

► Crevice Corrosion of Stainless Steel

- Application : Treated Water Cooler
- Operating Period : Approximately 2 years
- Operating Fluids :
Treated water / Filtered water
- Operating Temperature
Treated water side: 50 °C
Filtered water side: 40 °C
- Plate Material : Type 304 Stainless Steel

● Phenomenon

Scale accumulated in the gap between the plate and the gasket on the treated water side, causing through-thickness corrosion cracks and resulting in external leakage.

● Cause

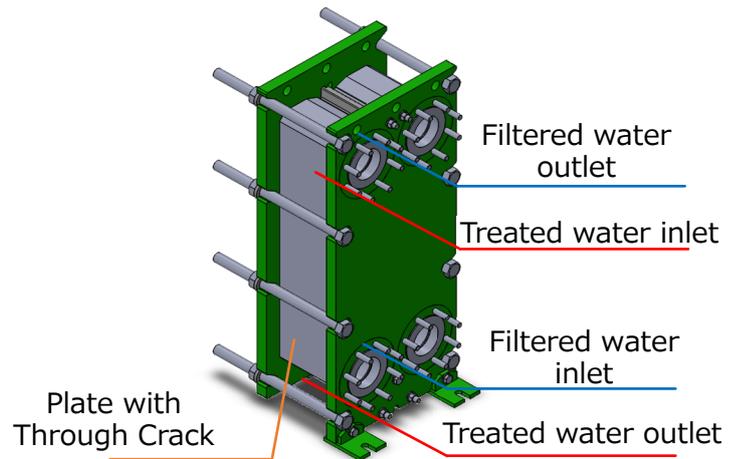
Stainless steel generally has sufficient corrosion resistance to neutral water; however, if the protective oxide film on the surface is damaged due to chloride ion attack or deposition/removal of foreign matter, corrosion can initiate at these points. After the initiation of localized corrosion, crevice corrosion likely progressed due to scale accumulation.

● Countermeasures

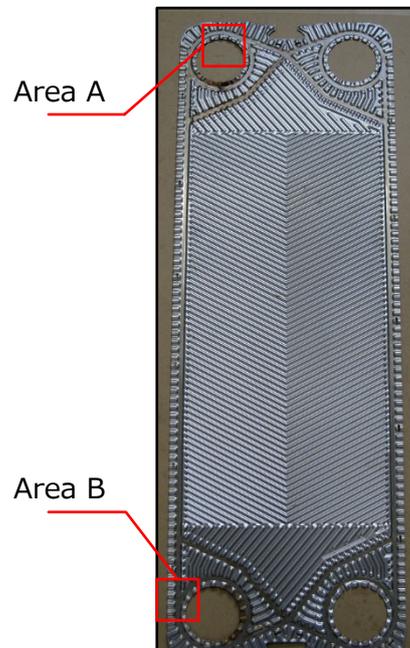
Possible countermeasures include:

- Replacing the plate material with SUS316, which has better crevice corrosion resistance;
- Improving water quality to reduce chloride ion concentration;
- Performing periodic disassembly and cleaning to reduce scale accumulation.

Note: Scale accumulation not only promotes corrosion, as in this case, but can also cause increased pressure loss and reduced heat transfer performance.

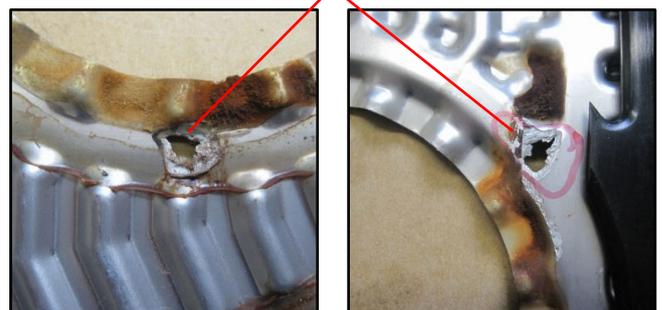


Defective Area



Overall View of the Plate on the Treated Water Side

Through Crack Caused by Crevice Corrosion



Enlarged Image of Area A

Enlarged Image of Area B (Rear Side)