

MINING TYRE RECYCLING ARRIVES

AS MORE AND MORE COUNTRIES AND MINING COMPANIES BEGAN LOOKING INTO EARTHMOVER TYRE RECYCLING, KAL TIRE SET OUT TO PROVIDE TWO PRACTICAL YET INNOVATIVE SOLUTIONS: THERMAL CONVERSION AND SHREDDING.

FOR DECADES, Kal Tire's Mining Tire Group has handled a tyre at almost every stage of its life. The company sells the tyre, services the tyre, and maybe even repairs or retreads the tyre. But when it was sent to the scrap pile for good—that was the last its technicians saw of the tyre.

“We wanted to be a part of the complete life cycle of the tyre we sell and service,” says Dan Allan, senior vice president, Kal Tire's Mining Tire Group. “It's important to our customers and the countries we operate in, and it's important to us.”

To help mine operators meet their mandate of environmental responsibility and prepare for earthmover tyre recycling legislation being developed in several regions, Kal Tire saw an opportunity to provide the last piece of the puzzle, and give customers they already serve significant, measurable value that would make a difference for generations. Two solutions—each with their own advantages—surfaced. The first was shredding. The second was thermal conversion.

IN CHILE, where gold, copper and nitrates have been mined for decades, government recently enacted recycling legislation for passenger tyres, with the possibility of including mining tyres on the horizon. Kal Tire, which has been operating in Chile more than 20 years, knows firsthand how mining tyres have been stockpiled along mining site fence lines.

When Kal Tire began exploring the idea of setting up its first thermal conversion recycling facility, the company saw in Chile



an ideal location: In 2015, the company had opened an earthmover retread and repair facility in Antofagasta, in the heart of the country's mining industry.

While plans began to build next door a 20,000 square metre plant site that would one day have the capacity to recycle nearly 20,000 kilograms of tyres each day, a leading industry manufacturer was testing and developing earthmover thermal conversion technology exclusively for Kal Tire.

Thermal conversion—a treatment that thermally decomposes organic materials with heat in the absence of oxygen, and turns tyres into fuel oil, steel wire and carbon black—has only been used on passenger and truck tyres until recently.

“The size of earthmover tyres, until now, didn't make it easy,” says Scott Farnham, project manager, recycling solutions, Kal Tire's Mining Tire Group. “We had to create much larger equipment to manage the enormous size and weight of these tyres.”

After three years of pilot plant testing and development, Kal Tire now has the proven



Three outcomes of thermal conversion from left to right: carbon black used in paint and printer ink, electrical energy generated from fuel oil and steel wire used in steel products.

technology, and soon it will have the Chilean facility built and recycling tyres using thermal conversion.

The process starts at the mine site, where tyres are collected then transported to the processing plant. At the plant, tyres are then cleaned to help remove impurities before moving into the vacuum chamber.

Since the chamber uses heat in the absence of oxygen, there is no smoke, no burning, just melting and decomposing of the tyre into three elements: steel wire, which can be reused in steel products; fuel oil, which will power heavy oil generators that will produce electrical energy for Chile's national energy grid or mine sites; and carbon black, which can be re-used in paints, printer ink and plastics.

"Virtually 100 per cent of the tyre is repurposed," says Farnham.

Even though the facility is in Chile, it is being constructed to exceed even the environmental standards of the EU—the highest in the world. That will put the plant designs in good stead as Kal Tire brings its thermal conversion technology to more international mining markets in the coming years.

IN CANADA, where the oil sands region of northern Alberta has seen heavy mining activity for more than 20 years, earthmover tyres have also been piling up.

"Until now, if a tyre on a mine in western Canada was no longer usable, it was sent to the scrap pile, where it probably stayed," says Bob Bennett, vice president of operations in Canada, Kal Tire's Mining Tyre Group.

Now, however, mine operators across western Canada have a solution for one of their biggest environmental concerns. In May 2016, Kal Tire began to offer a new earthmover recycling service from a facility near Alberta's oil sands, where it will conveniently serve western Canada's mining industry. Through a partnership with one of North America's leaders in tyre recycling, the plant will have the annual capacity to shred nearly 6,000 earthmover tyres.

"We sell and service these tyres, and we wanted to offer customers a simple, viable, environmentally friendly alternative when tyres reach the end of their life," says Bennett.

Scrap tyres of all sizes, including ultra-class 63-inch tyres, will be collected from mine sites and brought to the Legal, Alberta, facility. There, earthmover tyres will be segmented and shredded in a closed circuit. The final product—tyre crumb—will see additional processing or reuse as road base, mats, playgrounds, tyre-derived fuel and more.

Throughout the process, customers receive a complete history of the tyre from collection through processing, thereby completing the entire life cycle of the tyre.

"OUR CUSTOMERS want to ensure they are environmentally responsible and this is going to make a big difference," says Allan. "We see ourselves as innovators, but also as partners to our customers, and both solutions are great examples of our unique approach. We're proud to say we can now offer mining tyre services and solutions to customers at every stage in the life cycle of a mining tyre."