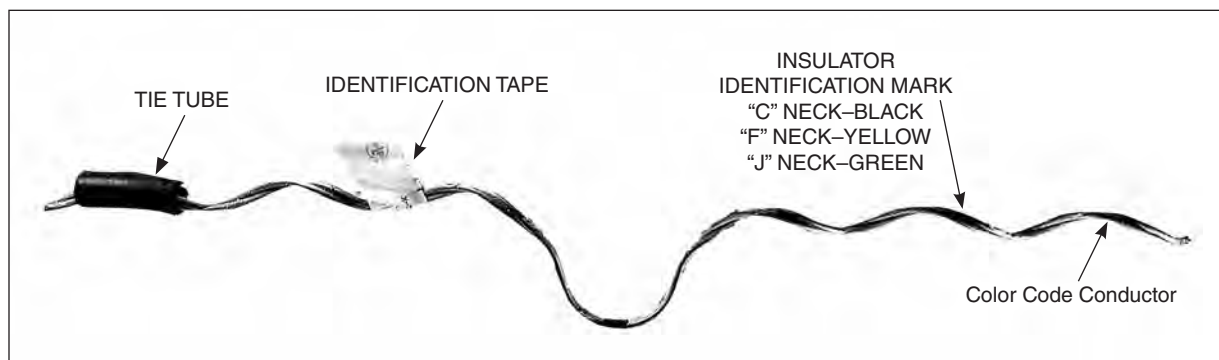


EZ-WRAP® Side Tie

NOMENCLATURE



Tie Tube: For bare conductor, each tie is furnished with a Tie Tube Component. The Tie Tube is detached and applied over the bare conductor.

Identification Tape: Shows catalog number, nominal sizes.

Insulator Identification Mark: Identifies the correct insulator headstyle by colors corresponding to information on catalog pages.

Color Code: Assists in identification of conductor size, corresponding to tabular information appearing on catalog pages.

GENERAL RECOMMENDATIONS

INTENDED USE: EZ-WRAP Side Ties, manufactured of aluminum covered steel, secure conductors in the side groove of interchangeable headstyle insulators.

EZ-WRAP Side Ties provide an improved method of securing conductor compared to clamp-top insulators or hand ties over Armor Rods.

EZ-WRAP SIDETIE: EZ-WRAP Side Ties provide superior abrasion protection over hand tie wire for the conductor under all types of motion, including low-frequency sway oscillation, high-frequency aeolian vibration and galloping.

The tube component surrounds the bare conductor with a resilient cushion where the conductor would come into contact with the insulator. In the case of EZ-WRAP Side Ties applied over plastic jacketed conductors, the tube can be discarded because contact with the bare conductor is prevented by the jacketing itself.



VIBRATION DAMPERS: While the EZ-WRAP Side Tie is superior to hand tie wire, there may be conditions where excessive conductor movement requires the use of supplemental dampers.

For excessive **aeolian vibration** on conductors up to .760" OD, the Spiral Vibration Damper is recommended. Typically 2 SVD/span on distribution construction is adequate for protection, although more may be required depending upon a number of factors.

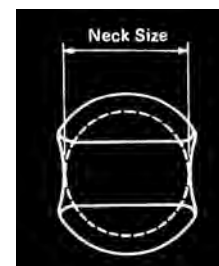
For **conductor galloping**, the Air Flow Spoiler is recommended. Use of the proper size and quantity of AFS per span can eliminate or minimize the effects of galloping. Quantity per span is based upon total span length and other factors.

Review the Motion Control section and/or consult PLP for engineering recommendations for Air Flow Spoilers, and if necessary SVD's.

MECHANICAL STRENGTH: The EZ-WRAP Side Tie is designed to provide longitudinal holding strength in excess of values required by the National Electric Safety Code. The holding strength is usually sufficient to contain the broken conductor to a single span, however, the EZ-WRAP Side Tie is designed to relieve the load before severe damage is done to the pole's structural components. **TM-200E** covers the mechanical testing of the EZ-WRAP Side Tie and is available upon request.

INTERCHANGEABLE HEADSTYLE INSULATOR:

To insure proper fit and service life, it is recommended that only insulators corresponding to C-Neck, F-Neck, or J-Neck be used. These neck-diameters and groove-height dimensions appear on ANSI standards.



(Continued)



EZ-WRAP® Side Tie

GENERAL RECOMMENDATIONS CONTD.

Consult PLP for engineering recommendations on non-interchangeable headstyle insulators. A sample of the insulator in question is desirable.

CONDUCTOR SIZE: The EZ-WRAP Side Tie exactly matches the DISTRIBUTION Ties' ranges, which means identical color codes on armless construction. Conductor sizes up to 1.240" O.D. can be accommodated depending on the insulator's side groove radius.

The EZ-WRAP Side Tie is designed to permit controlled movement of unbroken conductor, reducing cantilever loading at the base of the insulator or bracket, then restore itself. We refer to this unique feature as "resilience"

1" R.	1.240" Max.
7/8" R.	1.240" Max.
13/16" R.	1.240" Max.
3/4" R.	1.165" Max.
11/16" R.	1.000" Max.
5/8" R.	.968" Max.
9/16" R.	.860" Max.

RADIO INTERFERENCE:

The RIV/TVI characteristics of EZ-WRAP Side Ties are equivalent to those of a well-made hand tie when originally installed. During service life the precontoured EZ-WRAP Side Tie assures continued fit, which would have better RIV/TVI performance than a loosened tie wire.

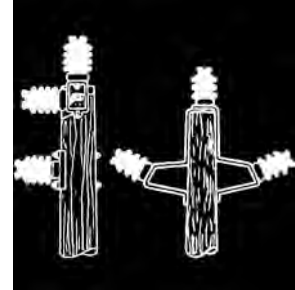
TAPPING: Compared to the use of protective rods, placing hot-line clamps directly over the applied legs of EZ-WRAP Side Ties cannot be recommended. Tapping over protective

rods will remain permissible, however, there are now stirrups available that provide a superior method of making hot-line taps.

LINE ANGLES GENERAL GUIDELINES:

On horizontally-mounted insulators, EZ-WRAP Side Ties can normally accommodate line angles up to 10°. On vertically-mounted insulators, line angles up to 40° can normally be achieved. When insulators are mounted at various degrees of cant between the horizontal and the vertical, line angles between 0° and 40° may be accommodated depending upon the actual cant of the insulator.

In all cases, the conductor should rest in the preferred insulator groove, independently of the tie, so the tie is not required to force the conductor to remain in that groove. The largest practical angle a tie can accommodate depends upon limiting factors such as conductor size, tension, span lengths, sag angles, insulator style and orientation, etc. Consult PLP® for further guidance on line angle issues not covered in the above test report.



SAFETY CONSIDERATIONS

1. This product is intended for a single (one-time) use and for the specified application. CAUTION: DO NOT REUSE OR MODIFY THIS PRODUCT UNDER ANY CIRCUMSTANCES.
2. This product is intended for use by trained craftspeople only. This product SHOULD NOT BE USED by anyone who is not familiar with and trained in the use of it.
3. When working in the area of energized lines with this product, EXTRA CARE should be taken to prevent accidental electrical contact.
4. For PROPER PERFORMANCE AND PERSONAL SAFETY be sure to select the proper size EZ-WRAP Side Tie before application.
5. EZ-WRAP Side Ties are precision devices. To insure proper performance, they should be stored in cartons under cover and handled carefully.

EZ-WRAP® Side Tie

For use on:
ACAR, ACSR,
All-Aluminum, AWAC®
Compacted ACSR,
Aluminum Alloy

C-Neck Interchangeable
Headstyle Insulators



ANSI 55-2 PIN **2-1/4" Neck Diameter**
ANSI 55-3 PIN

Catalog Number	Diameter Range (Inches)		Nominal Conductor Size	Units Per Carton	Wt./Lbs.	Approx. Applied Length (Inches)	Insulator Identification Mark	Color Code
	Min.	Max.						
9/16" R. GROOVE (See Note 2)								
EZSTC-270	.190	.215	#6, 6/1 #4, 7W Comp.	100	16	21	Black	Blue
EZSTC-271	.216	.244	#4, 7W, All Alum. #4, 6/1, 7/1 Comp.	100	17	22	Black	Brown
EZSTC-272	.245	.277	#4, 6/1 7/1 #4, 7W, Alum. Alloy	100	18	23	Black	Orange
EZSTC-273	.278	.315	#3, 7W, Alum. Alloy #2, 7W, All Alum.	100	18	24	Black	Purple
EZSTC-274	.316	.357	#2, 6/1 - 7/1 #2, 7W, Alum. Alloy #1, 6/1	100	19	25	Black	Red
EZSTC-275	.358	.405	1/0, 7W All Alum. 1/0, 6/1 1/0, 7W, Alum. Alloy	100	21	23	Black	Yellow
EZSTC-276	.406	.459	2/0, 7W All Alum. 2/0, 6/1 2/0, 7W Alum. Alloy	100	22	25	Black	Blue
EZSTC-277	.460	.520	3/0, 7W All Alum. 3/0, 6/1 3/0, 7W, Alum. Alloy	100	24	27	Black	Orange
EZSTC-278	.521	.588	4/0, 7W All Alum. 4/0, 6/1 4/0 7W, Alum Alloy	100	30	28	Black	Red
EZSTC-279	.589	.665	266.8, 37W All Alum. 266.8, 18/1 336.4, 19W All Alum.	100	34	31	Black	Purple
EZSTC-280	.666	.755	336.4, 37W All Alum. 336.4, 18/1 397.5, 19W All Alum. 400, 19W, 37W All Alum.	100	35	33	Black	Brown
EZSTC-281	.756	.858	477, 19W, 37W, All Alum. 477, 18/1, 24/7, 26/7	50	29	35	Black	Red
5/8" R. GROOVE (See Note 2)								
EZSTC-282	.859	.968	556.5, 26/7, 636, 18/1 700, 37W, 61W, All Alum.	50	35	36	Black	Blue
11/16" R. GROOVE (See Note 2)								
EZSTC-283	.969	1.096	795, 37W, 61W, All Alum. 715.5, 24/7 795, 54/7	50	38	38	Black	Green
3/4" R. GROOVE (See Note 2)								
EZSTC-284	1.097	1.240	954, 36/1, 54/7 1033.5, 37W, 61W, All Alum.	50	38	39	Black	Yellow

Right-hand lay standard

EXPLANATORY NOTES:

- (1) Nominal Conductor size indicates one of various conductors within each range.
- (2) For the succeeding ranges, the insulator's side groove radius should be at least as large as shown above.
- (3) AWAC is a registered trademark of the Copperweld Co.



EZ-WRAP® Side Tie

For use on:
ACAR, ACSR,
All-Aluminum, AWAC®
Compacted ACSR,
Aluminum Alloy

F-Neck Interchangeable
Headstyle Insulators



ANSI 53-4 Spool

ANSI 53-5 Spool

ANSI 55-4 Pin

ANSI 55-5 Pin

ANSI 57-1 Post

ANSI 57-2 Post

ANSI 57-3 Post

2-7/8"
Neck Diameter

Catalog Number	Diameter Range (Inches)		Nominal Conductor Size	Units	Wt./Lbs.	Applied Length (Inches)	Insulator Identification Mark	Color Code
	Min.	Max.		Per Carton				
9/16" R. GROOVE (See Note 2)								
EZSTF-170	.190	.215	#6, 6/1 – #4, 7W Comp.	100	16	21	Yellow	Blue
EZSTF-171	.216	.244	#4, 7W All Alum. – #4, 6/1, 7/1 Comp.	100	17	22	Yellow	Brown
EZSTF-172	.245	.277	#4, 6/1, 7/1 – #4, 7W Alum. Alloy	100	18	23	Yellow	Orange
EZSTF-173	.278	.315	#3, 7W Alum. Alloy – #2, 7W All Alum.	100	18	24	Yellow	Purple
EZSTF-174	.316	.357	#2, 6/1, 7/1 – #2, 7W Alum. Alloy #1, 6/1	100	19	25	Yellow	Red
EZSTF-175	.358	.405	1/0, 7W All Alum. 1/0, 6/1 1/0, 7W Alum. Alloy	100	21	23	Yellow	Yellow
EZSTF-176	.406	.459	2/0, 7W All Alum. 2/0, 6/1 2/0, 7W Alum. Alloy	100	22	25	Yellow	Blue
EZSTF-177	.460	.520	3/0, 7W All Alum. 3/0, 6/1 3/0, 7W Alum. Alloy	100	24	27	Yellow	Orange
EZSTF-178	.521	.588	4/0, 7W All Alum. 4/0, 6/1 4/0, 7W Alum. Alloy	100	30	28	Yellow	Red
EZSTF-179	.589	.665	266.8, 37W All Alum. 266.8, 18/1 336.4, 19W All Alum.	100	34	31	Yellow	Purple
EZSTF-180	.666	.755	336.4, 37W All Alum. 336.4, 18/1 397.5, 19W All Alum. 400, 19W, 37W All Alum.	100	34	34	Yellow	Brown
EZSTF-181	.756	.858	477, 19W, 37W, All Alum. 477, 18/1, 24/7, 26/7	50	54	36	Yellow	Red
5/8" R. GROOVE (See Note 2)								
EZSTF-182	.859	.968	556.5, 26/7, 636, 18/1 700, 37W, 61W, All Alum.	50	36	37	Yellow	Blue
11/16" R. GROOVE (See Note 2)								
EZSTF-183	.969	1.096	795, 37W, 61W, All Alum. 715.5, 24/7 795, 54/7	50	39	39	Yellow	Green
3/4" R. GROOVE (See Note 2)								
EZSTF-184	1.097	1.240	954, 36/1, 54/7 1033.5, 37W, 61W, All Alum.	50	40	40	Yellow	Yellow

Right-hand lay standard

EXPLANATORY NOTES:

- (1) Nominal Conductor size indicates one of various conductors within each range.
- (2) For the succeeding ranges, the insulator's side groove radius should be at least as large as shown above.
- (3) AWAC is a registered trademark of the Copperweld Co.

EZ-WRAP® Side Tie

For use on:
ACSR, ACAR, All-Aluminum, AWAC®,
Compacted ACSR, Aluminum Alloy

J-Neck Interchangeable
Headstyle Insulators

ANSI 55-6

Single Skirt Pin

ANSI 55-7

Single Skirt Pin

ANSI 56-1

Double Skirt Pin

3-1/2"
Neck Diameter



Catalog Number	Diameter Range (Inches)		Nominal Conductor Size	Units	Wt./Lbs.	Applied Length (Inches)	Insulator Identification Mark	Color Code
	Min.	Max.		Per Carton				
9/16" R. GROOVE (See Note 2)								
EZSTJ-570	.190	.215	#6, 6/1	100	18	24	Green	Blue
EZSTJ-571	.216	.244	#4, 7W, All Alum.	100	19	25	Green	Brown
EZSTJ-572	.245	.277	#4, 6/1 - 7/1 #3, 7W, All Alum.	100	19	26	Green	Orange
EZSTJ-573	.278	.315	#3, 7W, Alum. Alloy #2, 7W, All Alum.	100	20	27	Green	Purple
EZSTJ-574	.316	.357	#2, 6/1 - 7/1 #2, 7W, Alum. Alloy #1, 6/1	100	21	28	Green	Red
EZSTJ-575	.358	.405	1/0, 7W-19W All Alum. 1/0, 6/1 1/0, 7W, Alum. Alloy	100	23	26	Green	Yellow
EZSTJ-576	.406	.459	2/0, 7W-19W, All Alum. 2/0, 6/1	100	25	28	Green	Blue
EZSTJ-577	.460	.520	3/0, 7W-19W, All Alum. 3/0, 6/1 3/0, 7W, Alum. Alloy	100	26	30	Green	Orange
EZSTJ-578	.521	.588	4/0, 6/1 4/0, 7W, All Alum. 4/0, 7W, Alum Alloy 250, 19W-37W All Alum.	100	35	31	Green	Red
EZSTJ-579	.589	.665	266.8, 19W-37W All Alum. 300, 19W37W, All Alum. 266.8, 26/7	100	38	34	Green	Purple
5/8" R. GROOVE (See Note 2)								
EZSTJ-580	.666	.755	336.4, 37W, All Alum. 397.5, 19W-37W, All Alum.	50	40	36	Green	Brown
EZSTJ-581	.756	.858	397.5, 24/7, 26/7 477, 19W, 37W, All Alum. 477, 18/1, 24/7, 26/7	50	31	38	Green	Red
EZSTJ-582	.859	.968	556.5, 61W All Alum. 556.5, 26/7 636, 18/1	50	38	39	Green	Blue
EZSTJ-583	.969	1.096	636, 24/7, 26/7, 30/19 715.5, 36/1, 24/7, 26/7	50	40	41	Green	Green
EZSTJ-584	1.097	1.240	954, 54/7 1033.5, 45/7 1113, 61W All Alum. 954, 37W Alum. Alloy	50	43	42	Green	Yellow

Right-hand lay standard

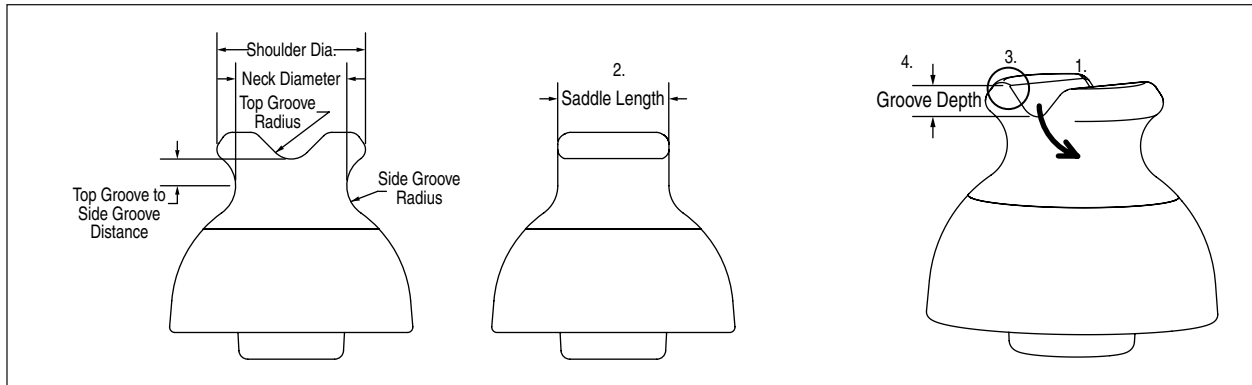
EXPLANATORY NOTES:

- (1) Nominal Conductor size indicates one of various conductors within each range.
- (2) For the succeeding ranges, the insulator's side groove radius should be at least as large as shown above.
- (3) AWAC is a registered trademark of the Copperweld Co.



Insulator Fit

Interchangeable Insulators for use with PLP® Ties Dimensional Factors that affect Tie Application and Performance



It is recommended that only insulators meeting the dimensional requirements of the most recent ANSI® C29.3, C29.5, C29.6, and C29.7 specifications be used with the appropriate PLP ties.

ANSI C29 Insulator Specifications and their Affects on PLP Ties

ANSI C29 specifies and defines dimensions for insulator heads that are crucial to the proper application and lifetime performance of PLP factory formed ties. These dimensions include:

- Neck Diameter - nominal
 - C-neck – 2-1/4"
 - F-neck – 2-7/8"
 - J-neck – 3-1/2"
 - K-neck – 4"
- Top groove radius (minimum)
- Side groove radius (minimum)
- Maximum shoulder diameter (maximum)
- Top groove to side groove vertical spacing

Some of the specified dimensions are simply maximum or minimum allowable values. The dimensions for the vertical distance from the bottom of the top groove to the middle of the side groove and the neck diameter have minimum and maximum values designated.

These dimensions and insulator designations determine the proper tie to be used and the maximum conductor size for the groove application. Review the individual tie sections for groove/conductor diameter limitations.

Insulator characteristics that are not part of the ANSI C29 Specifications

Some of the insulator characteristics that have an impact on the application and performance of PLP Ties are not included in the ANSI specification. These characteristics include:

1. The transition contour of the top groove into side groove
2. Length of the saddle or top groove
3. Extension of shoulders past the edge of the top groove.
4. Depth of the top groove

Each of these items has different results on a factory formed tie's performance. Combinations of several of these characteristics could result in initial tie damage and incorrect application.

1. The transition contour of the top groove into the side groove is important due to the tie's shape. If an edge is created instead of a smooth rounded transition, the tie's formed wire is forced to bend over a fulcrum point resulting in a high concentration of stress. This is detrimental for both the insulator and tie.

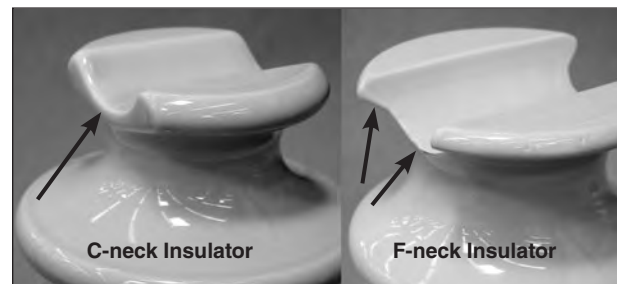


Figure 1a

Note the edge that exists between the top groove and the side groove above. Figure 1b shows a smooth transition.



Figure 1b

Insulator Fit

2. A top groove length longer than the insulator's neck diameter results in an edge. This edge creates a high stress contact point and results in an abnormal tie application. As an example, Figure 2 illustrates how a Distribution Tie reacts to this configuration (the tie tube was omitted to illustrate the gap beneath the conductor). Note the point contact at the insulator/tie interface.

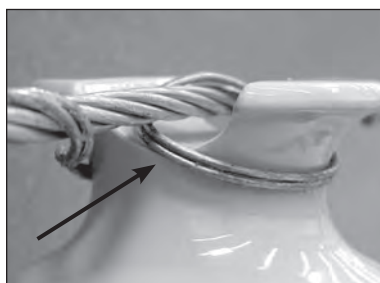


Figure 2

3. The shoulder extensions result in difficulty in application of top ties. As the tie is rotated, the added protrusions from the shoulders past the end of the top groove provide catch points for the tie (see F-neck Insulator in Figure 1a).

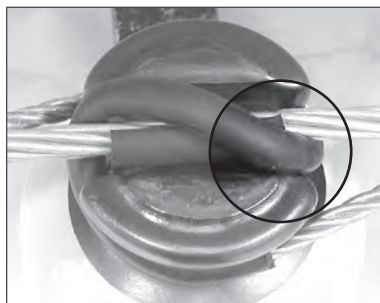


Figure 3

4. The top groove of the insulator can cause installation difficulties of top ties when its diameter is at the minimum ANSI designation. This is especially troublesome when installing the WRAPLOCK® Tie. Figure 3 illustrates the application on a C-neck insulator on 1/0 ACSR 6/1 conductor.

The circled area illustrates that the covered center section of the WRAPLOCK® Tie is wedged between the conductor and the inner surface of the insulator. This increases the installation difficulty of the tie.

In many instances the transition of the grooves can have a great impact on the form, fit, and function of a factory formed tie and hand tie wire. The sharp edge of a long top groove saddle (see Figure #1) can be especially hazardous to the soft hand tie wire as well as a factory formed tie.

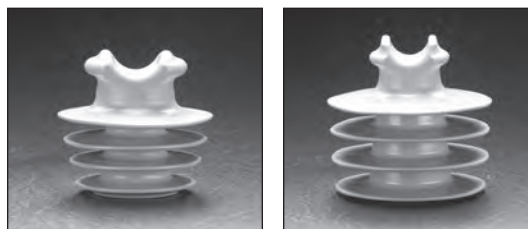
Insulator Review and Trial Applications

It is recommended the user conduct a thorough review of the insulator size, shape and geometry and conduct trial fits with the ties, prior to full scale field installations. Consult PLP for assistance, especially if there are any doubts concerning tie and insulator fit or performance.

Non-ANSI C29 Insulators

Some insulators that do not technically meet all the ANSI C29 Wet Process Porcelain Insulator standards may be suitable for use with PLP factory formed ties depending on their head and neck dimensions and geometry.

An example is the PLP polymer C & F-neck tie top insulators. These insulators have head and neck designs for use with PLP factory formed ties or PLP Ring Ties. The head and neck dimensions of the PLP Polymer C & F-neck insulators have been designed to match critical ANSI C29 dimensional specifications and meet or exceed most of the mechanical and electrical performance requirements specified in that standard.



PLP Polymer 15kV and 35kV Insulators