CROWN PUBLICATIONS

MODERN QUARRYING

QUARTER 1 | 2024

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AFRICA'S HORIZO

MOTOR GRADER

620P 670P 770P 870P
622P 672P 772P 872P

138kW - 209kW

18,300kg - 20,725kg Operating Weight

DOZER

450P 700J-II 850J-II 950P
650P 750J-II 1050P

78kW - 264Kw

8,634kg - 62,640kg Operating Weight

WHEEL LOADER

524K-II 644K-II 444G 744P
544K-II 724K-II 544G 824P
624K-II 644G 844P

92kW - 311kW

1.9 m^3 - 6.1m^3 Heaped Bucket Capacity

EXCAVATOR

E210-II E300-II
E260-II E380-II

117kW-233kW

23,900 kg - 38,200kg Operating Weight

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ADT

410P **460P**

329kW -359kW

22.9m³ - 25.2 m² Heaped Capacity

32,266kg - 41,820 kg Rated Payload

BACKHOE LOADER

310P **315P**

62kW-69kW

4.23m - 5.29m Digging Depth

SKID STEER

316GR **318G**

44kW

795kg - 883kg Rated Operating Capacity

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CONTENTS

TOWARDS EMBRACING THE DIGITAL QUARRY

In the quarrying industry the continued use of traditional methods to measure payloads may make it difficult to attain total effectiveness, something that is of utmost importance in an industry with tight margins and a high level of competition. There is an increasing realisation that if digital transformation strategies, such as digital loadout processes, are not adopted, there may be repercussions that could range from a quarry's loss of competitiveness to an unsafe environment.

The advantages of embracing digitalisation do not only entail a potential increase in output. The positive impact will lead to improved overall competitiveness. This includes the real-time monitoring of machines and operators which can lead to quarry owners more effectively managing downtime and the introduction of safety measures.

Digitalisation for commercial improvement

A digital loadout process may lead to small savings and efficiencies per tonne moved, but over time these small changes can become significant and lead to improved competitiveness.

Our cover story focuses on the Loadrite L5000 system as the next step in the progression of digital measurement of loadout processes. Loadtech Load Cells, the distributors of Loadrite products, are specialists in onboard weighing as well as providers of complete weighing solutions for heavy goods vehicles. The company uses the latest load cell and display technology, combined with machine-to-machine communication, to give consumers all the modern-day benefits, combined with extended reliability, durability and accuracy. In the end it takes the guesswork out of the quarry loadout process.

According to Glen Webster, Loadtech Load Cells' Sales Director, the launch of this system was necessitated by two factors: the need to move with technology and to negate the delays of importing electronic components to manufacture previous generation Loadrite models. You can read more on this system on page 14.

Digitalisation and safety

South Africa's mining safety legislation has made significant strides and now also incorporates how the use and reliance on technology can improve safety. In December 2022, South Africa implemented the Mine Health and Safety regulation focused on trackless mobile machinery. This regulation aims to reduce collisions involving diesel-powered trackless mobile machinery in the mining industry, ultimately decreasing fatalities and injuries. Read the article on page 36 on how Booyco Electronics' Proximity Detection Systems (PDS) and Collision Prevention Systems (CPS) offer crucial vehicle-to-pedestrian and vehicle-to-vehicle detection capabilities.

Prioritising the proactive investment in technology, such as those focused on in this issue, can lead to improved safety, sustainability (not just environmental but also the feasibility of a quarry for people and profit) and resilience.

PUBLISHED QUARTERLY BY:
Crown Publications
P O Box 140
Bedfordview, 2008
Tel: +27 11 622 4770
www.crown.co.za

TOTAL CIRCULATION
Q4 2023 7 042

EDITOR
Wilhelm du Plessis
quarrying@crown.co.za

ADVERTISING
Erna Oosthuizen
ernao@crown.co.za

DESIGN
Ano Shumba

CIRCULATION
Karen Smith

PUBLISHER
Karen Grant

Wilhelm du Plessis – Editor
quarrying@crown.co.za

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‘DISRUPTIVE’ DIGITAL TECHNOLOGY WILL ADD VALUE

Digital technology stands to add significant value to the mining industry in terms of the exploration, project evaluation, mine design, operations, closure, and post-closure phases. This is the view of Heinrich Jantzen, Senior Mining Advisor at Zutari.

On a revenue-to-revenue basis, the industry spends 80% less on technology and innovation compared with the petroleum sector, for example. However, the operating costs are increasing three times faster than consumer-inflation rates and could double in under five years.

“With industry margins being squeezed on all fronts, the mining industry simply must embrace innovation if it wants to find more productive, efficient, and sustainable ways of extracting value from the minerals it mines,” says Jantzen. This calls for major innovation for the industry to resolve its critical challenges.

“The potential to add value lies in increased production, productivity, efficiency, safety, and reducing the risk of human error,” adds Jantzen. So-called ‘disruptive’ technology that stands to play a critical role includes the Internet of Things, cloud computing, advanced robotics, genomics, 3D printing, and artificial intelligence (AI). Other emerging technologies such as automation, machine learning, renewable energy generation, energy storage, advanced materials, and more will unlock further value.

Jantzen suggests that mining companies develop a ‘technology map’ to facilitate mine modernisation by means of technological advancement in the mining lifecycle. For example, selected innovative technologies have been adapted specifically for mining. In addition, technology deployed in non-mining industries has potential to add value to mining.

“Given the magnitude of the extraction challenges faced, it is quite extraordinary that the global mining industry currently spends so little on innovation and business-improvement programmes,” comments Jantzen.

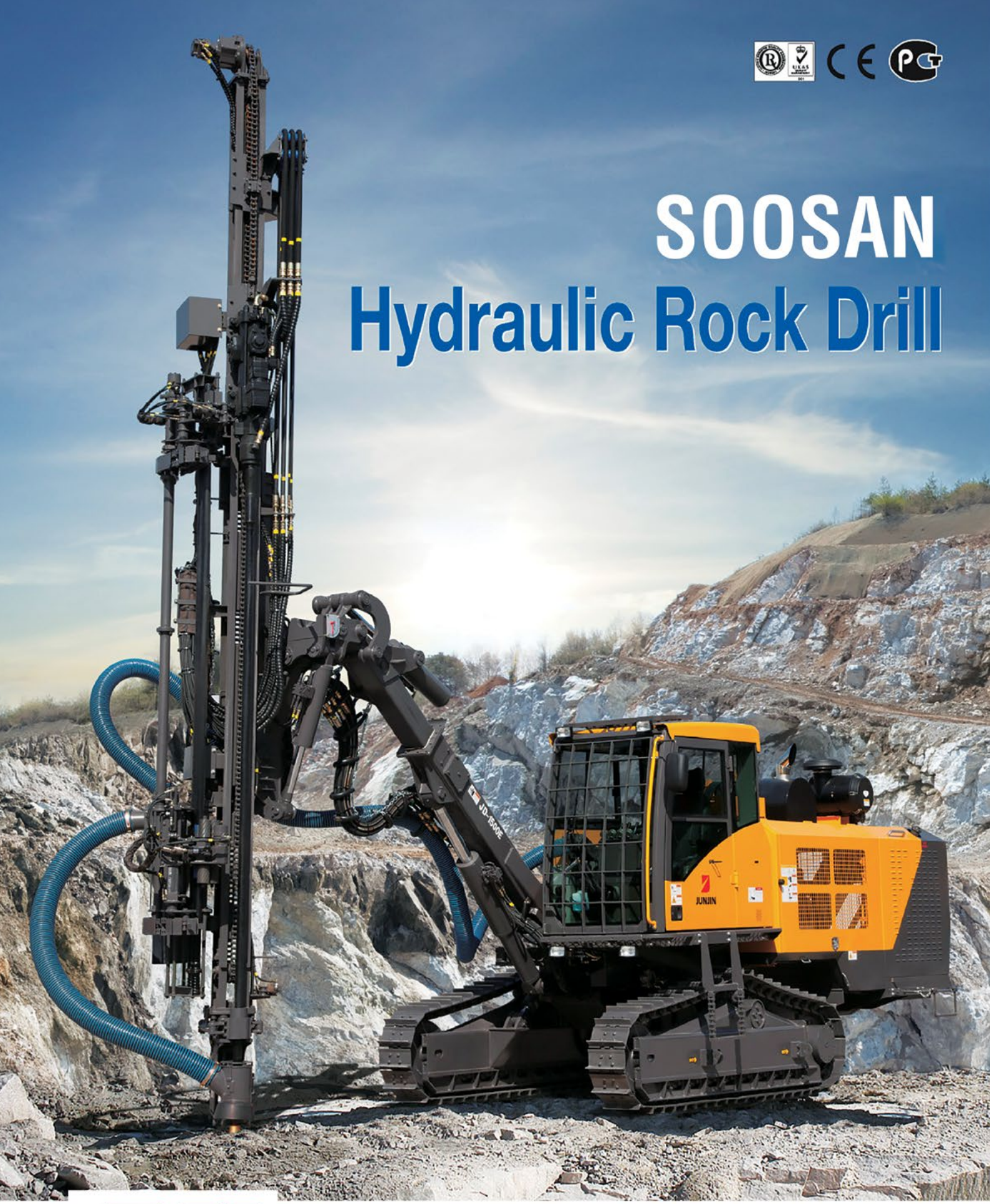
Heinrich Jantzen, Senior Mining Advisor at Zutari.

Jantzen also calls for lean management and lean operating system improvements. However, these are likely to be harder to sustain. “Every year, the work becomes more difficult. Ore grades are declining, while water scarcity threatens to strand assets in the ground, and operating licences have become more difficult to obtain,” highlights Jantzen.

Technology can improve the industry’s environmental footprint, move workers out of harm’s way, turnaround uneconomical reserves and make work less repetitive and strenuous. However, obtaining the correct technology is just part of the puzzle.

“There are many examples of companies that have invested in technology and not seen improvements because they neglected the vital engines of tech-enabled transformation, management systems, and culture,” points out Jantzen.

While the mining industry plays a critical role in the global economy, it also presents unique challenges when it comes to sustainability and environmental impact and accelerating the industry’s transition to a greener future. “Constantly evolving technology, innovation, and digitalisation are key. Mining must embrace these future advancements to remain competitive,” concludes Jantzen. ●



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AFRIMAT CONSTRUCTION INDEX
RETURNS TO GROWTH

Afrimat, the JSE-listed mid-tier mining and materials company providing construction materials, industrial minerals, bulk commodities and future materials and metals, has released the findings of its Afrimat Construction Index (ACI) for the third quarter of 2023. The ACI is a composite index of the level of activity within the building and construction sectors, which is compiled by economist Dr Roelof Botha on behalf of Afrimat.

According to Dr Botha, the lethargy of the economy as a whole during the third quarter was not evident in the construction sector, with six of the nine constituent indicators of the ACI recording positive real growth rates compared to the second quarter.

The index recorded a level of 131.5 in the third quarter, compared to 120.3 in the previous quarter. "Significantly, this is the highest level since the fourth quarter of 2016 and, if the current momentum can be maintained in the fourth quarter of 2023, it may herald a new, sustained growth phase in the construction sector," said Botha.

He added that it was especially encouraging that the important indicator of job creation continued to record a healthy growth rate, with 145 000 new jobs having been created since the beginning of 2023. "Equally encouraging is the increase of almost 10% in the volume of building materials produced compared to the previous quarter, with year-on-year growth also having returned to positive growth."

The quarter-on-quarter increase of 9,2% is in sharp contrast to the marginal decline in the country's GDP and builds on the positive ACI growth rate of 5,8% recorded in the second quarter. "Also worth noting is that the year-on-year increase has moved from less than one per cent in quarter two to 5.4 in quarter three, signalling the likelihood that construction sector activity may have entered a new, sustained growth phase."

Botha further pointed out that the only two indicators in the ACI that fared poorly were the "Value Of Building Plans Passed" and "Buildings Completed at Larger Municipalities". He explains that these data sets are aligned to a sharp decline in the number of mortgage bond applications administered by BetterBond and a hefty increase in the average deposit required for a home loan.

"The residential property market is suffering at the hands of unduly restrictive monetary policy in South Africa. With the consumer price index within the South African Reserve Bank's target range for inflation and no sign whatsoever of demand inflation in the economy, lower interest rates are overdue

Equally encouraging is the increase of almost 10% in the volume of building materials produced compared to the previous quarter, with year-on-year growth also having returned to positive growth.

% Change in the constituent indicators of the ACI (quarter-on-quarter and year-on-year) 3rd quarter 2023

Indicator	% q-o-q	% y-o-y
Wholesale Construction Trade	21,3	24,4
Employment in Construction	4	11
Building Materials (Volume)	9,8	2,7
Retail Trade Sales – Hardware	7,3	2,3
Construction Value Added	-2,9	-2
Salaries & Wages – Construction	2,2	-3,2
Building Materials (Sales)	6,1	-4
Buildings Completed (Value)	-1,5	-15,7
Building Plans Passed (Value)	-24,6	-25,4
Afrimat Construction Index	9,2	5,4
Real GDP	-0,2	-0,5

Notes: 1. Ranked by y-o-y % change
2. GDP data has been seasonally adjusted by Stats SA

KEY TAKEAWAYS

- Progress with public/private partnerships or outright privatisation in the area of repairing, maintaining and expanding the country's logistics infrastructure.
- Progress with the inevitable and gradual switch to renewable energy, is intrinsically linked to construction activity.
- New capital formation in the economy, which recorded its seventh successive double-digit growth rate during the third quarter of 2023.
- Closer co-operation between the South African Police Service and contractors to prevent undue criminal activity at building sites, including adequate fiscal support.

and will certainly serve to boost construction activity further."

In addition to the sterling performance of wholesale sales of construction materials, new job creation, and the volume of building materials, other highlights were the positive real growth in the value of building material sales, retail hardware sales and remuneration of construction workers (quarter-on-quarter).

Botha concluded by saying that the impressive uptick in the ACI in this latest reading is especially encouraging against the background of extremely high interest rates and a generally subdued macro-economic environment. "The positive trend seems to have been influenced by the increase in the public sector's spending on capital formation, which will hopefully continue and gather momentum over the next few years as the damage done to the country's infrastructure by state capture is addressed." ●

REASON FOR OPTIMISM AS SA INFRASTRUCTURE LAYS THE FOUNDATION **FOR FUTURE GROWTH**

Much like building a skyscraper requires a sturdy foundation, infrastructure is often described as the backbone needed to build prosperous economies. With this in mind, there is reason for optimism looking ahead to 2024 and beyond as, much like China's example has demonstrated, government's focus on infrastructure development could serve as the catalyst needed to reignite economic growth. However, to be successful, the private sector must urgently step up to play its part. By Roelof van Berg, CEO of Gap Infrastructure Corporation (GIC).

Between 2002 and 2016, the Chinese government tripled its infrastructure investment as a share of GDP from 8% to almost 24% – during which time the country experienced an average annual real GDP growth of 9,6%.

Quality infrastructure is the driver of trade and commerce, facilitating the smooth transportation of goods, services, and people across regions both within and past a country's borders. It's likewise responsible for providing the energy needed to fuel industrial and manufacturing activities, and the modern communication networks required by digital economies. Furthermore, infrastructure underpins human and socio-economic development, improving access to educational and healthcare facilities, and economic opportunities.

By Roelof van Berg, CEO of Gap Infrastructure Corporation (GIC).

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Understanding the critical role of infrastructure as an engine for fuelling economic growth, infrastructure investment has formed a central pillar of China's economic strategy for decades. Between 2002 and 2016, the Chinese government tripled its infrastructure investment as a share of GDP from 8% to almost 24% - during which time the country experienced an average annual real GDP growth of 9,6%.

By contrast, the Infrastructure Consortium of Africa (ICA) estimates that poor and ageing road, rail and harbour infrastructure in African countries generally may currently be adding as much as 30-40% to the cost of goods traded across the continent. This is placing an undue burden on consumers and businesses, and strangling growth.

So, by continuing its diligent efforts to lift the various logistics constraints facing the country, as well as to roll out world-class national infrastructure to support the needs of South Africa's expanding population, government can achieve the 5% growth target needed to stimulate job creation and eliminate poverty and unemployment.

As a result, South Africans should be comforted that government has allocated R8,47b to Public Works and Infrastructure in the 2023/24 year as evidence of its commitment, as outlined in the Medium-Term Budget Policy Statement (MTBPS). Furthermore, an additional R1,18b was allocated this year for reconstructing and rehabilitating municipal infrastructure damaged by disastrous floods in KwaZulu-Natal, Eastern Cape, Limpopo and Mpumalanga.

The role of the private sector

Critically, however, infrastructure development and the task of reaching the 5% growth target cannot and should not be the responsibility of government alone. There is no denying that South Africa has suffered a difficult few year, as the aftereffects of the pandemic, geopolitical shocks, and what the International Monetary Fund has described as a "limping" world economy have weighed heavily upon our own economy and the fiscus.

So, as government faces the enormous challenge of balancing the many urgent demands on its limited budget, the private sector must engage to seek where it can be of service in investing in vital infrastructure projects. Quality infrastructure acts to boost investment confidence in countries, which in turn attracts further investment in areas such as infrastructure. So, by leading the way in supporting infrastructure projects in South Africa, local investors can spark a virtuous economic cycle that benefits all.

Developers, too, have a role to play in nation-building by ensuring that infrastructure is delivered at a high standard, on time, and within budget. In many cases in the past, private companies have played a role in causing wastage and cost overruns in major projects. In response, the entire industry must make every effort to improve governance, transparency, and accountability in public infrastructure projects.

As the Gap Infrastructure Corporation (GIC), for example, we are proud to be leading the way through finalising a fully digital cutting-edge project management programme that will provide real-time dashboards for monitoring projects' progress. This will not only provide internal teams with greater insights and a holistic view of ongoing work but will also benefit government partners and other clients and stakeholders.

By embracing this type of innovative solution, GIC hopes to bolster confidence, attract infrastructure investment, improve living and working conditions for local communities, and support the public sector in positively changing lives.

Many governments across Africa have increased their infrastructure spending, and the Africa Finance Corporation has even described Africa as on the precipice of a 30-year infrastructure boom. As the continent's most industrialised nation, it is encouraging to see South Africa's public sector and private developers at the forefront of this shift, working in tandem to address the formidable infrastructure and service delivery challenges in our path and unlock economic growth to enhance the welfare of our communities. ●

A BRIGHT FUTURE FOR FEMALE SERVICE TECHNICIANS **IN AFRICA**

With the support of Volvo CE and its dealer partners, women across Africa are pursuing careers in the traditionally male-dominated field of mechanics, enhancing their opportunities in life, and delivering outstanding aftermarket service for customers. Modern Quarrying celebrates some of these women.

Volvo Construction Equipment (Volvo CE) is on a mission to "build the world we want to live in". This vision encompasses not only a commitment to sustainability and connectivity but also an unwavering dedication to achieving gender equality within the company.

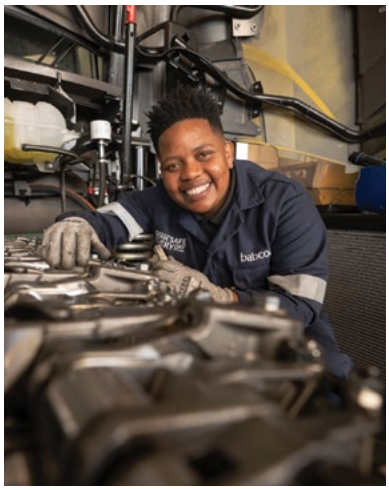
A few years ago, Volvo CE set an ambitious target to have at least 35% female leaders and employees by 2024. To this end, the company has implemented significant initiatives to encourage women, especially young women, to consider careers in the construction equipment industry. Since then, Volvo CE has witnessed remarkable progress, not only within its own ranks but also among its network of dealer partners.

Lonah from Babcock in South Africa.

Equality begins with education

The Ghabbour Foundation for Development, established by GB Auto, the parent company of Volvo CE's Egyptian dealer Ghabbour, for example, is working tirelessly to bridge the gender gap in vocational education. Out of

Wendy from Leal in Mauritius.



Thando from Babcock in South Africa.

1 000 students currently enrolled across three vocational schools set up by the foundation in Egypt, 150 are now female.

"The foundation acts as a gateway for companies to recruit highly qualified technicians who match their needs and for students to find well-paid jobs that align with their qualifications. We are particularly dedicated to promoting women's roles in a traditionally male-dominated sector and encouraging women to join the commercial vehicle specialisation programme," says Aleya Serageldin, Executive Director for the Ghabbour Foundation for Development.

Dina, a third-year student at one of the Ghabbour vocational schools, specialising in commercial vehicle maintenance, says: "As I entered this specialisation, I developed a genuine passion for it and am determined to excel. My trainers have been incredibly supportive from the beginning, urging me to strive for excellence. After completing my education, I dream of working and honing my skills, and I envision enrolling in a university in the same field for higher education. Ultimately, I aspire to establish the service centre I've always dreamed of owning."

Women in the workshop

Babcock, Volvo CE's dealer partner in Southern Africa, meanwhile, has developed a strong team of female mechanics at its workshops. Thando, a 26-year-old woman working at Babcock, began her journey with an apprenticeship programme in 2019.

"My fascination with mechanics started at a young age when I helped fix my father's taxis," she says. "On my journey, I met an amazing neighbour who taught me that mechanics is about more than just cars. His help sparked a strong interest in me. I've had incredible mentors guiding me throughout my journey. On Saturdays, we have special training sessions where we simulate faults and solve problems. It's a great learning experience. Day-to-day, I handle various tasks like stripping engines and overhauling transmissions and brakes. I'm also the designated driver on site. I manage the loading and off-loading of machines from transport. I'm licensed to operate everything from forklifts to rigid trucks. Right now, I'm focused on advancing my career. I'm studying instrumentation at Unisa. It helps me stay up to date with improvements in engine management, emissions, control, telematics, and other related topics. Believing in yourself opens endless possibilities. I tell everyone – go out and follow your dreams."

Lonah's is another inspiring story. She started working at a Babcock workshop in 2018. "After high school, a friend suggested diesel mechanics to me. The more I researched, the more fascinated I became with machines. I decided to give it a shot and guess what? I found it to be perfect! I absolutely love being a diesel mechanic. Today, I'm proud to say that there are six women working alongside me in this workshop. We support and encourage each other every day. It's amazing to see this progress. To all the girls out there who dream of pursuing a career in mechanics, don't let anyone tell you that you can't do it. Gender should never limit your potential. Embrace your passion, work hard, and believe in yourself. You can achieve anything," she says.

Moving up the career ladder

After working at Leal in Mauritius for 14 years, Wendy exemplifies the career growth and success that women can achieve. She started as a mechanic aged 17 and is now a customer support representative, responsible for travelling across the island to meet customers, assess their needs, and advise them outside of the workshop.

"My passion for mechanics came from growing up with two older brothers. I was always in the garage with my brothers, working with them on cars and trucks," she says. "Mechanics is an interesting subject and becoming a technician seemed logical for me. I am a problem solver and working on a difficult case motivates me. To allow an excavator or truck to go back into the field or on the road and see the satisfaction of our clients is very rewarding for me. For my clients, I am always there to give them the best advice and share my knowledge in order for them to exploit the full potential of the machines."

The significance of achieving a better gender balance in the construction equipment industry goes far beyond a social obligation; it's also a smart business move. The industry, faced with challenges such as a shortage of skilled labour, especially among service technicians, recognises that nurturing talent, regardless of gender, is essential. As Christophe Lagandre, Head of Market Area Africa at Volvo CE aptly puts it: "Having a better gender balance is not just the right thing to do for society. It's also good for business and helps us deliver the best possible support for our customers." ●

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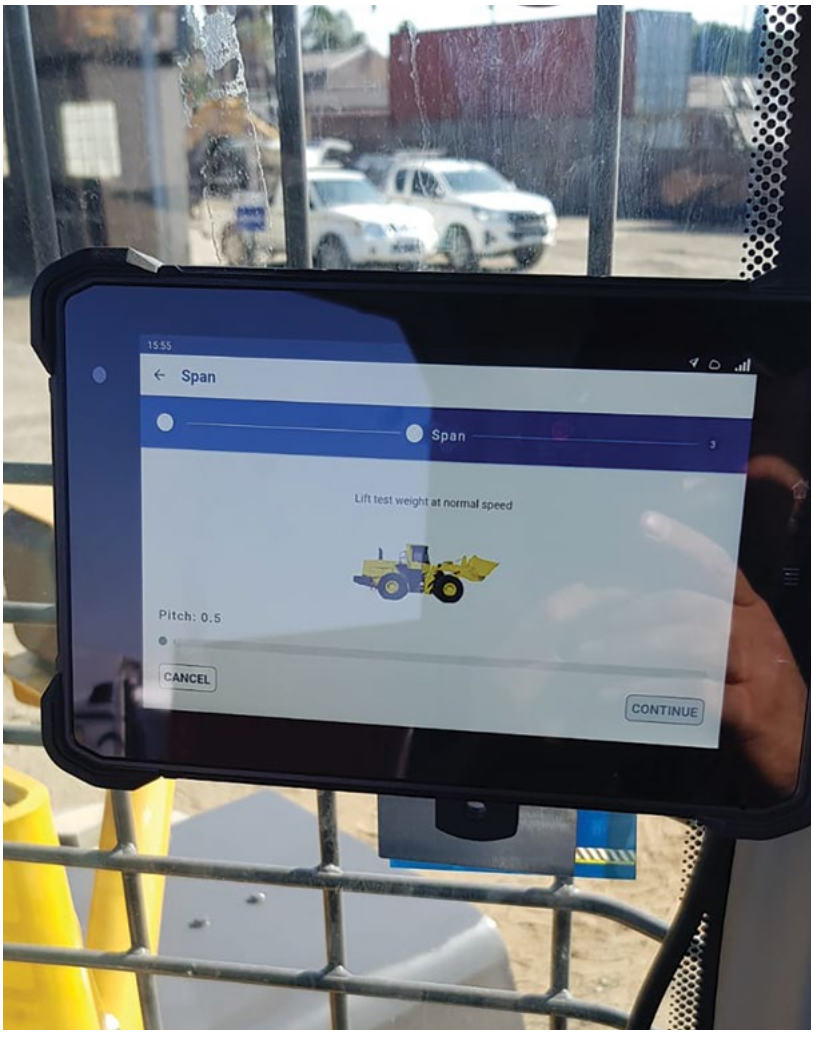
L5000: SATISFYING THE PROGRESSIVE APPETITE FOR DIGITAL LOAD WEIGHING

Loadtech Load Cells are specialists in onboard weighing as well as providers of complete weighing solutions for heavy goods vehicles. This is especially valuable in trucks carrying payloads in the quarry environment. The company uses latest load cell and display technology, combined with machine to machine communication, to give the consumer all the modern day benefits, combined with extended reliability, durability and accuracy, eliminating guesswork in the quarry loadout process. In an industry with tight margins, increasing efficiency and productivity is crucial. Modern Quarrying spoke to Glen Webster, Sales Director of Loadtech Load Cells, about a new addition to the company's line-up as a natural progression in the company's offering, the increasing uptake of payload management systems, as well as growing business in Southern Africa.

KEY TAKEAWAYS

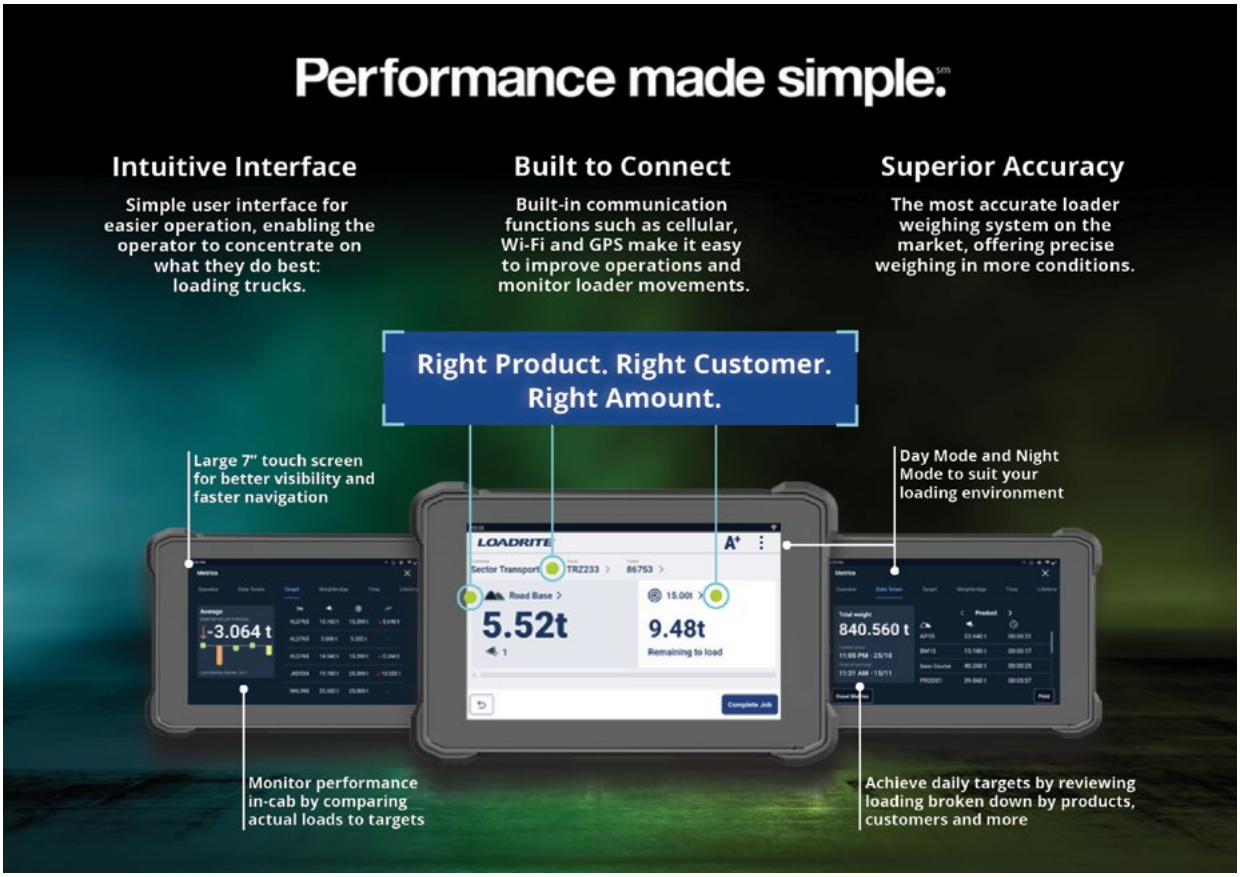
- **Bigger**
- **Cellular internet-ready**
- **On-device performance metrics**
- **Multi-touch control**



Loutjie van der Merwe has been appointed as Loadrite's Brand Manager and will be responsible for managing the Loadrite brand for Loadtech.

A new product for 2024 and beyond

In addition to its current offering of products that assist with the loadout process, Loadtech is



introducing the new Loadrite L5000 wheel loader scale to the South African market. This is the next generation of onboard weighing systems inspired by smart devices and enables operators and quarry owners to stay on top of every load using the powerful new Loadrite L5000 wheel loader scale. With a modern and easy-to-use interface, built-in connectivity and best-in-class weighing, quarry owners can maximise every load with accurate data. It connects machines, people, and the office to make bulk material handling management easier, safer, and more efficient.

Webster explains that Loadtech's growth in the last three years is a sign that the market is maturing and that there is a growing appetite for digital loadout processes, whether it is at the excavation, conveying belt or loading phase.

He says that the appetite for monitoring productivity has grown. "We offer solutions to monitor what the input is into a crusher (excavator scales), conveyor belt scales and loader scales."

In this sense, Webster says the best seller of the Loadrite offering is its products for wheel loaders for the loadout, followed by scales for belts to measure how many tons have been crushed. The third most popular product is scales to monitor the tonnage of rocks originally excavated.

The main advantage of the L5000 is that operator manuals and guided videos are available on the tablet. The simcard enables the operator to go online and view videos of how to operate the system. This solves the problem when the operator cannot read.

The logical next step in technology

Webster says that two factors informed the launch of this system. "We need to move with technology and, secondly, because importing electronic components can be problematic. The supply chain interruptions caused by the COVID-19 pandemic led to waiting periods of six to eight months for components to build the L3180 (which the L5000 will eventually replace). "We then investigated how to adjust and the L5000 was the answer as the intelligence is not in the tablet, but the SIM card that is inserted," he says.

Says Webster: "The L5000 system enables you to capture activity and also enables performance improvements with real-time insights and streamlined ticketing capabilities. It is the ultimate choice for any bulk material handling operation."

The L3180 has a modem, but

We need to move with technology and, secondly, because importing electronic components can be problematic. The supply chain interruptions caused by the COVID-19 pandemic led to waiting periods of six to eight months for components to build the L3180 (which the L5000 will eventually replace).

the new system, although it is similar, does not need one. A SIM card is inserted, directly, into a protected touch screen. Similar to the L3180, the L5000 uses weighing intelligence and solid-state sensors for more accurate, precise and faster loading. It also connects machines and devices for the collection and syncing of data to the InsightHQ reporting portal. The latter is optional, but provides production and performance metrics in a simple dashboard. It visualises activity in real time or plays back the shift to improve productivity.

"The main advantage of the L5000 is that operator manuals and guided videos are available on the tablet. The simcard enables the operator to go online and view videos of how to operate the system. This solves the problem when the operator cannot read. The touchscreen (as opposed to its predecessor's push buttons) also allows recordability and it is faster to operate than the button system," Webster explains.

Growing Loadrite

The Institute of Quarrying's 2024 conference will showcase how the products offered by Loadtech have developed innovatively and progressively by showcasing (chronologically) the entire line-up of Loadrite solutions available for the local industry. These are the L-Series SmartScale for loaders, the X-Series excavator payload management systems, the C-Series conveyor belt scales and the InsightHQ for actionable insights, dashboards and notifications.

Webster says that the company is growing its team to expand into other parts of South Africa. "We have appointed a Loadrite brand manager, Loutjie van der Merwe, who will be responsible for managing the Loadrite brand for Loadtech.

The company has recently opened a service point in Western Cape Province. "We are starting from a service level and have based a technician there who focuses on Loadtech's tyre inflation product as well as Loadrite. He services our customers in the West Coast and adjacent areas. Van der Merwe will aim to expand Loadrite into quarries operated by especially Afrimat in both the Western and Northern Cape, but there are also plans afoot to expand into Southern Africa."

Loadrite 360

The L5000, which replaces the L3180, works in the Loadrite 360 solution. This is a connected quarry solution that can holistically improve loadout operation through performance metric tracking, job data automation, and real-time 360° job visibility. The L5000 connects the loader and weigh bridge to provide data sharing of loadout jobs, resulting in greater efficiency, improved visibility and higher product sales. ●

MAXIMISING THE EFFICIENCY, LONGEVITY AND SAFETY OF CRUSHERS WITH PREVENTATIVE MAINTENANCE

The optimal performance and longevity of critical equipment like jaw crushers and cone crushers, as well as the safety of personnel, often hinges on a crucial yet increasingly overlooked factor: preventative maintenance.

In today's tough economic climate, there is always a drive to reduce costs, but cutting back on preventative maintenance comes with a high price, including workers' safety, production and business losses, long-term reputational damage, and secondary failures, cautions Stefan Bekker, Aftermarket Business Line Manager at Astec Industries' Johannesburg manufacturing facility. He says that his department has noticed an increase in breakdowns. "Preventative maintenance is designed to identify and address potential problems before they escalate into more significant issues. It enables parts requirements to be anticipated and planned for," Bekker stresses.

He says that maintenance practices will dictate equipment's performance and durability in the long term. Astec Industries' unrivalled "Rock To Road" range of equipment includes durable jaw and cone crushers that have made their mark in the most arduous operating conditions around the world. However, even durable equipment requires preventative maintenance. Neglecting it can lead to a cascade of adverse consequences. These include avoiding failure on crucial components, leading to diminished productivity, higher operating costs and more frequent, expensive repairs. Unforeseen breakdowns can result in costly downtime and disrupted project timelines. Neglecting routine or preventative maintenance may compromise equipment's structural integrity, which poses serious safety risks to personnel operating and working in proximity to the crushers.

Preventative maintenance can be split into three different categories: time-based, usage-based and condition-based maintenance. Time-based maintenance is scheduled at specific intervals, for example every three months or annually. Usage-based maintenance is performed after a certain number of operating hours or tons produced. Condition-based maintenance is triggered by the actual condition of the equipment, as assessed through monitoring or inspections, including technical assessments offered by Astec Industries.

Preventative maintenance requirements will vary from one type of equipment to another and are mostly based on the material specification of the product being processed. Bekker says that with Astec jaw crushers and cone crushers being utilised in various applications from aggregate to chrome slag, the replacement of wear components could differ from annually to weekly. "With more abrasive materials, more frequent assessments and interventions are needed due to the short period of time needed to critically damage equipment."

Planning, including aligning parts availability for maintenance days, is crucial when it comes to preventative maintenance. Bekker contends that upskilling employees can help to address this and enhance preventative maintenance and its benefits. "We note that end users are more comfortable and confident with our equipment after on-site training by Astec Industries has been conducted. Staff training should be conducted on an ongoing basis due to the employment of new staff and the movement of employees within organisations," he advises.

Advancements in technology have facilitated the monitoring and analysis of parameters for equipment such as jaw and cone crushers. However, visual assessments and interventions remain crucial for preventative maintenance, according to Bekker.

As part of its preventative maintenance service, Astec Industries offers on-site technical assessments. These comprehensive assessments entail disassembling the equipment to assess and recommend the necessary interventions. Astec Industries has partnered with a key customer to schedule technical assessments and they have benefitted from a significant reduction in breakdowns, unplanned shutdowns and factory repairs, Bekker says. "They have also reduced production losses and been able to efficiently identify windows to conduct planned maintenance. ●

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Minerals

TROLLOPE MINING SERVICES EXPANDS FLEET WITH METSO MACHINES FROM PILOT CRUSHTEC

Amid growing demand for its crushing and screening services, Trollope Mining Services, one of the largest opencast mining contractors in Africa, has in the past three years taken delivery of a large fleet of Metso machines from Pilot Crushtec.

With nearly 500 pieces of equipment in its fleet, Trollope has over the years established itself as the go-to contractor in the opencast mining sector in Southern Africa. Currently operating in South Africa, Namibia and Botswana, the company has also previously executed projects in the DRC and Guinea. The company operates across commodities including but not limited to coal, platinum, copper, andalusite, gold, phosphate, lithium, iron ore, manganese, diamonds and limestone.

To establish itself as a total solutions provider in the opencast mining contracting fraternity, Trollope Mining Services added a crushing and screening division to its business in 2016. Managing Director, Guy Hopkins says that in the past three years the division has seen exponential growth on the back of some major projects, necessitating an expansion of the crushing and screening fleet.

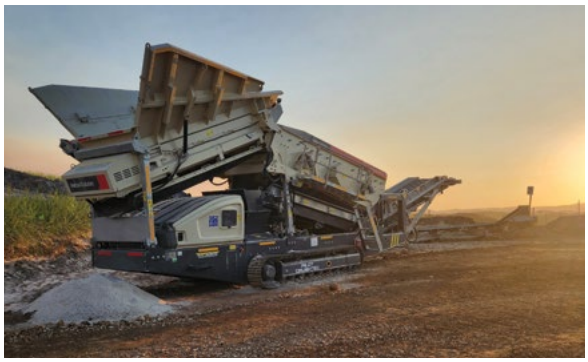
Following the fleet expansion programme, Trollope Mining Services now operates a total of 15 machines. Of note is that the whole fleet is made up of only Metso machines. "We prefer Metso machines because of our experience with the equipment," he says. "Fundamentally, the design and build quality of these machines are unmatched. Our buying decision is also influenced by the technological evolution of the Metso offering, which allows us to run 'hands off' operations. Apart from improved efficiencies, technology paves the way for improved safety on mining sites."

Of its 15 Metso machines, six are dual-powered units, making Trollope Mining Services the biggest operator of Metso hybrid crushers and screens in southern Africa, confirms Charl Marais, Sales Manager at Pilot Crushtec. The dual-power fleet comprises two Lokotrack® LT120E™ jaw crushers, a Lokotrack LT330D™ cone crusher and three Lokotrack® ST2.8E™ scalping screens. These were expressly purchased for a project in the Northern Cape Province of South Africa.

With their ability to have both electricity and diesel as power sources, Marais says dual-power solutions provide the best of both worlds – significant fuel savings and a marked reduction in carbon emissions. "Significant cost reduction is achieved when the machines are connected to the grid," explains Marais.

"Given the high cost of diesel, dual-powered solutions help reduce operating costs for our customers. In our experience, the cost of running bi-power machines off the grid is 1/20 the cost of running them off a diesel engine. There is therefore a major cost benefit for our customers' operations," says Hopkins.

Guy Hopkins, MD of Trollope Mining Services.



Overlooking the pit – the Metso mobile train processes primary and secondary crushing on-site.

Apart from the Metso build quality, Hopkins says the complementary aftermarket support from Pilot Crushtec is crucial to ensuring high uptime. "In all our buying decisions, having a partner that we can trust for the long term is fundamental. Pilot Crushtec plays a crucial role in supporting us with all the necessary spares and technical expertise to keep our Metso machines running," concludes Hopkins. ●

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200
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TWO MACHINES IN ONE **WITH THE NEW SCREENCORE TRIDENT 125 HI-STAK**

Producing accurately sized aggregates in the mining, quarrying, recycling and demolition industries is essential, as is the ability to produce massive stockpiles of material. Although mobile screens have their own integrated stockpiling conveyors, they are generally compact and often need to be augmented by separate specialist stockpilers.

This is unproductive, inefficient, and of course expensive. To overcome this, Screencore has combined precision screening and enhanced stockpiling with the introduction of New Trident 125 Hi-Stak.

The Screencore range of stockpilers has been designed to boost operational productivity. The components of the range have been developed to work on their own or alongside Screencore's - and other manufacturers' - ranges of crushers, screens and trommels etc. In order to deliver flexible, mobile stockpiling, Screencore conveyors are designed to be transportable and highly durable, offering features such as twin drives, check valves and hopper feeders. The stockpilers have been specifically developed to help construction, recycling, quarrying and surface mining operations, delivering a solution that can handle bulk materials on any site.

Providing the highest levels of precision screening efficiency, Screencore's Trident range of scalper screens is renowned globally for toughness, adaptability, high performance and screening excellence. Members of the range are known for the ability to handle heavy duty operations, being an industrious piece of equipment designed for scalping and precision screening. With an exceptionally large screen area and high-capacity performance, Screencore's range of scalper screens deliver a robust capability to withstand vast amounts of material, making them a favourite in such industries such as quarrying aggregate production, surface mining, construction, and recycling.

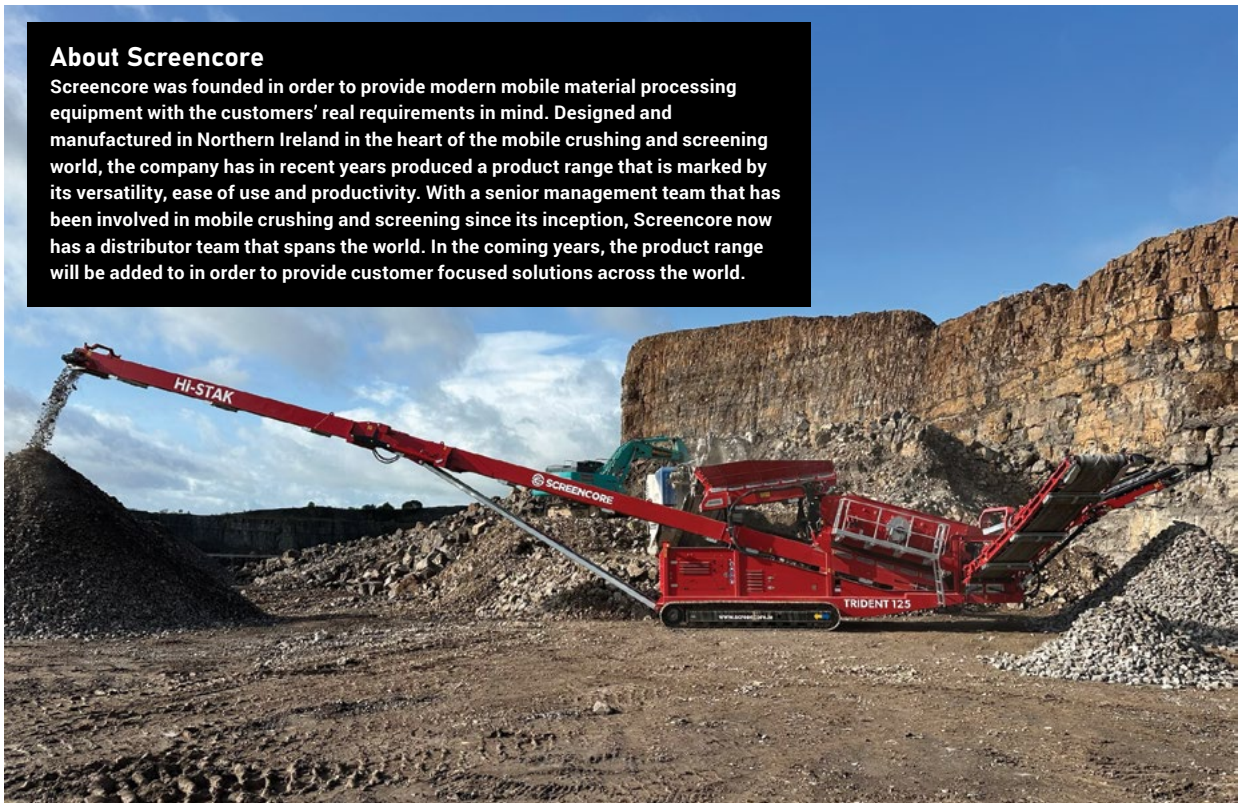
Despite the excellence of the individual product ranges, to combine the attributes of precision screening and scalping with large material stockpiles, two pieces of equipment are required: a screener and a stockpiler. Now, however, Screencore has combined stockpiling and scalping-screening with the introduction of the new Trident 125 Hi-Stak. This machine is believed by Screencore to be a first, combining the benefits of an advanced scalper screen with the stockpiling capabilities of an advanced stacker.

Best of both worlds

"Being able to produce high quality accurately sized aggregates is essential today, whether it's materials from a surface mine, quarry or an aggregate plant, or recycled construction materials from highways, demolition or recycling operations. The Screencore range of scalper screens has developed a reputation for advanced screening globally, being

About Screencore

Screencore was founded in order to provide modern mobile material processing equipment with the customers' real requirements in mind. Designed and manufactured in Northern Ireland in the heart of the mobile crushing and screening world, the company has in recent years produced a product range that is marked by its versatility, ease of use and productivity. With a senior management team that has been involved in mobile crushing and screening since its inception, Screencore now has a distributor team that spans the world. In the coming years, the product range will be added to in order to provide customer focused solutions across the world.



The Screencore Trident 125 Hi-Stak really is in a class of its own. It combines the benefits of a modern heavy- duty primary screen with the obvious benefits of a 24 m stacker.

Trident 125 Hi-Stak technical details

- Cat 3.6 Tier 4, Stage V 100 kW
- 3 700 mm x 1 550 mm top and bottom deck screenbox
- 1 100 mm wide heavy 4-ply feed belt
- 1 200 mm wide fines conveyor with twin OMV500 drives
- 1 200 mm heavy chevron overs belt
- 800 mm chevron middles belt
- Check valves on lift rams
- 4 700 mm tracks
- 31 000 kg
- Fixed catwalks both sides
- Available in dual-power
- Transport width 3 094 mm

tough, productive, environmentally friendly and accurate," explains Screencore Director Ciarán Ryan.

"Likewise, the Screencore range of stockpilers has been developed to deliver huge stockpiles of materials, working with their own on-board power unit, or powered by a crusher, screen, or plug in mains or genset.

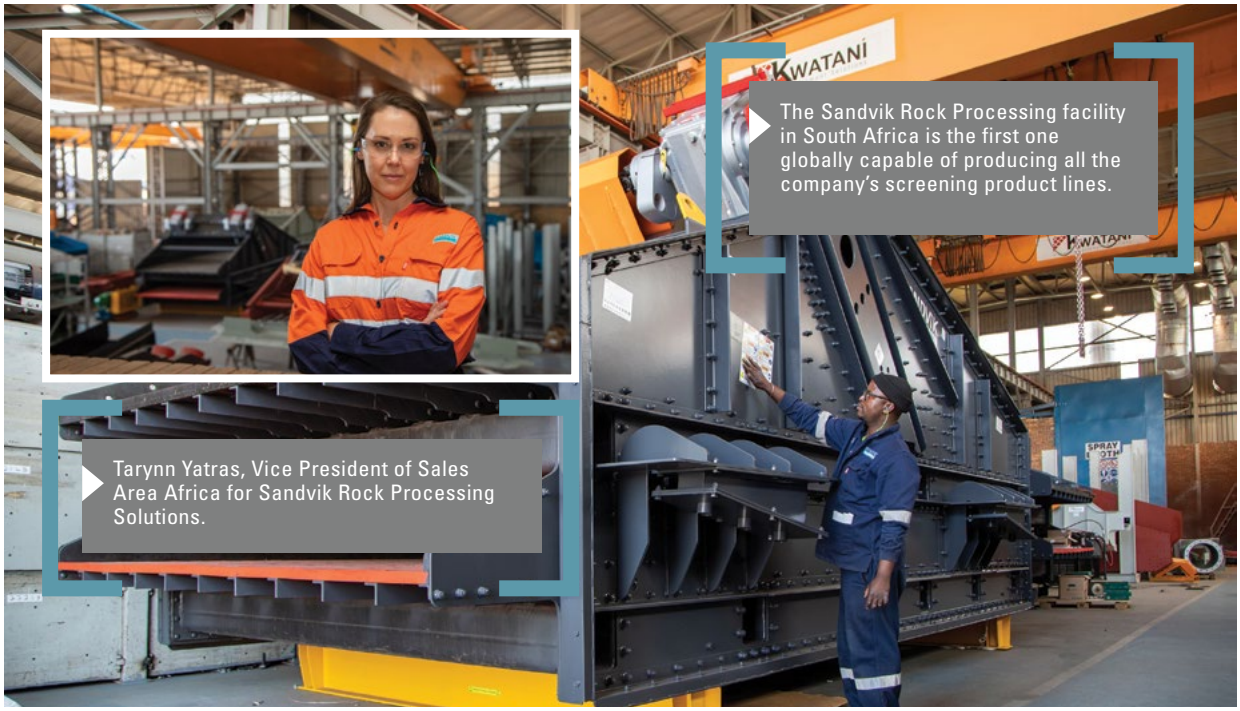
Material stockpiles result from screening and/or crushing, with a large size of stockpile being considered essential for efficient and productive operations. With this in mind, and based on customer feedback, we decided to combine stockpiling and screening excellence into one machine. The result is the New Trident 125 Hi-Stak, which we believe is a game changing development," explains Ciarán Ryan.

Class of its own

"The Screencore Trident 125 Hi-Stak really is in a class of its own. It combines the benefits of a modern heavy-duty primary screen with the obvious benefits of a 24 m stacker," adds Ciarán Ryan. "Essentially, customers get two machines in one resulting in remarkable reductions in carbon emissions, substantial fuel savings, and the elimination of the need for double-handling fines.

"The Hi-Stak is set to revolutionise efficiency across various primary screening operations. Whether it's within the confines of a quarry, sand and gravel operation, or dealing with soil and mulch, its capacity to effortlessly screen and stockpile large quantities of fines without necessitating double-handling or the creation of a wheel-loader stockpile is hugely beneficial. Furthermore, and in common with all new Screencore products, it aligns perfectly with our stated objective of prioritising carbon-reduction," concludes Screencore director Ciarán Ryan.

The Hi-Stak is now available for shipping globally after an intensive testing and development programme. ●



SANDVIK BUILDS ITS BASE TO GROW LIFECYCLE SCREENING SOLUTIONS **ACROSS AFRICA**

To provide customers with screening solutions that suit their needs and fit their infrastructure, OEMs must be close at hand with the right facilities and expertise, according to Mats Dahlberg, Sandvik's Vice President for Screening Solutions in Europe, Middle East and Africa.

This is a key element of the strategy being rolled out in Africa by Sandvik Rock Processing, as it takes a leading position in bringing customers innovative solutions for the full lifecycle of screening equipment. The extensive footprint of the Sandvik group on the continent is being leveraged, with entities being empowered with training and extra resources to support its full range of screens.

"Our screening offering now includes a wide range of capacities and applications, which we can support through our strong presence in Africa," says Dahlberg. "A strategic priority is being close enough to customers to understand their requirements in detail, and customise solutions to align with existing site infrastructure.

"This requires a strong local presence and technical competencies, along with a regional supply chain for better responsiveness," he says. "This can be achieved alongside the global commonality of screen components, which ensures customers of a safe, reliable and tested product."

Sandvik already has registered entities in Zimbabwe, Botswana, Namibia, Democratic Republic of Congo, Tanzania, Zambia, Ghana, Mali and Burkina Faso, and a distributor in Mozambique.

Tarynn Yatras, Vice President of Sales Area Africa for Sandvik Rock Processing Solutions, highlights that the company has already begun employing more resources to strengthen the technical capability of these entities in the field of screening.

"We are also able to hold higher volumes of spares and components in-country, for instance, reducing lead times for customers," says Yatras. "Customers of all our screen ranges and brands have started to see the benefit of our enhanced in-country support."

SAM by Sandvik is expected to play a more important role as a digital platform through which customers can receive remote support and other digital services. Local manufacture of screens has also been an important feature of the company's expansion strategy in Africa. The Sandvik Rock Processing facility in South Africa is the first one globally within Sandvik to be capable of producing all the company's screen product lines. It has also begun producing original Sandvik screens and feeders for local customers.

As a leading global screening solutions media supplier, the strategic focus in Africa will include strengthening the existing local manufacturing capability and supply chain for screening media. ●

SACEEC EXPORTER OF THE YEAR AWARD

Bheka Majola, Managing Director for Processing Equipment at Multotec, says the award is not only an indication of the company's growth over the years but also the culmination of a 15-year strategy to grow its global presence.

The SACEEC Exporter of the Year Awards celebrate the passion and commitment of members who have participated and succeeded, through determination and innovation, in their respective local and export markets.

Majola explains that exports currently contribute 63% of Multotec's total annual turnover, of which more than 60% is exported into Africa. Multotec has more than 50 years of experience and expertise in supplying a wide range of good quality mineral processing equipment that is backed by field service and maintenance specialists in most of the commodities, including gold, platinum group metals, lithium, and copper.

He explains that to support the growth of its export business, Multotec has had to invest in its manufacturing facilities and now has almost 80 000 m² of manufacturing and storage space in the Spartan, Pretoria, and Secunda areas.

Bheka Majola, Managing Director – Processing Equipment, Multotec.

Growing international footprint

"We now employ nearly 2 000 people to service our customers globally and make high-quality products for them. With an increasing international footprint, we are now present on six continents and do business with customers in over 100 countries. We were the first to embrace verification by the South African Bureau of Standards (SABS) to prove that our equipment has more than 60% local content," says Majola. ●

ADVANCEMENTS IN CRUSHING, SCREENING, AND SIZING FOR ENHANCED QUARRYING SAFETY

The quarrying industry plays a crucial role in the extraction of valuable minerals and materials for construction and infrastructure projects. However, the handling of challenging materials in quarries has always posed risks and obstacles to workers' safety. David Strain Technical Director at systems integrator Technidrive, tells Modern Quarrying how technological advancements have revolutionised the way materials are crushed, screened, and sized in quarrying operations, significantly enhancing safety measures.

From hand-arm vibration and falls from heights, to explosives and heavy machinery, quarrying workers may be exposed to a number of health and safety risks due to the hazards typically found in quarries.

Automation has long played a pivotal role in enhancing safety in quarrying operations. Machinery equipped with automation systems can perform tasks that were previously executed by manual labour, eliminating the need for workers to enter hazardous areas.

Intelligent crushing systems

One of the most significant advancements in quarrying technology is the introduction of automated crushing systems. Crushing is an integral process, where large rocks and aggregates are broken down into smaller, more manageable sizes. Traditionally, this task involved heavy machinery and manual labour, which posed significant safety risks.

Crusher blockages in particular can be highly hazardous and can lead to costly downtime. To unblock a crusher a plant must usually be shut down and the system must first be isolated. Despite these precautions, a crusher can still be a serious risk to personnel due to the material which can be suspended in the crusher chamber.

In response, modern crushing technologies have brought about remarkable improvements in safety and automation plays a pivotal role here. Advanced control systems and sensors are employed to monitor and adjust crushing parameters, ensuring optimal performance while minimising human involvement. This reduces workers' exposure to hazardous environments, such as confined spaces and noise pollution.

The system employs intelligent algorithms, combined with sensors, to identify blockages and initiate the unblocking process without human intervention. This ground breaking technology not only improves productivity and reduces downtime but also enhances the safety of quarrying operations by minimising the need for manual intervention in hazardous situations.

Efficiently separating materials while prioritising worker safety

Screening is a critical process in quarrying that separates materials based on size, allowing the extraction of specific aggregate fractions. As with crushing, advancements in screening techniques have led to enhanced safety measures.

Innovative sizing methods

Sizing materials in quarrying operations is essential to meet specific requirements for construction projects. Traditionally, this process involved manual handling of heavy machinery and increased the risk of accidents and injuries. However, innovative sizing methods are transforming this aspect of quarrying, improving safety and efficiency.

Modern sizing techniques leverage advanced technologies like laser scanning, 3D modelling, and computer simulations. These tools enable accurate measurements and precise sizing without the need for workers to physically interact with the machinery. By minimising manual intervention, these methods significantly reduce the risk of accidents and create a safer working environment for quarrying personnel.

As the quarrying industry progresses into a new era, technology is playing a pivotal role in transforming health and safety practices and revolutionising the handling of challenging materials. Technidrive's crusher unblock system stands as a shining example of innovation within the quarrying industry. ●

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The pivoting idler assembly rotates in the opposite direction of the mistracking belt.

HIGHLY RESPONSIVE CONVEYOR BELT TRACKER

IMPROVES PRODUCTION AND SAFETY WORLDWIDE

The pioneer in belt conveyor accessories has launched the next generation of tracking technology for a global marketplace. Martin Engineering designed the highly responsive Martin® Tracker™ HD (heavy-duty) belt conveyor alignment system with widely available plate steel to increase availability and affordability across all six continents it serves.

A mistracking belt produces excessive spillage which increases labor costs for cleanup and may cause contact with the mainframe. This seriously damages both the belt and the structure and increases the potential for a friction fire. The Martin Tracker HD upper and lower units provide immediate, continuous, and precise adjustment of the mistracking belt. The result is greater productivity with less unscheduled downtime from both equipment replacement and spillage cleanup for a lower cost of operation.

"Since most OEM mistracking devices are only designed to prevent contact with the stringer and don't actually realign the belt, operators can spend a lot of time monitoring the system and adjusting idlers to achieve consistent alignment," explained Dave Mueller, Product Manager for Martin Engineering. "With enough manual adjusting, operators find that idlers must be recentered if there's a change in cargo characteristics or to install a new belt. The Tracker HD automates the alignment process, eliminating the need for constant monitoring and manual adjustments, reducing the labour and downtime for maintenance."

How it works

The Martin Tracker HD's unrivalled precision comes from sensing rollers that ride either side of the belt edge and are attached to the end of an arm assembly. As the rollers detect slight variations in the belt path, the force of the wandering belt causes the arms to automatically position a pivoting idler in the opposite direction of the misalignment. The lever action requires less force to initiate the correction and only slight adjustments mean the consistent contact between the belt and idlers reduces the energy needed to bring the belt back into alignment.

"Certain countries can't buy the square tubing, so we're now manufacturing the equipment from readily available plate steel without any changes to the performance or life of the unit," Mueller pointed out. "This allows the Tracker HD to be produced and supplied across all global business units."

Compatible with most belt conveyor systems

Easy to install and designed to withstand the stress associated with wider, thicker belts moving at higher speeds and carrying heavier loads, the Martin Tracker HD is suitable for a belt thickness up to 28,5 mm and speeds up to 4 m/s. Both the upper and lower units accommodate belt widths of 915-1 828 mm with an effective tracking distance of 45,72 m.

Available in 20, 35, and 45-degree trough angles,

The torsion rollers ride smoothly on the belt edge, detecting slight variations in the belt path.

KEY TAKEAWAYS

A mistracking belt produces excessive spillage which increases labour costs for cleanup and may cause contact with the mainframe.

The Martin Tracker HD's unrivalled precision comes from sensing rollers that ride either side of the belt edge and are attached to the end of an arm assembly.

The lower tracker has been redesigned to include an extra safety feature not found in competitor units.

Since the basic design of the Martin Tracker HD is similar to that of its predecessors with square tube construction, the testing focused on performance, durability and installation time.

there are options for the addition of a Martin® Trac-Mount™ Idler, which allows the entire troughed idler unit to be slid away from the mainframe and safely serviced from outside of the system by a single worker. This important safety element can considerably reduce the amount of labour and maintenance time for the replacement of broken or frozen idlers. Also available are rubber-lagged rollers on the lower tracker and a grease kit for both the upper and lower assemblies. The unit is not suitable for reversing conveyors, belts with substantial rollback, or paddle or chevron belts.

Proper placement is the key

It is recommended operators install Martin Tracker HDs after the load zone on belts wider than 610 mm with additional units placed down the system to keep the belt centered and tracking. By placing an upper unit before the discharge, operators ensure the belt is centered on the head pulley allowing for optimal belt cleaning with maximum cargo discharge.

The lower tracker has been redesigned to include an extra safety feature not found in competitor units. Regardless of the conveyor, return rollers have been known to detach and drop, creating a serious safety issue, so the Martin Tracker HD has been equipped with safety guarding on the steering roll to prevent the roller from coming off or putting workers in harm's way. On the return, it is recommended to place a tracker after the discharge zone or take-up pulley, as well as periodically down the system depending on length. To ensure centered loading, the belt must enter the loading zone aligned, so installing a lower unit approximately five times the belt's width in distance from the tail pulley will support an efficient loading process.

Field tested and approved

Since the basic design of the Martin Tracker HD is similar to that of its predecessors with square tube construction, the testing focused on performance, durability and installation time. Tested in bulk handling operations including mining and cement where mistracking leading to spillage had historically been a concern, the unit performed up to Martin Engineering's high standards.

"Martin Engineering believes safety should be a core function in any conveyor accessory we design, and the Tracker HD is no different," Mueller said. "By automating consistent belt tracking, this solution reduces equipment wear, maintenance time, and downtime. These factors lower the cost of operation offering the best return on investment of any tracker on the market." ●

Amritesh Anand, Associate Vice President at In2IT Technologies.

PAVING THE WAY FOR A FUTURISTIC MINING SECTOR - THE DIGITAL TWIN MODEL

The mining sector is known for its complex and resource-intensive operations, where the efficient use of resources, safety, and environmental sustainability are of paramount importance. In recent years, the mining industry has witnessed a technological transformation through the adoption of digital twin models. Digital twins are virtual replicas of physical assets, processes, or systems that provide real-time, data-driven insights. By Amritesh Anand, Associate Vice President at In2IT Technologies

Digital twins in the mining sector

The concept of digital twins has gained recognition and is being explored in various industries globally, including South Africa. South Africa's illustrious mining industry has started adopting digital twins to optimise mining operations. This adoption allows for better resource management, safety improvements, and enhanced operational efficiency in mines. Digital twins in the mining sector encompass various aspects of mining operations, offering a comprehensive and dynamic representation of the industry. These digital replicas are created by integrating data from a multitude of sources, including sensors, drones, geological surveys, and historical data.

There are several key components of digital twins in the mining sector, firstly physical asset twin represents the mining equipment, infrastructure, and geological features. It includes 3D models, sensor data, and real-time status information, allowing for a complete view of the physical assets. Process twin simulates mining processes and workflows, the process twin enables operators to optimise operations, monitor performance, and make informed decisions. It helps streamline mining activities and reduce inefficiencies. Thirdly, the environmental twin monitors and models the impact of mining activities on the environment, allowing for better environmental management and mitigation of adverse effects.

Benefits of digital twins in the mining sector

The adoption of digital twins in the mining sector offers a multitude of benefits that significantly impact operational efficiency, safety, and sustainability. Digital twins empower mining companies to make data-driven decisions, reducing operational costs and maximising resource utilisation, thereby addressing operational inefficiencies and increasing productivity. Safety, a paramount concern in the mining industry, is enhanced through digital twins by simulating emergency scenarios and enabling real-time equipment monitoring, preventing accidents, and facilitating prompt emergency responses.

In terms of sustainability, digital twins can contribute to more eco-friendly mining practices by monitoring and minimising environmental impacts, including air and water quality, noise, and land reclamation. Additionally, digital twins enable real-time equipment monitoring and maintenance, predicting maintenance needs, reducing downtime, and optimising maintenance schedules, resulting in cost savings and improved operational efficiency. They also aid in optimising operations by modelling the entire mining process, identifying bottlenecks, streamlining processes, and

KEY TAKEAWAYS

- Digital twins represent a futuristic approach to mining operations, offering a data-driven, real-time view of the industry.
- Understanding and implementing digital twins is vital for companies in the mining sector for several compelling reasons.
- The adoption of digital twins in the mining sector offers a multitude of benefits that significantly impact operational efficiency, safety, and sustainability.
- Safety, a paramount concern in the mining industry, is enhanced through digital twins by simulating emergency scenarios and enabling real-time equipment monitoring, preventing accidents, and facilitating prompt emergency responses.

reducing waste, ultimately enhancing resource utilisation. Furthermore, the integration of geological data and models in digital twins helps mining companies better understand the location and quality of resources, aiding in strategic decision-making.

The importance of digital twins for mining companies

Understanding and implementing digital twins is vital for companies in the mining sector for several compelling reasons. Firstly, digital twins provide a real-time, data-driven representation of mining operations, enabling companies to optimise their processes, resulting in increased efficiency, reduced downtime, and better resource utilisation. By comprehending the digital twin, mining companies can identify bottlenecks and make informed decisions to streamline their operations. Secondly, the improved operational efficiency and predictive maintenance offered by digital twins can significantly reduce operational costs. Companies can minimise equipment downtime, lower maintenance expenses, and manage resources more effectively, contributing to overall cost savings. Lastly, safety is a paramount concern in the mining industry, and digital twins play a pivotal role in enhancing it. They allow for the simulation of emergency scenarios and the monitoring of real-time data related to equipment and environmental conditions. This helps companies prevent accidents, respond to emergencies, and protect the well-being of miners and the environment.

Digital twins represent a futuristic approach to mining operations, offering a data-driven, real-time view of the industry. Their applications in the mining sector encompass physical assets, processes, and environmental management. The benefits of digital twins are far-reaching, from improved efficiency and safety to sustainability and optimised operations. For mining companies, understanding and implementing digital twins is not just a technological choice but a strategic necessity. The impact of digital twins in South African business and IT sectors is also on the rise, making it a significant development in the country's industrial landscape. As technology continues to evolve, digital twins will play an increasingly vital role in the mining sector's future.

What is a digital twin?

A digital twin is a virtual model designed to accurately reflect a physical object. The object being studied — for example, a wind turbine — is outfitted with various sensors related to vital areas of functionality. These sensors produce data about different aspects of the physical object's performance, such as energy output, temperature, weather conditions and more. This data is then relayed to a processing system and applied to the digital copy. Once informed with such data, the virtual model can be used to run simulations, study performance issues and generate possible improvements, all with the goal of generating valuable insights — which can then be applied back to the original physical object.

JOHN DEERE: WHERE IT ALL BEGAN

John Deere's journey into the Industrial Equipment business is a tale filled with innovation and grit. While the exact starting point might be up for debate, one landmark moment can be traced back to 1909 when the Portland, Oregon branch sold log wagons. However, it was in 1920 that a Waterloo Boy tractor in Moline, Illinois, pulled a road scraper, marking a pivotal turning point. The introduction of the hard-rubber tire version of the 27-belt horsepower Model 'D' in 1926 as the 'John Deere Industrial Tractor' further solidified the company's entry into the industrial equipment realm.

This model was subsequently adopted as the 'DI' in 1935 and remained in production until 1941. During the late 1930s, the DI Tractors were used for various industrial applications, such as pulling graders, road sprinkling wagons, and serving as power sources for belt-driven saws and winches in the logging business.

In the 1930s, John Deere engines and drivetrains were employed by the Lindeman Power Equipment Company of Yalima, Washington, in their line of small crawlers. This collaboration laid the foundation for a significant development in December 1946 when Deere & Company acquired certain assets of the Lindeman company and commenced its own line of crawlers. Initially used for agricultural purposes, these early crawler tractors gradually evolved to cater to the construction and forestry industries. This evolution marked the inception of John Deere's industrial equipment division.

The year 1946 also saw the groundbreaking of the Dubuque Tractor Works, which would eventually become the company's primary industrial equipment factory. The opening of this facility, combined with the acquisition of Lindeman's assets, paved the way for the introduction of the 'MI' industrial M model wheeled tractor. This series of events propelled Deere towards a dedicated industrial equipment division.

1955 witnessed the expansion of the Allied Equipment Programme to include backhoes, pumps, generators, trenchers, and winches, aiming to enhance the utility of John Deere tractors in light industrial and logging fields. Subsequently, in 1956, the company initiated a strategic process to establish the industrial equipment business as a distinct entity, acknowledging the unique nature of industrial markets and engineering requirements. This marked the beginning of a carefully planned and determined investment, totalling USD15m, with USD24m earmarked for manufacturing facilities in 1957 to propel the industrial programme forward.

Simultaneously, at the John Deere Wagon Works in Moline, the foundation of an industrial factory organization was laid. The inception of the first industrial engineering group, comprising Wayne Kellums, Charles Termont, and Albert van Auwelaer, signalled the company's dedicated focus on industrial product designs. This momentum culminated in the renaming of the Wagon Works to the John Deere

Industrial Equipment Works in 1957.

The year 1958 marked a significant milestone as the first John Deere wheel and crawler tractors designed specifically for industrial customers rolled off the production lines at the Dubuque factory. These tractors, painted 'industrial' yellow, included the 35-horsepower '440IC' with a John Deere petrol engine, the GM diesel-powered '440ICD' crawlers, and the 35hp '440I' wheel tractor. This period ignited a spirit of curiosity and determination, leading to the development of the first all-hydraulic bulldozer, the Model '64', in 1958.

The year 1960 saw the culmination of these efforts in the form of "Deere Day," an event in Dallas, Texas, which brought together dealers from various regions to witness the complete product line display. This period also witnessed pioneering advancements such as sealed drive axles, self-adjusting wet-disk brakes, and the first hydraulic direction reverser for crawlers, solidifying Deere's position as an industry leader in innovation.

In the early 1960s, the company identified six major industrial product fields for development, including crawlers, wheel tractors, self-propelled elevating scrapers, four-wheel-drive log skidders, articulated motor graders, and four-wheel-drive articulated loaders. By 1967, John Deere achieved a major breakthrough with the introduction of the world's first articulated-frame motor grader, the JD570, representing a significant leap in motor grader design.

The 1970s witnessed remarkable expansions at the Dubuque Works and the acquisition of land for a new factory, anticipating a period of remarkable growth. By 1975, the Industrial Equipment Division had reached a turning point, with substantial sales growth and extensive expansions at the Dubuque Works, cementing its position as a key player in the industry.

By 1981, Deere had expanded its industrial product line to include 68 models, ranging from construction and utility machines to forestry equipment. The company also introduced a new direction in technology and design, emphasising computer-aided design and manufacturing (CAD/CAM), showcasing a new area of expertise and leadership. This transition marked a significant shift towards consistent control of quality, cost, and production through computerised methods.

As the mid-90s approached, John Deere's construction line expanded to include 60 products.

In 2002, John Deere made a pioneering move with the introduction of JDLink™ Machine Messenger, which later evolved into JDLink™ Select and JDLink™ Ultimate in 2009. These products offered remote diagnostics and expanded wireless capabilities, with an optional satellite module for areas with poor cellular coverage. The company continued to enhance its offerings, updating Select and Ultimate with a more user-friendly web interface in 2011.

The year 2005 marked a significant milestone with the creation and release of the first dump truck by Deere Davenport Works. Building on this momentum, Deere introduced Total Machine Control with the 310SJ and 410J Backhoes.

In 2010, Deere achieved another breakthrough with the launch of its 744K Loader, the first construction equipment with a horsepower exceeding 75 to meet regulations. Additionally, the company unveiled John Deere WorkSight™, further solidifying its commitment to innovation and customer satisfaction.

After 2010 John Deere's construction division continued to push boundaries in technology and product development. The company expanded its range of machinery, incorporating advanced telematics and remote monitoring capabilities to enhance operational efficiency and productivity for customers. Deere also continued to invest in research and development, focusing on sustainability, autonomous machinery, and digital solutions to meet the evolving needs of the construction industry.

In 2024, John Deere's construction division stands at the forefront of innovation, offering a comprehensive portfolio of construction equipment, forestry machinery, and associated attachments. The company remains committed to its legacy of excellence, consistently striving to deliver cutting-edge solutions that empower customers to build a better, more sustainable future.

As the years progress, John Deere's construction division will undoubtedly continue to shape the industry through its unwavering dedication to technological advancement, environmental stewardship, and customer-centric innovation. ●

A SMOOTH OPERATOR, **EVEN IN TOUGH CONDITIONS**

HPE Africa's new Hyundai R215 crawler excavators, which were launched locally in October 2023, are set to lead the way with many 'best in class' features that optimise efficiency, maximise productivity and ensure safety in arduous conditions.

"Our new Hyundai R215 series - an exciting addition to our earthmoving portfolio - boasts many benefits, including a long, strengthened undercarriage for greater stability, an advanced ECO operating mode for enhanced fuel efficiency and higher profitability, and new features for improved safety on site," explains Ross Collard, Managing Director, HPE Africa. "The Hyundai design team continually advances its wide range of earthmoving equipment to ensure maximum performance and proven quality. Design improvements also ensure greater precision, versatility, safety and simplified maintenance.

"Intensive field testing of R215 excavators in tough conditions shows impressive performance. What's significant are excellent digging forces (bucket – 15 500 kgf and arm – 12 000 kgf), higher maneuverability and traction force (21 100 kgf) and improved fuel efficiency.

"The newly designed operator cab offers more space, better visibility, easy to access controls and an adjustable fully suspension seat to ensure the operator has a comfortable and safe working environment and can work for longer hours without stress or fatigue. A large LCD monitor enables operators to choose between power, work and user modes and also easily check on the machine's condition. Self-diagnostic systems for oil and coolant temperature and other vital statistics reduce downtime, while warning indicators ensure safer working conditions.

"The local market will also be pleased with the convenience of easy access for maintenance procedures, which means regular checks get done faster. The newly-designed, more efficient cooling system extends service intervals, reduces machine downtime and minimises operating costs."

The Hyundai R215 series - with a Gross Power (HP) of 140 HP @ 2 000 rpm and an operating weight of 21 700 kg – has a variable displacement axial piston type pump, with an electro-hydraulic control function that provides a wide range of flow at various workloads, to meet exact operating requirements.

The water cooled, 4 cycle diesel, 6 cylinder in line, direct injection turbocharged engine is designed for power and reliability in challenging heat, humidity and dust conditions, without compromising productivity.

Features for fuel efficiency include an advanced CAPO system and newly designed CMCU, power and working mode options. A fuel saving kit comprises sensors that monitor loads and send signals to the main control valve to minimise fuel consumption. Fuel savings are enhanced by the exclusive power mode for breaker operation.

For enhanced efficiency, this series features a one touch deceleration switch and an auto idle function that prevent fuel losses by reducing engine rpm during no-load conditions. The auto-piloted swing priority increases hydraulic oil flow to the swing circuit in combined operation, which leads to a faster swing cycle for greater productivity and profitability.

The open centre design of the main control valve provides fast synchronisation between the joystick and hydraulic components, increasing the speed and smoothness of operations. To enhance performance and prevent

KEY TAKEAWAYS

The Hyundai design team continually advances its wide range of earthmoving equipment to ensure maximum performance and proven quality.

The newly designed operator cab offers more space, better visibility, easy to access controls and an adjustable fully suspension seat.

An important feature for optimum safety on site includes an automatic engine overheat prevention system that monitors the coolant temperature and automatically lowers engine speed if it overheats.

The new forged ring body in the lower frame enhances the durability and structural integrity of the excavator, extending service life.

cavitation, the arm regeneration design helps to recirculate hydraulic energy from the return line to the pump supply line.

Structural features for greater durability include a boom and arm made from high tensile strength steel, reinforced with steel bearings and internal baffle plates to maximise impact strength. The new forged ring body in the lower frame enhances the durability and structural integrity of the excavator, extending service life. A heavy-duty track shoe of the undercarriage provides better stability on arduous terrain. In addition, the control link is cast in a single piece design and the bucket linkages are reinforced to ensure high durability and greater digging forces.

An important feature for optimum safety on site includes an automatic engine overheat prevention system that monitors the coolant temperature and automatically lowers engine speed if it overheats, preventing premature failure of the excavator. A counterbalance valve applies hydrostatic braking, to stop the machine from rolling down steep slopes, while a holding valve keeps attachments locked in position. A specially designed cover protects the fuel tank during excavation operations. Another critical safety feature is the anti-restart system.

HPE Africa specialists recommend the use of Hyundai genuine parts and lubricants to ensure the highest levels of performance, reliability and safety from every machine.

The company's range includes Hyundai wheel loaders, tracked and wheeled excavators, backhoe loaders, skid steer loaders and motor graders. HPE Africa also supplies and supports Soosan hydraulic breakers and quick couplers, which are complementary attachments to Hyundai construction equipment.

All machines are supported by skilled technical service and after-sales teams throughout Southern Africa. ●

Proximity Detection Systems (PDS) and Collision Prevention Systems (CPS) offer crucial vehicle-to-pedestrian and vehicle-to-vehicle detection capabilities.

SOUTH AFRICA **LEADS THE WAY** IN PDS TECHNOLOGY

In December 2022, South Africa implemented the Mine Health and Safety regulation focused on trackless mobile machinery. This regulation aims to reduce collisions involving diesel-powered trackless mobile machinery in the mining industry, ultimately decreasing fatalities and injuries.

A decade ago, the mining sector faced a grim reality with 270 fatalities annually. However, the industry has made significant strides in reducing these numbers by 20% annually, resulting in improved safety records.

In 2021, the industry saw a slight setback with an increase in fatalities and injuries, but progress remains evident as 49 too many fatalities were recorded last year.

Booyco Electronics, an original equipment manufacturer specialising in mine safety equipment, has witnessed a surge in demand for its Proximity Detection Systems (PDS) and Collision Prevention Systems (CPS) since the regulation's promulgation. These systems offer crucial vehicle-to-pedestrian and vehicle-to-vehicle detection capabilities.

Anton Lourens, CEO of Booyco Electronics, notes that South Africa's mining industry has been proactive in adopting technologies and innovative products to foster behavioural changes in pursuit of safety.

With stricter mine safety legislation, the company is focused on ensuring compliance with South African proximity detection and collision prevention systems requirements.

Lourens says the Minerals Council South Africa played a pivotal role in understanding and mediating around this regulation and identified concerns related to equipment supply, installation, and maintenance. In addition to implementation of PDS systems, some mining houses are keen to take ownership of product maintenance, requiring comprehensive training for their personnel and this creates further opportunities for Booyco Electronics to expand its workforce.

"Significantly, South Africa was the first country to regulate PDS deployment in mining, attracting interest and engagement not only locally but also internationally," Lourens says. Booyco Electronics, in business for over 17 years, has evolved its product line to meet diverse operational needs. However, Lourens emphasises that PDS alone cannot guarantee safety improvements and that overall CPS success hinges on buy-in from all stakeholders implemented through an integrated approach.

"The mining industry's appetite for technology adoption varies, but the majority has been quick to embrace advanced technology systems, including PDS and CPS. Better connectivity and data management are also priorities, aiding in safety, efficiency, and productivity enhancement," he adds.

The company, which is also growing its African footprint, already has a presence in Congo, Ghana, Namibia and Zambia, and has been appointing collaborative technology partners in areas that have a similar mode of operation to that of South African mines.

Lourens says that digital twin technology is also gaining traction, enabling real-time scenario simulations for risk mitigation, traffic management and analyses and movement monitoring. Booyco Electronics remains committed to helping industries save lives and reduce injuries through its innovative technology. ●

FUCHS SOUTHERN AFRICA
LOOKS TO EXPAND LOCAL AND AFRICAN GROWTH IN 2024

Despite a challenging 2023, FUCHS SOUTHERN AFRICA is poised for continued growth in 2024, asserts MD Paul Deppe.

"We anticipate completion of this project by October 2024," says Deppe. In addition, FUCHS completed a world-class laboratory earlier in the year and has upgraded its capability to manufacture greases as part of its continued commitment to innovation.

"Another milestone in 2023 was the successful implementation of SAP and go live with our new warehouse," says Sales Director Andrew Cowling. "The new system will bring about improvements in process efficiency," he says. Another avenue for growth is the export market in Africa, with FUCHS signing up new distributors to grow its footprint on the continent. However, external factors such as municipal service delivery, energy and water security, and logistics infrastructure continue to affect both supply chain management and the broader business environment.

Looking ahead to 2024, Deppe outlines a plan to increase FUCHS' reliance on renewable energy, with around 25% of its electricity consumption anticipated to come from PV systems. The company is exploring other forms of renewable energy and is also investing in backup generators. In addition, the company is exploring using recycled oil to manufacture products, in line with the group's commitment to sustainability globally.

To live up to this claim, we think in terms of perfection, not merely standards. When developing individual solutions, we enter into an intensive customer dialogue – acting as an experienced consultant, innovative problem solver and reliable team partner. The results we provide meet not only the highest technological requirements, but also help customers save on operating costs and emissions. Because at FUCHS, sustainability is not simply an empty phrase, but a mindset – and thus the basis and aspiration of all our business activity. ●

B60ES PROVIDE THE MOST COST-EFFECTIVE MINING SOLUTION FOR AFRIMAT

When Afrimat, a leading mid-tier mining and materials company, bought out the assets of the Nkomati Anthracite mine in 2019, the company did a critical evaluation of the mine's landscape and haulage vehicle requirements. Given prevailing underfoot conditions in both dry and weather, they decided to buy the largest Articulated Dump Truck (ADT) on the market to fulfil their needs.

The Group, known for its entrepreneurial drive, supplies industrial minerals and construction materials to a range of industries across southern Africa. In addition, Afrimat supplies bulk commodities such as iron ore and anthracite to local and international markets. During the past year, Afrimat also started supplying phosphates to the agriculture sector. As of this year, it is listed in the 'General mining' sector of the JSE Main Board, having been previously listed in the 'Construction & Materials' sector since 2006.

It is about the Group's anthracite commodity and the haulage vehicles that move it, that we chat with Adriaan Lategan, Afrimat's Physical Asset Management Lead. "Since buying the Nkomati Anthracite mine, which lies between Komatipoort and the Eswatini border in Mpumalanga, we've had several challenges to overcome," he says. "One was the flooding of our main pit in 2021 due to heavy rain which took eight months to dry and become productive again, which prompted us to start looking at developing further pits as production areas."

Adriaan mentions that instead of asking their current mining contractor to increase his fleet size, which would have meant increased production costs, Afrimat, after careful and critical analysis of the haul distances and underfoot conditions amongst other factors, decided to rather deploy its own fleet of haulage trucks for this purpose.

"As we usually do, we researched the wider earthmoving equipment market and did some testing of various haulage vehicles at our Jenkins iron ore mine in the Northern Cape," Lategan explains. "Here we saw first-hand how Bell B60E ADTs came out tops in terms of production and fuel consumption which convinced us that the Bell B60E ADT would be the ideal haulage vehicle for the planned expansion at the Nkomati Anthracite mine."

Afrimat placed its order for four Bell B60E ADTs in the second quarter of 2022 and the machines were delivered in January 2023. They are matched with a 120-ton excavator loading with a 7 m^3 bucket. Creating the new pit means stripping off the topsoil which is stockpiled for use in later rehabilitation. Then the overburden is removed and this, according to Lategan, when dry, has a relatively low specific gravity which means that the operator in the cab of the Bell B60E ADT can sit and watch his onboard load indicator steadily climb as more material is added to the large bin with its heaped 35 m^3 design capacity. This optimises the loads on the average 1 km haul to the waste dump.

"I should just mention that another important reason for us buying Bell ADTs stems from the long and solid business relationship we have with Bell Equipment," Lategan explains."We believe, on the sales side, in trusting a single point of entry which we have with the company's Sales Representative, Sascha Caixeiro, and on the maintenance and repair side, we will approach whichever Bell branch is closest to an operational site and introduce ourselves to the branch and workshop manager, so creating a relationship where everyone knows what we expect and we get to know the Bell managerial, technical and support staff, which is always a pleasant experience."

Lategan mentions that they did the same when their Bell B60E ADTs were delivered to the Nkomati Anthracite mine. He approached Brett Peddie, the Bell Equipment Customer Service Centre Manager at the Nelspruit branch from where the machines would be supported.

"We were impressed that Adriaan and his Afrimat colleagues took the trouble to visit us personally to clarify how they would prefer having their Bell B60E ADTs serviced," says Brett. "This gave us an opportunity to introduce our support staff to them as new customers and so establish open lines of communication."

Afrimat's new Bell B60E ADTs have been bought with extended warranties that are backed with a 12 000-hour Bell Care Package. "As we don't yet have our own mechanics on the mine, we thought it imperative to rely on Bell Equipment's technical staff to be totally in control when it came to maintenance and repair of this fleet, as small as it may seem," Lategan says. "These four Bell B60E ADTs form such an important part of our operation that we'd like to minimise downtime due to servicing and repair when needed by using the best skilled mechanics and where better to find them than from the original supplier of the equipment."

Afrimat has found good use for the full Fleetmatic® package which provides comprehensive feedback on machine performance.

"This care by skilled mechanics is already paying off because once small initial technical hitches were ironed out, the Bell B60E ADTs are achieving the budgeted 400 hours per month and doing that with very frugal fuel burn," Lategan adds.

"Currently the units are running with their full loads and returning average fuel figures of below 20 litres an hour. This has surprised and impressed us all, although it is expected to increase a bit as the haul conditions will change due to inclines getting steeper.

"With new equipment being hard to find due to most OEMs having long lead times, using a contractor may be the more convenient option currently," Lategan states. "However, we have found that in the long term, using one's own equipment is the more cost-effective way of mining and buying these Bell B60E ADTs is proving that point on all fronts." ●

SOOSAN CSM CRAWLER DRILL RIGS: ROBUST FOR LOCAL CONDITIONS

JMH Equipment has been distributing Top Hammer drill rigs since 2007 in Southern Africa. It has sold machines in South Africa, Namibia, Botswana and Angola and has been repairing various drifters for the same period of time, like Montabert, Sandvik, Epiroc, Yamamoto and Furukawa drifters. The company, which is based in Rustenburg (North West), has workshop facilities, field service units and parts stores. Modern Quarrying spoke to Maurits Holtzhausen, the company's MD about the Soosan CSM Crawler rigs that the company supplies to the mining and quarrying industries.

"These rigs are ideal for the African market, they do not make use of computer/ECUs in the machine. Soosan CSM Crawler drill rigs are a pilot over hydraulic system which makes them much more robust for our conditions and easy to maintain," explains Holtzhausen.

The standout characteristic of these drills is the use of well-known major components such as Cummins, Kawasaki, GHH and Yamamoto. "There were no shortcuts taken when designing and building these rigs," explains Holtzhausen.

The machines have ROPS & FOPS certified cabins, as safety for the operator is paramount. "Together with the CE certification, you can be sure that these rigs have been built with safety as the top

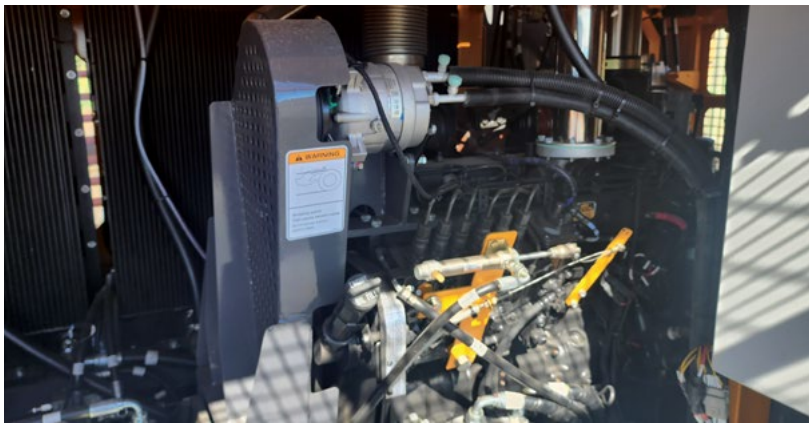
KEY TAKEAWAYS

These drills use of well-known major components such as Cummins, Kawasaki, GHH and Yamamoto.

There is no need to remove components to get access to other components, filters or parts for servicing.

These rigs are ideal for the African market as they do not make use of computer/ECUs in the machine.

These drills have a reputation amongst service technicians for the ample space available for them to complete their servicing.



priority," Holtzhausen explains.

"What sets JMH Equipment apart from other companies is that parts availability is of utmost importance, and is the reason for us being where we are today. We do whatever it takes to have availability for customers to ensure maximum uptime and are in the business of building and growing trustworthy relationships," Holtzhausen continues.

After-market support and ease of servicing

He says that with this ease of maintenance and readily available parts, ensuring maximum uptime is a breeze. "We can assist with field service and parts wherever required. All our clients know that we are just a phone call away and always ready to assist no matter what the situation," he maintains.

"We have invested significantly in the aftermarket support, which can be opted in, depending on the clients' needs," says Holtzhausen. Each mine has its own set of requirements, and we can offer solutions no matter the requirement. This can range from fire suppression, depth meters and hydraulic pressure consoles to many others.

Ease of maintenance

Ergonomically the machine is designed for maximum operator comfort while ensuring ease of maintenance. For the operator, controls are easily accessible.

As there is so much space in the engine compartment, servicing and oil replacements are quick and easy. "There is no need to remove components to get access to other components, filters or parts," says Holtzhausen. "These drills have a reputation amongst service technicians for the ample space available to complete their servicing."

"JMH Equipment offers a drifter test bench where all drifters are tested after repairs, while it gathers other vital information through its test facilities such as flow rate, pressure readings on percussion and rotation, etc.," Holtzhausen explains. ●

The SOOSAN CSM Hydraulic Crawler Drills are easy to maintain, robust and very cost effective. With the mechanical layout and absence of computers, these drills ensure the minimum downtime for your drilling operation. JMH Equipment offers the J-800E, JD-1300E and JD-1400E SOOSAN CSM Hydraulic Crawler Drills.

Thomas Chao, Managing Director at Powerbit Rocktools (left) and Nardus Bezuidenhout, Director at Torque Africa Exploration.

POWERBIT ROCKTOOLS: **YOUR TRUSTED PARTNER IN DRILLING EXCELLENCE**

What sets Powerbit Rocktools apart from other suppliers? Nardus Bezuidenhout, Director at Torque Africa Exploration, explains: "Powerbit Rocktools has earned its reputation by actively listening to customers, understanding their unique challenges and consistently delivering top-notch solutions. They are more than a supplier to us. They partner with us to create the right solutions our drilling business demands."

Powerbit Rocktools industrial drilling products – which encompass DTH hammers and bits, RC hammers and bits, tri-cone bits, top hammer bits and rods, casing systems, grinding machines and more – are technologically advanced but also surprisingly affordable.

The company's ongoing commitment to excellence and dedication to customer service have established it as a force to be reckoned with in the drilling industry. The world of drilling is rapidly evolving, and with it, the demand for robust and reliable rock drilling tools is constantly on the rise.

Powerbit Rocktools collaborates with advanced research centres and technology experts in Taiwan, China and Japan. This global presence ensures they stay ahead of technological advancements, allowing them to tailor their products to meet clients' specific needs effectively.

Powerbit's extensive product range is complemented by its focus on building long-term client partnerships. Wors Prinsloo, Director at Kibela Drilling – a leader in the drilling and blasting industry – emphasises the significance of collaboration, especially in the African sector, where drilling operations are essential for resource extraction and progress:

"In our industry, we can't afford downtime. Having partners who are always available to help us address the unique challenges we face is critical. The Powerbit team works with us, not for us. That makes them a valued partner for our business."

The value of economical, long-life rock drill bits, hammers and grinding machines in today's drilling environment is immeasurable. Powerbit recognises these tools' vital role in enabling clients' success and driving infrastructure projects that underpin local economies.

The Powerbit product range is a testament to their commitment to empowering progress in drilling operations. Each Powerbit product is meticulously engineered to deliver exceptional drilling capabilities and ideally equipped to serve a diverse clientele with varying requirements across different industries and working conditions.

Experience Powerbit precision

Experience the power of precision-engineered rock drilling tools and exceptional customer support, empowering your operations to thrive in the face of modern drilling challenges. Connect with Powerbit Rocktools and embark on a journey of progress and empowerment that has been driving the southern African mining industry for almost two decades. ●

BME'S PARTNERSHIPS **DRIVE GLOBAL GROWTH** AND ESG FOCUS

Globalising through partnerships, Omnia company BME continues to roll out its plans for expansion in markets including African countries, Canada, Australia and Indonesia.

According to BME Managing Director Ralf Hennecke, the drive into these high-potential markets has been a key aspect of the company's strategic direction.

"These markets are exciting for us as they boast high mineral exploration rates and a diverse range of battery and other minerals which are important for future growth," said Hennecke. Much of the achievement of recent years has been BME's establishment of infrastructure in these markets, setting itself up to serve its customer base there. In Canada for instance, the company has been busy in recent years building assembly plants for electronic and non-electric detonators.

Differentiators

"This gives us the opportunity to highlight our differentiators such as our blasting technology and digital tools, as well as blasting products and our high level of technical service," he explained. Each market had its own specific conditions, he emphasised, so the approach has to be tailored.

In Indonesia, the partnership with leading explosives producers MNK allows BME to contribute its blasting tools and equipment to new segments. While the softer mineral environments like coal are not as demanding in respect of technology, digitisation and services, there are a range of minerals and metals in Indonesia.

Plants in Australia

"In Australia, we have been successfully conducting electronic detonator trials, and are also building infrastructure," he said. "This includes plants in the east and west of the country."

Non-nitrous technology

"We are also successfully partnering in the field of technology – where our recent tie-up with Hypex Bio strengthens our sustainability ambitions for non-nitrous emulsions," he said. "Using hydrogen peroxide is a ground-breaking technology in our sector, and a direction that we want to help pioneer globally."

He highlighted that this partnership also adds considerably to the environmental, social and governance (ESG) conversation which BME has with its mining customers, and opens doors in new and existing markets. The company's dual-salt emulsions are already assisting mines to meet their decarbonisation targets, due to the lower greenhouse gas emissions from blasts. Much lower proportions of ammonia in its emulsions also reduces the risk of environmental contamination – an ongoing concern for miners.

Digital collaboration

Having built considerable in-house digital expertise, the company nonetheless continues to prioritise more partnerships that leverage cutting-edge technologies. Collaborations in these fast-developing fields are likely to feed into the company's established efforts to automate areas like emulsion truck operations. He pointed to the growing number of mining companies who are looking to automate their sites, and who are looking for innovative solutions to facilitate this process.

BME has already introduced smart functionality into its mobile manufacturing units, using its Xplolog and Xplocharge solutions to enable real-time monitoring, data capture and analysis. This is raising the bar in the accuracy of emulsion pumping into blastholes, allowing cost savings and efficiency.

Blasting ecosystem

"Our global expansion is supported by the enabling ecosystem that we provide for customers, to achieve quality blasts which reduce downstream costs while enhancing energy efficiency," said Hennecke. "This aligns with our customers' sustainability goals while ensuring optimal productivity."

He explained that BME is already working on the next generation of electronic detonators, and continuing to enhance accuracy to deliver blast results that support ESG targets. ●

COMMON AUTOMATION PANEL **FOR MIXED FLEET (ONE TO CONTROL THEM ALL)**

Epiroc is now launching the revolutionary Common Automation Panel (CAP) for RCS-based surface drill rigs - Pit Viper and SmartROC DTH MKII models. CAP enables a transformation in remote control centres, with improved ergonomics and a platform approach to run mixed fleet operations from a single station.

The Common Automation Panel is designed for an innovative transformation of the control room.

"CAP has been created for the modern mine remote control centre environment. This product will help our customers to streamline the value chain of their surface drilling operations – and create a safer and more productive environment," says Christopher Blignaut, Automation Manager at Epiroc Surface division.

CAP creates opportunities for complete transformation, including improving the layout in the control room, the way operators are trained and work, and reduced variability and spare parts costs.

"The CAP station will bring value to the daily mining operations that focus on technology and automation – through direct opportunities to increase utilisation of the fleet and reducing operating costs. Operation through CAP can also prolong the effective life of the equipment by ensuring that equipment operates within optimal design parameters. This results in lowering maintenance costs overall", says Blignaut.

Common Automation Panel has a new design approach, which was developed in collaboration with close partners. It includes a 12" touchscreen display and joystick configuration for different machine types, which is an important benefit when it comes to mixed fleet operations with Pit Viper and SmartROC DTH MKII as well as training for new operators. For operators, this means easier adaptation between machines and more flexibility to run the fleet. The product was also designed with improved ergonomics in mind, to allow the panel to be situated comfortably in multiple positions.

The Common Automation Panel also offers a new safety system to further reduce the office footprint and increase the total number of machines that can connect into a control room in a single system. This is important for situational awareness during remote operations and will reduce maintenance and operating costs for larger fleets.

CAP will enable more consistent and predictable operations and a lower overall cost of ownership. In the long run, this will have a positive effect on de-carbonisation as well as enhancing the health and wellbeing of the operators.

"We see increased environmental, social, and governance (ESG) demands, tighter demands on health and safety, and the need to integrate groundbreaking digitalised solutions that boost productivity in the mining environment. CAP answers these demands directly," says Blignaut. ●

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