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Curragh coal mine – improved service life of conveyor pulleys

The Curragh Coal Mine is an open cut coal mine located near Blackwater in Central Queensland, Australia. The mine supplies high quality, low ash coking coal and has reserves of approximately 90 million tonnes which is amongst the largest in the world. Coal from Curragh is shipped via the Blackwater rail system to the Port of Gladstone for export. Curragh Coal mine is owned by the Coronado Coal Group a US based company.

In 2016 HEME P/L an engineering firm based in Emerald were asked by the Overland Conveyor Co-Ordinator at Curragh to assist with pulley improvements to overcome problems that they faced on a regular basis. The problems included mechanical issues such as pulley shafts breaking or spinning inside shells, and a multitude of lagging problems such as lagging debonding from the pulley shell, ceramic tiles debonding and coming out of the lagging, and edge lifting of lagging. On inspection of over 50 pulleys held on site as spares, John Herman the Business Development Manager for HEME noted that all pulleys were fitted with cold vulcanised lagging. These pulley failures were causing unplanned conveyor stoppages, and were affecting production out put, operating costs and were increasing the OH& S risks. Additionally poor packaging was causing deterioration of spare pulleys held in service to such an extent that many were unserviceable when required.

Lagging debonding

Lagging edge lifting

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Ceramic tile loss due to debonding

In response to the request from Curragh HEME consulted with Elastotec and as a result recommended a change to Hot Vulcanised (HV) FRAS Rubber and Hot Vulcanised Ceramic pulley lagging (HVCL). This recommendation was based on the fact that the HV lagging would eliminate three of the most common failure modes that the mine was experiencing:

- debonding from the pulley shell
- edge lifting
- separation and lifting at the joints between lagging strips

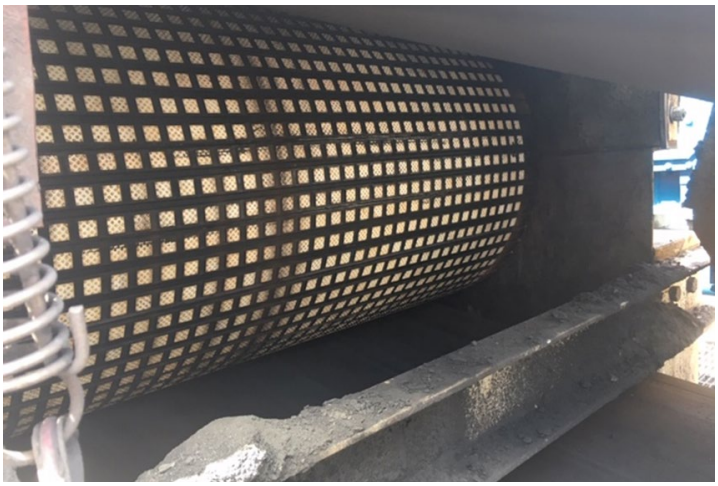
Additionally Elastotec provided a guarantee that the there would be no debonding of tiles from the HVCL.

Based on this recommendation Curragh maintenance personel committed to a trial with three pulleys to be installed with the Elastotec HV lagging.

After six months operation the decision was made to change all lagging for refurbished pulleys to the Elastotec HV lagging.

A pulley with Elastotec HVCL being removed from the autoclave

HEME trades



Elastotec HV Ceramic lagging operating at Curragh – note all tiles inplace – no tile debonding guaranteed by Elastotec

Elastotec HV FRAS Diamond Lagging Installed and operating at Curragh

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To address the issue of pulley deterioration during storage HEME developed a combined pulley cradle and cover that can be used for storage either indoors or outdoors. The cover includes removable sides for inspection, external labelling and a design that allows for ventilation to prevent “sweating” in humid conditions.

HEME pulley cradles and storage unit

Removable sides for easy access

Pulley well secured in the HEME cradle – note the “RED” diamonds in the lagging that indicate “FRAS” lagging

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