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Increasing Throughput And Decreasing Maintenance In The Iron Ore Sector

In a tightening economy the focus shifts to maximised return on investment. Increasing beneficiation process outputs whilst simultaneously adhering to safety regulations and minimising maintenance can be challenging.

In order to sustain and ideally grow profitability and quality, processing plants need to align themselves with suppliers who are able to customise solutions that fit specific applications. Capital equipment needs to be designed and selected with maximised throughput and uptime in mind.

Johannes Kottmann, managing director of MBE Minerals SA, says the company is able to access over 150 years of experience gained in the tough and demanding global mining industry, of which 40 years have been achieved in Africa. "This allows us to engineer and provide the necessary capital equipment for iron ore beneficiation processes within the harsh African beneficiation environment," he explains.

MBE Minerals SA is a leading supplier of iron ore and coal beneficiation technology offering basic and detailed engineering, components for complete plants and systems including modernisation and capacity increase measures, as well as automation and process control equipment. The company's scope of services includes feasibility studies, raw material testing, financing concepts, erection and commissioning, personnel training and pre- and after-sales services and support.

By strategically reacting to customer demand and tailoring solutions that closely match explicit needs, MBE Minerals has amassed a large footprint of customers and a stable of products with robustness and productivity in mind. A burgeoning customer base in the Northern Cape provides a clear example of anticipating and servicing customer needs. The company recently opened a branch in the Kathu Industrial Area to deliver fast turnaround times on the supply and maintenance of its entire product range to its local customers.

Targeted range of products

MBE Minerals employs extensive R&D to design and engineer equipment that not only ensures optimised throughput of product but is also affordable and durable. The company's BATAC® jigs are

becoming increasingly popular in the iron ore beneficiation sector due to their rapid detection of changes in the raw material, quick reaction to such changes and easy operation.

Kottmann says that BATAC® jig technology has excellent separation accuracy, is relatively small in footprint and has a comparatively low capital cost.

Similarly, the robust Jones® Wet High Intensity Magnetic Separator (WHIMS) is characterised by a high throughput capability, coupled with simple maintenance and lower energy consumption. “We find that the compact Jones® unit is popular for treating feebly magnetic minerals with a particle range from 20 µm up to 1 mm. It can operate at up to 13 000 Gaus and due to the special design of the grooved plates, the gaps keep their dimension for a longer operational time, generating a uniform magnetic force, which is essential for selective separation,” says Kottmann.

Operating at 5.000 Gauss on the drum surface, the PERMOS MIMS medium-intensity magnetic drum separator allows wet and dry separation of high grade coarse and fine ferromagnetic and paramagnetic ores with a medium susceptibility, at high throughput rates, and with minimal energy consumption. It is suitable for various applications which in the past could be treated only with electromagnets. Because it is a permanent magnetic separator, the PERMOS MIMS does not require electric power for generating the magnetic field, despite strong field intensities thereby guarantee high iron recoveries with minimum operating costs.

MBE Minerals’ Pneufлот® technology improves product quality and overall recovery. It is an attractive alternative to conventional agitator flotation due to its lower capex and opex, as well as reduced wear and higher levels of efficiency. Pneufлот® systems are available in sizes ranging in diameter from 800 mm to 6 m and have been successfully installed in almost 150 industrial applications worldwide. Slurry feed rates of 10 to 1 400 m³/h can be achieved in a single cell, depending on cell diameter.

A large footprint of MBE Minerals’ vibrating screens in the African mining industry stand testament to the durability and effectiveness of the products. Options are available for wet and dry classification as well as for dewatering and depulping of coal, minerals and ores. Variants include RSL and RFS resonance screens and conveyors; type VSL and USL linear motion screens; type VSK and USK circular motion screens; type VRL micro screens; and type VMSL vibrating screens.

A range of vibrating feeders, designed in Germany and manufactured locally, feature feed capacities of 100 up to 3 000 tph. These feeders are suitable for all applications where controllable discharge of bulk materials is required. Replaceable bolt-on wear liners are fitted to the feeder troughs to prolong feeder life.

Ongoing R&D

Due to extremely wide variations of mineral deposits and requirements for final products, MBE invests substantially in undertaking pilot scale test work at its fully equipped R&D centre in Cologne, Germany. The R&D Centre is able to simulate complete separation processes with its own crushers and mills, using wet as well as dry classification on screens, in cyclones or in air classifiers, and finally separating the minerals by gravity, magnetic properties or using specific chemical surface attributes for flotation.

“A well-established product base, a team of experienced and knowledgeable engineers and technicians and a large and varied database of customers, provides MBE Minerals with the ability to customise efficient solutions for the iron ore beneficiation sector,” Kottmann concludes.

IRON SECTOR OFFERING PIC 01 : MBE’s robust Jones® Wet High Intensity Magnetic Separator (WHIMS) offers a high throughput capability.

IRON SECTOR OFFERING PIC 02 : BATAAC® jig technology has excellent separation accuracy, is relatively small in footprint and has a comparatively low capital cost.

IRON SECTOR OFFERING PIC 03 : A view of the Batac® jig plant at Khumani.

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