

MAINTAINING A PLATE & FRAME HEAT EXCHANGER

Issue: How to clean/maintain a plate and frame heat exchanger.

Each Vmax system is tested and checked at the factory prior to shipment to ensure trouble-free operation. In the unlikely event you encounter a problem, we recommend that you consult with your local distributor for parts/service. Remember, when calling for service, parts or system information, always have the pump or system model number and serial number ready.

[Click here to find your local authorized distributor.](#)

WARNING! Before attempting any repairs, disconnect all power from the system by switching off power at the main breaker or disconnect switch. Always use appropriate Lock Out – Tag Out procedures.

A plate and frame heat exchanger is a stack of thin, corrugated metal plates (most often stainless steel), with ports for the passage of two fluids between which the heat transfer will occur. The plate pack is assembled between two frames that are compressed with threaded rods that are tightened to maintain pressure on the stack of plates.

The heat exchanger must be allowed to maximize its efficiency as it was originally designed at specific pressure drops. Proper maintenance of the heat exchanger will help to maintain the design temperatures of the process and reduce costly unscheduled downtime.

It does not take a process heating professional to recognize when maintenance is required on a plate and frame heat exchanger. Failures can be easily detected by visually inspecting for leaks from gaskets to the atmosphere or cross-contamination between fluids through cracks in the plates. Visual inspection can also indicate when fouling or plugging occurs on the plate surfaces, or when gaskets fail due to thermal fatigue or compression set. Also, when loss of heat transfer occurs and the unit does not cool or heat as designed, maintenance may be required.

Heat exchanger maintenance is provided by using CIP on-site maintenance or by cleaning facilities that are off-site. The difference is not the “how” but the “who”. Because CIP has the advantage of quick turnarounds in the maintenance cycle, it is an attractive method to use.

A typical CIP operation would be:

- The plate heat exchanger unit is turned off.
- All fluids are drained from the unit. Single-pass units are self-draining while multipass units may require special drain holes.
- A cleaning solution is circulated through the unit in a bottom-to-top flow to totally flood the unit and prevent channeling. When it is determined that the solution is no longer reacting with the substances inside the unit, the cleaning is complete.
- The unit is drained of the cleaning solution and, if necessary, rinsed with water and put back online.

While CIP has its advantages, there are times when the heat exchanger needs to be taken off to perform the proper maintenance. If the replacement of gaskets or other parts is necessary, off-site maintenance should be performed.

All replacement components should be original OEM parts to ensure they will be compatible with process fluids, pressures and temperatures.

If the plates are removed from the heat exchanger for cleaning, each plate should be inspected to determine if it requires replacement. A visual inspection of the gaskets and contact points on the remaining plates should be performed to determine if there is any erosion or apparent change from the original specification.

Plates should be pressure washed, rinsed and subjected to either hot caustic stripping (to be performed only by trained technicians) or a manual procedure to remove gaskets and any residual scale buildup. Plates are then re-gasketed with an OEM-specified gasket adhesive. The plates are reassembled in the frame and the tightening rods are tightened to the OEM torque values.

