

# Idler Rightsizing

## *Mining operation finds upsizing to new CEMA E idlers worth its weight in gold.*

Barrick Gold Corporation maintains 27 operating mines and boasts the largest gold and copper reserves in the industry. Barrick is targeting its 2009 gold production at an approximate 7.6 million ounces and copper production at 400 million pounds. Its Goldstrike property, located near Elko, Nevada, is the company's largest gold producing operation with an output exceeding 1.65 million ounces annually and an employee roster topping 1,300 workers. Treating ore from one open pit and two underground operations, the Goldstrike mine combines two processing facilities – an autoclave circuit, which treats non-carbonaceous sulfide (refractory) ore; and the roaster, which treats carbonaceous ore.

Mark Morfin is the wetmill crusher maintenance supervisor for Barrick Goldstrike's autoclave facility. From initial material feed to final stockpiling, his challenge is maximizing uptime, which is no small feat for a 24/7 operation with a processing capacity of more than 12,000 tons per day from its gyrosphere crushing circuit and 7,000 tons per day from its jaw crushing circuit. As such, Morfin welcomes the right solutions from equipment and component suppliers – ones that will increase efficiency and reduce maintenance requirements while decreasing costly downtime. For example, he says that a recommendation from equipment dealer CIR of Sparks, Nevada, resulted in a significant decrease in maintenance downtime in replacing failed idlers. CIR is a representative for Morris, Minnesota-based Superior Industries, a leading manufacturer of conveyor equipment and components. After consulting with Superior engineers, Morfin switched out his previous brand of CEMA D idlers and upsized to Superior CEMA E idlers on a 60-inch by 150-foot-long belt conveyor which draws material from underneath the gyrosphere crusher. "This belt takes a big beating. The ore that hits the belt is minus-4 ½-inch material, loaded a foot deep. So that's a lot of weight," says Morfin. He adds that he is pleased with the new idlers, particularly because they feature a sealed bearing that requires no greasing, and an ability to retrofit to competitor frames or to previous Superior frames.

Prior to the installation of the Superior CEMA E idlers, Morfin says they would have to shut down the crushing circuit at least once a week (after stockpiling enough material) just to change out rolls or entire idlers on the heavy duty conveyor. "From just days to a week or two, we were wearing them out. They would start to make noise and then seize up long before the actual roll would wear out. It was always a bearing failure," he says. After upsizing to the CEMA E idler, Morfin says that this downtime is eliminated and he gets the same desired wear life from the

CEMA E idler on the heavy duty conveyor as he would get from a CEMA D idler on his smaller systems.

Selecting the right idler for an application involves much more than mere calculations. "In running the numbers on an application such as the one at Goldstrike, it may indeed be within the CEMA D idler range. But you must also factor in the amount of vibration and impact load, which is what will really change those numbers," says Jarrod Felton, chief engineer of standard products for Superior Industries. "In this application, the belt is operating from the primary crusher, so there could be significant vibration just from the crusher depending upon how it's mounted. This belt is also located on the wetmill side of the operation, so the material is heavier than the dry material and has a little more density," he says.

Importantly, Felton stresses that it is often difficult for producers to determine the exact actual load on the bearings. He explains that it is not as simple as determining the average tons per hour that travel on the belt. Load impact and ultimate wear life is affected by lump size, drop height, surge loading, idler misalignment, and the all-too-common practice of mixing different brands of idlers on the same belt. "Some of these idlers are rated higher and some lower, so the actual load will affect some more than others," he says.

According to the CEMA manual, the main influences in idler selection are belt weight, material weight, idler load rating, belt sag, idler life, belt rating and belt tension. And, proper idler roll diameter, size of bearing, and shaft selection is based upon the load carried, belt speed and operating conditions.



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However, in addition to all of the aforementioned parameters, Felton points to the importance of seal design. “What is often ignored is that bearings may fail due to the load, but they may also fail due to contamination – or a combination of both. This is why seal design and technology is so important,” says Felton.

The new Superior Industries CEMA E idler used at Goldstrike is engineered with 40-millimeter precision-sealed ball bearings, which eliminate maintenance labor and grease expenditures while also extending bearing life, says the company. Its Spin-Guard® seal design technology features improved contact seals that result in less seal drag; triple labyrinth seals that increase the distance that contaminants must travel; and grease fills that easily trap contaminants. The idler is also designed to eliminate pinch points between the end stand and the outside roll, as the pinch points in typical idlers allow foreign materials to lodge within them, causing the roll to seize up.

Bottom line, Felton says there may often be a little trial and error in idler specification. “You just have to take your best shot. However, sticking with the same manufacturer and the same high quality sealing technology as you upsize will ensure that you gain that longer life from bearings with a higher load rating. And, if you have a high enough load rating, you will have little worry. Overkill is less expensive than finding out that the idler is not sufficient enough for the load. While there are other products available to handle impact in the loading areas – such as impact idlers or impact beds – upsizing idlers works well too,” he says.

Rightsizing the idler and maximizing its performance is one more way that producers can cut costs and maintain profitability. Morfin says he is getting the wear life he needs from the new idlers. Plus he is pleased with the support he gets from the dealer and the factory. “The reps have been great and they really make life easier for me,” he says.

Goldstrike has been Barrick’s flagship property for more than 20 years. Its dedicated employees and its vendors are key factors in the corporation’s ability to pursue exploration and acquisition opportunities now and into the future.