



WET USA Inc.

316 Roma Jean Pkwy, Streamwood, IL 60107
tel 630-540-2113 • fax 630-540-2117
www.wet-usa.com • info@wet-usa.com

TECHNICAL PUBLICATION

INFORMATION & STRATEGY FOR THE
FACILITY MANAGER

White Rust Mitigation

by Mario C. Uy

Although White Rust has been occurring in the galvanizing industry for decades, it has only been an apparent problem in galvanized cooling towers when the water treatment industry changed the technology from acid based program to alkaline based program, sometime around the mid 80's. Since then, many theories regarding its prevention and mitigation have been conjectured. Through further research and experiences, some theories have been proven right, some wrong, and while other theories continue to be debated until further statistics are collected to sway the opinion one way or the other.

One thing for sure, once White Rust is formed, it has to be mitigated to prevent further pitting. One early theory was to leave the White Rust deposits alone. The argument was that the White Rust deposits will eventually harden to protect the underlying surface. However, experience has shown otherwise. Over time, reddish spots begin to develop around the White Rust deposits, indicating that pitting corrosion is occurring underneath the White Rust deposits even with conventional water treatment. As such, we now believe that the White Rust deposits must be mitigated to prevent pitting corrosion.

One mitigation method is mechanical. This method requires the tower to be off-service for an extended time. All the internal parts will have to be removed. The first step is to sandblast the galvanized surface to base metal. The next step is to apply a protective coating over the freshly sandblasted surface. Certain areas may require reapplication of the coating from time to time.

Consult with a mechanical contractor and the cooling tower manufacturer to ensure that this method is implemented properly.

The other method is chemical. This method also requires the tower to be off-service, but only for a couple of days. The first step is to remove the White Rust using a chemical White Rust Remover, to expose the base metal as well as to prevent under-deposit corrosion. The next step is to apply a White Rust program to passivate the exposed surface and to prevent the formation of new White Rust on the remaining galvanized area. The White Rust Program will have to be implemented on a continuing basis to ensure continued success. Consult with an industrial water treatment company to ensure that this method is implemented properly.

The formation of White Rust is truly the destruction of the protective zinc coating. Because this destruction is not uniform, but rather localized, the smaller exposed surface area become severely anodic to a larger cathodic area, increasing the severity of any corrosion and shortening the life of the cooling tower exponentially. Therefore, White Rust has to be mitigated to preserve the life of the cooling tower.

Obviously, the best way to prevent this destruction is to start-up any new galvanized cooling tower properly to preserve the zinc coating. For information regarding the preventive measures, please refer to our technical publication on the Prevention of White Rust on New Galvanized Cooling Towers.