Winning the war on corrosion

Frank Goodwin, director of Technology and Market Development at International Zinc Association explains how zinc thermal spray and paint duplex systems keep ships rust-free

It is estimated that rust and corrosion cost the marine industry US$50-80 billion per year. Despite this staggering cost, many ship operators and companies in the marine industry still do not track and measure their corrosion maintenance expenses, which makes them difficult to manage.

Many shipowners see planned corrosion maintenance (i.e. regular scheduled painting) as a necessary burden, but this doesn't need to be the case. High performance corrosion protection systems that comprise a thermal spray zinc base coat and a paint top coat – known as duplex coatings – are readily available and already widely used in other industries facing similar corrosion problems. Shipowners now have a significant opportunity to lower the total cost of ownership by implementing duplex coatings that can meet, or exceed, the design life of their vessels.

Zinc thermal spray provides ships with a physical barrier and cathodic protection against corrosion

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Zinc coatings are highly effective at protecting ships from rust and corrosion because they provide a physical barrier, as well as cathodic protection, for the underlying steel. Metallic zinc coatings – thermal sprayed or galvanised – have the added benefit of being highly resistant to abrasions. This combination of corrosion resistance and durability is why car manufacturers can offer 10-year rust warranties, and it is why offshore wind tower structures can stay in service 25 years without coating maintenance.

For shipowners, zinc thermal spray is the the best method of preventing long-term corrosion. Unlike organic paint systems, thermal spraying creates a layered metallic coating that is both highly durable and extremely long lasting. It also adheres strongly to steel, forming an ideal substrate for paint topcoats. These duplex systems can often be specified to provide corrosion protection over the entire service life of the vessel, up to 25 years without interim coating maintenance.

Zinc thermal spray and paint duplex systems offer a sustainable and economic solution for protecting steel from rust and corrosion. Slightly higher initial expenditures are significantly offset by lower maintenance expenses over time, as are indirect costs due to reduced downtime. In addition, the vessel is kept in a better shape, adding value to both her aesthetic appearance and asset resale price.

Not only do thermal spray coatings provide decades of maintenance-free longevity, but also their primary component, zinc, is a natural, abundant and fully recyclable material. Using thermal spray zinc as part of a duplex coating system ensures that fewer natural resources are consumed, fewer emissions are produced, and less money is spent over the life of a ship.

Factoring corrosion protection into a vessel's total cost of ownership may not be a common practice in the shipping industry at present; however, it should be because the lowest priced option is rarely the least costly in the long run. The consequent higher return on investment is not only good business, but it also helps secure financing. **C&F**