FLSmidth

WE DISCOVER POTENTIAL

KREBS® pumps
UMD™ 650 Conversion

Longer wear life with KREBS® cyclone feed and mill discharge pumps offers the lowest cost per ton pumped

- Handles tough, abrasive slurry
- Ultra wear-resistant materials
- Even and predictable wear life
- Reduces maintenance and safety risks

The KREBS® UMD™ has tripled the life of the fastest wearing parts, with plans to further increase. The customer is happy with the safety benefits gained by these improvements. With fewer visits to the pump, lowering the injury risk to workers was a key part of the decision to buy two more complete pumps.

With these results, it's easy to see why the competitor's pump was converted to the KREBS® UMD™ pump.

Background and objective

A gold mine in Indonesia was seeking improvement at a ball mill in the concentrator for a cyclone feed application.

The wear life of the installed competitor pump's wet end parts was not reaching the targets expected by maintenance and production. With the periods between pump rebuilds shorter than planned, the hours of required maintenance were increased, which elevated the risk of injury.

In a facility processing 240,000 tons of ore per day, the frequent maintenance requirements added up to be a significant concern. As part of the plant's continuous improvement strategies, they decided it was time to look at other pump options.

FLSmidth received an opportunity to offer a longer-lasting, safer solution.

A winning combination of innovative design and materials

Defining the project

In a fast moving, high intensity process such as milling, continuous operation of the equipment is essential for maximising production and revenue. At these plants, downtime is not cheap. It can take up to 18–19 hours to rebuild large mill discharge pumps, which equates to millions in lost revenue unless the plant has duty and standby pumps, as this customer does. Considering the time, expense and hazards that are part of replacing wear parts, the life of these parts is vital. For this study, a side by side comparison of wear life would be completed to see what improvements could be made using the KREBS Ultimate Mill Discharge (UMD) pump.

FLSmidth proposed to the customer that they install the KREBS UMD pump at one ball mill. Upon installation, FLSmidth would trial different material combinations on the suction liner and wear ring in order to maximize the life of the wear parts.

The solution

FLSmidth installed the UMD 26×22 at the ball mill, in the highly abrasive, severe duty, cyclone feed application. Different suction liner and wear ring material combinations would be tested, while impeller and casing material remain constant across both trials. Targets for the casing, impeller and suction liner assembly were set at the values shown in the table below.

The results

At the end of the first run, the suction liner and wear ring were removed and assessed. Even wear was seen across the wear ring. The suction liner, however, showed little wear. Regardless, both suction liner and wear ring were decommissioned and replaced with new materials. The casing and impeller were not removed because both parts still had significant life left and new materials would not be tested for the trial.

After the second run, considerable uniform wear of the suction liner was found. It was at the end of its life. However, the wear ring showed no signs of wear and it could continue in operation with the pump. The original casing and impeller were still not removed. The impeller has already surpassed the target wear life, and the casing is on track to achieve its targeted wear life. Moving forward, more material combinations are planned to further surpass the targeted wear life.

After only two runs, with more planned, the impeller has already surpassed the life of the competitor's component by 2.5 times. The suction liner assembly has already lasted three times as long as the wear life of the competitor, and it still has additional life left. With significantly increased life, the KREBS UMD pump is increasing uptime in this critical cyclone feed application. These numbers will only get better when a complete optimisation of the pump's materials is completed.

Component	Wear Life (%) Competitor pump 24×20	Target Wear Life (%) UMD 26×22 Run 1 & 2	Wear Life (%) UMD 26×22 Run 1	Wear Life (%) UMD 26×22 Run 2
*Suction Liner Assembly	100%	200%	306%	233%
Impeller	100%	220%	(still running) **see note	270% (still running) **see note
Casing	100%	102%	(still running) **see note	90% (still running) **see note

** KREBS® Suction liner assembly contains the wear ring*
*** Note that the impeller and casing operated in both Run 1 and 2 and are still running. The current wear life percentages are shown in Run 2.*

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