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INDUSTRIAL
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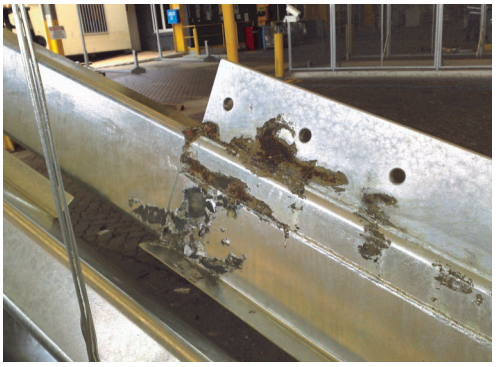
CORPORATION

Tech Tips

Galvanized Coatings Appearance & Defects



'Blowout': Unsealed welds where preparation chemicals penetrate the overlap cause blowouts, which cause surface defects and contamination.

The galvanized coating applied to steel is generally continuous, tough and of a thickness that will provide years of maintenance-free or low maintenance service.

However, there are a number of common defects that arise in the galvanizing process. These are readily visible and have a variety of causes - many of which can be avoided through good communication and disciplined operations.

The Australian Standard *AS 4680:2006 - Hot Dipped Galvanized Coatings on Ferrous Articles*, provides guidance regarding defects. It states that, galvanized coatings shall be:-

- Continuous, and as smooth and evenly distributed as possible;
- Free from defects that may affect the stated use of the article.
- Free from blisters, roughness, sharp edges and flux residues.

Lumps and zinc ash are not permitted where they may affect the intended end use of the galvanized product.

Visual inspection is the simplest and most important method to assess the quality of galvanized coatings.

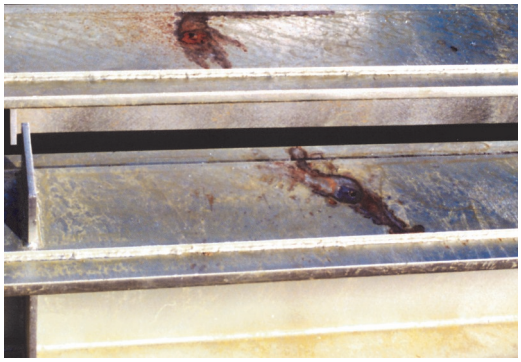
A useful characteristic of the galvanizing process is that if the coating is continuous and has a satisfactory appearance , it will be sound and adherent.

Dark Staining Adjacent to Welds ('Blowout', or 'Welding Blowout')

Galvanizing preparation chemicals entering unsealed overlaps, or through poor quality welds, will boil out of the connection when dipped in the molten zinc (450°C). This can cause surface contamination and coating misses during galvanizing. To avoid welding blowouts, check weld areas for complete welds to insure there is no fluid penetration (though remember any air trapped in hollow sections or between welded plates needs to vent to avoid distortion). Products can be preheated prior to immersion into the galvanizing kettle to dry out overlap areas as much as possible. Blowouts that cause bare areas should be repaired according to the Australian Standard.

Flux Staining

Any anhydrous (dried) fluxing salts left in the connection will absorb atmospheric moisture and leach out onto the adjacent galvanized surface. The affected area should be washed clean with water to remove the slightly corrosive leachate. Correct design of the overlapping plate joint can avoid this problem.



Flux staining: should be washed off to revel a sound coating and is not usually grounds for rejection of the work.

WHY GALVANIZE?

Hot dip galvanized coatings are applied to steel to improve its anti-corrosion performance so that it lasts as long as possible with a minimum of maintenance.

COATINGS DIFFER

Only hot-dip galvanizing gives a coating that can reach the 50 year life of structural building products.

THICKNESS COUNTS

Compared to other zinc-rich coatings, hot-dipped galvanizing is:-

- THICKER
- HARDER
- FULLER

HOT-DIP GALVANIZED PRODUCTS LAST LONGER...

INDUSTRIAL GALVANIZERS
A valmont COMPANY

Galvanized Coatings Appearance & Defects

TRIED & PROVEN

150 years of field testing shows that all things being equal, galvanized coating life is proportionate to galvanized coating thickness.

CUT EDGE PROTECTION

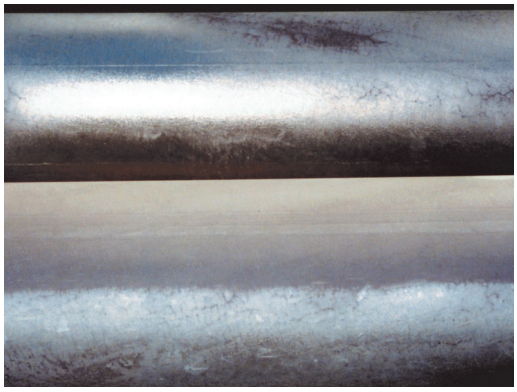
The thicker coating of hot-dip galvanized products provides added protection for exposed cut edges.

WHY GALVANIZE WITH INDUSTRIAL GALVANIZERS?

For steel users requiring fast, proven corrosion protection for local or national projects, Industrial Galvanizers is the established hot dip galvanizer with nationwide coverage.

Dull Grey Coating

Caused by growth of the protective zinc-iron alloy layer through to the surface, and may be localized or appear as a lacework pattern on an otherwise normal coating. Dull grey coatings are often thicker than bright or spangled coatings, and will give longer life. It is difficult for the galvanizer to control the development of dull grey coatings but they can be overcome by using appropriate steel grade.



Dull grey coatings usually occur on steels - or at welds - with higher silicon content

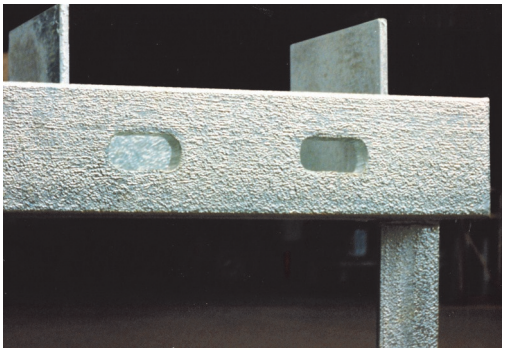
Bare Spots

Bare spots have a number of causes but small, localized flaws up to ~3mm wide tend to be self -healing because of the cathodic protection provided by galvanized coatings. Larger bare areas (0.1% / 250cm^2 of total area or individual areas >40cm^2) should be repaired per the Australian Standard.

Ash Staining

Zinc ash forms in the galvanizing process as work is immersed in the zinc. It is skimmed off the surface of the molted zinc before the work is withdrawn. Sometimes ash is trapped inside inaccessible areas or sticks to the outside of the coating, where it may leave a dull surface of light brown stain after removal by brushing. Coating performance is unaffected.

General Roughness

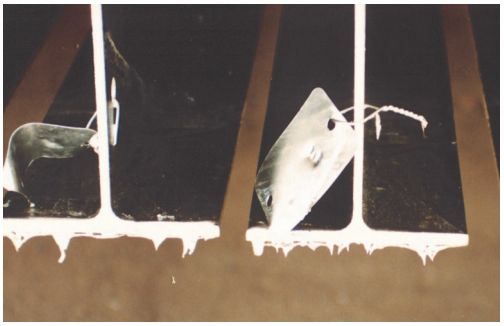


Rough coating surface is not necessarily detrimental to coating performance

This is usually the result of the composition or surface condition of the steel. The galvanized coating on welds may be thicker where high-silicon welding electrodes have been used. Other causes include over-pickling, prolonged immersion in the zinc bath or excessive bath temperature. Generally the coating is acceptable unless aesthetics are of concern.

Lumpiness, Runs and Spikes

A perfectly smooth hot dip galvanized finish is unattainable; in practice lumps and runs from uneven drainage are not detrimental to coating life. Zinc drainage spikes should be removed from galvanized articles where they present a danger in handling or use.



Drainage spikes formed when molten zinc freezes should be removed by the galvanizer during dressing and inspection.

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