
****THIS IS A NEW APPENDIX. – PLEASE READ CAREFULLY.****

PREPARATION OF GALVANIZED SURFACES FOR PAINTING

This practice requires clean and suitable galvanized surfaces free of zinc oxides, zinc hydroxides and zinc carbonates for painting, specifically so that an applied coating system can develop the adhesion necessary for a satisfactory service life. The newly galvanized surfaces interacts with the environment, therefore surface conditions will dictate the type of surface preparation to be selected.

Process for Newly Galvanized Steel:

1. Newly galvanized steel means zinc coated steel that has no surface treatment after galvanizing, such as water quenching or chromate conversion coating and has been galvanized within the previous 48 hours. There should be no visible signs of zinc oxide or zinc hydroxides, which first appear as a fine white powder.
2. Surface smoothing: after the hot dip galvanizing process, there may be some thick edges due to excess liquid zinc run-off or there may be a high spot in the coating due to included zinc hydroxide particles. These high spots must be removed and / or must be smoothed to avoid paint film gaps in the area of the high spots. These high spots can be removed by cleaning with hand or power tools until it is level with the surrounding area, taking into consideration that the zinc base coating is not removed. Again, galvanized surfaces that have been water quenched or treated with chromate conversion coatings should not be painted.
3. Surface preparation: hot dip galvanized surfaces that have a layer of zinc oxide and zinc hydroxide must be removed before painting.
4. Sweep blasting: abrasive sweep or brush blasting must provide a stripping action without removing excess zinc layers. The purpose of sweep blasting is to deformed and not to remove the galvanized zinc metal. Blasting media can be either one of the following:
 - a. Aluminum / magnesium silicate
 - b. Soft mineral sands (with MOH hardness of five or less)
 - c. Organic media such as walnut shells, corn cobs, and limestone.
 - d. Surfaces must be blown clean with compressed air.

Note: oil contamination of compressed air must be avoided. Oil contamination will degrade paint adhesion to sweep blasted hot-dip galvanized surfaces. Oil contamination can be removed by the use of solvent cleaning such as mineral spirits. Based on Iowa's atmospheric conditions such as high humidity, high temperature, or both, the formation of zinc oxide on the blasted surface will begin almost immediately (interact with the environment), therefore the paint coating should be applied within 60 minutes after sweep blasting and as soon as possible after surface preparation.

5. Notification of surface treatment; the paint shop must be and shall be notified by the galvanizer as to how the galvanized articles have been processed and which surface treatment method, if any is used to prepare the surface.

Process for Partially Weathered Galvanized Steel:

Before preparing the surface of partially weathered galvanized steel, the surface must be checked for the presence of a chromate conversion coating. The presence of chromate conversion coating can severely impair the adhesion of the paint system. The chromate conversion coating is usually applied at the galvanizing facility to protect the newly galvanized surfaces from excessive growth of zinc oxide and zinc hydroxide which commonly called "wet storage stain".

Mild case of wet storage stain can be treated with mild ammonia solution using a soft bristle brush to remove mild cases of the wet storage stain. Then thorough water rinsing must immediately follow the brushing.

Severe case of wet storage stain can be cleaned using rigorous soft bristle brushing with mild acidic solution that has a Ph of 3.5 – 4.0, this must immediately follow with thorough water rinsing and be completely dry prior to sweep blasting.

High spots, zinc build up and thick edges should be removed using either hand or power tools until it is level with the surrounding areas.

Sweep blasting must provide a stripping action and surface profile without removing the excess of zinc layers.

Blasted surfaces must then be blown with clean compressed air.

Paint application should follow soon after (within 30 minutes), due to the affected atmospheric conditions such as humidity and high temperature on the blasted surfaces.

Process for Weathered Galvanized Steel:

Fully weathered galvanized steel usually would have developed a stable and finely etched surface that is very suited for paint coat adhesion.

Organic contaminants such as oil or grease should be cleaned before any other cleaning is performed using solvent cleaning (such as mineral spirits).

Followed by thoroughly rinsing with hot water or a pressure wash, and then thoroughly dried.

This treatment should be performed by the paint shop prior to painting.

The natural corrosion of the zinc metal produces a roughened surface film consisting primarily of basic zinc carbonate. Therefore, the surface preparation that is needed is a power wash with warm water to remove loose particles from the surface. The water pressure should not be less than 1450 psi.

No other profiling is needed. Surface must be totally dry before application of the paint system.

Fully weather galvanized steel can be painted with the application of the appropriate paint systems including primers and top coat paint.

High spots of zinc build up and thick edges should be removed using either hand or power tools until it is level with the surrounding areas.