

Information Surface Treatment

To improve the corrosion resistance of steel products, Walraven uses all kinds of methods. Here below you will find an overview:

BIS UltraProtect® 1000 system

The BIS UltraProtect® 1000 system is the ideal and most durable solution for securing or supporting mechanical installations, solar systems and many other types of installations.

The products in the BISUltraProtect® 1000 system have very high corrosion resistance. They effortlessly withstand a salt spray test of at least 1000 hours* (in accordance with ISO 9227).

The salt spray test shows that the corrosion resistance of BIS UltraProtect® 1000 products is considerably higher than that of, for example, Hot Dip Galvanized products (approximately 300-600 hours).

Although the system utilizes a relatively thin protective coating, the corrosion resistance is high. Not only does the BIS UltraProtect® 1000 system offer a smooth and fine finish, the products are also visually appealing. An additional benefit of the relatively thin protective coating is that threaded products are also well protected against corrosion. The BIS UltraProtect® 1000 products, including threaded items such as bolts, nuts and threaded rods, have superior corrosion resistance and will last at least 20 years**!

Zinc plating

The products to be treated are cleaned, degreased and pickled. The protective coating is then applied in an electrolytic process. The thickness of the layer of zinc is between 1 and 20 µm (0,001 - 0,020 mm) and is determined by the current intensity and the duration of the galvanizing process. After the galvanizing process the products are passivated to extend the protection period.

Pre-galvanized

Also known as Sendzimir galvanization. Pre-galvanizing is a continuous thermal galvanizing process. The strip steel is guided through a bath containing liquid zinc after having been cleaned, degreased and pickled. Later the steel is cut to the required width. The sides of this cut material are not galvanized. This is also the case with any holes that may be drilled in the pre-galvanized material.

The sides of material thinner than 1,5 mm are protected somewhat by the zinc layer on the top and bottom by the electrolytic process of 'pulling together'.

This method is excellently suited for products with a screw thread, which are to be used indoors or in a non-corrosive environment.

*Until the occurrence of maximum 5% red rust

**The warranty conditions can be found on our website www.bis-ultraprotect.com

Hot Dip galvanizing

Also known as 'thermal galvanizing', 'full bath galvanizing' or 'centrifugal galvanizing'. The products to be treated are cleaned, de-greased and pickled and subsequently put into an immersion bath of liquid zinc. The immersion bath has a temperature of 550 °C. In this process an alloy of zinc/iron develops on the surface and is then covered by a layer of pure zinc.

The thickness of the zinc layer varies between 50 and 150 µm (0,050 - 0,150 mm). In consequence the process is less suitable for products with screw thread. Hot Dip galvanized products are suitable for inside as well as outside use and for damp and light-corrosive environments.

Dacromet

With Dacromet, in an immersion/centrifugal process, steel is provided with a metallic coating based upon zinc and aluminum flakes in a chrome solution and is then dried at a temperature of 321 °C.

Through the immersion process an even layer covers the whole product. This process results in a protective layer of approximately 8 µm.

In contrast to electrolytic and thermal galvanizing, with Dacromet there is no danger of hydrogen embrittlement in materials with an increased carbon content, such as spring steel. As the zinc is embedded with the chromium particles the corrosion process develops very slowly in comparison with a protection layer of pure zinc.

Dacromet retains its corrosion protecting properties at temperatures up to approximately 250 °C. Products protected by Dacromet are suitable for outside use as well as moderate corrosive environments.

Information Surface Treatment (cont.)

Delta-Tone 9000

Delta-Tone 9000 consists of zinc and aluminum particles that are held together by an inorganic binder. This offers effective protection against corrosion even with a limited layer of thickness.

Delta-Tone 9000 is applied in an immersion/centrifugal or spray process and then dried at a temperature of 200 °C. With this method an even layer is formed over the whole product with a thickness of 10 – 12 µm. Subsequently Delta-Tone 9000 forms a connection with the metal underneath and the surface consists of a layer of inorganic material with zinc and aluminum flakes.

In contrast to electrolytic and thermal galvanizing, with Delta-Tone 9000 there is no danger of hydrogen embrittlement in materials with an increased carbon content, such as spring steel.

To improve the corrosion resistance, the process can be repeated which increases the thickness each time by 10 - 12 µm.

Products protected by Delta-Tone 9000 are suitable for outside use as well as moderate corrosive environments.

Salt-spray test

To compare the protection duration of various surface treatments, a salt-spray test is carried out according to ISO 9227. In this test products are placed in a space and sprayed with a salt solution. The products will start to corrode. The point at which 'white' and then 'red' rust appears is noted down.

This test does not give a perfect protection duration (this depends on the surroundings in which the product is applied) but does offer a comparative view of the various surface treatments.

Table 1: results of salt-spray test

	Thickness Protection Layer (µm)	Hours until 5% red rust*
BIS UltraProtect® 1000 system	**	1.000
Surface treatment		
Zinc plating, blue passivation	8 - 10	72
Zinc plating, yellow passivation	8 - 10	80
Pre-galvanized	25	150
Hot-dip galvanizing	50 - 80	300 - 600
Dacromet	8	600*
Delta-Tone 9000	10 -12	480
*Until the occurrence of maximum 5% red rust **Method and thickness protection layer differ per product ***Test stopped		

Stainless steel 316 (1.4401)

Stainless steel 316 is one of the best corrosion resistant types of stainless steel. It offers a superior corrosion resistance compared to many other types of stainless steel in very many corrosive environments.

The protective layer is damaged by treatments such as punching, rilling and welding. That is why, after the last treatment, all stainless steel products receive an extra treatment which pickles and passivates to repair the protective layer.

Products from stainless steel 316 can be applied in aggressive situations such as a sea climate and industry.