

TEADIT® 25BI CASE HISTORY

INDUSTRIAL SEGMENT: Pulp and Paper

APPLICATION

Fluid(s)

Chlorine

Equipment

Chlorine filter (FRP material)

Temperature and Pressure

104 °F and 2.1 psi

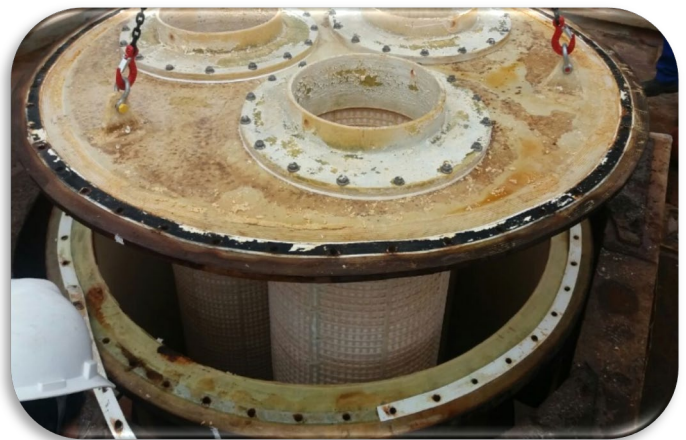
(Metric: 40 °C and 0.15 kgf/cm²)

SCENARIO

A pulp and paper mill had been experiencing leaks on their vertical wet chlorine filter tank for more than eight years. When the tanks leaked, they experienced contamination and corrosion of the equipment in the area. The leaking wet chlorine had become a major health and safety risk for the maintenance personnel who were exposed to an increased opportunity of chemical burns. Non-metallic equipment, like this FRP tank, provide a unique set of sealing challenges. The lightweight plastic flanges provided uneven sealing surfaces and would have bent or cracked if too much bolt load was applied during the flange assembly. These low bolt load flanges are designed to seal with gasket materials that can provide a reliable seal with very low gaskets stress applied – often less than 1,000 psi. That is why the original gasket specified was an elastomer, nitrile, because it seals at low gasket stress. Nitrile rubber is not chemically compatible with chlorine and would fail very quickly after coming in contact with the media. The original attempt to solve the problem was to change from an elastomer to an expanded PTFE gasket. The ePTFE gasket was supplied in a tape form the full width of the flange face. While it did provide great chemical resistance, the low bolt load spread out across the full width of the gasket tape resulted in low gasket stress. After the gasket tape failed, an evaluation of the gasket tape revealed that there was cracking of the low quality ePTFE gasket material and the supplier had recommended too thin of a tape to make sure that the recommendation was cost effective. The failed ePTFE gasket was too wide, too thin, and too cheap to handle an application that is too risky to sacrifice performance.

SOLUTION

Teadit's engineering team was contacted for technical support and was brought in to evaluate the application with the goal of increasing the safety and runtime of the equipment. The final recommendation was to continue to use an expanded PTFE gasket tape, but it needed to be a high quality, multi-directional ePTFE and there needed to be changes in the thickness and width of the tape used. Premium gasket tape, specifically Teadit



Style 25BI, was recommended in a thickness twice that of the previous tape to better compensate for the uneven surfaces of the flanges. The recommendation included installing two narrow strips of gasket tape instead of one wide tape. One strip would be placed inside the bolt holes providing the primary seal and a second strip would be outside of the bolts to avoid rotation and cracking of the flange. By using a two-piece solution, the total gasket area was reduced by approximately 40% resulting in an increase in gasket stress by more than 65%. Teadit also provided torque values and flange assembly assistance.



CUSTOMER GAINS

The pulp and paper mill installed the Teadit 25BI gasket tape over 18 months ago and have experienced no chlorine leaks.

This is a significant improvement when compared to the previous gasket tape, which would start to leak after only several hours of operation and get worse over time. There has been no loss of containment events on this tank, therefore allowing the mill to operate longer without a forced outage or routine maintenance. Teadit is being asked to assist with more problem-solving to continue to reduce the risk of injury and unnecessary maintenance. As a result, the culture in the wet chlorine area is changing. No longer is there the, "it's just always leaked" motto. They now believe that not all ePTFE spool gaskets are created equal.