



MODERN QUARRYING

QUARTER 3 | 2022

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28 Lifetime costs of fabricated parts for vibrating screens

BUILT FOR THE LONG HAUL

JOHN DEERE

LAUNCHES ITS 460E-II ADT

04



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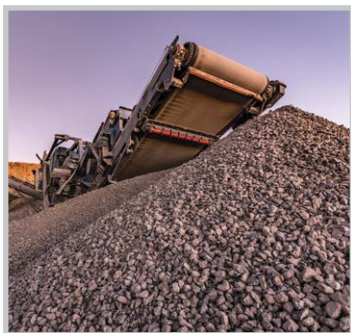
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DELIVERING OPTIMAL UPTIME!

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MEASURING TO MANAGE: LOAD WEIGHING SYSTEMS SET THE STANDARD

In the current cut-throat quarrying industry with its slim margins, operations need to be as effective and accurate as possible when the weight of mined aggregate is determined.



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CAN THE INDUSTRY BE REBUILT?

South Africa's construction industry (especially road building) has been on a decline for more than five years. The COVID-19 pandemic, despite the short-term positive impact it had as thousands renovated their homes in order to make them places of work, had a severe impact, further exacerbating the situation. Add to this the unrest of last year, the negative international global economic climate, South Africa's own political uncertainty and the ongoing load shedding and one has a highly volatile situation for the built environment – and the reason stockpiles at quarries are growing larger and larger.

Quarries are first in line to feel the effects of this lack of activity in the built environment. The decline in large build opportunities and investment in infrastructure in addition to the shortage of general construction projects are of grave concern. There have, since the pandemic started, been attempts to address the short- and long-term

business challenges in the built environment. One such long-term plan is the South African Economic Reconstruction and Recovery Plan that is aimed at stimulating equitable and inclusive growth.

Sadly, so far little has transpired and the industry is faced with margin squeeze as everyone is scrambling and cutting prices to get a piece of the dwindling pie. Road building projects – a major consumer of the aggregate that quarries produce – are stuttering, large construction projects are few and far between and civil projects, apart from being hard to come by, are further complicated by red tape.

From the 2021 PPS Graduate Professional Index (GPI) results it is evident that many graduate professionals in the built environment sector are continuing to feel the effects of the pandemic.

During the national lockdown the government diverted infrastructure spending to alleviate the country's economic and social crisis, cutting traditional expenditure by some 80%. Even though this was necessary,

it had a ripple effect for almost all sectors – the built environment and the leisure industry arguably the worst hit. The sector is now faced with the task of recovering, rebuilding and re-establishing operational sustainability.

The road to recovery will be long and full of curveballs. Even though the pandemic, by and large, may be a thing of the past, the other issues all remain. Government has committed to using infrastructure projects to drive post-COVID-19 economic recovery, but some 70% of the skilled professionals surveyed do not believe there are enough building and construction projects in South Africa to help the sector rebuild and recover. I hope there is an implied 'yet' in that sentence.

Seeing this first-hand

This lack of activity is something I have witnessed first-hand. For this issue I visited AfriSam's Rooikraal Quarry located near Brakpan, Gauteng which mines competent dolerite rock. The quarry is a big supplier to asphalt markets which it supplies with its sought-after products – especially 10 and 20 mm road stone. Despite this quarry's quality rock and operational excellence, it is evident that the lack of demand from the built environment – particularly road building – is having an effect: there is need to cut down shifts as the stockpiles are growing larger. The ongoing woes with Eskom's load shedding are making an already difficult situation, even worse.

Despite the contextual difficulties this quarry is faced with, the article on page 22 discusses how Rooikraal uses a closed water circuit to wash its aggregate. In the production of aggregate, sand and gravel used in roadbuilding, raw material is mined from a deposit of high-grade material that is intermixed with other undesirable materials and detritus. As asphalt cannot have aggregates with any particles, the aggregate must be washed to get rid of such materials. ●

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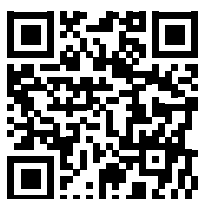
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Legal compliance

Updates on legislation
Explosive audits and other



Health and safety

Audits, training and advice
(cost effective legal opinions)
H&S audits - MHSA and OHSA



Technical

Quality and information
Quality and laboratory audits



Engineering

Committee/development of
career paths in surface mines
*ECSCA registration info
sharing on products*



Public relations

Advertisements, articles,
handouts, law books and bulletins
Marketing the industry



Internal liaison

Members of other bodies
in SA with similar mandates
*Work with other bodies
in the mining industry*



Transport

Trackless mobile, PDS
and road transport
*Assistance with TMM legislation
and traffic management*



Government liaison

Meetings with legislator
and others
*MHSC, MRAC, DEA, DMRE,
COGTA and SANRAL*



Environmental

Audits, training and advice
*Environmental audits
(cost effective legal opinions)*



HR and training

Audits/workshops - need to
comply with mining charter
Training and skills audits



International liaison

GAIN and other bodies
*Keeping up with
international standards*



General

A host of issues
*Anything from legal
to industry issues*



Social security/compliance

Assistance with mining charter
*SLP/WSPs/training/education
and a host of others*



Security

A host of issues
*Theft, crime attacks on
mines and related issues*



Young professionals

Developing young talent
*Mentoring young
professionals/ECSCA registration*



Women in mining

A host of issues
Gender justice



Illegal mining

Involvement with DMRE
*Crime fighting and preventing
collusion*



Legal issues

A host of issues
Royalty act/rehabilitation funds



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10 Garingboom Street
Randpark Ridge
Randburg
Gauteng

This John Deere-designed machine delivers ultimate productivity with a redesigned wider dump body, electrical and hydraulic systems, and new drive modes to help quarries get the job done in various conditions.



JOHN DEERE INTRODUCES NEW ADT TO SOUTHERN AFRICA MARKET

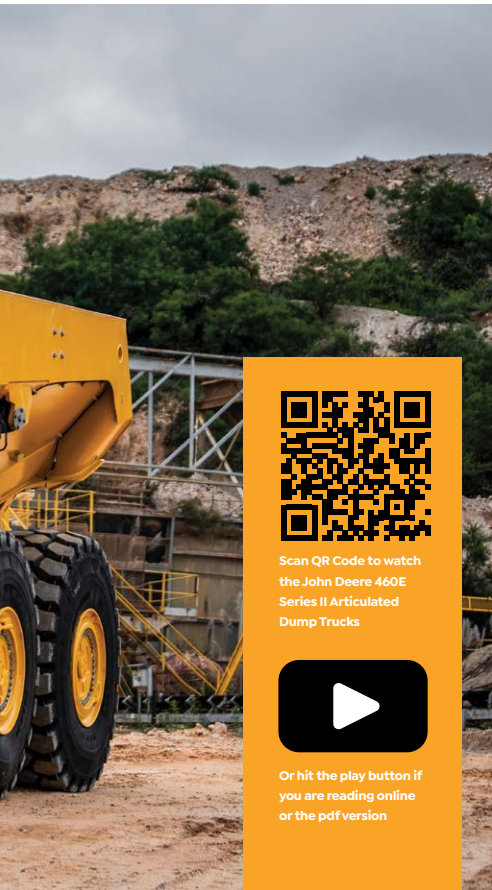
Designed with the demands of today's job site in mind, John Deere has introduced the new 460E-II Articulated Dump Truck (ADT) to the local market. This John Deere-designed machine delivers ultimate productivity with a redesigned wider dump body, electrical and hydraulic systems, and new drive modes to help quarries get the job done in various conditions. John Deere says that this machine is built for the long haul as it is aimed at optimal productivity, is easy to run and is highly efficient. **Modern Quarrying** attended the launch of this ADT in Johannesburg where it was positioned within the John Deere value proposition that aims to give customers peace of mind.

The John Deere DNA

Jaco Beyers, John Deere's Managing Director Africa Middle East says that John Deere has made a commitment to infrastructure. "By 2050 the African continent will have a population of 2,5 billion people who will need to be fed and will need infrastructure. We are fortunate to be part of the world's leading agricultural machine producer – it is also the world's third largest mining and construction equipment producer

and the world's biggest producer in road building equipment."

Five years ago John Deere embarked on a journey to redesign its channel. "In the Africa Middle East region it was started 18 months ago: we selected the strongest dealers – these are our channel partners. These dealers have established a footprint across Africa which allows them to stay close to customers. They have invested in infrastructure, personnel, tools and training to enable



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the John Deere 460E
Series II Articulated
Dump Trucks



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John Deere to support yellow metal for many years to come," he says.

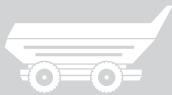
"Our equipment is designed for fuel efficiency, productivity and operator comfort. In the John Deere DNA, technology is what has driven it forward. There has been pioneering technology in agricultural equipment and this will be piloted on yellow equipment," Beyers states.

Value proposition

"Our value proposition includes aftermarket support, parts availability, servicing and financing support. It is easy to sell the first product, but keeping them running is the real test. Thus the reason why we started with a small range of construction equipment: we wanted to ensure parts availability and that our staff had the correct training," adds Beyers.

Given the 24/7 operating context of construction, John Deere understands the importance of having parts available for machines. "Our dealers are the first in line of our customer service. We serve the markets for agricultural and construction equipment through the same channel," says Glenys

KEY TAKEAWAYS



A vital feature of 460E-II ADT is the redesigned dump body, which is wider and has a lowered and levelled rail height to improve material retention and allow it to be loaded easily.



All servicing is conducted from ground level and no climbing onto stairs or platforms is required.



Remote diagnostics enable dealers and customers to monitor machines remotely and react quickly and proactively when problems occur.



Some 68% of parts are common among agri and construction machines.



Millingham, Manager Aftermarket Sales, Africa and Middle East. "The dealer parts management system is used by both the agricultural and construction markets and ensures a standardised system for our dealer personnel." Some 68% of parts are common among agri and construction machines.

A good context for an ADT

Against this background John Deere has introduced the 460E-II Articulated Dump Truck. E-II

Trucks combine the most popular features of the E-Series line with customer-driven performance and operation enhancements, resulting in a machine that is easier and more cost-effective to operate. It is designed and manufactured with state-of-the-art tools and techniques in Iowa.

John Deere has been selling ADTs for 25 years in North and South America. These were built in Richards Bay. In 2004 John Deere began manufacturing the



D series of ADTs in its own factory in Davenport, Iowa. Their own E-series range of four ADTs was first introduced in 2012. Last year this range was upgraded to the current E series with enhancements in terms of economy, performance, reliability and serviceability.

The 460E-II has a 13,5 litre turbo intercooled inline 6 engine which is also fitted to other large construction machines and agricultural machines – with all the benefits of parts commonality.

Built to maximise performance

A vital feature of 460E-II ADT is the redesigned dump body, which is wider and has a lowered and levelled rail height to improve material retention and allow it to be loaded easily. Additionally, the bin rail features an angled top, helping to reduce material spillage while travelling.

The 460E-II model is also available with a new ejector body solution. This solution allows operators to spread a load over a given area and can be used in areas with overhead powerline concerns or where the risk of rollover is high due to steep grade unloading.

Improved fuel consumption

The three drive modes available



Our equipment is designed for fuel efficiency, productivity and operator comfort. In the John Deere DNA, technology is what has driven it forward. There has been pioneering technology in agricultural equipment and this will be piloted on yellow equipment

on the 460E-II ADT help optimise the drivetrain, reduce inputs from the operator, and enable easy customisation.

Normal Mode for everyday operation reduces fuel burn by up to 7% compared to existing models. In contrast, **Eco Mode**, when conditions allow, conserves fuel by managing engine power delivery and optimises transmission response for those conditions, thus improving fuel consumption by up to 12% compared to Normal Mode. **Traction Mode** optimises differential lock for maximum tractive effort in soft and slippery ground conditions.

The new wheel-speed sensors also provide a more accurate reading than the ground-speed radar to confirm the traction-boosting

auto-differential lock engages when needed.

With these modes, the clients' operation will save fuel costs and help reduce the operation's environmental impact.

Designed for durability

The John Deere 460E-II ADT axles are designed for heavy-duty and longer life. They are lubricated, filtered, and cooled to extend their service life, while the spring-applied, hydraulic-released park brake is also highly reliable.

The inboard wet-disc brakes run cool, clean, and unexposed. Each of the brake axles are force cooled and filtered separately. The cooling oil is separate and not shared, ensuring that cross-contamination



is never possible. Combined with the strong transmission retarder, they help deliver consistent stops and maximum brake life.

Improved reliability

The hose and wire routing on the ADT has been simplified to reduce rubbing and improve reliability, while the factory-installed auto lube further boosts uptime and reliability.

The redesigned electrical and hydraulic systems maximise machine uptime with a 10% reduction of electric and hydraulic routings, further reducing leak points and improving reliability.

Safety first

Safety is paramount. The John Deere 460E-II ADT features a number of safety features that help keep operators out of harm's way, such as; remote park-brake release, rollover protection, ground-level service, and auto horn.

With rollover protection, operators can set limits for the rear-chassis level when unloading. If the limit is exceeded, the dump body will not raise, and an alert message will appear on the monitor.

All servicing is conducted from

ground level and no climbing onto stairs or platforms is required.

Operator comfort is key

This model's updated operator station includes features that promote increased productivity and all-round comfort. One of the most notable features is the single switch model, reducing the

number of switches by 25% compared to previous models.

The quiet, pressurised Deere-designed cab also features a new, easy-to-read monitor and rear-camera display, along with options such as premium heated/ventilated seat and automatic temperature control (ATC) system. ●

About John Deere

With a rich history of more than 140 years in South Africa, John Deere is a trusted, world-renowned leader in producing turf, agricultural, construction, and forestry machinery solutions with state-of-the-art precision technology. With its continued focus to strengthen its presence throughout the Africa Middle East region (AME), John Deere AME serves its customers through more than 218 dealer touch points across Africa Middle East and supports its dealer network with a Regional Parts Distribution center in South Africa as well as sales and marketing offices in South Africa and Kenya.

Committed to delivering a distinctive customer experience coupled with solutions-driven advice from its authorised dealer network and John Deere Financial Solutions, John Deere AME promotes food security while actively driving a successful and inclusive agricultural community while supporting Africa's growth via its construction and forestry solutions.

The ACI is a composite index of the level of activity within the building and construction sectors and is compiled by economist Dr Roelof Botha on behalf of Afrimat.



AFRIMAT CONSTRUCTION INDEX SHOWS A DECLINE IN FIRST QUARTER OF 2022

Afrimat, the JSE-listed open pit mining company providing industrial minerals, bulk commodities and construction materials, has released the findings of the Afrimat Construction Index (ACI) for the first quarter of 2022. The ACI is a composite index of the level of activity within the building and construction sectors and is compiled by economist Dr Roelof Botha on behalf of Afrimat.

According to Dr Botha, the lifting of most of the lockdown regulations resulted in a V-shaped recovery for most key sectors of the economy, including construction during the second half of 2020. Since then, several sectors have fully recovered and progressed to a new phase of expansion, but construction sector activity remains subdued.

The only sub-indicator of the ACI that recorded positive growth between the fourth quarter of last year and the first quarter of 2022 was the value of wholesale sales of construction and building materials.



The lifting of most of the lockdown regulations resulted in a V-shaped recovery for most key sectors of the economy, including construction during the second half of 2020. Since then, several sectors have fully recovered and progressed to a new phase of expansion, but construction sector activity remains subdued.

KEY TAKEAWAYS



The lifting of most of the lockdown regulations resulted in a V-shaped recovery for most key sectors of the economy during the second half of 2020.



The only sub-indicator that recorded positive growth between the fourth quarter of last year and the first quarter of 2022 was the value of wholesale sales of construction and building materials.



As long as the value of construction works represents only 4% of the country's infrastructure project pipeline, new jobs will not be created at scale in the construction sector.



The Group's diversification positioning is also being driven by additional commodities coming on stream.

Although the ACI managed to marginally outperform the gross domestic product (GDP) growth rate during the first quarter of 2022 on a year-on-year basis, the index has returned to its traditional trend of recording a decline between each year's fourth quarter and the first three months of the following year, recording a drop of 3,5% in the index value (from 118,8 to 114,7).

The only sub-indicator of the ACI that recorded positive growth between the fourth quarter of last year and the first quarter of 2022 was the value of wholesale sales of construction and building materials. However, compared to the first quarter of last year, the picture is considerably more positive, with four of the nine sub-indicators recording positive growth, whilst two others were virtually unchanged (declines of less than one per cent).

"Ever since the ACI recorded its highest level yet, namely 143,8 during the third quarter of 2016, a combination of high interest rates, low economic growth, state capture, public sector incompetence and high levels of violent crime have dampened activity in the country's construction sector," says Botha. ●

Multi-Pivot Trainer for the return run.



NO JOKE: KNOCK-KNOCK ON CONVEYOR IDLERS

On any belt conveyor system that moves bulk materials, the belt must run straight and true to maximise its life, minimise fugitive material and safety hazards, and achieve high system efficiency. There can be many consequences of a mistracking belt, but all result in higher costs and increased maintenance. Even a slight belt misalignment can lead to a variety of issues, from small annoyances to full-blown catastrophes. **By Cory Goldbeck - Territory Manager, Martin Engineering**

The most obvious effects include spillage and dust that require personnel to do cleanup, which is unproductive work that introduces risks from activities in close proximity to the moving conveyor. Spillage from non-centered cargo often gets into idlers and pulleys, reducing bearing life and causing them to seize, leading to friction damage

on the belt and potentially starting a fire. A misaligned belt can also come in contact with the stringer, causing fraying, shredding or splice damage. Great lengths of valuable belting can be destroyed with surprising speed, and even the support structure itself can be damaged. A compromised bracket or support can cause a catastrophic idler failure, which could damage other components of the system

and require extensive downtime to repair. Further, there is potential for injury from a damaged belt or loose idler not to mention the increased exposure to injury from too frequent a need to clean.

"I've been working around conveyors for 20 years, and I've seen thousands of belts," observed Martin Engineering Process Engineer Dan Marshall. "I've seen just about every problem that can



Multi-Pivot Trainer for the load-carrying run.



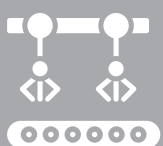
A tracking idler tied off to limit its travel.

Martin Engineering Company owns the copyright to all the photographs.

KEY TAKEAWAYS



A compromised bracket or support can cause a catastrophic idler failure, which could damage other components of the system and require extensive downtime to repair.



Multi-Pivot Belt Trainers use longer arms than other designs, positioning the guide rolls further from the pivot roller, as well as closer to the belt edge.



Specific designs are available for both the load-carrying belt path and the return run.



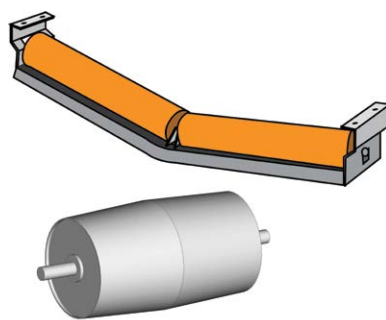
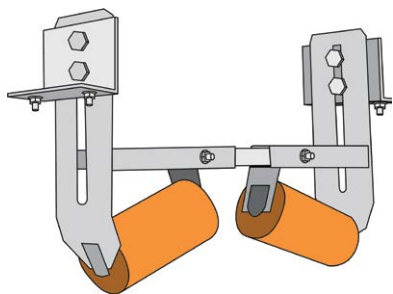
Installing trackers is the economical solution, but operators should do a full analysis and consider also addressing other causal issues.

be caused by a mistracking belt, but one thing I've never seen is a belt that runs true right out of the box. All conveyors, no matter how well designed and built, have some belt wander."

A wide variety of circumstances can lead to mistracking, and operators have tried many things to correct the alignment. Some have elected to place an obstacle such as a block of wood in the belt path, so it won't travel too far out of line. This occasionally improves the situation, but more often it's just temporary and the belt will eventually slice through the obstacle.

Many operators have realised that pivoting an idler is a quicker and more effective way to steer a belt. This common approach is called "knocking an idler," striking it with a hammer to move it slightly and realign the belt.

Equipment manufacturers have also designed components to help align a belt, and these solutions



Different component designs for improving belt alignment.



"Knocking" an idler with a mallet to change its position.

can be successful in specific applications. They include specially-shaped rollers, angled idlers and devices that apply pressure to the belt edge to push it back in line.

"While these mechanisms can improve a belt that's consistently off-center in one direction, they do not react to dynamic belt movement, meaning that they don't correct intermittent belt wander," Marshall continued. "To combat such changing conditions, engineers designed the tracking idler. Unlike the edge correction approach, the device senses belt movement in either direction, and pivots the idler slightly to steer the belt back into position. It doesn't apply a great deal of force to the edges, which can damage a belt and splices. When the belt is running true, it remains centered, and when it senses a misaligned condition, it gently corrects the belt."

Unfortunately, to accommodate limited space availability, tracking idlers typically have short sensing arms. This requires a fairly large belt displacement to create a small movement of the idler. While these



Tracking idler.

designs do tend to improve tracking, there are limits to how much correction they can deliver, and short sensing arms can actually pinch a belt if the idler pivots too far. To combat this, some operators choose to "tie off" a tracking idler to limit its movement. While the practice can help preserve the belt, it doesn't address significant mistracking.

To overcome the limitations of existing belt alignment devices, Martin Engineering has invented and patented a Multi-Pivot Belt Tracker, which employs sensors, pivoting idlers and geometry to align a wandering belt. The sensors avoid pinching the belt, and the engineered geometry amplifies any detected

misalignment to create a greater pivot.

Multi-Pivot Belt Trainers use longer arms than other designs, positioning the guide rolls further from the pivot roller, as well as closer to the belt edge. The closer proximity allows guide rolls to sense very slight misalignments and make immediate corrections. Rather than waiting for a powerful mistracking force, the longer arms require considerably less pressure to move the pivot roller. The result is better correction with no pinch points and less wear on conveyor and tracking equipment, for a longer and more efficient service life. Specific designs are available for both the load-carrying belt path and the return run.

"Installing trackers is the economical solution, but operators should do a full analysis and consider also addressing other causal issues," Marshall added. "By focusing solely on belt alignment, plant personnel may miss other opportunities to increase production and relieve some of the burden on their system."

Keeping the belt centered and moving quickly is the key to high production, controlled operating cost and a safer workplace.

"Misalignment causes downtime and costs money," Marshall concluded.

"But nothing causes more downtime and expense than a destructive belt fire or other catastrophe as a result of inattention to mistracking problems." ●

Martin Engineering is a global innovator in the bulk material handling industry, developing new solutions to common problems and participating in industry organisations to improve safety and productivity. The company's series of Foundations books is an internationally-recognised resource for safety, maintenance and operations training - with more than 2 000 print copies in circulation around the world. The entire 500+ page volumes can also be downloaded as free PDFs from the Martin web site. Martin Engineering products, sales, service and training are available from 19 factory-owned facilities worldwide, with wholly-owned business units in Australia, Brazil, Chile, China, Colombia, France, Germany, India, Indonesia, Italy, Japan, Mexico, Peru, Russia, Spain, South Africa, Turkey, the USA and UK.

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Our components reduce harmful conditions for workers and equipment, decrease maintenance and insurance costs, and increase overall productivity. Got dirt? We're ready to assist with all of your bulk material handling problems.



SAFE AND RESPONSIBLE DUST SUPPRESSION



Michelle Fick, CHRYSO Business Development Manager for Concrete Aesthetics.

Modern Quarrying spoke to Michelle Fick, CHRYSO Southern Africa's Business Development Manager for Concrete Aesthetics & Key Account Manager about its Eco Dust range. This product can be used on quarries for safe and responsible dust suppression on all areas that generally create dust – from haul roads to stock piles. In the competitive market of dust suppression where most companies sell dust suppression as an application service to the market, CHRYSO only sells the product, enabling it to supply product in small quantities to suit clients' needs.

What was the motivation behind the Eco Dust range?

We launched the product range at The Totally Concrete Conference back in August 2016. The logic behind the launch of the Eco Dust range was that it would be easy to service our existing markets as we already supply product to mining, precast yards, construction sites, ready mix and cement plants. In addition, we received numerous enquiries on a monthly basis for such a product and therefore saw opportunities in sub-Saharan African countries.

What dust suppressants do CHRYSO offer the quarrying market?

The CHRYSO Eco Dust range for the quarrying market includes: Eco Dust 100 (a sealing coat with hydrophobic properties), Eco Dust 200 (a surface sealer that's an emulsified dust lubrication system), Eco Dust Primer (a co-product of cellulose production that aids as a binding additive and used as a surface primer with CHRYSO® Eco Dust 200) and Eco Dust Oil (an emulsified surface lubricant that coalesces particles to form a dust suppressing film).

What are the benefits of using these products?

For a quarrying application, the products enable compliance to safety, environmental, health and occupational regulations. Because the products are water soluble and biodegradable, they are easy to apply. They require less fuel, cause virtually no tyre traction and have a high tolerance to rainfall.

Were the products developed locally?

Yes. The raw material used for the Eco Dust Range is also used in our admixtures. It made sense to include this product as a value-add solution to the existing product offering as it complements the wide product range of dosing products that we already supply.

Are the products ideal for South African conditions?

The products in the range are UV stable, made from locally sourced raw material and produced here. Its performance is not affected by the climate or humidity.

Are these products soluble and biodegradable?

They are both biologically degradable and environmentally safe. The Eco Dust product is a dust lubrication adhesive based on a blend of a natural polymer and aqueous dispersions. The aqueous dispersion component is a colloidal stabilised emulsion which contains trace amounts of a non-ionic surfactant for the interface in the polymerisation process.

How easy is it to use these products?

Very easy: add to a water tanker fitted with a liquid distribution bar and the product is ready to spray onto surfaces.

How safe are the products during application?

The products are water based, VOC-free and UV stable. They have no onerous handling or safety



CHRYSO's Eco Dust range stabilises dust by forming a dust suppressing film over surfaces such as gravel roads.



The CHRYSO Eco Dust range is a dust lubrication adhesive based on a blend of a natural polymer and aqueous dispersions.

requirements and do not stick to vehicle tyres.

Does the use of these CHRYSO products assist with compliance to safety, environmental and health aspects?

The eco-friendly, UV-resistant and VOC-free Eco Dust range is particularly welcomed by mines and quarries. These establishments need to comply with the increasingly stringent health and safety and environmental regulations all over Africa. There is a growing concern about the dust emissions generated during quarrying, mining and construction. In addition, the dust generated from traffic on gravel or dirt roads needs to be controlled on a continuous basis. Section 8 of the Occupational



CHRYSO Eco Dust can also be used to suppress dust on stock piles.

Health and Safety Act, Act No. 85 of 1993 places the onus on the employer to provide and maintain, as far as is reasonably practicable, a working environment that is safe and without risk to the health of employees.

How do the products enhance the use of water for dust suppression?

Water is regarded as the cheapest treatment of dust. However, the frequent re-application of water proves this method to be the least effective and not so cost effective in the long run. With the scarcity of water, most industries have a responsibility to focus on changing their practices to more environmentally friendly methods for the



CHRYSO Dust Suppressants are both biodegradable and safe for the environment.

sustainability of water. In terms of the Eco Dust Range, each application is assessed and a guideline is advised to the dilution rate.

How competitive are the products?

It is a competitive market. Most companies that do dust suppression sell it as an application service to the market. CHRYSO only sells the product. The CHRYSO brand and reputation are sound in the South African market and this ensures trust in our products. Furthermore, CHRYSO has developed a simple calculator method to calculate costs and quantities per square metre. The product can also be supplied in small quantities to suit the clients' needs. ●

TIPS FOR WATER TANK SAFETY AND EFFICIENCY

Site safety and efficiency are two of the main reasons why spraying haul roads is common practice. Yet ironically, the equipment many operations use to wet the roads is neither the safest nor most efficient option. The secret to finding the ideal solution lies within the water tank's design and spraying system. **By Josh Swank, Vice President of Marketing, Philippi-Hagenbuch Inc**

Don't cut corners

Square tanks haul about 20% more water than rounded tanks with the same basic exterior dimensions. They also improve safety by creating a lower center of gravity. Curved sides raise the water's centre of gravity, reducing stability. Rounded sides also contribute to water churning since there aren't corners to slow the water's momentum. This sloshing can shift the center of gravity, making the truck unstable and unsafe. Drivers who can feel water surging often mitigate the problem by not filling the tank completely, in turn, wasting time and fuel on unnecessary trips to refill. And at the end of the day, each truck covers far less ground.

Spray smarter

Providing drivers with precise control of the tank's water output increases efficiency. Individually controlled spray heads make it easier for drivers to optimize water use while reducing the risk of oversaturating roads. Operators can turn on the individual spray heads and, with some systems, program a spraying interval to cover a greater surface area without making the roads too slick.

Water-metering controls also increase driver safety by allowing him or her to focus more on the surroundings and less on water output. Remote controls can further improve safety by keeping drivers out of harm's way – especially when battling fires. Traditional systems require the operator to use a joystick and monitor in the cab, but some remote-control systems allow control of a water cannon from as far as half a mile away.

Bafflingly safe

A tank's baffling system affects both safety and efficiency as it prevents



PHIL water tanks have baffling from floor to ceiling, as well as along the complete length and width of the tank, resulting in full compartmentalisation of the water and less surging.

water from surging side-to-side and front-to-back. Almost all water tanks feature baffles, but some designs are more effective than others.

Many baffles have large holes for maintenance personnel to access individual compartments through which water can also move freely, resulting in surging. While baffles require holes for water to flow throughout the tank, they should be small enough to prevent surging. Additionally, some tanks feature baffling from floor to ceiling, as well as along the complete length and width of the tank, for more complete compartmentalisation. Others take it even further with side-surge stabilisers along interior walls to prevent water from churning within individual sections. These added measures go a long way toward improving tank stability and overall safety.

Anytime safety and efficiency are the main objectives, using equipment that falls short in either category doesn't add up. When evaluating future tank purchases, take a close look at how its design lends itself to accomplishing these goals. ●

About Philippi-Hagenbuch Inc.

Engineering innovative haul-truck solutions for over 50 years, Philippi-Hagenbuch Inc. is located in Peoria, Illinois and has been building equipment for off-highway haul trucks since 1969. During this time PHIL has become the global leader in off-highway truck customisation. In addition to their innovative tailgates, push blocks, rear-eject bodies and trailers, Philippi-Hagenbuch designs and builds end-dump bodies, trailers, sideboards, load ejectors and water tanks for nearly every make and model of articulated and rigid frame off-highway truck available.

Metso:Outotec

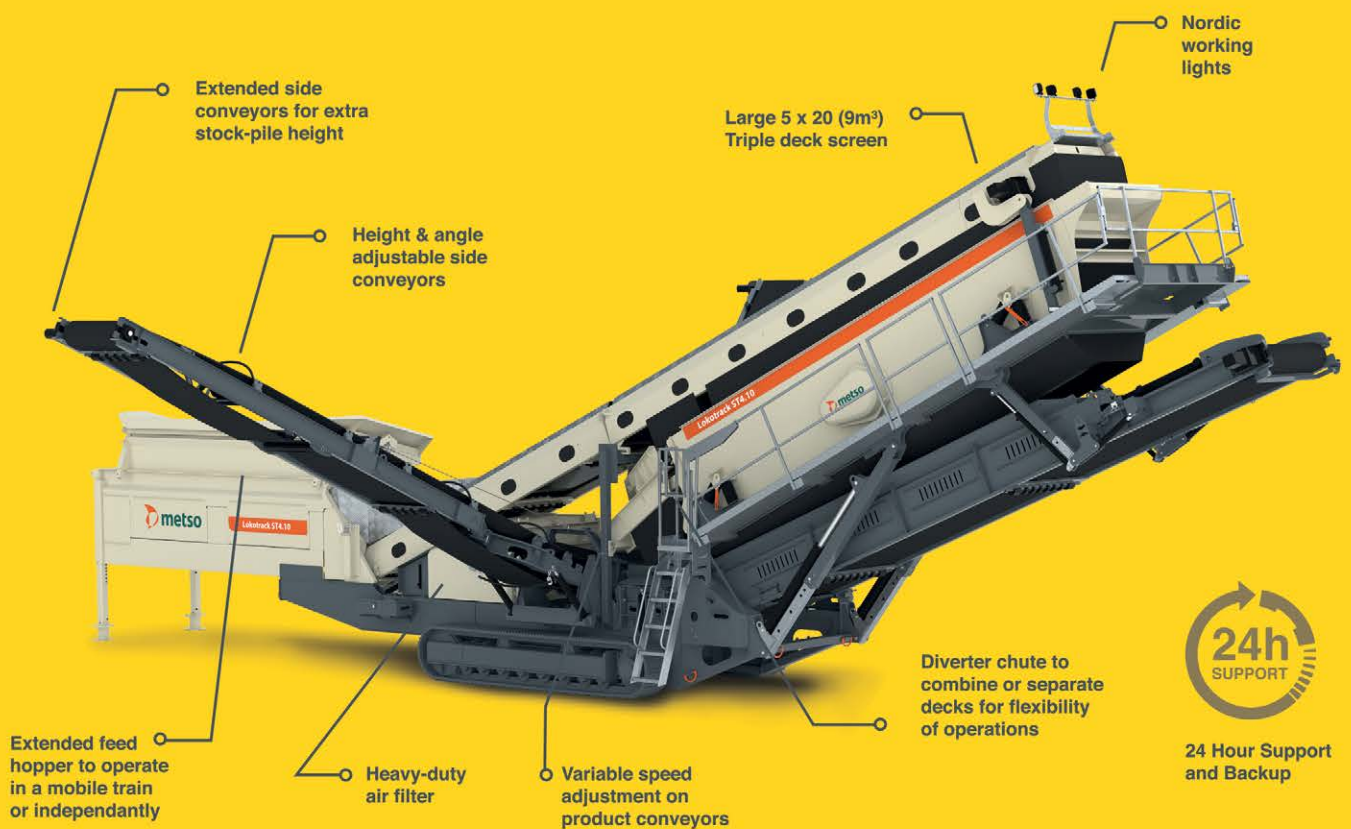
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CRUSHING AFRICA'S ROCK

MEASURING TO MANAGE: **LOAD WEIGHING SYSTEMS SET THE STANDARD**

In the current cut-throat quarrying industry with its slim margins, operations need to be as effective and accurate as possible when the weight of mined aggregate is determined. Trimble LOADRITE L3180 Smartscale is a system that assists operators optimise the loadout process by enabling them to load faster and more accurately. Glen Webster, the Sales Director at Loadtech, who distributes and supports this New Zealand product in sub-Saharan Africa, tells **Modern Quarrying** how this next generation of on-board weighing uses artificial intelligence to track productivity so as to achieve optimal performance.



The quarrying context is a dynamic one and output is vital," says Webster. "This means that performance and efficiency have become – especially in the current climate – more important than ever." These aspects influence the profitability of a quarrying business directly. It is for this reason that Webster says an effective on-board weighing system is critical as it determines how successful an operation will be. "It is vital for quarrying operations to know how productive their machines are by knowing how much fuel they use and how much material they are moving," says Webster. By having such information, changes can be made to make operations more effective.

"Some two years ago LOADRITE launched the LOADRITE L3180 Smartscale," says Webster. "LOADRITE offers a range of weighing systems designed for wheel loaders, excavators and



conveyor belts. This system can be for businesses needing a basic entry level system to businesses that require a system that can offer operators an advanced functionality," he explains. "This loader scale product line is setting the standard for the industry and is the result of Loadtech's 35 years industry expertise," Webster adds.

"The new system was necessary because the old regime of loading required that loading had to happen on level ground. The newer system allows loading to happen on an incline, does not have moving parts and has fixed angle sensors instead of traditional rotary triggers allowing quicker loading and better accuracy," says Webster.

"The systems is calibrated on an incline, which we call a slope setting, as well as on level ground. We then provide operator training which makes it more efficient. The system's efficiency is operator dependent, so this is



vital for the system to achieve the optimal benefit,” Webster elaborates. “If it is managed well, it works well,” says Webster.

Quarrying managers also have access to Insight HQ which is a quarry management portal that can be viewed on web browsers or mobile phones. “This shows, in near real-time what the productivity, availability, extraction, processing and load-outs are,” says Webster.” The system was especially useful during the COVID-19 pandemic access to facilities was restricted and when there had to be minimal human interaction.

The LOADRITE L3180 Smartscale provides reports to customers that gives totals per product and machine. “These reports can be adjusted per shift, day, week, month or year,” explains Webster. The on-board weighing system calculates the weight of materials in the loader or excavator’s bucket and relays this to either the operator or the Insight HQ system. This information can assist the business with increasing its productivity.

Webster gives two examples of where the system is working to enhance productivity while at the same time enabling remote tracking. “Our system is deployed on a new mine in the Northern Cape and the Dubai-based owner receives regular reports via this portal, while Lafarge, who is one of our biggest customers, has the full system on its belts and loaders of their Ridgeview quarry in KwaZulu-Natal,” he says. “Lafarge Ridgeview, particularly, can monitor tons and can see losses in terms of black belt times when belts are running empty because the loaders are not loading correctly. They are being more efficient because trucks are not turning around to refill or remove material when they get to the weigh bridge – they are getting more product out because they are loading correctly so the cycle times are also optimised,” says Webster.

Lafarge is one of the early adopters of the new system and has seen that it reduces total cost of ownership across their

KEY TAKEAWAYS



The system allows loading to happen on an incline, does not have moving parts and has fixed angle sensors instead of traditional rotary triggers allowing quicker loading and better accuracy.



The on-board weighing system connects via the built-in WiFi with the Insight HQ which enables personnel to gauge site production and operator performance on their desktops or mobile devices.



The aftermarket support of this product is beyond reproach, unusual for this segment of the market.



The 5.7” touchscreen is twice the size of the previous generation and has a cleaner interface.



earthmoving equipment, trucks and conveyor belts.

System guarantees more uptime

The LOADRITE L3180 SmartScale uses weighing intelligence and robust sensors for accurate and faster loading. This on-board weighing system connects via the built-in WiFi with the Insight HQ which enables personnel to gauge site production and operator performance on their desktops or mobile devices.

"The digital display fitted in the cabin of the vehicle offers easy assessment of weight metrics, and minimises supervisory overheads and human error," explains Webster. The data is presented in dashboard or graphical formats. "In addition, the system has built-in GPS and heat mapping and one can see if product is being stolen or if a truck is working in an area where it should not," explains Webster.

e-Tickets are also possible with this system. "This sends load information to an email address and enables drivers to stay in their vehicles and so save time by being operational and not have the need to leave their vehicles

to get instructions," says Webster. The loading information can be customised for each operator to maximise the productivity.

The 5.7" touchscreen is twice the size of the previous generation and

has a cleaner interface.

"Because the system is robust and has no moving parts, there is no need for repair and maintenance and therefore the system can guarantee uptime," says Webster.

Owning the market

Webster is confident that Loadtech's LOADRITE has at least 75% market share. "There are competitors but they offer basic systems," says Webster. When the new system was launched, a buy-back option was also launched. "It is a business strategy we embarked on two years ago whereby we buy whatever weighing system was fitted to a vehicle or machine and take it off the purchase price of the new system."

In addition to this strategy that has seen LOADRITE further extend its dominance in the market, Webster says that the aftermarket support of this product is beyond reproach. "We have a 24 hour call around time, which is unusual in this context. In addition we have more than 20 technicians and a footprint across the country. Aside from the headquarters in Centurion, support is provided by three other branches of Loadtech. ●

LOADRITE weighing systems

LOADRITE L3180 SmartScale for wheel Loaders

The new L3180 SmartScale for loaders adjusts for rough terrain, technique, and movement so the skilled operator can load accurately with confidence and speed.

LOADRITE X2350 for excavators

The LOADRITE X2350 system takes 35 years of industry-leading wheel loader technology and combines it with many of the top-end features of the LOADRITE on board weighing systems.

LOADRITE C2850 for conveyor belt weighing

This is an advanced conveyor belt weighing system designed in particular for rugged industries like aggregate, construction, scrap metal recycling and mining. It is the ideal tool for monitoring inventory, production output and product load out.

LOADRITE S1100 compact machine scale

The Trimble S1100 is an on board scale provides an accurate in-cab payload measurement for compact machines such as forklifts.

L3180

SmartScale for Wheel Loaders

LOADTECH

ON BOARD WEIGHING

When the pressure is on and customers are waiting, you need to perform faster without compromising accuracy and precision. The new L3180 SmartScale for loaders adjusts for rough terrain, technique, and movement so new and skilled operators can load with greater accuracy, precision and speed.



What is a smart scale

A SmartScale is the next generation of onboard scales that uses weighing intelligence for more accurate, precise and faster loading. It also connects machines and devices for the collection and syncing of loading data.

L3180 Offers

- Weighing intelligence
- Connected Quarry connectivity
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- Multi-axis Inertial Measurement Unit (IMU)
- Best-in-class interactivity and interface

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ROOIKRAAL QUARRY'S **CLOSED** WATER CIRCUIT

AfriSam's Rooikraal Quarry is located near Brakpan, Gauteng and mines competent dolerite rock. The quarry is a big supplier to asphalt markets which it supplies with its sought-after products – especially 10 and 20 mm road stone. In the production of aggregate, sand and gravel used in roadbuilding, raw material is mined from a deposit of high-grade material that is intermixed with other undesirable materials and detritus. As asphalt cannot have aggregates with any particles, the aggregate must be washed to get rid of such materials. **Modern Quarrying** visited Rooikraal Quarry to learn about the closed circuit it has established to wash its products and which furthers AfriSam's environmental credentials.

The Rooikraal Quarry has a Life of Mine of 240 years. "The property itself is large and only two portions are used for quarrying purposes. These consist of two adjacent pits – one for dolerite mining and one for dolomite mining. "Before AfriSam acquired the quarry in 2001, dolomite was being mined, but it is mining dolerite now," says Zielas du Preez, AfriSam's Regional Manager – Gauteng and Western Cape Operations. "The historical dolomite pit is used as tailings catchment facility for the quarry's recycling process and the tailings

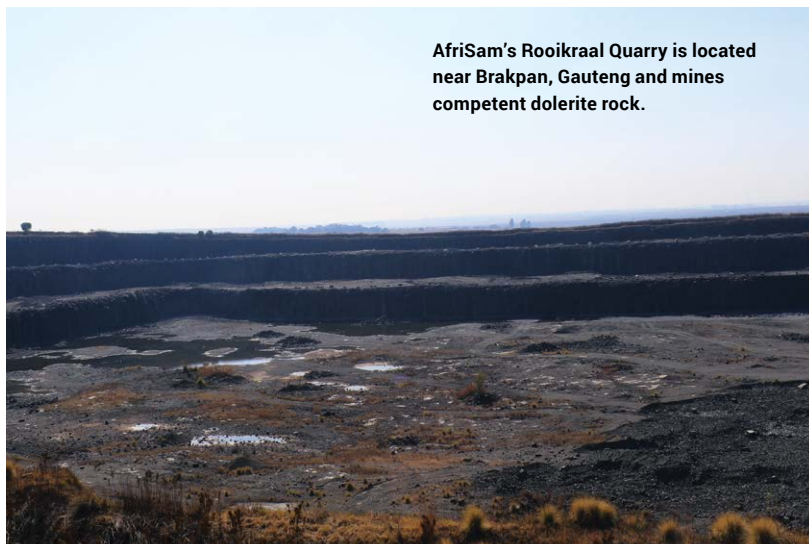
produced from the washing process is pumped into it."

Louis Sterley, Rooikraal's Works Manager explains the reason for the change from dolomite to dolerite. "Although dolomite has excellent cementitious properties and a pozzolanic effect (the chemical reaction between reactive silica or alumina present and portlandite formed during the cement hydration in the presence of water) and therefore ideal for ready-mix and precast customers, it is limited to these markets. "Dolerite has a wider use with which to produce saleable product," he says.

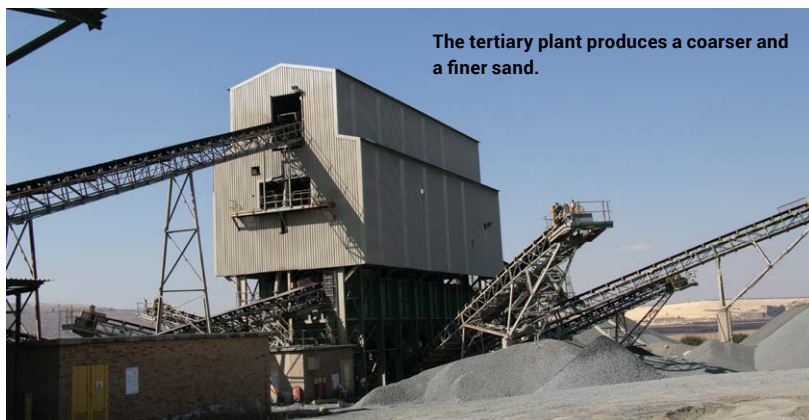
Rooikraal Quarry's dolerite is crushed to produce an array of material sizes including G6 (base course); ballast; 7,1 mm, 22 mm and 28 mm concrete stone; 10 mm, 14 mm and 20 mm road stone, as well as crusher sand.

"Apart from major companies in Gauteng that are involved in the supply of asphalt for road building, Rooikraal supplies its aggregate to the Free State, from Heilbron to Deneyville to Villiers. It has even supplied its product – because of the competent rock that is mined – to some projects in KwaZulu-Natal," says Sterley. In addition, the quarry supplies material to the

AfriSam's Rooikraal Quarry is located near Brakpan, Gauteng and mines competent dolerite rock.



The tertiary plant produces a coarser and a finer sand.



construction companies and sister establishments within AfriSam.

A closed circuit for washing

"All the products produced by the quarry are washed. The plant was originally designed for the asphalt market. In road building the aggregate must be devoid of any particles," says Du Preez. Dust on the aggregate surface adversely affects bituminous hot mix pavement performance and decreases the long-term performance of roads.

"In order to produce the various products for the road building industry, a washing process is needed to meet the requirements and specification of the saleable products. During this process those fines that are by-products of the washing process are discarded."

The tailings produced as a result of the washing of aggregates is pumped to the unused dolomite pit that is used as a tailings dam and its rehabilitation facility. "We have a closed circuit regarding water within the operation itself," explains Du Preez as environmental regulations prohibit the release of untreated contaminated water into the stream that runs alongside the site, and it is economically feasible to recover and reuse the same process water again.

Rooikraal Quarry does not make use of municipal water as this will be uneconomical given the volume of water needed for washing. Instead, the quarry is dependent on rainwater that is collected in both the dolerite and dolomite pits. "The last time the facility used municipal water was in 2014. Since then seasonal rain has provided us with enough water to run the closed circuit. On the dolerite side there is a sump too and we collect water there and pump the water to the dolomite side," says Sterley.

There is an HDPE pipeline running underground from the unused pit (which functions as a tailings dam) to the primary, secondary and tertiary sites of the plant and a pipeline taking slime away from the plant to the pit.

"We supply water to all the screens and cyclone. Including the dewatering screen, there are

KEY TAKEAWAYS



Rooikraal Quarry does not make use of municipal water as this would be uneconomical given the volume of water needed for washing. Instead, the quarry is dependent on rainwater that is collected in both the dolerite and dolomite pits.



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The biggest challenge is sales demand. It is a cut throat market. Road projects are scarce and there are many competitors.



The fairly square shape of the shallow pit allows for big blasts.



Villa Liza, the closest community, is 2 km from the quarry.



In order to produce the various products for the road building industry, a washing process is needed to meet the requirements and specifications of the saleable products

six screens across the primary, secondary and tertiary plant," says Du Preez. In the primary section rock is broken down from 600 mm to 85 mm fragmentation. "We have a secondary crusher in the primary section which crushes the stone down further before it goes onto the ISP. Our secondary crushing is the biggest process and it has the most conveyors and most screens. This where smaller products such as concrete stone and sand are produced."

The tertiary plant makes a coarse and a fine sand. The latter is used by the likes of Much Asphalt and the former by ready-mix customers. At the tertiary plant smaller sizes of aggregate, 6, 7, 10, 14 mm are produced while it also produces 20 road stone aggregate.

Challenges

Even though the facility is using its own water, there is no getting away from using Eskom. "Because the water for the screens are pumped via the underground pipelines, the escalating electricity cost has been significant. Even with the lower demand for especially road building product resulting in us running at lower capacity, our electricity costs are still almost 50% more than before," says Du Preez.

In addition to the steep increases in electricity cost, the ongoing load shedding has been challenging from a scheduling, planning and especially time perspective. "If the load shedding schedule is not adhered, resulting in a

power outage, while under load and rock gets stuck in the jaw crusher, that machine can be non-functional for a day or two," says Du Preez.

Optimising efficiency

Rooikraal Quarry is fortunate that the depth from the overburden to competent rock is mere 0,5 m. The result is that development costs are very low, and planned drilling and blasting only has to happen once a month. "The fairly square shape of the shallow pit allows for big blasts," says Sterley. "This leads to cost savings as up to 120 000 tonnes of rock is blasted at the same time. The quarry also has wide benches which allow space for bigger blasts."

In addition Villa Liza, the closest community, is 2 km from the quarry. The only structures that are relatively close are 88 kVA Eskom transformer which is located about 260 m from the pit and the quarry' office which is about 500 m from the area where blasting takes place.

This potential risk has been mitigated by innovation in blast designs.

"The better you blast the less you have to crush," explains Sterley. "Our blasting achieves increased fragmentation which leads to easier rock removal, increased truck capacity and less wear and tear on crushing equipment," says Sterley.

"The biggest challenge is sales demand. It is a cut throat market. Road projects are scarce and there are many competitors. In addition, we still have certain customers needing certain products. We are making a basket of products and cannot close taps to make a single product," says Du Preez. "Because of the demand for 10 mm stone in the asphalt market, the tertiary plant used to run 24 hours a day, the secondary plant operated in two shifts of 9 hours each per day and the primary plant has always been a single shift. The current climate has forced us to play around and be flexible with what plant is operational and when. While we need to maintain our agreed stock levels, we cannot just run the plant. This is a challenge," concludes Du Preez. ●

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Efficiency and reliability

Brauteseth Blasting is a KwaZulu-Natal based group of companies that offers a drilling and blasting service to the mining, quarrying and construction industries throughout Southern Africa. It specialises in providing a rock-on-ground (ROG) service to these markets and prides itself on being well-managed and financially astute to offer efficient and effective services by a stable and safe workforce. **Modern Quarrying** spoke to Sven Brauteseth, Senior Contracts Manager at Brauteseth Blasting about how the DNA of respect, having the right people in the right places, profitable work, a culture of self-discipline and having clear direction have propelled this company forward.

Brauteseth Blasting was founded in 1983 by John H Brauteseth as a civils blasting company to service the construction industry. In 1989 the company was taken over by Clive Brauteseth who continued to service the construction industry and began branching out into the commercial quarry market, obtaining contracts with NPC as well as Idwala in the early 2000s. In 2009 the company was awarded a ROG contract at Tendele Colliery which then took Brauteseth Blasting into the large-scale mining sector. Since then, the company has grown from strength to strength by continuously investing in people and equipment to stay at the forefront of the drilling and blasting market.

The company, which has a footprint in KwaZulu-Natal, Eastern and Northern Cape, Limpopo and Zambia currently employs 185 people and is contracted to over 20 commercial quarries, five large scale mining operations and to various construction sites. Brauteseth Blasting has had contracts at NPC and Idwala for over 20 years where they provide ROG services. They have performed contractual work at Tendele Colliery for 13 years, while they have long-term contracts with Foskor and AfriSam KZN.

Brauteseth says that the company keeps abreast with the latest in blasting technology by skills retention and training. "All of our commercial quarry blasters are trained and competent on multiple different initiation systems. This allows flexibility, continuous training and improvement



for blasters and their teams," he says. "All blasts are recorded and analysed to identify any areas where improvements can be made."

Brauteseth adds that the company's unique selling point is its new and well maintained fleet of equipment, strong workshop team as well as strict replacement policy. "Highly competent staff are equipped with the resources to perform their duties at the highest possible level," he says.

Highly effective fleet

Brauteseth Blasting's fleet is an essential part of what makes the company effective. "We have 23 new and well maintained Sandvik Drill rigs ranging from Dx800 up to Di650, DTH and top hammer options with a hole size capability of 50 mm – 229 mm. In addition we have six MMUs to pump

emulsion as well as Anfo auger trucks. These are supported by five excavators with hydraulic hammers that range between the 20 and 50 ton class," says Brauteseth.

Efficiency. Reliability. Cost efficiency

Efficiency, reliability and cost efficiency are part of the company's offering. "We achieve this by striving to be efficient with our new high-performance equipment that is operated by highly trained teams," explains Brauteseth. "All plant and equipment is owned and maintained in-house. This eliminates third party delays and allows us to be accurate with our planning and execution of all of our projects," he says.

Strong and dedicated maintenance teams ensure high availability (a

minimum of 85%) of all plant. "This allows us to get the job done as quickly as possible, ensures that we put more tons on the ground in a shorter period of time and ultimately reduce the cost per ton for the client," he explains the cost efficiency the company offers clients.

Safety is paramount

For Brauteseth Blasting safety is of paramount importance. "We want to ensure that everyone gets home safely every day," says Brauteseth. "We have a dedicated safety team that oversees safety throughout the organisation along with safety representatives in all teams to ensure the safety culture is upheld in all levels. We instill a culture that safety is everyone's responsibility," he concludes. ●



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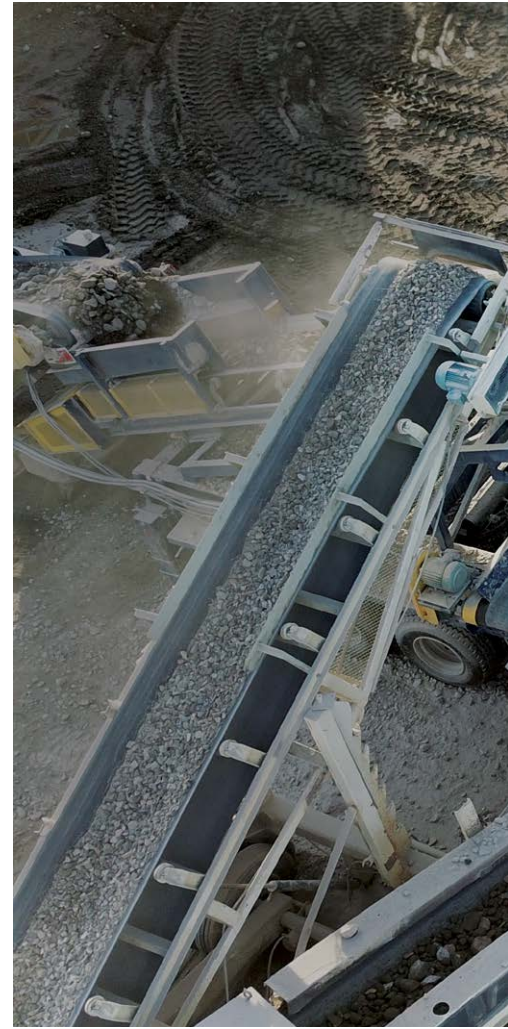
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FABRICATING FAILURE: EXAMINING THE LIFETIME COSTS OF FABRICATED PARTS FOR VIBRATING SCREENS

One of the ways operation managers naturally presume to increase profits in a mining or aggregates operation is to cut costs. Parts are often an area that production managers eye as a way to save money, but it's important to look beyond the price and understand the part. By Duncan High, Processing Equipment Technology Division Manager, Haver & Boecker Niagara



Operation managers need to be sure they are choosing the most reliable parts for their equipment. They need to consider the knowledge, experience and resources required to manufacture the part, the potential hazards of using a fabricated version and the value of having the support of the original equipment manufacturer (OEM). Here's a look at the difference between the two and how those differences can impact production.

OEM Expertise

Consider the difference between fabricated and OEM components. Fabrication shops have come a long way and are often able to produce quality components, but some equipment, such as vibrating screens, need such a precise tolerance that a fabricated part might not work correctly no matter how closely it resembles the



The weight of the parts, the required running speed plus amplitude are all taken into consideration when balancing the screen. If an operation chooses to fabricate a side plate and the weight is wrong, for example, it could impact the machine's balance.

OEM version. Only a machine's manufacturer has the precise equipment drawings, measurements, plus/minus tolerances, material composition and know-how on what needs to be heat-tempered. This means only the manufacturer can produce a component that fits those fine-tuned parameters. Even a reputable fabrication shop with capabilities similar to that of the OEM has to rely on reverse engineering and guesswork to fashion a replacement. The part may look identical, but if it's even a little off it could cause problems.

A vibrating screen isn't so much a machine as a complete system where every component works in tandem to accomplish a specific goal.



A professional safety inspection takes a third-party perspective of aspects that workers often overlook.

KEY TAKEAWAYS

The part may look identical, but if it's even a little off it could cause problems.

This chain reaction of issues could result in maintenance costs far greater than the price of the fabricated component.

Any fabricated parts introduced to a machine during a warranty period will void the entire machine warranty.

Choose carefully when looking at replacement parts. While fabricated components are usually cheaper and may appear to work correctly, any variance could cause damage and downtime down the line.

If an operation screens 1,200 tons per hour, for example, a manufacturer designs parts with different strength and rigidity than they would for a 200-tons-per-hour application. This customization ensures the entire system runs to the proper g-force and is strong enough to resist the forces of the material running over the screen. The weight of the parts, the required running speed plus amplitude are all taken into consideration when balancing the screen. If an operation chooses to fabricate a side plate and the weight is wrong, for example, it could impact the machine's balance. This could lead to improper motion in the vibrating screen causing poor stratification of material, lower bearing life, or premature breakage of body components due to improper operation. In the end, this leads to unscheduled downtime, contaminated product, or the required tons per hour not being produced.

Call for backup

Custom fabrication shops can't offer the support benefits of the original equipment manufacturer. OEMs usually have the infrastructure to ensure fast, efficient problem solving. If there is a problem with a part, the OEM will take full responsibility, quickly assess the situation and send a replacement almost immediately. Most parts shops don't have the resources for a quick, precise turn-around if the part doesn't work right, and there is no guarantee the replacement fabricated part will be correct.

In addition, working with an OEM means having a support team that understands an operation, its production and equipment. They know what parts will wear quickly and what parts need to be on hand to limit downtime. They often offer OEM supplier agreements that ensure they will have critical parts in stock for immediate delivery, limiting or eliminating extended downtimes.

OEMs' focus on vibrating screens also brings an in-depth product knowledge that's rare elsewhere. Some manufacturer's certified technicians test machines as a system before each leaves the factory, and they run the same tests once the vibrating screen has been commissioned to ensure results are identical. They use this information to make sure every component is running at OEM standards, and the machine plus components are backed by a strong warranty program. Not only do some manufacturers offer warranties on new equipment purchases, some guarantee parts for up to a year if an operation uses OEM certified technicians and parts and performs regular maintenance. Any fabricated parts introduced to a machine during a warranty period will void the entire machine warranty.

Fabricated parts' hidden price tag

While at first a fabricated component seems to make sense because it can often cost less than an OEM part, those savings are often short term. Minor imper-



OEMs usually have the infrastructure to ensure fast, efficient problem solving. If there is a problem with a part, the OEM will take full responsibility, quickly assess the situation and send a replacement almost immediately.

fections in the part or lower tolerances for the stress placed on the machine can cause the component to fail prematurely, resulting in additional replacement costs on top of unscheduled maintenance. Even while the part is functioning, it often adversely affects the production of the machine, diminishing the throughput and limiting profit potential.

But the potential damage from an imperfect part doesn't stop there. Those imperfections could start a chain reaction that leads to the damage of a series of other parts. This is especially true for shaft components, which form the heart of a vibrating screen. For example, if the shaft shoulders are not machined within the OEM tolerances, an operation could see problems within hours of operation. This slight difference in size can cause the shaft assembly stack up to be too tight or too loose, leading to excessive heat and or wear of the shaft components. This can cause bearing

failure or premature breakage of shaft components or body components.

This chain reaction of issues could result in maintenance costs far greater than the price of the fabricated component, but the cost is compounded by the fact that rarely is the heart of the problem diagnosed on the first pass. Most operators miss the true cause of the problem and begin fixing the symptoms – a cracked panel, a cross member or sections of screen media. Then the damage is destined to repeat and those parts must be replaced again. These symptoms might become obvious within 48 hours; while the root cause might take a month before it's realised. By the time technicians find the issue, the cost of the initial part fix could be greatly multiplied and could be much higher than what the OEM counterpart would have cost.

Take tension rails, for example. A customer might wonder why his screen media is breaking after



Duncan High, Processing Equipment Technology Division Manager, Haver & Boecker Niagara.

just a week of use, where before it lasted a month or more. An OEM representative visits the site and finds the operation has been buying tension rails from a local fabrication shop to save money. The tension rails looked right but were not tensioning the screen media properly across the screen deck, causing the sections to break. What saved the operation a few bucks up front on new tension rails cost them thousands of dollars in screen media and downtime for change-outs. In addition, if the faulty part caused the vibrating screen to operate incorrectly, there's a good chance that the stratification didn't occur correctly and that materials may have to be rescreened or discarded.

If operators do notice a problem soon after installing a fabricated part, they can prevent further damage by shutting the machine down quickly. However, this still results in costly downtime, as mechanics order parts and make repairs. Any time the vibrating screen can't run will bite into profits, particularly for operations in the midst of production season or a mining operation, where a few hours of lost time can result in tens of thousands of dollars of profit losses. This cost alone would quickly offset any savings from choosing fabricated parts.

Stick with OEM

While it's good business practice to find ways to save money, site managers should not compromise on the quality of vital equipment. The risks of expensive repairs and time wasted are just too high.

Choose carefully when looking at replacement parts. While fabricated components are usually cheaper and may appear to work correctly, any variance could cause damage and downtime down the line. Continue to work with the original equipment manufacturer to guarantee a supply of reliable parts and the backing of a company with the resources to solve problems quickly. The right choice means more uptime, more profits and the assurance that a part will only make a machine run better. ●

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Hillhead 2022: back with a bang

Celebrating its 40th anniversary this year, Hillhead 2022 welcomed almost 18 500 visitors and 604 exhibitors across the three show days.

With an impressive total of just under 18 500 unique visitors in attendance and more than 600 of the world's leading equipment manufacturers, suppliers and service providers taking part, this year's Hillhead exhibition – held from 21–23 June at Tarmac's Hillhead Quarry, near Buxton, Derbyshire – once again cemented its status as the world's biggest working quarry event for the mineral products, construction, and recycling sectors.

It was very much back to face-to-face business at Hillhead 2022, as exhibitors and visitors alike took the opportunity to reconnect with their industry peers, take the pulse of what is happening, and marvel at the plethora of live machinery action that took place in the show's four dedicated demonstration areas – and all under warm, clear blue skies.

Following the trials and tribulations of the past 18 months for the events sector, and a gap of four years since the last Hillhead show, this year's eagerly anticipated event was very well received, with every square metre of exhibit space – including a reconfigured Quarry Face demo area, new-look extended Registration pavilion, and revised layout at the top of the show-ground – completely sold out before its official opening.

As thousands flocked to the show-ground and thronged the aisles and live demonstration areas to catch up on the latest plant, equipment, and services, Hillhead recorded the busiest ever opening day in its 40-year history, with a total of 8 283 visitors attending on day one. And the consensus among the exhibitors and visitors at this year's show was that they were thrilled to be back at a leading in-person event such as Hillhead.

'Despite the supply issues affecting the industry as we emerge from the pandemic, Hillhead 2022 was our largest and



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most successful edition yet,' commented event director Richard Bradbury. 'More than 600 exhibitors showcased their latest products, innovations, and technology, collectively offering more choice for the quarrying, construction, and recycling sectors than ever before. Some 18,500 unique visitors attended the show and were entertained by a record number of

live demonstrations.

Above all else, Hillhead 2022 has proved there is no substitute for face-to-face events for keeping up to date with the industry, building positive relationships, and doing business. We look forward to welcoming you all again in 2024 with our provisional dates set for 25–27 June. ●

Cleaner and alternative energy solutions crucial for future of mining

Mining is a power-intensive industry. Because sites are often in remote areas, the potential shortfall of available grid power introduces further complexity into operations. This has resulted in mines relying on fossil-based fuel sources such as diesel or coal and supplement those with massive on-site diesel generators. **Dinesh Buldoo, Director: Power at WSP in Africa, takes a closer look.**

Mining companies across Africa are looking to invest in standalone or micro-grid hybrid power solutions that incorporate some form of alternative resource such as gas, or renewable energy options like solar or wind to address off-peak demand. These enable mines to address the risk associated with grid power interruptions or find a workable solution where grid power access is not available. They can also offset the unstable costs and risks associated with their reliance on and access to diesel.

At a time when the focus is on ESG (environment, social and governance), using hybrid power solutions can also see mines positively contribute to the carbon reduction of their operations.

Powerful benefits

The benefits of adopting renewable energy resources in hybrid power generation solutions are clear. For one, it is a cleaner fuel source. Environmental pollution from solar or wind energy is far lower than technologies that rely on combustion of fossil fuels.

It is also more sustainable. As long as the sun shines and the wind blows, the energy produced can be harnessed to send power across the grid. Simply put, renewable energy resources are cost effective.

On-site generation

Mining companies are under immense pressure to address climate risk by reducing greenhouse gasses and the impact of their operations on the environment. By adopting alternative power solutions, mining companies will not only be in a better position to secure their supply but, by integrating cleaner alternative energy sources, also support decarbonisation strategies and therein meet the mine's ESG commitments.

Admittedly, this adoption is still in the early days although it is gaining traction. For instance, in Chile, BHP, Anglo American, and Antofagasta Minerals have all asserted their plans to power their local operations from entirely renewable resources. Brazilian mining company Vale has committed to reach 100% of renewable self-generation by 2025 in

Brazil and 100% of renewable electricity consumption globally by 2030.

Limitless opportunities

Additionally, hydrogen used as energy storage can contribute to the resilience of major electricity systems. And clean hydrogen technologies can help domestic sectors to decarbonise. Heavy vehicles powered by hydrogen fuel cells could meet the increasing demand for zero emissions transport, with the advantage of long range, rapid refuelling, and moderate costs. Replacing natural gas with hydrogen could in many cases decarbonise direct combustion at less cost than can electrification. One of the biggest business opportunities for renewable energy is certainly off-grid mines. This holds potential to reduce pressure on national and regional grids. ●

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UN warns of worldwide sand shortage

Centuries of unregulated sand usage has left tracts of the world without useable construction sand that threatens to bring future construction projects to a halt.

The United Nations, in an unprecedented announcement made recently, warned world leaders of looming sand shortages that could stunt mankind's future development. So dire was the warning, that it was made even amidst war in the Ukraine and looming energy crisis.

"We now find ourselves in the position where the needs and expectations of our societies cannot be met without improved governance of sand resource. If we act now, it is still possible to avoid a sand crisis," said Sheila Aggarwal-Khan, director of the Economy Division at UNEP.

Local protection

In South Africa, the situation is not that dire – yet! Nico Pienaar of surface mining industry association, ASPASA, says timely interventions in recent decades have contributed to the country's sand resources being better managed than before.

The establishment of the association in the 90s was a turning point for the sector when leaders and stakeholders from the industry took matters into their own hands to self-regulate the industry and manage resources for future generation.

Full Government recognition of ASPASA in later years also led to close cooperation between the Department of Mineral Resources and Energy (DMRE), members and labour. This type of cooperation has paved the way for a more sustainable sand industry.

Emerging threats

"Unfortunately, there are still some major challenges and emerging threats to our 'sand sanctity'. Top of the list are illegal mining and organised crime. In addition, we are concerned about the lack of enforcement of regulation and even the lax application to local bylaws that prejudices legal and compliant operations.

"Political mongering at a local level



We now find ourselves in the position where the needs and expectations of our societies cannot be met without improved governance of sand resource. If we act now, it is still possible to avoid a sand crisis.

often opens the doors for illegal operations and borrow-pit operations where the municipalities themselves break the law to make use of "freely available" sand and aggregates. This also applies to equally harmful practices of river-sand and beach sand mining, as well as unnecessary borrow pits that are tolerated – even where legal quarries exist nearby.

"If law officials keep turning a blind eye to these indiscretions we will most certainly lose the fight and our legal establishments will cease to exist. If this were to happen South Africa may lose the ability to provide quality and

graded materials for large-scale infrastructure projects and will certainly run out of sand resources sooner than we think," says Nico.

Future uncertain

He adds that the country has resources that will last for the foreseeable future provided sustainable practices are adopted and enforced now. Right now, the country has all the expertise, resources and capital funding needed to ensure the industry's longevity, provided the scales aren't tipped in favour of illegal and informal operations that are sprouting around the country. ●

Sandvik customers welcome new crushing solutions

Quarry owners have given an enthusiastic reception to two new Sandvik static crushing solutions – the Reborn plant and the FastPlant™ – both of which offer fast delivery times and substantial cost savings. The plants clearly fill a market need and several installations are already up and running in South Africa's quarrying industry.

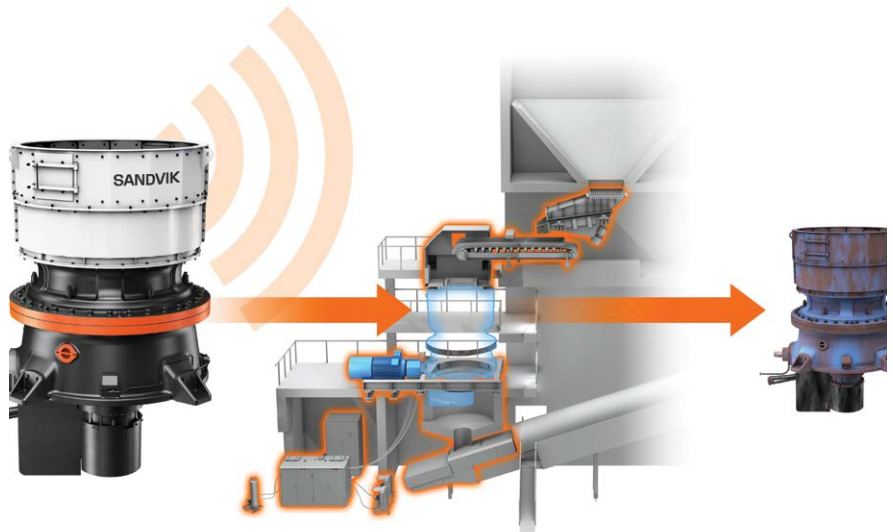
The Reborn package delivers a new factory-tested crusher that is fully compatible with the customer's existing plant infrastructure at a fraction of the cost of a complete crusher system while the FastPlants are a range of pre-defined crushing and screening plants that reduce delivery and installation times dramatically, a key requirement with most new projects.

"South Africa has a very mature quarrying industry with a big population of relatively old crushers out in the field and yet they are often matched with infrastructure and auxiliaries that are still perfectly serviceable," says Glenn Schoeman, Vice President – Sub Sahara Africa at Sandvik Rock Processing Solutions.

"This is where the Reborn plant comes into its own. Sandvik can install a new crusher on the same footprint and link it seamlessly to the existing infrastructure and auxiliaries. The new unit will be covered by an extended warranty and the package will also include comprehensive on-site training and periodic condition inspections. All told, capex savings can be as much as 40%."

Schoeman says that Reborn crushers can – depending on the exact model and the customer's requirements – be equipped with all the latest technological advances from Sandvik.

"Take our new 800i series range of cone crushers," he says. "The performance improvements which come with these machines are amazing. These come not only from the ACS which is installed as standard but from other features. Bolted rather than welded top and bottom shell liners make liner changing 90 % faster, to give one example, while all the machines in the range deliver more



The Sandvik REBORN solution rebuilds your crusher system by exchanging your worn-out Sandvik crusher for a new one, and re-utilising your crusher auxiliaries and infrastructure.

power output from less energy compared to their predecessors."

Turning to the FastPlant concept, Schoeman says the prime advantages of these packages are fast delivery and installation, allowing the plant owner to get into production faster, as well as economy, as the need for expensive customisation is eliminated.

Sandvik has just completed a FastPlant installation at the City of Tshwane's Bon Accord quarry in Pretoria North, which was originally established more than a century ago to supply road building materials for Pretoria. The new upgraded facility was officially opened in early May this year and has a capacity of 270 t/h, a significant increase on the previous plant.

"A full suite of Sandvik equipment including jaw and cone crushers, screens and feeders make up the plant," says Schoeman, who adds that the facility is fully automated. He also notes that Sandvik collaborated

with several long-standing partners, mostly black empowered, on the project, who provided services such as civils, steel fabrication and erection, and electrical installation.

Further north in Africa Sandvik is also supplying a 300 t/h FastPlant to a quarry owner in Mali. "We are certainly not limited to the South African market with our Reborn and FastPlants and we expect them to prove very popular throughout the continent," says Schoeman.

Sandvik Rock Processing Solutions (SRP) is a new Business Area within Sandvik which became operational in January 2021. Schoeman and his team are based at Khomanani, Sandvik's new premises in Kempton Park, Johannesburg, and have responsibility for sub-Saharan Africa.

SRP offers a full line-up of both static and mobile crushing equipment, including cone, gyratory and jaw crushers, as well as Vertical Shaft Impact (VSI) and Horizontal Shaft Impact (HSI) crushers. ●

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Visit them at Electra Mining Africa 2022,
5-9 September (Hall 5, Stand C06)



Trysome is sub-Saharan Africa's largest single-source supplier of auto-electrical heavy-duty components, industrial wireless networks, telematics, collision avoidance, and personnel and vehicle safety systems.

The Group has branches in all provinces in South Africa with subsidiaries and agents in Botswana, Ghana, Mozambique, Namibia and Zambia. Mission critical to Trysome is improving safety while mitigating the risks associated with operating heavy equipment in challenging environments. Trysome meets market

demand via five business units, each with its unique selling proposition, product and service baskets:

RiskTech

The project-driven, intelligent technologies and solutions are engineered to improve productivity and visibility of personnel and assets in real-time while improving safety and mitigating the risks associated with operating heavy equipment in challenging environments. These include:

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Engineered to keep you moving, the Automotive and Commercial Division offer a broad and deep range of high-quality, branded, auto-electrical parts sourced through only the best global partnerships and assured to improve asset performance. These include:

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TechServ boasts a pool of diverse, multi-skilled, technical, auto-electrical, and engineering talent. The core focus is improving asset life, operational productivity, and profitability through preventative maintenance.

This includes installation, commissioning, preventative maintenance, repair and breakdown services, when and where the need arises, ensuring peak performance 24/7/365.

ManTech

ManTech creates solutions for the industries it serves. These are custom solutions, designed and manufac-

tured per operational requirements, scoped, engineered, manufactured, installed and supported anywhere in Africa. All enclosures, air-conditioners and harnesses are manufactured to OEM spec. Aside from manufacturing, ManTech also boasts a state-of-the-art Remanufacturing Centre, which caters for the repair and maintenance of rotating equipment to OEM spec.

EngTech

EngTech offers a broad spectrum of consulting, engineering, and analytical services to support Trysome's sales and marketing divisions and their respective customers. Trysome's engineers work with clients to define solutions to problems or to help determine and recommend the best course of action for a given initiative. ●



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Beowolf Mining to launch new products at Electra Mining

Drilling tools supplier Beowolf Mining, which has been supplying rock drills and hammers to the Southern African mining and quarrying market for the past 18 years will be launching new drill bits, hammers and an inhouse designed App at this year's Electra Mining trade show. By Nelendhre Moodley

The strategic supplier to the mining and quarrying industries recently developed an innovative wireless digital management programme aimed at streamlining drilling information.

"Drilling is a crucial component of mining with clients requiring detailed information such as depth, penetration speeds and wear and tear of equipment, among others. The new App generates this information instantaneously, providing a step-change to the traditional method of only having access to important information on a weekly basis. The move away from the conventional paper trail means that decisions related to the drilling process can be made on the turn and errors easily picked up and amended. The information can be shared with all key stakeholders as it is generated, therefore allowing for speedy responses from the team," explains MD Riaan Theron.

Clients attending Electra Mining 2022 will have the opportunity to interact with the new App which will be showcased at Beowolf Mining's Outside Stand Nr C23 (OS - C23). The company has been attending Electra Mining for the past 14 years and believes that the widely attended event offers an ideal platform to connect with both its existing client-base and potential new clients.

Other new products

"Aside from the wireless App, we will be launching a range of new products related to our range of hydraulic hammers which now offer increased efficiency and improved productivity as well as new drill bits that have been in the test phase for the past seven months. Given that different commodities have varying types of orebodies with some such as iron ore and manganese requiring more robust equipment to meet the arduous operating environment, we have

Beowolf product range

- Down the hole drilling Equipment
- Hydraulic open pit drill rigs
- DTH Drill rigs
- Drill rig lubricants
- Top hammer drilling Equipment
- Drifters and drifter spares
- Refurbishment of hydraulic drifters

Service offering

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- Drilling Equipment management & Improvement
- Customising application on products to better rand/meter/ton
- Re-sharpening of bits on site
- Refurbishment of all drill steel
- Technical advice on the application of drilling consumables to optimise rand/meter/ton costs



developed drill bits to suit the different orebody requirements," says Theron. He explains that it takes the equipment producer between 25 to 30 days to produce customised drill bits for the specific mining applications.

The new products (hammers and drill bits) have been in test phase at an iron-ore and a manganese mine in the Northern Cape. According to Theron, the products have performed significantly better than the market average.

Backed by close to two decades of industry experience, Beowolf's focus of subcontracting services to big mining projects requiring drilling products as well as complete management systems with infrastructure on site have seen the company growing by leaps and bounds.

"We have firm plans in place to grow the business to become a leading supplier of rock drilling tools to the African continent," he says.

Aside from its local footprint which currently accounts for the majority of revenue generation, the equipment manufacturer supplies product to Botswana, Zimbabwe and Namibia and is eager to expand into the fast-growing gold producing West African market.

In fact, the company has made great strides in laying the groundwork for partnerships with key West African mining projects and expects to soon sink lucrative sub-contracting deals with projects in Guinea and Burkina Faso, and so shift its expertise and products dominance to African markets. ●

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New Lokotrack LT200hpx increases capacity by up to 30%

Leveraging the new Lokotrack® LT200HPX™ mobile cone crusher's two-deck pre-screen, contractors are not only able to increase their material throughput by up to 30%, but also reduce unnecessary wear and energy costs by limiting the amount of fine material that reports to the crushing chamber.

deal for secondary and tertiary hard rock crushing, the Lokotrack® LT200HPX™ features the proven Metso Outotec Nordberg® HP200™ cone crusher unit, which is renowned for its high productivity, low operating costs and long service life. With over 10 000 units sold globally, the Nordberg® HP200™ has over the years established itself as Metso Outotec's most popular cone crusher.

When designing the Lokotrack® LT200HPX™, Metso Outotec paid particular attention to increased productivity, which largely hinges on the machine's two-deck pre-screen, as well as the wide feeding and production conveyors, resulting in up to 30% more capacity.

"In many instances, the crusher is fed with a high proportion of fine material, which needlessly passes through the crushing chamber, resulting in reduced throughput and increased wear and energy consumption. With the 1,2 m x 1,8 m two-deck pre-screen, the fine material in the feed can bypass the crusher and go straight to the stockpile or further in the process. This not only increases overall output, but also decreases wear and packing in the crushing chamber and can enhance product quality," explains Francois Marais, Sales and Marketing Director at Pilot Crushtec.

The standard H12-10 main conveyor's adjustable discharge height (2 900 mm/3 900 mm) allows the LT200HPX™ to be combined easily with other machines in the train. It can also be lowered to ground level for easy maintenance.

Further optimisation of crushing results is achieved through Metso Outotec's IC™ process control system. The user interface enables single-button start and stop and features built-in troubleshooting as well as various



The LT200HPX is equipped with a two deck pre-screen and wide feeding and production conveyors to significantly increase production capacity.



LT200HPX™ mobile cone crusher is especially suitable for a secondary or tertiary crusher in a 2 or 3 stage crushing process.

parameter selections. It also allows for connection between all Lokotrack® crushers and screens in the same process.

With efficiency in mind, the Lokotrack® LT200HPX™ comes with a CAT® engine and direct v-belt crusher drive, ensuring optimum fuel efficiency. Direct drive for crusher with purposely designed gearbox and hydraulic clutch increases machine reliability. ●



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