

# Not just any pump will do for a filter press

The role of a filter press in recovering valuable saleable product makes it an important consideration for a mine operator, and just as important is the selection of the most appropriate pump for this application. Weir Minerals Africa has the expertise to advise on the best selection and offers a wide range of suitable pumps. Marnus Koorts, product manager for slurry pumps at Weir Minerals Africa explains.

**A**s a mission-critical system in the mineral concentration process, the filter press demands a carefully selected pump to ensure optimal performance and uptime.

According to Marnus Koorts, product manager for slurry pumps at Weir Minerals Africa, the role of a filter press in recovering valuable saleable product is an important consideration for a mine operator. The high pressures associated with operating a filter press, however, often lead the pump to underperform.

"The operation of a filter press involves a wide spectrum of pressure and flow conditions within each cycle," Koorts says. "This ranges from high-flow, low-pressure conditions when slurry is initially being pumped into the press, to low-flow and high-pressure when full."

He emphasises that it is not enough to simply specify a pump for the average of this range of conditions. Rather, it is vital to establish the minimum and maximum values on the spectrum and to specify accordingly.

"Filter presses in the market can demand pressures of up to 45 bar," he says. "In many cases, therefore, the application requires high-pressure pumps such as the Warman AHPP high pressure range. Where lower pressure requirements are present, the newer

technology of the Warman WBH could be used as it is generally a more efficient pump with longer wear life of spare parts."

Failure of the pump to deliver enough pressure to the filter results in the solid-liquid separation process being inefficient. The selection of the right size of pump is therefore an important starting point in ensuring optimal operation.

With decades of experience in this field, Weir Minerals Africa has developed the expertise to advise on the best selection. It also offers a wide range of pumps suitable for filter press use.

Another key aspect of the customer's selection, Koorts says, is the choice of sealing arrangement. This aspect of the pump can often lead to issues in the plant, when valuable product is lost through leakage.

"An expeller seal is not usually recommended, as the pressure it needs to generate to seal the pump is generally not sufficient for filter press applications," he says.

The stuffing box option can be used under certain conditions. However, the pressure of the surface water needs to be higher than the pressure inside the pump. This means that it would usually only be suitable for a low-pressure pump on a low-pressure filter press.

"When the filter press requires a higher pressure, then the plant will have to provide



a water line with a higher pressure to feed the gland, or it will not seal properly," he says.

The preferred sealing option is a mechanical seal. While more costly, the mechanical seal can offer the customer substantial savings by preventing product being lost and downtime being incurred. "While the benefits of a mechanical seal far outweigh its cost, it must be properly installed by a specialist," Koorts warns. "It is a specialised piece of equipment and we see plenty that fail due to incorrect installation."

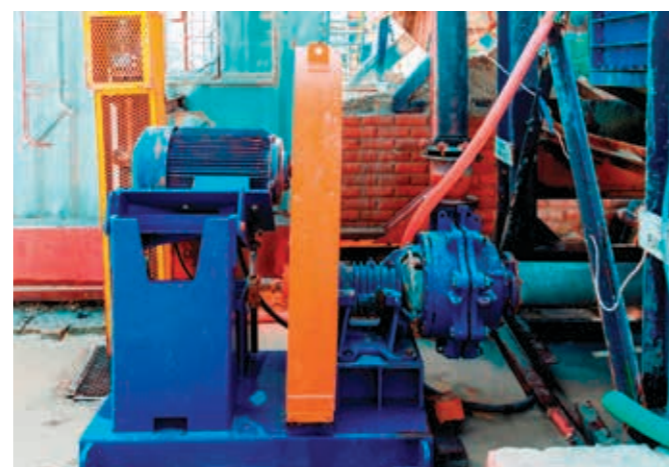
A further consideration is the level of corrosive trace elements in the slurry. This can lead to rapid corrosion of mild steel pumps, and many applications require stainless steel options.

Comprehensive technical backup needs to underpin each step in this process, emphasises Koorts. For Weir Minerals Africa, this begins with its high quality local manufacturing process. This integrated process includes foundries for casting components, through to local componentry manufacture and assembly capability.

"This quality control and capacity feeds



The local manufacturing process at Weir Minerals Africa includes foundry and assembly capacity for producing slurry pumps.



The new Warman WBH slurry pump with streamlined impeller inlet handles the most difficult slurries.



Technical backup for the slurry pump range is readily available through the extensive branch network throughout the region.



Pressure tests are conducted on slurry and dewatering pumps to ensure the quality of Weir Minerals' locally manufactured products.

into our spares availability and service exchanges for refurbished pumps," he says. "The

result is quick supply throughout strategically located branch network with 12 offices in

South Africa and eight through the rest of Africa." □

## Warman upgrade for world's largest platinum mine

Anglo American Platinum's Mogalakwena Mine was able to increase throughput and reduce energy consumption in its secondary mill circuit with the installation of a Warman® MCR® 450 pump. The pump solution, equipped with a rubber lining and metal impeller, was provided by Weir Minerals Africa.

The mine, near Mokopane in Limpopo province, is the world's largest open pit platinum mine with among the lowest operating costs. In line with the mine's focus on productivity, Weir Minerals Africa proposed this pump solution as it offered a higher volumetric capacity in anticipation of future increases in throughput.

The larger impeller of the Warman® MCR® pump allows lower pump speeds and consequently less wear. The rubber liner of the Warman® MCR® pump is lighter and the hydraulic design has improved efficiency and wear characteristics. This allowed the mine to raise its production target from 600 000 to 700 000 dry tonnes per month.

The replacement pumps were retrofitted to the existing footprint, without disturbing existing motors, gearbox drives or pipework. On-site Weir Minerals Africa technicians were deployed during the commissioning phase. Once installed, the MCR® 450 pumped milled ore at a rate of 4 400 m³ per hour, shifting 760 000 dry tonnes per month.

Online for 78.9% of the plant's operational time, the pump was able to deliver significant savings through lower power consumption. After 3 000 hours in operation, the Warman® MCR® 450 pump was examined to evaluate the wear rate of the hydraulic components. Localised wear was evident on some of the components, and the mine decided to continue running the pump to its point of imminent failure. The improved wear life will result in a significant saving for the customer.

The independent study conducted after the initial installation confirmed the pump's improved performance. The study also recommended converting all mill discharge

pumps at the operation to Warman® MCR® 450 pumps, to maximise pump performance and reduce energy consumption.

Based on the mine's satisfaction with the way the pump met its objectives, it has placed an order for three Warman® MCR® 450 pump conversion kits to retrofit the remaining Warman® AH® 20/18 RE pumps installed in the secondary mill circuit. □



A Warman MCR 450 installed at Mogalakwena Mine. The MCR 450 runs at lower speeds resulting in lower wear rates on the parts.



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