



Heat Exchanger (HEX) Cleaning-In-Place (CIP) Procedures

Initial Steps Prior to CIP

Before disengaging the HEX to be cleaned from the production line ("going offline" and having the in-situ camera inspection), gather the Initial Premaintenance Parameters:

1. dT (Difference in Temperature T1 (In) & T2 (Out)).
2. dP (Difference in Pressure. P1 & P2 and dF (Flow In minus Out)).
3. Before picture documentation.

Chemical Cleaning Procedures

- Transfer the specific quantity of BGA Chemical from the tote into a tank that will heat the chemical to 160° F.
- Upon reaching temperature begin the circulation process into the heat exchanger. A flow pressure of 35 to 40 PSI will be adequate at ground level (adjust pressure for elevation).
- At the top of the first hour reverse the flow direction. At the top of each subsequent hour repeat this process for a total of six hours.
- During the cleaning procedure and when reversing the flow each hour, monitor the pH (only for BGA Scale 130 chemical) to ensure the product performance during the CIP.
- Drain the BGA Chemical, at the conclusion of chemical cleaning, to another empty container **while simultaneously adding heated rinse water or adding heating rinse water as soon as the chemical is evacuated out of the vessel.**

Hot Water Rinsing Procedures

Remember, rinsing with **heated water (140° to 160° F)** is just as important as the circulation. (Note: Rinsing with cold water will counter the effect of the chemical cleaning and will redeposit what hydrocarbon remains in the HEX onto the interior surfaces.)

- Fill the heat exchanger with heated water from the bottom of the vessel so that the rinse water accesses all of the cells. The heated rinse water should circulate for 90 to 120 minutes depending on the vessel size.
- After rinsing, flush out the heated rinse water until the discharge has the same color as the incoming flush water. For BGA Scale 130 chemical – the pH level should be the same as the incoming flush water.
- Use as high a flow as possible and reverse the direction during rinsing, if possible.

After Cleaning Documentation

Gather after-cleaning parameters:

1. dT (Difference in Temperature T1 (In) & T2 (Out)).
2. dP (Difference in Pressure. P1 & P2 and dF (Flow In minus Out)).
3. After picture documentation.