ROCKY

By Silvia Carina Firmino ESSS

ME Elecmetal harnesses power of Rocky DEM to improve crusher liner performance

ME Elecmetal — a global supplier of integrated wear solutions for mining, construction and industry — is among the first companies to benefit from Rocky DEM's latest technology: the Tavares breakage model. The industrial supplier chose Rocky software specifically for this capability, which accurately shows how particle breakage affects crusher liner equipment, in an effort to improve liner longevity and, subsequently, to reduce maintenance downtime, and increase throughput.

In mining companies around the globe, crusher liners are regularly used to reduce large ore chunks into smaller pieces. By nature, the crushing process is very abrasive; therefore, this equipment is outfitted with wear linings that must be replaced periodically — and downtime affects profitability. In addition, it is impossible to physically observe the specific impact that crushing has on equipment. In the past, DEM breakage simulations often produced biased results — sometimes even useless solutions.

Incorporating the latest technology, Rocky DEM extends the existing application range for modeling particle breakage, including predictive simulations that match real-world experience. The Tavares breakage model (named for Prof. L.M. Tavares' Ph.D. work at the University of Utah and further development with his group at the Federal University of Rio de Janeiro, Brazil), adds capabilities (submodels) that can make breakage model is useful in describing ore degradation during handling as well as size reduction in different types of crusher liners, providing greater confidence in predicting both the proportion of broken particles and product size distribution.



Copper ore model validation.

At the outset, the Tavares model accounts for variability in particle strength: Even when particles are the same size and material, each particle has a distinct strength or fracture energy. Strength varies with particle size so that as a particle becomes smaller, its strength increases — that is, the fracture energy per unit of material mass increases. This is described using the size-dependent breakage probability submodel.



Laboratory cone crusher in operation simulated with Rocky DEM Tavares breakage model. Feed: 22.4–16 mm; closed side setting 5 mm.

"Crusher OEMs generally offer a limited choice of wear-part designs, and these are usually based on average conditions. But few crusher liner operators work under 'average' conditions," noted Tavares. "We have been working with ME Elecrnetal for about 10 years now, and we are thrilled that they want to become 'early adopters' of this virtual breakage technology." Tavares and the Rocky DEM team are going beyond investigating liner wear and life expectancy — they are building a foundation for exploring how liner parameters interact, from performance improvements to geometry changes.

"With Rocky DEM, ME Elecmetal has confidence that simulation is the right direction, the proof needed about how crushers operate in the real world," Tavares, said.

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