

CASE STUDY: HOT VULCANISED CERAMIC LAGGING EXTENDS PULLEY LIFE AT AN IRON ORE MINE

At a leading iron ore mine in Western Australia, recurring failures with direct bond ceramic lagging were causing costly shutdowns, belt reliability issues, and maintenance challenges. Elastotec and PROK worked together to identify the root causes and implement a hot vulcanised rubber-backed ceramic lagging solution, delivering significant improvements in reliability and performance.



LOCATION: Western Australia

YEAR: 2024

APPLIC.: Material Loading Zone

SOLUTION: Hot Vulcanised Ceramic Lagging

ISSUES ON SITE:

At a leading iron ore mine in Western Australia, recurring failures with direct bond ceramic lagging were causing costly shutdowns, belt reliability issues, and ongoing maintenance challenges.

The pulley was experiencing frequent tile debonding in the centre, largely due to its position in a material loading zone with heavy spillage. Spillage material was continuously recirculating between the lagging and the belt, accelerating wear and stressing the system.

As a result, the direct bond lagging lasted only nine months before failure.

These failures not only drove up repair costs but also led to unplanned shutdowns, increased risk of belt damage, and potential tracking issues that threatened production reliability.



Tile debonding with existing lagging

SOLUTION

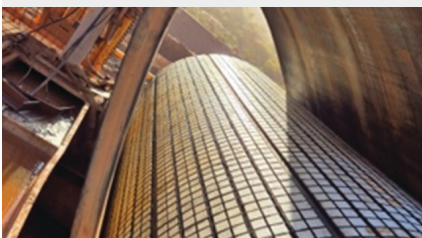
PROK and Elastotec conducted a detailed site analysis to uncover the root causes of the recurring lagging failures.

One of the primary issues was the sudden stresses created by the movement of the take-up trolley, which introduced extra force onto the pulley and caused over-flexing in the centre.

In addition, the recirculation of spillage material was raising interface temperatures, which gradually weakened the adhesion strength of the direct bond epoxy system. Compounding these challenges was the inherently brittle nature of the direct bond ceramic lagging, which lacked the flexibility to absorb constant flexing and cyclic stresses.

To address these problems, Elastotec and PROK implemented Elastotec Hot Vulcanised Rubber-Backed 80% Ceramic Lagging (15mm thick with smooth tiles). This solution was applied using a hot vulcanisation process at 140°C and 450kPa in an autoclave, creating a permanent chemical bond between the lagging and the pulley shell.

The rubber backing provided much-needed flexibility, cushioning, and thermal resistance, enabling the lagging to absorb stresses, withstand higher temperatures, and protect against spillage-related damage. This upgrade has since delivered significant improvements in both reliability and performance.

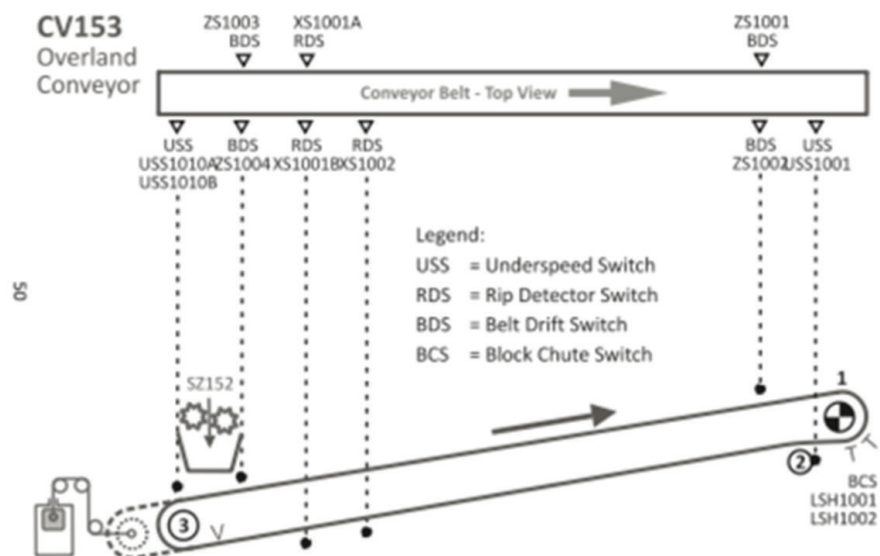


RESULTS

Since its installation in October 2024, the new lagging has delivered 12 months of uninterrupted, trouble-free operation - a significant improvement compared to the frequent failures experienced previously.

Throughout this period, there has been no sign of tile loss or lagging failure, and the mine has reported zero cases of belt damage or tracking issues. By eliminating unplanned shutdowns and repair work, the solution has reduced maintenance demands and extended the life of both the pulley and the belt.

This has translated into improved reliability, higher production availability, and lower operating costs. Beyond the measurable gains, the mine now has greater confidence in its equipment performance, knowing that the lagging system can withstand the harsh conditions of a high-spillage environment while maintaining long-term durability and efficiency.



12+ months
service life with
no failures

Eliminated tile loss issues

No belt damage or tracking problems

Reduced
shutdowns and
maintenance costs

Flexible, high-strength adhesion system tolerates extreme temperatures

