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STORM-LOCK TYLE-TYE® and RINESS® TILE-TIE ROOF TILE FASTENERS and FASTENING SYSTEMS FOR CLAY AND CONCRETE ROOFING TILES

CSI Section:

07 32 01 Roof Tile Accessories

1.0 RECOGNITION

The Storm-Lock roof tile fasteners and roof tile fastening systems recognized in this report have been evaluated for physical components and structural capacity and found to comply with IBC Chapter 15 and IRC Chapter 9 for use as fasteners for attachment of clay and concrete roof tiles. The following code editions and standards are recognized:

- 2015, 2012, and 2009 International Building Code® (IBC)
- 2015, 2012 and 2009 International Residential Code® (IRC)
- ICC-ES AC65

2.0 LIMITATIONS

2.1 The Storm-Lock roof tile fasteners shall be manufactured, identified, and installed in accordance with this report, the applicable code, and the manufacturer's installation instructions. In the event of a conflict more restrictive governs.

2.2 Use of the Storm-Lock roof tile fasteners and roof tile fastening systems is limited to roof slopes of not less than 2½ units vertical in 12 units horizontal (21-percent slope) and not more than 24 units vertical in 12 units horizontal (200-percent slope).

2.3 Calculations verifying allowable capacities for the Storm-Lock roof tile fasteners and roof tile fastening systems, as applicable, shall be submitted to the building official. The calculations shall be prepared by a registered design professional where required.

3.0 PRODUCT USE

3.1 General: Storm-Lock roof tile fasteners and roof tile fastening systems recognized in this report are identified in Tables 1 and 2 of this report. The fasteners are satisfactory alternatives to the clay and concrete tile attachments shown in Table 1507.3.7 of the IBC.

Storm-Lock roof tile fasteners and roof tile fastening systems shall be installed over solid sheathing or spaced structural sheathing boards in accordance with Section 1507.3.1 of the IBC. Plywood or OSB sheathing shall be a minimum ½ inch (12.7 mm) thick exterior-grade or Exposure 1 complying with DOC PS-1 or DOC PS-2, as applicable. Concrete decks shall have a minimum 28-day compressive strength of 2,500 psi (17.2 MPa). Steel decks shall be minimum No. 24 gage [0.0239 inch (0.61 mm)] thick steel complying with ASTM A653 SS, Grade 33. Foam plastic used as above-deck thermal insulation shall comply with Section 1508 of the IBC or Section R906 of the IRC, as applicable.

Clay and concrete roof tiles shall comply with Section 1507.3 of the IBC or Section R905.3 of the IRC, as applicable, and be recognized in a current and valid code evaluation report.

3.2 Design: Design and installation of the fastening system shall be based on the roof tile, slope, decking, and roof design. Design loads shall be determined for each project and shall not exceed the allowable loads shown in Table 2 in this report. The Storm-Lock roof tile fasteners and roof tile fastening systems are corrosion resistant, in accordance with Section 1507.3.6 of the IBC and Section R905.3.6 of the IRC, and shall be used with similar materials to prevent a galvanic reaction.

3.3 Installation: Installation of the Storm-Lock Tyle-Tye® and Riness® Tile-Tie fastening systems shall be in accordance with this report, the applicable code, and the manufacturer's installation instructions. In the event of a conflict, the more restrictive governs.

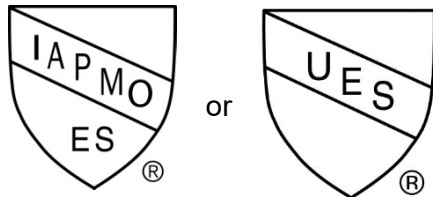
4.0 PRODUCT DESCRIPTION

4.1 General: The Storm-Lock roof tile fasteners and roof tile fastening systems consist of wire ties and metal straps of materials, thicknesses, and physical characteristics as shown in Table 1 of this report. Figure 1 of this report illustrates typical fastener and system configurations.



5.0 IDENTIFICATION

Packages of the Storm-Lock roof tile fasteners are labeled with the name: Frances Fasteners Dba Storm-Lock Fasteners; address; fastener type; material designation; and evaluation report number (ER-444). Either IAPMO UES Mark of Conformity below may also be used:



IAPMO UES ER-444

6.0 SUBSTANTIATING DATA

6.1 Data in accordance with the ICC-ES Acceptance Criteria for Concrete and Clay Roof Tile Fasteners, AC65, dated June 1991 (editorially revised July 2015), manufacturer's descriptive literature, and installation instructions.

6.2 Test reports are from laboratories in compliance with ISO/IEC 17025.

7.0 STATEMENT OF RECOGNITION

This evaluation report describes the results of research completed by IAPMO Uniform Evaluation Service on Storm-Lock Tile Fasteners' Storm-Lock Tyle-Tye[®] and Riness[®] Tile-Tie roof tile fasteners and fastening systems for clay and concrete roofing tiles to assess its conformance to the codes and standards shown in Section 1.0 of this report and documents the product's certification.

For additional information about this evaluation report please visit www.uniform-es.org or email us at info@uniform-es.org



TABLE 1
TYLE-TYE® AND RINESS® PRODUCTS, MATERIALS AND CHARACTERISTICS

Product / Use	Material	Diameter or Thickness (inch)	Allowable Tensile Load (lbf)
Wire Tie Products			
(SL-UNS) Tyle-Tye® “U” Nail	Stainless Steel (ASTM A580, Type 302 or 304)	0.135	-
(SL-TNS) Tyle-Tye® TileNail		0.105	170
(SL-TWTS) Tyle-Tye® Twisted Wire		0.090	303
(SL-NHS) Tyle-Tye® Wind Lock Nose Hook			180
(SL-CNS) Tyle-Tye® Connector			170
(SL-SHS) Tyle-Tye® “S” Hook			170
(SL-TRS) Tyle-Tye® Tie Rod			170
(SL-RS) Riness® Tile Tie			195
(SL-TWS) Tyle-Tye® Tie Wire			74
(SL-UNG) Tyle-Tye® “U” Nail		Galvanized Steel (ASTM A641)	0.135
(SL-TNG) Tyle-Tye® TileNail	0.120		166
(SL-NHG) Tyle-Tye® Wind Lock Nose Hook			166
(SL-TWTG) Tyle-Tye® Twisted Wire	0.105		354
(SL-SHG) Tyle-Tye® “S” Hook			166
(SL-RG) Riness® Tile Tie			175
(SL-CNG) Tyle-Tye® Connector			219
(SL-TRG) Tyle-Tye® Tie Rod	0.062		303
(SL-TWG) Tyle-Tye® Tie Wire			52
(SL-TNB) Tyle-Tye® TileNail	Brass (ASTM B134)		0.135
(SL-UNB) Tyle-Tye® “U” Nail		-	
(SL-TWTB) Tyle-Tye® Twisted Wire		0.101	133
(SL-RB) Riness® Tile Tie			177
(SL-NHB) Tyle-Tye® Wind Lock Nose Hook			157
(SL-SHB) Tyle-Tye® “S” Hook			156
(SL-TWB) Tyle-Tye® Tie Wire		0.064	42
(SL-TWTC) Tyle-Tye® Twisted Wire		Copper (ASTM B3)	0.101
(SL-TWC) Tyle-Tye® Tie Wire	0.064		29
Sheet Tie Products			
(SL-DAS) Tyle-Tye® Deck Anchor	Stainless Steel (ASTM A240, Type 302 or 304)	0.62 x 0.050	-
(SL-HCS) Tyle-Tye® Hurricane Clip		0.50 x 0.050	-
(RP-3S) Tyle-Tye® DPA Anchor Plate		3.00 x 0.024	-
(SL-STG) Tyle-Tye® Strap		1.00 x 0.024	210
(SL-DAG) Tyle-Tye® Deck Anchor	Galvanized Steel (ASTM A653)	0.62 x 0.050	-
(SL-HCG) Tyle-Tye® Hurricane Clip		0.50 x 0.050	-
(SL-STG) Tyle-Tye® Strap		1.00 x 0.024	244
(SL-DAB) Tyle-Tye® Deck Anchor	Brass (ASTM B36)	0.62 x 0.050	-
(SL-HCB) Tyle-Tye® Hurricane Clip		0.50 x 0.050	-

For SI: 1 inch = 25.4 mm; 1 lbf = 4.448 N



**TABLE 2
ALLOWABLE LOAD CAPACITY**

System / Component	Deck Fasteners ¹	Connection	Uplift (Vertical) Load (lb ^f)			Horizontal Load ² (lb ^f)		
			Sheathing		Steel or Concrete Deck ⁵	Sheathing		Steel or Concrete Deck ⁵
			Plywood	OSB		Plywood	OSB	
Tyle-Tye[®] Hurricane Strap System								
SL-STG; SL-CNS; or SL-TRS	Nails: No. 10 gage stainless steel or 11 gage galvanized	180° bend at strap loop	19	15	-	22	18	-
	Screws: No. 14 gage stainless steel or No. 12 gage galvanized	180° bend at strap loop	20	-	15	28	-	21
		360° bend at strap loop	117	-	88	-	-	108
SL-STG; SL-CNG; or SL-TRG	Nails: No. 10 gage stainless steel or No. 11 gage galvanized	180° bend at strap loop	24	17	-	38	31	-
	Screws: No. 14 gage stainless steel or No. 12 gage galvanized	180° bend at strap loop	36	-	27	50	-	37
		360° bend at strap loop	130	-	98	173	-	130
SL-STG and SL-TWS	Nails: 10 gage stainless steel or 11 gage galvanized		30	19	-	70	69	-
	Screws: No. 14 gage stainless steel or No. 12 gage galvanized		95	-	71	113	-	84
SL-STG; and SL-TWG	Nails: No. 10 gage stainless steel or No. 11 gage galvanized		23	15	-	40	41	-
	Screws: No. 14 gage stainless steel or No. 12 gage galvanized		46	-	35	55	-	41
Tyle-Tye[®] Twisted Wire System								
SL-TWTS; SL-TWS; and SL-DAS	Nails: 2 x No. 10 gage stainless steel or 2 x No. 11 gage galvanized		39	42	-	94	96	-
SL-TWTS; SL-TWS; and DPA	Screws: double plate with No. 14 gage stainless or No. 12 gage galvanized		37	-	36	96	-	87
SL-TWTS; SL-TWS; and SL-DAG	Nails: 2 x No. 10 gage stainless steel or 2 x No. 11 gage galvanized		30	31	-	43	39	-
SL-TWTS; SL-TWS; and SL-DAB	Nails: 2 x No. 10 gage copper or 2 x No. 10 gage stainless steel		40	34	-	92	87	-



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SL-TWTG; SL-TWG; and SL-DAG	Nails: 2 x No. 10 gage stainless steel or 2 x No. 11 gage galvanized		49	49	-	63	53	-
SL-TWTG; SL-TWG; and DPA	Screws: double plate with No. 14 gage stainless or 2 x No. 12 gage galvanized		46	-	46	64	-	64
SL-TWTC; SL-TWC; and SL-DAB	Nails: 2 x No. 10 gage copper		32	28	-	33	34	-
SL-TWTB; SL-TWB; and SL-DAB	Nails: 2 x No. 10 gage copper		18	21	-	49	50	-
Riness® Tile Tie System								
SL-RS; and SL-NHS	Screws: double plate (RP-3S) with No. 14 gage stainless steel or No. 12 galvanized	360° wire bend at double plate	45	41	48	40	45	31
SL-RG; and SL-NHG	Screws: double plate (RP-3S) with No. 14 gage stainless steel or No. 12 galvanized		73	48	67	56	58	47
SL-RS; and SL-NHS	Nails: SL-UNS "U" Nail	180° wire bend at double plate	51	26	-	22	28	-
SL-RG; and SL-NHG	Nails: SL-UNG "U" Nail		43	39	-	16	25	-
SL-RG; and SL-NHB	Nails: SL-UNB "U" Nail		23	20	-	42	35	-
Tyle-Tye® Tile Nail								
SL-TNS Tile Nail			26	10	-	19	16	-
SL-TNG Tile Nail			18	16	-	21	20	-
SL-TNB Tile Nail			34	19	-	10	9	-
Tyle-Tye® Supplemental Connectors								
SL-NHS Wind Lock Nose Hook	Nails: No. 10 gage stainless steel	180° wire bend at connection	12	11	-	-	-	-
	Screws: No. 12 gage galvanized							
SL-NHG Wind Lock Nose Hook	Nails: No. 11 gage galvanized		22	22	-	-	-	-
	Screws: No. 12 gage galvanized							



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SL-NHB Wind Lock Nose Hook	Nails: No. 10 gage copper		12	13	-	-	-	-
SL-HCS Hurricane Clip	Nails: 2 x No. 10 gage Stainless steel		15	15	-	-	-	-
	Screws: 2 x No. 12 gage galvanized							
SL-HCG Hurricane Clip	Nails: 2 x No. 11 gage galvanized		15	15	-	-	-	-
	Screws: 2 x No. 12 gage galvanized							
SL-HCB Hurricane Clip	Nails: 2 x No. 10 gage copper		6	7	-	-	-	-
SL-SHS "S" Hook	Nails: No. 10 gage stainless steel or No. 11 gage galvanized		12 ³	12 ³	-	-	-	-
SL-SHG "S" Hook	Nails: No. 11 gage galvanized		15 ³	15 ³	-	-	-	-
SL-BCS Batten Clip	N/A		20 ⁴	20 ⁴	-	-	-	-
SL-BCG Batten Clip	N/A		15 ⁴	15 ⁴	-	-	-	-

For **SI**: 1 inch = 25.4 mm; 1 lbf = 4.448 N

¹ Nails shall be ring shank nails complying with ASTM F1667. Screws shall comply with ANSI/ASME B18.64. No. 12 galvanized screws shall have #3 Phillips drive or ¼ Hex drive heads, with 13-thread per inch, 0.448" head diameter, 0.167" shank diameter, and 0.222" thread diameter. No. 14 stainless steel screws shall have #3 Phillips truss head, be 400 series magnetic heat-treatable stainless steel with 0.440" head diameter, 0.180" shank diameter, and 0.235" thread diameter. Screws shall be subject to approval by the building official. Fasteners shall be long enough to penetrate a minimum of 1/2-inch through the substrate.

² Direction of the horizontal load is parallel to the roof slope.

³ With clay or concrete tile.

⁴ 1" x 3" douglas-fir battens.

⁵ Insulated steel decks shall be a minimum No. 24 gage ASTM A611 Grade C or ASTM A653 Grade 33 with polyisocyanurate insulation complying with ASTM C1289 or better.



FIGURE 1

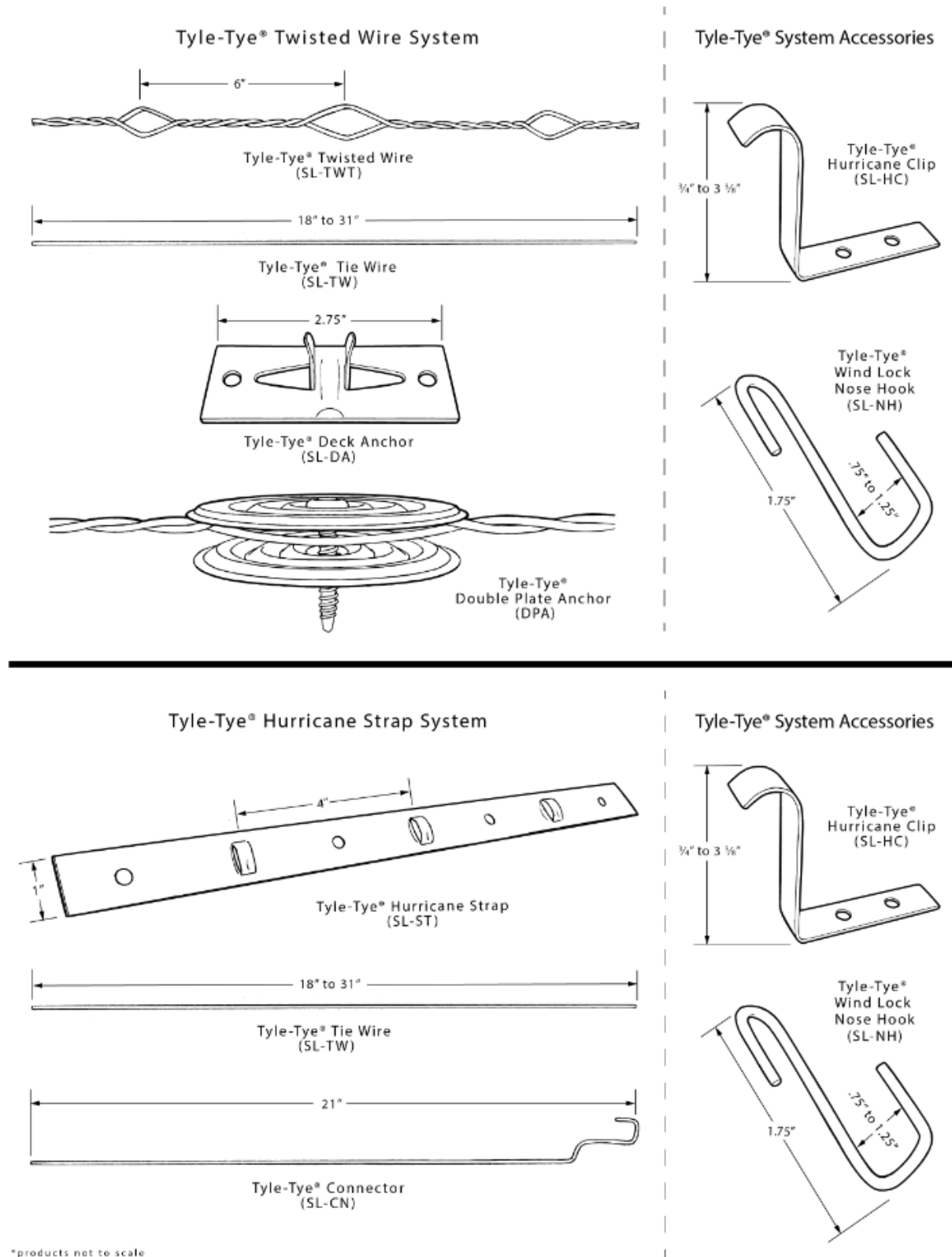
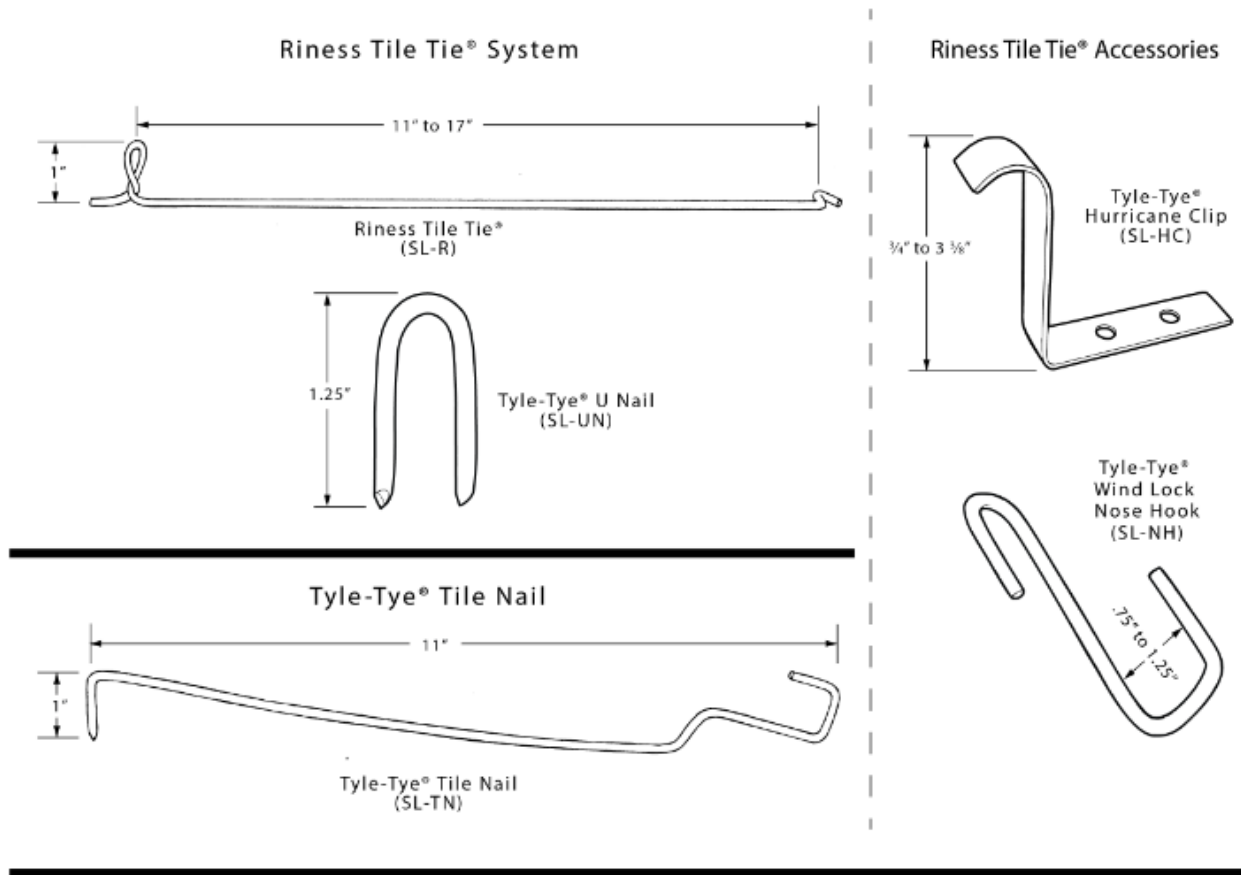
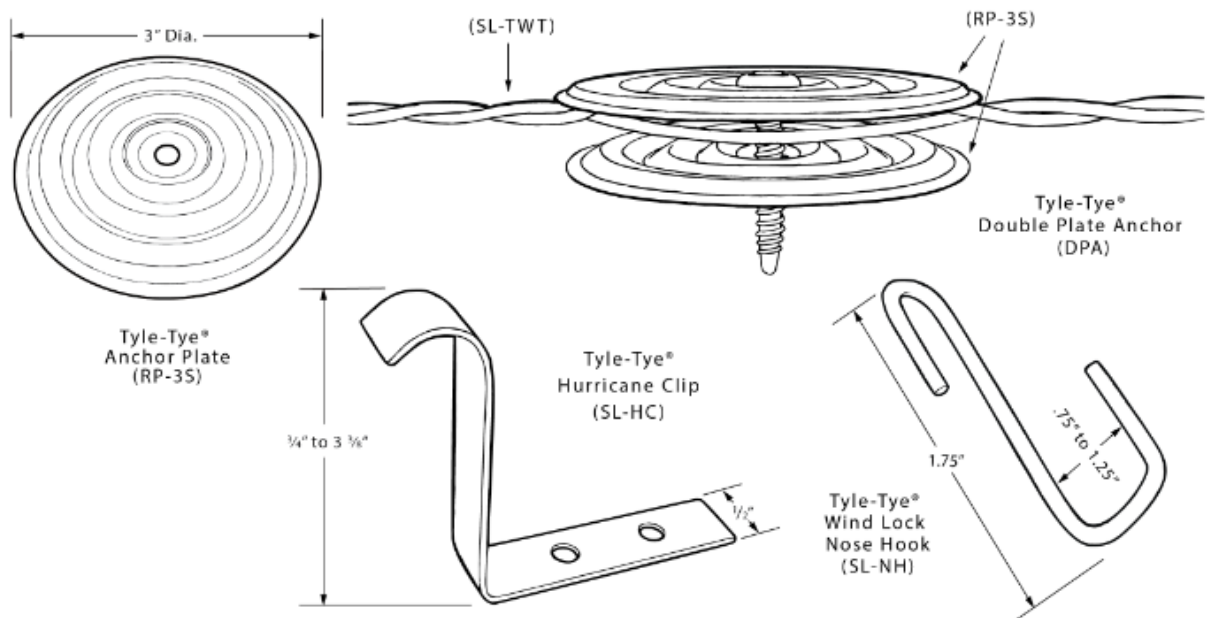




FIGURE 1 Cont.



Tyle-Tye® and Riness Tile Tie® Alternate Anchor + Accessories



*products not to scale