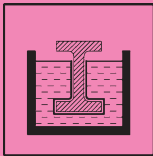
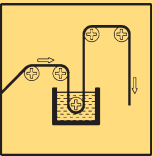


## Comparison of three galvanizing processes

<b>Liquid Dip Process</b> Immersion in liquid Zinc/Zinc-Aluminium	<b>Electrolytic Process</b>	
		
<b>Process standard</b>		
Hot Dip Galvanizing (HDG) after fabrication according to Din EN ISO 1461 (DIN EN ISO 10684 for hardware)	Continuous Strip Galvanization (Sendzimir Process) according to DIN EN 10 346	Electrolytic Galvanizing (Electroplating) according to DIN EN ISO 19598/DIN EN ISO 2081 (DIN EN ISO 4042 for hardware)
<b>Structure and composition of the coating</b>		
Alloying with the base material	Alloying with the base material	Laminated coating
<b>Usual thickness of the zinc layer</b>		
Depending on the thickness of the material to be galvanized, up to 1.5 mm thickness approx. 45 µm, up to 3 mm thickness approx. 55 µm, up to 6 mm thickness approx. 70 µm	Layer thickness Z 140: 10 µm ± 3 µm Layer thickness Z 275: 20 µm ± 5 µm according to DIN EN 10 346	Approx. 2.5 to 20 µm, in undercuts and recesses (thread flanks) the layer thickness is less than on open surfaces
<b>Special features</b>		
Each component is individually dipped in the liquid zinc bath. The zinc washes over the entire surface. Hollow sections are protected on the in- and outside. Rigid corrosion protection.	The corrosion protection layer is applied to the surface by passing the steel as a continuous ribbon through a bath of molten zinc.	The zinc layer is deposited from an aqueous electrolyte by means of DC current. Post-treatment is generally applied to improve the protective effect. Decorative visual appearance, smooth surface with no edges and burrs.
<b>Distinguishing features</b>		
The surface is relatively rough, and solidified zinc may block small holes. Newly galvanized surfaces are bright shining; high temperature galvanized part such as screws are grey.	Smooth surface depending on the process, slightly greased. Holes and cut edges expose "bare metal". Corrosion protection of "bare" edges up to 2 mm material thickness is provided by the by cathodic protection effect. <span style="float: right;">1</span>	Iridescent shimmer, bright and shiny surface after passivation.
<b>Usage - Application</b>		
Welded components, equipment exposed to the weather.	Non-welded components up to 2 mm thick, especially for interior building work.	For parts in almost all shapes and sizes, corrosion protection and decorative finish. Recommended for dry, indoor areas only.
<b>Corrosion Protection (typical annual degradation for Central Europe)</b>		<b>Corrosion Protection</b>
Depending on the atmospheric conditions and the local environment. Rural 0.1 - 1.0 µm Suburban 1.0 - 2.0 µm Marine 2.0 - 4.0 µm <span style="float: right;">2</span>	Annual degradation almost unmeasurable in dry indoor areas without pollution.	Salt spray tests according to DIN EN ISO 9227 NSS show up to 360 hours before rusting depending on the thickness of the zinc layer and the passivation method.

**1** Components over 2 mm in material thickness are hot dip galvanized at Niedax.

**2** Local environmental conditions would be for instance the direct corrosive effect of a chimney with CO<sub>2</sub> flue gases.

# Galvanizing

## Batch galvanizing **F**



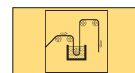
(Hot-dip galvanisation) according to DIN EN ISO 1461 (DIN EN ISO 10684 for hardware)

By immersion in liquid zinc (hot-dip process, ca. 450° C), the entire surface, including all corners and edges lapped. On the steel is an iron-zinc alloy layer forms with an overlying layer of pure zinc. The layer thickness depends on the material thickness and is according to DIN EN ISO 1461 to 1.5 mm material thickness 45 microns, up to 3 mm thick 55 microns and up to 60 mm material thickness 70 microns. Due to the very hard iron-zinc alloy layer can batch-galvanized components, without damaging the zinc surface, not deformed.

### Application examples from the Niedax program:

All components with welded joints, for example, suspension struts, cable and pipe clamps as well as products with more than 3 mm thick, cable trays / ladders, wide span cable trays / ladders and many more, as far as increased demands on the corrosion resistance (weathering without rain shield).

## Strip coating **S**



(Sendzimir Process) according to DIN EN 10 346

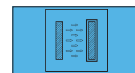
The zinc coating is on both sides, applied by a zinc bath on broadband in the run. The project uses the modified Sendzimir. On the steel is an iron-zinc alloy layer forms with an overlying layer of pure zinc. The layer thickness of the Sendzimirbandes used for Niedax cable laying systems is under consideration of the test method according to DIN EN 10346 according to three surface sample depending on the product group 10 - 20 microns.

Strip galvanisation is used for components up to max. 2 mm material thickness, as up to this strength, a sufficient edge protection is achieved by "cathodic protection". The process-related "bare iron" interfaces of the components are in use in dry interiors, by the cathodic protection effect is not a disadvantage. Strip galvanized components can be formed without damaging the zinc surface.

### Application examples from the Niedax program:

Cable trays / ladders, wide span cable trays / ladders, cable ladders, cable protection ducts, light boom, rails up to 2 mm thickness. In dry indoor areas without aggressive media, the strip galvanizing provides permanent corrosion protection.

## Zinc coating **V G**



Selon DIN EN ISO 19598/DIN EN ISO 2081 (DIN EN ISO 4042 for hardware)

The zinc coating is applied in aqueous electrolytes by means of direct current. To improve the corrosion protection can be carried out by an aftertreatment thick layer passivation and blue passivation according to DIN 50961.

The zinc coating is 2.5 to 20 microns. Parts with undercuts, such as C-shaped armature rails, due to the process less heavily coated inside than outside (Faraday cage).

### Application examples from the Niedax program:

Small parts (screws, washers up to max. 6 M), mounting rails and screws for distribution board, but with additional thick layer passivated.

## Galvanizing

### Additional plastic coating



#### Strip galvanized components with plastic coating

Strip galvanized components according to DIN EN 10 346 can be additionally equipped with a plastic coating. Niedax uses exclusively the electro static powder coating process. Besides aesthetic reasons or individual colour scheme requests, there are many more reasons to coat strip galvanized steel. For example the marking of the cable trays (High voltage, medium voltage, low voltage, communication-/EDP-lines etc.). The coating does not represent extra corrosion protection.

The COLOR-coating is applied according to the electro static powder coating process. The particular characteristics of this high quality powder coating process are excellent resistance against detergents as well as against highest thermic and mechanical stress. The material for the coating process is free of halogen. The inner surfaces of the COLOR-ducts remain blank from zinc; this means a well contact for protective conductors at any position. The outer surfaces are just coated in the field of view, with good wrap-around to the rear. If the COLOR-ducts are supposed to be applied freestanding, for example as energy columns, it needs to be indicated along with the order.

For the COLOR-coating, exclusively coating powder is applied according to the RAL-colour chart. With processing clearly defined colour shades and the use of latest process engineering, colour deviations are avoided to the greatest possible extent. Regardless these precautions it is not excluded, especially for additional deliveries, that there might be some lower colour deviations (DIN 6175 Part 1). We understand by colour deviation the track of colour differences according to DIN EN ISO 3668, chart B.1, evaluation 2.

### Hot Dip Galvanizing components with a polyester epoxy resin coating

The products marked with C1 are hot-dip galvanized and polyester resin with an epoxy coating in a thickness of 60 - 80 microns provided. When using indoors this plastic coating ensures excellent corrosion protection as well as high mechanical resistance and is resistant to most chemicals.

The zinc coating is thus protected by the overlying coating from atmospheric and chemical influence. A removal of metallic zinc is avoided, so that the zinc coating remains intact for a long time under the coating in mint condition.

For special use in the outdoor area, we are pleased to offer other coatings.


### Coat with zinc dust paint



The zinc-rich paint shall be such that in the dry film more than 90% zinc is included. To avoid the formation of cracks in the coating, the coating is applied in several steps.

#### **Application examples from the Niedax program:**

Improvements, particularly assembly-related injuries of the zinc surface by welds or the like.

 For detailed information about the zinc can be found in the cited standards as well as in a voluminous literature offer.