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Fastener Design

Threaded fasteners for roofing and siding systems are available in a wide range of materials, designs, and coatings. When specifying your fastener, be sure to choose one that has a performance life equaling or exceeding the life of the proposed project.

Fastener Materials

Common Fastener compositions:

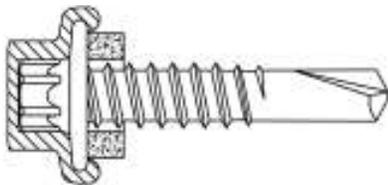
- Zinc plated and paint coated carbon steel
- Alloy capped fasteners with zinc-aluminum, stainless steel, and nylon capped head designs
- Stainless Steel: 300 Series austenitic stainless steel
- Stainless Steel: 400 Series martensitic stainless steel
- Bi-metal: stainless head and threaded shank with a joint welded hardened carbon steel drill or sharp point

Coated Corrosion-Resistant Fasteners

SFS intec offers various coating systems such as electroplating, mechanical plating, VistaCoat™ Premium System and Chromagard™ paint. Zinc serves as a sacrificial coating to provide cut-edge plating protection.

Metal Alloy Capped Fasteners

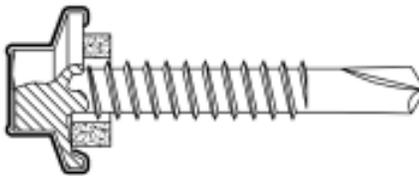
ZAC® Zinc Aluminum Capped Head



ZAC design fasteners provide the corrosion resistance of a zinc-aluminum alloy capped head on a hardened steel fastener for self-drilling or self-tapping installation. ZAC is the original capped zinc-aluminum head fastener and is used in more metal buildings than any other capped fastener.

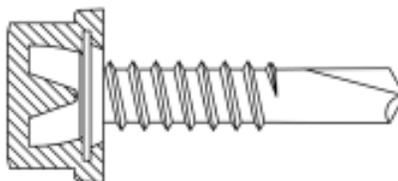
ZAC design fasteners are available with a 5/16" and 3/8" capped hex washer head in Impax™ self-drilling fasteners, Woodgrip™ sheet-to-wood fasteners and self-tapping screws.

MAC™ Stainless Capped Head Self-Drilling Fasteners



MAC stainless capped head design combines the corrosion resistance of stainless steel and a hardened steel fastener for self-drilling installation. MAC design fasteners are available with a 5/16" capped hex washer head in a wide selection of Woodgrips and Impax self-drilling fasteners.

Prisma™ Nylon Head Self-Drilling and Self-Tapping Fasteners



Prisma design fasteners combine the corrosion resistance of a nylon-molded head with a hardened steel fastener for self-drilling and self-tapping installation. The nylon head is formulated with the color built in. It naturally resists fading and will never rust like steel headed fasteners. Prisma design fasteners are available with 3/8" and 7/16" hex washer heads in self-drillers, Woodgrip metal-to-wood fasteners, and self-tapping AB fasteners.

Stainless Steel Fasteners

A commonly held belief that stainless steel will not rust or corrode is not necessarily accurate. Stainless steel is a generic term covering over 200 different types of alloys that, to varying degrees, corrode less than carbon steel. It is important that a specifier be aware of the panel and project performance expectations when specifying stainless steel fasteners.

Several types of stainless steel are used for fasteners.

300 Series Stainless/Austenitic

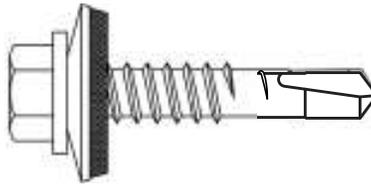
- 18-8 stainless alloy with 18% chromium and 8% nickel
- Best known grades are 304 and 316, both work hardened in the thread-rolling process to manufacture a self-tapping fastener capable of tapping threads into steel
- Can be manufactured as a self-drilling, bi-metal fastener by incorporating a heat-treated hardened carbon steel drill point joint welded to the austenitic stainless fastener
- Nonmagnetic
- Provides excellent corrosion resistance compared to martensitic 410SS fasteners and plated steel fasteners
- Austenitic stainless steel is considered the only type of stainless steel for panel fasteners

410 Series Stainless/Martensitic

- Stainless alloy with 11.5% to 13.5% chromium
- Can be heat treated to provide hardness to manufacture as self-tapping or self-drilling fasteners (when hardened, the part has less corrosion resistance)

- Poor corrosion resistance compared to austenitic stainless
- Magnetic
- Plated to improve corrosion resistance (like carbon steel fasteners)
- Martensitic stainless is not considered suitable for panel fasteners

Bi-Metal Fasteners



SX Fastener: Austenitic Stainless Self-Drilling Fasteners

SX design fasteners combine the corrosion resistance of an austenitic 300 series stainless head and threaded shank with a hardened carbon steel point for self-drilling installation. These bi-metal fasteners install like carbon steel fasteners and provide the corrosion resistance of 18-8 300 series austenitic stainless. SX fasteners are true stainless steel self-drilling fasteners.

When selecting a stainless steel fastener for any application where minimizing or virtually eliminating corrosion is the goal, a specifier should strongly consider the dramatically greater benefits of 300 series over 400 series stainless steel fasteners. The richer chemical composition and SX welded drill point make 300 series stainless steel fasteners more costly, but the corrosion resistance benefits are far superior.

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Washer Styles

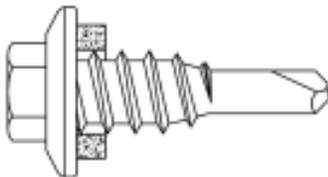
Washer design contributes to the weather seal of a fastener. SFS offers several washer options based upon the type of fastener and the application requirements.

Bonded Washer



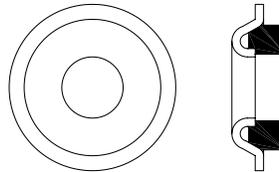
- EPDM rubber bonded to metal
- Metal washers are available in galvanized steel, aluminum, and stainless steel
- Bonded washers offer a low-profile appearance
- Provides positive weather seal between panel and fastener head

Sealer Cupped Hex Washer Head



- EPDM rubber captured under integral cupped hex head washer
- Cupped washer head prevents overdriving
- EPDM washer and cupped head offers an excellent weather seal
- EPDM is protected from UV rays by cupped washer head

Control Seal



- EPDM rubber captured under the stamped "dome"
- Available on all #9 and #12 XG Woodgrip drill screws
- Reinforced domed shoulder distributes clamp load
- EPDM sealant compressed in three key areas
- Weather tight seal even if fastener is driven in on an angle*

Fastener Head Styles

SFS offers a wide variety of fastener head styles designed to meet your project and fastener requirements. Each head style will provide proper panel attachment and desired finish appearance.

Available fastener head styles are:

-  • irius® drive, low profile
-  • HWH (hex washer head)
-  • Cupped hex washer head sealer
-  • Metal-alloy capped cupped:
HWH ZAC or HWH MAC
-  • Pancake head
-  • Low Profile TORX®

*Proper installation techniques should always be employed.

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Structural Performance

Fastener and steel gauge sizes used throughout this Weather Gard section are nominal.

Fastener Sizes

Fastener Size	#10	#12	#14
Thread Diameter Decimal Equivalent	.190	.216	.250

Steel Gauge Sizes*

Gauge	30	28	26	24	22	20	18	16	14	12	10
Decimal Equivalent	.012	.015	.018	.024	.030	.036	.048	.060	.075	.105	.135

*Standard steel thickness used for panels, purlins and girts.

Fasteners are designed to withstand a varied range of types of loading. Each panel or structural system has its own specific fastener loading requirements. Care must be taken to ensure that the appropriate loading requirements for each application are considered.

Typical structural performance criteria that influence fastener design include:

Ultimate Tension Strength

The point at which a fastener fails under a load exerted in two direct opposite directions.

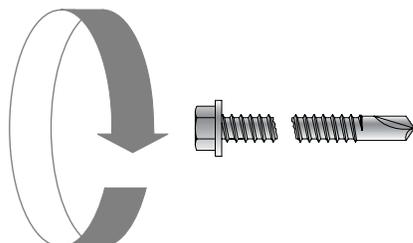


Typical ultimate tension strengths of each fastener type are provided on the fastener information pages.

Ultimate Torsion Strength

The point at which a fastener fails under a twisting load exerted on the head during installation in a torsional direction.

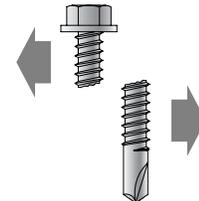
Typical ultimate torsion strengths of each fastener type are provided on the fastener information pages.



Ultimate Shear Strength

The point at which a fastener fails under a load exerted in offset opposing directions, usually upon the shank of the fastener.

Typical ultimate shear strengths of each fastener type are provided on the fastener information pages.

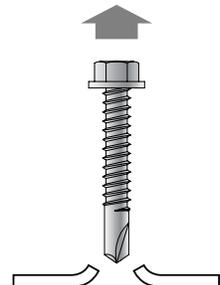


Pull-out Performance

The ability of a fastener's threaded connection to remain intact and resist tensile loads.

Self-tapping fasteners require that a pilot hole be drilled prior to installation. The pullout resistance will be directly related to the pilot hole diameter.

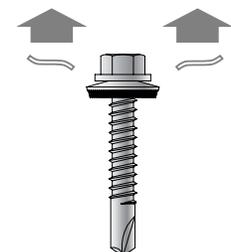
Self-drilling fasteners have been developed, and are available, for most steel construction applications, to a metal thickness of 1/2". This type of fastener is manufactured with its own integral drill point, which is engineered to drill the optimum hole size to facilitate efficient thread forming in the metal structure, resulting in optimized pullout values.



Pull-over Performance

The ability of a fastener to resist the pulling of the fastened sheet material over the head of the fastener due to gravity, wind, or other load.

The resistance to pullover failure is related to the strength and diameter of the fastener washer and the strength and thickness of the metal panel.



Coatings

Plating Definitions

Electroplating is a method of depositing zinc on the surface of the part using an electrolytic attraction of the zinc to the fastener. Electroplating deposits a dense coating of zinc over the entire surface of the part. The zinc plating is a sacrificial coating protecting the base part from scratches or other coating breaks.

Mechanical plating is a method of depositing zinc on the surface of the part using a hammering or impact process. This method applies the zinc to the entire surface of the part. Mechanical plating deposits a less dense, but thicker coating of zinc over the surface of the part. The zinc plating is a sacrificial coating protecting the base part from scratches or other coating breaks.

VistaCoat™ Premium System

SFS intec developed the VistaCoat Premium System finish for panel attachment fasteners. Utilizing new coating and processing technology, the finish has improved appearance, corrosion resistance, durability, and installation performance, and it covers the entire fastener.

The finish system consists of

- zinc plating
- pre-treatment
- seal coat
- primer coat
- color top coat in multiple layers

VistaCoat Premium System is standard on the following exterior panel attachment fasteners in any of the SFS intec standard colors and plain silver.

Post Frame

#9 Woodgrip Control Seal
 #10 Woodgrip HiLo Bond Seal
 #12 Woodgrip XG Bond Seal
 #14 Type A-MP Bond Seal
 #12 Stitch SP
 #10 Wood ZAC
 #9 WoodMAC

Metal Frame

#12 Sealer SD
 #12 HWH SD
 #14 x 7/8" Sealer Lap
 #14 x 7/8" HWH Lap
 #12 ZAC SD (5/16 & 3/8)
 #14 x 7/8" ZAC Lap (5/16 & 3/8)

Performance

- Corrosion Resistance - on all plain and color product
 - Kesternich per DIN 50.018 - 2.0 liter - 15 cycles - 0% red rust
 - Salt Spray per ASTM B117 - 1,000 hrs. - <5% red rust
- Consistent Durability
 - adhesion
 - impact resistance
 - appearance - Gloss and color; application processes ensure consistent results

UV Resistance

- New superior UV-resistant pigmentation
- Results exceed previous market offerings in gloss retention and color stability

Full Coat - the entire fastener and sealing washer are covered by the system. No bare zinc surfaces exist.