

BLAZER[®]

DRILL SCREWS



Full line of self-drilling screws for attaching to metal

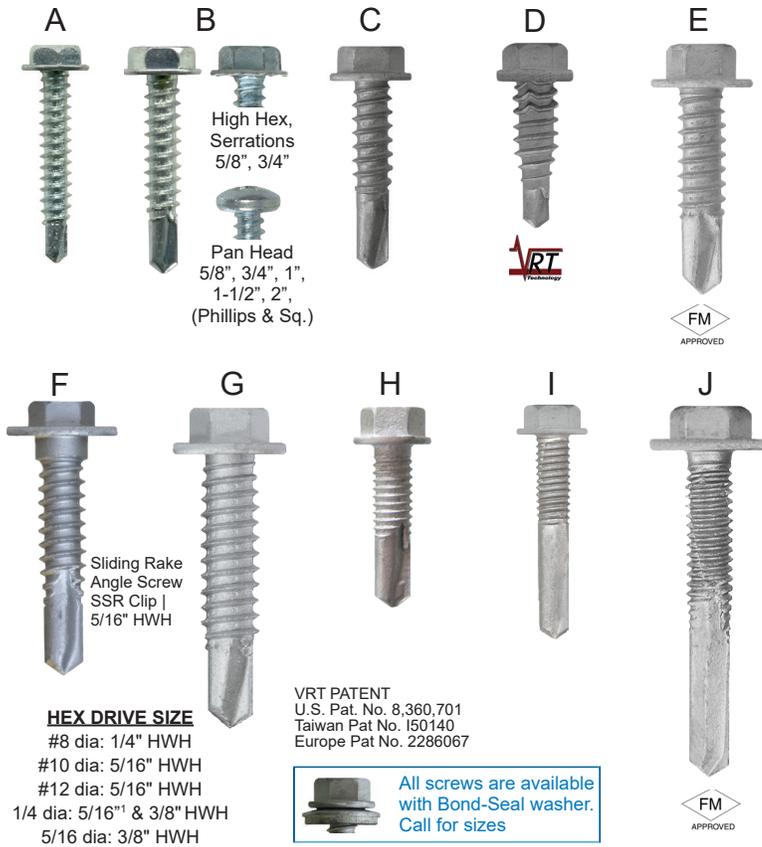
- Consistent Drilling
- Lengths up to 10"
- VRT Back-out Resistant
- Corrosion Resistant

MD395 - 0323



TRIANGLE FASTENER CORPORATION
www.trianglefastener.com | 800.486.1832
Fastening Systems and Solutions For Construction

- 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!



SIZES

Blue colored sizes denotes popular DC items

ITEM	SIZE	Point Type	LENGTHS	Load Bearing Length (MAX)	Box Qty			
A	#8-18	DP2	1/2"	.100"	10M			
			5/8"	.125"	10M			
			3/4"	.250"	10M			
			1"	.500"	7.5M			
			1-1/4"	.750"	5M			
			1-1/2"	1"	5M			
B	#10-16	DP3	1/2"	.100"	10M			
			5/8"	.125"	5M			
			3/4"	.250"	5M			
			3/4" HH/SERR	.250"	5M			
			1"	.500"	5M			
			1-1/2"	1"	3.5M			
			2"	1.500"	2M			
			3"	2.500"	1M			
			C	#12-14	DP3	3/4"	.125"	5M
						1"	.250"	3.5M
1-1/4"	.625"	3M						
1-1/2"	.750"	2M						
2"	1.25"	2M						
2-1/2"	1.75"	1M						
3"	2.25"	1M						
4"	3.75"	500						
D	1/4-14 ¹ VRT	DP1	7/8" VRT	.325"	2.5M			
E	1/4-14	DP3	3/4"	.125"	2.5M			
			1"	.250"	2.5M			
			1-1/4" ¹	.625"	2M			
			1-1/2" ¹	.875"	2M			
			2"	1"	1.5M			
			2-1/2"	1.50"	1M			
			3"	1.25" - 2.25"	1M			
			4"	1.73" - 3.25"	500			
			5"	2.6" - 4.25"	500			
			6"	3.6" - 5.25"	250			
			8"	5.6" - 7.25"	250			
9"	6.6" - 8.25"	250						
10"	7.6" - 9.25"	250						
F	1/4-14 SHLDR	DP3	1-1/4"	.625"	3.5M			
G	5/16-12	DP3	1"	.250"	1.5M			
			1-1/2"	.875"	1M			
			2"	1.25"	1M			
			3"	2.25"	750			
			4"	3.25"	500			
			5"	1.38 - 4.25"	500			
			6"	2.50 - 5"	500			
			8"	4.25" - 7"	200			
H	#12-24	DP4	7/8"	.325"	5M			
I	#12-24	DP5	1-1/4"	.500"	2.5M			
			1-1/4"	.500"	2M			
			1-1/2"	.625"	1.5M			
J	1/4-20 5/8" OD washer face	DP5	1-1/2"	.500"	2M			
			2-1/4"	1.250"	1M			
			2-1/2"	1.500"	1M			
			3-1/8"	2.125"	1M			
			4"	3"	250			
			5"	4"	250			
			6"	2.50" - 5"	250			
			7"	3.38" - 6"	500			
			8"	4.25" - 7"	500			

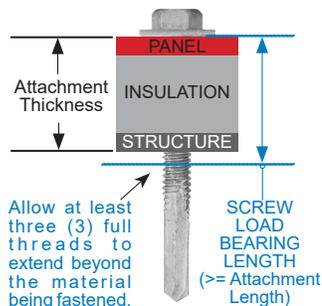
Drill Point and Length Selection

1. Determine the Screw Drill Point Type

- Add up the total thickness that will be drilled by the screw.
- Select the desired drill point (DP) type and screw size located on the size chart below.



Drilling and Tapping Thickness													
Gauge	24	20	18	16	14	12	10						
Inch	.024	.036	.048	.060	.075	.100	.105	.135	.175	.210	.250	.375	.500
Screw & Point	1/4-14 DP1	.024" - .072"											
	#8-18 DP2	.024" - .100"											
	#10-16 DP3	.024" - .175"											
	#10-24 DP3	.048" - .210"											
	#12-14 DP3	.024" - .210"											
	1/4-14 DP3	.035" - .250"											
	5/16-12 DP3	.048" - .175"											
	#12-24 DP4	.175" - .375"											
	#12-24 DP5	.175" - .500"											
	1/4-20 DP5	.175" - .500"											



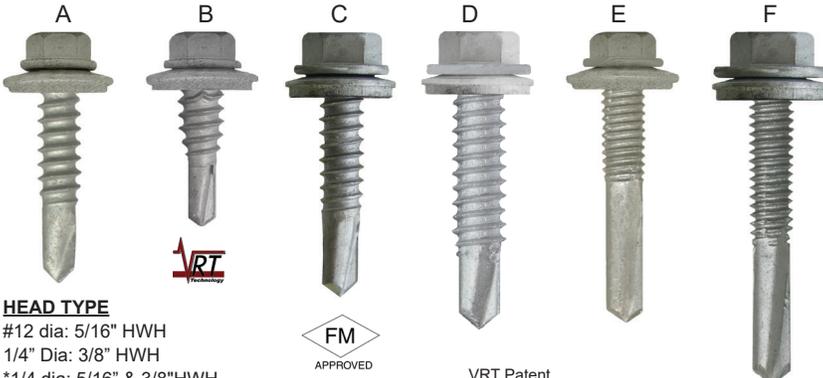
2. Determine Screw Length

- Measure from the top surface of the material being fastened to the underside of the metal that will be drilled and tapped. Be sure to allow for any void or insulation. This is called the attachment thickness.
- Select a screw length where the attachment thickness is less than or equal to the Load Bearing Length listed on the chart to the right.

All information is non-binding and without guarantee. Before using the products, all specifications and calculations must be checked by a suitably qualified person and local regulations must be observed. This document is subject to revision. We reserve the right to make technical changes. (0321-1)

BOND-SEAL SEALING WASHER

- The BOND-SEALER™ sealing washer is EPDM vulcanized to a 20 Gauge galvanized backing.
- TRI-SEAL® long life coated for superior corrosion protection.



HEAD TYPE

#12 dia: 5/16" HWH
1/4" Dia: 3/8" HWH
*1/4 dia: 5/16" & 3/8" HWH
5/16 dia: 3/8" HWH

WASHER DETAILS

20 ga G-90 Galvanized Steel | Vulcanized to .062" thick non-conductive EPDM | 15MM OD Washer
Special sizes available upon request.

VRT Patent
U.S. Pat. No. 8,360,701
Taiwan Pat No. 150140
Europe Pat No. 2286067

FLANGE-SEAL HEAD with EPDM WASHER



- FLANGE-SEAL™ self-sealing fastener has a deep undercut head that entraps the EPDM sealing washer to assure a leak free seal.
- TRI-SEAL® long-life coated for superior corrosion protection.

WASHER DETAILS

.125" Thick EPDM
Non-conductive

HEAD TYPE

5/16" HWH with Flange Undercut

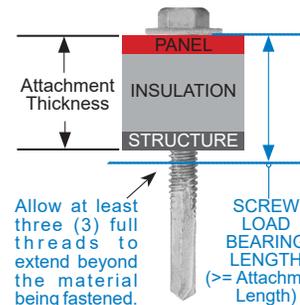
Drill Point and Length Selection

1. Determine the Screw Drill Point Type

- Add up the total thickness that will be drilled by the screw.
- Select the desired drill point (DP) type and screw size located on the size chart below.



		Drilling and Tapping Thickness													
		Gauge	24	20	18	16	14	12	10						
		Inch	.024	.036	.048	.060	.075	.100	.105	.135	.175	.210	.250	.375	.500
Screw & Point	1/4-14 DP1	.024" - .072"													
	#8-18 DP2	.024" - .100"													
	#10-16 DP3	.024" - .175"													
	#10-24 DP3	.048" - .210"													
	#12-14 DP3	.024" - .210"													
	1/4-14 DP3	.035" - .250"													
	5/16-12 DP3	.048" - .175"													
	#12-24 DP4	.175" - .375"													
	#12-24 DP5	.175" - .500"													
	1/4-20 DP5	.175" - .500"													



2. Determine Screw Length

- Measure from the top surface of the material being fastened to the underside of the metal that will be drilled and tapped. Be sure to allow for any void or insulation. This is called the attachment thickness.
- Select a screw length where the attachment thickness is less than or equal to the Load Bearing Length listed on the chart to the right.

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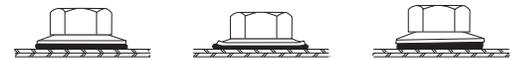
SIZES **Blue colored sizes denotes popular DC items**

Item	SIZE	Point Type	LENGTH	Load Bearing Length (Max)	Box Qty
A	#12-14	DP2	3/4"	.125"	5M
			1"	.250"	3.5M
			1-1/4"	.625"	3M
			1-1/2"	.750"	2M
			2"	1.25"	2M
			2-1/2"	1.75"	1M
	3"	2.25"	1M		
B	1/4-14	DP1-VRT	*7/8" VRT	.325"	2.5M
C	1/4-14	DP3	3/4"	.125"	2.5M
			*1"	.250"	2.5M
			*1-1/4"	.625"	2M
			1-1/2"	.875"	2M
			2"	1"	1.5M
			2-1/2"	1.50"	1M
			3"	1.25" - 2.25"	1M
			4"	1.73" - 3.25"	500
			5"	2.6" - 4.25"	500
			6"	3.6" - 5.25"	250
			8"	5.6" - 7.25"	250
10"	7.6" - 9.25"	250			
D	5/16-12	DP3	1"	.250"	1.5M
			1-1/2"	.875"	1M
			2"	1.25"	1M
			3"	2.25"	750
			4"	3.25"	500
			6"	2.50 - 5"	500
8"	4.25" - 7"	200			
E	#12-24	DP5	1-1/4"	.500"	3M
			1-1/2"	.625"	2M
			2"	.750"	3M
F	1/4-20	DP5	1-1/2"	.500"	2M
			2-1/4"	1.250"	1M
			3-1/8"	2-1/8"	1M
			4"	3"	250
	5/8" OD washer Face	DP5	5"	4"	250
			6"	2.50" - 5"	250
			8"	4.25" - 7"	150

FLANGE-SEAL HEAD

G	#12-14	DP3	1"	.250"	3.5M
			1-1/4"	.625"	3M
			1-1/2"	.750"	2M
			2"	1.250"	2M
			2-1/2"	1.5"	1.5M
	3"	2.25"	1M		
	4"	3.25"	500		
H	1/4-14	DP1-VRT	7/8" VRT	.325"	2.5M
I	1/4-14	DP3	1"	.250"	2.5M
			1-1/4"	.625"	2.5M
			1-1/2"	.875"	2M
	2"	1"	1.5M		

Proper Fastener Installation



CORRECT

Slight circle of sealant extrudes to outer edge.

TOO TIGHT!

Metal backing begins to turn up.

TOO LOOSE

Sealant not compressed, can't form a seal.

To assure a proper seal, torque the fastener until the EPDM sealant extrudes to the outer edge of the backing material.



 All screws are available with Bonded Sealing Washers. Call for sizes

HEAD SIZE
SIZE **HEAD TYPE**
 #8 1/4" HWH
 #10, #12, *1/4" 5/16" HWH
 1/4" 3/8" HWH

BONDED WASHER
 #8, #10 = 1/2" o.d.
 #12, #14 = 15mm o.d.
MATERIAL
 304 Stainless Steel
 EPDM Sealant

- Provides corrosion resistance in mild atmospheres.
- Plated to resist surface rust and to reduce tapping torque.
- Optional TRI-SEAL® 1,000 hrs salt spray long-life coated to reduce tapping torque and provide additional corrosion protection.

Blue colored sizes denotes popular DC items

SIZES AND PERFORMANCE SPECIFICATIONS

DIAMETER & POINT	LENGTH	Load Bearing Length (MAX)	Box Qty	LIST PRICE
A #8-18 BLAZER-2	1/2"	.100"	10M	
	3/4"	.125"	10M	
B #10-16 BLAZER-3	3/4"	.250"	7.5M	
	1"	.500"	5M	
C #12-14 BLAZER-3	1-1/2"	1"	5M	
	3/4"	.125"	5M	
	1"	.250"	3.5M	
	1-1/4" LP	.625"	3M	
	1-1/2"	.750"	2M	
	2"	1.250"	2M	
D 1/4-14 BLAZER-1 VRT	2-1/2"	1.750"	1.5M	
	3"	2.250"	1.0M	
E 1/4-14 BLAZER-3	7/8"	.325"	2.5M	
	1-1/8"	.875"	2.0M	
F #12-24 BLAZER-5	3/4"	.125"	2.5M	
	1"	.250"	2.5M	
	1-1/4"	.625"	2M	
	1-1/2"	.575"	2M	
	2"	1"	1.5M	
	3"	2"	1.5M	
	4"	3"	500	
	5"	4"	500	
F #12-24 BLAZER-5	6"	2"-5"	500	
	1-1/4"	.500	5M	
	1-1/2"	.625"	3.5M	
	2"	.875"	2m	

SCREW AND POINT	DRILL AND TAP CAPACITIES						
	.036"	.100"	.175"	.210"	.250"	.375"	.500"
#8-18 BLAZER-2							
#10-16 BLAZER-3							
#12-14 BLAZER-3							
#12-24 BLAZER-4							
#12-24 BLAZER-5							
1/4-14 BLAZER-1 VRT							
5/16-12 BLAZER-3							
1/4-14 BLAZER-3							
1/4-20 BLAZER-5							

MATERIAL: 410 Stainless Steel
PLATING: Passivated (24hrs Salt Spray), Zinc Plated (48hrs Salt Spray), TRI-SEAL® Coated (1,000hrs Salt Spray). Call for sizes

Pullout Loads | Ultimate in Pounds Force

Carbon Steel and 410 Stainless Steel Screws

The tensile strength of the substrate that is used in the chart below is typical for metal building and roofing applications. Contact TFC if other substrate tensile strengths are required.

Fastener Information		PULLOUT ULTIMATE LOAD IN POUNDS													
		Calculated Values In Accordance to AISI S100 Section E4													
		Grade 50 per ASTM A1011 60Ksi Min. Steel							Grade 50 per ASTM A792/A653/A572/A529 65Ksi Min. Steel						
Screw Size	Nom Dia. (in.)	26 Ga. (.018")	25 Ga. (.021")	24 Ga. (.024")	22 Ga. (.030")	20 Ga. (.036")	18 Ga. (.048")	16 Ga. (.060")	14 Ga. (.075")	12 Ga. (.105")	1/8" (.125")	10 ga (.135")	1/4" (.250")	3/8" (.375")	1/2" (.500")
#8-18	.164"	151	177	202	252	303	435	543							
#10-16	.190"	174	203	233	291	349	504	627	786	1,101	1,311				
#12-14	.216"	198	231	264	330	397	573	716	895	1,253	1,492	1,611			
#12-24	.216"										1,492	1,611	2,984	*4,475	*5,967
1/4-14	.250"	230	268	306	383	459	633	829	1,036	1,450	1,727	1,865	3,453		

For allowable loads, please apply an appropriate Factor of Safety as required by local and national code requirements.

AISI S100 Section E4 recommends a Factor of Safety of 3 for allowable loads

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Security screws specifically designed for metal siding and roofing applications

TORX® PIN-HEAD

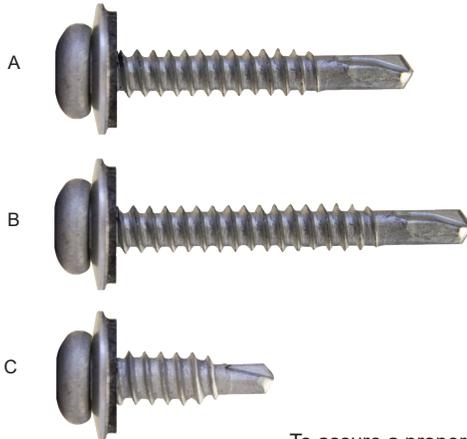
Maximum torque transfer and positive tool engagement means easier drive installation with less pressure and slippage. Torx® Pin Head offers a high degree of security and requires matching drive bit. Available in button head for neat appearance and TRI-SEAL™ 1,000 hours salt spray coating for additional corrosion protection.



T-27 Torx Pin Recess Drive

Does your building need security?

- ▶ Mini Storage
- ▶ Prisons
- ▶ Government Buildings
- ▶ Banks
- ▶ Dealerships



Assembled with a BOND-SEALER™ sealing washer that has EPDM vulcanized to a 20 Gauge galvanized backing that will withstand harsh weather conditions.

Blue colored sizes denotes popular DC items

SIZES AND PERFORMANCE SPECIFICATIONS

Size	Point Type	Drilling Thickness	Load Bearing Length	Box Quantity
A #12-14 x 1-1/2"	BLAZER 3	.036" - .210"	.625"	2.0M
B #12-14 x 2"			.750"	2.0M
C 1/4-14 x 7/8"	BLAZER 1	.036" - .090"	.250"	2.5M

To assure a proper seal, torque the fastener until the EPDM sealant extrudes to the outer edge of the backing material.



We supply insert bits to make installation fast and easy!

MATERIAL: C1018-1022 Carbon Steel
PLATING: .TRI-SEAL™ 1,000 hours salt spray coating

INSTALLATION TIP

Screw gun: 2,000 RPM

DO NOT USE IMPACT TOOLS

Pullout Test Result - Ultimate Average in Pounds

Fastener Information		PULLOUT ULTIMATE LOAD IN POUNDS													
		Calculated Values In Accordance to AISI S100 Section E4													
Screw Size	Nom Dia. (in.)	Grade 50 per ASTM A1011 60Ksi Min. Steel					Grade 50 per ASTM A792/A653/A572/A529 65Ksi Min. Steel								
		26 Ga. (.018")	25 Ga. (.021")	24 Ga. (.024")	22 Ga. (.030")	20 Ga. (.036")	18 Ga. (.048")	16 Ga. (.060")	14 Ga. (.075")	12 Ga. (.105")	1/8" (.125")	10 ga (.135")	1/4" (.250")	3/8" (.375")	1/2" (.500")
#12	.216"	198	231	264	330	397	573	716	895	1,253	1,492	1,611	2,984	*4,475	*5,967
1/4	.250"	230	268	306	383	459	633	829	1,036	1,450	1,727	1,865	3,453	*5,180	*6,906

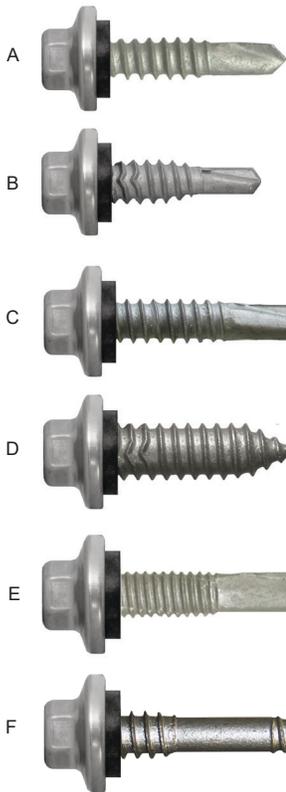
The tensile strength of the substrate that is used in the chart is typical for metal building and roofing applications.

Contact TFC if other substrate tensile strengths are required.

Contact Triangle Fastener for additional sizes and types of security screws.

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BLAZER® STAINLESS CAP HEAD WITH EPDM SEALING WASHER



- 304 stainless steel cap head for exceptional corrosion resistance.
- TRI-SEAL® long life coated shank for superior corrosion protection.



U.S. Pat. No. 8,360,701
Taiwan Pat No. I50140
Europe Pat No. 2286067

Specifications

Washer
.100" Thick EPDM. Non-conductive

Head Type: 5/16" HWH

Material
HEAD - 304 Stainless Steel
BODY - Carbon Steel



Plating
HEAD - Passivated
BODY - TRI-SEAL® Long-life Coating

Corrosion
HEAD - >2,000hrs Salt Spray
BODY - 1,000hrs Salt Spray

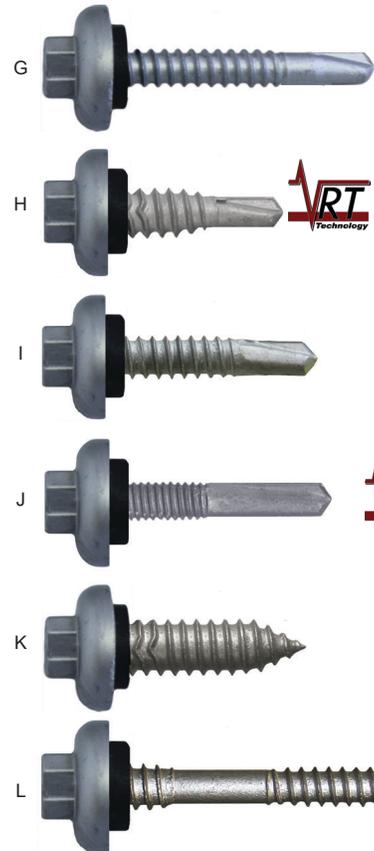
SIZES AND PERFORMANCE SPECIFICATIONS

DIAMETER AND POINT		LENGTH	Load Bearing Length (Max)	Box Qty	LIST PRICE
A	#12-14 BLAZER-2/3 LP	x	1"	.250"	3.5M
			1-1/4"	.625"	2M
			1-1/2"	.750"	1.5M
			2"	1.25"	1.5M
			3"	2.25"	2.5M
B	1/4-14 BLAZER-1 VRT	x	*7/8" VRT	.325"	2M
			1-1/8" VRT	.750"	2M
C	1/4-14 BLAZER-3	x	*1-1/4"	.625"	2M
			3"	2"	1M
			4"	3"	500
D	#17-14 x 1" TYPE AB W/VRT	x	1"	.750"	2.5M
E	#12-24 BLAZER-5	x	1-1/4"	.500"	2.5M
			1-1/2"	.625"	2.5M
			2"	.750"	3M
F	#12-14 1/4-14 BLAZER-3	x	1-7/8"	.875" - 1.125"	2M
			2-3/8"	1.250" - 1.625"	1M
			3-1/4"	1.750" - 2.437"	1m
			4"	2.500" - 3.1875"	500

LP denotes long-pilot design for metal roofing and siding

SCREW AND POINT	DRILL AND TAP CAPACITIES						
	.036"	.100"	.175"	.210"	.250"	.375"	.500"
#8-18 BLAZER-2							
#10-16 BLAZER-3							
#12-14 BLAZER-3							
#12-24 BLAZER-4							
#12-24 BLAZER-5							
1/4-14 BLAZER-1 VRT							
5/16-12 BLAZER-3							
1/4-14 BLAZER-3							
1/4-20 BLAZER-5							

BLAZER® ZINC CAP HEAD WITH EPDM SEALING WASHER



- ZAMAC 5 zinc alloy cap head for premium corrosion resistance WILL NOT RED RUST!
- TRI-SEAL® long life coated shank for superior corrosion protection.



HEAD TYPE
5/16" HWH



WASHER DETAILS
.125" Thick EPDM.
Non-conductive



SIZES AND PERFORMANCE SPECIFICATIONS

DIAMETER AND POINT		LENGTH	Load Bearing Length (Max)	Box Qty	LIST PRICE
G	#12-14 BLAZER-2/3 LP	x	1"	.250"	3.5M
			1-1/4"	.625"	2.5M
			1-1/2"	.750"	2.5M
			2"	1.25"	2M
			2-1/2"	1.5"	1M
H	1/4-14 BLAZER-1 VRT	x	*7/8" VRT	.325"	2.5M
			1-1/8" VRT	.750"	2M
i	1/4-14 BLAZER-3	x	*1-1/4"	.625"	2M
			1-1/2"	.750"	2m
			2"	1"	2m
			3"	2"	1M
J	#12-24 BLAZER-5	x	4"	3"	500
			1-1/4"	.500"	2.5M
			1-1/2"	.625"	2.5M
K	#17-14 x 1" TYPE AB W/VRT	x	2"	.750"	3M
			1"	.750"	2.5M
L	#12-14 1/4-14 BLAZER-3	x	1-7/8"	.875" - 1.125"	2M
			2-3/8"	1.250" - 1.625"	1M
			3-1/4"	1.750" - 2.437"	1m
			4"	2.500" - 3.1875"	500

Specifications

Material: HEAD - Zamac 5 Zinc Alloy; THREAD - Carbon Steel

Plating: BODY - TRI-SEAL® Long-life Coating.

Corrosion Resistance: HEAD - No Red Rust; BODY - 1,000hrs Salt Spray

LP denotes long-pilot design for metal roofing and siding

Need a 3/8" Hex Washer Head? Contact us for available sizes.

BLAZER® ENGINEERING DATA



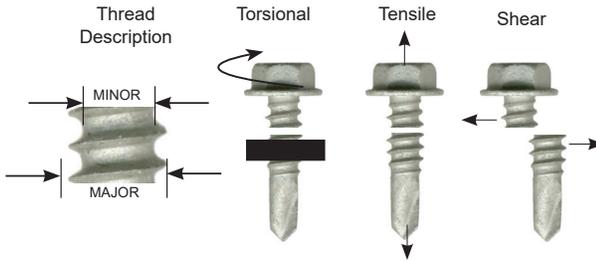
The following information is compiled to assist the design professional in selecting the appropriate fastener for the application. This data is compiled from fastener standards and independent tests. An engineering professional should be consulted to determine expected loads on the connection, environmental 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 B18.6.4 and AISI TS-4-02 specifications. Conforms to ICCES AC118 acceptance criteria for tapping screw fasteners.



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

Physical Properties

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	24	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	3,850	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	196	4,550	2,576
5/16-12	0.313	0.315	0.306	0.244	0.236	0.0702	290	5,439	3,264

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

Inch to Millimeter Decimal x 25.4

PSI to Newton / Millimeters² PSI x .007

Pounds Force to Newtons Pounds Force x 4.448

FM APPROVED	1/4-14 DP3
	1/4-20 DP5
sdi	#10-16 DP3
	#12-14 DP3
	#12-24 DP5
	1/4-14 DP3
	1/4-20 DP5

PULLOVER TEST RESULTS

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



Note: Estimated pullover for fasteners without sealing washers can be calculated using the following formula per AISI S100.

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.

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

PULLOUT TEST RESULTS

* Denotes load exceeds tensile strength of screw.

Fastener Information		PULLOUT ULTIMATE LOAD IN POUNDS Calculated Values In Accordance to AISI S100 Section E4													
Screw Size	Nom Dia. (in.)	Grade 50 per ASTM A1011 60Ksi Min. Steel					Grade 50 per ASTM A792/A653/A572/A529 65Ksi Min. Steel								
		26 Ga. (.018")	25 Ga. (.021")	24 Ga. (.024")	22 Ga. (.030")	20 Ga. (.036")	18 Ga. (.048")	16 Ga. (.060")	14 Ga. (.075")	12 Ga. (.105")	1/8" (.125")	10 ga (.135")	1/4" (.250")	3/8" (.375")	1/2" (.500")
#8-18	.164"	151	177	202	252	303	435	543							
#10-16	.190"	174	203	233	291	349	504	627	786	1,101	1,311				
#10-24	.190"						504	627	786	1,101	1,311				
#12-14	.216"	198	231	264	330	397	573	716	895	1,253	1,492	1,611			
#12-24	.216"										1,492	1,611	2,984	*4,475	*5,967
1/4-14	.250"	230	268	306	383	459	633	829	1,036	1,450	1,727	1,865	3,453		
1/4-20	.250"										1,727	1,865	3,453	*5,180	*6,906
5/16-12	.3125"						829	1,036	1,295	1,813	2,158	2,331			

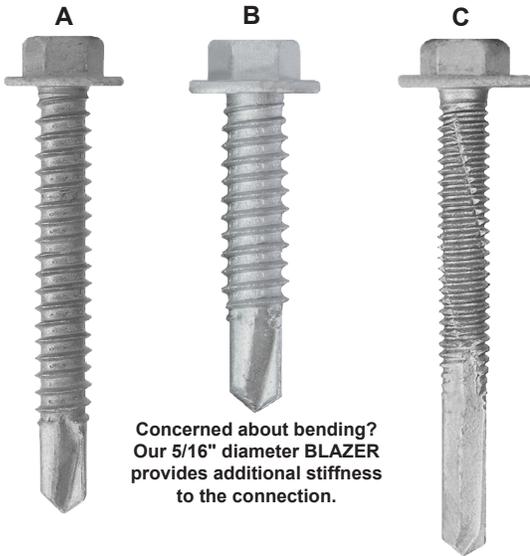
Pullout Loads for Carbon Steel, 304 Stainless Steel & 410 Stainless Steel Screws

The tensile strength of the substrate that is used in the chart below is typical for metal building and roofing applications. Contact TFC if other substrate tensile strengths are required.

For allowable loads, please apply an appropriate Factor of Safety as required by local and national code requirements.

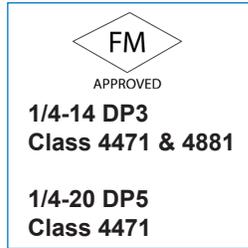
AISI S100 Section E4 recommends a Factor of Safety of 3 for allowable loads.

DISCLAIMER: All information is non-binding and without guarantee. Before using the products, all specifications and calculations must be checked by a suitably qualified person and local regulations must be observed. This document is subject to revision. We reserve the right to make technical changes. (0321-1)



Concerned about bending?
Our 5/16" diameter BLAZER
provides additional stiffness
to the connection.

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



Item	SIZE	Point Type	LENGTHS	Load Bearing Length (MAX)	Box Qty
A	1/4-14 3/8" HWH	DP3	3/4"	.125"	2.5M
			1"	.250"	2.5M
			1-1/4"	.625"	2M
			1-1/2"	.875"	2M
			2"	1"	1.5M
			2-1/2"	1.50"	1M
			3"	1.25" - 2.4"	1M
			4"	1.73" - 3.4"	500
			5"	2.5" - 4.4"	500
			6"	3.5" - 5.4"	250
B	5/16-12 3/8" HWH	DP3	8"	5.5" - 7.4"	250
			9"	6.5" - 8.4"	250
			10"	7.5" - 9.4"	250
			1"	.250"	1.5M
			1-1/2"	.875"	1M
			2"	1.25"	1M
			3"	2.25"	750
			4"	3.25"	500
C	1/4-20 3/8" HWH 5/8" OD washer Face	DP5	5"	1.38 - 4.25"	500
			6"	2.50 - 5"	500
			8"	4.25" - 7"	200
			1-1/2"	.500"	2M
			2-1/4"	1.250"	1M
			2-1/2"	1.500"	1M
			3-1/8"	2.125"	1M
			4"	3"	250
			5"	4"	250
			6"	2.50" - 5"	250
7"	3.38" - 6"	500			
8"	4.25" - 7"	500			

Drill Point and Length Selection

1. Determine the Screw Drill Point Type

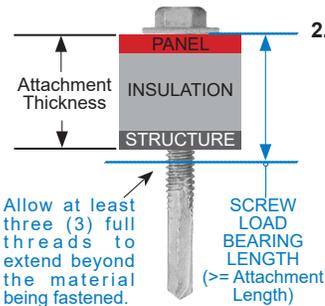
- Add up the total thickness that will be drilled by the screw.
- Select the desired drill point (DP) type and screw size located on the size chart below.



Drilling and Tapping Thickness													
Gauge	24	20	18	16	14	12	10						
Inch	.024	.036	.048	.060	.072	.100	.105	.135	.175	.210	.250	.375	.500
Screw & Point	1/4-14 DP1	.024" - .072"											
	#8-18 DP2	.024" - .100"											
	#10-16 DP3	.024" - .175"											
	#10-24 DP3	.048" - .210"											
	#12-14 DP3	.024" - .210"											
	1/4-14 DP3	.035" - .250"											
	5/16-12 DP3	.048" - .175"											
	#12-24 DP4	.175" - .375"											
	#12-24 DP5	.175" - .500"											
	1/4-20 DP5	.175" - .500"											

2. Determine Screw Length

- Measure from the top surface of the material being fastened to the underside of the metal that will be drilled and tapped. Be sure to allow for any void or insulation. This is called the attachment thickness.
- Select a screw length where the attachment thickness is less than or equal to the Load Bearing Length listed on the chart to the right.



Allow at least three (3) full threads to extend beyond the material being fastened.

SCREW LOAD BEARING LENGTH (>= Attachment Length)

All sizes are available with BOND-SEAL™ Sealing Washers.



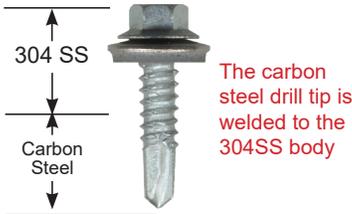
TOOLING: Install using a 2,000 RPM screw-gun with torque control (DeWalt DW267).
Do not use impact tools.

TECHNICAL DATA

Fastener Diameter	Nominal Screw Diameter	Major Diameter (inch)		Minor Diameter (inch)		Tensile Stress Area (sq in.)	Torsional (lb-in)	Tensile (Pounds)	Shear (Pounds)
		Max	Min	Max	Min				
1/4-14	0.250	0.246	0.240	0.192	0.185	0.0269	150	3,497	2,098
1/4-20	0.250	0.250	0.242	0.218	0.214	0.0360	156	4,680	2,808
5/16-12	0.313	0.315	0.306	0.244	0.236	0.0418	290	5,439	3,264

Fastener Size	PULLOUT ALLOWABLE Grade 50/55 Steel 65Ksi Calculated Values In Accordance to AISI S100 Section E4 Applied Factor of Safety = 3									
	18 Ga. (.048")	16 Ga. (.060")	14 Ga. (.075")	12 Ga. (.105")	1/8" (.125")	10 ga (.135")	1/4" (.250")	3/8" (.375")	1/2" (.500")	
1/4-14 DP3	221.0	276.2	345.3	483.4	575.5	621.6	1,151.0			
1/4-20 DP5						621.6	1,151.0	1,726.5	2,302.1	
5/16-12 DP3	276.2	345.3	431.6	604.3	719.4	776.9				

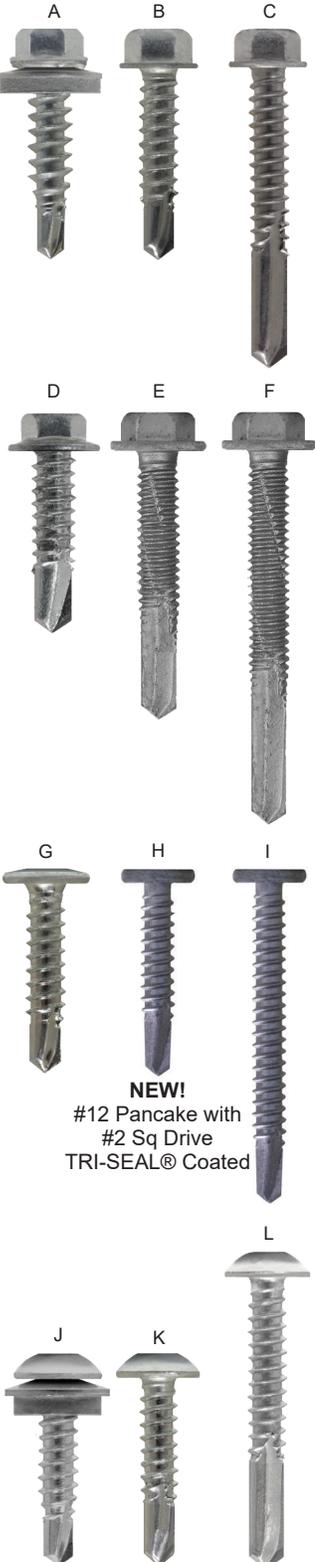
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The largest selection of 304 stainless steel bi-metal self-drilling screws. The head and threads are made of 304 stainless steel, providing exceptional corrosion protection and ductility. The drill point is made of hardened carbon steel welded to the body. Sizes that will drill and tap steel up to 1/2" thick!

Sizes • Specifications • Part Numbers

Head Style	Description	Drilling Thickness	Load Bearing Length W/W	Part Number		
				No Washer	With Washer	
5/16" AF HWH	A #12-14 x 1" DP1	.090" max	.470"		12100HWT1S3BMBW	
	B #12-14 x 1-1/4" DP3	.059" - .236"	.350"	12100HWT3S3BMBW	12100HWT3S3BMBW	
			.550"	12125HWT3S3BMBW	12125HWT3S3BMBW	
	C #12-14 x 2" DP3	.157" - .472"	.750"	12137HWT3S3BMBW	12137HWT3S3BMBW	
			1.375"	12200HWT3S3BMBW	12200HWT3S3BMBW	
	D #12-14 x 1-1/2" DP5	.047" - .118" (AL = .125")	.500"	12150HWT5S3BMBW	12150HWT5S3BMBW	
			1.220"	12225HWT5S3BMBW	12225HWT5S3BMBW	
	3/8" AF HWH	D 1/4-14 x 1" DP2	.047" - .118" (AL = .125")	.468"	14100HWT2S3BMBW	14100HWT2S3BMBW
		D 1/4-14 x 1-1/2" DP2		.970"	14150HWT2S3BMBW	14150HWT2S3BMBW
		D 1/4-14 x 2" DP2		1.4327"	14200HWT2S3BMBW	14200HWT2S3BMBW
E 1/4-20 x 1-1/8 DP4		.100" - .312"	.375"	14112HWT4S3BMBW	14112HWT4S3BMBW	
			.718"	14150HWT4S3BMBW	14150HWT4S3BMBW	
F 1/4-20 x 2" DP4		.125" - .500"	1.203"	14200HWT4S3BMBW	14200HWT4S3BMBW	
			.937"	14200HWT5S3BMBW	14200HWT5S3BMBW	
G 1/4-20 x 4" DP5			1.3968"	14400HWT5S3BMBW	14400HWT5S3BMBW	
T25 TORX	G #12-14 x 1" DP2	.047" - .118"	.340" (n/w)	12100TPCULT2S3BM		
#2 Square	H #12-14 x 1" DP3	.059" - .210"	.375"	12100SPC3BM		
	I #12-14 x 2" DP3		1.750"	12200SPC3BM		
T-25 TORX	J #12-14 x 1" DP1	.090" max	.475"		12100TBT1S3BMBW	
	K #12-14 x 2" DP2	.059" - .236"	1.475"	12200TBT2S3BMBW	12200TBT2S3BMBW	
			.350"	12100TBT3S3BMBW	12100TBT3S3BMBW	
	L #12-14 x 1-3/8" DP3	.157" - .472"	.750"	12137TBT3S3BMBW	12137TBT3S3BMBW	
			.510"	12150TBT5S3BMBW	12150TBT5S3BMBW	
M	T-25 TORX WEDGE BIT		Part Number: TB25W			



MATERIAL
Body: 304 Stainless Steel
Drill Tip: Carbon Steel

PLATING
#12 Dia.: Zinc and Wax
1/4" Dia.: Zinc with TRI-SEAL™ Topcoat

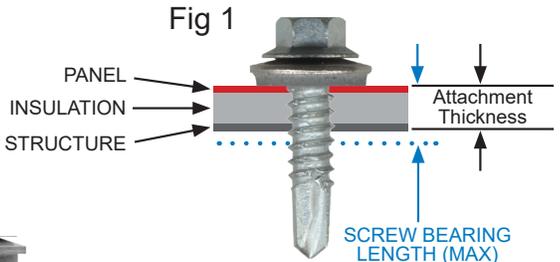
SEALING WASHERS (BOND-SEAL)
15MM OD. 304SS Stainless Steel
Backing to Non-conductive EPDM

Installation Information
Use a 2,000 rpm max screw-gun with torque control or depth sensing.

MANY MORE SIZES AVAILABLE!
Checkout our CONCEALOR® pancake line of screws!

- Notes**
1. Add .125" to bearing length for no washer.
 2. TORX Recess: Must use a T25W Torx Wedge bit.

Screw Length Selection
The attachment thickness should not exceed the load bearing length of the screw. Refer to fig 1 below.



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PULLOUT

Because the tensile strength of the substrate dramatically affects the pullout of the fastener, TFC provides published pullout results based on a calculation developed by AISI and **The Aluminum Association Aluminum Design Manual**

The following pullout loads were calculated per AISI S100 | Section 4 of the Supplement No. 2 to the American Specification for the Design of Cold-Form Steel Structural members (S100-07/S2-10).

Many tests were conducted with compressible fiberglass insulation placed between steel sheet samples. It was determined by the results that the equations are valid for steel connections including applications that use compressible insulation. Refer to AISI S100 for more details.



- The pullout calculation requires the use of the nominal diameter of the screw and the tensile strength of the substrate.
- Because substrate tensile and specific fastener details like point diameter affects pullout loads, these pullout loads are conservative.

For tested values, contact Triangle Fastener to conduct actual pullout tests based on a specific fastener style and the tensile strength requirement of the substrate.

PULLOUT LOADS | ULTIMATE IN POUNDS (Carbon Steel, 304 Stainless Steel & 410 Stainless Steel Screws)

The tensile strength of the substrate that is used in the chart below is typical for metal building and roofing applications. Contact TFC if other substrate tensile strengths are required.

STEEL

Fastener Information		PULLOUT ULTIMATE LOAD IN POUNDS Calculated Values In Accordance to AISI S100 Section E4										
Screw Size	Nom Dia. (in.)	Grade 50 per ASTM A1011 60Ksi Min. Steel		Grade 50 per ASTM A792/A653/A572/A529 65Ksi Min. Steel								
		22 Ga. (.030")	20 Ga. (.036")	18 Ga. (.048")	16 Ga. (.060")	14 Ga. (.075")	12 Ga. (.105")	1/8" (.125")	10 ga (.135")	1/4" (.250")	3/8" (.375")	1/2" (.500")
#10-16	.190"	291	349	504	627	786	1,101	1,311				
#12-14	.216"	330	397	573	716	895	1,253	1,492	1,611	2,984	*4,475	*5,967
1/4-14	.250"	383	459	633	829	1,036	1,450	1,727	1,865	3,453		
1/4-20	.250"							1,727	1,865	3,453	*5,180	*6,906

* Denotes load exceeds tensile strength of screw.

ALUMINUM | 6063-T5

Fastener Information			PULLOUT ULTIMATE LOAD IN POUNDS Calculated per The Aluminum Association Aluminum Design Manual					
Screw Size	Nom Dia. (in.)	Tensile	Grade 6063 - T5 (27Ksi Tensile - 21Ksi Yield)					
			.030"	.040"	.050"	.125"	.250"	.375"
#10-16	.190"	950 ¹	161	201	242	599	2090	3582*
#12-14	.216"	1135 ¹	183	229	275	680	2231	3928*
1/4-14	.250"	2138 ²	212	265	318	788		
1/4-20	.250"	2413 ²					2583	4546*

* Denotes load exceeds tensile strength of screw.

¹ Per ICCES ESR-4009 (Ejot)
² Per CCRR-0387 (SFS)

Fastener Information		Screw Strengths (Ultimate)	
Screw Size	Nom Dia. (in.)	Screw Strengths (Ultimate)	
		Tension	Shear
#10-16	.190"	950 ¹	695 ¹
#12-14	.216"	1135 ¹	875 ¹
1/4-14	.250"	2138 ²	1703 ²
1/4-20	.250"	2413 ²	1803 ²

¹ Per ICCES ESR-4009 (Ejot)
² Per CCRR-0387 (SFS)

js0721

REPORTS

ICCES ESR-4009 (Ejot)
CCRR-0387 (SFS)

MATERIAL

Body: 304 Stainless Steel
Drill Tip: Carbon Steel

PLATING

#10 & #12 Dia.: Zinc and Wax
1/4" Dia.: Zinc with TRI-SEAL Topcoat
Salt Spray Per ASTM B117 - > 2,000 Hrs

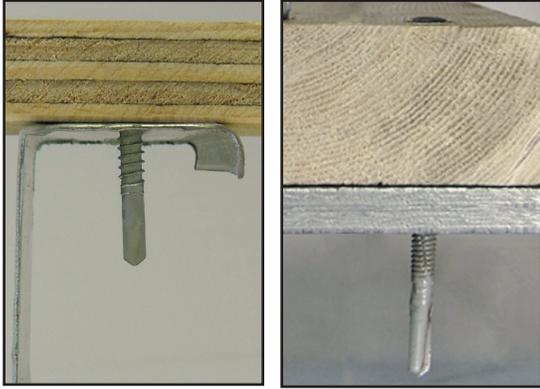
SEALING WASHERS (BOND-SEAL)

15MM OD. 304SS Stainless Steel
Backing to Non-conductive EPDM



For allowable loads, please apply an appropriate Factor of Safety as required by local and national code requirements. AISI S100 Section E4 recommends a Factor of Safety of 3 for allowable loads.

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We have the largest selection of wood-to-metal drill screws engineered to provide high performance and easy installation.

Need to attach wood to metal thinner than 1/4"?

Our full line of sizes are designed to fasten to metal as thin as 18-gauge!

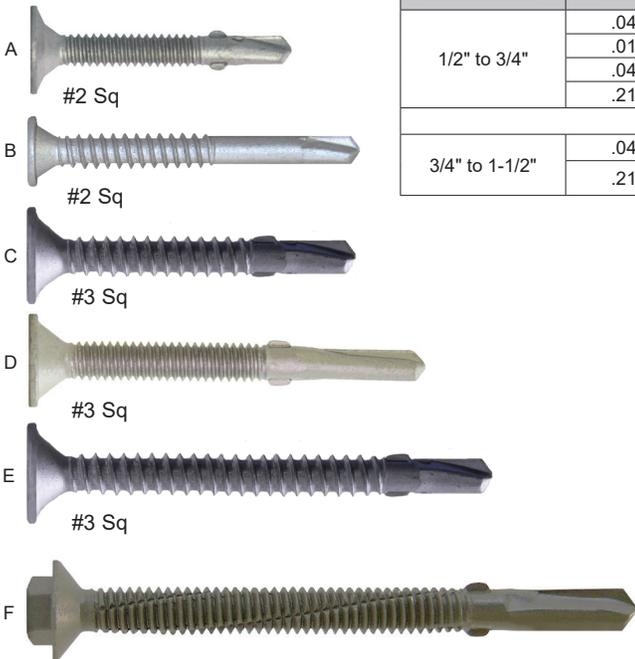
Need to attach wood to steel that is 1/2" thick?

We offer the only wood-to-metal fastener that will drill and tap steel up to 1/2" thick. It has a special hex-countersunk head that provides optimal driving stability and can also be installed **flush** to the surface of the wood.



Square recess for superior stability during installation.

SIZES



5/16 hex countersunk head provides exceptional stability during installation and can be installed **flush** to the wood surface.

WOOD THICKNESS	DRILLING THICKNESS	Screw	Diameter Length Point	Head Dia.	Box Qty
1/2" to 3/4"	.048" - .210"	A	#10-24 x 1-7/16" BLAZER-3 With Wings	.460"	4M
	.018" - .175"	B	#10-16 x 1-3/4" BLAZER-3 Long Pilot	.380"	2.5m
	.048" - .210"	C	#12-14 x 1-3/4" BLAZER-2 With Wings	.500"	2M
	.210" - .500"	D	*#12-24 x 2-1/8" BLAZER-5 With Wings	.500"	2M
3/4" to 1-1/2"	.048" - .210"	E	#12-14 x 2-1/2" BLAZER-2 With Wings	.500"	1M
	.210" - .500"	F	1/4-20 x 3-1/8" BLAZER-5 With Wings	.510"	1M

Select a screw based on the thickness of the wood and the thickness of the steel substrate.

Screw Recommendations

Steel <= .210" : Screw E
Steel > .210" : Screw F

Screw Recommendations

Steel <= .210" : Screw A, B, C
Steel > .210" : Screw D



TECHNICAL DATA

Recommended Screw Gun Speed: 2,000 RPM Max

Fastener Information		PULLOUT ULTIMATE LOAD IN POUNDS Calculated Values In Accordance to AISI S100 Section E4													
Screw Size	Nom Dia. (in.)	Grade 50 per ASTM A1011 50Ksi Min. Steel						Grade 50 per ASTM A792/A653/A572/A529 65Ksi Min. Steel							
		26 Ga. (.018")	25 Ga. (.021")	24 Ga. (.024")	22 Ga. (.030")	20 Ga. (.036")	18 Ga. (.048")	16 Ga. (.060")	14 Ga. (.075")	12 Ga. (.105")	1/8" (.125")	10 ga (.135")	1/4" (.250")	3/8" (.375")	1/2" (.500")
#10	.190"	174	203	233	291	349	504	627	786	1,101	1,311				
#12	.216"	198	231	264	330	397	573	716	895	1,253	1,492	1,611	2,984	*4,475	*5,967
1/4	.250"	230	268	306	383	459	633	829	1,036	1,450	1,727	1,865	3,453	*5,180	*6,906

* Denotes load exceeds tensile strength of screw.

Head Type

#10: #2 Sq - Wafer Countersunk
#12: #3 Sq - Wafer Countersunk
1/4": 5/16" Hex Countersunk
Material: C-1022 Carbon steel
Finish: TRI-SEAL® Long-life Salt Spray: 1,000hrs
Compatible for use in ACQ and fire treated lumber.
Produced to SAE J78 specifications.

DISCLAIMER: All information is non-binding and without guarantee. Before using the products, all specifications and calculations must be checked by a suitably qualified person and local regulations must be observed. This document is subject to revision. We reserve the right to make technical changes. (0321-1)