PLATE & FRAME HEAT EXCHANGERS

INSPECT, MAINTAIN, REPLACE

OVERVIEW

This episode examines plate and frame heat exchangers as a critical component of refrigeration systems and how the IMR strategy supports reliability, efficiency, and long-term planning.

WHY PLATE & FRAME HEAT EXCHANGERS MATTER

Plate and frame heat exchangers transfer heat between fluids and are commonly used as:

- Evaporators and chillers
- Condensers
- Oil coolers
- Heat recovery systems

Their compact design delivers high efficiency while reducing refrigerant charge requirements.

WITHOUT PROPER OVERSIGHT:

- Performance declines due to fouling and scaling
- Energy consumption increases
- Leaks can develop
- Capacity can be reduced during peak demand

Plate and frame heat exchangers contain few moving parts, but they still require routine inspection and maintenance to ensure reliable operation.

PLATE & FRAME VS SHELL & TUBE

Plate & Frame	Shell & Tube
• Compact footprint • Higher heat transfer efficiency • Lower refrigerant charge • Expandable by adding plates • Serviceable plate packs and gaskets	• Larger footprint • Lower surface area efficiency • Higher refrigerant charge • Capacity changes require major modifications • More extensive repairs and retubing

IMR STRATEGY

INSPECTION: ESTABLISHING A BASELINE

Consistent inspection helps identify developing issues before they become costly failures.

Key Checks

- Look for oil, glycol, brine, or refrigerant leaks
- Inspect drain pans and drain lines
- Monitor pressure drop across the heat exchanger
- Track suction and head pressure trends
- Check for signs of fouling or reduced flow
- Review historical operating records for changing performance

Consistent inspection helps identify developing issues before they become costly failures.

New Facility?

When taking over an existing plant, establish a performance baseline with a qualified contractor and review historical operating data.

MAINTENANCE: EXTERNAL CARE

Routine maintenance can prevent many common issues.

Best Practices

- Keep external surfaces clean
- Inspect piping, valves, flanges, and gaskets
- Replace drain hoses as needed
- Verify mounting and frame bolts remain tight
- Lubricate tightening rods and bearings
- Inspect under shrouds for early signs of leakage

Regular inspections help identify small issues before they affect reliability.

REPLACEMENT PLANNING

Unlike many refrigeration components, plate and frame heat exchangers are typically repaired rather than replaced.

Typical Considerations

- Estimated service life is often 25+ years
- Replacement decisions should be condition-based
- Plates and gaskets are commonly renewed during the equipment lifecycle
- Entire heat exchangers are usually replaced only during major system upgrades or expansion projects

In some cases, additional plates can be added to increase heat transfer capacity rather than replacing the unit.

Beyond the System Podcast
Learn more at https://www.cimcorefrigeration.com/our-work/podcast
Helping refrigeration operators maximize equipment life through Inspect, Maintain, Replace (IMR).