

FLS screen media optimisation replaces rubber with polyurethane and increases productivity

FLS screen optimisation service found that the customer would be better served by the next generation of polyurethane screen media panels rather than traditional rubber panels. This discovery increased the customer's screen panel wear life by 10–20%. The customer is pleased that their wear life goals have been met, and excited that the integrity of the apertures increases the screen effectiveness. They immediately converted the full deck screen to polyurethane after reviewing the results of the trial.

The improvements they have seen led the customer to question what else we could do to help their operations and they are currently working to further optimise their process.

Background and objective

A large gold producer in the Goldfields of Western Australia was disappointed in the lack of availability of their SAG discharge screens due to the short wear life of the rubber screen decks. The area is known for its harsh ores, and the ores processed at their high-grade underground gold mines were no exception.

The screen decks were continuously loaded with highly abrasive ores that had a top size greater than 30 mm (1.18 in), and the screen media did not last the target wear life needed for the desired screen availability.

Frequent shutdowns for screen panel replacement led to high maintenance and opportunity costs, and low equipment productivity. The accompanying increase in safety risk to the teams who must spend excessive time on the screens performing maintenance made the situation unsustainable.

We approached the customer for a trial to explore the possibility of improving the wear life of the screen media to improve the availability of their SAG discharge screens and increase site safety.

Benefits of optimised screen media material

- Increased wear life by 10% to 20%
- Improved screen availability
- Decreased maintenance requirements
- Improved screen safety
- Increased sharpness of separation to improve screen effectiveness

Defining the project

FLS performed a screen media optimisation analysis to determine the best type of media for the customer's process. The analysis took into consideration the strengths and weaknesses of each type of media as well as customer-specific factors such as mineral characteristics and properties, operating conditions, throughput, and other aspects of the process.

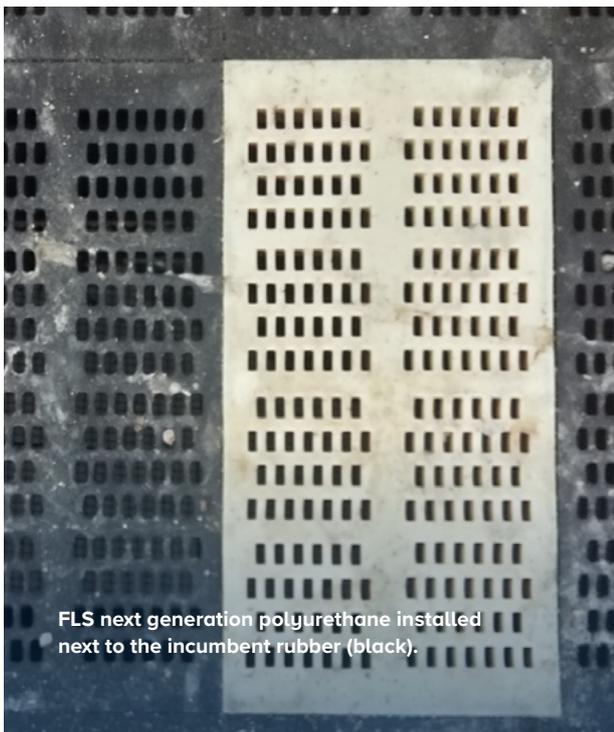
FLS product experts ran scenarios to compare media types and make a recommendation. The analysis showed that the optimal screen media was a new grade of polyurethane material that FLS developed working with a trusted prepolymer supplier. The material combines the most desirable properties of rubber and polyurethane elastomers for a longer wear life.

FLS proposed a trial to compare their next generation polyurethane material with the rubber media that the mine was using. The customer was surprised at our recommendation that a type of polyurethane material be tested alongside the traditional rubber media for their screen.

The trial

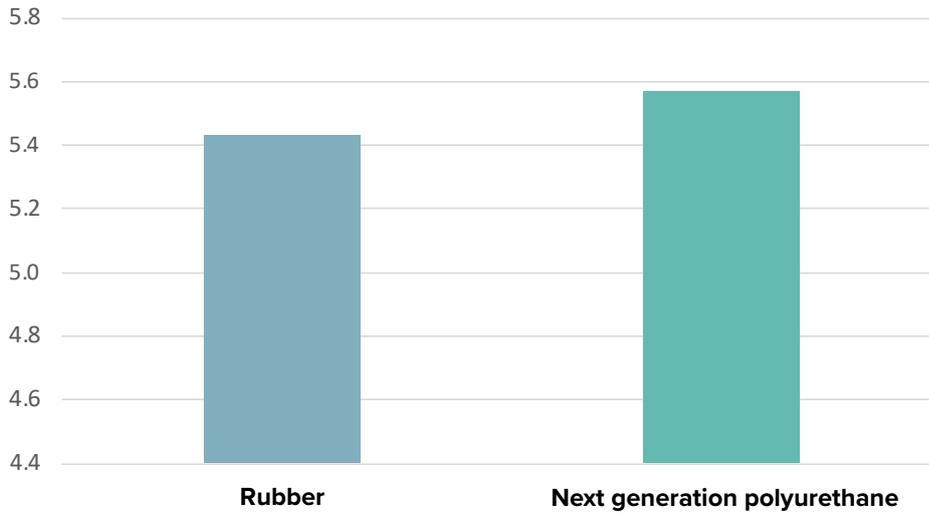
FLS installed trial panels with the selected polyurethane media in the feed, centre and discharge ends of a SAG discharge screen to assess the media performance in different positions on the screen. The test polyurethane panels were dimensionally identical in aperture size, aperture positioning and open area to the existing rubber panels to compare the wear rates effectively. However, the improved material properties of polyurethane have the potential to increase the open area and screen performance in the future.

The SAG mill was shut down every eight weeks for wear rate inspections. The polyurethane and rubber panel wear rates were monitored for ligament loss and the final weight and volume losses were quantified. The trial duration was 30 weeks.

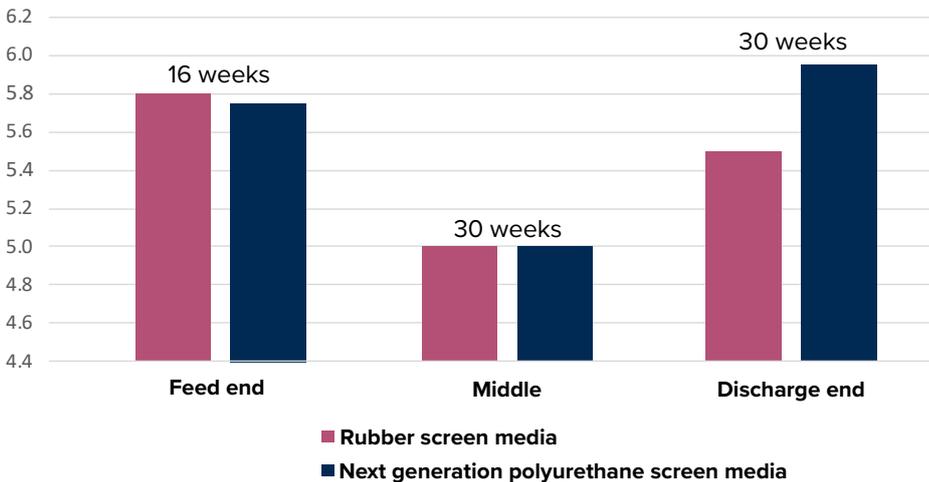


The ligament size measured at the end of panel life showed that the polyurethane panels installed at the feed end and middle section of the screen had wear rates that were comparable with the rubber panels. At the discharge end, it had a significantly lower wear rate than the rubber media.

Average ligament size (mm)



Ligament size (mm)



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The solution

One-fifth of the rubber panels were replaced during the 30-week trial, but all the polyurethane panels had additional wear life left. The polyurethane panels had a 10–20% longer wear life than the rubber panels. The feed type, hardness and abrasive properties of the ore would traditionally demand rubber screen media, but the new grade of polyurethane that FLS uses for screen media changes expectations for what polyurethane can do

The improvement in deck screen media wear life lowered the amount of time maintenance personnel were required to spend on the screens. The customer benefited from increased safety and decreased maintenance expense, meeting their goals for the trial. Maintenance personnel noted that as the polyurethane panels wore, the apertures retained their profiles longer and with less

scalloping than the rubber panels. This benefit went beyond what the customer expected.

With so many positive results from the trial, the customer converted the full deck of the screen to the FLS next generation polyurethane panels. The improved aperture integrity and resulting sharper cuts increased their screening efficiency. They are excited about the improvements that they have already seen, and they are working with FLS to further optimise screen operations and feedbox liner performance.