

POSITIVE SOLUTIONS

for

PUMPING PROBLEMS

Two success stories highlight the versatility of rotary lobe pumps

By Sarah Long, LobePro Rotary Pumps

Although careful measurement and testing can overcome many design problems, the obstacle of a limited or misplaced perception can be difficult to shake. For example, some people—even those with years of field experience—have a blind spot when it comes to the application of a rotary lobe pump and may be unclear why one can do the same, or better, job than a progressing cavity or centrifugal pump.

However, a rotary lobe pump can reduce an end user's total costs compared to other alternatives. These savings are achieved through reliability, energy efficiency, and wear part durability. Additionally, rotary lobe pump manufacturers, such as LobePro of Brunswick, Georgia, can provide application engineering and training and caring management, which can extend savings even further.

ROTARY LOBE PUMPS AT WORK

Rotary lobe pumps are typically used to pump sludge to and from thickeners, separators (such as belt presses, centrifuges, and rotary presses), digesters, and clarifiers. In fact, they are suitable for pumping any wastewater treatment plant sludge that contains hard solids over 1/8 inch and most grit removed for flows up to 2000 gallons per minute and pressures up to 150 pounds per square inch. The pumps can be specified for an in-line grinder, filter, or knock-out tank—should hard solids larger than 1/8 inch be present.

But the role of rotary lobe pumps is expanding. LobePro pumps are also used in oil and gas applications: pumping clean drilling fluid, feeding decanting centrifuges, booster pumps in pipelines for oil containing abrasives and waste oil, and pumping jet fuel and diesel from tanks requiring a suction lift. The API-Series pump complies with API 676 with a seal exception. LobePro manufactures an oil lubricated cartridge seal that is long lasting, leak free, and proven in many harsh applications.

To better understand the cost savings and the versatility of the rotary lobe pump, consider the following pair of examples.

CASE 1: PLAYING TO THEIR STRENGTHS

In this example, rotary lobe pumps, the LobePro SL133 and SM68 pumps, were used for an oily water sump transfer application. This was a large job that called for two API 676 compliant with exceptions LobePro SL133 pump systems, four API 676 compliant with exceptions LobePro SM68 pump systems, and one API 676 compliant with exceptions LobePro CL133 stainless steel pump system.

Oily Water Sump Transfer

Rotary lobe pumps work well for oily water sump transfer applications because they are self-priming and have a suction lift of up to 25 feet, which allows the pump to be mounted



LobePro pumps were used for an oily water sump transfer application

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at the top of the sump for easy servicing and prolonged life. The pumps also have a low shear, which leads to less emulsification.

Additionally, rotary lobe pumps are able to pump viscous fluids and fine abrasives because of their positive displacement design. The pumps are able to run at a slow speed, use rubber coated lobes, and hardened metals to reduce their sensitivity to abrasives.

Screen Backwash Pumping

The LobePro CL133 stainless steel pump was used for screen backwash pumping. Benefits of using a rotary lobe pump in screen backwash pumping applications are: The pumps are able to run at a high pressure allowing the pump to pump through long piping runs in the plant. The pumps have the capability to run forward or reverse which is an advantage in the backwashing process.

Rotary lobe pumps can also handle corrosive materials and fine abrasives. Stainless steel pumps are available to increase the pumps resistance to corrosive materials.

CASE 2: CONVERSION FROM PROGRESSING CAVITY PUMPS

A wastewater treatment plant in Pennsylvania contacted LobePro's local distributor to discuss replacing progressing cavity pumps that were costing the plant quite a bit of money in repairs. Dave Brenneman, one of LobePro's regional sales managers, met with the plant maintenance superintendent. The plant owns three 10-horsepower progressing cavity pumps, which are used to feed a centrifuge for dewatering their sludge. They are designed for 200 gallons per minute at 6 to 10 PSIG. The sludge ranged from 2 to 2.5 percent solids and has high grit content.

The Cost of Clogging

The plant operates two of the pumps to feed the centrifuge with one on standby. The issues with the progressing cavity pumps included the accumulation of hair and stringy material on the gear joint, which required monthly removal and rebuilding three to four times annually. The rebuilds range from only the rotor and stator at a cost of approximately \$6000 to a complete rebuild including the gear joint drive at a cost of approximately \$10,000. Annual maintenance for each pump runs between \$24,000 and \$32,000.

Efficient Repairs, Effective Service

Brenneman was able to show the plant maintenance superintendent and his maintenance crew the advantages of the LobePro Rotary Pump. LobePro offers a package that is half the size of the 101 inch progressing cavity pump the plant was using while maintaining an equivalent performance.

Parts to rebuild the LobePro are a fraction of the progressing cavity parts, and repair time is significantly less. The superintendent and his crew saw the value of LobePro and agreed to try our model SL-133 on a rent-to-buy option. The SL-133 was chosen to operate slowly in order to minimize wear and maximize time between rebuilds.



This 10-horsepower LobePro SL-133 was rebuilt fifteen months after installation in the wastewater treatment plant

When their LobePro SL-133 was put into service, it was initially set up to run pumping 217 gallons per minute. To see how the LobePro would hold up, the speed was bumped up to where the pump was pumping 240 gallons per minute. This was 20 percent higher capacity than the progressing cavity pumps were operating due to clogging and stringing, which allowed them to slow the one progressing cavity pump still operating to maintain the same flow to the centrifuge.

Reliable Over Time

The cover was pulled each month to inspect the LobePro for wear. After four months there were some signs of slight wear but no drop in performance. The plant would have ordinarily had to rebuild their pumps within that time frame. However, since the LobePro was carrying most of the plant load and they were able to alternate the remaining progressing cavity pumps, no rebuild was necessary. The LobePro had already paid for itself in maintenance savings.

Facing Adversity

Later that year, though, trouble hit the plant. A waste hauler dumped some highly abrasive material into the system. The LobePro and the original progressing cavity pumps were victims to the material. The plant maintenance superintendent says, "The bad news is the LobePro dropped off to about 30 percent of its designed flow. If there is any good news, the progressing cavity pumps are even worse." LobePro shipped them new lobes, wear plates and housing segments. The seals were not affected. A vacuum truck was called in to clean out the system and the LobePro pump was repaired.

Back on Line, Doing Fine

The system was back up and the LobePro back on line in just a few days. Cost of the repairs was under \$4000. The pump has now been back on line for ten months and is performing perfectly. Flow and pressure are continuing to hold with no drop off. The plant maintenance superintendent says, "We couldn't be happier with LobePro. We have requested budget approval to replace a second progressing cavity pump with a LobePro and will eventually replace them all."

The plant's lead mechanic adds, "I love this LobePro pump. It takes three guys three days to rebuild a progressing cavity pump. It took three hours to rebuild the LobePro, and I did it myself. I can't wait until we replace the other progressing cavity pumps with rotary lobe pumps." ■