

MEMORANDUM

Date: December 10, 2007

Subject: White Rust – Remedial Actions

From: Unistrut Engineering

According to the American Galvanizers Association, white rust is a white or gray deposit that is an accelerated corrosion of the zinc coating. It generally occurs when closely packed galvanized products are stored or shipped under damp or poorly ventilated conditions. The moisture required for formation of white rust can originate in many ways.

- Present on the product at time of stacking
- Incomplete drying after quenching
- Direct exposure to rain or salt water
- Condensation from atmospheric temperature changes

Close packing results in the moisture being retained between the surfaces in contact. Deprived of freely moving air and exposed to this moisture, drying does not occur and the water on the surface forms an “oxygen concentration cell” (white rust). White rust is not indicative of inferior or poor quality galvanizing. When found, it’s typically not in sufficient quantity to be detrimental to the coating protection.

When white rust has occurred, the products should be arranged (separated) so the surfaces can dry, at which time they can be inspected and classified as light, moderate or severe white rusting.

Light White Rusting

This is characterized by the formation of a light film of white powdery residue as judged by lightly rubbing the fingertips across the surface. Generally, no remedial treatment is required since it will gradually disappear and blend in with the surrounding finish during normal weathering.

Moderate White Rusting

This is characterized by a noticeable darkening and apparent etching of the galvanized coating with the white rust appearing bulky. Following are suggested mechanical and chemical removal methods.

- Mechanical
 - 1) Remove by brushing with a stiff bristle (not wire) brush, OR
 - 2) Remove by wire brush and then using a cloth wet with aluminum paint, rub the surface to apply a thin film of aluminum paint to the affected area and blending it in with the surrounding unaffected areas.

- Chemical
 - 1) Using a 5% chromic acid solution, wash the affected area to dissolve the deposit, rinse with water and dry, OR
 - 2) Using a mild solution of phosphoric acid, clean the area with a stiff bristle brush (not wire), rinse with water and dry.

Severe White Rusting

This is characterized by a very heavy oxide deposits or red rusting. The corrosion should be removed and repaired in accordance with ASTM A780 "Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings".

These are suggested methods for remedial actions based on information from the American Galvanizers Association, Association of Water Technologies and the Industrial Galvanizers Corporation PTY Ltd (Australia).