

pump's gas collection chamber. The inducer vanes apply a swirl effect to the feed, forcing the heavier slurry to the outer edge of the pump while the gas gathers in the middle, where it's transferred to the collection chamber by holes in the impeller.

This technology is aimed at delivering flexibility to operate at far higher froth volume factors where standard froth pumps will generally stall, the company says.

On the digital side, Weir Minerals is also continuing to log Warman pump design data, maintenance histories and pump curves within its Synertrex® digital platform.

Ole Knudsen, Weir Minerals Digital Director, said: "We've recently announced partnerships with AVEVA, a global leader in industrial software, driving digital transformation and sustainability, and XMPRO, a leading digital twin platform, that enhance our Synertrex digital ecosystem, where collaborative actions can be performed and events put into perspective.

"In the future, the connected mine will

combine intelligent data from multiple equipment levels, ushering in a new era of equipment performance."

Through an expanded partnership related to tailings processing with Andritz, Weir Minerals is also looking into integrating Andritz's separation technology with its own minerals and tailings processing solutions for dry-stacking applications.

John McNulty, Weir Minerals Vice President Global Engineering and Technology, said: "The partnership with Andritz allows Weir Minerals to draw on their extensive knowledge of tailings thickening and evaluate, develop and execute a bespoke tailings management solution."

At the same time as the emphasis on potential dry stacking of tailings is gaining motion, so too is the use of diesel alternatives for powering pumps.

Ian Ross, Weir Minerals Global Product Manager, Dewatering Solutions, said the company is in a good position to help operators make the transition from diesel- to electric-powered pumps, especially on the dewatering side.

"We already have the capabilities," he said.

"The Multiflo® range of electric-driven pump units are capable of pumping not only water against high head situations, but also the large quantities of solids and slurries associated with mine dewatering."

Across mines in Indonesia, owned by PT Putra Perkasa Abadi (PPA) and PT Bukit Makmur Mandiri Utama (BUMA), Weir Minerals already provides a combination of both diesel- and electric-powered units.

In the future, the company sees many opportunities to add to its electric-powered pump reference list with business from third-party contractors.

Ross explained: "Because the Multiflo dewatering pumps are specialised equipment, it's not always necessary for a mine site to have one on-hand all the time; they may want to hire a contractor to carry out project work, instead. The type of projects it is ideal for – relocating mud, dredging pits after a new orebody is discovered, etc – usually take between three and 12 months.

### Critical valve selection

Valve selection is a critical factor in the successful operation and commercial success of a slurry transportation pipeline, according to Kenny Gorman, Mining Industry Director, **ValvTechnologies**. An inferior valve selection can significantly negatively impact the valves, other pipeline equipment (pumps, piping, instruments, chokes, etc) and the pipeline operation itself, with risks of substantial downtime and related losses in revenue.

ValvTechnologies has been involved in slurry valve technology for 35 years as a designer and manufacturer of severe service, zero leakage valves, supplying long-distance slurry transportation pipelines across the globe and many tailings transportation pipeline operations.

The first of its valves were commissioned at a copper operation in Chile. From there, ValvTechnologies says it has gone on to supply over 8,000 AbrasoTech® valves to slurry pipelines worldwide, amassing over 500 million operating hours in the process.

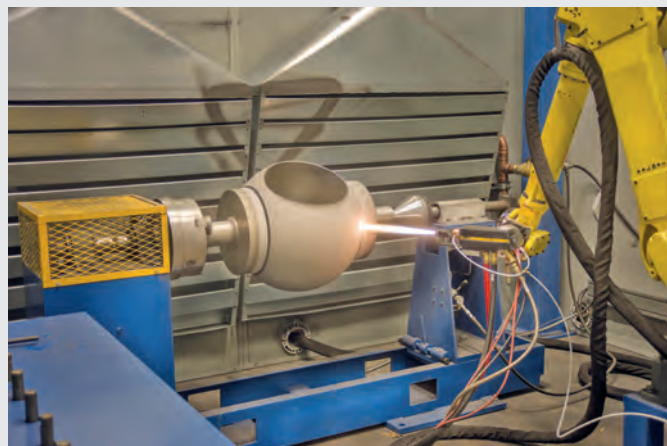
"Whether installed in a pump station, choke station, valve station, terminal or header station, all applications have one thing in common: the need for dependable and absolute zero leakage isolation," Gorman said.

ValvTechnologies engineers are involved from the preliminary stages of a project and work closely with engineering consultants, EPCs and mining companies to ensure all requirements are fully defined and that an optimal valve solution is provided, Gorman says. At existing pipeline operations, ValvTechnologies engineers work as consultants with operators to offer knowledge to increase efficiencies, lower costs and achieve increased production targets.

"The unmatched success of the AbrasoTech valve is due to its unique internal design features, which are engineered specifically for each application to achieve maximum reliability and long service life," Gorman said. "AbrasoTech's unique integral seat design significantly improves the reliability and wear life of the valve by eliminating internal leak paths through which high-pressure slurry can pass and cause erosion and wear."

ValvTechnologies' experience covers various ores, concentrates and tailings. Within this, copper, iron, zinc, nickel and phosphate operations have been served in extremely diverse environments.

"For each case, numerous operational factors need to be considered, such as slurry properties and characteristics, the effects of a changing



*State-of-the-art HVOF RiTech® coatings are robotically applied to critical areas in the AbrasoTech® valve to further protect against erosion and corrosion, ValvTechnologies says*

orebody, sites of valve installations and the expectations of future throughputs," Gorman said. "Every operation is unique, and this needs to be reflected in the valve designs proposed if the customer is to receive the most appropriate solution."

Specifically, pump isolation is a vital application, and the reliability of valves is arguably more critical in this service than in any other, he argues. Any leak at the pump isolation valve can jeopardise the integrity of the pumps and team safety.

Current industry standards for testing metal/metal seated ball valves (ANSI/FCI 70-2, ASME B16.34 & API 598) permit a certain amount of leakage during factory acceptance tests, but if a valve shows leakage during the factory test, this situation can only worsen when introduced into operation and subjected to the slurry.

ValvTechnologies developed in-house test acceptance criteria exceeding all industry standards to provide the most reliable and safe valve solutions, Gorman said. This requires "no visually detectable leakage for the test duration", equivalent to ISO5208 rate A: a measure that previously only soft seated valves could achieve. This is a distinction proven in the field and highly valued by operators, he added.