Weir Minerals' Mudflo pump shows value of ETO solution

Launched globally last year, Weir Minerals' dredge/excavator-mounted Multiflo® Mudflo™ pump is a telling example of how the company has leveraged its growing range of products to integrate diverse offerings into solutions that are engineered to order (ETO).

Marnus Koorts, general manager of pump products at Weir Minerals Africa, points to this hydraulic submersible slurry pump as indicative of the company's journey from equipment supplier to solution provider. The Multiflo® Mudflo™ pump has been engineered for abrasive applications and large particle handling. Its key features are a hydraulically driven wet-end, specifically designed to efficiently and safely reprocess and relocate tailings ponds, maintain water retention dams and manage slimes and sludge ponds.

"Initially developed by our colleagues in Australia for a mining customer in Indonesia, the Multiflo Mudflo pump addressed their constant challenge with mud on site, which was caused by high rainfall and really impeded production," says Koorts. "The traditional method of dealing with this problem was by digging up the wet material with an excavator and trucking it off-site for dumping. This was a laborious and costly process."

Since Weir Minerals' heavy duty pump solution began operating at the mine in mid-2021, it has reduced mud processing time by 60%, and is estimated to be 13 times more affordable than the truck and shovel technique. Cutting down on fuel and transport costs, the new solution is able to conveniently pump mud through robust pipelines to its end destination. At a head of 70 metres, the unit on this site was able to pump 180 ℓ of mud every second.

"This translates into increased uptime for mining operations, improvements in environmental impact, and lower operating expenses," he says. "The beauty of the solution is that it incorporates a number of equipment offerings that are well proven by our customers and well supported by Weir Minerals."

Marnus Koorts, general manager pump products at Weir Minerals Africa.

The Multiflo Mudflo pump combines elements of the Warman® MGS submersible slurry pump-end and a custom Multiflo designed bearing assembly coupled to a hydraulic motor. The motor can be sized to handle a range of high density liquids. The Mudflo is also paired with twin Multiflo® CB33 hydraulic cutters with Weir ESCO® excavation teeth. The cutters mechanically agitate the settled solids, allowing abrasive and highly charged slurries, and mud, to be efficiently pumped.

The Multiflo® Mudflo™ pump and dredge unit is paired with twin Multiflo® CB33 hydraulic cutters with Weir ESCO® excavation teeth.

Weir ESCO® teeth utilise the two-piece Ultralok® tooth system to prevent premature breakage, avoid tooth loss and protect the integral locking system to ensure continuous operation of the pump. Weir ESCO, as the world leader in ground-engaging tools, became part of the Weir Group a few years ago. Koorts notes that Weir Minerals' expertise in abrasion was therefore valuably augmented by Weir ESCO's expertise about impact.

Other key product combinations in the Multiflo Mudflo pump are Weir Minerals' Ultrachrome® A05 chrome alloy casting for high wear resistance, and a suction strainer to prevent excessively large particles clogging the pump. This ensures optimal uptime for the unit, while facilitating high levels of performance: the Mudflo 200 pump is capable of pumping between 150 m^3/h and 1 200 m^3/h, up to a head of 82 m. The maximum particle size it can handle is 80 mm, while the maximum temperature of the liquid being pumped can be as high as 35 °C.

"This new innovation can be assembled on land, eliminating the safety risks associated with assembling pumps over water," he says. "Our new hydraulic hose management system further reduces risk by preventing hose entanglement and avoiding trip hazards, while still providing a reliable hose bend radius to ensure smooth oil flow.

"Our Multiflo brand is a well-established range of mobile solutions including pumps and skids, which can be electrically powered or diesel-driven," says Koorts. "We have also expanded into the application of pontoons recently, which has earned us considerable success through the incorporation of equipment such as pumps, hydraulics, cyclone separators, valves and hoses, in which Weir Minerals excels."

He highlights industry's need for mobile dewatering solutions and also flotational dewatering solutions, for which Weir Minerals has developed a depth of expertise in the science of buoyancy. The Multiflo Mudflo pump can be applied to many different dredging applications including tailings storage facilities, harbour or marine maintenance, sand and gravel mining, maintaining water storage capacity in retention ponds, slime removal from sludge ponds, and land reclamation.

"The way this solution has evolved shows the progress we have made in recent years towards integrating our product lines to add value to our offerings," says Koorts. "ETO is fully embraced by our engineering teams to achieve results that are more than just the sum of their parts." In this case, the company's dewatering experts were able to draw on the best technology from Weir Minerals' Multiflo, Warman and Weir ESCO brands – combining them with advanced hydraulics to create an innovative result.

Engineered for abrasive applications, the design can be applied to many different dredging applications including tailings storage facilities, harbour or marine maintenance, sand and gravel mining, maintaining water storage ponds, slime removal from sludge ponds and land reclamation.

The Multiflo Mudflo pump was initially designed to address the constant challenge of mud caused by high rainfall, which was impeding production.

The Mudflo pump can be assembled onto the dredge unit on land, eliminating safety risks of assembling pumps over water.

"Our presence in the field and our proximity to customers means we develop a detailed understanding of their specific requirements," he says. "This gives our ETO capability a special relevance to our customer base, as we can ensure that our innovations are fit for purpose."

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