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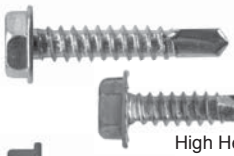
HEX WASHER HEAD

- The hex washer head is the most popular drive system and provides the best stability during installation.
- Available with TRI-SEAL™ long life coating for the ultimate corrosion protection...1,000 hrs salt spray with no red rust!

HEX DRIVE SIZE
#8 dia: 1/4" HWH
#10 dia: 5/16" HWH
#12 dia: 5/16" HWH
1/4 dia: 3/8" HWH
5/16 dia: 3/8" HWH

A

B



High Hex for better driving stability!

C

D

E

F

G

Metal Roof Clip Screw

H

SIZES AND PERFORMANCE SPECIFICATIONS

	Size	Point Type	Drilling Thickness	Attachment Thickness	Box Quantity
A	#8-18 x 1/2"	DP2	.036" - .100"	.205"	10M
	#8-18 x 5/8"	DP2	.036" - .100"	.330"	10M
	#8-18 x 3/4"	DP2	.036" - .100"	.455"	10M
	#8-18 x 1"	DP2	.036" - .100"	.705"	7.5M
	#8-18 x 1-1/4"	DP2	.036" - .100"	1.000"	5M
	#8-18 x 1-1/2"	DP2	.036" - .100"	1.205"	5M
	#8-18 x 2"	DP2	.036" - .100"	1.750"	1.5M
B	#10-16 x 1/2"	DP3	.036" - .175"	.150"	10M
	#10-16 x 5/8"	DP3 (HH)	.036" - .175"	.200"	10M
	#10-16 x 3/4"	DP3 (HH)	.036" - .175"	.325"	7.5M
	#10-16 x 1"	DP3	.036" - .175"	.575"	5M
	#10-16 x 1-1/2"	DP3	.036" - .175"	1.075"	3M
	#10-16 x 2"	DP3	.036" - .175"	1.500"	2M
	#10-16 x 3"	DP3	.036" - .175"	2.500"	1M

"HH" Denotes High Hex

MATERIAL: C1018-1022 Carbon Steel
PLATING: Standard: .0003" Min. Electro Zinc (46hrs Salt Spray - ASTM B117)
Meets ASTM C 1513-04 and AISI TS-4-02 Standards

	Size	Point Type	Drilling Thickness	Attachment Thickness	Box Quantity
C	#12-14 x 3/4"	DP3	.036" - .210"	.290"	5M
	#12-14 x 1"	DP3	.036" - .210"	.525"	3.5M
	#12-14 x 1-1/4"	DP3	.036" - .210"	.750"	3M
	#12-14 x 1-1/2"	DP3	.036" - .210"	1.000"	2M
	#12-14 x 2"	DP3	.036" - .210"	1.500"	2M
	#12-14 x 2-1/2"	DP3	.036" - .210"	2.000"	1M
	#12-14 x 3"	DP3	.036" - .210"	2.500"	1M
D	#12-14 x 1-1/4"	DP2 LP	.036" - .200"	.750"	3.5M
E	1/4-14 x 7/8"	DP1 W/VRT	.036" - .090"	.325"	2.5M
F	1/4-14 x 3/4"	DP3	.036" - .250"	.210"	2.5M
	1/4-14 x 1"	DP3	.036" - .250"	.460"	2.5M
	1/4-14 x 1-1/4"	DP3	.036" - .250"	.710"	2M
	1/4-14 x 1-1/2"	DP3	.036" - .250"	.960"	2M
	1/4-14 x 2"	DP3	.036" - .250"	1.460"	1.5M
	1/4-14 x 2-1/2"	DP3	.036" - .250"	2.460"	1M
	1/4-14 x 4"	DP3	.036" - .250"	3.460"	500
	1/4-14 x 5"	DP3	.036" - .250"	4.460"	500
	1/4-14 x 6"	DP3	.036" - .250"	5.460"	250
	1/4-14 x 8"	DP3	.036" - .250"	7.460"	250
G	#12-14 x 1-1/4"	DP2 SHLDR	.036" - .200"	.750"	3.5M
H	5/16-18 x 1"	DP3	.100" - .250"	.460"	1.5M
	5/16-18 x 1-1/4"	DP3	.100" - .250"	.710"	1.5M
	5/16-18 x 1-1/2"	DP3	.100" - .250"	.960"	1.5M
I	1/4-20 x 1-1/2"	DP5	.250" - .500"	.500"	2M
	1/4-20 x 2-1/4"	DP5	.250" - .500"	1.250"	1M
	1/4-20 x 3"	DP5	.250" - .500"	2.000"	500
	1/4-20 x 4"	DP5	.250" - .500"	3.000"	250
	1/4-20 x 5"	DP5	.250" - .500"	4.000"	250
	1/4-20 x 6"	DP5	.250" - .500"	5.000"	250
	1/4-20 x 8"	DP5	.250" - .500"	7.000"	150
J	#12-24 x 7/8"	DP4	.125" - .137"	.325"	5M
	#12-24 x 1-1/4"	DP4	.125" - .137"	.375"	3.5M
K	#12-24 x 1-1/4"	DP5	.250" - .500"	.375"	3.5M
	#12-24 x 1-1/2"	DP5	.250" - .500"	.625"	2.5M
	#12-24 x 2"	DP5	.250" - .500"	1.125"	2M

MATERIAL: C1018-1022 Carbon Steel
PLATING: Long-Life: TRI-SEAL™ Coating (1,000hrs Salt Spray - ASTM B117)
Meets ASTM C 1513-04 and AISI TS-4-02 Standards

Heavy Gauge Applications - DP4 & DP5 Points

- Drill and tap up to 1/2" thick steel.
- Supplied with our TRI-SEAL™ long life coating for superior corrosion protection.
- Lengths up to 8" for retrofit metal roof base attachment.

I

J

K

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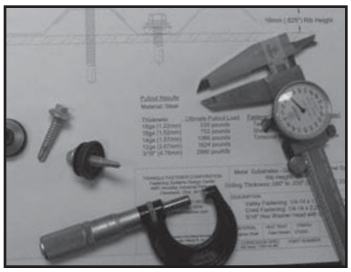
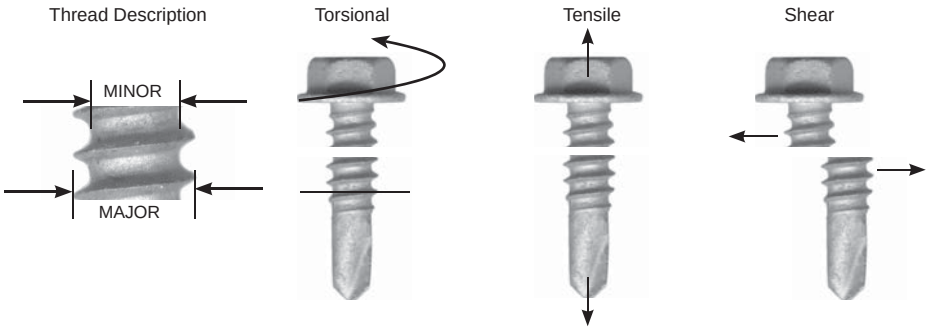
BLAZER® ENGINEERING DATA



The following information is compiled to assist the design professional in selecting the appropriate fastener for the application. Data supplied is compiled from fastener standards and independent tests. An engineering professional should be consulted to determine expected loads on the connection, environmental effects, and any other conditions that could effect the performance of the fastener. Selecting a fastener is the responsibility of the engineer and changes to a fastener should not be made without approval. Using the wrong fastener can lead to failure.
TFC WILL NOT WARRANTY, EITHER EXPRESSED OR IMPLIED, THE USE OF THIS INFORMATION.

TECHNICAL DATA

BLAZER® self-drilling fasteners are produced and perform to SAEJ78, ASME/ANSI 18.18. and AISI TS-4-02 specifications. Conforms to ICCESAC18 acceptance criteria for tapping screw fasteners.



Fastener Diameter	Nominal Screw Diameter	Major Diameter (inch)		Minor Diameter (inch)		Area Of Minor Dia. (sq in.)	Torsional (Lb-In.)	Tensile (Pounds)	Shear (Pounds)
		Max	Min	Max	Min				
#6-20	0.138	0.139	0.135	0.104	0.099	0.0077	25	1,125	750
#8-18	0.164	0.166	0.161	0.122	0.116	0.0106	42	1,575	1,000
#10-16	0.190	0.189	0.183	0.141	0.135	0.0143	61	2,100	1,400
#10-24	0.190	0.190	0.182	0.144	0.137	0.0147	65	3,400	2,275
#12-14	0.216	0.215	0.209	0.164	0.157	0.0194	92	2,778	2,000
#12-24	0.216	0.216	0.209	0.189	0.185	0.0269	100	3,188	2,100
1/4-14	0.250	0.246	0.240	0.192	0.185	0.0269	150	4,275	2,600
1/4-20	0.250	0.250	0.242	0.218	0.214	0.0360	156	4,275	2,700
#18-9	0.306	0.306	0.300	0.217	0.209	0.0343	170	4,550	2,576
5/16-12	0.313	0.329	0.327	0.309	0.299	0.0702	250	8,550	5,700

Material: C1018-C1022 / 410 SS

Heat Treatment: Case Harden

Case Hardness: 52-58 Rockwell C

Case Depth:

#6 Dia = .002" - .007"
#8, #10, #12 Dia = .004" - .009"
1/4" = .005" - .011"

Core Hardness

Carbon Steel: 32-40 Rockwell C

410 Stainless: 42-48 Rockwell C

Ductility: 5 Degree minimum bend

English to Metric	Formula to Use
Decimal to Millimeters	Decimal x 25.4
PSI to Newton / Millimeters²	PSI x .007
Pounds Force to Newtons	Pounds Force x 4.448

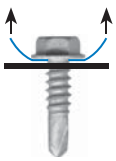
DISCLAIMER: ALL TEST RESULTS AND SPECIFICATIONS ARE A RESULT OF LABORATORY TESTS. APPROPRIATE SAFETY FACTORS SHOULD BE USED BY THE USER OR SPECIFIER. DETERMINING THE PROPER FASTENER IS THE RESPONSIBILITY OF THE USER OR SPECIFIER. SINCE APPLICATION CONDITIONS VARY AND ARE UNCONTROLLABLE BY TFC, WE ASSUME NO LIABILITY FOR THE USE OF THIS INFORMATION.

Gauge Thickness	Decimal	Metric
29 GA	.013"	.33mm
28 GA	.015"	.38mm
26 GA	.018"	.46mm
24 GA	.024"	.61mm
22 GA	.030"	.76mm
20 GA	.036"	.91mm
18 GA	.048"	1.22mm
16 GA	.060"	1.52mm
14 GA	.075"	1.91mm
12 GA	.105"	2.67mm
1/8"	.125"	3.18mm
10 GA	.135"	3.43mm
1/4"	.250"	6.35mm
5/16"	.312"	7.92mm
3/8"	.375"	9.53mm
1/2"	.500"	12.7mm

PULLOVER TEST RESULTS

These pullover results are for self-sealing fasteners listed in this catalog.

Pounds - Ultimate Average



Steel Thickness	BOND-SEALER		FLANGE SEALER	ZINC CAP HEAD	STAINLESS CAP HEAD
	12.7MM OD	15MM OD			
22 ga	945	1,249	1,298	1,647	1,298
24 ga	704	1,056	1,102	1,310	1,102
26 ga	519	654	692	794	692

Note: Estimated pullover for fasteners without sealing washers can be calculated using the following formula per AISI.

Pullover force = 1.5 -x- Thickness of the member in contact with the screw head. -x- Larger of the screw head diameter or washer diameter. -x- Tensile strength of the member in contact with the screw head.

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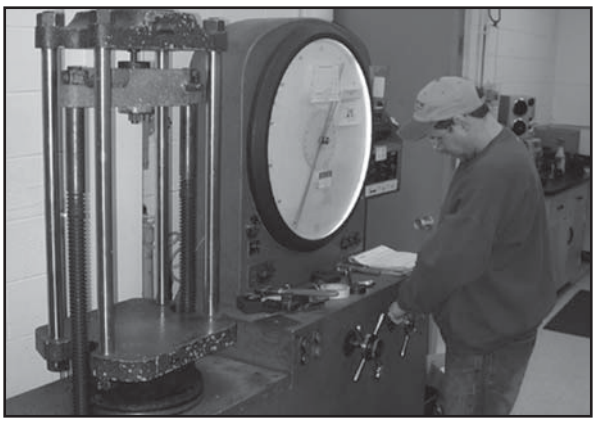
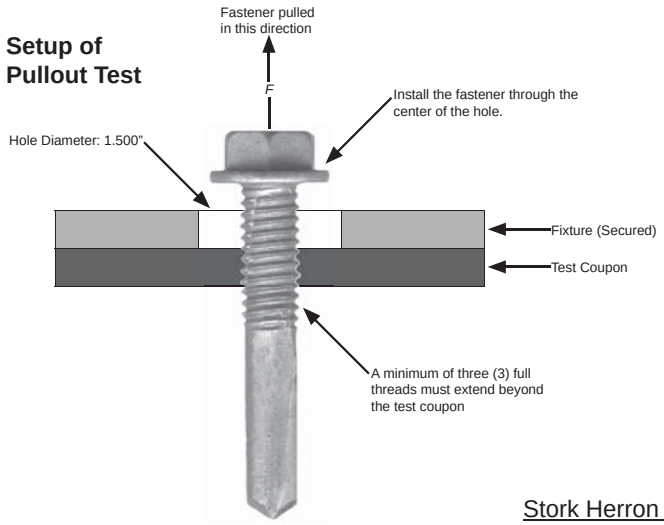
PULLOUT TEST RESULTS



The following fastener pullout loads are a result of independent tests conducted at Stork Herron Testing Laboratories. The results are ultimate averages as a result of conducting three pullouts per fastener size in each material thickness.



Stork Herron Report #
TRI081-05-01-88910-1
Test Material: 55ksi - 100ksi

Pullout Test Result - Ultimate Average in Pounds

Fastener Size	GAGE THICKNESS & ROCKWELL HARDNESS OF THE TEST PLATE											
	26 Ga. (.018") 45-49Rb	24 Ga. (.024") 46-52Rb	22 Ga. (.030") 61-67Rb	20 Ga. (.036") 54-62Rb	18 Ga. (.048") 64-73Rb	16 Ga. (.060") 65-67Rb	14 Ga. (.075") 68-70Rb	12 Ga. (.105") 74-86Rb	1/8" (.125") 75-91Rb	3/16" (.188") 83-85Rb	1/4" (.250") 92-96Rb	1/2" (500") 92-93Rb
#6-20 DP2	120	183	248	296	241	679	847					
#8-18 DP2	120	193	243	297	447	703	910					
#10-16 DP3	153	207	243	293	487	710	900	1327	1503			
#10-24 DP2	161	238	293	324	517	1096	1544	1906				
#12-14 DP2					577	790	1137	1697	1920			
#12-14 DP3					533	752	1163	1947	2250	2870		
#12-24 DP5						687	986	1850	1670	2673	3844*	1873
1/4-14 DP1	173	240	337	387	657	1250						
1/4-14 DP3				343	533	886	1077	2170	2060	3863	4493*	
1/4-20 DP5						708				3853	4283*	4680*
5/16-12 DP3				457	706	1609	1707	2831	2915	3745		

* Exceeds Tensile Strength

SHEAR TEST RESULTS

Shear tests are a result of installation of the fastener in the noted gauge thickness and applying load until failure occurs.

Size	26 Ga. (.018")	24 Ga. (.024")	22 Ga. (.030")	20 Ga. (.036")	18 Ga. (.048")	16 Ga. (.060")	14 Ga. (.075")	12 Ga. (.105")
#6-20 DP2	278	466	526	758	845			
#8-18 DP2	294	496	560	740	1,060			
#10-16 DP3				728	1,266	1,540	1,552	
#12-14 DP3				769	1,358	1,620	1,970	1,986
#12-24 DP5								2,650
1/4-14 DP3				930	1,442	2,100	2,584	2,650
1/4-20 DP4								2,650

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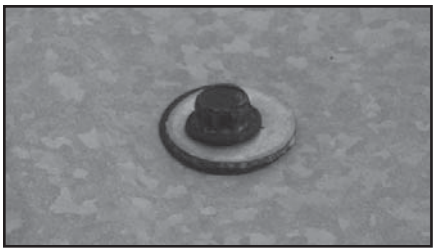
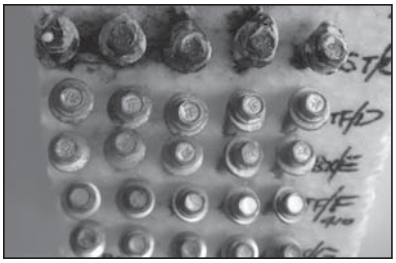


CORROSION PROTECTION INFORMATION

The following information was compiled from known data that compares various finishes in a controlled environment. The material set forth herein is for general information only and cannot be construed as a substitute for competent professional advice or service. Any part considering application use of this information does so at their own risk and assumes any and all liability from application or use. Consult a corrosion specialist to determine the best fastener for your condition.

SALT SPRAY RESULTS

The chart to the right provides general information with regard to corrosion resistance of various plating and coatings. Contact TFC for detailed information.



SALT SPRAY Per ASTM B117 (Hours to red rust)
Carbon steel and 410 stainless steel materials

Coating	Salt Spray
.00015” min. (3 um) zinc plate with clear chromate	24hrs
.0002” min. (6um) zinc with clear chromate	32hrs
Passivated 410 Stainless Steel	48hrs
.0003” min. (8 um) zinc plating with clear chromate	48hrs
.0003” min. (8 um) zinc plating with yellow di-chromate	144hrs
.0005” min. (12 um) zinc plating with clear chromate	60hrs
.0007” min. (14 um) mechanical zinc with clear chromate	72hrs
Epoxy (E-Coat)	500hrs
TRI-SEAL™ Long-life coating	1,000hrs

FASTENER COMPATIBILITY FOR METAL ROOFING AND WALL CLADDING

Table developed by the Metal Construction Association Members (Rev. by MCA 09.27.10)

	Fastener Material								
Metal Roof or Wall Cladding Material	Zinc Plated Steel Screws[2]	Organic Coated Steel Screws[2]	Hot-Dip Galvanized Steel Nails[3] and Screws	Zinc-Alloy Head Steel Screws	Stainless Capped Head Steel Screws	Aluminum	Copper and Copper Alloys	300 Series Stainless Steel	400 Series Stainless Steel
Unpainted Galvanized Steel	Yes[4]	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes
Painted Galvanized Steel	Yes[4]	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes
Unpainted Galvalume Steel	No	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes
Painted Galvalume Steel	Yes[4]	Yes	Yes	Yes	Yes	Yes	No	Yes[4]	Yes[4]
Aluminum	No	Yes	No	No	No	Yes	No	Yes	No
Copper & Copper Alloys	No	No	No	No	No	No	No	Yes	Yes4
Stainless Steel	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Zinc alloy	No	No	No	No	No	Yes	No	Yes	Yes

Note 1: Cautionary Guideline: This table serves as a guideline for the selection of fasteners used with metal roofing. The performance of compatible fasteners shown in this table matches the expected life of the metal roof or wall cladding materials. However, in highly corrosive environments such as heavy industrial, coastal marine, high airborne pollutants or salt spray, preservative treated lumber or fire-retardant lumber, the compatibility of certain fasteners with metal roofing or wall cladding materials may be affected. In those types of applications, the manufacturers of the fastener and metal panel will have specific and unique recommendations.

In addition, in the event that certain coating barriers are damaged or scratched through to the substrate there is increased potential for premature corrosion. Care should be taken during installation and during routine maintenance of the panels in order to protect the integrity of the coatings used for metal panels.
Note 2: Screws should be plated/coated per ASTM F1941
Note 3: Nails should be galvanized per ASTM A153
Note 4: Not recommended for coastal and heavy industrial environments

Special Note: Preservative-Treated Lumber Applications

ACQ, Penta, CA or CBA preservative-treated lumber can be incompatible with certain types of fasteners. In those cases where any type of metal roof or wall cladding materials are being attached to preservative treated lumber, the following fasteners are not compatible: zinc plated screws, zinc-alloy headed screws, stainless capped screws, aluminum, copper and copper alloy. When attaching metal panels to those types of preservative-treated lumber, a moisture barrier should be used between the lumber and the panel material. Metal panel fasteners that are compatible with preservative-treated lumber are stainless steel fasteners, or hot dip galvanized nails manufactured to ASTM A153 class D or heavier. Other types of fasteners coated with proprietary anti-corrosive technologies are also available for use with preservative-treated lumber. In addition, zinc-plated screws can be used in CCA and MCQ pressure-treated lumber.

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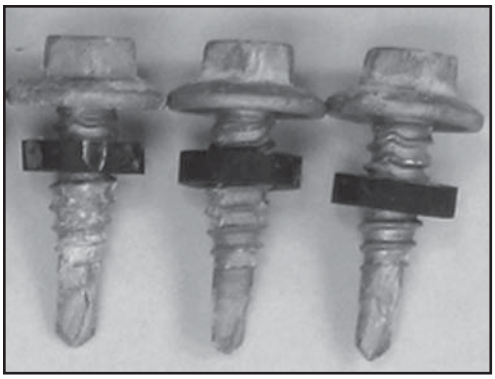


TRI-SEAL™ LONG-LIFE COATING

TRI-SEAL™ Long-Life Coating is a high performance dip spin finish, developed to minimize corrosion when used in exterior building applications. It consists of three layers; the first layer is a metallic zinc layer, the second layer is a high-grade anti-corrosion chemical conversion film and the third, outer layer, is a baked ceramic surface coating.

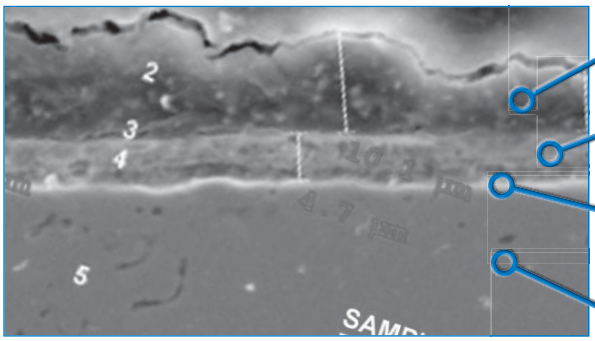
The distinguishing feature of **TRI-SEAL™** is the tight joining of the baked ceramic surface coating and the chemical conversion film. These two layers are bonded together through chemical reactions, and this unique method of combining layers result in a rigid combination of the coating films.

- Excellent resistance against gas, weather, and other kinds of corrosion factors, including salt water.
- Compatible for use in ACQ and Fire Treated Lumber.
- Composite layers minimize the effect of scratches on the protection coating.

Salt Spray Test Results
1,000hrs Per ASTM B117

Compatible for use in treated lumber

SEM IMAGING



Layer 1 - Baked Ceramic Surface Coating Layer
Corrosive elements are intercepted by the strong paint film made of ceramic materials.

Layer 2 - Chemical Conversion Coating Layer
Rust proof performance is improved as the chemical conversion inactivates the zinc plated surface and creates a tight adhesion between the chemically converted layer and the paint layer.

Layer 3 - Metallic Zinc Layer
The steel / iron substrate is protected from corrosion by the self-sacrificial galvanic effect of the zinc coating.

Layer 4 - Fastener

MATERIAL PROPERTIES

Test Items	Test Methods	Test Results
Hardness	Peeling test by pencil hardness	Over 4H
Adhesion	Peeling test by adhesive tape on cross scribed test piece in 1 mm width	Nothing abnormal
Acid Resistance	Immersion in 5% sulfuric acid solution for 24 hours	Nothing abnormal
Alkali Resistance	Immersion in 5% sodium hydroxide solution for 72 hours	Nothing abnormal
Heat Resistance	Exposure to 250 C (482 F) heat for an hour	Nothing abnormal
Accelerated Weathering	Sunshine weather-0-meter test for 1,000 hours	Free from red rust
Contact Corrosion w/other Metals	Corrosive investigation after Salt Spray Test (JIS Z2371) done comparatively on surface treated steel bolts/nuts tightened on a stainless steel plate	Clearly superior to zinc electroplated (colored chromate) and hot dip galvanizing

Corrosion Testing
Salt Spray: 1,000hrs.
Per ASTM B117.
No red rust

Kesternich: 30 cycles.
Per DIN 50018

Contact TFC for additional details on TRI-SEAL™.

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