

# Helical Ties

Product Catalogue



# Standard Terms and Conditions of Business

## 1. Application of Conditions

These terms and conditions shall govern and control all offers and sales by PREFORMED™ LINE PRODUCTS (SOUTH AFRICA) (PTY) LTD. (herein called "the company"). Unless expressly accepted in writing signed at its head office in Pietermaritzburg by an authorised signatory, any qualification of these conditions in a customer's order or enquiry, or anything contrary to or conflicting with any of these conditions shall be treated as inapplicable and of no effect.

## 2. Acceptance

Any tender or quotation by the company only applies for thirty days from date thereof; and no order shall bind the company until the customer shall receive written confirmation thereof from the company, duly signed on behalf of the company.

## 3. Prices

All prices are nett, F.O.R. Works at Pietermaritzburg and subject to change without notice. Value Added Tax (VAT) is not included and will be added-on where applicable.

## 4. Financial Responsibility

The Buyer's financial responsibility is at all times subject to approval of the company's credit department and the company at any time may require payment in advance for a satisfactory security or guarantee that invoices will be paid promptly when due. If the Buyer fails to comply with any term of payment, the company reserves the right to withhold further deliveries or to terminate the agreement and any unpaid amount thereupon shall become due immediately.

## 5. Terms of Payment

Net 30 days from date of the company's invoice.

## 6. Delivery

The company will use its best endeavours to deliver the goods by the time fixed for delivery, but if from any cause other than the wilful default of the company delivery is delayed, the company will not be responsible for any loss or damage thereby caused to the Buyer. Failure of one delivery shall not vitiate the contract as to others. No responsibility is accepted for delays due to loss in manufacturing or for damage and/or other delays due to Act of God, War, Fire, Civil Commotion, Accidents, and for other causes beyond control. Offers of delivery from stock are subject to the fitting being unsold on receipt of order.

## 7. Delivery Charges

Unless otherwise agreed or stated, delivery charges are for customer's account.

## 8. Warranty

We warrant all goods manufactured and supplied by us are in accordance with our standard proprietary specifications and designs, and that products are fit for the ordinary purposes for which they are manufactured and when installed to our recommended procedures. In the event of product malfunction, our liability will be limited to the free replacement only of our defective products provided such malfunction is proved to be directly attributable to defective materials or workmanship and subject to a claim in such event being received by us in writing within 90 (ninety) days after receipt of such goods by our customer.

## 9. Packing

All goods are packed in our standard corrugated cartons, wooden crates and/or suitable alternatives at the company's discretion.

## 10. Loss or Damage in Transit

The company is not responsible for this risk. In the case where the company has accepted transit risk in terms of clause 1 of these conditions, transit loss or damage must be reported by the customer or consignee immediately in writing to the carrier, and also to the company. Documentary evidence, as prescribed by the CARRIERS must be given by the consignee to the company within seven days of receipt of the consignment in question.

## 11. Testing and Inspection

When testing and inspection is specified by customers, this shall be carried out at the company's Works in a suitable area designated by the company.

## 12. Deviations in Quantities Manufactured

Goods manufactured are subject to a deviation of plus or minus 10% in quantity.

## 13. Standard Packs

The company reserves the right to supply in increments of its standard packs.

## 14. Cancellation

The Buyer shall not be able to cancel any order for delay in delivery or other cause until written notification of such intention has been received by the company. In any event the Buyer shall be obligated to accept and pay for any goods previously despatched to order, and to pay cancellation charges based on expenses incurred or commitments made by the company for any goods which are in the process of manufacture.

## 15. Returns

No materials shall be returned without our prior written authorisation. Only non-obsolete standard items in original cartons may be returned. Carriage must be prepaid. Requests for return must be instituted within 90 days of original delivery and returns will be subject to factory inspection before acceptance and credit authorisation. We reserve the right to apply a minimum servicing charge of 15% of the invoice amount.

## 16. Specifications

In pursuance of our policy of continuous research and development we reserve the right to change specifications without prior notice.

## 17. Disclaimer

PLP reserves the right to make changes to the data presented in this brochure when required. Every effort has been made to ensure the accuracy of the information in this brochure. PLP disclaims responsibility for any liabilities, claims, damages, and costs arising from the incorrect use of this information.

# Index

Galv. Steel Twin-Ties .....	2-3
Armor Rods .....	4-5
Galv. Steel Side & Spool Ties .....	6-7
Galv. Steel Dead End .....	8-9
Galv. Guy-Grip .....	10-11
Pole Top Make-Off .....	12
Distribution Ties .....	13-14

# Galvanised Steel Twin-Ties

**Tie Pad:** For bare conductor a tubular elastomeric pad is supplied which must be placed under the conductor in the top groove of the insulator. The pad is not required with jacketed conductor.

**Centre Section:** Only the section applied to the conductor is helical, the remainder is cabled to ensure a snug firm fit on the insulator.

**Material Used:** TWIN-TIES are made of material compatible with the conductor to which they will be applied.

**Lay Direction:** The Lay Direction of the tie must be the same as that of the conductor.

## General Recommendations

TWIN-TIES are intended for use in securing conductors to the top groove of insulators, the neck configuration of which may not be suitable for WRAPLOCK® or DISTRIBUTION-TIES. The neck configuration is described in the next paragraph.

They provide an improved method of securing conductors when compared to hand-binding or insulator clamps. Protection is provided against conductor abrasion, as occurs with hand-binding, and they provide better RIV characteristics. The pad provides protection for the conductor against abrasion from the insulator.

**Insulators:** TWIN-TIES will perform well on any vertically mounted insulator with a neck groove diameter exceeding 15 mm but is designed especially to cater for insulators with a shallow lip at the top of the groove, making them unsuitable for WRAPLOCK®-TIES. Typical insulators of this type are 1017 (Old Design) and 1018 (Old Design)

**Line Angles:** On vertically mounted insulators TWIN-TIES will accept an angle deviation up to 10°. Larger angles may be accommodated on after consultation with PLP.

TWIN-TIES will permit controlled movement of the conductor reducing load on the base of the insulator.

**Vibration Dampers:** TWIN-TIES provide, as do all PREFORMED™ products, protection against vibration fatigue, however on lines subject to severe vibration the use of Spiral Vibration Dampers is recommended.

**Tee-offs:** Tee-offs should be applied on the conductor beyond the ends of the tie.

**Vertical Mounting:** On vertically-mounted pin insulators or bobbin type insulators, Side Ties should be used.



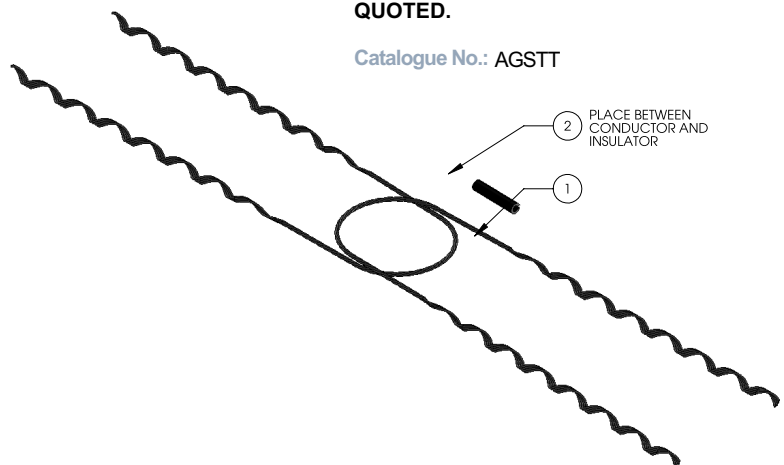
**Application:** Ensure that the correct size fitting is used and consult "Here's How with PREFORMED™" for application instructions. Always insure that the one part interlocks with the other part so that the colour marks are top and bottom respectively.

**Ordering:** State the conductor material, diameter, stranding and lay direction of the outer strands. Guessing nominal area can cause delivery of the wrong size fitting. Also quote insulator reference number and neck diameter.

TWIN-TIES can normally be supplied for any type or size of conductor up to 25 mm diameter. Remember the initial parameters are conductor diameter plus 6 mm for the pad in deciding whether the top groove diameter is adequate.

**NOTE: WHEN ORDERING TWIN-TIES IT IS MOST IMPORTANT THAT THE NECK DIAMETER AND INSULATOR TYPE ARE QUOTED.**

Catalogue No.: AGSTT

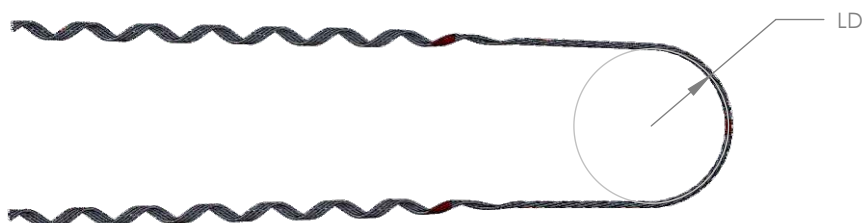
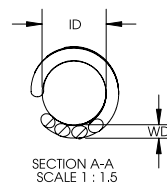


## Galvanised Steel Twin-Ties

RIGHT HAND LAY STANDARD. ALWAYS QUOTE INSULATOR TYPE AND NECK DIAMETER.

CATALOGUE NUMBER	CONDUCTOR	COLOUR CODE	APPROX. LENGTH (L)	WEIGHT (kg)
AGSTT 280-73F	GOPHER	YELLOW	325	0.047
AGSTT 330-73F	FOX	BLUE	365	0.081
AGSTT 396-73F	RABBIT	YELLOW	405	0.136
AGSTT 432-73F	MINK	RED	445	0.15
AGSTT 558-73F	HARE/DOG	BROWN	510	0.23

COLOR/ CROSSOVER MARK



# Armor Rods



## General Recommendations

**Protection:** PREFORMED™ Armor Rods are intended to protect against bending, compression, abrasion, and arc-over, and to provide repair. The degree of protection needed on specific line depends on a number of factors such as line design, temperature, tension, and exposure to wind flow, and vibration history on similar construction in the same area. As a general guide, the following recommendations may be adapted to the specific conditions. Armor Rods are recommended as minimum protection for bolted clamp-type supports or suspensions. Armor rods are recommended as minimum protection for use with hand-tied spans of 90 metres or more. Line Guards are recommended as minimum protection for hand-tied spans of less than 90 metres in urban construction having no experience of vibration. The use of supplementary damping devices should be considered in areas experiencing a history of vibration problems. Spiral Vibration Dampers should be given serious consideration when distribution conductor spans exceed 105 metres and/or 15 percent tension at 16°C.

**Application-Inspection:** After application of the correct number of rods per set, a slight gap between rods should be present. Apply no more than one-half the number of rods per set at a time on smaller sizes. On conductor 12mm and larger, do not attempt to apply more than four rods at a time. The alignment of the ends of the rods should be maintained within 50 mm for voltages of 230 KV and lower.

### Armor Rods: Parrot-Bill® Ends

To meet the corona onset and RIV requirement for most extra-high voltage application. PARROT-BILL® Ends are to be used instead of the standard ball-end rods. Consult PLP for an engineering recommendation.

### O.D. Calculations

Applied overall diameter computed as follows:

The rod diameter can be obtained from the catalogue page tables. Conductor/strand O.D. can be found in conductor charts.

Rod Diameter.	3mm x 2 = 6.00mm
Conductor Diameter.	+ 4.78mm
Total Applied O.D.	10.78mm



**Design Modification:** WRAPLOCK® Ties are recommended as being superior to armor-tie combinations in providing protection for abrasion, and equivalent in providing protection from vibration fatigue. ARMOR-GRIP® Suspension is recommended as being superior to armor-clamp combinations in providing protection from bending stress and abrasion.

### Armor Rods Restorative-Repair:

Armor Rods may be used to restore full conductance and strength to ACSR and aluminum conductors where damage does not exceed approximately 50 percent of the outer strand layers. Consult PLP for repair capability of specific stranding.

**Note:** All conductor, new or weathered MUST be thoroughly wire-brushed and coated with a good quality inhibitor along the area where restorative repair fittings are to be applied. Damage should be located at the “point of support” or within the “midspan area”

**Tapping:** Tapping over applied aluminum or Hard drawn copper Armor Rods is permissible. Where it is known that Tapping clamps will be installed over Armor-Rods, an inhibitor must be applied.

**Material Selection:** For copper conductor, Copperweld Armor Rods are recommended when electrical requirements such as tapping or repair are not involved. Where such requirements are involved Hard Drawn Copper Armor Rods may be used.

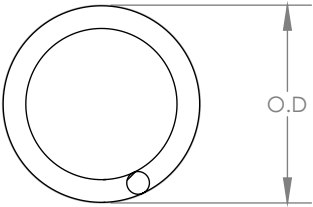
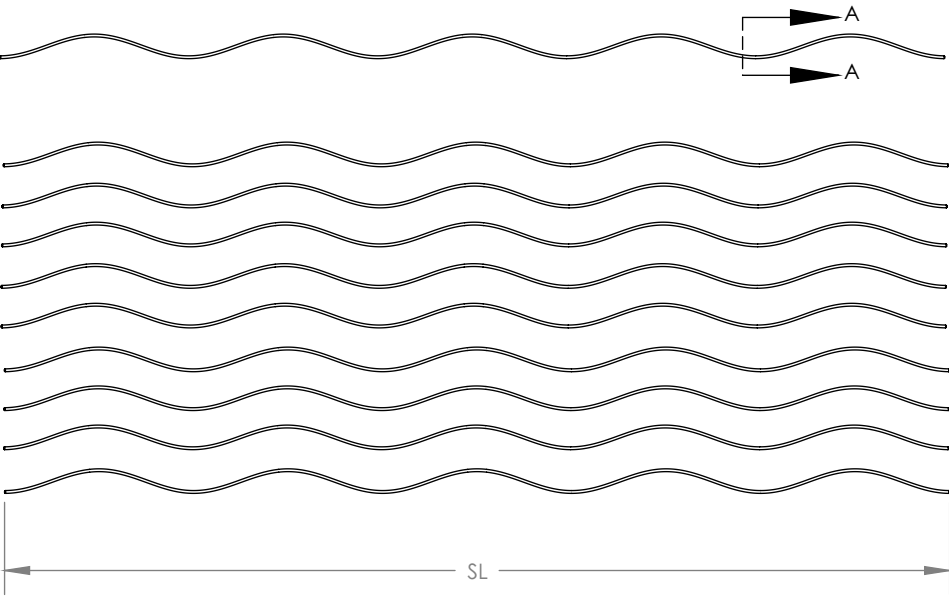
**Catalogue No.:** ASPR (STEEL)



# Armor Rods

RIGHT HAND LAY STANDARD. ALWAYS QUOTE INSULATOR TYPE AND NECK DIAMETER.

CATALOGUE NUMBER	CONDUCTOR	COLOUR CODE	SHOP LENGTH (SL)	OUTSIDE DIAM. (mm)	RODS PER SET	APPROX WEIGHT (kg)
ASPR 280	GOPHER	YELLOW	792	10.38	10	0.375
ASPR 330	FOX	BLUE	912	11.98	11	0.475
ASPR 396	RABBIT	YELLOW	1045	13.33	13	0.640
ASPR 432	MINK	RED	1140	14.7	14	0.750
ASPR 558	HARE/DOG	BROWN	1476	18.62	13	1.740



SECTION A-A

## Galvanised Steel Side & Spool Ties



Side-Ties for bare conductor include a neoprene tie pad interspaced between the insulator and conductor. Because of the very small contact area afforded, high pressure and bending stresses may accelerate abrasion damage at the insulator-conductor interface if the conductor is not protected. In the case of plastic covered conductor it is unnecessary to use a Side-Tie pad since the plastic covering itself provides the necessary conductor protection at the insulator.

**Maximum Size:** The factors which determine the absolute maximum diameter of conductor allowable for specific pin insulator Side-Tie combination are, the dimensions of the side groove in insulator; diameter of rods in manufacture of Side-Tie and clearance for application dictated by helical loop geometry. Because the clearance for application is the same whether or not the Tie-Pad is installed, the maximum allowable conductor outside diameter is not reduced by the addition of the Tie-Pad.

SIDE-TIE is recommended as being superior to Armour-Rod – Hand tie combinations for protection against abrasion damage. The Side-Tie is equivalent to a well made Armour Rod – hand tie combination in regard to conductor fatigue.

**Vibration Dampers:** By using Side-Ties, the vibration fatigue life is maximized to the extent that the original endurance limit of the conductor is not reduced by abrasion on its outside surface. However, on selected lines where experience indicates that prolonged periods of vibration might approach the fatigue life of the conductor, or cause inner wire fretting it will be necessary to supplement with dampers. The following are guideline definitions for vibration activity. They should be applied to a Utility's own experience on lines in a given area.

**“Excessive” Vibration:** Areas where abrasion damage has been known to require replacement of both hand tie wire and protective rods, or where fatigue has been found under clamps. Protective rods should be replaced when visual inspection shows approximately  $\frac{1}{4}$  of the rods diameter has been worn away.

**“Severe” Vibration:** Areas where abrasion have required replacement of hand-tie wire, but less than  $\frac{1}{2}$  of the protective rod's diameter has been worn away.

**“Moderate” Vibration:** Areas where replacement of hand-tie wire has not been required, and damage is minor. Side-Ties provide protection in areas of “severe” or “moderate” vibration.

For areas experiencing “excessive” vibration supplemental use of damper is recommended. Spiral Vibration Damper's single purpose is to prevent the unlimited accumulation of aeolian vibration.

**Insulators:** Side-Ties are suitable for use on only those insulators which correspond to C-neck, F-neck H-neck, designs. Details of these designs appear in the I.E.C. 720 publication. When an insulator is not suited to the WRAPLOCK® Ties, then the PREFORMED™ TWIN-TIES can be used. Consult the factory for engineering recommendation when in doubt.

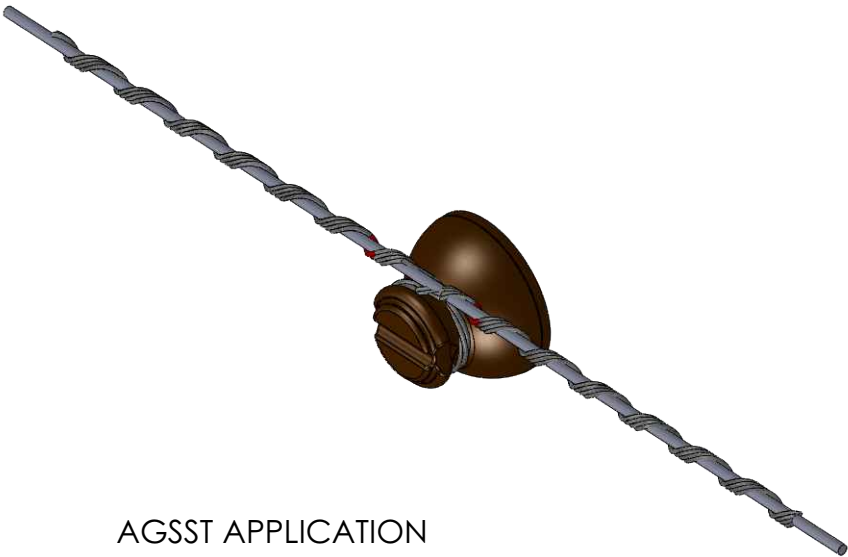
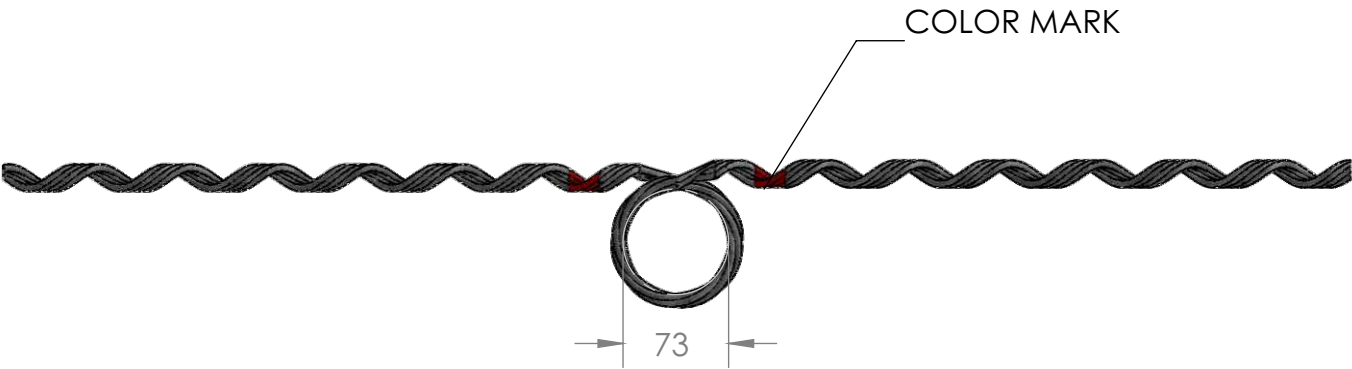
**Mechanical Strength:** Maximum holding strength is usually sufficient to contain the broken conductor to a single span, however, the WRAPLOCK® Ties is designed to relieve the load before severe damage is done to the pole's structural components.



# Galvanised Steel Side & Spool Ties

RIGHT HAND LAY STANDARD. ALWAYS QUOTE INSULATOR TYPE AND NECK DIAMETER.

CATALOGUE NUMBER	CONDUCTOR DIAMETER (mm)	COLOUR CODE	CONDUCTOR
AGSST 280-73F	7.08	YELLOW	GOPHER
AGSST 330-73F	8.37	BLUE	FOX
AGSST 396-73F	10.05	YELLOW	RABBIT
AGSST 432-73F	10.98	RED	MINK
AGSST 558-73F	14.16	BROWN	HARE/DOG



## Galvanised Dead End



### General Recommendations

**Dead-End:** Bare; manufactured from similar basic material to that of the conductor to which it should be applied as used in general distribution construction.

Where conductors are of homogeneous stranding the Rated Holding Strength approximates the Rated Breaking Strength of the conductor.

On ACSR conductors the Rated Holding Strength approximates the full strength of the aluminium strands plus 10% of the steel core.

**Vibration Dampers:** The use of Spiral Vibration Dampers, see data in special section, should be considered for areas experiencing a history of vibration.

**Application and Inspection:** Dead-ends must not be re-used after original installation. Lay direction of both conductor and dead-end must be the same when terminating bare conductor. Suitable thimble clevises, described elsewhere in this catalogue, are manufactured for use with dead-ends.

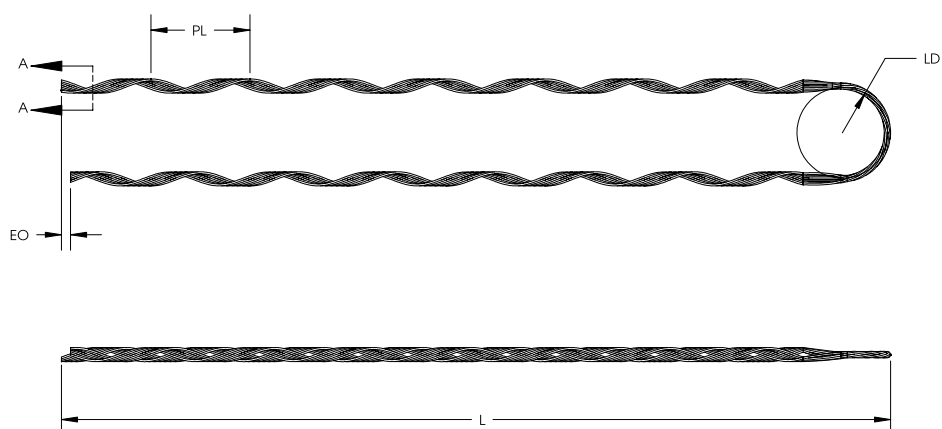
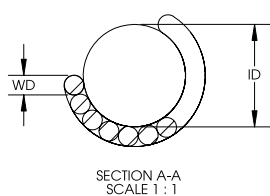
PREFORMED™ Dead-Ends up to Cat. No. ADE 760 are manufactured with a cabled loop to ensure ease of application and the minimum of “stretch” after installation.

**Catalogue No.:** AGDE

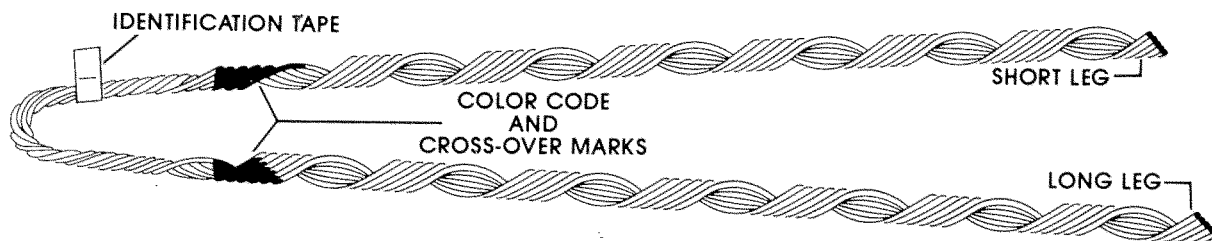
## Galvanised Dead-Ends

RIGHT HAND LAY STANDARD.

CATALOGUE NUMBER	CONDUCTOR NAME	DIAMETER (mm)	COLOUR CODE	LENGTH (L)	LOOP DIAMETER (LD)	WEIGHT (KG)
AGDE 280	GOPHER	7.1	YELLOW	485	75	0.07
AGDE 330	FOX	8.37	BLUE	560	75	0.12
AGDE 396	RABBIT	10.05	YELLOW	580	75	0.16
AGDE 432	MINK	10.98	RED	635	75	0.21
AGDE 558	HARE/DOG	14.16	BROWN	745	75	0.38



## Galvanised Steel GUY-GRIP®



### General Recommendations

GUY-GRIPS® are generally recommended for wood pole distribution and telecommunication construction.

Refer to section Big Grip dead-end, an alternative product recommended for staying transmission tower and antenna construction.

Refer to the page for the Preformed Pulling Eye, designed to assist with the application of GUY-GRIPS® on the stay rod.

RATED HOLDING STRENGTHS are at least equal to those of the staywire.

GUY-GRIPS® is supplied with a cabled loop to ease application and to prevent stretch.

**Material Used:** GUY-GRIPS® are made of the same basic material as the strand to which they are applied.

**Application and Inspection:** GUY-GRIPS® may be removed and re-applied three times, if necessary, on new construction, for the purpose of retensioning stays. GUY-GRIPS should not be re-used after original installation.

PREFORMED™ GUY-GRIPS® up to Cat No. GSDE 640 are cable-looped to ensure ease of application and the minimum of "stretch" after installation.

BE SURE THE CORRECT SIZE IS USED

GUY-GRIPS® should be used on hardware that is held in a fixed position; the fitting should not be allowed to rotate or spin about the axis of the strand. They should not be used as come-alongs tools, pulling-in grips etc; etc.

Lay direction of GUY-GRIPS® must be the same as that of the strand to which it is applied.

For appearance and safety the strand tail should be cut as close as convenient to be crossover mark. If desired, the strand tail can instead, extend through the loop for earthing.

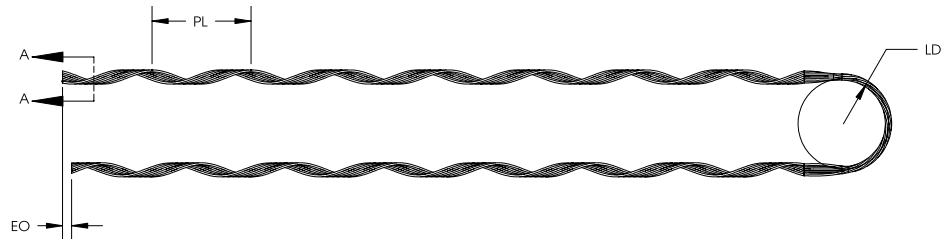
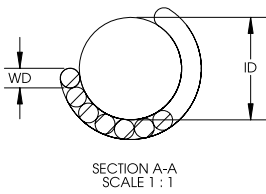
Please check with us as to the suitability of hardware adaptors for use with GUY-GRIPS®

**Catalogue No.:** AGSDE (Galvanised)

# Galvanised Steel GUY-GRIP®

RIGHT HAND LAY STANDARD.

CATALOGUE NUMBER	CONDUCTOR DIAMETER (mm)	COLOUR CODE	STRANDING	LENGTH (L)	LOOP DIAMETER (LD)	WEIGHT (KG)
ASDE 240	6.09	ORANGE	7/2.03	600	60	0.16
ASDE 284	7.21	BLACK	3/3.35	730	60	0.27
ASDE 312	7.95	BROWN	7/2.64	725	60	0.34
ASDE 384	9.8	BLACK	7/3.25	865	60	0.45
ASDE 396	10.05	BLUE	7/3.35	880	60	0.51
ASDE 432	11.00	BROWN	5/4.00	905	60	0.63
ASDE 472	12.00	GREEN	7/4.00	940	60	0.53

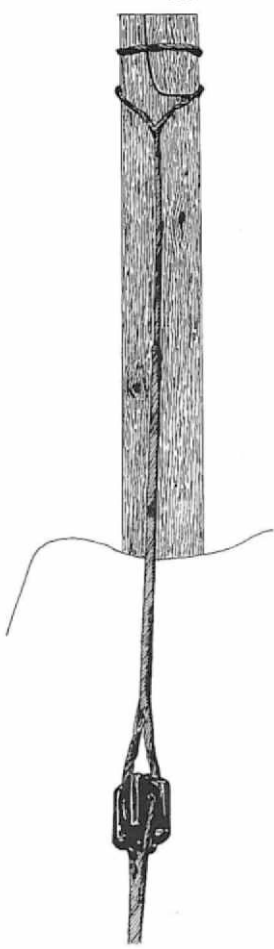
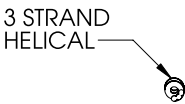
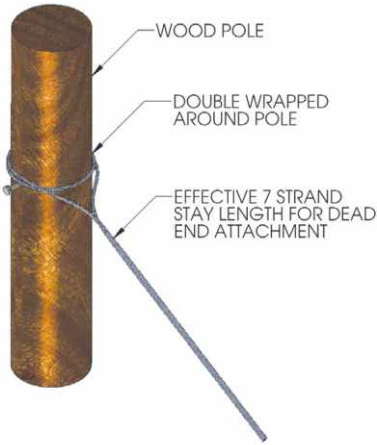
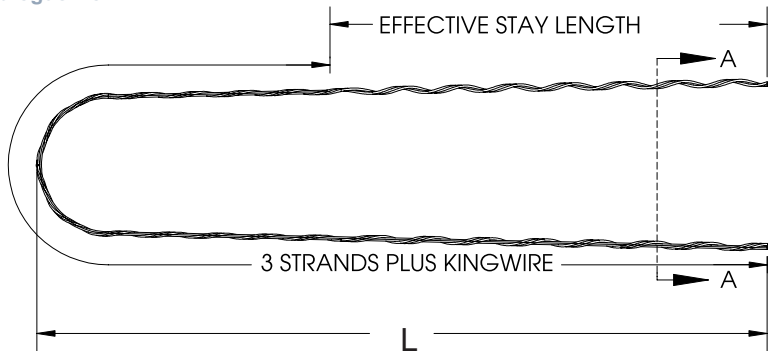


# Pole Top Make-off

## General Recommendations

The Pole Top Make-Off is a complimentary fitting to the Guy-Grip, described earlier. It is in effect a custom built Pole Top Stay, and consists of a single set of 3 galvanised steel wires of 1400 M Pa strength, helically formed with a single unformed 700 M Pa core wire. The central part of the Make-Off is double-wrapped onto the pole top, after which the two legs are wrapped over the unformed wire to form a seven strand stay of similar strength and diameter to that of a normal staywire, the minimum effective “stay” length is 1800 mm. The central “king” wire is of sufficient length that the parts above the crossover may be utilised as an earth bond. Similar fittings are designed for use with thimble adaptors.

Catalogue No.: APT



SECTION A-A  
SCALE 1 : 4

# Galvanised Steel Pole Top Make-offs

CATALOGUE NUMBER	STAY DIAMETER (mm)	STRANDING (mm)	COLOUR CODE	APPROX. LENGTH (mm)	ASSOCIATED GUY-GRIP USED WITH APT
APT 284-6	7,2	3/3,35	BLACK	1540	ASDE 284
APT 396-6	10.05	7/3.35	BLUE	1710	ASDE 396
APT 432-6	10.8	5/4.00	BROWN	1720	ASDE 432
APT 480-6	12.0	7/4.00	GREEN	1750	ASDE 472



# Distribution Tie

## General Recommendation

Distribution Ties are intended to secure bare or jacketed distribution conductors in the top groove of vertically mounted insulators. They provide an improved method of securing conductors compared to clamp top insulators or handmade binds. Distribution Ties with pad are recommended for use with bare conductors. They provide superior abrasion protection for the conductor under all types of motion, including aeolian vibration, galloping and sway.

The pad component is recommended because it surrounds the conductor with a resilient cushion which eliminates abrasion at the conductor-insulator interface. Pads are not required with jacketed conductors.

## Insulator Recommendations

Distribution Ties can be supplied to fit a wide range of insulators with neck diameters up to a maximum of 124mm.

The fittings listed in the data sheets are designed to fit insulators with Dimensions A of 14-41 mm, dimension B of 14-22 mm and neck diameter of 78 mm plus or minus 3 mm, within the conductor ranges shown. For insulators outside this category, and for other conductor sizes, the dimensions shown in the diagram should be supplied, together with manufactures drawing, if possible, and conductor data.

## Product Characteristics :

**Pitch Length:** One complete wrap.

**Colour Code:** Assists in identification of conductor size.

**Tie Pad:** For bare conductors, each tie is supplied with a neoprene tie pad that is detached and applied over the conductor centred in the top groove of the insulator. For jacketed conductors a tie pad is not provided.

**Centre Section:** The straightened centre section is contoured to fit a variety of insulators.

**Identification Label:** Shows catalogue number, insulator details and conductor diameter.

**Material Used:** Distribution Ties are made of material compatible with the conductors to which they are applied.

**Lay Direction:** The lay direction of the Distribution Tie must be the same as that of the outer layer of the conductor strands to which it is applied.

## Special Applications

ENSURE THE CORRECT SIZE FITTING IS USED.

For detailed method of installation both by hand and with hot sticks, refer to application instructions. The design dimensions of the Distribution Tie and Pad are different from those supplied without Pads of jacketed conductors ensure that correct design is used.



**Line Angles:** On vertically mounted insulators, Distribution Ties are recommended for line angles up to 10 degrees. Larger angles can be obtained under certain conditions.

## Mechanical Strength:

The Distribution Tie has a slip load exceeding 318 Kp/700 lbs in unbalanced load conditions. The maximum holding strength is usually sufficient to contain a broken conductor to a single span. Distribution Tie are designed to relieve the load before severe damage occurs to the pole's structural components.

The Distribution Tie is designed to permit controlled movement of unbroken conductor, reducing cantilever loading at the base of the insulator. The resilience of the Tie permits it to then restore itself.

## Vibration Dampers

Distribution Ties maximise the vibration fatigue life of the conductor to the extent that its original endurance is not reduced by abrasion. However on lines subject to long periods of vibration that might approach the fatigue life of the conductor, cause inner wire fretting or scoring of the insulator glaze, the use of Spiral Vibration Dampers is recommended.

## Radio Interference

The R.I.V. characteristics of Distribution Ties are equivalent to those of well made handbinds when originally installed. During service life the pre-contoured Tie assures continued fit which would have better R.I.V. than a loosened tie wire.

## Tapping

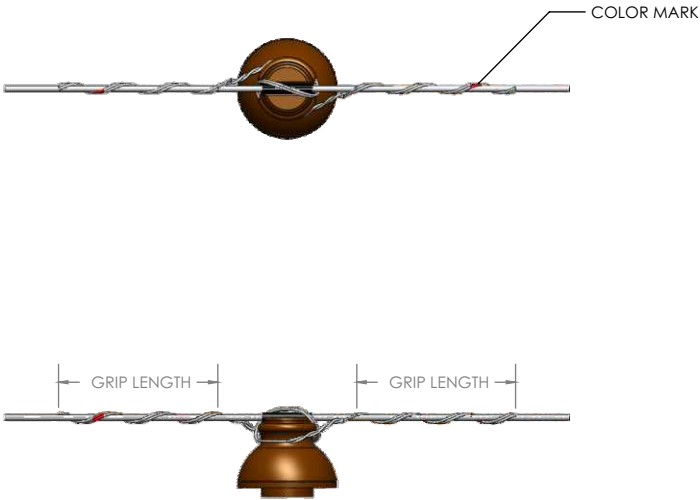
Tapping over the applied legs of Distribution Ties is not recommended. Taps can be made on the conductor beyond the ends of the legs.

## Special Applications

PLP can supply special designed insulator ties for use on double insulator arrangements and for unusually severe conditions.

# Distribution Tie

CATALOGUE NO.	CONDUCTOR	COLOUR CODE
ADT 280-73F	GOPHER	YELLOW
ADT 330-73F	FOX	BLUE
ADT 396-73F	RABBIT	YELLOW
ADT 432-73F	MINK	RED
ADT 558-73F	HARE/DOG	BROWN



- NOTES
- 1. MATERAIL : TIE: GALVANISED STEEL  
PAD: NEOPRENE ELASTOMER
  - 2. SUITABLE FOR 73F NECK INSULATORS HOWEVER OTHER SIZES ARE AVAILABLE ON REQUEST.
  - 3. NEOPRENE PADS INCLUDED

