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Midwest Industrial Supply's MineKleen Underground Mine Dust Control System. CREDIT: MIDWEST INDUSTRIAL SUPPLY

A DUST-BUSTING solution for underground mines

By Alisha Hiyate

For most underground mines, water is the go-to method for dust control. It makes sense – why would any underground mine operator pay for dust control products when water is free?

That's a good question, and one that Midwest Industrial Supply's Dan Carpenter is happy to answer.

"With water, we almost assume that there's no cost to it. Everybody says that watering is free," says Carpenter, senior technical sales and application specialist with Midwest.

However, because water evaporates quickly, some mines spray it six times a day or more, adding up to significant labour and equipment costs over a year.

"You start calculating the hidden costs associated with water and the next thing you know, it's a big number. It's not free."

(In fact, in a case study on one underground base metals mine in the western U.S., Midwest found that using water for dust control cost the operation $642,000 annually.)

Not only that, but water can cause problems, especially in cases where it needs to be applied frequently. In those cases, water can cause deterioration of roads, and subsequently, increase maintenance and labour costs.

And alternative dust control products – for example, magnesium chloride, or products containing lignin sulphide – may be cheap, but they're not necessarily effective.

Midwest's search for a better dust control solution has led to the development of its latest product, the MineKleen Underground Mine Dust Control System. The Canton, Ohio-based company, which has a 45-year long history of researching, developing and improving dust control products, believes the solution can save mines

on labour, productivity and even maintenance costs.

Building on Midwest's existing EnviroKleen dust control product, which was originally developed for above ground dust control, MineKleen has been tailored to the underground environment. The MineKleen system, launched in September, includes both a synthetic fluid that has a unique binding agent and an anti-mould biocide in it, and a sprayer that ensures effective and efficient application.

The product contains no water, is environmentally safe and non-hazardous, and has proven to be long-lasting. The binder in it also strengthens roads, rather than deteriorating them like water does. In addition, the binder helps keep dust in place – a much-needed feature in an underground environment where the ventilation system can keep dust moving around or even suspended in the air.

Compared with the original EnviroKleen product (which also had a binder), the MineKleen Plus formulation can reduce the number of applications by as much as 50%.

As proper application of the product is key to its performance, Midwest has also put a lot of work into its proprietary MineKleen Sprayer – a more sophisticated and upgraded version of its existing E-Sprayer equipment.

In a case study comparing MineKleen Plus with a generic lignin sulphide dust control product, MineKleen Plus was shown to reduce dust by 95%, costs by 35% and annual man hours spent on dust control by 73% to 133 hours per year.

The mine was able to reduce applications to two per month for roads and once every two to three months for mine ribs and backs. The reduced time spent on dust control freed up manpower for other tasks and vastly reduced the impact of dust control efforts on production, increasing efficiency.

Midwest also offers MineKleen Basic, an oil-based product that's more comparable with what its competitors' offer and doesn't have a binder.

The company so far has five clients in Canada using MineKleen, with several other clients using its previous product, EnviroKleen.

MineKleen development

The MineKleen system was developed as a response to the real needs of underground mines.

Colin Shaw, a mine engineer who now works as a project manager/consulting engineer with Nordmin Engineering, is a former client of Midwest who helped out with the development of MineKleen.

"They're pretty much my first call whenever I have any questions for dust control," Shaw says.

While working at an underground mine in the western U.S., Shaw found the existing lignin sulphide dust control product that was being used was not only ineffective for dust, but was causing issues with maintenance and safety.

"The road was so hard from the lignin sulphide product, it would run off into the ditches and drain out. We were putting product on 4-6 times a shift, running 24/7, 12-hour shifts."

In addition, while the roads remained wet from product application, they would be very slippery – like "driving on snot," Shaw says.

"We were already having a dust problem. What really made us motivated to do something about it was the safety issue."

That's when Shaw called up Midwest senior sales representative Lynn Edwards for help.

While safety on the roads was primary, Edwards also recognized Midwest could help with a maintenance issue the company was having on the haulage level of the mine, where constant traffic of fully loaded 80-tonne trucks was driving deep ruts into the road.

"We had to scrape and grade the roads on the entire haulage level every three days because the ruts were getting too deep," Shaw says.

Because MineKleen Plus has a binder in it, it actually strengthened the road. That allowed the company to go 11 days without maintenance, aligning it with the standard rotation for doing preventive maintenance on the crusher. This allowed for additional labor to be reallocated towards other projects, a big plus for the mine.

That example shows what Midwest is really about, says Carpenter.

"We pride ourselves on problem solving more than dust control," he says. "We're always looking to stay ahead of the curve, looking at new technologies, new chemistries and applications for existing chemistries." **CMJ**