

Sishen Expansion project (extract from Modern Mining)
By: Sylvester Haskins 15 August 2008 Edited by: Laura
Tyer (Engineering News)

The world's fourth-largest supplier of seaborne iron-ore, Kumba Iron Ore's (KIO's) Sishen Expansion Project (SEP) will see the extraction of an additional 10-million tons of iron-ore from its Northern Cape operation. This will bring KIO's total extraction volume to 38-million tons, by next year.

"A critical aspect in determining the successful implementation of the diverse range of screens for the multitude of applications throughout the plant was the close relationship fostered between Kumba Resources, the screen cloth supplier, and the different original-equipment manufacturers (OEMs) on site," says manufacturer and supplier of vibratory screens and feeders Joest sales director, **Malcolm Skeen**.

Joest holds the licence and distributorship of Joest technology for the sub-Saharan Africa region. Skeen says the company has the necessary resources to design, manufacture and test equipment at its facility in Spartan, Johannesburg. "One of the primary differentiators is the company's ability to select the most appropriate vibrating screen or feeder for a given application."

He explains that Joest will typically analyse the process requirements and design the machine to suit the application, resulting in better process efficiencies and throughput. "With this focus on custom specific equipment, the company was well positioned to be able to offer SEP a cost-efficient and viable solution."

The company secured the full scope of supply in the crushing and screening building at SEP. This includes a Joest secondary scalping screen, a secondary feeder, and eight tertiary feeders, which feed the tertiary screens that were supplied by screening specialist Schenk Process.

The Joest secondary scalping screen is 3,6 m wide and 10 m long, and is engineered to screen up to 90 mm at 6 500 t/h. The secondary and tertiary feeders are capable of handling between 1 200 t/h and 2 000 t/h and are 2,5 m wide and 4 m long. The secondary feeder transfers material into the tertiary crusher, and the tertiary feeders, in turn, feed the 3-m-wide by 9-m-long Schenck screens cutting at 27 mm.

During the design stages, the Joest secondary scalping screen, with a 43-t vibrating mass, required in-depth finite element analysis to ensure the most efficient strength-to-mass ratio. "In addition, the metallurgical efficiency of a screen is determined by the mechanical characteristic of the screen and this has to be factored into the machine from the start and cannot be retroactively adjusted on the screen," Skeen says.

He adds that the secondary feeders had to be able to withstand significant bunker loads, which were also taken into account during the design and engineering of the feeder.

The jig beneficiation plant at the SEP comprises eight modules and each module consists of nine screens in the format of a double-deck primary vibrating screen of three 6,1 m each, a 2,1-m by 4,8-m single deck secondary sizing screen, four 1,8-m-wide by 4,88-m-long jig dewatering screens and three 1,2-m by 3-m fines jig dewatering screens. In total, Joest supplied 72 machines for the jig beneficiation plant.

“In addition to the SEP, Joest has supplied screen machines to other iron-ore projects in the Northern Cape, including ferro- alloys producer Assmang’s Bruce King Mokaning project, and the company is considered to be the dominant supplier into hard-metal-mining in this region,” says Skeen.

Skeen says that the jig beneficiation plant was an expansion in the company’s market share in the screens business. He explains that the company typically supplies machines for the front end of the beneficiation process. “With the SEP, the company engineered and supplied screens for the downstream processes in beneficiation, which proves that Joest is able to offer the full scope of screening solutions for a mining process,” he says.

“At the end of the day, the success of the project was achieved through superior teamwork and meeting exacting customer demands,” Skeen concludes.