# Technical Bulletin TB-009

## Air-Cooled Heat Exchanger Maintenance

Revision 2, 1/12/2018, Matt Reed & Ross Putvin

**A clean heat exchanger will keep your cooling system operating at peak performance and minimize energy usage.**


*Illustration 1: Air-Cooled Heat Exchanger*

## *Preventive Maintenance*

These simple steps can be taken to ensure your ACHE performance remains at peak levels and the longevity of the unit is maximized. Check each air cooler every 6 months:

1. Manually cycle ALL the fans ON / OFF to ensure all fans are operating properly.
2. Inspect each fan for abnormal noise or vibration. Note that clogged fins can cause excessive vibration.
3. Stop the fans and thoroughly inspect fan blades and motor mounts for cracks or signs of fatigue.
4. Inspect the bottom of each air cooler for debris or clogging of the coil.
5. Check the glycol concentration prior to every winter to insure adequate freeze protection.

# Dirty Heat Exchanger Coil

The most common issue seen with air-cooled heat exchanger is blockage of the fins on the coils. The air passing thru the heat exchanger coil can pickup debris from the surrounding area and clog the coil (Illustration 2). Some customers have seasonal problems with cottonwood fluff and know to regularly check the finned surface multiple times in the spring.

*Illustration 2: Partially Blocked Heat Exchanger Coil*

It is a good idea to visually inspect the fin surface of the coil every few months and clean off the coil instead of waiting for the coil to be completely clogged. The longer you wait, the more deeply embedded debris can become in the fins.

If getting beneath the air cooler is difficult, another method of checking for a dirty heat exchanger is to observe the airflow around the unit. With all of the fans running you should feel a wall of air being sucked into the bottom of the heat exchanger. The fans will discharge air vertically out of the top of the fans* (Illustration 3). Any air blowing out of the sides of the fan guard, or insufficient suction to hold a sheet of paper to the bottom of the coil indicates blocked air flow (Illustration 4).

*Note: this does not apply to bottom fan units –SQC/Solanus – or reverse airflow units in high temperature applications.

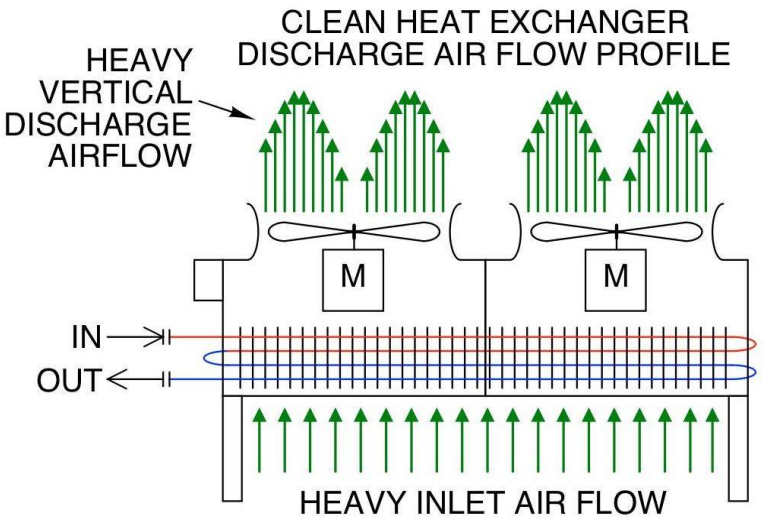


*Illustration 3: Air-Flow Profile of a CLEAN Heat Exchanger*

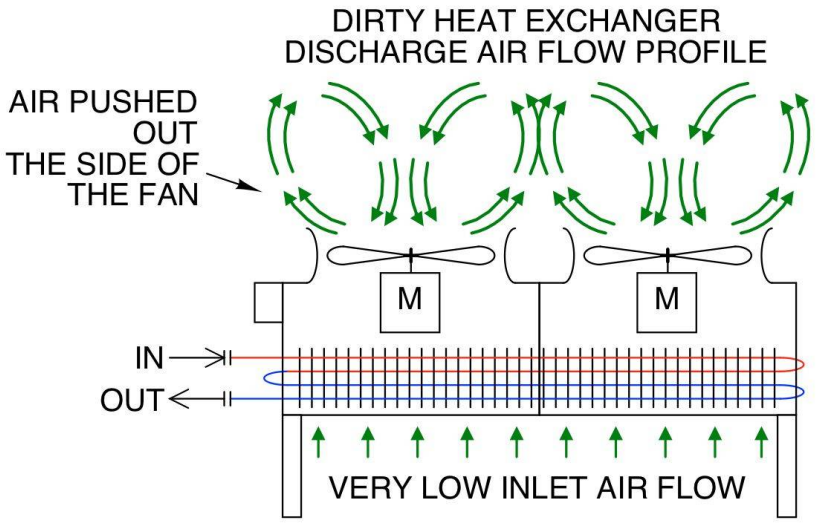


*Illustration 4: Air-Flow Profile of a DIRTY Heat Exchanger*

# Cleaning a Heat Exchanger Coil

## Regular Fin Cleaning Procedure

1. Lockout the air cooler electrical panel to ensure the fans do not energize during cleaning.
2. Clear any large debris from the bottom of the coil by hand. If needed, use a soft broom to assist in removing debris being careful not to damage the fins.
3. Remove the fan guard and gently spray water on the INSIDE of the coil to help debris fall out of the coil. *Do NOT spray the motor.*

   *DO NOT USE PRESSURIZED AIR OR WATER* to clean the fins and coils. This can result in damage to the coil fins, or drive dirt/debris further into the coil pack.

## Deep Fin Cleaning Procedure

1. For a severely clogged coil, Dry Coolers recommends a specialty foaming cleaner, such as NuCalgon NuBrite Condenser Coil Cleaner (Illustration 5). This type of cleaner is applied on the inside of the coil and the foaming action will "push" debris out the bottom of the heat exchanger.
2. Ensure the cleaner you choose is non-acidic and safe for the materials of the heat exchanger (most commonly aluminum fins, copper coils, galvanized or powdercoated steel framing) as well as your jobsite – such as roofing, siding/flashing, and other nearby equipment.
3. Some customers will put plastic sheeting or small inflatable swimming pool beneath the air cooler (Illustration 6) to capture debris to prevent runoff or site contamination. Follow the instructions for application and timing to foam the entire coil and allow any blockages to work free.
4. Rinse the coil from the top down with a standard garden hose to force any debris out the same way it came in.


*Illustration 5: NuCalgon Nu-Brite Condenser Coil Cleaner*

*Illustration 6: Pool Beneath Air-Cooler to Capture Debris during Cleaning Process*

# Fin Screens

For those customers who know they are prone to clogged coils, such as those with heavy seasonal presence of cottonwood or outdoor dirt and debris, a pre-filter may be the best course of action. Fitting filter or screen skirts around the unit can help trap contaminants before they clog a coil (Illustration 7).

Dry Coolers offers a poly mesh filter media designed to trap cottonwood fluff and other larger debris. The trapped debris is easily brushed off the bottom of the filter media. The filter is sized to fit the bottom of your air cooler and includes grommets every 12” for fastening to the bottom of the air cooler. Shipped loose for field installation.

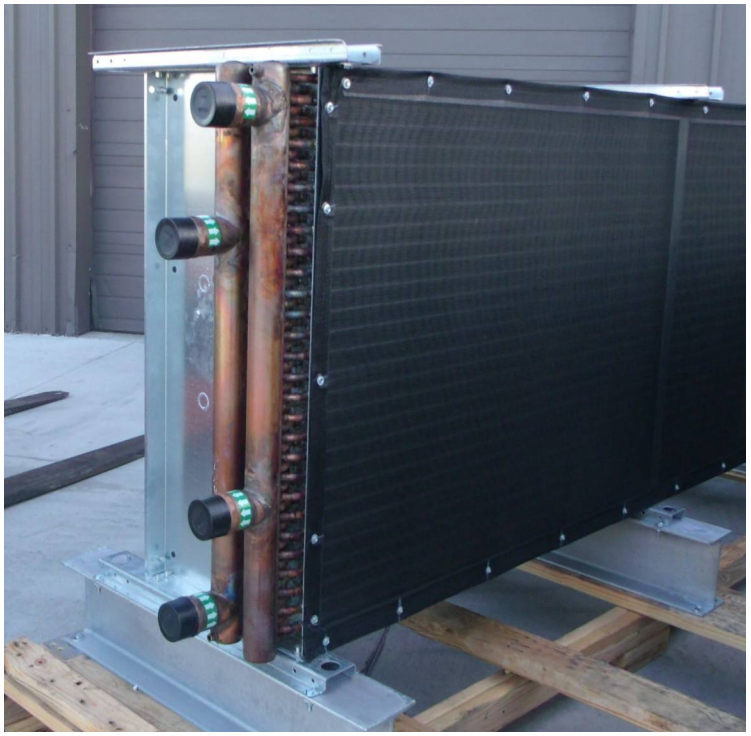

*Illustration 7: Cottonwood Filter Mounted to Bottom of Air Cooler*

**RELATED BULLETINS:**

- Technical Bulletin TB-002: Glycol Freeze and Burst Protection
- Technical Bulletin TB-027: Air Cooled Heat Exchanger Freeze Damage
- Technical Bulletin TB-028: Air Cooled Heat Exchanger Fin Combing
- Nu-Calgon Nu-Brite: http://www.nucalgon.com/products/coil-cleaners/condensers/nu-brite

**REVISION LEVEL:**

- Rev 0: 10/04/2017, Ross Putvin
- Rev 1: 12/28/2017, Matt Reed & Ross Putvin
- Rev 2: 1/12/2018, Matt Reed & Ross Putvin