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MAINTENANCE
GUIDE FOR

GALVANIZED
EQUIPMENT

DESIGN & MANUFACTURING

Hot dip galvanizing is one of the most effective ways to protect steel from corrosion. Versatile and durable, hot-dip galvanizing makes it possible to treat steel structures and elements intended for a multitude of applications. In order to make the most of the anti-corrosion protection offered by galvanizing, it is imperative that the steel elements and structures are designed and developed to be subjected to the hot galvanizing process after their manufacture. To do this, a series of standards dealing with industry best practices has been developed. Among other things, the hot-dip galvanizing process is governed by ASTM A123, the design and manufacturing of pieces are governed by ASTM A143, ASTM A384, ASTM A385 and ASTM D6986. There are also other standards dealing with specific applications related to galvanizing.



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MAINTENANCE OF A GALVANIZED PRODUCT

Zinc exposed to the atmosphere reacts naturally with the ambient elements: humidity, oxygen, carbon dioxide to form a patina. The formation of the patina will be noticeable due to a progressive decrease in the metallic luster of the surface. The layer formed is insoluble in water, adherent and provides additional protection to the coating. However, in the presence of standing water, the patina formation process can be altered and can quickly result in the formation of what is called white storage stain, with generally poorly adherent and unprotective qualities.



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Photo 1 : Example of galvanized material exposed to de-icing salts before the natural passivation of zinc has taken place.

Thus, during the first year after galvanizing, it is important to ensure that the galvanized steel is not left in a humid environment with no air circulation. For example, avoid leaving newly galvanized parts buried under a pile of snow. In winter it is strongly recommended to cover newly galvanized items during their transport on the roads in order to avoid exposure to de-icing salts, (photo 1).

During storage, the parts must be stored and transported in such a way that standing water cannot be trapped between them. Do not store equipment directly on the ground. Avoid contact of the parts with each other, ensure that air can circulate and tilt the parts in order to favor proper drainage of water. The sap of certain wood species can leave marks on galvanized surfaces. The use of wood species with a pH below 4 is not recommended (**photo 2**).



Photo 2 : Example of marks left on zinc by contact with wood whose sap is acidic.

Generally, galvanized products require little or no maintenance. For certain products including rolling stock such as trailers, cleanliness can help maintain durability and longevity. Soiled galvanized surfaces can be cleaned using mild soap and water. Never use corrosive products in the hope of increasing the shine or the sheen of galvanized parts; this could alter the natural passivation process and reduce the durability of the galvanized coating. It is not recommended to use soap or detergents containing waxes or polymers.

If white corrosion appears (**photo 3**), it is strongly recommended to remove the zinc salts in one of the following ways: using a hard nylon brush; using a soft nylon brush and a solution of citric acid (lemon juice) of 25 to 50 g / liter of water followed by rinsing with fresh water and drying; using a soft nylon brush and 5-10% by volume ammonia solution of water, rinse with fresh water and dry; or by using a ready-to-use solution available on the market.



Photo 3 : Example of white corrosion on a galvanized surface.

When the galvanization has been damaged (surface) during machining, assembly, transport or during the positioning of the parts (**photo 4**), it is necessary to repair (re-touch) the damaged parts using a zinc paste approved for the repair of galvanized material (**photo 5**). Other alternatives such as metallization and repair with zinc wire can also be used to restore damaged surfaces. Repairs should then be carried out in accordance with the standards set out in ASTM A780.

Although this document mainly refers to standards issued by the American Society for Testing and Materials, other international standards dealing with galvanization such as ISO 1461 and CSA G164 may be considered in some cases.



Photo 4 : Example of galvanized material requiring repair.



Photo 5 : Example of galvanized material repaired with zinc paste.