Indian Steel Sheet Building Group: Technical Note 2.13

Coating Processes and Surface Treatments

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Treatments for Resistance to Handling Fingerprint Marks

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 pretreatments used to prevent handling and fingerprint marks during fabrication and installation of products made with coated sheet**. Other treatments are used for different reasons, namely:

- Improving uniformity of surface appearance (see GalvInfoNote 2.8)
- Treatments for enhancing formability (see GalvInfoNote 2.9)
- Treatments for improving resistance to storage stain (see GalvInfoNote 2.10)
- Preparing galvanize for field painting (see GalvInfoNote 2.11)
- Pretreatments for metallic-coated sheet (See GalvInfoNote 2.12)

Some metallic-coated sheet products are susceptible to surface marking during processing and handling. For instance, galvanized sheet can be permanently marked by the perspiration of workers who come in contact with it during the manufacture of heating/ventilating ductwork. While not harming performance, the marking affects the esthetics of the product when intended for an exposed end use, such as shown in Figure 1. The white stains are most likely the result of the salt from the worker's perspiration permanently marking the surface. Once stained in this manner, there is no known method of restoring the original metallic lustre.

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Figure 1 – Fingerprinting and handling marks on exposed galvanized ducting

Aluminum-zinc coated sheet is subject to roll forming and handling marks that appear as permanent black smudging. Contact with the forming rolls in roofing sheet lines can leave permanent black abrasion lines on the sheet surface. Workers constructing roofs can leave handprints and boot marks that turn dark and remain visible for years.

To provide a product that is resistant to marking, the industry has developed special coatings (generally acrylic-based) for metallic-coated sheet. They are usually applied at the coating line using a roll-coating technique and infrared and other curing ovens. The coating is clear and typically consists of a water-soluble acrylic resin and inorganic corrosion inhibitor. Benefits may include being able to be roll formed dry without need of vanishing oil, resistance to hand and/or foot marking during handling/installation, good resistance to storage stain/transit corrosion, and retention of brightness over a longer time.

Keep in mind that these products are not all alike. Some are more paintable than others, and if not painted, tend to dissipate after 12 to 18 months. Non-permanent types also tend to be less roll-formable. The coatings that are more roll-formable (and have a tendency to be less paintable) are good at staying on the surface for many years and thus enhance the long-term corrosion resistance, and brightness of the sheet product.

Most producers of acrylic-coated metallic-coated sheet market the product with the term “Plus” added to their normal coated sheet trade names, e.g., “Galvalume® Plus” or “Zincalume® Plus”.

A source of additional information on acrylic-based surface treatments can be found in Appendix X2 of ASTM A924/A924M Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process, available at www.astm.org.

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