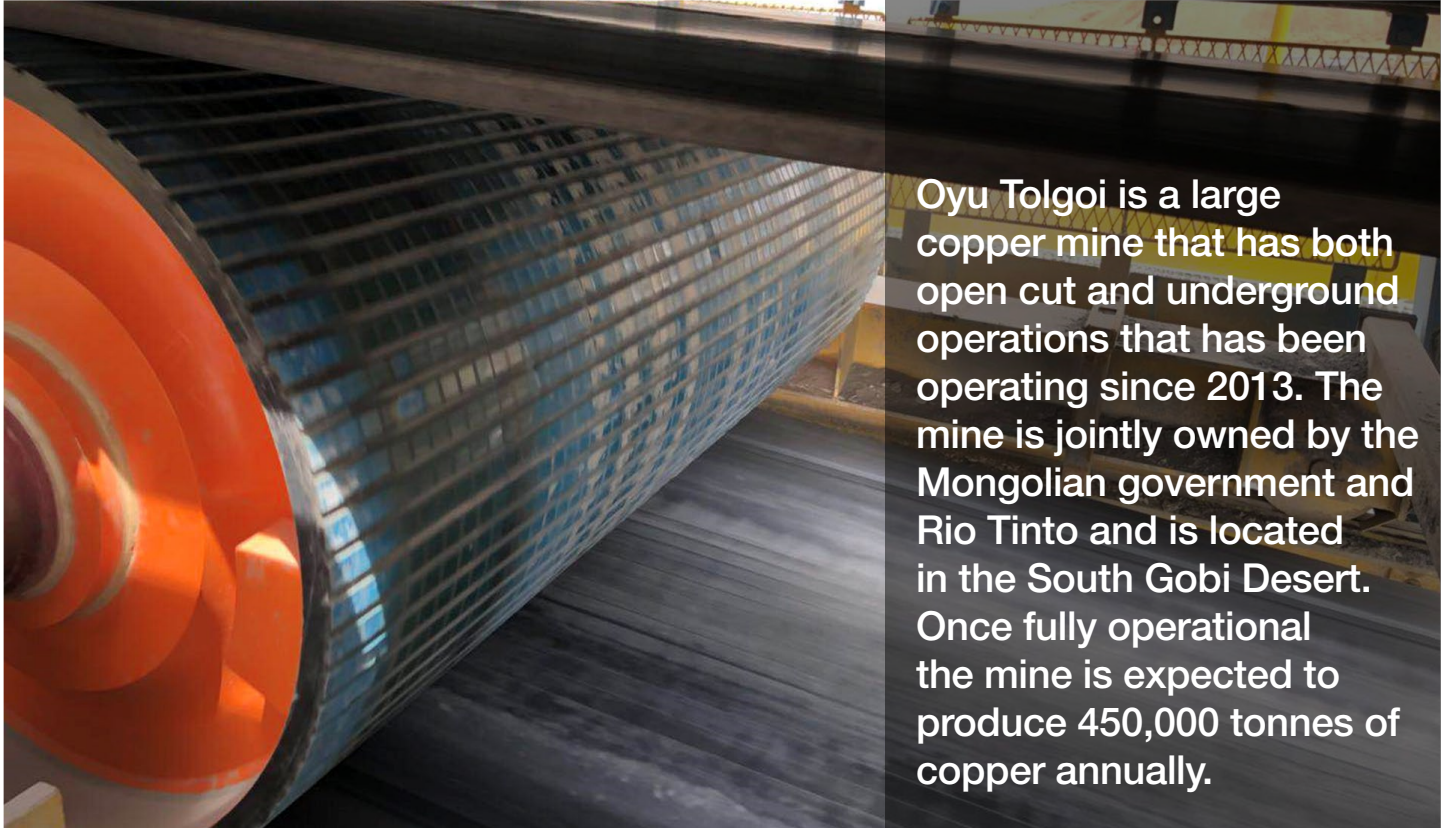


OYU TOLGOI HIGH TENSION BEND PULLEYS



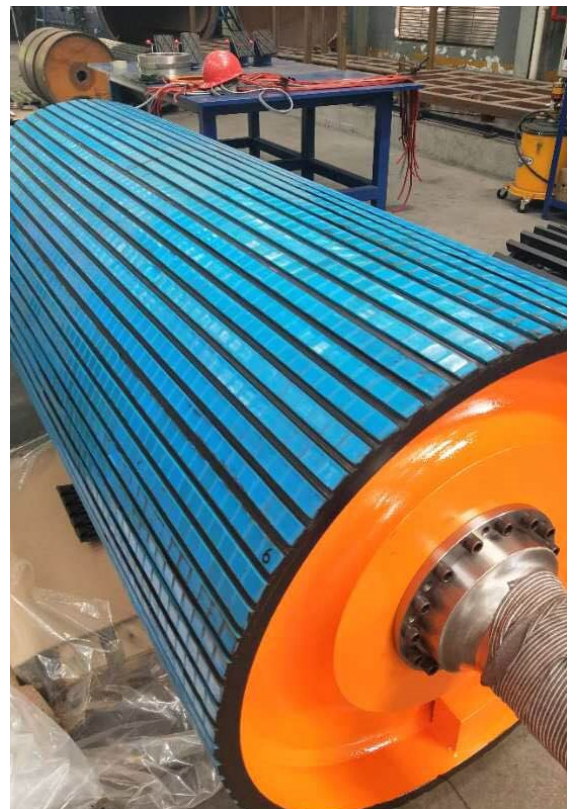
Oyu Tolgoi is a large copper mine that has both open cut and underground operations that has been operating since 2013. The mine is jointly owned by the Mongolian government and Rio Tinto and is located in the South Gobi Desert. Once fully operational the mine is expected to produce 450,000 tonnes of copper annually.

The location of the mine in Gobi desert means that operating temperatures can be extreme from +45 C in summer to -35 C in winter. These operational conditions require careful selection of conveyor materials for robust and reliable performance. Martin Sprocket & Gear China have been working closely with the maintenance personnel at Oyu Tolgoi to improve the performance of their conveyor pulleys. With regard to pulley lagging a number of ongoing problems have been identified and targeted for improvement:

- Debonding of lagging from the pulley shell. This problem is seen with cold vulcanized lagging on replacement pulleys and is accentuated during operation at low temperatures where the loads on the bonding system increase with the increasing stiffness of the lagging
- Insufficient service life with rubber lagging on drive and non drive pulleys due to wear
- Build up of carryback on drive and non-drive pulleys that will result in belt tracking problems.

Martin Sprocket & Gear and Elastotec have been working closely to address these lagging problems and provide increased lagging service life.

In October 2017 Martin China applied Elastotec Hot Vulcanised Ceramic Lagging (HVCL) to two drive pulleys for Oyu Tolgoi. Both pulleys were installed in early December 2017 and were operational throughout the winter months with temperatures reaching -35 C. Pulley performance/Lagging performance was unaffected by the low temperatures and maintenance personnel at Oyu Tolgoi indicated they were very happy with this outcome.



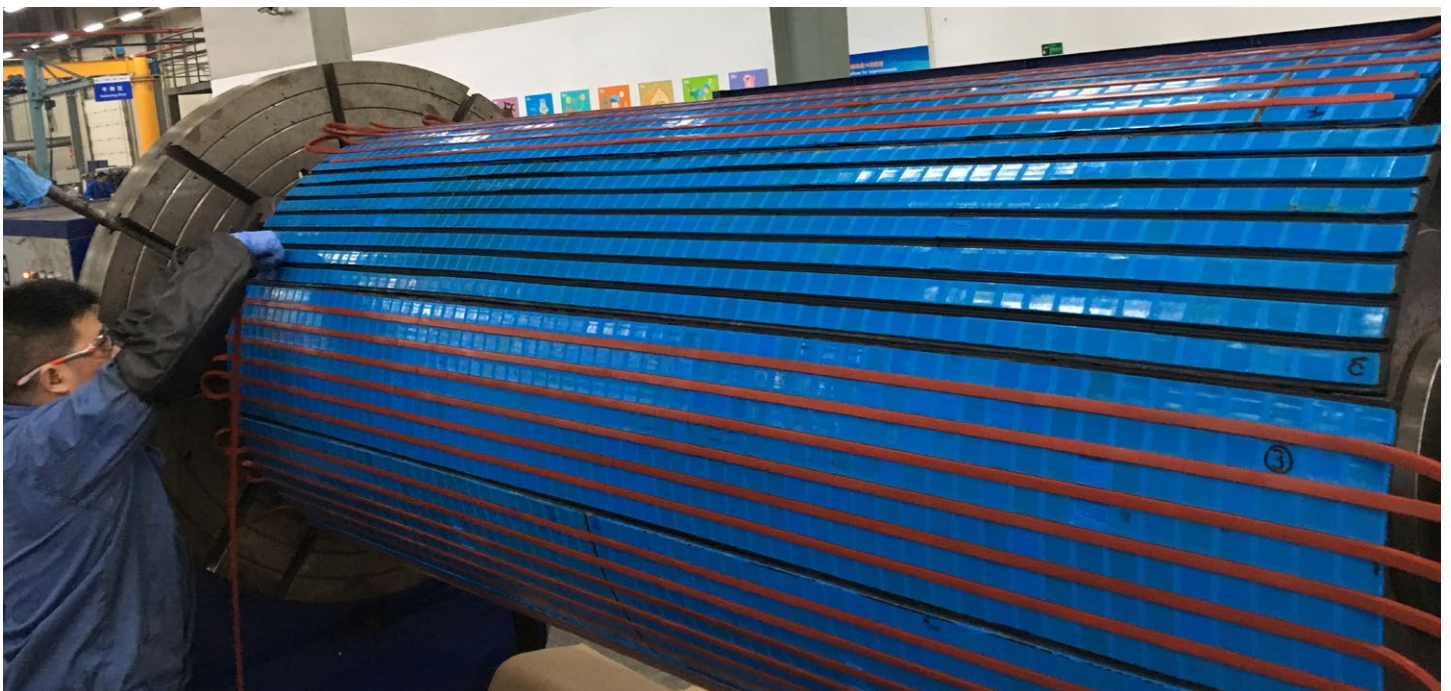
OYU TOLGOI HIGH TENSION BEND PULLEYS

Following on from this success Martin China recommended the use of the Elastotec Hot Vulcanised Polyurethane Lagging (HVPU) for a number of high tension non drive pulleys. These pulleys had suffered from problems with localized debonding of lagging and material build up due to carry back problems.

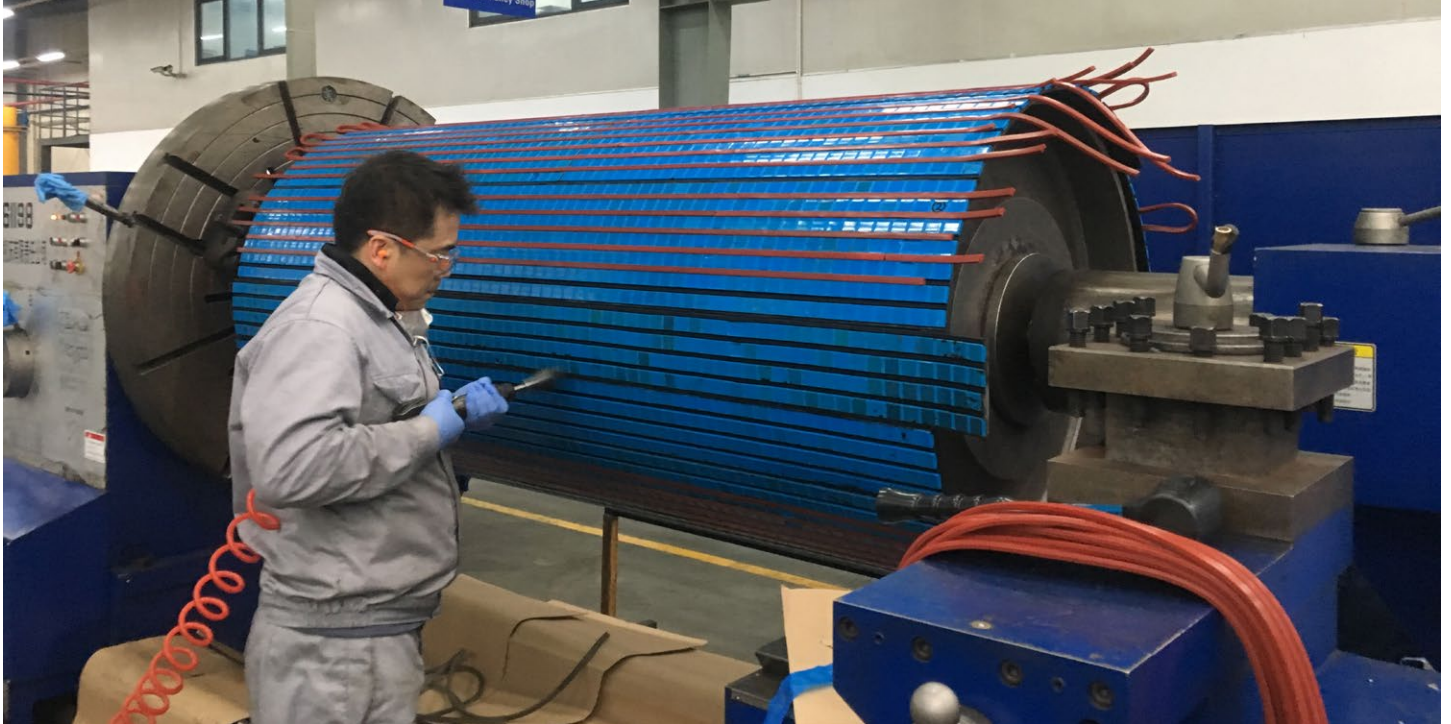
The Elastotec Hot Vulcanized (HV) Bonding was a well proven way to eliminate the debonding of the lagging and the use of Polyurethane greatly increased the abrasion resistance of the lagging compared to rubber, while at the same time providing resistance to buildup as a result of the much lower co-efficient of friction.

Once this recommendation was approved Martin arranged for Elastotec to assist with the training and supervision of the application of the HVPU Lagging at their pulley manufacturing facility in Changzhou. In addition to developing the high performance Hot Vulcanised Polyurethane Lagging Elastotec have a detailed application procedure to ensure that the lagging performs exactly as designed.

Martin China have established a state of the art pulley manufacturing plant in Changzhou and have invested in a PLC operated autoclave for applying hot vulcanized lagging. This state of the art equipment allows Martin to control both the quality of the lagging application, and the lead time.



OYU TOLGOI HIGH TENSION BEND PULLEYS



The two high tension bend pulleys with Elastotec HVPU were supplied to Oyu Tolgoi and put into service in early 2018. Greg Fogo (International Bulk Material Handling Director for Martin) has visited Oyu Tolgoi to see the pulleys in operation and obtain feedback from the site maintenance personnel. Current operation is as expected with no sign of the buildup or excessive wear problems experienced previously.

For additional information on the use of HVPU lagging in critical conveyor pulley applications please go to the link below:

<http://www.elastotec.com.au/blog/new-technology-extends-service-life/>

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