



Jaytech, Inc. E-Newsletter

"A candid conversation about water treatment issues facing today's mechanical engineers."

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In This Issue

- White Rust: A Common Concern
- Welcome newcomers
- Next Issue: The various causes of Recirculating pump seal failure
- Industry Insider: The White Rust Dilemma
- Jaytech-Tip

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White Rust: A Common Concern

For those of you who have purchased a new cooling tower or evaporative condenser in the past several years, you may be familiar with the term "white rust" or "white storage stain." White rust is a condition in which a newly galvanized surface is not able to form a shielding zinc oxide layer to adequately protect itself from localized corrosion. Since galvanized steel is widely used in the construction of cooling towers, the problem has become the responsibility of both mechanical engineers and water treatment professionals.

Although white rust is a type of corrosion, it is generally discovered when the galvanized cooling tower surfaces develop a white, waxy, inconsistent camouflage type pattern of zinc oxide on water contacting surfaces. It is often initially thought to be scale.



(White Rust – camouflage look)



(Calcium carbonate scale)

It is the thickness of the galvanizing and the stable oxides that form on the zinc's surface that determine the durability of the galvanizing. Left untreated and allowed to develop, white rust will result in aggressive corrosion of the underlying steel and a notably early replacement of the condenser.

"White Rust can cause considerable damage to the coating and is always detrimental to the galvanized coatings appearance."

– Industrial Galvanizers Corporation

Helpful Links

www.indgalv.com

www.marleyct.com



It is commonly accepted that changes in the galvanizing process during the mid-1980's driven by environmental restrictions and economics are the causes of white rust. It is also commonly accepted that changes in water treatments driven by safety and performance have optimized the potential for white rust incidents. Regardless, it has become a very real problem for operators and engineers everywhere.

"The best cure for white rust is an ounce of prevention when you begin operating your tower. Consult with your water treatment specialist and ask about his program for initial system operation and passivation of your galvanized steel cooling tower."

– The Marley Cooling Tower Company

The standard treatment for white rust until recently has been the use of sulfamic acid to remove the deposits and then passivation of the system with a concentration of polyphosphate. Within the past year, Jaytech has developed an effective single product white rust remover and passivator for systems already affected by white rust. This is a dynamic non-acid product that can be fed with our line of other solid water treatment products. This product is also available in liquid form.

A second and less desirable treatment for extreme white rust includes having the tower disassembled, professionally cleaned, and recoated with a protective layer to repair the damage. This is less common due to the extreme cost and downtime.

For more information about the prevention and removal of white rust, contact your Jaytech representative or contact me at mjuhl@jaytech.com.

Welcome Newcomers

I would like to welcome several new members to this e-newsletter. If you know of anyone that would like to receive this e-newsletter just let me know and we will include him or her in future issues.

Next Issue:

The Industry Insider discusses:

The Various Causes of Recirculating Pump Seal Failure

The White Rust Dilemma...

I'm sure that there are many people out there in the Facility Maintenance/Engineering profession that can probably say that the best way of learning about problems is when they actually occur. Especially how to fix the problems. You tend to learn the value of 'networking' amongst your peers real quickly. This is especially true in the Ammonia Refrigeration arena for my fellow workers and myself.

We naturally assumed that when using a well-known refrigeration company for its design, installation and well-known products that all was well. We maintain it, service it, inspect it and life is good, right? Well, no.

It was always believed that the quality of water coming into the facility was fine. For those pesky impurities that cause scale, we are utilizing the water treatment system that relies on silica type sand and backwashing to prevent any buildup of scale in the condensing towers. A lot of gadgetry and timers to "filter" the water going in. Works great. Really. Here comes the learning curve – It works great for what it is designed to do. Going on advice from the initial installer and the manufacturer it was all that was needed at our Facility.

We added two new condenser towers during a building expansion, which included another treatment system to match our existing ones. Here again, we're thinking life is good. Upon inspection one day, we noticed a white colored formation appearing on the coils of these new towers. We questioned our water treatment system with the installer as expected. They sent a service technician in along with a "Water Treatment Specialist" who tells us that the coils are covered in "White Rust". Of course, he can fix this with acid cleaning the coils and installing his chemicals to prevent it from coming back. Wait a minute, acid clean new coils? Wasn't the water treatment system that was installed supposed to prevent this type of thing?

I got Jaytech involved at this point after I talked with some of my peers about water treatment and our problems. One guy says calcium deposits; another says White Rust, etc. Jaytech provided me with some very useful, general information on White Rust that has taught us a very valuable lesson at our facility. It explained even further about the galvanizing process on the coils and most importantly the need to passivate the coils. All new language for us. We assumed that the product and installation was good to go.

Lesson learned – talk with fellow peers within the industry. We didn't get any schooling on this. As we opened up this dilemma, we also became more aware of the biological possibilities that could occur. We expected our installer to do everything needed to make sure that we had not only a flawless install, but also operation.

We still use the original water treatment machines we started with. We have now learned how to "help" them work a little better with a solid water treatment program from Jaytech. We have also learned that you can't possibly over research what your vendors and contractors are supposedly doing in your best interests.

Jaytech Tip

“Jaytech Tip-1” If you are wondering if you have white rust in your new cooling tower, visually inspect any stainless steel components for deposition. If the deposits are on the stainless, you have scale since white rust only affects galvanized steel.

Have an idea?

If you have an idea or question you would like more information about, send me e-mail at mjuhl@jaytech.com and we'll answer it! Remember, it must be water treatment related and be of interest to other professionals such as you.

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