

CHEMICAL SANITIZATION OF DI DISTRIBUTION LOOPS

Job Name _____

Job Number _____

Job Address _____

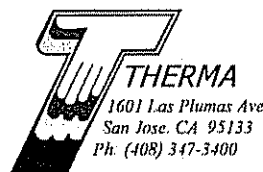
Section 5: Procedures

| Step | Description | Yes | No | N/A | Comments |
|------|--|--------------------------|--------------------------|--------------------------|--------------------------------------|
| 5.1 | IMPORTANT: Tag all points of use (POU): "DO NOT USE, CHEMICAL SANITIZATION IN PROGRESS" prior to performing the sanitization. Also, notify customer about the sanitization is in progress. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| 5.2 | Turn off UV sterilizer. Verify that the UV is off. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| 5.3 | Turn off loop circulation pump(s). Verify that the pump is off. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| 5.4 | Turn off loop make up water. Verify that water is not being introduced into storage tank. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| 5.5 | Close DI bottle(s) inlet & outlet isolation valves, then open bleed valves to relive pressure and drain lines. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| 5.6 | In order not to pass chemical sanitizer through DI bottles, bypass DI bottles by disconnecting DI bottle(s) inlet & outlet hoses and connecting them together. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| 5.7 | Close DI bottle(s) bleed valves. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| 5.8 | Open DI bottle(s) inlet and outlet isolation valves. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| 5.9 | Slowly open storage tank's drain valve and drain water 2 inches above low-low level setpoint. Note: DO NOT drain water below Low-Low Level Setpoint. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| 5.10 | Turn on loop circulation pump. Verify that the pump is running | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| 5.11 | Follow Minncare instruction to add sufficient 1% solution of Minncare® cold sterilant into storage tank. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| 5.12 | Circulate water with Minncare® solution for approximately 25 minutes to allow time for mixing. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Start Time: _____ End Time: _____ |



CHEMICAL SANITIZATION OF DI DISTRIBUTION LOOPS

| Step | Description | Yes | No | N/A | Comments |
|------|---|--------------------------|--------------------------|--------------------------|--------------------------------------|
| 5.13 | Add 2 cups of baking soda in a 5-gallon bucket. The baking soda is used to neutralize the 1% Minncare® cold sterilant to pH 7. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| 5.14 | Collect sample in the bucket. Sample at points of use by opening user drop valve and test water with 1% Minncare® test strip to confirm the loop water contains 1% concentration of Minncare. Note: If necessary, add more Minncare into storage tank to achieve 1% concentration | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| 5.15 | After confirming to achieve 1% Minncare® concentration in the loop, record start time of chemical sanitization on form # 6.022.1, Chemical Sanitization. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Record start time on step 5.17. |
| 5.16 | If the storage tank does not have spray ball(s), collect 500mL of 1% Minncare® cold sterilant in a spray bottle and spray the 1% solution to the upper internal surface of storage tank. Be sure to get all internal surfaces of the tank in order to ensure sanitization. Note: If possible, connect a ¼" flexible hose to a nearby sample valve in the loop (possible on loop return, close to tank) and use this to sanitize the upper interior surface of the tank. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| 5.17 | Allow the water to circulate in the loop for approximately 60 minutes. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Start Time: _____ End Time: _____ |
| 5.18 | Open user drop valve and collect sanitizer in the bucket. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| 5.19 | Test sample with 1% Minncare® test strip to confirm diluted concentration. Allow the sanitizer pass through user drop valve for 45 seconds to ensure sanitization of points of use and test sample again with 1% Minncare® test strip. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |



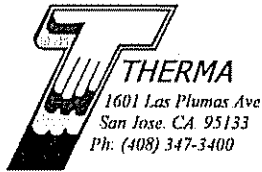
CHEMICAL SANITIZATION OF DI DISTRIBUTION LOOPS

| Step | Description | Yes | No | N/A | Comments |
|------|--|--------------------------|--------------------------|--------------------------|--------------------------------------|
| 5.20 | After all points of use have been sanitized and complete of 60 minutes of sanitization in the loop, turn on the loop make-up in order to dilute the Minncare solution. Note: if loop make-up rate is slow (e.g. less than 2 GPM, you can feed city water into a DI polish bottle, producing DI water, and add to storage tank. Note: When adding water by feeding city water through a DI bottle, total organic carbon (TOC) is not being removed from the water. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| 5.21 | Open the loop storage tank's drain valve to maintain the tank level (feed & bleed). | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| 5.22 | Continue the feed & bleed dilution for 1-2 hours. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Start Time: _____ End Time: _____ |
| 5.23 | Rinse the interior surface of the storage tank with DI water in order to rinse the sanitizer off the tank walls. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| 5.24 | Collect sample at points of use by opening user drop valve with the 5-gallon bucket. Make sure sufficient baking soda has been added in to bucket. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| 5.25 | Test sample at the points of use with Minncare® residual test strip to confirm the water concentration is less than 1 ppm residual concentration. Note: This may take longer than 1-2 hours. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| 5.26 | When the residual is less than 1 ppm, allow water to flow through user drops for 45 minutes to ensure the sanitizer is flushed from the point. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| 5.27 | Cycle ball valves in DI system to ensure chemical is not held-up in the valve's internal surface. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| 5.28 | Once the Minncare® residual is less than 1 ppm, drain the storage tank to the low-low level then close the drain valve and turn off the loop circulation pump. Note: The tank should be filled primarily with the make-up system (e.g. reverses osmosis system). This will keep the TOC level to a minimum. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |



CHEMICAL SANITIZATION OF DI DISTRIBUTION LOOPS

| Step | Description | Yes | No | N/A | Comments |
|------|--|--------------------------|--------------------------|--------------------------|----------|
| 5.29 | Close DI inlet and outlet valves and break the connection of inlet and outlet hoses. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| 5.30 | Connect inlet hose to inlet port of new (regenerated) DI bottle(s). Slowly open inlet valve and fill water through the regenerated DI bottle(s). | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| 5.31 | Until water level appears at the outlet port of the regenerated DI bottle(s), connect DI outlet hose to the outlet port of the regenerated DI bottle(s). | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| 5.32 | Open DI bleed valve to flush DI bottle(s) to drain for at least 3 minutes. Note: The loop circulation pump may be needed to accomplish this. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| 5.33 | With the loop circulation pump off, valve off and remove cartridge filter(s) (DI post filter and final filter) and replace with new filters. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| 5.34 | Return all valves to their normal operating position. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| 5.35 | Turn on the loop circulation pump. Verify that the pump is running. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| 5.36 | Turn on the UV sterilizer. Verify that the UV is on. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| 5.37 | After the system has been stabilized for 15 minutes, record the operating conditions on form # 6.022.1, Chemical Sanitization. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| 5.38 | Remove Tag at all points of use. Notify customer about the completion of sanitization. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |



CHEMICAL SANITIZATION OF DI DISTRIBUTION LOOPS

Operating Conditions

| Operating Conditions | Record Data |
|-----------------------------|-------------|
| Flow Rate (GPM) | |
| Pressure (PSI) | |
| Temperature (Deg F) | |
| Total Dissolved Solid (TDS) | |
| Others: _____ | |
| | |
| | |

End of Section

Comments: _____

Performed By
(Therma)

| Print Name | Signature | Date |
|------------|-----------|------|
| | | |