

Market and pressures cause tyre maintenance tech upgrade

The mining tyre maintenance sector is going through a significant shift, seeing more digital technologies and collaboration with start-ups to improve visibility, communication and efficiency

By Max Schwerdtfeger

Industries globally are adapting to new ways of maintaining and improving productivity amid the challenges posed by the COVID-19 pandemic and related market pressures.

These major macro-economic trends have also emphasised the importance of data in tyre maintenance, which has created more chances for stakeholders to work together and with smart technology innovators.

According to Reinhard Klant, Earthmoving Product Line Manager, Continental, there are “challenges in many areas of mining industry,” but there are also “numerous opportunities for improvement”.

Among these are automation, autonomous driving, connectivity, digitalisation and electrification.

“All these mega-trends are directly or indirectly linked, and they make up the biggest challenge of all in mining, which is efficiency,” Klant explained.

Improving efficiency in Continental's products, Klant told *Mining Magazine*,

has meant meeting and overcoming target conflicts, such as maximising the lifetime of tyres while carrying higher loads at greater speed.

Another is ensuring enough traction for the tyres while guaranteeing robustness of tyres as vehicles move along the load cycles. These are substantial challenges, Klant said, and because each mine is different companies such as Continental have to deliver specific solutions for their customers.

Meeting customer demand as mines get deeper has required “state-of-the-art, intelligent innovations” that monitor wear and health data of tyres, which in turn can substantially improve the tyre and help boost fuel efficiency, Klant claimed.

“In the market there is a challenge when it comes to tyre availability, and this combines with greater demand for more raw materials such as copper and steel, the prices of which are soaring.

“Everybody wants to explore for minerals, so that is good for us on the one side, but on the other side it is a real challenge due to the sudden strong tyre demand.”

Manufacturers of tyres have been placed under significant pressure because of “a big uptick in original equipment orders” and plummeting supply chain capacity, according to Dan Allan, senior vice president, Kal Tire.

Allan added that the market situation has created difficult conditions in some locations as “inventory levels are getting squeezed”. But while the pandemic has “exacerbated” the case, the market problems will pass, Allan predicted.

“The mining industry has been doing quite well in recent years, so this uptick in equipment orders should not on its own wreak havoc, this situation is COVID dependent.

“In response we have to continually work with customers to make sure they understand the situation, ▶

“We predict an exponential growth in demand for data”



Meeting customer demand as mines get deeper led to tyre innovations



TOMS has ► we have to increase our order rates and improve our planning cycle, which means we take our rolling three month forecast and make it a rolling six month forecast to make sure we don't run short of inventory."

stopped Kal Tire from being overwhelmed by data

GETTING THE MOST VALUE FROM DATA

Meeting greater demand requires more innovation, and tyre manufacturers have had to utilise digital technologies to collect performance data to ensure their products fit their purpose.

One innovation is 'smart tyres', which Klant described as "decisive in improving the tyre's life because it reports health data and proper operating conditions". For instance, if a tyre's pressure drops by 15%, wear will increase by 10% and reduce its lifecycle.

"You get higher fuel consumption with underinflated tyres, and all this fits nicely into digitalisation, which goes into sustainability, efficiency and the safety of the product," Klant explained.

Key to deploying digital technologies is data sharing, which can be a contentious issue for stakeholders that need to balance the need for collaboration and security.

While Klant believes data offers "big benefits" to the tyre maintenance sector and wider mining industry, sharing it must be "looked at carefully because the operational end users' information has to be regarded as "strictly private" and said the industry should look at "aggregated operational data" by which stakeholders can see trends and could lead to new standards.

According to Allan, data-led tyre maintenance is not so much about the data itself but the quality. Innovations such as its Tyre Operational Maintenance System (TOMS) enable improved uptime, performance and safety.

Allan says TOMS has stopped Kal Tire from being overwhelmed by data and helped benchmark progress and adapt customer offerings.

Mark Goode, director, Business Insights, Kal Tire, said TOMS upgrades historical reporting programmes and is "far more focused on maintenance planning" in the mining tyre space.

On sharing data, Allan said the idea of who owns it is "an interesting question", and its use is a sensitive subject "fraught with pitfalls".

"As a tyre service provider, we are in a very niche position. Our expertise is very specialist, so our struggle is always figuring out what to do with the data and creating meaningful information for customers.

"The data we have is very situational and you can't aggregate it up too far because otherwise it loses its meaning.

"We predict an exponential growth in demand for data and the applications by which it will be used – we're seeing this more and more. Big mining operators spend enormous amounts of money on data centres. The interest is increasing and there will be more opportunities to use data in a more meaningful manner."

Artificial intelligence (AI) means turning masses of information into quality data and meaningful insights for tyre maintenance. Goode said

AI enables better decision-making and consistency.

"AI allows us to take the skills in the business and propagate them into areas where our team members can make more effective decisions that help operations and customers. It is going to be a real boost for us in the future.

COLLABORATING WITH AI INNOVATORS

Innovations in digitalisation, visibility and communication in mining tyre maintenance were already in motion before the beginning of the pandemic. Still, according to Goode, the situation has "accelerated the roll-out" of systems such as TOMS.

The surge in demand for data and commodities, exacerbated by the pandemic, has made AI software providers more prominent in the mining industry, and tyre maintenance has proven to be an area of collaboration.

In August 2021, Kal Tire signed a contract with smart technology start-up Pitcrew AI to create a new automated solution for the detection of tyre damage on mining sites, integrating it with TOMS.

The confluence of heavy asset providers and AI companies has made it easier to pilot and deploy projects, as has the falling price of smart technologies.

Five years ago, an AI-enabled robot in mining would have cost more than \$1 million; now, it costs approximately \$50,000. These consequences are down to 25 years of data collection from suppliers and mines, according to Allan.

"Absolutely," Goode said when asked if AI start-ups will have a greater sway over the industry in the coming years.

There are still questions as to how effective AI can be globally, and Goode speculates that algorithms may have to differ depending on the type of mine and regional challenges.

"When you build something, you hope it applies on sites a and b, but we will learn because each operation is slightly different.

"Essentially, when we are looking at predicting when a tyre will fail based on damage we identify, we will have to learn and set different parameters, because the key with AI is being able to plan better.

"We will see over time, there will be plenty of surprises, but the only way to manage data effectively is to standardise it and apply AI." ♥