

# Forced Circulation Reboiler Proprietary Process Liquid

**Industry: Chemical**  
**Location: USA**

**Application: Forced Circulation Reboiler**  
**Proprietary Process Liquid**

## Fouling Issue/Frequency

A steam-heated evaporation system recovers a volatile organic from a heavy organic solution laden with foulants. A hard, black scale that was forming in the upper 25% of the tubes was forcing the plant to switch two parallel once-through rising film evaporators with a clean pair every four to five days. When asked to increase throughput and simplify operations engineers considered installing a 2100-sq-ft falling film evaporator (FFE) to operate in series with the existing rising film evaporators (RFE). Although the combination system was expected to run approximately 10 weeks between cleanings, a better solution was needed.

## Solution/Approach

A fluidized bed heat exchanger used as a reboiler for an evaporator system to recover a volatile organic (82 m2)

## Results:

- More than 20 years in operation.
- No cleanings per year required compared to the 70 cleanings per year with the conventional reboiler (annual turnaround replaces cleaning every 4 to 5 days).
- A significant cost saving results from the higher recovery of acetic acid and the more concentrated residue in the bottoms.
- The reboiler circulation rate has been constant, thus providing uniform tower operation and more total throughput.

Heat exchanger specifications		Process Conditions	Tubes Side		Shell Side	
<b>Number of tubes</b>	55	Medium	Proprietary Liquid		Condensing Steam	
<b>Length Tubes</b>	10.5 m	Pressure	5 barg		11.4 barg	
<b>Diameter Tubes</b>	47.5 mm		In	Out	In	Out
<b>Particle Type</b>	Stainless Steel	Temperature (°C)	124	150	181.5	–
<b>Particle Size</b>	2 mm	Flow (m <sup>3</sup> /h)	160 m <sup>3</sup> /h		788 m <sup>3</sup> /h	



Say **NO** to fouling with the KLAREN self-cleaning heat exchanger technology