

Indian Steel Sheet Building Group: Technical Note 2.11



Coating Processes and Surface Treatments

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Preparing Galvanize for Field Painting

Introduction

The surface of zinc and zinc alloy-coated steel sheet can be treated using one or more of many methods. **This GalvInfoNote deals with surface treatments to enhance field paintability of galvanized sheet.** Other treatments are used for different reasons, namely:

- Improving uniformity of appearance (see GalvInfoNote 2.8)
- Treatments for enhancing formability (see GalvInfoNote 2.9)
- Imparting resistance to storage stain (see GalvInfoNote 2.10)
- Pretreatments for metallic-coated sheet (see GalvInfoNote 2.12)
- Treatments for resistance to handling and fingerprint marks (see GalvInfoNote 2.13)

Preparing for Field Painting of Galvanize

It is very difficult to obtain good paint adherence on **new zinc-coated surfaces** passivated with chromate solutions. Where possible, the sheet should be allowed to “weather” for at least 12 months to allow the surface to oxidize. In some environments it may take up to 18 months for sufficient oxidation to occur to provide good paint adhesion. Passivated galvanize remains brighter longer than unpassivated, but even the latter must weather for a period of time before it is ready for painting.

Weathered galvanize has oxidized to the point where chromate and very thin alumina films have been washed away and the zinc at the surface has been converted to zinc oxy-carbonate. Good paint adhesion is more readily achieved on such a surface. **To determine if the galvanize is ready to be painted, check if it is water break-free** (no beading of water when the surface is wet). If it is not then it must weather for a longer time or be treated with phosphoric acid or zinc phosphate before painting.

Sources of more detailed information on painting galvanize are: ASTM D7396 Standard Guide for Preparation of New, Continuous Zinc-Coated (Galvanized) Steel Surfaces for Painting; and ASTM D6386 Standard Practice for Preparation of Zinc (Hot-Dip Galvanized) Coated Iron and Steel Product and Hardware Surfaces for Painting, available at www.astm.org.

On any galvanized surface that is to be painted, it is extremely important that the surface be clean and dry. Any surface dirt or rust must be removed with a stiff wire brush. Grease and oil must be removed with mineral spirits or detergent and water. All traces of soap should be removed by thorough rinsing. Paint only when the surface is completely dry. Again, having a water break-free surface is preferred to obtain good adhesion.

Numerous proprietary pretreatment solutions, including zinc phosphate, are available from many suppliers. The use of these solutions should be seriously considered to maximize the adherence, and thus protective life, of the paint.

Many different primers are available that are designed for galvanize. The paint supplier should be consulted as to whether a primer is necessary and compatible with the topcoat being used. Similarly, the topcoat should be designed for metal surfaces, whether or not a primer is used. Many paints designed for wood do not perform well on galvanized steel. Products of decomposition in the oils of these paints

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react with the zinc surface and cause the paint to peel. Many paints designed for galvanize are based on acrylic resins.

To summarize, when field painting galvanized steel:

- Allow adequate time for weathering or pretreat the surface
- Paint on a clean and dry surface
- Use a paint designed for galvanized steel, including any primer that is used
- Follow the paint suppliers recommendations

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