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Tailings Management — What progress has been made since Brumadinho?

MINExpo 2024 Post-show Report

Advances in Shotcrete

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our equipment," Rooney said. "The idea is to try to reduce our client's downtime and really understand our equipment better."

Service centers enable the supplier to "get as close to our clients as possible," Rooney said. Whereas the manufacturing centers are large, "our service centers are smaller and much more intimate," he said. "We are teaming up with our clients to bring product back into our shops, do a teardown, and then rebuild them, usually at a fraction of the cost of a new product."

The service centers also support the company's exchange program. "We partner with them so we really understand their usage," Rooney said. "When they bring their product in, we already have one ready to go on the truck for them," he said. "We send that to them. It minimizes their downtime and lead times overall."

The exchange program works "well for our customers if they have resource issues, but also, just from a planning perspective, in managing their inventory better," Rooney said. "They are bringing product out and putting product in much quicker with these programs than they ever have before."

Also, FLS announced a mill liner recycling solution. "We are going to be putting that system into North America in 2025," said Todd Moir, global director, milling consumables.

The solution answers the enduring challenge of what to do with the company's top-shelf composite liners. "How do you separate rubber from metal instead of it going to the landfill?" Moir said.

"We've developed a system that is very environmentally friendly," he said. "Our first system will be installed in Chile later this year."

FLS showcased its composite liners. "Some of the advantages of this type of product are that you get wear life, the durability of metal, but you have a much lighter product that is considerably safer to install," Moir said. "This is one of the premium products we are producing now."

Compact Battery-electric Loader

Aramine showcased the L140B, a battery-powered loader with roughly 1.5-metric ton (mt) capacity. Leadership at the company said the unit caps a long evolutionary process driven by customer sustainability needs.

"We now have more than 50 machines in operation," said Marc Melkonian, managing director. "We have passed 200,000 operating hours underground in very tough mines, in very high altitude mines," he said. "We know our solution is really proven for all the mines."

The design is available in two models. The bigger L440B "has a near-5-mt capacity but with exactly the same technology," Melkonian said.

Exemplary of that technology is the quick disconnect system for recharging. "It is simple, efficient, reliable," he said.

The energy module on the rear of the unit integrates the battery, charger, and electronic controls. "It offers four-hours of autonomy in very difficult applications," Melkonian said. "In an easy application, on flat ground, it can go over 5 hours."

On the L140B, the module can be replaced in 10 minutes using a 1-mt crane. The bigger model uses a 5-mt crane.

The quick replacement system allows the loader to run almost continuously. A module can be charging while the ma-

chine is in operation, and installed during a 10-minute break.

The module is compact, small enough to have no bearing on the machine's center of gravity, Melkonian said. It has two plugs for the two integrated battery packs.

"The reason for that is if there is a failure on one battery pack, on the charger, on the electric components, then the machine continues running on the other pack," he said. "It doesn't stop the operation of the mine."

The clean-sheet design all but eliminated the need for brakes. "We have designed the system in a way that we can use the electric motor to stop the machine," Melkonian said. "Fully charged, on a ramp, the machine does not need a brake pedal."

While the loaders do feature a brake pedal, "it is not necessary," he said. Its redundancy means the brakes could last the life of the machine. "That is a big, big change."

Both models come ready to adopt Industry 4.0 solutions. "All these machines are electronic and collect all of the information on the battery, the wheels, driveline, and hydraulic system," Melkonian said. "All the data can be collected and analyzed to anticipate any possible failure of the components," he said. "With the correct maintenance, there is no breakdown."

Neither models have a transmission. "These machines are fully electric," he said. "They have an electric motor for locomotion and an electric motor for driving the hydraulic system."

Thus far the units in the field have undermined the myth that battery electric loaders are burdensome compared to diesel competitors, Melkonian said. "When we provide a battery machine to a mine, they realize how simple it is compared to a diesel machine," he said. "Bringing the fuel underground, for example."

The success of the units in the field have also positioned Aramine for growth, said Christophe Melkonian, president. "We tend to be the best offer on the market for this small segmentation."

Weir Displays Its Breadth of Solutions

Weir unveiled a range of new innovative technologies and solutions for mining and mineral processing. The company officially launched the ESCO NEXSYS GET Lip System for rope shovel dippers. It also showcased an new high-capacity ENDURON ELITE screen. The stand also featured a Digital Hub, which highlighted the company's digital offering — MOTION METRICS and Weir's new digital brand, NEXT Intelligent Solutions.

"We've been doing a lot of work to expand our portfolio of innovative, end-to-end solutions to help our customers produce the metals and minerals required to transition to a low carbon economy and it's exciting to be able to show that off at the world's largest mining show," said Jon Stanton, CEO, Weir. "It is clear the world needs more metals and minerals but there is a recognition in the industry that we need to mine them more sustainably than we have in the past. That means using less energy, using water wisely and generating less waste. And Weir — with our world-class engineering, advanced materials science and intelligent automation — is at the forefront of helping miners do that."

At MINExpo 2024, Weir displayed a Production Master bucket with a NEXSYS Lip System, which lowers lip maintenance requirements, extends tooth and adapter life and, ultimately, provides miners with longer uninterrupted shovel operation.

"This system has been under development since about 2018," said Kevin Sause Stangeland, vice president of global products for ESCO Weir Group. "The tooth offers about 15% longer wear life than our current system. The aspect ratio of the box section has been expanded and that helps protect the bottom leg of the adapter.

"We were able to optimize the geometry to take the loads that come into the system very cleanly, which eliminates the wear," he said. "The new geometry also offers a tight cast fit with the leading edge of the lip. Those factors combine to extend the life on the lip. In our first trial, which ran about 15 months, we pulled the system apart and found we only needed a couple of weld touchups. Typically, the mine would see about 25 hours of welding repair required after one campaign per position. And in our field trials we saw about three hours."

Weir said the NEXT Intelligent Solutions extend and expand its current capabilities and transforms its process optimization services into real-time digital solutions. Weir has developed digital packages for much of its equipment, including pumps, cyclones, HPGRs, and screens.

"Using real time data, AI driven analytics and the latest technologies, we are delivering a solution that provides insights and recommendations for the customers so they can optimize the efficiency and operation of the machines and processes," said King Becerra, Director Digital Product Strategy at Weir Minerals. "These digital solutions help the mining industry work smarter, more efficiently and more sustainably."

The ENDURON ELITE screen is a high-capacity, double-deck banana screen, available in a range of sizes, the largest of which has a deck measuring 4.3- x 8.5-m and weighs nearly 50 metric tons.

"This is the first machine of this size that has been driven by only two exciters," said Corné Kleyn, global product manager - vibrating screens for Weir Minerals. "A screen building on a mine would have eight to 12 screening machines, which means 24 exciters versus 36. That's a

The rear segment of the above L440B loader is the detachable energy module, which can be replaced in 10 minutes, Aramine said at MINExpo. (Image: Aramine)