INTERNATIONAL MINING PROFILES

LARGE NEW TOMRA X-RAY SORTER A GAME CHANGER FOR MINERAL PROCESSING

he contribution of X-ray ore sorting to the efficiency of mineral processing is growing, and TOMRA's new COM XRT 2.0 sorters are taking the value added by this technology to another level.

This upgraded model features higher belt speed and throughput, which translate directly into increased productivity in mineral processing. It also offers increased wear resistance and longer component lifetime, with quick and safe maintenance through providing easier access to replaceable components.

Ines Hartwig, Product Manager at TOMRA Sorting Mining, emphasises that the valuable experience gained over the past fifteen years, through monitoring and maintaining the TOMRA COM XRT units operating in the field, has been incorporated into the design of the TOMRA COM XRT 2.0.

"Our sorters have been operating under harsh conditions in both hot and cold climates, sorting wet and dry feed across a wide range of commodities," says Hartwig.

The speed of the belt in the new design has been increased from 2,7 to 3,5 metres per second, while the more powerful X-ray system accommodates the sorting of larger-sized material due to better X ray penetration.

"Higher levels of belt occupancy are facilitated by our improved data processing capacity, and this allows the particle size of the feed to be increased," she says. "The maximum size of the particles that the TOMRA COM XRT 2.0 can handle is between 100 mm and 125 mm, depending on the material, which also contributes significantly to throughput capacity."

She notes that these higher levels of capacity are particularly valuable for larger mines, as they reduce the number of machines required, and therefore also decrease capital and operating expenditure. The unit boasts a highly selective ejection system, using data processing in combination with precise control of the pneumatic valves which eject the selected material from the stream. Driving this system is TOMRA's proprietary data processing pipeline that

links sensors, image processing and the valve control boards.

Reducing cost per ton at Ma'aden Phosphates

The performance of this ore sorting technology has been proven at Ma'aden Phosphates' new \$560 million processing plant at the Umm Wu'Al project in Saudi Arabia, one of the largest integrated phosphate fertiliser facilities in the world. TOMRA Sorting Solutions has installed nine of its TOMRA COM XRT sorting units, each with an operational width of 2,4 metres, to process a 1,850 tonne per hour sorter feed at this facility.

The objective of the sorters is to reduce the milling and flotation of silica in the plant process, using a dry technology at a low cost per ton. The TOMRA units achieve this by removing more than 90% of the chert in the +9 mm fraction, which makes up half of the plant feed, before the phosphates are fed to the milling and flotation circuit. This leads to the removal of over 1,2 million tons a year of SiO₂, which therefore does not have to be crushed, ground and flotated.

This installation considerably improved the mill performance by reducing the consumption of energy, water and chemicals per ton of final

product, which was all achieved with a smaller sorting plant footprint. The resultant saving in flotation reagents alone amounts to almost US\$8 million a year.

Maximising upfront recovery of diamonds

In Botswana, TOMRA Sorting Solutions has installed two TOMRA COM



Nine TOMRA COM XRT 2.0 sensor-based ore sorters at Ma'aden's Umm Wu'al phosphate project sort more than 70 per cent of the run-ofmine material by removing flint stones from the phosphate reducing the silica content.

TOMRA

XRT 2.0 /1200 sorters in the mega-diamond recovery (MDR) circuit of Lucara Diamonds' Karowe mine. Located directly after the primary crusher and ahead of the process plant, the MDR circuit treats material in the size range between 50 mm and 120 mm. It maximises the upfront recovery of exceptional diamonds before the ore reaches the comminution processes, where diamond damage may occur.



The TOMRA COM XRT 2.0 sorter features higher belt speed and throughput, as well as a heavy duty mining design and better accessibility for maintenance work.

"The machine has proven itself through its high availability throughout its first year of operation there," Hartwig says.

TOMRA Sorting Solutions also has several smaller units in portable and containerised configurations in many different countries, where they must operate in a variety of climatic conditions from arctic to tropical. These machines sort minerals ranging from copper, iron ore and coal to industrial minerals, chrome and diamonds.

TOMRA Sorting GmbH Website www.tomra.com/mining

