



Extending cyclone underflow launder wear life - Australian iron ore mine

When a large West Australian iron ore mine was looking to extend the wear life of its underflow launders, they turned to FLS for a solution. The mine now uses more than 50 tons per year of the new WEAR MAX[®] ceramic-epoxy wear coating: more than doubling wear life and reducing expenditure on ceramic-epoxy compounds by 35%.

Background and objective

West Australia is home to some of the largest and most-efficient iron ore mines in the world. But the process of improvement at these vast operations is never over, and in 2018 one of these mines set its maintenance team a challenge: to extend the wear life of its hydrocyclone underflows from four to eight weeks. The mine had three interlinked aims:

- Improve safety by reducing the number of man-machine maintenance interactions.
- Improve sustainability by reducing waste and the consumption of wear coatings.
- Reduce maintenance costs.

The mine initially tried three competitor ceramic-epoxy wear coatings, but none held up more than four weeks. The mine then approached FLS experts for a solution. We were in the final stages of developing our latest ceramic-epoxy wear coating – WEAR MAX. Hearing this, the mine proposed a trial of the new product to test its performance against three competitors.

WEAR MAX[®] Leads the Pack

Our WEAR MAX[®] coating outperforms other ceramic-epoxy coatings in a side-by-side trial to deliver:

- Extended wear life from 4 weeks to more than 8 weeks.
- Reduced ceramic-epoxy costs by 35%
- Improved up-time due to fewer maintenance stops for re-coating.
- Shorter maintenance stops due to easier application and faster cure time.
- Reduced waste and Scope 3 emissions.



Cyclone Underflow Launder with Wear Max applied in high wear areas.

WEAR MAX is best-in-class solution, offering significantly longer wear life compared to competitor products. Switching to WEAR MAX therefore provides a pathway to extending wear life of the launder.

Defining the project

The site maintenance team applied the WEAR MAX coating to zones of high wear on the hydrocyclone launder, alongside the three other coatings that were commonly used for the application. The cyclone was then run for four weeks and removed from service to examine the four coatings.

In addition to the wear life of the coatings, the team monitored each coating's curing time and the ease with which it was applied.

Solution

At the end of the four-week trial period, WEAR MAX showed significantly less wear than its competitor products and could be returned to service. Two of the other coatings had worn away completely; the third was less than half as thick of the remaining WEAR MAX coating.

The site decided to extend the trial by eight weeks. They re-coated the other compounds but left WEAR MAX untouched. At the end of this period, WEAR MAX was worn enough to require a re-coat, but not completely gone, even after 12 weeks of service.

Additionally, WEAR MAX hard-cured much faster than any of the other ceramic-epoxy compounds. The maintenance team also reported that they preferred working with WEAR MAX: it mixes easily without any specialised tools or training.

The Results

Following the trial, the site maintenance team determined that WEAR MAX provided more than double the service life of the other three ceramic-epoxy compounds. This exceeded expectations and allowed the team to meet their goals to improve the safety and sustainability of maintenance operations, while also lowering maintenance costs.

WEAR MAX has since been adopted as the exclusive wear coating for the mine's hydrocyclone launders, and after 12 months the mine found they were spending 35% less on ceramic-epoxy than they had with previous coatings. Happy with this success, the mine worked with us to find additional uses for WEAR MAX that would allow them to extend the benefits to other areas of the mine.

Over the course of six months, the site maintenance and engineering teams tested WEAR MAX in a range of applications on both rubber- and metal-lined surfaces. By 2021, the mine was using about 50 tons of WEAR MAX to successfully improve protection and wear life not only of its hydrocyclone launders, but of equipment including vibrating screens, pumps, pipes, chutes, and tanks.

These results don't only represent a major win for the mine's bottom line; they also provide significant sustainability benefits, notably by reducing waste. But with significant energy consumed globally in the production of wear parts for the mining industry, reducing consumption of these materials helps to reduce the industry's Scope 3 carbon emissions on the path to achieve zero-emissions mining.

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