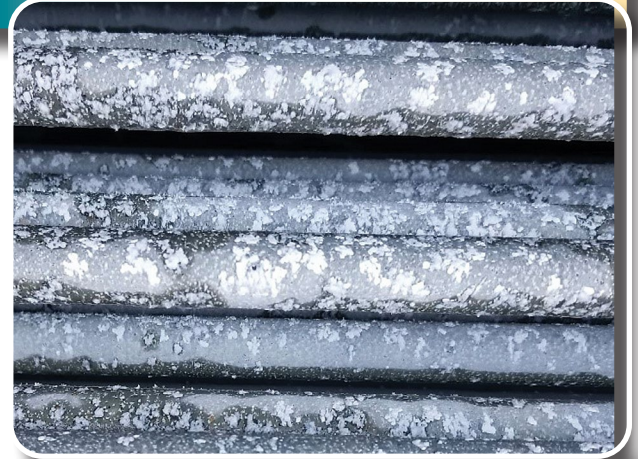


Pass-Protect®

WATER SYSTEMS



PRACTICAL SOLUTIONS FOR WHITE RUST
Enhance passivation and minimize white rust for galvanized equipment

EVAPCO Research & Development

EVAPCO engineered and constructed a one of a kind Passivation Testing Facility at their Maryland (USA) R&D headquarters. By using their Passivation Testing Facility in conjunction with their Water Analytical Services Laboratory, EVAPCO can simultaneously test, compare and analyze various passivation alternatives. They can test up to 16 separate galvanized coils at the same time with heat load to simulate quick start-up optimization for galvanized coils in the field.



Six years of scientific research and testing resulted in an innovative passivation solution which significantly reduces the potential for white rust formation on new galvanized equipment.



EVAPCO utilizes their Water Analytical Services Laboratory that is equipped to analyze water samples. Testing the makeup water early on in the project's design phase will dictate how to develop a site-specific passivation plan.

The White Rust Problem

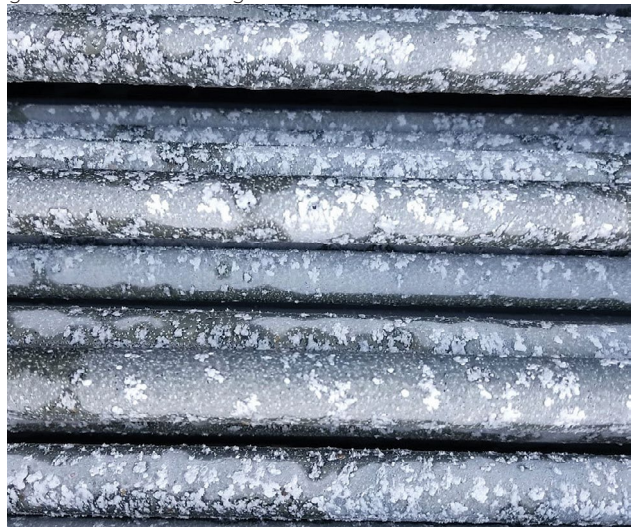
Galvanized steel has been the preferred material of construction for evaporative cooling equipment for over 50 years and provides a long service life when properly treated and maintained. However, a form of premature zinc corrosion known as "White Rust" can occur on new galvanized surfaces. To help minimize white rust, galvanized surfaces need to develop a protective oxide layer through a process called "Passivation."

Equipment manufacturers and water treatment companies recommend passivating new galvanized systems prior to the introduction of any heat load. But the reality is that many equipment operators must quickly place their evaporatively cooled equipment into operation with a heat load to serve a process. They simply don't have the time to passivate the new galvanized surfaces before operating the equipment.

The evaporative cooling industry has experienced white rust issues on galvanized steel coils for many years. Unfortunately, the industry has been underserved with practical solutions for white rust.

To the right you see a coil that has developed white rust. This happens all too often when new evaporative units with galvanized steel are started up. The Association of Water Technologies (AWT) defines white rust as a type of corrosion

product that affects galvanized surfaces and is characterized as "an accumulation of white, fluffy or waxy non-protective zinc corrosion which adheres to the surface of galvanized steel". A quote from Cooling Technology Institute (CTI) says "untreated, white rust corrosion can seriously damage the galvanized zinc coating to shorten the life of the condenser."



The Pass-Protect® Passivation Solution

Step 1: Passiv-Assist® Factory Applied Pretreatment

After a new coil is hot-dipped galvanized, EVAPCO applies a proprietary chemical pretreatment which substantially reduces the potential for subsequent white rust formation. Coils that receive the factory pretreatment consistently develop less white rust than untreated galvanized coils across a broad range of makeup water qualities and ongoing water treatment programs. The factory pretreatment does not provide a completely passivated coil. It does, however, make field passivation faster and yield better results. The coils are then assembled into the custom condenser or fluid cooler and shipped to the customer.



Step 2: Field Passivation

EVAPCO coordinates the field passivation service through our network of Factory Authorized Water Treatment Partners and the installing contractor. The site-specific field passivation service includes EVAPCO inhibitor chemistry, feed and control equipment and routine service visits by a local Water Treatment Partner.

This usually lasts between 4-8 weeks whereas other properly executed field passivations can take up to 8-12 weeks or require white rust inhibitor to be fed throughout the life of the evaporative cooling equipment.



Comprehensive Water Treatment Solutions

Initial Startup: Pass-Protect your new galvanized evaporative unit

1. Test makeup water quality through EVAPCO's Water Analytical Lab early in the design process
2. Develop a site-specific passivation plan
3. EVAPCO's Passiv-Assist factory pretreatment is applied to the new galvanized coil
4. Field passivation plan is implemented by EVAPCO Factory Authorized Water Treatment Partner once evaporative condenser or closed circuit cooler is installed



Ongoing Water Treatment:

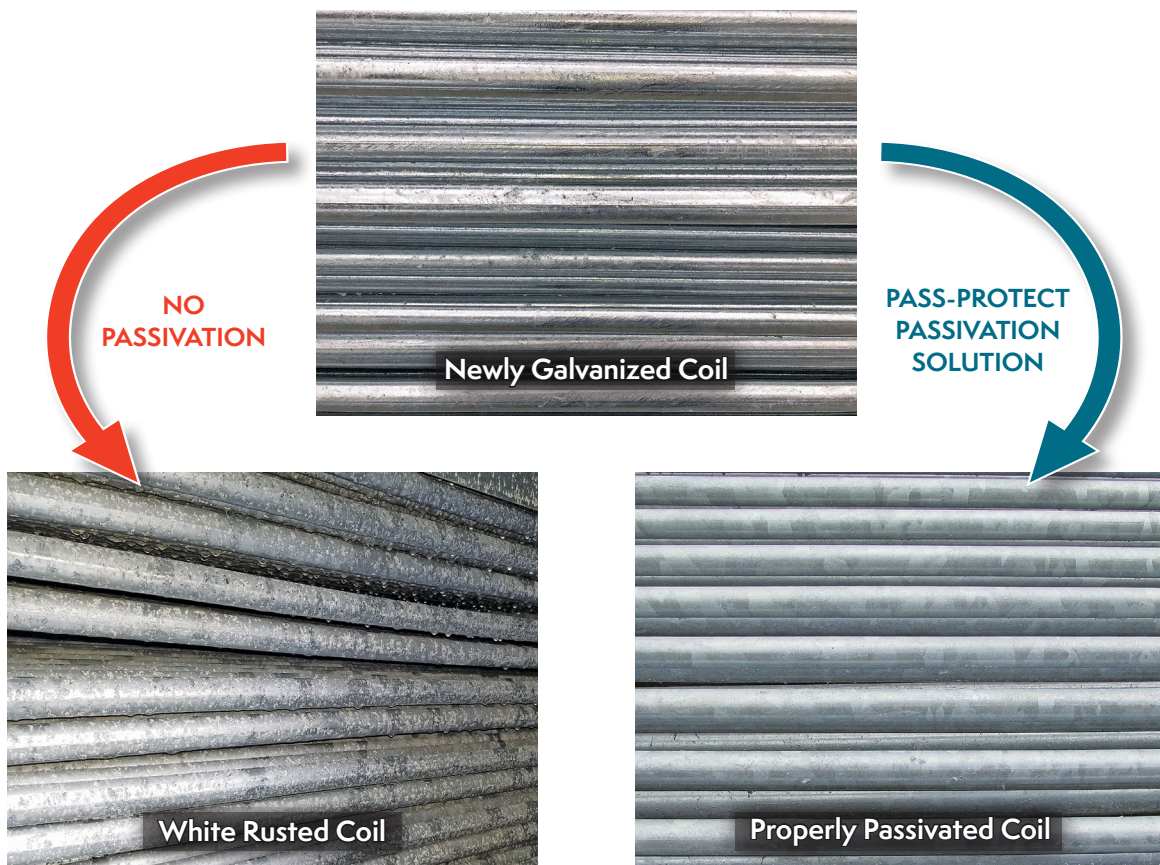
- **Pulse-Pure - Factory Mounted & Remote Sump Applications**
Non-chemical water treatment system that can eliminate the need for hazardous liquid chemicals from ongoing water treatment. Utilizes pulsed electric field technology to physically treat recirculating water for scale, corrosion and microbiological activity.
- **Smart Shield - Factory Mounted**
Solid chemistry water treatment system that is factory mounted on evaporative condensers or fluid coolers.
- **Smart Shield - Remote Sump Applications**
These systems either use controlled release or monitored release chemistry and provide easy installation in the field.



The Benefits

- Factory pretreatment (Passiv-Assist) enhances the speed and effectiveness of properly executed field passivation, including units requiring immediate heat load
- Field passivation tailored for each location and the site-specific makeup water quality
- EVAPCO's network of Factory Authorized Water Treatment Partners are trained to assist in the field passivation
- Factory Mounted *Pulse~Pure*® and *Smart Shield*® systems are designed with ports to aid in passivation field panel install
- Passivation plan promotes the formation of a passive oxide layer, eliminating the need to feed white rust inhibitors for the life of the unit

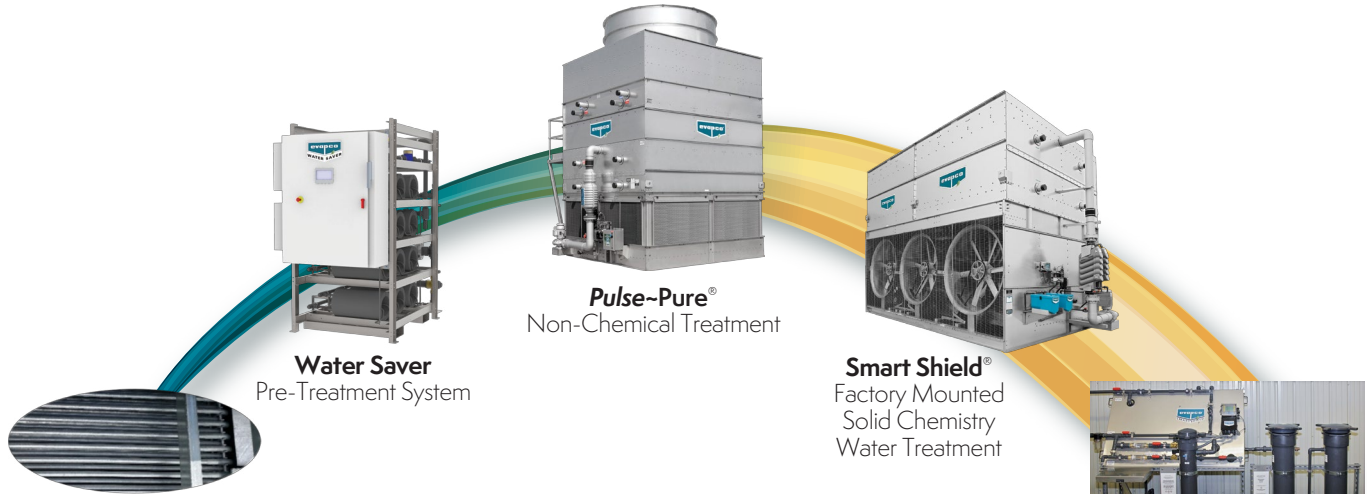
The Results



Whether the application is a cold storage warehouse, food or beverage processing facility, manufacturing plant, commercial HVAC or another application, the EVAPCO Passivation Solution is applicable across a broad range of makeup water qualities and provides **RESULTS**.



Full Spectrum of Water Treatment Solutions



Water Saver
Pre-Treatment System

Pulse-Pure®
Non-Chemical Treatment

Smart Shield®
Factory Mounted
Solid Chemistry
Water Treatment

Factory Assisted Passivation
Galvanized Coil Treatment



Smart Shield®
For Open Towers and
Remote Sump Applications



www.evapco.com

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