

# Chilled Water Loop Strainer Cleaning And Pressure Drop Verification

## 1.0 Maintenance Objective & Frequency

The objective of this procedure is to clean the Y-type or basket strainers installed on the chilled water supply and return lines, and to verify that the pressure drop across the strainer is within the OEM-specified range. This prevents debris accumulation from restricting flow, which can cause chiller inefficiency, cavitation in pumps, and increased energy consumption.

Frequency: Quarterly (every 3 months) or immediately if the differential pressure across the strainer exceeds the OEM threshold (typically 3-5 psi above clean baseline). For systems with high debris loading (e.g., open-loop cooling towers), monthly inspection is recommended.

## 2.0 Lockout/Tagout (LOTO) & Safety

- **Electrical Isolation:** Lock out the chilled water pump motor starter at the motor control center (MCC). Verify zero voltage with a voltmeter.
- **Pneumatic Isolation:** If the system uses pneumatic control valves, isolate and bleed the air supply to the valve actuator.
- **Hydraulic Isolation:** Close the isolation valves on both sides of the strainer. Depressurize the line by cracking a vent or drain valve downstream of the closed isolation valve.
- **PPE:** Safety glasses, chemical-resistant gloves (nitrile or neoprene), steel-toed boots, and a face shield when opening the strainer. Have absorbent pads ready for any water spillage.
- **Hot Work:** Not applicable. No welding or grinding.

## 3.0 Required Tools, Parts & Lubricants

- Adjustable wrench or socket set (size to match strainer cover bolts, typically 13mm, 16mm, or 19mm)
- Flathead screwdriver (for gasket removal)
- Wire brush (stainless steel or brass)
- Clean bucket or plastic tub (to catch debris and water)
- Replacement gasket or O-ring (match strainer model)
- PTFE tape or pipe thread sealant (if threaded connections)
- Digital manometer or differential pressure gauge (0-10 psi range, 0.1 psi resolution)
- Clean rags and absorbent pads
- Flashlight or inspection mirror
- Calibrated torque wrench (if cover bolts have specified torque)

## 4.0 Step-by-Step Maintenance Procedure

1. Perform LOTO as per Section 2.0. Verify that the pump is locked out and the isolation valves are closed. Crack the vent valve to confirm zero pressure.

2. Place a clean bucket or absorbent pads beneath the strainer drain port. Open the drain valve slowly to drain residual water into the bucket. Dispose of water per facility environmental guidelines.
3. Using the appropriate wrench, remove the strainer cover bolts. Tap the cover lightly with a rubber mallet if stuck. Remove the cover and set aside on a clean surface.
4. Carefully extract the strainer basket or Y-strainer screen. Inspect for tears, corrosion, or deformation. If damaged, replace with an OEM-approved element.
5. Clean the strainer element using a wire brush and a stream of clean water. For stubborn debris (scale, algae), soak in a mild descaling solution (e.g., 5% phosphoric acid) for 15 minutes, then rinse thoroughly. Do not use a wire brush on fine mesh screens (use compressed air or a soft brush).
6. Inspect the strainer housing interior for scale, rust, or debris. Wipe clean with a rag. Check the gasket seating surface for nicks or corrosion. Replace the gasket or O-ring if any damage is visible.
7. Apply a thin film of non-petroleum lubricant (silicone or PTFE-based) to the new gasket/O-ring. Reinstall the cleaned or new strainer element, ensuring it is fully seated and oriented correctly (arrow on housing matches flow direction).
8. Reinstall the strainer cover. Tighten the bolts in a star pattern to the OEM torque specification (typically 20-30 Nm for small flanges, 40-60 Nm for larger). Do not overtighten.
9. Slowly open the upstream isolation valve (supply side) to pressurize the strainer. Check for leaks at the cover gasket. Tighten bolts slightly if needed, but do not exceed torque spec.
10. Open the downstream isolation valve fully. Then open the vent valve to purge trapped air. Close the vent once a steady stream of water flows out.
11. Connect the digital manometer to the pressure taps on the strainer (upstream and downstream). Record the differential pressure. Compare to the baseline value from the last PM or OEM spec (typically <2 psi for a clean strainer). If the differential pressure exceeds 5 psi, investigate for blockage elsewhere in the loop.
12. Remove LOTO tags and locks. Restore power to the pump. Verify that the pump starts smoothly and that the system pressure stabilizes within normal operating range.

## 5.0 Verification & Return to Service

1. Monitor the chilled water loop for 10 minutes of normal operation. Check for any unusual noises (cavitation, water hammer) or leaks at the strainer.
2. Record the final differential pressure reading in the PM log (ServiceGrid work order). If the reading is within 0.5 psi of the clean baseline, the procedure is successful.
3. If the differential pressure remains high (>3 psi above baseline), re-inspect the strainer for debris or consider that the issue may be elsewhere (e.g., fouled chiller tubes, closed valve). Escalate to the maintenance supervisor.
4. Sign off on the PM work order in ServiceGrid, noting the date, technician name, differential pressure readings, and any parts replaced.

**Regulatory Disclaimer:** This document is a generic maintenance template provided for educational and informational purposes only. It does not constitute professional engineering or reliability advice. The end-user assumes all liability for validating all step sequences, torque specs, and LOTO protocols against specific machinery OEM manuals before deployment to a live production floor.