



# FLSmidth trommel panels

## Screen media optimisation triples panel wear life

### Benefits of the correct screen media material

- Tripled the wear life
- Decreased maintenance
- Increased screen availability
- Improved safety
- Improved mill performance
- Decreased pegging

### Background and objective

A large Chilean copper producer in the Atacama Desert was having issues with their trommel operations. The existing rubber panels did not meet the target life expectancy, necessitating an increase in shutdown frequency. The fastest wearing panels at the feed end of the trommel were only able to endure two months of operation with the abrasive and high impact feed rather than the six month target for mill liner inspection and replacement.

FLSmidth's trommel screen media optimisation assistance lengthened the time between maintenance shutdowns from two months to six months. The difference has increased safety and production, and decreased maintenance expenses. Resources previously spent on the mill were freed for value-added activities.

With these results, it's easy to see why the customer converted a second SAG mill trommel after the trial was complete.

Replacement of the trommel media required a full shift shutdown and a team of five service technicians. The cost of the lost production and maintenance due to the underperforming panels was significant.

In early 2020, the customer contacted FLSmidth to discuss the problems they were experiencing. FLSmidth proposed an analysis for trommel screen media optimisation.

# Exceptional optimisation assistance and technical support

## Defining the project

Selecting the optimal wear media materials is a notoriously difficult challenge, which is why a thorough analysis of the product, feed and operating conditions is an important part of the assistance provided by FLSmidth.

FLSmidth's regional technical experts, in consultation with the global experts, recommended a new grade of polymer panel be created as a customised approach to satisfy the customer's targets and improve operations. In addition to improving the shutdown maintenance schedule, converting the rubber panels to the new polymer material would also reduce the pegging that they found during the analysis. Even though the main focus would continue to be on meeting the customer's target maintenance schedule, the team added the secondary goal of improving the mill operation.

After the new material was developed and panels were produced, FLSmidth recommended a six month trial of the panels with four main objectives.

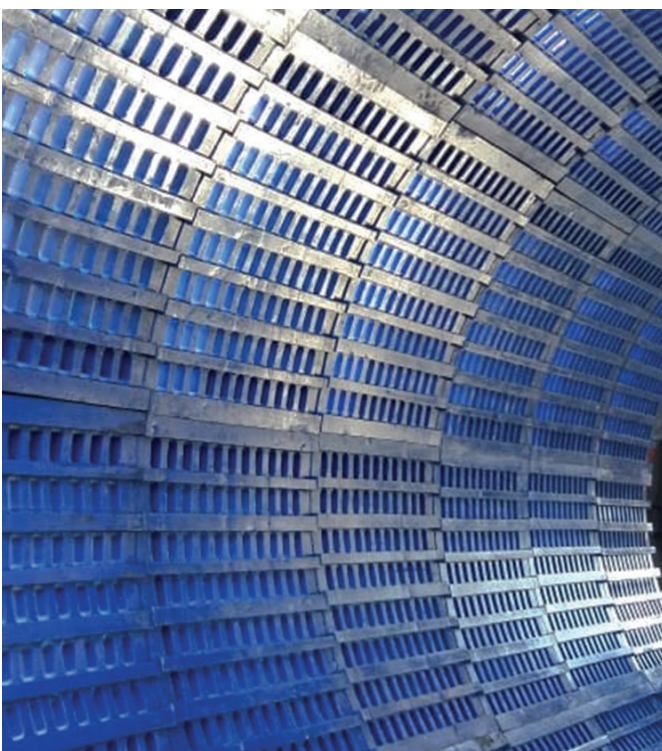
- Compare the overall performance of the new material to the previous rubber panels
- Determine the overall wear patterns
- Analyse the wear patterns and determine the frequency of wear screen media replacement
- Verify whether the new trommel panels meet the customer's primary requirement of six months wear life

## The solution

The challenging operating conditions for the SAG mill required some fundamental changes to the trommel screens. FLSmidth worked with a trusted prepolymer supplier to develop a new material that combines the most desirable properties of rubber and polyurethane elastomers to obtain an outstanding wear life.

The FLSmidth regional polyurethane shop in Santiago, Chile produced the new panels, adjusting their manufacturing as required for the new grade. The finished panels were shipped to the mine on schedule and were installed in June 2020. The six month trial began immediately after installation was complete.

During the trial, FLSmidth partnered with the site for service and performed regular panel inspections. Expected wear patterns occurred during the trial, but none of the panels showed physical damage such as splitting, tearing, severe pegging or displacement. In December 2020, the trial was completed when it was determined that the first three rows of panels at the feed end finally reached the replacement threshold. There was minimal wear on the remaining five trommel rows. There was minimal wear on the remaining five trommel rows. However, after six months of operational duty all the trommel panels were replaced again with the optimised material, ending the trial.

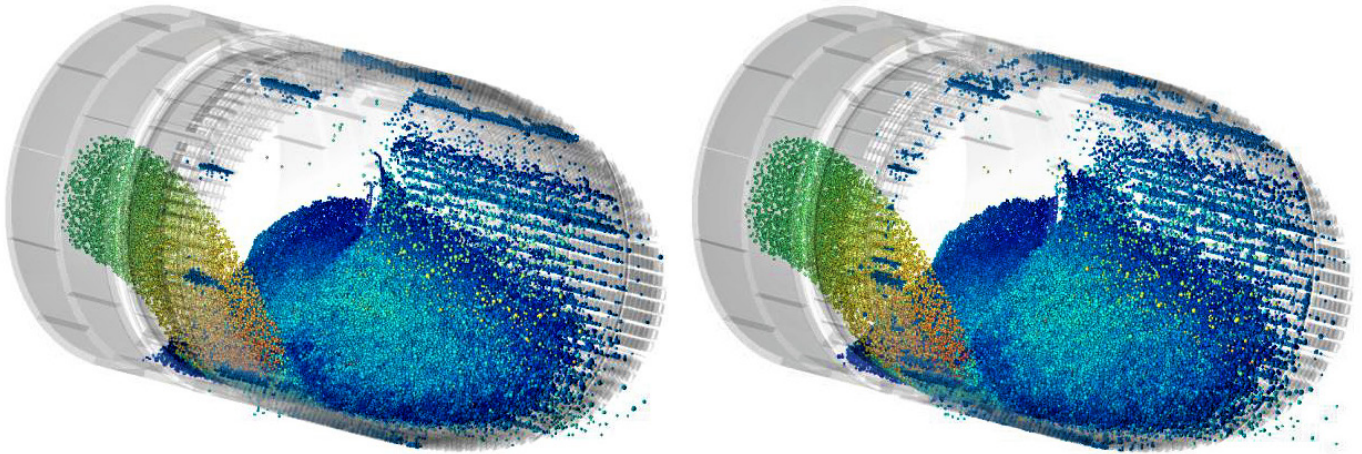


Installation of the new trommel screen media



Frequent inspections and performance monitoring

# The right materials for enhanced performance



Discrete element method (DEM) was used to simulate and confirm the effects of lower wear rates versus the degree of pegging/blinding as a part of our technical services to the client. The study validated the new design and pointed to potential improvements in throughput from reduced pegging/blinding.

## The results

In December 2020, after six months of operation, the following results were evaluated:

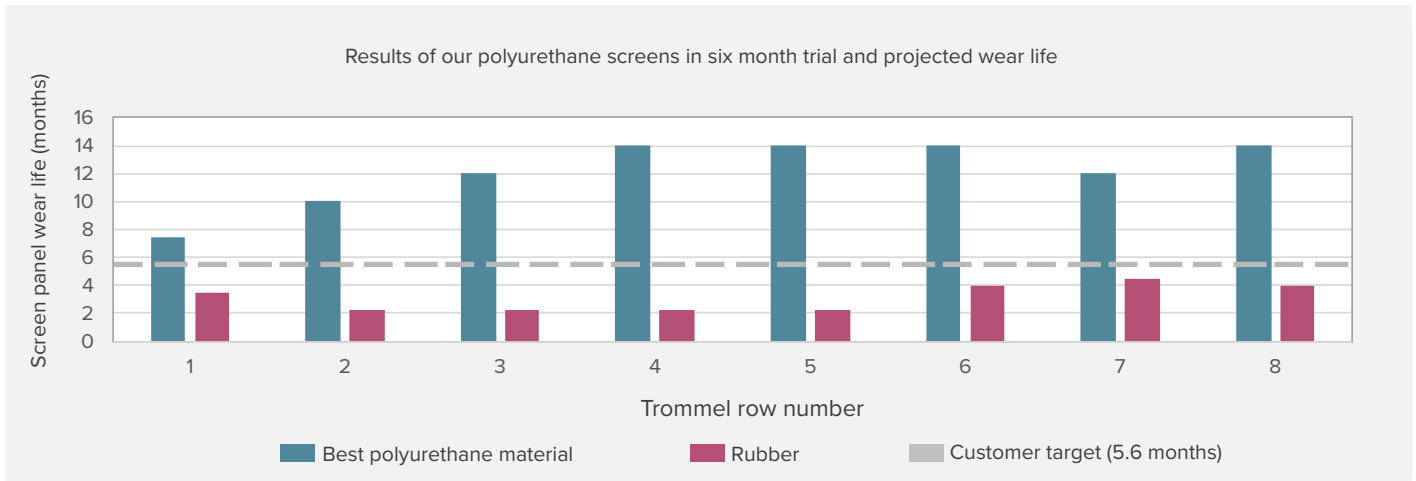
The new trommel panels operated for 171 days (six months) without premature failures or replacements compared with two months of operation for the original trommel panels. This was the first time any panels had achieved so long a wear life in this application. The total copper sulphide mineral treated by the mill during the trial period was approximately 3.7 million tonnes. The panels were exceptional in achieving the desired target for operational duty. Panels from rows three to eight had remaining wear life, giving the opportunity to reduce total cost of operation further if they were left for continued operation.

FLSmidth identified several opportunities to further increase process performance by making additional minor modifications to the panel design as part of an ongoing effort to optimise the panels.

Tripling the screen panel wear life has decreased technician on-screen exposure and increased site safety. The decrease in maintenance hours has significantly lowered maintenance costs and freed up resources that can now be spent on activities that provide more value to the site. Additionally, the improved wear life has decreased the wear media expenses and the site experienced an estimated \$240,000 USD of additional copper recovery due to increased circuit availability.

The customer converted the second SAG mill trommel without hesitation, keen to extend the safety and performance improvement along with cost savings to the remainder of the circuit.

# Lab-supported theory, field-proven results



## Trial summary

- Previous rubber panels lasted two months before replacement
- Our high performance polyurethane screens lasted six months and were projected to last an additional six months in rows 3 through 8
- The panels were removed by customer after achieving the trial's goal of six months
- Reduced downtime with a corresponding increase in production, resulting in an estimated \$240,000 USD of additional copper recovery
- Reduced maintenance expenses



Screen panel at six months

Working with individual customers to optimise their screen media instead of giving generalised recommendations ensures that every mill operates at its best. FLSmidth's manufacturing base can cater to varying site conditions with a wide range of materials, including rubbers, polyurethanes and steel. Global operations mean that delivery and lead times are reduced and responsiveness to local customers is enhanced. The technical experts in screen media build on decades of materials expertise to deliver the best performance for each ore type and application.

Our screen media experts are ready to help you find real-world solutions for your milling problems. Contact the FLSmidth Chile or FLSmidth Brisbane office today to find the answer you've been waiting for.

FIND OUT MORE AT  
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