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International Edition

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## **Subject: RECOMMENDATIONS FOR INTERNATIONAL RTAA APPLICATIONS IN AGGRESSIVE ENVIRONMENTS**

### **Introduction:**

The purpose of this bulletin is to explain the special needs for proper unit preparation, condenser coil cleaning, and condenser coil treatment for RTAA air-cooled units installed in seacoast applications with high salt concentrations or in other aggressive environments.

### **Discussion:**

Trane International Technical Service considers any RTAA air-cooled chiller unit installed within 5 kilometers of any seacoast to be in an environment with potential for high salt concentrations in the ambient air. The actual salt exposure levels will vary with closeness to the coast, sea conditions, prevailing winds, surrounding walls, etc.. These seacoast applications are considered to be very harsh and can be damaging to the unit. Other aggressive environments may include RTAA chillers installed near engine exhausts, plumbing vents, manufacturing vents, etc.

The RTAA chiller, with or without 'Black-Fin' coil protection, is intended to be installed in normal to moderately aggressive ambient conditions, without proper maintenance procedures corrosion damage is possible when the chiller is installed in a harsh or very aggressive seacoast application or in an application with an otherwise corrosive atmosphere. This alert will make recommendations that are useful to prevent or slow the occurrence of corrosion.

## **Recommendations:**

### **Condenser Coil Protection Panels :**

It is recommended that RTAA units in seacoast applications be ordered with the optional condenser coil protection panels. These louvered panels are effective in deflecting light spray, rain, and mist from direct contact with the coil surface, resulting in a drier coil. A dry coil is less likely to suffer corrosion. Also recommended are the optional architectural louvered panels. These full-length louvered panels provide some additional protection for the remainder of the unit below the condenser coils.

### **Condenser Coil Material:**

Pueblo RTAA units are supplied with coils constructed with aluminum fins, either standard plain or factory coated with an epoxy (Black-fin). The factory applied epoxy fin coating is effective at providing a longer service life for the coils of a unit installed in normal or moderately aggressive operating conditions. However, we have observed that in a very aggressive environment like a seacoast application it may be necessary to provide extra protection for the coils.

The recommendations made in this alert apply to both standard and epoxy coated types of coils.

*Note: The use of copper condenser fins is not always the best choice for seacoast applications. Pueblo does not offer a copper fin option. For further information regarding fin material please refer to Epinal bulletin A40 EB 034.*

### **Unit Paint:**

For seacoast or corrosive applications it is recommended that the standard unit paint and galvanized coatings be enhanced with a field applied anti-corrosion paint. Any good locally purchased anti-corrosion paint would be acceptable, but typical examples would include "Amerlock 400" special marine paint or Rust-Oleum® 5300 System Water Based Epoxy.

The paint should be applied by the installing contractor prior to the time of commissioning. The entire unit should be cleaned and painted, including the unit base rail, compressors, oil separators, copper lines, unit framework, condenser fan grills, unit top panels, etc.. Do not paint over nameplates and identification tags, sight glasses, controls, and the unit control panel human interface. Newer production Pueblo RTAA chillers have galvanized steel fan blades replacing the painted steel blades that were originally used. The new galvanized fan blades are much more corrosion resistant and painting the blades is not necessary.

Any corrosion that then occurs during unit operation should be repaired and repainted as part of the normal monthly maintenance procedures.

### **Condenser Coil Painting:**

In many cases it may be desired to field apply a light coat of special anti-corrosion paint to the surface of plain or Black-Fin condenser coils. The extra coating will give slightly added corrosion protection to a standard coil, and will also seal the 'cut' or 'open' edges of a condenser with the factory epoxy coating. Sealing the edges will help prevent corrosives from working their way beneath the factory coatings, and our experience shows this can be effective at extending the protection provided by the Black-Fin coils. An example of an acceptable special anti-corrosion coating for this purpose would be Bronz-Glow™ Husky "Green Fin" Coil Protector. Husky "Green Fin" is a flexible synthetic elastomer formulated to be spray applied to coils in the field, and it can extend the corrosion and moisture protection of most coil types, including RTAA. Husky "Green-Fin" has passed independent salt spray tests (\*ASTM B 117.85) of 1200 hours.

Also available from Bronz-Glow™ is Husky Sea Coast Protector. It is an economical elastomer coating that is resistant to corrosive attack. Husky Sea Coast Protector can be applied by spray to all surfaces of

the RTAA including coils, pipework, framework, cabinets, compressors, etc.. Husky Sea Coast Protector has passed independent salt spray tests (\*ASTM B 117.85) of 1000 hours. Husky "Green Fin" and Sea Coast Protector products should be applied over a base coat of Husky 150 Primer.

In some cases it may be desired to apply industrial epoxy coatings like "Amerlock 400" special marine paint or Rust-Oleum® 5300 System Water Based Epoxy, or an equivalent product, to the outer surface of the coil. These coatings can be effective at enhancing the coil protection, but great care must be taken to avoid reducing the capacity of the condenser coil. The paint should be thinned and then lightly applied using a spray or a roller.

***Note: Care MUST be taken to prevent over application of paint to the coil. Excessive paint will inhibit the heat transfer properties of the coil. The primary areas to coat with the paint are the leading edges and bottom edges of the coils. DO NOT restrict the airflow through the coil.***

### Motor Terminal Boards:

GP and Intermediate helical rotor compressors are shipped with the motor terminal board painted. The paint slows the corrosion of the motor terminal board and the winding temperature sensor terminals. The regular maintenance performed on the chiller must include inspecting the motor terminal board, using a wire brush to remove loose corrosion and clean the terminal board, and applying new paint as needed.

### Coil Maintenance:

The recommendations for cleaning the condenser coils will remain the same as described in the IOMs for the units. Because seacoast applications are considered to be a 'dirty' environment for condenser coils, it is logical that the coils will need to be cleaned more often than a coil located inland. Cleaning 4 times per year may be required, or even more often if conditions are very poor or if corrosion damage begins to occur.

To clean the coils, use a soft brush and a sprayer, either the 'garden' pump-up type or a high-pressure type. A high quality detergent, such as "Trane Coil Cleaner, CHM0021" is recommended for both standard and coated aluminum coils. Follow the directions included with the detergent. The most effective method of coil cleaning is to remove the condenser end panels and clean the coils from the inside out using a pressure type sprayer.

***Note: If the detergent mixture used is strongly alkaline (pH greater than 8.5), an inhibitor must be added.***

***Note: Rinse the coil thoroughly after cleaning. Failure to completely flush the detergent from the coil can result in accelerated coil corrosion. Blow excess water from the coil using low-pressure air.***

***Note: The water used to clean the coils should always be clean fresh water (it should not be brackish, it should not contain excessive dissolved minerals, it should not contain chlorine, and it should not contain excessive water softener salts).***

### Coil Treatment:

We are also recommending that all RTAA condenser coils installed in seacoast or corrosive applications be treated at start-up and after each cleaning with a new product called "Cal-Shield™ Coil Protector", it is a liquid formula based on Dupont Teflon®. Once Cal-Shield is applied to a clean coil, it forms a protective shield of Teflon that helps the coil resist the depositing of dirt, grime, and salt....moisture will "bead up" and run off. Where coils are installed in aggressive environments, like corrosive salt air, the Teflon will help extend the coil's service life.

Cal-Shield is manufactured by Nu-Calgon Wholesaler, Inc., and is distributed through many refrigeration supply houses. If you are unable to purchase this chemical locally, you may contact Trane International Parts in LaCrosse and request ordering information.

A light coating of Cal-Shield should be applied at least once every 3 months or after every coil cleaning. We estimate that 2 or 3 gallons will be needed for every treatment of a RTAA200.

## **Conclusion:**

These recommendations are made only to provide a means for the customer to extend the service life of an RTAA chiller installed in a harsh seacoast or corrosive environment. It is the customer's responsibility to assume all costs that may be incurred from following these recommendations. The Trane Company cannot warranty that these recommendations will prevent all corrosion from occurring. The standard terms and conditions of sale state that NO warranty is made against corrosion, erosion, or deterioration.

RLC-SVB-1EN For questions or comments regarding this bulletin, please contact the Trane WASG International Technical Service Department in LaCrosse