**NEWS ARTICLE**

How zinc-rich paints enhance the corrosion protection of steel

**23 January 2023:** Often referred to incorrectly as ‘cold galvanizing’, zinc-rich paints play a key role in corrosion protection of construction steel exposed to a range of corrosive conditions, where hot dip galvanizing is not feasible. Applied by brush or spray, these versatile coatings consist of zinc particles or flakes mixed with either organic or inorganic binders.

Prior to application, the steel must be cleaned by grit blasting to near-white metal (SSPC-SP 10), commercial blast cleaning (SSPC-SP 6) or white metal (SSPC-SP 5). The zinc is usually mixed with a polymeric-containing vehicle and must be agitated constantly during application to produce a homogenous mixture and ensure proper adhesion.

Zinc-rich paints contain 65% to 95% metallic zinc in a dry film, with 92% to 95% zinc-containing paints being common. “The paints can be brushed or sprayed onto steel,” explains **Simon Norton**, Executive Director of the [International Zinc Association (IZA) Africa](http://www.zinc.org). When applying by means of a spray, the feed lines must be kept as short as possible to prevent the zinc dust settling and resulting in uneven film coats.

Zinc-rich paints can be applied either in the workshop or in the field, notes Norton. However, with inorganic zinc-rich primer paints, it is critical to allow the coating to cure completely before overcoating. It can be applied to steel of any size or shape, although application is more challenging on complex fabrications. Zinc-rich paints are also used widely as primers for high performance two- and three-coat systems and to repair batch hot dip galvanized steel.

In mildly corrosive environments, zinc paint may be used on its own without a top coat. However, it should be top coated in more severe environments to extend service life. As with all paint coatings, zinc-rich paint is a surface coating bonded mechanically to steel. Zinc-rich paints are either organic, consisting of zinc powder mixed with epoxies, chlorinated hydrocarbons and other polymers, or inorganic with zinc powder suspended in organic alkyl silicates. They are usually applied at a thickness of 60 to 90 microns.

However, inorganic and organic zinc-rich paints vary somewhat in their performance. The former, which adhere to the steel with mild chemical reactivity, have good solvent resistance and can withstand temperatures of up to 375°C. They do not chalk, peel or blister readily, are easy to weld and make for simpler clean-up than organics.

The performance of organic zinc-rich paints depends on the solvent system used to formulate the paint, points out Norton. Multiple coats may be applied within 24 hours without cracking. They do not have the same temperature resistance of inorganic zinc-rich coatings, as they are limited to 100°C to 110°C. They are also degraded by ultraviolet radiation from sunlight and do not feature the same corrosion resistance.

Duplex coating systems (galvanized steel plus coating) offer synergy in that the durability of the combined hot dip galvanized and organic coating system is greater than the sum of the separate durability of the hot dip galvanizing and coating layer. In some circumstances, such as with design restrictions, size of component, geographical location of the fabricator in relation to the galvanizer, or where hot dip galvanizing is physically impractical or impossible, it may have to be substituted by either inorganic or organic (epoxy) zinc-rich paint.

“Should you decide to select these excellent zinc-rich coatings for a construction or engineering project, please engage your paint supplier to ensure that you specify correctly and so that the painting contractor understands fully what is required to apply zinc-rich coatings,” concludes Norton.

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Often referred to as ‘cold galvanizing’, zinc-rich paints play a key role in corrosion protection of steel exposed to a range of corrosive conditions, but where hot dip galvanizing is not feasible. #IZAAfrica #Zinc

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**About the International Zinc Association**

The IZA is the only global industry association dedicated exclusively to the interests of zinc and its users. Operating internationally and locally through its regional affiliates, the IZA helps sustain the long-term global demand for zinc and its markets by promoting such key end uses as corrosion protection for steel and zinc as being essential in human health and crop nutrition. IZA’s main programmes are Sustainability & Environment, Technology & Market Development and Communications.

In South Africa, the IZA plays a vital role in establishing the basis for the successful revitalisation of the zinc industry by increasing awareness of zinc and its applications and benefits in key sectors and markets, which will ultimately translate into the increased uptake of zinc.

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