Cleaning a Water-Cooled Condenser

Maintenance Procedure

READ THESE INSTRUCTIONS BEFORE ATTEMPTING TO CLEAN A WATER-COOLED CONDENSER. FAMILIARIZE YOURSELF AND ANY OTHER PERSONNEL AS TO THE POTENTIAL HAZARDS. OBSERVE ALL SAFETY PRECAUTIONS. FAILURE TO COMPLY WITH THESE INSTRUCTIONS COULD RESULT IN PROPERTY DAMAGE OR PERSONAL INJURY.

Only a qualified air conditioning technician should clean a water-cooled condenser.

Cleaning a water-cooled condenser helps to improve the heat transfer rate, reduce operational cost, restore efficiency, prolong heat exchanger life and reduce pressure drop pumping cost. Deposits from water or water treatments, such as scale, lime, rust, and mud are removed.

Each installation is unique. Therefore,, the fluid quality and operating conditions will dictate when the heat exchanger needs to be cleaned.

For future reference, it is beneficial during the start-up procedure to record the water pressure drop across the condenser as well as the inlet and outlet water temperatures of each water-cooled heat exchanger. After a period of time these values can be checked to see how much loss of operating performance has occurred. If a 10% or greater change has occurred it would be beneficial to clean the heat exchanger.

There are several commercially available environmentally safe products on the market that will do an excellent job. Contact your local wholesaler for availability. Follow all safety guidelines published by the cleaner manufacturer.

There is a safety concern whenever using any chemical cleaner at elevated temperatures. The cleaner manufacturers recommend using the cleaners at 120° F or lower. Since the heat exchanger might be in operation just prior to the cleaning, it should be cooled to lower than the 120° F threshold. Due to the ability of the heat exchangers mass to hold heat, this may take a period of time. If possible, circulate cool water through the unit to help dissipate some of the heat.

Check each field installed component to ensure the chemical cleaner will not damage them when the cleaner is circulated. For example, the structural makeup of the strainer may not stand up to the chemical detergent and rapidly deteriorate or fail to function after cleaning. If there is a possibility of this happening, use an alternative cleaner that all components will withstand or create another method of circulating the cleaner that would isolate the component in question from the cleaner. While cleaning the heat exchanger, it may also be a good idea to check and clean the strainer as well.

NOTE: Do not chemically clean a refrigerant circuit.

1. Record performance values (Ref. following charts). Turn off the fluid source.

2. Cool the heat exchanger, if above 120° F.
3. Close the valves to and from the fluid circuit loop.
4. Open the drain valve and drain all fluid from the heat exchanger.
5. Back flush the heat exchanger to remove any loose particles.
6. Attach pump and hoses as illustrated in Figure 1, making sure al fittings and connections are secure.
7. Check to make sure valves to system are closed and valves for cleaning loop are open.
8. Calculate the total gallons volume of the heat exchanger and the piping using the following charts:

NOMINAL PIPE SIZE	STD. STEEL PIPE VOLUME GAL / FT	TYPE L COPPER TUBE GAL / FT
½"	.0157	.0121
5/8"	-----	.0181
¾"	.0277	.0251
1"	.0449	.0429
1-1/4"	.0779	.0653
1-1/2"	.1060	.0924
2"	.1740	.1610
2-1/2"	.2490	.2480

UNIT . . . . . _____ Gallons

Pipe (") ____ Gal / Ft x ____ Ft = ____ Gallons

Pipe (") ____ Gal / Ft x ____ Ft = ____ Gallons

Pipe (") ____ Gal / Ft x ____ Ft = ____ Gallons

Total = ____ Gallons

9. Calculate the volume of de-scaler required (typically a 50% mixture), but follow manufacturer recommendations:

Water Quantity = ____ x ____ Total Gallons = ____ Gallons

De-scaler Quantity = ____ x ____ Total Gallons = ____ Gallons

10. Make sure pump is primed.
11. Circulate the required quantity until fluid characteristics indicate that de-scaling process is complete. Manufacturer's instructions will provide details on this.
12. Disconnect pump, hose, and tank from heat exchanger.
13. Flush entire water system with water.
14. Return heat exchanger and system components to service. Check all valves and fitting connections.
15. Start up system.
16. Record performance values after system has stabilized.

	BEFORE	AFTER
Pressure Drop	_____ psig	_____ psig
Entering Temp.	_____ °F	_____ °F
Leaving Temp.	_____ °F	_____ °F

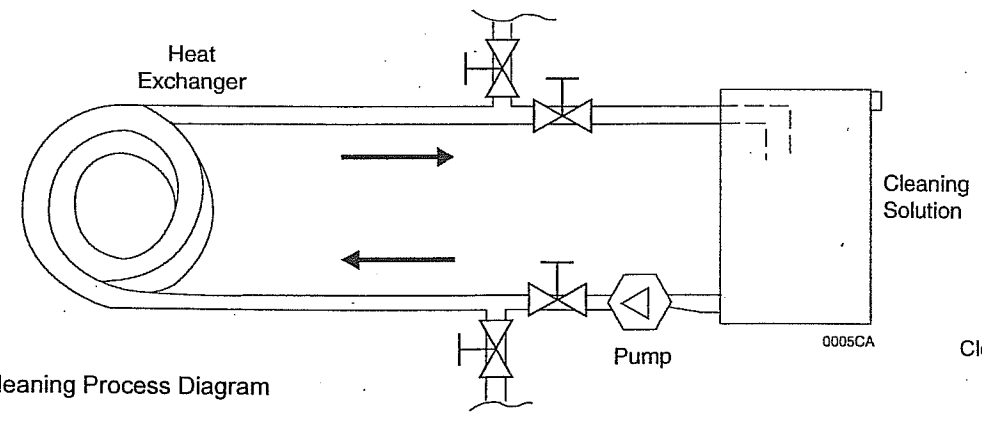

Figure 1: Cleaning Process Diagram