

**Ultimate Building Performance Requires  
Austenitic Stainless Steel Fasteners**

Fastening Systems for  
Sustainability and  
Corrosion Resistance

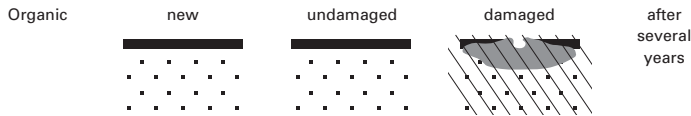


# Coating and Plating Myths

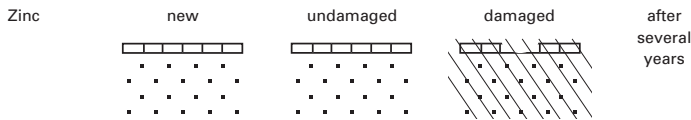
**Carbon steel fasteners are used throughout the construction industry. However, carbon steel itself offers very little resistance to corrosion.**

The most common preventive measures against fastener corrosion are coating and plating, however this is not an effective solution. The integrity of these coatings are often compromised once the fastener is driven.

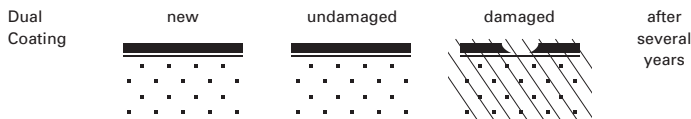
**Organic coatings:** fasteners are dipped into an organic suspension containing metal flakes (including zinc) and then heated in a stove furnace. To achieve a satisfactory coating, it is standard practice to repeat this process four times.



**Zinc-plating:** a pure zinc layer is applied to the carbon steel surface by positively charging the carbon steel to attract the negatively charged zinc ions.



**Dual-Coating:** a combination method where the fasteners have a base layer of zinc and an organic top coating.



A common belief throughout the building industry is that protective coatings offer sufficient resistance to corrosion in non-critical applications.

**All applications are critical!**

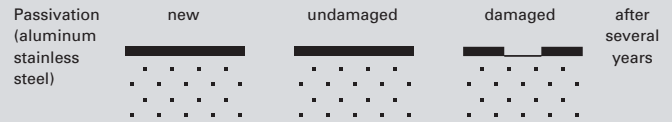
**What's the solution?**

**Specify Austenitic Stainless Steel from SFS intec**

# Stainless Steels are Not Created Equal

**Stainless Steel is defined as an iron alloy with a minimum chromium content of 11%. It is the chromium content that offers the resistance to corrosion, preventing the formation of rust on the surface and hence the term 'Stainless' Steel.**

**Stainless Steel** forms a very thin surface layer of oxide film, called the passivating layer. This protects the metal beneath and if scratched, the exposed surface rapidly oxidizes to form a new replacement layer.



There are more than 200 alloys that are recognized as 'Stainless Steel', but not all possess the same level of corrosion resistance.

**Martensitic Stainless Steel** is usually referred to as 400 series and contains the minimum chromium content required to develop a passivating layer. Fasteners manufactured from this grade are prone to stress corrosion cracking as well as visible red rusting. Martensitic Stainless Steel is not considered suitable for use in roofing and cladding.

**Ferritic Stainless Steel** contains 12-30% chromium. However it has a low ductility, cannot be hardened and is subject to brittleness. As a result, Ferritic Stainless Steel is also unsuitable for the manufacture of fasteners for the construction industry.

**Austenitic Stainless Steel** contains at least 18% chromium and 8% nickel. It is widely used in the construction industry for applications requiring a high level of corrosion resistance.

Grade 304 Austenitic Stainless Steel Fasteners (300 series) have to be manufactured using advanced production techniques and contain 18-20% chromium and 8-10% nickel. Fasteners manufactured from this grade of Stainless Steel offer the optimum corrosion resistance.

Austenitic Stainless Steel Fasteners can be classed as 'long life' to a minimum building design life of 30 years.

Austenitic Stainless Steel Fasteners are often only specified on prestigious contracts, or in areas close to marine or other highly corrosive atmospheres.

But Austenitic Stainless Steel Fasteners should be specified wherever the potential for corrosion exists.

One reason why Stainless Steel Fasteners are not widely used is a perception that only a limited range is available. However, in recent years, SFS intec has developed Stainless Steel Fasteners for all applications.

Stainless Steel Fasteners are also perceived to be expensive. In reality they represent a small fraction of the total construction cost, adding only a few cents per fastener.

**Their effectiveness is proven. Using anything else is a risk you cannot afford to take.**

# Corrosion is a fact of life

Corrosion is the tendency of metals to change from their pure, unstable form back to the more stable, metallic oxides commonly found in the ground as ore.

All metals have potential to corrode due to:

- High moisture content
- Dissimilar metals reaction
- Polluted environments
- Loss of protective coating by abrasion or mechanical damage
- Differing oxygen concentrations
- Saline moisture content

Whether flat or pitched roof, vertical metal panel, composite system, or fiber cement sheeting, all are subject to conditions which lead to a high corrosion risk.



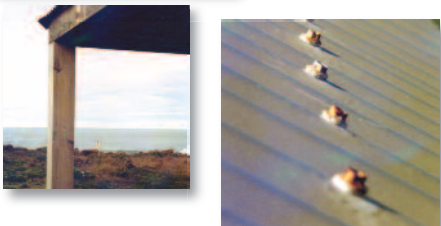
Loss of pull over value on the fastener head and unsightly rust stains due to corrosion of fastener



Corrosion of fastening elements in flat roof applications will occur; specifically with wet or damaged substrates.



Adverse effect of coastal salt air on carbon fasteners in post-frame construction



## Results of Fastener Corrosion in Construction



Aesthetic degradation due to corrosion is easy to see. It is the loss of structural integrity and performance that may lead to catastrophic failure.

Due to:

- Decreased pull-out values
- Decreased pull-over values
- Decrease of shear value
- Loss of tensile strength

Fastener corrosion not only produces a loss of visual harmony, but corrosion of construction fastening systems can lead to the catastrophic failure of a building's critical elements.



Atmospheric pollution can lead to corrosion of the fasteners.

# For Maximum Performance and Sustainability, Spec

SFS intec offers a wide program of Stainless Steel fastening systems suitable for many roofing, cladding and construction applications. All are manufactured by SFS intec from Austenitic Stainless Steel.

## SX Stainless Steel Self-Drill



For metal to metal applications, the SX stainless steel self-drill has a 25-year warranty. Designed with an austenitic (300 series) stainless steel head and shank, the fast-pierce hardened carbon steel drill point eliminates pre-drilling. The SX provides ultimate corrosion performance for attaching steel, stainless or aluminum panels in structural and lap applications.

## *irus*<sup>®</sup> SX Stainless Steel Self-Drill



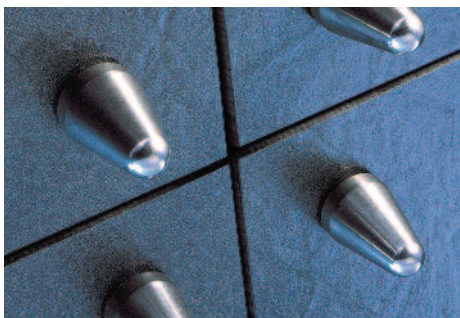
A low profile, self-drilling roof and sidewall fastener, the *irus*<sup>®</sup> SX stainless steel fastener has an aesthetically pleasing head style, and the color can be custom matched to any building panel.

## TW-S & SL2 Cladding Fasteners



An aesthetic fastener for fastening cladding panels to timber battens, aluminum and steel framework. The TORX<sup>®</sup> drive head can be colored to match to any cladding panel.

## GAZ Design Element Fastener



A purpose-designed austenitic stainless steel fastener is the basis of the Design range. They offers secure attachment of high performance cladding to timber, steel or aluminum sub-frames. Available in a choice of colors and fascinating effects, to create special emphasis on internal or external surfaces.

## TU-S Blind Fasteners



A cost-effective and reliable fastener for attaching brackets or clips to the back of HPL cladding panels. Installation can be performed by one person without using special tools, and can be installed into panels 8mm to 13mm thick. The TU-S blind fasteners can be removed once, if required.

# Specify Austenitic Stainless Steel - Specify SFS intec

Corrosion resistant fastening systems by SFS intec in Austenitic Stainless Steel provide the only reliable way of fundamentally avoiding the problems associated with corrosion.

## AP Rivets



Used for fixing high-performance cladding panels to aluminum or steel sub-frames.

## EVERGRIP® Bi-Metal



An austenitic stainless steel head and shank is combined with a fast-pierce hardened carbon steel sharp point, which eliminates pre-drilling. Available in a hex washer head or T-25 TORX® pan head configuration. Designed specifically for corrosion resistance in new wood treatments (ACQ/CA). 40-Year full system warranty.

## IR2



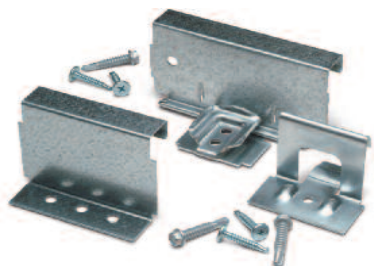
Austenitic stainless steel fastening solution for attaching membrane and insulation to steel deck. Ideal for corrosion resistance in new construction or re-roof applications with moist or unknown substrate conditions.

## SD2



Fasteners for attaching treated lumber to metal decking. Special threads provide high pull out resistance, even in thin sheet (22 ga.) metal decking. Head design countersinks in timber.

## SSR Panel Clips



Utilized for standing seam panel attachment, a wide offering of engineered fixed and float panel clips are available. Custom clip designs can be manufactured to customer specifications.

## Austenitic Stainless Steel Fasteners Contribute to LEED Certification

Even where green materials are used the attempt at sustainability may be in vain. If the fastener in a system fails due to corrosion the failure could be catastrophic. Therefore sustainable materials should be used for the attachments in conjunction with other sustainable building products to achieve the optimum life cycle goal in any LEED design.

Following are examples in which specifying SFS intec, Inc. products may help you earn LEED credits for your project.

**Material Usage: MR Credit 4.1: Recycled Content: 10% (post-consumer + ½ pre-consumer) 1 point**

**Material Usage: MR Credit 4.2: Recycled Content: 20% (post-consumer + ½ pre-consumer) 1 point in addition to MR Credit 4.1**  
- SFS intec, Inc. 300 series stainless steel fasteners are manufactured from wire that is 60% recycled material. Using this as a portion may allow up to (2) LEED credit points for your project.

**Regional Content: MR Credit 5.1: Regional Materials: 10% Extracted, Processed & Manufactured Regionally 1 Point**

**Regional Content: MR Credit 5.2: Regional Materials: 20% Extracted, Processed & Manufactured Regionally 1 Point in addition to MR Credit 5.1**  
- SFS intec, Inc. is an international company. SFS intec, Inc. headquarters are in Heerbrugg, Switzerland with manufacturing plants throughout Europe and North America. In the United States our products are manufactured, assembled and further processed in two locations: Medina, OH, (44256), and Wyomissing, PA (19610). For projects within 500 miles of these locations, our products may contribute to the attainment of LEED credits. Please contact your SFS intec, Inc. specialist for product and location availability.

**Building Lifecycle: MR Credit 1.1: Building Reuse: Maintain 75% of Existing Walls, Floor, & Roof 1 Point**

**Building Lifecycle: MR Credit 1.2: Building Reuse: Maintain 95% of Existing Walls, Floor, & Roof 1 Point in addition to MR Credit 1.1**  
- Fasteners manufactured from 304 Stainless Steel offer the optimum corrosion resistance, and can be classified as "long life" to a minimum building design life of 30 years. The specification and use of 304 Stainless Steel self-drilling fasteners by SFS intec, Inc. will help extend the life cycle of your new or existing building and may contribute to earning additional LEED credits for your project.

The statements mentioned above are merely examples of how our products may help you earn LEED credits. We encourage the architect, specification writer, or other design professional to contact an SFS intec, Inc. specialist for more information.

The SFS intec complete LEED statement is available on request, or by visiting the Architectural Sales & Systems section of our website at [www.sfsintecusa.com](http://www.sfsintecusa.com).

### Technical advice and sales service

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## SFS intec offers AIA Continuing Education Seminars

- Corrosion Prevention in Construction Fastening Systems
- Single Point Glass Fixing Technologies
- Specifying Roofing and Cladding Fastening Systems
- Structural Fastening Systems for Heavy Timber Construction
- Fastening Systems for Flat Roofing Applications

Complete program summaries are available by visiting the AIA Continuing Education section at [www.sfsintecusa.com](http://www.sfsintecusa.com)



## SFS intec: Partners in quality design

### Our dynamic services include:

- Intensive research and development
- Secure guarantee of quality
- 25 year warranty
- Highly specialized precision manufacturing
- Worldwide presence
- On-site advice and fast supply

For more information on how SFS intec can benefit your next project, call 1-800-234-4533 or visit [www.sfsintecusa.com](http://www.sfsintecusa.com).

**SFS intec**  
Turn ideas into reality.