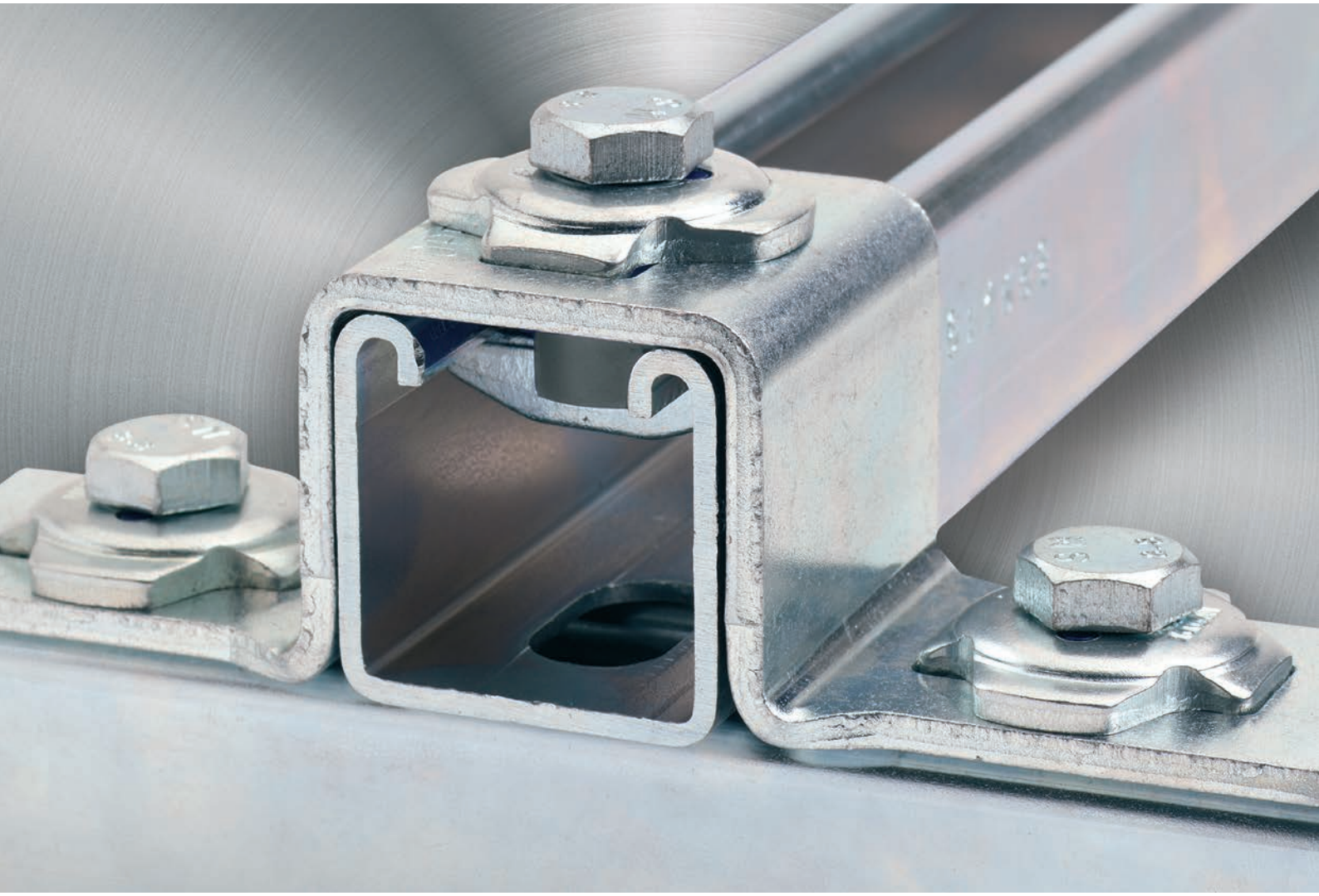
Kwikstrut®

Materials and Finishes



The power behind **your mission**

Johnson Controls

Kwikstrut

Safe. Fast. Flexible. Innovative.

Our high-class range of materials and finishes

Pre-galvanized

Pre-galvanized (Sendzimir) S280GD + Z275 (EN 10346:2015) is a continual strip galvanization using a process of hot-dipping. Once the strip steel has been cleaned, degreased and pickled it is fed through a liquid zinc bath.

After the treatment, the strip steel is either cut into plates or wound into so-called mother coils, which can then be split again into smaller coils as required. The cut surfaces that are exposed on the strip steel as a result of the splitting and trimming processes are sufficiently protected from rust through cathodic protection. The profiling process has no negative influence for the coating.

- The thickness of the zinc coating is approx. 7-20 µm.
- Area of application: Interior applications or non-corrosive environments

Plain Oil Black

Plain oil black steel (available) in grade S280JR according to EN 10025 standards. Pickled & Oiled with a minimum yield strength of 280 N/mm². Excellent for welding and finishing on site. Ideal bases for powder coating and other surface finishes.

Electro Zinc Plated

In the Electro Zinc Plated galvanization process (EN ISO 12329 & EN ISO 19598) the workpieces are first cleaned, degreased and pickled. They are then dipped in to a zinc electrolyte, instead of a liquid zinc. The workpiece is suspended in the solution and acts as the cathode. The anode used is either an electrode made of the coating metal or an insoluble electrode. Electro zinc plated galvanization uses very little zinc, but results in a very even protective coating, regardless of the shape of the workpiece. The thin nature of the coating makes this process highly suitable.

- The thickness of the zinc coating is approx. 5-10 µm.
- Area of application: Interior applications or non-corrosive environments

Hot Dipped Galvanized

Hot-dip galvanization (EN ISO 1461) refers to the process of applying a metallic zinc coating to steel parts by dipping the pre-treated parts in a molten mass of liquid zinc at a temperature of approx. 450 °C.

The advantages of this method are the simplicity of the process and the fact that it fills any pores and irregularities in the workpiece concerned.

- The thickness of the zinc coating is approx. 50-150µm.
- Area of application: Exterior applications or slightly corrosive environments

Below table shows the zinc layer thickness according to material thickness (see DIN EN ISO 1461 - Table 3)

Material thickness [mm]	Minimum zinc-layer thickness [µm]	Average zinc-layer thickness [µm]
> 6	70	85
> 3bis ≤ 6	55	70
> 1,5bis ≤ 3	45	55

Delta Tone corrosion protection

Delta Tone corrosion protection (DIN EN ISO 13858 - 480 h according to DIN EN ISO 9227) is a zinc flake coating. This is a thermo-reactive system made up of zinc and aluminium flakes. These create a silvery metallic coating with high corrosion protection properties. The resulting dry film contains approx. 85% metal parts in the form of zinc and aluminium particles. Coated parts can therefore be further processed without any problem.

- The thickness of the zinc flake coating is approx. 8-20 µm.
- Area of application: Exterior applications or moderately corrosive environments

Stainless Steel

Stainless Steel (EN 10088) with standard grade 1.4404 (316L) is excellent for marine applications, highly corrosive and extreme environmental conditions. For normal corrosive and environmental conditions we also have stainless steel with grade 1.4301 (304).

Our welded stainless steel products are cleaned (Pickled & Passivated). Cleaning of stainless steel by a pickling process will result in a clean product, it even removes any heat discoloration that has occurred during the welding process.

Special coatings

Deep Galvanised

When using steel containing a slightly higher proportion of silicon; for example Corten 'A' steel – silicon bearing steels modify the chemistry of the galvanizing process, resulting in the zinc coating continuing to increase in thickness as long as the steel remains immersed in the zinc. Coatings up to two to three times as thick as the normal thickness are both possible and practical to achieve.

Magnelis

Manufactured in a traditional hot-dip process, but with a unique metallic chemical composition- Steel to EN10346, Magnellis Coating to SEW022

Epoxy Coating

Epoxy coatings are based on thermosetting epoxy resins and give a very hard, durable finish suitable for internal applications. Epoxy coatings a have good chemical resistance with good adhesion and coating flexibility. High-build epoxy coatings are available but have, to a large extent, been replaced for support system applications by Kevlar.

PVC Coating

PVC coating is a thick, soft coating with good anti-corrosion properties. It gives a generally good chemical resistance to most acidic and alkaline materials. It is not suitable for use with most solvent-based contaminants. PVC coating is not suitable for application in combination with hot dip galvanized steel.

Other powder coatings with high UV resistance or special colour are available upon request.

Chromate Coating

Chromating passivates the surface of galvanized steel. This minimizes the formation of "white rust", which helps the appearance of the material. Chromating is carried out as a final finishing process immediately after hot dip galvanizing. After chromating the appearance of the galvanized finish is light yellow.

Corrosion Category according DIN EN ISO 12944-2: 2001

Steel components are usually to be protected against corrosion in order to guarantee their integrity during the planned service life. If corrosion damage occurs and remains unnoticed, the component and possibly the entire system may be adversely affected.

Corrosion and coating systems

In the case of supporting structures in particular, the focus is on unrestricted and safe use over the planned service life. To this requirement to ensure frequent certain coatings or are in tender and contract documents coating systems without specific knowledge about the local atmosphere and the micro and macro climate dictated. Innovations in surface and coating technology are often ignored. A holistic view of the requirements on site is therefore essential. This includes the analysis of the climatic site conditions of the construction according to DIN EN ISO 12944-2 (Table 1: Corrosion categories for out- & indoor environment type). According to this standard, six categories from "insignificant" to "extreme" are defined, which are based on the corresponding environmental conditions.

Environment Corrosion Classification	Environment Type		Decrement of zinc safe layer
	Outdoor	Indoor	
C1 very small	–	Heat buildings with clean atmosphere (offices, stores)	≤ 0,1 µm/year
C2 small	Atmosphere with non-significant pollution	Non-heated buildings with condensation (sport halls, warehouses)	> 0,1 to 0,7 µm/year
C3 Medium	Municipal and industrial atmosheres with average pollution with sulphur oxide (IV). Coastal area with minimal salinity	Production premises with high humidity and moderate pollution (breweries, laundries, dairies, etc)	> 0,7 to 2,1 µm/year
C4 High	Industrial zones and waterfront areas with moderate level salt atmosphere	Chemical plants, swimming pools, shipyards	> 2,1 to 4,2 µm/year
C5 Very High (Industrial)	Industrial zones with damp conditions and aggressive atmosphere	Buildings or areas with permanent condensation and extreme pollution	> 4,2 to 8,2 µm/year
C5 Very High (Sea)	Waterfront areas with intense salty atmosphere	Buildings or areas with permanent condensation and extreme pollution	> 4,2 to 8,2 µm/year

The decrease of the protective layer of the zinc within a year (according to PN-EN ISO 12944-2:2001)

In the case that separate external influences such as thermal, chemical, micro-climatic, mechanical or design-related factors, which can shorten the life of the corrosion protection, are not taken into account, it is essential to analyze the climatic conditions on site and, if necessary, to take them into account when selecting the corrosion protection or when classifying the corrosion category. Johnson Controls Mechanical Technical Service department can support and advise you from many years of practical experience.

Contact our Technical Service department on: mechserv-emea@tyco-bspd.com

The correct classification of a coating in the corrosively category takes place after the salt spray test. A certain number of hours is specified in the salt spray without the formation of red rust.

Environment Corrosion Classification	Corrosiveness	Corrosivity protection period (class)	Decrement of zinc safe layer (µm/year)
C1 very small	extremely low	short	≤ 0,1 µm/year
	unaggressive	medium	≤ 0,1 µm/year
	inside	long	≤ 0,1 µm/year
C2 small	low	short	0,1 µm/year
	moderately aggressive	medium	0,4 µm/year
	outside/inside	long	0,7 µm/year
C3 Medium	moderate	short	0,7 µm/year
	unaggressive	medium	1,4 µm/year
	outside/inside	long	2,1 µm/year
C4 High	high	short	2,1 µm/year
	moderately aggressive	medium	3,2 µm/year
	outside/inside	long	4,2 µm/year
C5-I High	very high	short	4,2 µm/year
	aggressive	medium	6,3 µm/year
	outside/inside	long	8,4 µm/year
C5-M Extreme	particularly high	short	8,4 µm/year
	maritime	medium	16,7 µm/year
	outside/inside	medium	25,0 µm/year

The decrease of the protective layer of the zinc within a year (according to PN-EN ISO 12944-2:2001)

Zinc layer thickness (µm)	Term of protection (years)	Condensation of water vapour in hours (h)	Exposure to salt spray in hours (h)	Term of protection (years)	Examples of typical environments
8	80	-	-	2-5 years	Heated buildings with clean atmospheres, e.g. offices, shops, schools, hotels
8	80	-	-	5-15 years	
8	80	-	-	over 15 years	
8	80	48	-	2-5 years	Atmospheres with low level of pollution: mostly rural areas
8	20	48	-	5-15 years	
8	11	120	-	over 15 years	
8	78	48	120	2-5 years	Urban and industrial atmospheres with moderate sulphur dioxide pollution and low salinity
55	39	120	240	5-15 years	
55	26	240	480	over 15 years	
55	26	120	240	2-5 years	Industrial areas and coastal areas with moderate salinity
55	17	240	480	5-15 years	
55	13	480	720	over 15 years	
55	13	240	480	2-5 years	Industrial areas with high humidity and aggressive atmosphere
55	8	480	720	5-15 years	
55	6.5	720	1440	over 15 years	
55	6.5	240	480	2-5 years	Coastal and offshore areas with high salinity
55	3.2	480	720	5-15 years	
55	2.2	720	1440	over 15 years	

About Johnson Controls Building Technologies and Solutions

At Johnson Controls, we transform the environments where people live, work, learn and play. From optimizing building performance to improving safety and enhancing comfort, we drive the outcomes that matter most. We deliver our promise in industries such as healthcare, education, data centers and manufacturing. With a global team of 105,000 experts in more than 150 countries and over 130 years of innovation, we are the power behind our customers' mission. Our leading portfolio of building technology and solutions includes some of the most trusted names in the industry, such as Tyco®, York®, Metasys®, Ruskin®, Titus®, Frick®, Penn®, Sabroe®, Simplex®, Ansul® and Grinnell®

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