



# WEISSENFELS USA, INC.

## Hot Dipped Galvanizing

The following comments are submitted regarding the superiority of hot dipped galvanizing over other surface protection systems for marine use.

“Hot Dip coatings have a number of advantages, including the ability to coat recessed or difficult areas with a standard minimum coating thickness, resistance to mechanical damage (because the coating is METALLURGICALLY bonded to the steel) and good resistance to corrosion in a number of environments.”

“When zinc is coupled to steel, the steel is polarized to such a potential that it becomes the cathode of the steel-zinc couple and is immune to further corrosion for the life of the zinc. In practice this means that steel exposed at a coating defect or cut edge will not rust until the nearby zinc is consumed.”

“The metallic coating produced by the hot dip galvanizing process is the result of a metallurgical reaction called diffusion. Diffusion occurs when the steel is immersed in the molten zinc. In this reaction, a series of intermetallic iron-zinc phases is formed as zinc diffuses inward and the iron diffuses outward. The finished product consists of FOUR layers on the steel: the outer layer is free zinc, and the three inner layers are separate intermetallic layers that are METALLURGICALLY bonded to each other and the steel. Thus, a galvanizing coating has extremely high bond strength relative to other coatings, which rely on mechanical or weak electric forces for bonding.”

“Unlike other coatings, which are mechanically or chemically bonded to the steel, the galvanized coating is metallurgically bonded to and INTEGRAL with the steel, making conventional measures of bond strength inappropriate for this coating. As a result of this metallurgical bond, the coating is very adherent.”

“Therefore, there is no real line of demarcation between iron and zinc: instead, there is a gradual transition through the series of iron-zinc intermetallics, which provide a POWERFUL bond between base metal and the coating.

“There is a difference in the density of mechanical galvanizing relative to hot dipped, the mechanical is approximately 2/3 that of hot dipped. Thickness comparisons of the two processes cannot be made unless this fact is considered”.

The summary of this information is that the HOT DIPPED GALVANIZING PROCESS that Weissenfels offers is the BEST OVERALL PROTECTION to the steel base that is economically possible and that the protection varies considerably with where and how it is used.