

Cleaning Procedure for Existing Non-ferrous Closed Circuit Process Water Cooling Systems:

General: The following cleaning & flushing procedure is intended to help remove scale, oxides, algae, and other contaminants from “closed” re-circulating process water systems which contain soft metals such as copper, brass, aluminum, and other non-ferrous materials. It is recommended that the user perform a review of the system wetted materials and address any chemical compatibility concerns relating to specific components in the system with the equipment OEM and/ or chemical manufacturer prior to implementation. OPTI TEMP assumes no liability for any damage that may result from use of the procedure outlined below.

Note(s): *During the cleaning procedure, deposits of scale, oxides, and other contaminants will be removed from surfaces within the process circuit. There is a potential for the some of the contaminants to separate out in the reservoir and then be drawn into the pump seals, possible resulting in damage to the seals. In severe cases, excessive amounts of scale, oxides, and algae can cause the refrigeration system evaporator to become restricted or plugged. If this occurs it may become necessary to back flush the system to remove contaminants (May not be necessary on systems that are equipped with cleanable plate exchangers). OPTI TEMP strongly recommends that particle filtration be installed on the “return side” (return to chiller) of all non-ferrous re-circulating systems. For non-ferrous systems filter cartridges or media sized to remove particles in the range of 30 to 50 microns and above is normally suggested.*

It is important to monitor filter media activity periodically during the procedure outlined below and also in the days and weeks following the procedure until the system stabilizes. It may be advisable to have some spare cartridges/media on hand before beginning the cleaning procedure and for future use.

Cleaning/Flushing Steps

1. Shut down process and re-circulating chiller.
2. Drain as much fluid as possible from the system including water from the process equipment, piping, chiller, reservoir, filter, etc..
3. Check any filter and filter media/screens in the system. Install new filter media if necessary.
4. Ensure that all valves are open and that flow is unrestricted through all branch circuits.
5. Prepare “Citrajel & distilled water cleaning solution as follows: Make a fresh 1 - 2% solution (3 - 5 Tbsp. per gal., 1 1/4 - 2 1/2 oz. per gal. or 10 - 20 ml per liter) in cold, warm, or hot water. Use warmest water available (up ~120 F). For severe cases raise water temperature and use more detergent. (Wear protective gloves and eyewear. Observe all safety precautions as identified on product labeling and MSDS).
6. Add “Citrajel” Solution to system and begin circulating to remove entrained air. Continue re-circulating for at least 8 hours, preferably overnight, and as close to full flow conditions as possible. Heat the system to 104°F during circulation process if possible. (Adjust TCU temperature controller as necessary).
7. After 8 hours shut down system and drain as described in item (2) above.
8. Remove, inspect, and clean all filters and strainers located in the distribution piping.
9. Fill the entire system with water and bleed out any entrained air. Re-circulate for one hour and drain.
10. Refill system. After one hour test the water to ensure cleanliness and stability. Required water quality is as follows:
 - a. Total Dissolved Solids: <500 uS/cm
 - b. pH: <8.0
 - c. Soluble Iron: <0.5 ppm as Fe (optional)
 - d. Color: No visible color or suspended soils
11. Repeat above steps if water quality parameters are not met.