

Mining Operation Uses NETZSCH Progressing Cavity Pumps to Efficiently Move Slurry

At a gold and silver mining operation in Mexico, a customer turned to NETZSCH for a low-maintenance solution to pumping slurry with a high concentration of minerals.

One of the processes involved in the mining of gold and silver requires the concentration of mineral slurry – essentially dewatering a mixture of mineral ore and water. Once the mineral slurry is concentrated, it must be pumped to the next phase of processing, normally leaching. At a large gold and silver mining operation in northern Mexico, the customer was having problems optimizing the transport of slurry from their dewatering process, causing havoc with pumps involved in the operation.

Concentration of 60% sought by customer

The customer was looking to achieve a concentration of 60% mineral solids in the slurry. The problem they faced was that the centrifugal pumps transporting the decanted slurry were not able to pump slurry with a concentration above 30%. This required the mine operator to re-inject water back into the slurry to make it fluid enough to pump – after just spending energy and chemicals to dewater it in the decanting process. In addition, the centrifugal pumps required constant maintenance and a complete change-out after only three months of operation. Slurry with a lower concentration of minerals also requires costly dewatering in the next phase of



One of the three NETZSCH NEMO® progressing cavity pumps at the mining operation seen here in slurry transport service.

processing. And, to make matters worse, a more fluid slurry contains less gold and silver, leading to lower plant optimization.

Looking for a solution to their problems with centrifugal pumps, the customer tried out a rotary lobe pump. However, after two days of operation the pump housing was destroyed. NETZSCH was then contacted through a distributor to help try to solve this production problem. Antonio Castilhos, a NETZSCH representative recalls, “When I first learned about the slurry concentration the customer was looking to pump, I wasn’t sure if we could achieve that. However, I knew if we could get the customer to a higher concentration of minerals in the slurry, they would be able to produce more

Pump Data

Pump type:	NEMO® NM Series
Capacity:	10 m³/h / 45 gpm
Pressure:	130 psi / 9 bar
Medium:	Gold and silver slurry
Solids content:	Up to 65%
Temperature:	Approx 85° F / 30° C
Viscosity:	N.I.
Speed:	130 rpm

silver and more gold per hour, at a lower cost. So, we decided to take a look.”

NETZSCH began production trials at the mine with a stock progressing cavity pump. The production testing began with

Contact NETZSCH

NEMO® Progressing Cavity Pumps have a very broad application range and are used in all branches of industry for the continuous, pressure-stable, gentle and low-pulsation conveyance of almost any substance. Whether for sludge, chemical substances, adhesives, petroleum or yogurt, one of the eleven pump types by NETZSCH in four rotor/stator geometries and a selection of engineered joints are sure to suit your application.

NETZSCH customers rely on our rigorous standards in design, engineering and manufacturing to deliver products with absolute functional reliability and exceptional quality. NETZSCH service, like NETZSCH quality, is geared to surpass our customers' expectations.

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the same slurry mixture of 30% mining solids that was currently feeding the centrifugal pumps. Throughout the trials, the water content in the slurry was constantly lowered until the water injection was stopped altogether – with the NETZSCH pump able to pump slurry of up to 65% of minerals solids. Castilhos remembers, “With the capabilities of the NEMO® pump line to work in difficult processes, we were able to pump the slurry without any injection of water. The customer told us that this level of performance would pay for the cost of the pump within two or three hours of operation.” Additionally, with less water in the slurry, the next processing phase (leaching) would be able to use a lower volume of aggressive chemicals – a big cost benefit for the customer.

Custom progressing cavity pump specified

With a successful trial, final specifications for the production pumps were addressed. For this slurry pumping application, a NEMO® NM Series pump was specified using a tungsten carbide rotor and a NEMOLAST® S61M with superior abrasion resistance stator. A variable frequency drive was also used to verify the best operating speed during the tests. Pump rotation was initially 189 rpm with a 20 hp motor, but after testing, the best rotation was determined to be 130 rpm.

The NETZSCH progressing cavity pump product line is built for difficult applications. The company's NEMO® NM Pump

Series is built with an enlarged stuffing box and tapered suction housing that results in more efficient and trouble free operations. The pump is self-priming, has a low shear rate on pumped fluid, and is built for handling highly viscous fluids with solids content.

Today, the mining operation is running three slurry lines with NEMO® progressing cavity pumps and the customer is seeing bottom-line operational and life cycle cost benefits. Not having to inject water back into the slurry saves on costly chemical processing in the leaching operation. From a life cycle cost perspective, the mining operation has dramatically lowered the maintenance and replacement costs associated with the earlier centrifugal pumps. Even with the abrasive nature of the slurry, the rotor and stator in the NETZSCH pump are lasting three months before requiring replacement. And, with plant uptime improved, more gold and silver ore can be processed, leading to an improvement in overall operational profitability.