ZRC Worldwide
INNOVATIVE ZINC TECHNOLOGIES

Guide to Topcoating over ZRC

PART I: DO YOU NEED TO TOPCOAT ZRC?

In most cases, the answer is NO. By definition, "Galvanizing" requires two dissimilar metals (most often zinc and steel) in direct electrical contact so that, theoretically, an electrical charge could be passed through each. In the presence of an electrolyte (rain, water, salt), the zinc (being more susceptible to corrosive attack) corrodes in preferences to the steel.

When first applied, the ZRC coating is very porous. It's zinc begins to corrode forming a hard, cementous layer of zinc hydroxycarbonate salt, which closes the pores, making a physical barrier to corrosive attack. Once this salt forms, the rate of zinc corrosion decreases until fresh zinc is exposed by scratching or abrading. This newly exposed zinc forms its salt, filling in the damaged area, essentially "self-healing" the anti-corrosion properties of the coating.

Topcoating adds a barrier between the zinc and the electrolyte, thereby slowing down (or possibly blocking altogether) the formation of the zinc salt. This can be good and bad. By blocking the salt formation, the topcoat will increase the service life of the zinc by factor of approximately 3, dependent on the porosity of the topcoat chosen. The bad is that the porous nature of the zinc coating (as described above) is not changed through salt formation, which could allow moisture to bleed down to the metal surface once it has passed through the topcoat, leading to premature failure. This, of course, is very dependent on topcoat porosity.

Usually, the determining factors for topcoating are the environmentally service conditions, aesthetics (ZRC is available only in flat or silvery gray) and the availability of future on-going maintenance.

In severe environments, such as salt water, acidic (pH <6.5), alkalinity (pH> 10.5), chemical fume, etc., we recommend topcoating to avoid premature exhaustion of ZRC'S zinc and to prolong service life.

In applications where there will be little or no available maintenance, in order to maximize coating life we recommend topcoating. When maintenance is available, it is best to leave ZRC untopcoated so that additional, fresh ZRC can easily be applied later, if desired. A topcoat would make complete removal by mechanical, chemical or sandblasting means necessary before ZRC could be reapplied.

PART II: SO, YOU'VE DECIDED TO TOPCOAT

WHAT TYPE OF TOPCOAT SHOULD YOU USE?

The following are our general recommendations for topcoat selection. It is critical to ensure that the topcoat chosen has been formulated for use in your particular service environment and for use with zinc-rich coatings. In all cases, contact the topcoat manufacturer for environmental and compatibility data and apply the coating strictly in accordance with the manufacturer's printed instruction sheets.

EPOXY/POLYAMIDE: A two-component system which is probably our most recommended. It has excellent chemical resistance, flexibility and impact resistance; and is easy to use. We recommend it for indoor projects only because of epoxy's poor UV light stability; i.e. it will fade and dull during prolonged exposure to sunlight.

ALIPHATIC POLYURETHANE: This can be either a one or two-component coating which is most often recommended for exterior applications. It has great UV light stability, flexibility and chemical resistance, but can be expensive when compared with epoxies or acrylics.

ACRYLIC ENAMEL: Most often used in automotive work and by small O.E.M.'s (Original Equipment Manufacturers), acrylics are inexpensive and OK for use with ZRC provided they are 100% acrylic. Some manufacturers add Alkyd oils to their acrylics which will react with the zinc salt formed when ZRC corrodes, causing blistering and peeling. You must contact the acrylic's manufacturer to determine compatibility.

VINYLS: Another family of low-cost coating, frequently used in wet environments such as water tanks and oceanfront locations.

DO NOT USE ALKYDS OR LACQUERS!!!

Alkyds, as we discussed above, contains a "Tall Oil" which reacts with the salt formed when zinc corrodes and leads to blistering and peeling. Actually, the reaction is called "Saponification", that is, a zinc soap is formed leaving nothing for the topcoat to stick to.

Lacquer paints, such as those used for expensive automobile restoration, have extremely strong solvents which can soften the ZRC binder, making it easy to remove. Please remember that ZRC is 95% pure zinc and has only 5% binder holding it together.

We hope this information is helpful in your particular application of ZRC. We've made every effort to ensure the usefulness and correctness of the data discussed. Of course, not all concerns and questions can be addressed in such a short guide as this, so please contact us.

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