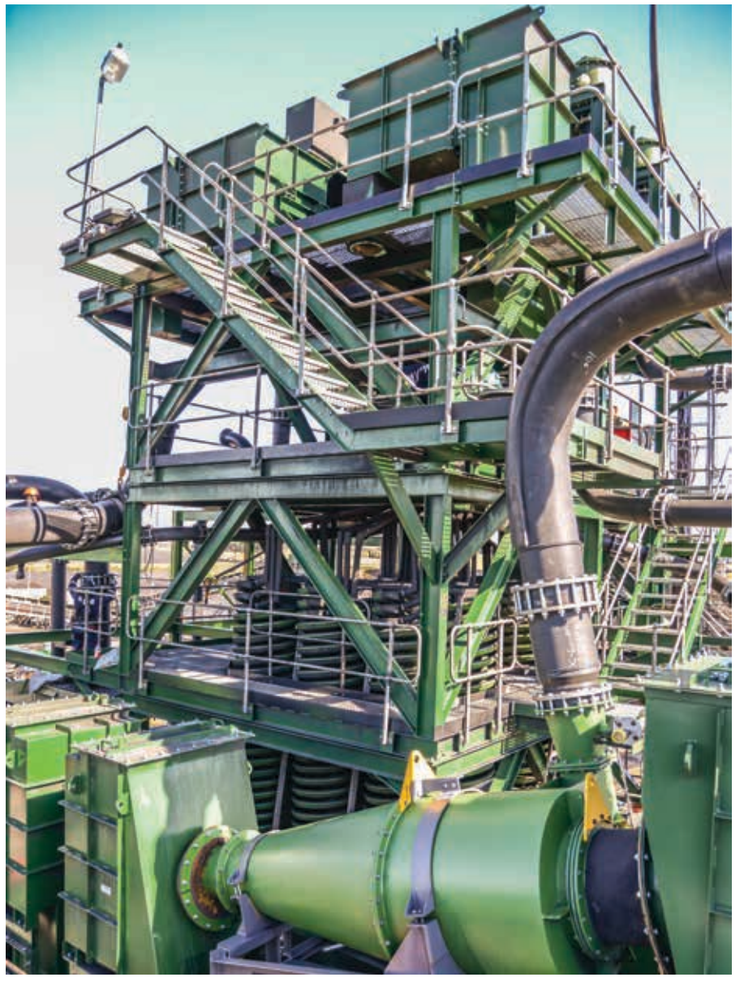
Multotec advocates joining hands to advance process technology

The age of digital technology holds huge potential for equipment performance in the field of mineral processing, but Thomas Holtz, group chief executive officer of Multotec, cautions that little progress will be made if equipment suppliers continue to work only on their own.

Thomas Holtz, Group Chief Executive Officer, Multotec.

The inclusion of today's technologies in mineral processing equipment, "demands collaboration on an unprecedented level," says Thomas Holtz, group chief executive officer of Multotec. "To begin with, we need outside specialists to help build digital technology into our existing products. But we also need to cooperate with other process equipment suppliers to ensure we feed into common systems that make customers' plants more efficient," he adds.

He highlights the power of sensors, digital data communication and computer analytics to transform how mineral processes are monitored and optimised. Technology can make the plant a safer place and can run processes more efficiently. This includes monitoring wear life, helping mines plan for better maintenance and improved uptime.



The challenge with the technology investment lies in analysing and interpreting data in such a way that it is useful and actionable.

"At Multotec, we have invested considerably in applying sensor technology – especially the use of accelerometers," says Holtz. "The real work, however, comes with the management and interpretation of the data these sensors generate."

For this reason, data analytics becomes the real value when applying this monitoring technology. He notes that this aspect of product development must generally be conducted with a specialist service provider over a long period of time. Even then, the process is usually arduous.

"Our technology journey to date shows how challenging it is to analyse the data we collect in a way that we can draw conclusions which are useful for our purposes," he says. "It is relatively easy to monitor vibration levels on a bearing and to generate a trend line on a graph. It is less simple, for example, to automate an operational response to that information."

Much progress has been made, he says. Through collaboration with a technology partner, Multotec is developing a machine learning process to analyse vibration data from a cyclone. Based on this real-time data, an artificial intelligence server generates alerts related to pre-defined condition levels. He makes the point, though, that each equipment supplier can only monitor those functions within a process circuit in which their equipment performs.

"To fully leverage today's digital technology, plant managers need equivalent information from every item of equipment operating in the circuit," he says. "This full range of data – coming in from all the equipment – then needs to be synthesised to optimise the running of the plant."

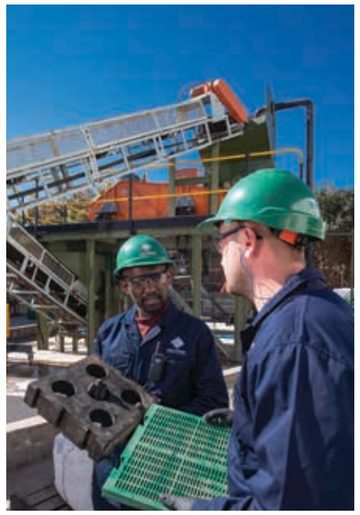
Industry collaboration will combine small innovations into significant progress in the use of technology for mining customers.

One immediate challenge is that most existing process plants were not built to accommodate the latest technologies. Especially under current cost pressures, retrofitting entire plants is seldom an option. Sadly, there are not many greenfield operations being opened that provide opportunities to apply new ideas and equipment from scratch.

Prevailing mindsets are also an obstacle, argues Holtz. Most suppliers jealously guard their intellectual property, frustrating any attempt at collaboration. "We need to work toward a new approach, in which each player brings some input based on their area of expertise," he says. "Many small innovations – when combined – can produce significant progress and generate a meaningful advance for our mining customers."

He highlights that all the equipment in a plant needs to talk to a central system or 'brain' that will drive the innovation mines are looking for. Only in this way can mines gain efficiencies through technology and become more sustainable. This, in turn, provides the foundation for success on which their service providers can thrive.

In conclusion, Holtz emphasises the importance of gradual and sustained technological progress. Many new technology ideas are met with unrealistic expectations, and people are disillusioned when these are not immediately realised.



Technology can improve safety and can run processes more efficiently.

"Closer and ongoing collaboration with all stakeholders – including mines and design houses – will allow us to achieve the important long-terms benefits that technology can and must deliver to our industry," he concludes.

www.multotec.com

New spiral for better ferrochrome recoveries

Following years of detailed test work in the ferrochrome sector, Multotec has successfully developed and proven a spiral concentrator that eliminates beaching and enhances recoveries in the 1 mm to 3 mm fractions of high density material. When compared to traditional spirals, the new spiral has shown extraordinarily higher metal recoveries, even for minus 1 mm fractions in ferrochrome slag.

"Our SC25 spiral concentrator features steeper angles that facilitate the flow of material and increase separation efficiency," says Hlayisi Baloyi, applications engineer at Multotec. "It also widens the particle size range that can be treated by the spiral. Traditionally, spirals would struggle to efficiently treat material above 1 mm in heavy mineral applications, but this spiral can go well beyond that. The spiral has been a game changer even for the minus 1 mm size range where higher separation efficiencies have been achieved on chromite ore."

Baloyi says that this innovation has provided the minerals processing sector with an exciting alternative to jigs in the minus 3 to plus 1 size range, which have been one of the conventional methods of separating larger particles. The solution is cost effective as spirals use no electricity, and are easy to maintain. So attractive is the new model that the first order for the commercialised version has already been placed.

"Taking ferrochrome samples from a number of mines over a period of two to three years, we conducted extensive test work on these at our well-equipped testing facility in Spartan near Johannesburg," he says. "Leveraging this data with our in-house engineering design capacity, we were able to develop the optimal solution and locally manufacture the new spiral concentrator."

The economic benefits of the Multotec SC25 spiral for ferrochrome producers are substantial, as some plants were losing the value of their 1 to 3 mm material to the tailings storage facility. Many of those who used jigs to treat this fraction were also finding that their efficiencies were low.

"Ferrochrome is not the only commodity we have successfully tested," says Refentse Molehe, process engineer at Multotec. "We have even seen improved recovery in heavy minerals below 1 mm, alluvial chrome and manganese slags, for example. There is also potential in industrial recycling, which opens up options for 'urban mining' – the recovery of metal particles from associated waste. Multotec has received a number of requests and conducted tests for recovery of metals from recycled electronic goods, and from customers who intend to recover metal from industrial scrap. ❑

Hlayisi Baloyi, applications engineer at Multotec, has been conducting extensive test work on Multotec's new SC25 spiral concentrator using ferrochrome samples from numerous mines.