

# Case Study: Mining Garlock ONE-UP® Diaphragms



## INDUSTRY

Zinc Refining

## CUSTOMER

A refining company located in the US specializes in the extraction of Zinc and uses 10+ AODD pumps in their process to move a slurry of sulfuric (up to 90% concentration) & hydrochloric acid (up to 36% concentration), D2EHPA (Di(2-ethylhexyl) phosphoric acid, kerosene, metal powder & flakes of various metals.

## BACKGROUND

The best option for the application was to use an AODD pump since it's able to handle the solids and it can be made mobile if the pumps are needed in different areas of the process. The process of extracting precious metals from refining requires a pump that can move various chemicals, fragments of metal and dust particles created from refining processes.

## CHALLENGES FACED

One of the issues the company ran into was their diaphragm performance which was drastically reduced due to the presence of the abrasives in their media. Initially they were using a two piece PTFE diaphragm with a rubber backer. This two piece PTFE diaphragm would begin to get concentrated areas of wear around the convolute area forming radial wear points which eventually crack and make the PTFE flake off piece by piece into the process media or the pump air motor. In this case, the PTFE began to fragment and was forced into the air side of the pump which caused major damage to the air distribution section of the pump.

This issue ended up costing them \$5k+ per pump due to downtime, pump repair costs and other administrative costs.

## SOLUTION AND BENEFITS

In response to this issue the companies MRO (maintenance, repair & operations) distributor converted them to the Garlock ONE-UP® diaphragm which has molded in ribs to reduce concentrated flex points. The results were very positive after 5 weeks; the ONE-UP® diaphragms showed no sign of crease marks, significant wear or sign of chemical attack. The ONE-UP® composite diaphragm is bonded together effectively capturing the ePTFE to the elastomer backer. Should the ePTFE of the diaphragm be breached, there is much less danger of diaphragm parts coming loose. This is important because it helps prevent pump damage, clogs that can occur in the pump or any other location down the pipeline and fragments of the diaphragm breaking off into the media. In the end the Garlock ONE-UP® composite diaphragms lasted 7+ months while the original 2 piece conventional PTFE & elastomeric parts only lasted an average life of 5 weeks.

For more information, please visit:  
<http://www.garlock.com>