total Length (m)	Quantity	Flashover Test (kV)		Wt (kg)
				Phase to Earth	Phase to Phase	
58-100SC	15.9	30.5	1 x 30.5	12.5	22	20.5
34-25SC	19.05	15.0	2 x 7.5	14.9	26	10.0

Pole Repair

UPR Pole Repair - Polywater

Part No. UPR Series

Polywater® UPR™ Utility Pole Repair makes it easy to repair pole damage such as decay and splits. The two-part formula is mixed quickly and injected into the hole through the 250mm mixing nozzle.

The UPR™ Pole Repair resin and hardener were specially formulated to expand in the pole cavity rather than to just fill. Because UPR™ Pole Repair expands in the hole, it easily fills irregularly shaped cavities for solid integration with the wood. This creates superior adhesion to the wood grain compared to non-expanding products. The exothermic reaction creates an environment that reduces the presence of bacteria.

- EXPANDS - Completely fills irregularly shaped cavities
- ADHERES - Solidly integrates with surrounding wood
- QUICK - Two-part formula mixes in nozzle when applied

UPR™ Pole Repair comes in two types.

1. The "PR" version is a liquid formula that flows around wood block fillers to save material.
2. The "NF" is a quick-gelling version that will not leak or drip out of wood cracks at the bottom of the hole.



Part No.	Kit Includes
UPR-PRKIT12	12 - 250-ml UPR™ Pole Repair cartridges, 16 mixing nozzles, 18 green-treated wood blocks, 1 roll of stretch wrap, 4 pair of gloves, Instructions
UPR-NFKIT12	12 - 250-m UPR™ "NO FLOW" Pole Repair cartridges, 18 mixing nozzles, 1 roll of stretch wrap, 3 pair of gloves, Instructions
TOOL-250	High Ratio Caulking Gun



Polywater
Solutions at work.

Leak Repair Kit - Polywater

PowerPatch™ Leak Repair Kit

Part No. EPCT Series

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

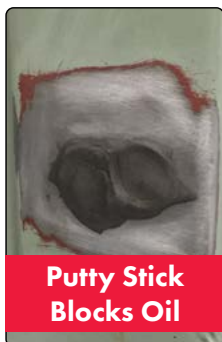


Part No. EPCT-KIT1 + TOOL-50-11

Repair active leaks



Active Leak



Putty Stick
Blocks Oil



Repaired Leak

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



Part No. EPCT-250KIT1

Application Tool: TOOL-50-11



Part No.	Kit Includes
EPCT-KIT1	2 x PowerPatch® 2-Part 50ml Cartridges with 4 static mixers 2 x Putty sticks, 8 x Type TR™ cleaning and preparation wipes 1 x 600mm sandpaper strip, 4 x application sticks, and instructions
EPCT-KIT1-G	Kit As Above (EPCT-KIT1) + Application Gun (TOOL-50-11)
TOOL-50-11	Application Gun only. Suits Powerpatch EPCT-KIT1 and Mini FST
EPCT-250KIT1 (Large Format)	1 x PowerPatch® 2-Part 250ml Cartridge with 3 x static mixers 2 x Putty sticks, 8 x Type TR™ cleaning and preparation wipes 1 x 600mm sandpaper strip, 3 x application sticks, 1 x instruction sheet
EPCT-250KITB12 (Large Format)	12 x PowerPatch® 2-Part 250ml Cartridge with 12 x static mixers 24 x Nitrile Gloves, 1 x 600mm sandpaper strip 12 x application sticks, 1 x instruction sheet

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

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



Also suitable for use with battery powered caulking guns



Duct Sealing Systems

FST™ Duct Seal is a two part “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 Duct Sealant™ Features

- 98% closed-cell content for increased strength and resiliency
- Resists 6.7m of water-head pressure
- Compatible with cable and duct materials
- 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-enterable
- Quick: Foam expands and cures quickly even when water is present
- Multi-Use: Packages are resealable

FST Quick Setting - Polywater

Part No. FST-250KIT1

FST™ Duct Sealant in a 250ml field ready cartridge kit.

Recommended for conduits 50 to 200mm.



Part No.	Kit Includes
FST-250KIT1	1 x 240g two-part Foam Sealant caulking tube style with resealing cap 3 x Mixing nozzles, 4 x 600m Foam damming strips 1 x Position rod, 1 x Pre-treating wipe, Instruction Sheet

FST Burst Pack - Polywater

Part No. FSTBP-200KIT1

FSTBP Duct Sealant comes in an easy to use, self-dispensing burst pack.

Ideal for the protection of conduits 125mm to 200mm.



Part No.	Kit Includes
FSTBP-200KIT1	1 x FSTBP-200KIT1-200 Burst Pack 1x Pair of gloves, 1 x Sanding cloth 4 x Foam Strips, 1 x Prep. Wipes, 1 x Instructions

FST MINI - Polywater

Part No. Various

Effectively Seals Small Conduits and Inner-ducts

Polywater® FST™ MINI is 50ml field ready kit.

Recommended for small conduits 20 to 50mm



Part No.	Description
FST-MINI	1 x 50ml FST Cartridge, 2 x Mixing Nozzles, 6 x Foam Discs 1x Pair of gloves, 1 x Instructions
TOOL-50-11	Application Tool



Cable Pull Planning Software - Polywater

Pull-Planner™ 4.0

Design Safe and Efficient Cable Pulls with Pull-Planner™ 4.0

Pull-Planner 4.0 makes the planning of any cable hauling project easier and more efficient.

Benefits

- Calculates maximum pulling and sidewall tensions to reduce joints and avoid cable damage
- Provide a detailed pull plan to your client for sign off
- Understand your coefficient of friction and maximise the length of run, based on using a high quality or specification grade lubricant*
- See the difference in varying coefficients of friction and determine the significant value created using a specification grade lubricant from Polywater
- Resource your job with the most suitable equipment
- Designers can minimise the number of pulling pits required in a cable run, saving considerable time and money
- Calculate the impact of bends, multiple cables, rollers/sheaves, pushing devices and back tension off drums and direction of pull
- Ability to provide a field based COF once the cable pull is complete
- Uses the well establish Rifenburg equation



Pull-Planner™ Report

Typical Pull-Planner™ Report

<p>Pull Name: 1C 630mm2 132kV HDPE Cable 150mm Conduit</p> <p>Conduit ID: 150 millimeter(s) Conduit Fill: 42.4%</p> <p>Total of 1 cable(s) of 1 different type(s) being pulled.</p> <p>Type #1 1 Cable(s) O.D. of 97.6 mm weight of 12.8 kgs/m</p> <p>Total cable weight: 12.8 kgs/m</p> <p>Weight correction factor set to: 1</p> <p>Configuration: Single Cable</p> <p>Jam/Clearance Analysis: Jamming Not Possible</p>	<p>Polywater® J with Jacket: HDPE and Conduit: PVC</p> <p>Pull Detail Summary</p> <p>Total (Cumulative) Bend: 211.6 degrees</p> <p>Total Length Including Bends: 909 meters</p> <p>Conduit Fill 42.4 %</p> <p>Total Cable Weight: 12.8 kgs per meter</p> <p>Conduit Condition: Good</p>	<p>Recommended Quantity : 185 Liters</p> <p>Lubricant Notes</p> <p>Lubricant Best COF Value: 0.090</p> <p>Un-Lubricated COF Value: 0.390</p> <p>* Additional lubricant in recommended quantity based on long pull length.</p> <p>* Additional lubricant in recommended quantity based on total degree of bend.</p>
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Seg #	Straight Section Slope (°)	Slope Direction	Straight Section Length (m)	Straight Section COF	Tension (kN)	Bend Type	Bend Direction	Bend Radius (m)	Bend Angle (°)	Bend Length (m)	Bend COF	Tension (kN)	Sidewall Pressure (kN/m)
1	0	--	100.0	0.11	1.38	Horizontal	--	6.00	11.3	1.2	0.11	1.42	0.24
2	0	--	55.0	0.11	2.17	Horizontal	--	6.00	90.0	9.4	0.11	2.61	0.43
3	0	--	212.0	0.11	5.53	Horizontal	--	6.00	33.0	3.5	0.11	5.90	0.98
4	0	--	115.0	0.11	7.49	Horizontal	--	6.00	33.0	3.5	0.11	7.98	1.33
5	0	--	80.0	0.11	9.08	Horizontal	--	6.00	33.0	3.5	0.11	9.68	1.61
6	0	--	215.0	0.11	12.65	Horizontal	--	6.00	11.3	1.2	0.11	12.93	2.15
7	0	--	110.0	0.11	14.45	None	--	--	--	--	0.11	14.45	--

The Pull-Planner™ 4.0 Software uses the cable pulling (tension estimation) equations common in technical studies and included in a number of industry standards. The friction coefficients in the software database are laboratory measurements. A number of field factors can influence the effective coefficient of friction. Engineering judgement and experience should be used in the selection of appropriate friction coefficients for use in the calculations.

Program for Cable Pulling Tension Calculation and Conduit System Design



* See Pulling & Hauling Section for Polywater's range of Cable Lubricants

SCAN or CLICK to view Polywater's Cable Jacket Coefficient of Friction Test methods

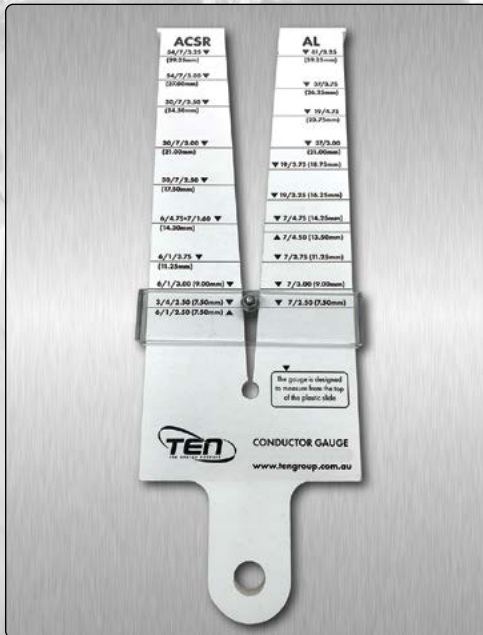


Contact TEN for further information on how the Planner can improve your next cable pull.

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NOTES

Conductor Diameter Gauges



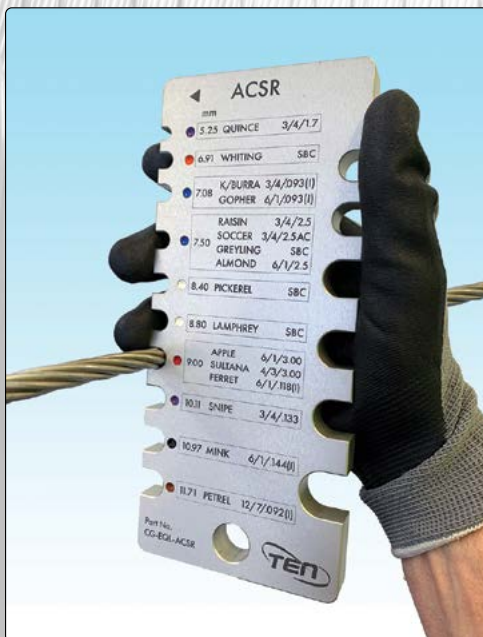
Part No. CG-430-AU

REDUCE INCORRECT CONDUCTOR IDENTIFICATION

Conductor Gauge - TEN

HDPE slide gauge quickly & easily identify conductor OD

- Designed for Australian AL, CU & ACSR conductors
- Measure Live Conductors
- For conductors 4.0 - 30mm Ø
- Fits universal sunrise fitting



Part No. CG-EQL-Series

Conductor Diameter Gauge -AL, CU & ACSR

Quickly & easily identify common overhead electrical distribution conductor or wire sizes in AL, CU & ACSR. Markings include conductor name, stranding and overall Diameter.

- Hole in base for use with a shotgun stick and hanging storage
- Imperial and metric sizes included
- Precision machined from lightweight aluminium alloy