



### In This Issue

- *“Don’t Break Me Down” : Ending Corrosion*
- *Introducing CIS’s COMPLETE Zinc-Silicate Application System “Mr. Zinki”*

## Don’t Break Me Down

### The Miracle of Zinc-Silicate And The Invention Of The Perfect Application System

Rust and corrosion have led to the inevitable downfall of most human structures and vehicles, eating their way through metal upon contact with moisture and naturally occurring chlorides, causing deterioration, and ultimately costing companies up to millions every year in replacement parts. In some cases, whole overhauls or complete rebuilds are necessary only to have the corrosion process repeat again. For marine-based companies that utilize metal components in everyday functioning equipment, this is a costly nuisance. For any outdoor structure with exposed metal beams, this means replacing pieces at regular intervals to preserve the safety and integrity of a building or bridge.

Traditional coatings have been used to protect against rust and corrosion, but over time may wear down and need to be re-applied. There is also the negative environmental impact from VOC’s, uneven layering of multiple coats, and the potential for blistering that can lead to the underneath “bleeding” of corrosion, even to previously coated surfaces.

There is, however, a simple solution out there.

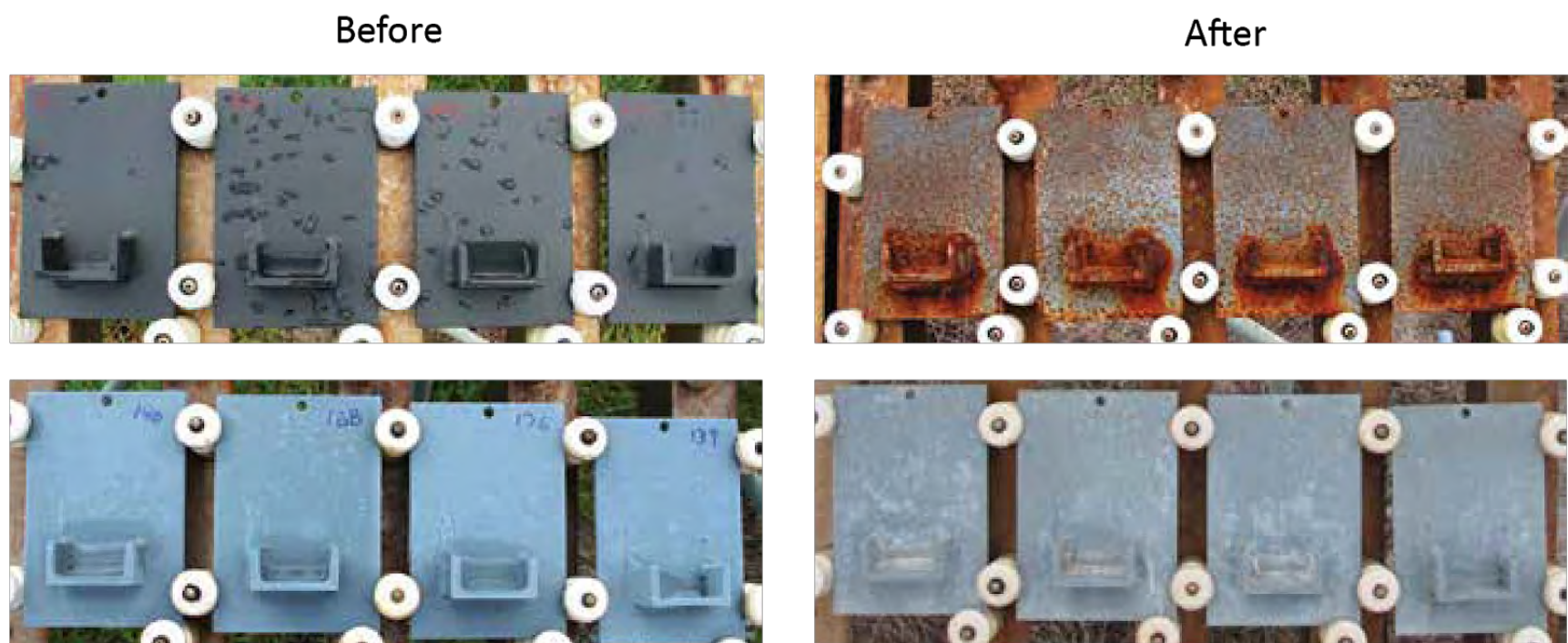
In the 1970s, a mixture of zinc powder and potassium-silicate was developed by NASA’s team at Goddard Space Flight Center to protect metal surfaces from corrosion.



Zinc had long been used in anti-corrosion coatings, but NASA wanted something that was easier and more cost-effective, so Goddard chemist John Schutt began to play around with the formula.

The product he ended up with did more than cover the metal to block sea spray, fog, or other corrosive elements. It actually formed a chemical bond with the underlying metal substrate.

NASA put the coating to use on structures at the seaside Kennedy Space Center, where it protects launch facilities not just from the salty, tropical environment but also from the temperature spikes and high-heat exhaust of rocket launches.



Recent Kennedy Space Center test: After 18 month's exposure to harsh marine elements, the surfaces given the zinc-silicate application remained almost pristine compared to the ones coated with another product that became riddled with rust and corrosion.

This incredibly effective and durable treatment is also effective on surfaces with regular water contact. Water damage and corrosion fails to seep into protected areas even if the coating is scratched or incomplete. The zinc-silicate bond also adds another benefit: it allows the surface to be electrically conductive, which deters marine critters like barnacles and mussels from clinging to the surface.





Only a thin coat is required—about six- to eight-thousandths of an inch. Although, unlike other inorganic zinc coatings that crack when over-applied, there is no harm if some heavier applications occur. Because it is water-based, it is also more environmentally friendly than coatings that include solvents or thinning agents, making it an ideal coating in states with more stringent environmental laws.



The bottom half of the buoy on the right was coated with NASA's zinc-silicate and shows no sign of marine growth after being submerged for two years.

For its many uses, however, application proved difficult. The strong bond that provides so many benefits to the surfaces to which it is applied also causes it to bond to the mixers and any metal surface in the pump system. The coating consists of a dense zinc powder and a water-like silicate binder that, when mixed, form a slurry of zinc particles. This slurry needs to stay in suspension throughout the system.

### **Introducing "Mr. Zinki"**

To solve these issues, Coast Industrial Systems set out to build a complete application system under the direction of Brad Hubbard and at the request of the US Navy at the Naval Amphibian Base in Coronado, California.



To meet the need of continued particle suspension, CIS started by utilizing a standard Graco 515 Double Diaphragm Pump to continuously circulate the mixture. To aid in cleaning, and to prevent the product from settling when not in use, CIS modified all aspects of the pump system to make it very user-friendly in the application and clean-up of water-based inorganic zinc-silicate coatings.

This completes a one-of-a-kind system for applying zinc-silicate to any properly prepared metal surface that can be corroded, adding years of integrity to almost any structure.

A system CIS has affectionately named, "Mr. Zinki."

Want more information? Call your CIS representative **today!**







**COAST INDUSTRIAL SYSTEMS, INC.**

2223 Verus Street • San Diego, California 92154

# "Mr. Zinki"

## Zinc-Silicate Coating Application System

### **Basic Model Features:**

Custom Check Valve Cartridge  
Polypropylene Surge Bottle  
Non-Stick Hopper and Lid  
Low Shear Glass-Filled Acetal  
Plastic Paddle Agitator

### **CIS Custom Zinc Gun with:**

Delrin Air Cap  
Delrin-tipped Fluid Nozzle  
Plastic Needle Tip



### **Benefits:**

*Zero VOC's  
Long-Lasting Protection  
To Applied Surfaces  
Flame-Proof Coating  
Easy To Clean  
Fully Customizable To Meet Your Needs*



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### COMPANY OVERVIEW

Coast Industrial Systems, Inc. is the #1 supplier of painting and coating application equipment to the marine and manufacturing industries, and is proud to serve both San Diego and Mexico since 1986.

Coast Industrial Systems, Inc. has always placed the customer first, and strives for business excellence in all ways. Our friendly sales and customer service staff are knowledgeable, experienced and qualified to help meet your painting and coating application requirements, and to exceed your expectations.

**Graco Top 20 High-Protective Coatings & Foam Distributor  
Award Winner 2010-2019**

