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Debtech Ore Sorters For Jwaneng Large Diamond Plant

Two high-throughput X-Ray Transmission (XRT) ore sorters from De Beers Technologies SA (DebTech) have been installed at Debswana's Jwaneng diamond mine, as key elements of its new Large Diamond Recovery Pilot Plant.

According to Gordon Taylor, Head of DebTech, the XRT Coarse Concentrator Plus (CC+) units were specially developed for the Botswana mine to treat run-of-mine at combined throughputs of up to 500 tonnes per hour while allowing for the recovery of large diamonds with negligible extra material. Design and construction of the XRT CC+ units began in 2017, and they were delivered to Jwaneng in January 2018 for early integration into the construction of the Large Diamond Recovery Pilot Plant.

Taylor highlights that the recent developments in XRT technology make the identification of diamonds much more accurate, changing the economics of finding larger diamonds. The XRT CC+ units at Jwaneng are based on the original XRT Coarse Concentrator model developed by DebTech and operate using imaging systems and sorting algorithms proven at several De Beers Group operations.

The CC+ machines are assembled, transported and operated in 12-metre shipping containers, allowing them to be fully tested in workshop conditions and quickly commissioned on site. Each unit is self-contained with its own power conditioning, compressed air generation, closed circuit water cooling and machine control room.

They are operated through a user-friendly, menu-driven control interface, which allows real-time reporting and is fitted to provide remote diagnostics. Material enters the unit via an inlet chute and is conveyed between the X-ray source and the X-ray camera; images captured by the camera are analysed by software algorithms and a pneumatic ejection system diverts the objects identified as diamonds.

The 'Dual Energy' feature on the XRT sorting system enhances its ability to analyse materials of differing thickness. Its powerful imaging capabilities not only identify and eject diamonds, but are also capable of generating online carat estimates and stone count values.

XRT technology is also targeted at replacing coarse and middles dense media separation (DMS), says Taylor, as the typical XRT concentrate yield is significantly less than an equivalent DMS plant.

“This considerably reduces downstream infrastructure with a further benefit of the technology the reduction in the consumables, power and water required,” he concludes.

XRT PIC 01 : The XRT Coarse Concentrator Plus (CC+).

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