Kal Tire leads the way in solving the challenge of scrap mining tires

As Kal Tire reaches the end of commissioning a new OTR thermal conversion recycling facility in northern Chile—a first for the country—the company is excited about what this solution at the top of the recycling hierarchy will mean for mines and tire scrap piles in Chile, and across the mining industry.

In Chile, where some of the world's largest copper mines have been operating for decades, mines haven't had a choice but to stockpile their earthmover tires. At some sites, scrap piles extend as far as the eye can see; one site is home to 50 football stadiums of tires stacked four high.

"The industry has never had a solution as robust as this," says Scott Farnham, director of recycling services, Kal Tire's Mining Tire Group, "It's a very important step along that road of solving the enormous challenge of scrap tires and giving mines a way to operate in a way that's more environmentally responsible."

Kal Tire's OTR tire recycling plant employs a unique thermal conversion process that uses heat and friction to induce a reaction that converts tires into their base elements so they can be reused. At full production, the plant will recycle five 63" tires or 20,000 kilograms a day; if the plant runs a minimum of 250 days of the year, that's 5 million kg or 1,250 earthmover tires in a year.

Getting the recycling facility to this stage has been a journey marked by firsts and overcoming setbacks, but Kal Tire was driven to develop a viable solution for customers that would contribute to a circular economy versus shredding.

"What to do with scrap tires has become such a source of concern for most mines. They've run out of room, it's a fire risk, and ESG commitments are increasingly important," says Dan Allan, senior vice president, Kal Tire's Mining Tire Group. "If our aim is to solve our customers' mining tire challenges, then developing a tire recycling solution is a necessary contribution. We could see the landscape changing and we wanted to do our part to create a sustainable future."

Several years ago, as Kal Tire began to explore mining tire recycling options, Chile became one of the first countries to develop mining tire disposal legislation. Kal Tire has been serving Chilean mines for decades, and so the company determined it would develop a mining tire recycling solution that would first be implemented in Chile—and one at the top of the recycling hierarchy. Significant research led the team to thermal conversion recycling. The challenge was, in 2015, that solution didn't yet exist.

What followed was the arduous process developing the technology and building the 20,000 square meter facility as well as hundreds of conversations with customers and the Chilean government to ensure the plant would meet the needs of government and industry, and exceed environmental and safety requirements. In the spring of 2021, the first reactor's full load tests were underway and were successful: The equivalent of five 63" tires were converted into 6,500 litres of alternative fuel, 4,000 kg of steel and 8,000 kg of carbon black as well as enough synthetic gas to fuel the plant itself for seven hours.

Now, as Kal Tire begins to recycle some of the estimated 500,000 tonnes of scrap tires in Chile, the potential opportunities for reuse of the materials are growing, as is the appetite for an approach that creates this kind of circular economy. Farnham imagines a future where the carbon output could be reused in conveyor belts on mine sites (and the belts could be recycled time and again), or in the manufacture of plastic piping that transports water on mine sites.

"We're seeing high quality outputs and a lot of opportunities for them to become high value chemical feedstocks or fuels," says Farnham. "Part of what makes the thermal conversion solution so exciting is that by offering mines a way to reuse a portion of a tire's original material in a form such as fuels, is the chance to make an even greater impact for customers and communities."

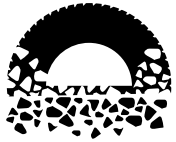
As a groundswell of interest in supporting a circular economy and ESG commitments takes greater focus in the mining industry, interest in Kal Tire's recycling solution grows too. Right now, it's the only operating facility of its kind that Kal Tire is aware of.

> *"Developing an innovation such as this requires strong collaboration between several partners—ourselves, customers, manufacturers and the Chilean government—and we want to thank everyone for their involvement and support," says Allan. "We now have a solution that's practical and scalable, and we're pleased to be in discussions with mining operations in various countries about how Kal Tire can provide this technology for their tire recycling needs."*

HOW DOES THE THERMAL CONVERSION RECYCLING PROCESS WORK?

STEP 1
Scrap OTR tires are transported to the plant from mines across Chile.

STEP 2
The tires are cleaned and cut into smaller sizes.



STEP 3
Tires are loaded into a chamber where they are processed using heat in the absence of oxygen.

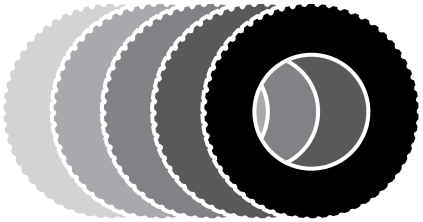
Thermal conversion converts tires back into their original components and virtually

100% of the tire is repurposed.

KAL TIRE'S OTR RECYCLING PLANT IN ANTOFAGASTA

- facility engineered to withstand a magnitude 9.0 earthquake
- meets and exceeds environmental and safety requirements

A full load at the Chile plant is 20,000 kg of tires—the equivalent of five 63" tires that will be converted into:



6,500 litres
of alternative fuel

4,000 kg
of steel

8,000 kg
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Enough **synthetic gas**
to fuel the plant for seven hours