When people at a plant hear “downtime,” their hearts sink. Days gone? Lost production? Backed up orders? During these times end users call on help from their local pump specialist. Such was the case in this application.

When a major producer of extruded aluminum had an issue of shortened life with some of the 6 x 6 sump pumps in service, the company called in a Motion Industries (Mi) process pump specialist to help.

The stainless steel sump pumps, used for an acid wash on their paint line, were lasting only 6 to 8 months. After that, catastrophic failure would occur to the volute and impeller. The aluminum producer suspected it was caused by cavitation.

The local Mi specialist made a quick observation and found that cavitation was occurring. The submersed depth of the suction of the pump was about 24 inches. The gallons per minute (gpm) was determined to be at least 850 gpm.

With some quick calculations, it was determined that the pump was not mounted deep enough in the tank to keep the liquid from vortexing (similar to draining in a bathtub) and causing cavitation to the pump.

Because of all this, the 1 percent sulfuric acid/water liquid that the plant was pumping was at a velocity far too high for the depth of the bell housing of the pump.

Because the bell depth on the sump pump was only 24 to 30 inches, the fluid should have been moving no more than approximately 4 feet per second, but instead it was moving at almost 9 1/2 feet per second. The lower velocity would prevent the pump from vortexing at the pump’s immersion depth. Immersing the pump lower would have stopped the vortex and resulted in inevitable failure.

But there was a problem. At the current fluid velocity, the suction of the pump would need to be immersed to 6 feet. The depth of the tank was only 44 inches deep. Luckily, immersion depth was not the only way to fix the problem and make the constant maintenance issues a thing of the past. The pump was incorrectly mounted, but this was quickly corrected with the right know-how.

The specialist determined that a simple fix would be placing a stainless steel plate above the bell housing of the pump to act as a “vortex breaker.” This plate would correct the vortexing, and with it the entire system. The specialist calculated the required size of the plate, the plant manager made it to his specifications, and the plate was immediately attached. The solution worked.

A Long-Lasting Solution

There was a time when these $10,000 pumps needed repairs of at least $2,000 to $3,000 every 30 to 45 days, with a complete replacement of the pump every 6 to 8 months at about $10,000 to $12,000.

By enlisting the help of a qualified process pumps specialist, users can have results as in this case: Two years with no new maintenance, no new repairs—adding up to an estimated $36,000 in savings since implementation.

To determine if process pumps are operating at their optimum or causing costly downtime, engage a qualified third party. Contact a local Motion Industries servicing branch to learn more.

This case study was written by Lon Boysen, a liquid handling product specialist for Motion Industries.