

Occurrence

Wet storage stain is the term used to describe the white corrosion products and black stains which may be seen on the surfaces of new galvanized or zinc coated products which have been close stacked and stored or transported under damp or wet conditions. When condensed moisture or rainwater is trapped between zinc surfaces the zinc reacts with the water and dissolved gases to form white corrosion products consisting of basic zinc compounds. Their volume is much greater than that of the zinc from which they are formed and even when copious amounts are present a substantial zinc coating often remains underneath. Where wet storage stain has formed, the coating beneath may be stained black. The term wet storage stain should not be applied to other types of corrosion or deposits.

Prevention

The best method of preventing wet storage stain is to ensure that zinc coated products are transported and stored under dry and wet ventilated conditions. If stored outdoors the zinc-coated surfaces should not be in close contact. The work should be stacked to allow free circulation of air to prevent condensation and retention of moisture. Nesting or close packing of zinc coated goods must be avoided as capillary action can attract water into closely contacting surfaces. Work should preferably not be store in direct contact with the ground.

Chemical treatments can be used to reduce the risk of wet storage stain; chromate conversion coatings are effective. Barrier coating, such as clear lacquers, may be used to preserve a bright finish where appearance is paramount. A range of proprietary products is available, some formulated for specific applications. Immersion in a simple solution of 0.15% sodium dichromate at above 30°C will generally give an adequate coating to reduce the risk of storage stain.

Restoration

Bulky and porous white corrosion products are not protective and should be removed so that the formation of a protective patina is encouraged. Light deposits can be removed with a stiff bristle brush but for heavier deposits it may be necessary to use a 'Scotchbrite' pad or to treat with an acidified (0.5% v/v sulphuric acid) 5% solution of sodium or potassium dichromate; this is applied by brush or spay and left for about half a minute before thorough rinsing and drying. The surface underneath frequently retains a black colour but this is not detrimental to corrosion performance.

After the wet storage stain has been removed, the coating thickness should be measured in the affected area and compared with that of the unaffected coating nearby. If necessary, zinc-rich paint may be applied to the damaged area to give uniform overall protection, but a sound zinc coating is normally present underneath wet storage stain.

