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## Mining Tires — Keeping the heavy equipment rolling

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# Learning to Roll With the Times

*The mining tire market has faced significant change over the past 2-3 years. E&MJ asks suppliers and service companies how they're keeping mines up and running.*

By Carly Leonida, European Editor



Site access and accurate forecasting are some of the biggest challenges tire service providers have faced during the COVID-19 pandemic. (Photo: Kal Tire)

The COVID-19 pandemic disrupted every aspect of the mining tire market in 2020 and 2021, and suppliers, service providers and mines are still feeling the effects today. In the early days of the pandemic, government-mandated shutdowns and reduced workforce numbers as team members dealt with the pandemic in their communities, restricted site access. And, two years on, transportation challenges, including port tie-ups and shortages of containers in many ports, continue to hinder shipments of both raw materials and finished tires.

“At the start of 2020, we honestly had no idea what was about to happen,” said Dan Allan, senior vice president, mining tire group at Kal Tire. “Mining was performing well, and there was a good balance between supply and demand. As the pandemic took hold, we saw many mines close temporarily or face extended quarantine periods. Tire usage continued as it had, but quarantines and closures even-

tually reached the manufacturers as well. Workforces around the world at different plants had challenges running consistently. Couple that with the already emerging logistics issues, and supply became a huge challenge.”

Many tire suppliers and service providers temporarily lost the ability to visit customers and even their own teams. This was challenging, as the accuracy of forecasting is dependent on an intimate knowledge of mines.

“At the start of 2020, we lost over a quarter of our service invoicing due to shutdowns, quarantines and travel restrictions,” Allan said. “We often have team members make visits to our customers. These visits are usually frequent, but short — around 1-3 days. During one of these visits to Burkina Faso, the borders were closed and our team member, who had planned for a three-day mine visit, was isolated at a mine for over eight

weeks as we awaited COVID-19 protocols to clear and borders to open up again.”

Allan credits flexibility and agility as key to overcoming many of the challenges associated with the pandemic.

“In some cases, we had to be very flexible with our customers,” he said. “For example, there was a period of time when the price of oil went negative. Our customers across the oil sands were dealing with huge swings in commodity pricing, and it was not clear at that time what would happen. We had to adapt our teams to customer needs and work closely with them, even when the product they were extracting was worth nothing.

“In other cases, we had crew changeovers that would normally be a rotation of seven days extended to 28 or even 60 days as the mine coped with the quarantine and infection processes. Through the whole process, our teams at the site were challenged on a personal and professional level and, in some cases, they were not able to spend time with their own families. We are truly appreciative and thankful for their dedication of the Kal Tire team members around the world.”

By fall 2020, tire demand seemed to be back on track and although there were some starts and stops, tire services became more normalized.

Today, mines are more concerned about consistency of supply. While there are still lingering planning, forecasting and delivery issues from COVID, Allan said the freight and logistics situation is now the largest challenge.

“Cost increases have been rampant across the industry, and the availability of carriers, containers or transportation options creates havoc with our supply lines,” he said. “We are working constantly with customers and suppliers to ensure we have the most reliable supply chain we can. For us, this has resulted in an increase in the level of inventory we carry, and an increase in the planning horizon for shipments.”

## Kal Tire Advances Tools and Technologies

Through this whole process, Kal Tire has been evolving its Tire Operations Management System (TOMS). TOMS is designed to move team activities, planning and information from a “reactive” state to a proactive one. This allows customers and Kal Tire’s own teams to plan ahead for things like forecasting, equipment downtime and planned maintenance events.

“We have been able to learn more about these capabilities and use them more effectively,” Allan added. “We are also using the aggregated learning from TOMS to leverage tools like artificial intelligence (AI) and help us predictively plan or recommend courses of action for customers, and provide feedback to manufacturers on what works, and what does not in specific applications.”

Today, the company is focusing on adding value through three main pillars. Disposal of end-of-life tires remains a huge challenge for miners, regardless of where they work.

Allan explained: “While mining companies have done an extraordinary job of keeping pace, evolving and committing to environmental stewardship, end-of-life mining tires remain a huge challenge. Kal Tire has recently opened an off-the-road (OTR) tire recycling facility in Chile and continues to explore how we can bring this — or a similar solution — to other areas and jurisdictions.”

A perennial problem across mining has been finding and keeping skilled workforces. This challenge is not new, but it is becoming more pressing. To that end, Kal Tire is working with ideas and concepts around automation (robots, autonomous devices, AI) to aid with some of these tasks.

“Although some of these technologies are still in their infancy, we know they will become commonplace in mining and service operations over time,” Allan said. “Our work with Pitcrew.ai, where we combine our TOMS systems with machine learning and optical recognition to perform in-the-field tire inspections is a great example of how digital technologies can be combined to add value. They also allow our team members to focus on the ‘expertise’ part of their role, rather than the physical or more routine parts.”

Kal Tire continues to invest in tools, processes and technologies to keep its

teams safe, and make them more efficient and effective.

“We have a dedicated Innovation Centre at Kal Tire, which focuses on our field team member challenges,” Allan said. “We look at our existing processes and tools, and try to ‘reimagine’ work or redesign tools and equipment to enhance the work.”

“Innovations like our Gravity Assist System, Rapid Deflator Units and our Wheel-Mounted Bead Breakers are all examples of this. Our latest tool — the Kal Clamp — will increase the level of safety in vertical mounting or unmounting of wheels by taking the worker out of the danger zone between the wheel and a piece of mobile equipment.”

## Supporting Productivity at Roy Hill

Kal Tire recently announced it won a five-year contract to provide mining tire management and maintenance services at Roy Hill in Australia’s Pilbara region. The company will be using TOMS to provide Roy Hill’s fleet planning teams with a 360° view of tire maintenance activity with near real-time reporting and improve mean-time-between-service (MTBS) with automated, priority-based work orders. TOMS will receive findings from autonomous inspection stations that detect signs of potential tire damage.

Kal Tire will also bring its Gravity Assist System, a Ram Mount Tool, which securely holds the bead in place, a Power Cart that allows technicians to stand at a safe distance to operate multiple hydraulic rams and bead breakers, and its Kal Clamp, which takes technicians out

of harm’s way during the installation and removal of tire and wheel assemblies.

Roy Hill will also benefit from Kal Tire Australia’s repairs services and Ultra Repair technology, and the Maple Program, which allows sites to quantify and report on the proven emissions savings of Ultra Repairs.

Over the next 12 months, Kal Tire will continue to invest in areas like automation, robotics, and the evolution and applicability of machine learning. There are very real advantages in leveraging these technologies, but the company is realistic that more learning is required before they can be implemented at scale.

Allan added: “We continue to work with our recycling activities, customers and tire manufacturers as we work toward a true circular economy. Our thermal conversion plant produces a version of recovered carbon ash (rCB). Finding the right characteristics for this rCB can enable it to be used in various other manufacturing processes e.g., as a replacement for carbon black, but there is still a large amount of research and collaboration that has to occur. Ultimately, we see a path to having this rCB be a meaningful contributor to the reduction of carbon emissions over time.”

## Bridgestone Expands MasterCore Production

While mining production indexes continue to improve, the industry has not reached pre-pandemic levels due to headwinds in labor, parts, shipping and equipment. However, the tide is turning and, today, strong commodity demand is impacting pricing. The industry will con-



MasterCore is Bridgestone’s newest line of 57- and 63-in. tires for open-pit ultra-class haulage. (Photo: Bridgestone)





Kal Tire's Kal Clamp tool in action. (Photo: Kal Tire)

tinue to ramp up production, which will positively impact the tire market.

Rob Seibert, president, off-the-road tires at Bridgestone Americas, said: "We plan to meet increased demand in 2022 thanks to increased capacity in the U.S. We also plan to make new investments in more flexible production capacity that will strengthen our ability to get the right product, to the right place, at the right time."

"For example, we have experienced strong demand for our MasterCore tires, our newest line of 57- and 63-in. tires for open-pit ultra-class haulage. The technology behind MasterCore is the pinnacle of OTR tire engineering. We began U.S. production of MasterCore tires at our 1.5 million-square-foot OTR tire factory in Aiken, South Carolina, in September 2020, and have since expanded production to include additional MasterCore sizes. Our supply remains strong, and the team continues to maximize production at Aiken to provide a greater percentage of domestic supply. We are taking actions to provide more product across all OTR sizes in 2022."

The MasterCore tire line is Bridgestone's most advanced surface mining tire line, which it claims can deliver up to 5% greater durability, 10% faster truck operating speeds, or 15% greater payload capacity based on internal testing

with select Bridgestone tires. Offered in various sizes and patterns to provide customized solutions based on surface and traction conditions, fleets receive greater utilization of their haulage assets to help improve mine performance and achieve a lower cost-per-ton, which is more important than ever in today's environment."

Like many of its peers, Bridgestone is seeing more customer requests centered around integrated tire solutions across their operations.

Seibert explained: "Today, mining clients are continuing to request the latest solutions to support their growth and create value through data, technology and services. Bridgestone leverages smart technologies to monitor and track tire health and identify areas for improvement. For instance, iTrack II is a real-time tire monitoring and management platform for the OTR vehicle market. iTrack II features 24/7 monitoring of OTR tire pressure and temperature as well as vehicle speed and G-forces, in conjunction with expert support to enhance operational safety and haulage asset productivity."

With one of the largest solutions networks in North America, Bridgestone offers comprehensive solutions such as on-site service and repairs, complemented by on-site field engineers and ongoing training opportunities to ensure customers' mine sites are operating as efficiently as possible.

"In addition to our integrated technologies and best-in-class service, Bridgestone offers intelligent products to equip our customers with the tools needed to maximize productivity and make informed, actionable decisions," Seibert said.

The company is using real-time data and mine-specific algorithms to provide insights into operational efficiency, including tire choice, rotation and scheduled services, and on-site inventory quantities.

"Our customers are tech savvy and are demanding innovative solutions," Seibert

said. "They want real-time updates on every aspect of their operation in the palm of their hands, and they also want safe and reliable equipment for the job site. Bridgestone is responding to this by investing time and resources to deliver the innovative solutions our customers want and need."

"As the industry continues to evolve, our focus is ensuring we are creating best-in-class technology that meets the needs of our customers. We will continue expanding our Mobility Solutions portfolio, which includes iTrack II, along with producing world-class tires technologically engineered for massive haulage to meet evolving customer needs."

### Michelin: The Right Tires at the Right Time

According to Sarah Robinson, marketing manager for mining in the U.S. and Canada, at Michelin North America, the company sees exceptionally strong demand from the market today as activity continues to expand toward pre-pandemic levels.

"At this point, the most lasting impacts of the pandemic have been due to logistics and labor force," she said. "The mining market had a healthy rebound in 2021 in both surface and underground, with some headroom to return to pre-pandemic levels. 2022 will see a return to pre-COVID levels of demand."

As logistics continue to challenge supply, Michelin is working closely with customers to ensure delivery that is optimized to best suit their needs. With shipping challenges continuing in 2022, the key focus for the company's dealers and end users is going to be having the right tires at the right time.

"It's imperative to closely monitor inventories and accelerate demand forecasts more than ever before," Robinson said. "Dealers and manufacturers will need to forecast earlier and more accurately than

### Continental Launches New Cameras

Continental has expanded its line of vehicle camera systems. The new Analog High Definition (AHD) Camera Systems are designed to enhance the driver's view and improve fleet efficiency.

Built to support drivers when navigating complex situations, these camera systems provide operators with extended visibility needed to get a better view of their surroundings and make operations safer.

Continental's AHD Camera Systems feature 2 mega pixel cameras with high image clarity and infrared lights for enhanced night

vision. The camera line includes rear-view and front- and side-view cameras. The displays work with CVBS and AHD camera inputs. Video can be stored for future driver analysis and training.

Offered with 7-in. and 10.1-in. displays, the AHD Camera Systems integrates seamlessly with Continental ultrasonic sensors to deliver backup detection that warns the operator of obstacles behind the vehicle. The cameras feature IP67 enclosures that are waterproof and dust tight. The systems are available with dual voltage (12 V and 24 V) and offered in different cables sizes.

we have historically to compensate for the longer shipping times and lack of flexibility caused by the existing backlogs.”

Additionally, any opportunity to improve site productivity with tires on the ground is clearly an advantage in the current landscape. Where shipment and logistics are challenged, tire performance on-site can improve a site's bottom line by increasing loads, speed, runtime, wear life or any combination of those.

### New Tires, New Technologies

In 2021, Michelin North America introduced two new tire lines for 57- and 63-in. rigid dump trucks with new compounding to improve wear resistance and MICHELIN Multilayer Technology that provides optimized wear across front and rear axles. The outer layer is optimized for front axles for the first cycle of the tire's life, while the inner layer underneath is optimized for rear axles for the second cycle. Tires are designed to be rotated to the rear axles to increase tire life.

Michelin also introduced the MICHELIN XDR 250+ in May 2021. This tire features improved wear resistance, optimized

wear and increased aggression resistance. Available in a 50/80R57 size, the MICHELIN XDR 250+ tire improves tire life by 8% for MB4 and MB compounds, with no trade-off in ton-miles per hour (TMPH) compared to the MICHELIN XDR 250 tire.

Improving upon the well-regarded XDR3, Michelin also launched the XDR3+ in 53/80R63, 59/80R63 and 50/90R57 in 2021. The XDR 3+ will offer at least 6% more tire life for the MB compound, and 4% more tire life for the MB4 than the XDR3 B & B4 compounds, respectively. Specifically targeting the needs of customers utilizing 57-in., the 40.00R57 XDR3+ offers increased load capacity of 67 tons, at a lower pressure than the 40.00R57 XDR3.

Surface mines can also take advantage of MEMS 4, Michelin's tire temperature and pressure management system (TPMS) solution for the management of mining vehicles and overall conditions on site. MEMS 4 harnesses digital insights to increase profits and reduce downtime by protecting people, tires and the equipment.

Productivity also being key underground, Michelin introduced the MICHELIN X UM Haul in 2021. Capable of 247

TMPH, the MICHELIN X UM Haul can carry heavier loads at lower pressures due to new construction and cables. With new rubber compounds that run cooler, users can now run up to 8.7 miles in an hour.

Looking forward to the goal of recovering 100% of end-of-life tires, Michelin has conducted more than 50 lifecycle analyses in accordance with the ISO 14040 Approved Life Cycle Assessment and holds key partnerships to develop new end-of-life tire recycling solutions.

Robinson explained: “The responsibility to improve sustainability reaches far beyond the physical tire that we see and consume. Michelin addresses every stage of that impact, from design, to usage, to tire purpose after it is demounted from a wheel.”

The Michelin Better Mining approach aims to enhance the industry's environmental and social performance, with a focus to be Safe, Smart and Sustainable.

“All development continues to support this approach, in order to maximize performance and value for the customer and minimize the impact the tire has on the environment,” Robinson added.”

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RIMEX ships rims, wheels and related products to customers worldwide. (Photo: RIMEX)

### RIMEX: Keeping Prices Low and Productivity High

RIMEX ships rims, wheels and related products to customers worldwide. Like it's counterparts in tires, the company saw

customer operations in many areas slow during the pandemic due to workforce issues and health restrictions imposed by local authorities. The same labor issues faced by RIMEX customers were also oc-

curing in the wheel supply chain, with workers unable to attend their jobs due to illness or care commitments, and the cost of raw materials and freight also increased.

RIMEX Chief Operating Officer Jonathan Robertson said: "As a manufacturer supplying to an essential industry, RIMEX helped its customers by focusing on forecasting: working closely with them to understand their requirements in the near- and medium-terms and planning accordingly.

"We worked to minimize delays and shortages in a fluid and rapidly changing environment by planning ahead as much as possible. To account for instability and inconsistency in the freight world, we have been bolstering our inventory and taking calculated risks on which products to stock based on ongoing conversations with our customers."

As in many industries, mining customers have been faced with sharply increasing costs and are looking to their suppliers for help in minimizing inflationary increases. The manufacturing sector is similarly experiencing sharply rising raw material and production costs.

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“We have been doing the best we can under challenging circumstances to minimize increases,” said Tyler James, RIMEX’s director for sales and marketing.

At MINExpo 2021, RIMEX announced new products for its TyreSense TPMS, including the new TPMS HUB Controller, which offers the latest in real-time enterprise connectivity for improved tire and vehicle performance management. Also announced at MINExpo was TyreSense Asset Management, an enterprise software solution that provides the ability to manage and maintain the service life and performance of critical tire, wheel and rim, and TPMS assets.

“Going forward, our R&D efforts are focused on manufacturing innovations to integrate new technologies,” James said. “We’re also developing more efficient processes with reduced defect probability, waste reduction strategies and recycling of consumables, and inhouse adaptive manufacturing for jigs and fixtures.”

Robertson said the outlook for 2022-2023 is positive. “We’ve already seen a dramatic uptick in opportunities and sales beginning late last year and continuing into 2022,” he said. “We remain cautiously optimistic, knowing and seeing first-hand how quickly things can change in this market. The challenge will be navigating continued cost increases.”

### Yokohama Looks to Optimize Tire Life

“If there’s one thing the industry has learned through the pandemic, it’s the importance of making tires last, and planning for what mines are going to need,” said Bruce Besancon, vice president for marketing and strategy at Yokohama Off-Highway Tires America. “That’s a lesson that will be helpful as the world gets through the latest supply chain disruptions.”

In addition to optimizing its factory operations to focus resources on the most-needed tires in the industry, Besancon said Yokohama Off-Highway Tires has become a lot more transparent with tire dealers since the pandemic.

“We’ve been helping customers understand our business processes so they can plan more effectively to meet the needs of the mines, quarries and construction companies they serve,” he said. “We’re also in the process of introducing new tools, like the Yokohama OHT B2B por-

tal. This allows our dealers and distributors to order products electronically, track orders, and plan their business decisions around up-to-the-minute data about the tires they’ve ordered.

“Our sales and field engineering staff are actively working with equipment companies, mines and quarries to help with optimum tire selection for particular situations. Being able to zero in on the tread pattern, tread depth, compound, and other features that deliver the best performance or longest service life in a particular role goes straight to

an operation’s bottom line. More hours out of a tire always makes a big difference in profitability.”

Yokohama offers both the Yokohama off-highway tire brand and the Galaxy brand of tires in mining. Together, those two brands provide plenty of choices that allow machinery owners get the performance they need to optimize their productivity and lower their total cost of ownership.

“We help dealers and their customers walk through choices of tread pattern and depth, compound, construction and price

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point to find the right tire for their machine, task and site,” Besancon explained.

“In February, we launched the new Yokohama RT41 in the 875/65R29 size that provides an L-4 radial option for medium loaders. Many of the new, high-horsepower loaders are using 29-in. rims to effectively transfer horsepower to the ground without spinning or indexing the tire on the rim due to high torque. By developing our new 29-in. RT41 — which includes new bead technology as well — we are able to provide customers with a tire with the durability, stability and puncture resistance that they trust in their 25-in. RT41s.”

In May, the company will also launch its new Yokohama Off-Highway Tires on-line platform to better connect tire distributors and dealer partners with its business and factories.

“The portal helps us improve the transparency of our manufacturing, logistics and sales systems. In turn, that helps customers not only make more Yokohama and Galaxy brand mining tires available to the mining industry, but helps their businesses stay competitive,” Besancon said.



Yokohama's new RT41 provides an L-4 radial tire option for medium loaders. (Image: Yokohama)

### Don't Forget the Basics

Yokohama is currently working on a new technology to further improve bead design and construction in its mining tires. These improvements are engineered and constructed to handle the massive weight

and torque of today's equipment. They provide a better ride and greater control of loads, as well as adding to tire life.

“Constant advancements in compound chemistry are important to us,” Besancon said. “You can't spot it from a distance like you can a new tread pattern, but good compounds can be revolutionary for tires, especially those that operate in the harsh conditions of mines and quarries.

“We are always working on new solutions, designs and dimensions. But it's important to point out that there's a lot of tried-and-true technology out there that keeps mining equipment running every day. Customers want to know they can trust their tires, understand which tires fit their operation, and know what to expect from them. That's key to their planning, budgeting and their peace of mind.”

This is where on-site mechanical teams and tire sales and service professionals can be a huge help. Besancon recommended that mines tap into that expertise to figure out which tires best fit their operation, work most effectively in the incumbent conditions, and which tires can help the mine achieve its financial objectives.

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Working hand-in-hand with people who know tires can significantly improve fleet efficiency, productivity and safety.

“We encourage mines to get back to basics when it comes to tires,” Besancon said. “Check the air and make sure tires are running at the right pressure. It’s not as flashy as the latest technology, but it’s the most effective way to help your tires last longer. Success is all about staying efficient and staying safe.”

Yokohama has a global team of field engineers who work directly with equipment manufacturers and mining operations to develop tires for specific challenges they face. A good example of that is the Yokohama Y67 mining tire. The team worked hand-in-hand with customers in West Virginia to develop an IND-3 line of 15-in. high-load tires for underground coal mining. These can accommodate larger loads and higher torque while maintaining a profile that fits both the height and width restrictions of the mine.

### No Time for Downtime

Every expert interviewed for this article had a positive outlook for the mining tire market (and the industry in general) over the next two years.

“I think success for tire companies and mining companies is going to require a lot of thought and skill,” Besancon said. “We’re going to see high demand for metals and minerals as the industry responds to two years of pent-up consumer demand. We’ll see a strong market for coal in many areas, especially as oil and gas supplies remain constricted.

“That means extraction, processing and movement have to go full-bore, so machinery has to be rolling all the time. There’s no time for downtime, and tires are going to have to last longer and perform better than ever, because replacements aren’t going to be as easy to get as they have in the past.”

Labor is also going to continue to be expensive, and things that analysts typically overlook, like whether or not operators are comfortable on the tires they’re running, can make a surprising difference, not just in how productive a worker is, but how happy they are on the job. When labor’s tight, worker satisfaction is more important than ever, and tires can play a big role in that.

Kal Tire’s Allan agreed: “Right now, all bets are off for the remainder of 2022 into 2023,” he said. “The events that are unfolding in Ukraine will have a big im-

pact on global economies. While we all hope for a peaceful and quick resolution, we need to understand various potential scenarios and how they may impact our business, and our lives.

“This aside, the coming years should be good for the mining sector. Coming through COVID, there is huge pent-up demand for everything from batteries to cars to buildings to bridges and cities. Metals are an essential part of that development.”

Indeed, projections for critical metals demand over the next decade are through the roof, particularly for copper, iron ore

and nickel, which are needed to support the transition to sustainable energy sources and storage technologies.

This, coupled with infrastructure investments over the next five years, such as the \$1.2 trillion Infrastructure Investment and Jobs Act signed by President Joe Biden in the U.S. in November 2021, with \$500 billion allocated specifically to transportation and utilities, will translate to greater demand for mined materials that will impact mining tire sales positively.

It’s a tough job, but someone’s got to keep these operations rolling.

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