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CHARGING UP

The most modern type of lithium processing plant in the world, Kemerton, in southwest WA and owned by Albemarle Corporation, has undergone significant expansion to double its production capacity.

Albemarle vice president of capital projects in Australia, Josh Rowan, says production at Kemerton is about to significantly increase.

"Albemarle is Australia's largest producer and manufacturer of lithium and our Kemerton plant is about to get a whole lot bigger," he said.

"The Kemerton expansion is a boon for the economy and construction of trains 3 and 4 is set to create over 1000 new jobs across all our major contractors - in construction, engineering, support services and more."

CONTINUED ON **PAGE 24**

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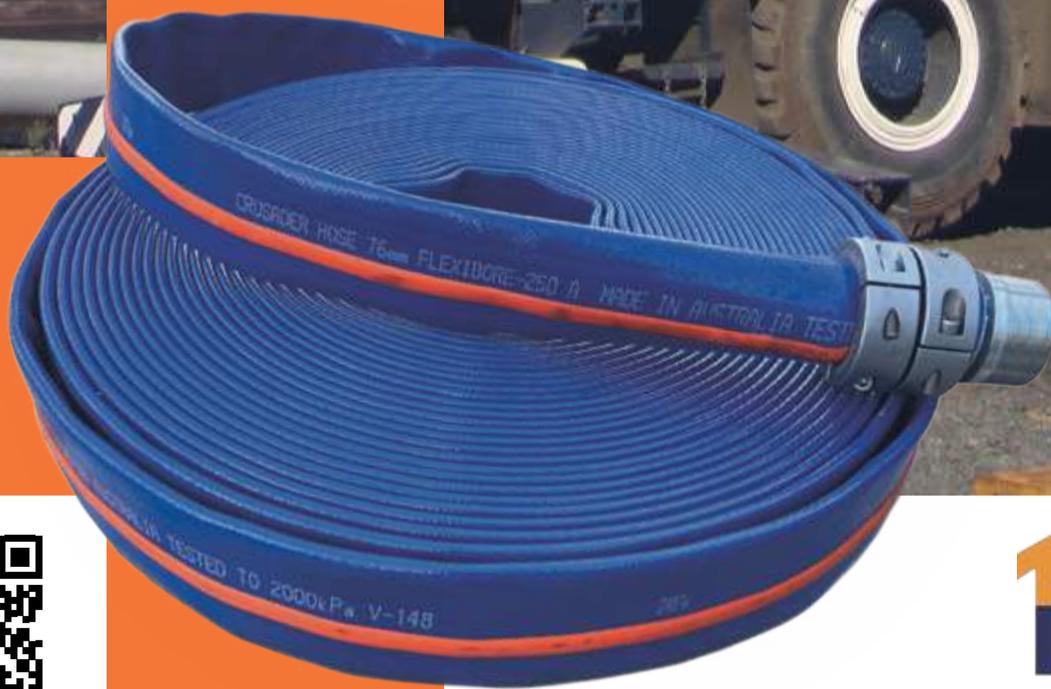




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NORTHERN TERRITORY:

NATURAL SELECTION FOR RESOURCES IN DARWIN



Simpson Gap in the Northern Territory.

On September 13 and 14, the Northern Territory hosted Northern Australia's biggest resource industry conference, Resources Week, at the Darwin Convention Centre.

In its 15th year, the annual event brought together The South East Asia Australia Off-shore and Onshore Conference (SEAAOC), Mining the Territory Conference and the Environmental Management and Decarbonisation Forum.

Resources Week was an opportunity to send a message to investors loud and clear that the Northern Territory is a world class destination for mining.

The Northern Territory's resource industry is worth around \$6.2b and is one of the largest job creators with around 5300 people directly employed by the sector. It supports hundreds of small businesses across all regions and delivers millions of resource royalty dollars every year into schools and hospitals.

In the 2022/23 financial year, mineral expenditure in the Northern Territory shot up to \$200.1m — a 17% increase from the previous year and the highest recorded since 2011/12. This rise was higher than Australia's 7% increase.

The Northern Territory has 15 interna-

tionally recognised critical minerals and has geological potential for a further 13 emerging critical minerals.

Northern Territory Mining and Industry Minister Nicole Manison says the mining and resource industry plays an important role in the Northern Territory.

"The mining and resource industry plays a vital role in the Northern Territory and it will continue to play one as we head towards a renewable energy and net zero emission future," she said.

"The Northern Territory is bucking the national trend in mineral exploration ex-

penditure and setting records, driven by demand for our critical minerals.

"As the world transitions to renewable energy the demand for the Northern Territory's resource will grow, we will be global leaders in the critical minerals supply chain — boosting our economy and creating thousands of jobs." **AMR**



Shovel on top of copper ore.

The NSW Government has begun consultations as it develops a new critical minerals and high-tech metals strategy.

This strategy is a crucial document that provides the framework for the critical minerals and high-tech metals mining industry. It will provide certainty and direction for the industry as it continues to grow and will include a sharper focus on domestic manufacturing, skills and training opportunities.

Discussions on the new strategy will outline new opportunities to:

- Create more local jobs by encouraging domestic processing and manufacturing of products with significant critical minerals inputs.
- Develop skills and training opportunities to reinforce the state's unique mix of deposits and its natural competitive advantages.
- Further encourage greenfield critical minerals exploration across NSW.
- Examine the economics of the industry and the best way to leverage

the government's purchasing power to ensure investment growth.

- Create additional certainty for the industry and support NSW's environmental, social and corporate governance position.
- Attract investment for innovation, research and development.
- Entrench NSW's role as a preferred supplier of critical minerals to global trading partners.

NSW has an abundance of critical minerals and high-tech metals, including 17 of the 26 nationally identified critical minerals.

Copper, silver and scandium are abundant in NSW and are crucial components in the products that will ensure the state realises its goal of net zero emissions by 2050.

NSW Natural Resources Minister Courtney Houssos said the strategy will ensure NSW is able to realise the gains of the next mining boom.

"NSW is uniquely positioned to support global supply of critical minerals with our

diverse mix of critical mineral and high-tech metal deposits and capacity to promote domestic processing and manufacturing," she said.

"We will establish a clear framework on how the government can support the exploration and mining of critical minerals and high-tech metals in NSW.

"Our ability to leverage the state's natural abundance of materials to create employment opportunities and economic growth will be the best measure of our success."

The NSW Government will now conduct a series of consultation meetings with key stakeholders, including mining companies, industry representatives, workers and investors.

The consultation period will run until November 17th, 2023.

Solar technology company SunDrive is looking to create a contact solar technology free of silver as solar consumers 20% of the world's annual industrial silver.

SunDrive chief executive Vince Allen said NSW has the potential to become a world-leading manufacturer of critical minerals and high-tech metals.

"NSW has the potential to become a world-leading manufacturer of product that leverage critical minerals and high-tech metals," he said.

"By building out a local solar manufacturing industry, we can help shape the future of net zero for NSW, Australia and the world.

"Promoting a strong supply of critical minerals — like the copper at the core of SunDrive's technology — is crucial to realising this ambition."

This year on August 17, the Federal Government closed the consultation period to update the country's critical minerals list. This new strategy sets out a plan to establish Australia as a global supplier of raw and processed critical minerals by 2030.

AMR

NSW DEVELOPS NEW CRITICAL MINERALS STRATEGY

BHP XPLORE

BEGINS SEARCH FOR 2024 COHORT



BHP Xplor begins search for 2024 cohort.

BHP Xplor, a six-month cohort-based accelerator program, has begun a global search for its 2024 cohort.

After successfully completing its inaugural year in 2023, BHP Xplor is now on the hunt for early-stage explorers and startups focussed on finding new resources of critical minerals needed for the world's future.

BHP Xplor is designed to provide selected participants with the opportunity to accelerate their exploration concepts and potential to establish a long-term partnership with BHP.

It offers participants funding, mentorship

and coaching as well as connection into BHP's network of suppliers and service providers.

BHP Xplor vice president Sonia Scarselli said the company is thrilled to begin the new search.

"We are energised by the success of the program's first cycle and thrilled to start our search for the next 2024 cohort," she said.

"As we've seen reflected through the first cohort, BHP Xplor is designed for people who are ready to think differently and push the boundaries of traditional exploration.

"We're looking forward to reviewing future opportunities from around the world for new and exciting exploration concepts needed to bring forward the critical minerals required to decarbonise."

The program offers BHP the opportunity to broaden its access to a diverse set of global exploration prospects as well as new geographies and geological concepts.

Selected companies will receive up to \$776k (US\$500k) cash payment from BHP, together with access to a network of internal and external experts to help guide development.

BHP chief technical officer Laura Tyler commented on the program.

"Through BHP Xplore, we're effectively transforming set models by testing opportunities at an accelerated pace, implementing new ways of thinking and creating innovative concepts to address some of today's biggest challenges facing early-stage minerals exploration," she said.

BHP Xplor will accept applications from August 23 to October 11, 2023. **AMR**

WA GOVERNMENT ALLOCATES \$3M FOR BENTLEY BATTERY MATERIALS LABORATORY

A new research and development laboratory facility has opened in Bentley, marking another milestone being met in WA's path to becoming a global battery materials manufacturing hub.

Through its Investment Attraction Fund, the WA State Government has allocated \$3m to local company AustVolt, which is working towards developing and producing battery precursor cathode active material (pCAM).

pCAM is a vital component for manufacturing lithium battery cells, which have a range of uses including in electric vehicles. This new Bentley facility will allow AustVolt to produce samples of its pCAM product.

It marks an important step towards AustVolt's full-scale manufacturing facility, which, when built, will be able to produce 40,000t of pCAM per year — enough to develop hundreds of thousands of lithium-ion electric vehicle batteries.

The hub will be situated on an 8.8ha piece of land in the Rockingham-Kwinana strategic industrial area.

Work is expected to begin next year.

WA Premier Roger Cook commented on the facility.

"WA is positioning as a leader in the global supply chain for battery manufacturing and with this latest investment in AustVolt, we are making sure WA is in the box seat

as the world shifts to a low-carbon future," he said.

"Today's opening of the AustVolt pCAM laboratory is another step towards WA becoming a major player in lithium battery manufacturing."

Indonesian Talks on Renewable Energy

In other news, WA Energy Minister Bill Johnston met with the Republic of Indonesia's Ministry of Energy and Mineral Resources to discuss renewable energy initiatives, as both countries transition towards net zero, while considering new initiatives around energy distribution to remote communities, including carbon capture and storage.

Indonesia is the world's largest exporter of coal, however the country also has significant potential to generate renewable energy through geothermal, hydropower, solar and other sources.

A memorandum of understanding (MoU) was signed between Australia's Future Battery Industries Cooperative Research Centre and Indonesia's National Battery Research Institute to strengthen collaboration in battery research, technology and innovation between the two countries.

This aligns with the Plan of Action on cooperation in critical minerals signed between WA and the Indonesian Chamber of Commerce and Industry in July 2023.

Minister Johnson says he looks forward to continuing the "productive and resourceful relationship as both regions work towards a green energy future." **AMR**



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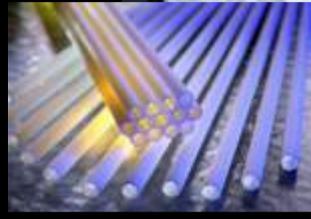
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(Image source: CSIRO) CSIRO's tubular solid oxide electrolysis (SOE) technology.



(Image source: CSIRO) (L-R) CSIRO lead scientist Sarb Giddey, CSIRO senior research scientist Gurpreet Kaur and Hadean Energy principal materials engineer Raj Ratnaraj with SOE tubes.

In a game changer for heavy industry, CSIRO and corporate advisor RFC Ambrian have co-founded Hadean Energy to commercialise technology that can significantly reduce hydrogen production costs and industry emissions.

While the International Energy Agency estimates hydrogen demand to increase 138% by 2030, high production costs and energy inputs remain at this stage key challenges for producing green hydrogen.

CSIRO's tubular solid oxide electrolysis (SOE) technology produces hydrogen efficiently by electrolysing water using a combination of heat and electricity.

CSIRO lead scientist on hydrogen research Dr Sarb Giddey says this SOE technology "has the potential to produce hydrogen at

a higher efficiency and lower cost for integration with industrial processes".

"It allows industrial waste heat to be integrated back into the industrial processes, which decreases the electrical energy required to produce hydrogen or syn-gas by up to 30%," Dr Giddey added.

"It's great news for industry, because integrating the hydrogen product back into industrial processes onsite also eliminates storage and transport costs while drastically reducing the use of fossil fuels in the industrial process."

CSIRO will trial the technology at BlueScope's Port Kembla Steelworks from April 2024 to demonstrate the equipment at pilot scale in an industrial environment.

BlueScope chief executive of Australian steel products Tania Archibald says the company supports the trial project as it aligns with its own sustainability objectives.

"SOE has the potential to dramatically reduce the cost of hydrogen for low emissions steelmaking," she said.

"The improved efficiency of SOE systems reduces energy consumption and reduces the electrical infrastructure required by electrolyzers."

RFC Ambrian chief information officer Stefan Skorut says the technology is well-placed to address the existing industrial hydrogen market which is currently almost 100% derived from fossil fuels.

"While SOE is the most efficient method of electrolysis, green hydrogen and synthetic fuels will remain uneconomic unless we address the scalability and cost of electrolyzers," he said.

"CSIRO's tubular SOE technology represents a step change improvement across these metrics."

RFC Ambrian manages a decarbonisation technology fund targeting early-stage investments in emerging technologies with the potential to decarbonise high emissions industries and the company has previously partnered with CSIRO to co-found other ventures including Chrysol Corporation, Nextore, and MRead.

Hadean Energy will have exclusive rights over CSIRO's SOE technology. **AMR**

NSW COAL MINING SUPPORTS HIGHEST NUMBER OF JOBS IN 10 YEARS

Recent data from Coal Services showed there were 24,984 people working in coal mining production in NSW to June 2023, the highest result since June 2012.

Data shows that in the Hunter — NSW's largest coal mining region — there were 14,584 coal mining jobs in June 2023. This is the second highest number of coal mining jobs in the region since June 2012.

In the Gunnedah region, there were 3134 coal mining jobs in June 2023, a slight drop from the record of 3253 set in April 2023.

There are over 300 more coal mining jobs in NSW's Western region than a year ago



Coal in a miner's hands.

at 3534 and the second highest number of jobs in the Southern region at 3397.

NSW Minerals Council chief executive Stephen Galilee says the increase in jobs is a sign of the ongoing importance and resilience of the NSW coal sector.

"The growth in the number of people in coal mining jobs across NSW in recent years shows that the NSW coal mining industry remains critical to regional communities and the state economy, and also highlights the need to ensure mining communities are supported," he said.

"The strong contribution of the coal sector reflects overall growth across the entire mining industry in NSW, including in metals mining.

"The demand for our metals, critical minerals and high-quality coal is expected to grow over the next decade.

"With the right policy settings we can ensure mining investment and jobs are locked in for the future." **AMR**

CORE LITHIUM SHIPS FIRST SPODUMENE CONCENTRATE DELIVERY TO GANFENG

Core Lithium (ASX: CXO) has shipped its inaugural delivery of spodumene concentrate to foundation customer Ganfeng Lithium in China.

This 10,000t shipment of spodumene concentrate came from Core's Finnis lithium operation in the Northern Territory.

The shipment was loaded onto the Clearwater Bay for delivery and the product presented well and was within the contract specifications.

Additionally, Core successfully negotiated the sale of an initial parcel of fines from Finnis with a 15,000t parcel grading 1.2% lithium oxide also loaded.

Core Lithium chief executive Gareth Manderson commented on the significant milestone for the company.

"Delivering concentrate into long-term offtake agreements is a significant milestone for Core as we ramp up operations at the Finnis lithium operation," he said.



(Image source: Core Lithium) Clearwater Bay at Darwin Port.

"The sale of the lithium fines has been established to deliver a revenue stream from a previously unsold by-product.

"Lithium fines sales provides an immediate commercial option while plant recovery improvement work is underway.

"Delivering first concentrate into long-term offtake agreements, and the sale of first fines are both significant milestones, and I commend the Core team for the work they have done to safely produce and deliver these products."

The ship was loaded at Darwin Port on September 7 and is expected to discharge at ports in China later in the month. **AMR**



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ALCOA INVESTS TO REDUCE LEAKS AND SPILLS



Alcoa fitter Riley Jenkinson replaces a hose on a Cat 993 loader.

Alcoa has nearly halved the amount of spills from its fuel, hydraulic fluid and other hydrocarbons over the past four years at its bauxite operations in the Peel region of WA.

And the company says it is on track to cut spills by up to 60% by the end of 2023.

The results at Alcoa's Huntly and Willowdale bauxite mines are due to measures including adopting a rigorous preventative maintenance schedule that far exceeds manufacturer recommendations, better training for personnel and introducing more regular inspections of mobile equipment.

With a focus on maintaining its 60-year record of never having negatively impacted public drinking water supply and to ensure mined areas can be readily restored to fully functioning forest ecosystems, Alcoa has identified hose failures as the most common cause of hydrocarbon spills.

To address this, Alcoa reduced the time between replacement of hydraulic re-

turn hoses, in some cases from a recommended 20,000 hours to 8,000 hours and trained specialist crews to inspect mobile equipment when it stops for refuelling or while in the field.

Alcoa WA mining manager Darrin Strange says dealing with potential issues before a failure occurs has been the key to achieving the 47% reduction in spills since 2019.

"We identified the most common points of failure, and the potential severity of various loss-of-containment events, across all our mobile equipment and fixed plant," he said.

"That gave us the data to understand where to adjust maintenance schedules, what additional spare parts we had to carry, and what dedicated training was required to stay ahead of potential risks."

Mr Strange says inspections of mobile equipment, which previously may have only occurred during major maintenance procedures, are now carried out every time a machine stops to refuel.

"Regularly looking for early signs of wear and leaks can prevent spills entirely," he said.

"We have also ensured maintenance technicians responsible for building and fitting hose assemblies have comprehensive training and access to manufacturer specifications."

In the event of a spill, Mr Strange says Alcoa has comprehensive response and remediation processes to ensure all traces of spilled fluids are quickly contained and removed, including thoroughly testing the affected area for any remnants.

"We use specialised soil sampling equipment to test samples in the area where a spill has occurred and if any further traces are found, we do further clean-up and testing," he said.

Mr Strange says that Alcoa is working with contractors and equipment hire providers to ensure the same rigorous maintenance procedures are followed.

The enhanced measures have grabbed the attention of original equipment manufacturers.

"We've heard anecdotally that many of our procedures go far above what others in the industry are doing," Mr Strange said.

"We're also working with some of our equipment suppliers on additional projects to continue improving the risks.

"While all miners have to be vigilant when it comes to managing loss of containment, Alcoa places exceptionally high importance on its performance given we operate in the jarrah forest and near public drinking water sources.

"One of the key aspects of our operations is restoration of the jarrah forest when we finish mining in an area.

"We are continually improving the ways in which we do that and inhibiting any unwanted spills from entering the environment in which we work is one of the keys to successful outcomes." **AMR**

A study by Charles Darwin University (CDU) has developed a framework to help reduce coal mining disasters.



Greater monitoring of wind, gas density and temperatures in coal mines can help reduce the risk of disasters, according to a new joint study with Charles Darwin University (CDU) and University Technology Sydney (UTS).

The study, *An FSV analysis approach to verify the robustness of the triple-correlation analysis theoretical framework*, focused on developing a gas monitoring system which takes a holistic approach to assessing wind, gas and temperature conditions.

The project used data from a large Global Fortune 500 listed mining company in China, which held 46% of the world's coal production in 2020.

Co-author and CDU Faculty of Science and Technology Associate Professor Niusha Shafiabady says the study examined real-time data and all tests indicates three significant correlations between gas, temperature and wind.

"A significant number (3,284) of coal mines have high gas content at outburst-prone

NEW STUDY BETTER PREDICTS MINE DISASTERS

risk levels across almost all 26 major coal mining provinces in China," Associate Professor Shafiabady said.

"For example on 10 June 2020, a serious coal and gas outburst accident occurred in Liaoyuan, China which resulted in seven deaths and two injuries, with a direct economic loss of 16.66 million yuan (\$3.4 million).

"It is significant to carry out real-time monitoring of coal and rock dynamic disasters during coal mining activities."

The project confirmed the framework could be used to develop a gas warning system with improved sensitivity to reduce the incidence of gas explosions.

The study was undertaken by CDU, University of Technology Sydney, Shanxi Normal University, Central Queensland University,

Taiyuan Normal University, Shanxi Fenxi Mining Industry Group Co and Shanxi Fenxi Mining Zhongxing Coal Industry Co.

Associate Professor Shafiabady says the results of the study can be used by different mining companies to avoid gas incidents.

"The outcomes of this study can also be used in other industries such as chemical industry, oil and gas industry, water treatment plants and semiconductor manufacturing industries," she said.

"Currently we are working on creating a real-time Artificial Intelligence decision making system with the ability to predict the accidents as an addition to the current designed gas monitoring system."

The study was published in the journal *Scientific Reports*. **AMR**

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GeoSLAM Production Mapping allows companies to make quick, short-term operational decisions on newly mined production areas. Rapid data capture minimises downtime and reduces costs, keeping operations on track with the agility to make any necessary logistical changes.



(Image source: Liebherr) Liebherr T 264 Autonomous Haulage Solution.



LIEBHERR DEPLOYS AUTONOMOUS VEHICLES TO WA MINE SITE

Liebherr has deployed a fleet of four T 265 trucks to support onsite validation at a mine site in WA.

The trucks have completed comprehensive internal validation of their autonomous haulage solution (AHS) at Liebherr's Mining Technology Development Centre in the USA.

Liebherr divisional general manager, product manager, Scott Bellamy commented on the solution.

"After significant research, development and program planning, Liebherr is excited to announce the commencement of onsite autonomous haulage solution validation as we move to deploy the next generation of autonomy technology for mining equipment," he said.

"This deployment not only represents Liebherr Mining's market introduction of the AHS, but also highlights Liebherr's continued expansion as a technology solution provider for the mining industry."

To provide onsite support for the full duration of the AHS validation program, Liebherr has expanded its autonomy project team.

"Along with the first deployment of the autonomy solution, Liebherr has expanded its autonomy project team to include onsite support for the duration of the AHS validation program," Mr Bellamy continued.

"However, our focus is to ensure the or-

ganisation can support in the future not only this exciting project, but also future AHS deployments across multiple customers and regions."

This onsite validation marks a new stage of Liebherr's strategy to accelerate development of a new autonomy product for the mining industry. **AMR**



(Image source: Schenck Process) Workers at Sandvik Rock Processing Australia.

SCHENCK PROCESS TO BECOME SANDVIK ROCK PROCESSING

On October 1 this year, Schenck Process Australia will become Sandvik Rock Processing Australia.

The next step in the integration of SP Mining — the mining related business of Schenck acquired by engineering group Sandvik — will see SP Mining entities change their names to reflect their new ownership.

Since the acquisition, which occurred in November last year, Sandvik has been focused on bringing together its expertise in crushing with Schenck's know-how in screening, feeding, weighing and loading.

Schenck president Asia Pacific Terese Withington said the move is part of an integration process, allowing SP Mining to become a seamless part of Sandvik.

"In Australia, we are bringing together our sales and back-office teams with those of Sandvik Rock Processing Solutions to allow our customers to access our combined expertise in crushing, screening, feeding, weighing and loading," she said.

"Together, we aim to deliver even better digitalisation, sustainability and productivity solutions to our industry.

"The end goal of our integration is to allow our customers to place combined crushing, screening, feeding, weighing and loading orders with our new legal entity.

"We look forward to continuing to service the business needs of our customers and remain fully focused on the delivery of high-quality equipment, consumables, OEM spare parts and services to help them achieve their business objectives." **AMR**

SANDVIK-MACA: SUPPLYING GRUYERE MINE'S NEW SURFACE DRILL RIGS

Sandvik Mining and Rock Solutions has been selected by mining, civil and materials processing contracting group MACA to supply nine new surface drill rigs.

These rigs will completely replace an aging mixed fleet at the Gruyere open pit gold mine in WA's Goldfields, where MACA was recently awarded a five-year contract extension.

MACA has provided various services at Gruyere, a joint venture between Gold Fields and Gold Road Resources, since the contractor initiated bulk earthworks in 2017.

Gruyere is expected to produce 350,000ozpa of gold with a current mine life until at least 2032.

The order includes six Sandvik DR410i rotary blasthole drills, two Leopard DI650i down-the-hole (DTH) drills rigs and a Pantera DP1500i top hammer drill rig.

Sandvik DR410i drill rigs are compact, powerful and technologically advanced. They are designed for rotary and DTH holes up to 254mm, with a mast offering a first pass capacity of 14m and a max depth of 32.3m.

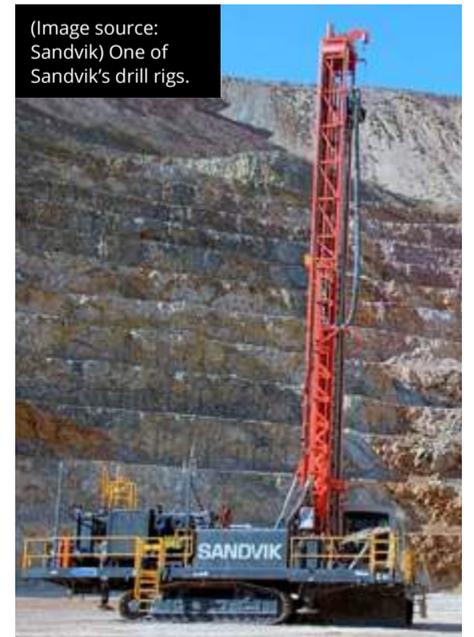
The Leopard DI650i is a self-contained,

crawler-mounted intelligent DTH drill rig designed for demanding high-capacity production drilling applications.

The Pantera DP1500i is a hydraulic, self-propelled top hammer drill rig ideal for production or pre-split drilling in large quarries or open pit mines and construction sites.

Deliveries of the rigs began in July and will continue through to April 2024. **AMR**

(Image source: Sandvik) One of Sandvik's drill rigs.





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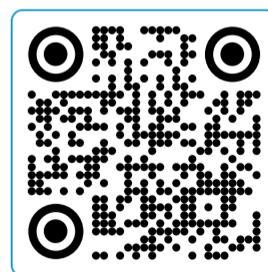
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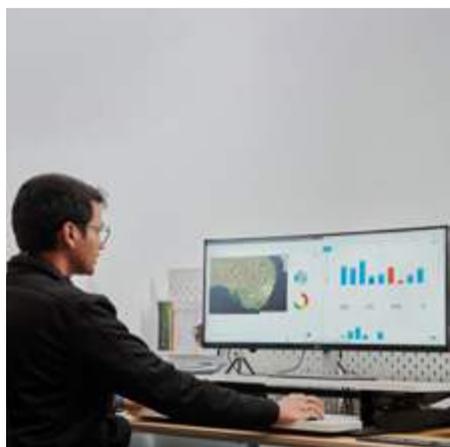
FuelFix & Tanks2Go (FuelFix) is committed to helping its customers in their journey to a clean energy future through innovative energy management and storage solutions.

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The Carbon Challenge

Mining operations are expected to be more efficient in their use of hydrocarbons and are looking for tangible strategies to immediately reduce their scope 1 and scope 2 CO₂ emissions, whilst maintaining operational reliability and cost efficiency.

Through its ACTION methodology, FuelFix provides a mechanism for customers to implement changes which ensure these operational targets are met. Understanding where and how fuel is used allows specialist technicians to design solutions to deliver significant reductions in cost of production, cost of maintenance, and cost of NGER compliance.



OCT2023 AMR

Sojitz Blue: New Way, New Value

Sojitz Blue is an Australian subsidiary of the Japanese company Sojitz Corporation. Since 1994, the company has been participating in Australia's mining sector and now operates three mines in Central Queensland: Meteor Downs, Gregory Crinum and Minerva which produce premium hard coking and thermal coal for export.



Driven by its core values of safety, environment, quality, people, and efficiency, Sojitz is actively involved in building a sustainable future for the community in which it operates.

With a committed workforce of over 500 people, Sojitz Blue strives for continuous improvement in its operations to minimise its impact on the environment. Targeting a 60% reduction in their Scope 1 and Scope 2 CO₂ emissions before 2031, Sojitz Blue partnered with FuelFix to help facilitate infrastructure and process improvements to effect measurable change in their diesel emissions (Scope 1).

Ann Houston, Head of Environment, Social and Governance at Sojitz Blue, said that "To-date, these emissions are much harder to abate, and incremental reductions in wastage are our first tactic. They also immediately reduce production costs."



Data Driven Decarbonisation Strategies

In early 2023, Sojitz partnered with FuelFix to optimise usage of its onsite ancillary equipment. With an overarching goal to reduce fuel consumption, improve asset utilisation, and reduce maintenance costs FuelFix designed a clear pathway to target those key deliverables.

To ensure effective strategies could be implemented, the accurate capture of fuel data was essential to success. Working collaboratively with Sojitz's team, FuelFix audited the existing fuel infrastructure and operational processes and made recommendations for improvements.

This comprehensive review allowed technicians to devise bespoke solutions to optimise the infrastructure without loss of equipment uptime and improve safety outcomes.

Analysing the datasets relating to fuel storage, distribution, and consumption, yielded several opportunities to bring about immediate improvements. In an industry where incremental changes can lead to significant impacts, the FuelFix-Sojitz partnership illustrates the importance of data analytics.

Mr Omar Hassalani, Contracts & Risk Advisor for Sojitz, highlighted the benefits of the partnership into the future for both businesses. "The analysis FuelFix has undertaken is adding real value for the organisation and we look forward

to working with them into the future to drive more cost efficiencies and carbon reduction," he said.

Continuous Improvement through Collaboration

The continued collaboration between FuelFix and Sojitz highlights the benefits of leveraging data to identify improvements in operations. Data analysis assists to identify bottlenecks, process inefficiencies, and cost savings.

Reflecting on this joint project, Mr. Jonathan Elsley, GM of FuelFix Go-Greener, said, "It's been an exciting opportunity for us to validate both our ACTION methodology and Data Analytics service in relation to fuel management. In the competitive landscape of Australia's mining industry, leveraging data can serve as a game-changer."

Following the success of their initial engagement, FuelFix and Sojitz are embarking on another ambitious project, with a focus on optimising the use of heavy machinery at Sojitz's Gregory mine site, broadening the scope of their collaboration. This next step demonstrates the versatility of data analytics in modern mining operations.

For more insights on how to optimise your mining operations through comprehensive fuel data management, email jonathan.elsley@fuelfix.com.au or visit www.fuelfix.com.au

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WESTRAC CELEBRATES 100TH WHEEL LOADER TO MGM BULK

In early September, leading Caterpillar® dealer WesTrac delivered its 100th Cat® Next Generation Medium Wheel Loader, released only 18 months ago, to WA bulk haulage company MGM Bulk.

MGM Bulk's fleet includes 152 prime movers, about 500 pieces of trailering equipment, 25 wheel loaders and a wide range of ancillary equipment, with Cat products making up about 90% of MGM's machinery fleet.

MGM Bulk fleet manager Allan Thomas says the full spectrum of Cat wheel loaders are a key part of MGM's operations from the Pilbara to the South West in WA, helping meet ever evolving productivity targets.

"Over the years we've had all sorts of machines," he said.

"The smallest one we currently have is the Cat 924K going all the way up to Cat 988s and 992s.

"The latest and main purchase we make these days are the Cat 982s, which are part of the Next Generation range.

"We are up to our eighth of those in our fleet."

MGM Bulk's most recent Cat 982 purchase was in August 2023, and it will be put to work with 11 others filling ultra quad road trains that cart iron ore in the Pilbara.

The machines average 7000 hours per year (almost 20 hours per day), giving them a front-line lifecycle of roughly two-and-a-half years.

WesTrac construction product manager Lawrence Hayles says Cat Next Generation wheel loaders are ready-made for operator comfort.

"We're rich in resources and construction activity in WA," he said.

"These machines are ideally suited for the construction market as well as resources

in loading road trains, feeding hoppers and crushers on mine sites.

"It's the most advanced machine in its class in terms of operator comfort, ergonomics and safety.

"It's easy to access and egress the cab and once you're in the cab, the gear, the amount of adjustments in the seat – that's heated and cooled by the way – dash layout touchscreens and seat mounted controls make it a very safe and controllable machine."

Mr Hayles says some of the many features popular with customers is full ground-level servicing access and a high-level of built in safety.

According to WesTrac, demand for Cat medium wheel loaders covering 19-36t class machines is accelerating, with approximately 300 units entering the market each year.

"We've sold and delivered 100 Cat medium wheel loaders since taking delivery of our first Cat 980 and 982 machines 18 months ago," Mr Hayles said.

"We're about to take delivery of the Cat 950, which completes the full suite of medium wheel loaders in the Next Generation range."

Mr Hayles says that gains in this range extend to productivity, with WesTrac working alongside customers to maximise machine output and improve efficiency.

"We've been able to train operators to typically load 350tph into a crusher with a Cat 982 and load a 150t road train in 12 minutes," he says.

"For MGM Bulk, the Cat 982 with an aggregate-type payload of 12t is the perfect class size to be loading trailers, not only in terms of total payload going into each trailer but achieving the correct distribution of weight and accurate axle loading.

MGM's Allan Thomas confirms efficiencies

and productivity gains the Cat 982 has introduced.

"In the North West, we've upgraded from the Cat 980 to the new Cat 982, substantially increasing our efficiency," he said.

"We've achieved an approximate productivity boost of 21.05% for loading ultra quad road trains and our focus on efficiency continues beyond there."

The latest model has a default eco mode and a power-dense 13L engine, which contribute to reduced fuel consumption.

Additional technological features, such as automatic dig to prevent wheel spin and automatic idle shutdown further increase productivity by up to 12%.

WesTrac's FitFleet® Customer Value Agreements and portal, Product Link and Vision Link services add more visibility and control than ever before to monitoring and managing product health, maintenance and servicing as well as improving performance on the frontline.

After about 30 months on the job, MGM Bulk's wheel loaders in the Pilbara retire back to the cooler surrounds of the South West in WA.

But not all MGM Bulk's machines cycle out at that pace, with one of the company's longest serving Cat machines being a 1999 model 966F still working today with 46,000 hours on the clock.

WesTrac account manager Anthony Garic looks after MGM Bulk and says the successful relationship between MGM Bulk and WesTrac is testament to their shared passion for high-quality products that deliver.

MGM Bulk has its roots in Giacci Bros which was set up by founding father Mario Giacci together with this brother Tony in the 1950s.

Cat products have featured prominently in their fleets over six decades and remain a

pillar of reliability at MGM Bulk today.

The passion for transport and logistics - and Cat machinery - bloomed in the 1960s when director Mario, now 85 years old, bought the company's first Cat machine, an 8t 933F Traxcavator powered by a Cat D320T.

"The Giacci family's passion for haulage and transport has been immense, growing multiple businesses from what started as a one truck operation between two brothers close to 70 years ago," Mr Garic said.

"Mario believes in two products – he runs Cat machines and Kenworth prime movers.

"He believes Cat loaders are the best solution available to load the material his trucks carry."

Mr Garic says the "marriage" of three customer-focused entities – MGM Bulk, Caterpillar and WesTrac – has been built on loyalty and the added trust MGM Bulk has of WesTrac's branch support across WA.

"Providing that back-up is obviously important," he said.

"But the machines themselves are extremely impressive.

"The productivity of the Cat 982 Wheel Loader is a great match to MGM's ultra quads.

"Very quick, agile, quiet and accurate in meeting axle loading requirements.

"MGM is looking forward, with their eyes set next on the Cat 982 XE as they seek out the latest low emissions, high productivity solutions.

"We strive to help MGM reach their goals and continue delivering to their clients.

"We're immensely proud to support MGM Bulk and look forward to our ongoing relationship together." **AMR**

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JAMES BAY MINERALS BEGINS TRADING ON ASX



(Image source: James Bay Minerals) (L-R) Non-executive chairman Gerard O'Donovan, executive director Andrew Dornan, non-executive director Dean Ercegovic and chief financial officer Daniel Loughnan.

James Bay Minerals (ASX:JBY) began trading on the ASX on September 12, 2023, following a highly successful \$6m initial public offering (IPO).

The Perth-based lithium explorer has secured an extensive and highly strategic ground position in the heart of the La Grande Greenstone Belt in Quebec, Canada. Following several world-class lithium-pegmatite discoveries, this belt has risen to prominence in recent times.

James Bay Minerals has plans in place to begin exploration immediately with exploration programs scheduled to begin in parallel with expanding its in-country exploration and administration teams.

Work includes lidar surveys, aerial imagery acquisition, geochemical and geophysical surveys, field mapping and rock chip and channel sampling.

Pending results from the 2023 field program, initial drill programs are set to begin in early 2024.

The James Bay Minerals leadership team comprises executive director Andrew Dornan, non-executive chairman Gerard O'Donovan and non-executive directors Judy Baker and Dean Ercegovic.

Mr Dornan commented on the IPO and future works.

"We are very much looking forward to unlocking the potential of our portfolio with focused, systematic and aggressive exploration programs that are planned to commence in the coming weeks," he said.

"We are starting our life as a Canadian-focused lithium explorer against the backdrop of unprecedented activity within the global lithium sector.

"Recent major news emanating from the James Bay district vindicates our strategy to focus on the James Bay area as the next major global frontier for hard rock lithium discoveries of scale." **AMR**

CARAWINE RESOURCES BEGINS DRILLING AT WEST PATERSON JV

Gold and base metals explorer Carawine Resources (ASX:CWX) has begun drilling at its West Paterson joint venture (JV) in WA.

The West Paterson joint venture is an agreement between Carawine and Rio Tinto Exploration, a subsidiary of Rio Tinto (ASX:RIO).

The reverse circulation drilling program will test several targets on the Baton and Red Dog tenements, with between eight to 14 holes planned at Baton and between six to 12 holes planned at Red Dog.

Between 3000m to 5000m of drilling will be undertaken, targeting gold, copper, zinc and other base metal sulphide mineralisation identified via geophysical surveys, historic data and geological interpretations.

Drilling will test a discrete conductive air-

borne electromagnetic (AEM) anomaly associated with a gravity high, coincident and offset magnetic and gravity high anomalies, a complex magnetic anomaly, a structurally hosted mineralisation target and resistive AEM anomalies.

Carawine managing director David Boyd commented on the drilling program.

"This is the second drilling program by Rio Tinto on the West Paterson JV tenements, and the first to include a number priority targets at Baton," he said.

"We're pleased to see drilling commence and look forward to updating the market with results of the program as they become available."

Drilling is expected to be completed over the next two months with results to be announced shortly after. **AMR**



Large quarry dump truck.

RESOURCE DEVELOPMENT GROUP REPORTS SIGNIFICANT MINERAL RESOURCE INCREASE FOR LUCKY BAY

Resource Development Group (ASX:RDG) has increased the mineral resource at its Lucky Bay garnet mine in WA by 80.8mt.

The total mineral resource tonnage increased 18% from 442.5mt to 523.3mt, while the total mineral resource of heavy minerals increased 14% from 19mt to 21.7mt.

Furthermore, the total mineral resource

of garnet increased 13% from 15.9mt to 17.9mt.

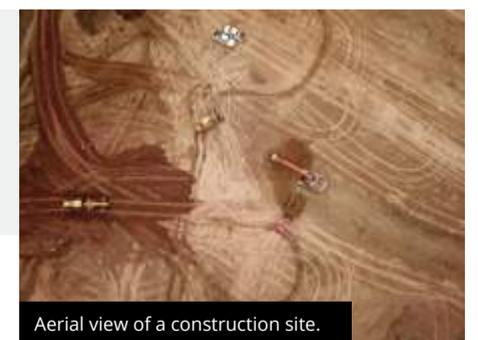
Now, 90% of the mineral resource tonnage (473.2mt) is classified as measured or indicated.

Since acquiring Lucky Bay in 2021, Resource Development has focused on realising the full potential of the project and building on the already significant resource.

Drilling undertaken so far has extended the June 2022 resource a further 3km to the north, confirmed the continuity of the mineralisation and identified several high-grade areas that will be the focus of future exploration and resource development.

Resource Development Group managing director Andrew Ellison says the upgrade confirms Lucky Bay's potential.

"The significant mineral resource upgrade



Aerial view of a construction site.

is a great result and confirms the world class potential at Lucky Bay," he said.

"With 90% of the mineral resource in the measured and indicated categories, we have the confidence in the project to deliver high quality garnet to the world markets for decades to come." **AMR**



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(Image source: Stephen Heath Photography)
Two women, one of which is a Breast Cancer Care WA worker.

BREAST CANCER CARE WA AND HANCOCK PROSPECTING PARTNER FOR FINANCIAL ASSISTANCE PROGRAM

Breast Cancer Care WA has partnered with Hancock Prospecting to support their financial assistance program for the next two years.

This partnership aims to provide much needed support to those in WA facing a breast cancer diagnosis, especially in regional and remote areas of the state.

Breast Cancer Care WA's financial assistance program has been pivotal in help-

ing individuals and their families facing a breast cancer diagnosis and cope with the financial burdens that accompany the diagnosis.

Through this program, clients can receive financial support, helping to enable that they can focus on their recovery without the added stress of financial strain.

Over the next two years, Hancock Prospecting will provide substantial funding

to this program, enabling Breast Cancer Care WA to extend their reach and impact within WA's regional and remote communities.

Breast Cancer Care WA's chief executive Max Clarke expressed his appreciation for the collaboration.

"We are really excited to have Hancock Prospecting's support for our financial assistance program," he said.

"Their commitment will directly impact the lives of those people affected by breast cancer in areas that often struggle to access the resources they need.

"This partnership allows us to extend our reach and provide much-needed relief to those who need it most, and this donation is even more necessary given the program doesn't receive any government funding."

AMR

BMA PARTICIPATES IN GIRLS MENTORING PROGRAM FOR ANOTHER YEAR

Women across BHP (ASX:BHP) Mitsubishi Alliance (BMA) have once again taken part in the Girls in Resources Life Skills (GIRLS) Mentoring Program for another year.

This annual initiative is delivered by the Queensland Resources Council's Queensland Minerals and Energy Academy (QMEA) and Women in Mining and Resources Queensland (WIMARQ).

BMA have been involved with the GIRLS Mentoring Program since its inception and have seen firsthand the reach the program has in terms of boosting the number of female school leavers interested in pursuing a career in the resources sector or entering STEM-related careers.

The six-month program sets up student mentees with industry mentors, including team members from BHP and BMA.

BMA head of performance and business development Lauren Molloy-Roberts said she was proud to support the program.

"It is very rewarding to see these passionate and aspiring young women achieve their goals and to help them make informed decisions about their own tertiary

education or training pathways," she said.

"With the number of applications from young women wanting to take part increasing each year since it started in 2019, the GIRLS Mentoring Program has become a well-established initiative that will help drive the future of the resources sector."

The mentoring program is celebrating its fifth year of connecting experienced women in the resources sector with female students who wish to know more.

QRC director of skills, education and diversity Katrina-Lee Jones said the GIRLS Mentoring Program had gone from strength to strength since it began.

"We are very proud of the role the program has played in encouraging and supporting female students who are interested in pursuing careers in the Queensland resources sector," she said.

"This mentoring program plays an essential role in the industry's efforts to attract more young females into the resources and energy sectors, which is steadily increasing its female participation rate with a target of 30% by 2026." AMR



(Image source: BHP) (L-R) BHP Mitsubishi Alliance head of performance and business development Lauren Molloy-Roberts, St John's Catholic School, Roma, mentee Lucinda Kemp and BHP development supervisor and mentor Kymberly Bouchardt.

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The DRA Global team at the Carmichael mine's coal handling and preparation plant.



Recruits will join some of DRA Global's First Nations employees who are already working at the Carmichael mine.

CARMICHAEL MINE TRAINEESHIP PROGRAM

TO EMPOWER FIRST NATIONS COMMUNITIES

Bravus Mining and Resources has joined with key contractor partner DRA Global to accelerate the development, training and employment of First Nations peoples in central Queensland.

DRA's First Nations Traineeship Program will recruit Aboriginal and Torres Strait Islander people to critical mining roles that support the operations of the 10mtpa Carmichael mine near Clermont, Queensland.

DRA provides operations and maintenance services at the Carmichael coal handling and preparation plant facility (CHPP) where the high-quality thermal coal mined from the Galilee Basin mine is crushed, washed and prepared for transport globally.

Bravus Mining and Resources chief operating officer Mick Crowe says the new traineeship opportunities will prioritise

Wangan and Jagalingou, Jangga, Birriah and Juru Traditional Owners.

"Traditional Owner engagement and participation has been a key focus for our business since the earliest days of the Carmichael project," he said.

"Programs like DRA's First Nations Traineeship build on our Indigenous Land Use Agreements, Cultural Heritage Management Plans and Indigenous Participation Plans to generate multigenerational benefits for Traditional Owners and Aboriginal and Torres Strait Islander people.

"Roles in the resources sector are often lifelong careers full of rewarding work and we're excited about the journey these traineeships will begin for First Nations people in our community."

The two-year Traineeship Program in-

cludes roles as a Coal Handling and Preparation Plant Operator, Site Administrator and Site Health, Safety and Environment Administrator.

Recruitment of First Nations Peoples will be conducted regardless of age, gender, religion or other demographic criteria.

DRA senior vice president delivery for APAC Michael Carretta says the program recognises the value of cultural diversity and further increases inclusion within the mining industry.

"As a global multinational company, DRA is committed to building an inclusive and diverse workforce that reflects the communities where we operate, employing local people to drive better economic outcomes and striving to leave a positive impact," he said.

"We are proud to partner with Bravus on this initiative to collectively strengthen our engagement with First Nations people in Australia."

Bravus Mining and Resources is committed to creating a positive impact in the communities in which it operates and prioritises local jobs and procurement for regional Queenslanders.

Under the company's Indigenous Participation Plan, Bravus Mining and Resources requires a minimum of 10% of trainees and 7.5% of workers to be First Nations people.

Bravus Mining and Resources has also committed \$7.5m to First Nations education bursaries and pre-employment programs and \$250m in First Nations contracting and business development.

AMR

BHP OPENS FUTUREFIT ACADEMY IN WA

BHP's (ASX:BHP) newly opened state-of-the-art FutureFit Academy in Forrestfield, Perth, is set to build the skills needed for modern mining.

Launched in 2020, the BHP FutureFit Academy offers paid training pathways into the mining industry for those without previous mining experience, at any stage in their career.

To date, more than 1100 people have joined FutureFit and more than 500 have graduated with qualifications and a guaranteed job with BHP.

BHP president Australia Geraldine Slattery was at the opening.

"BHP launched the FutureFit Academy in 2020 with a \$300m commitment to create a pipeline of future talent in highly skilled roles that will help support productivity and keep the Australian economy strong," she said.

"Minerals and mining are critical to Australia's economy and the global energy transition.

"We have an enormous opportunity but also challenges to overcome to keep competing in the global arena, among them the need to build the skills needed in a modern mining sector."

With an academy in WA and Mackay in Central Queensland, the BHP FutureFit Academy is creating 2500 new traineeships and apprenticeships over five years.

These academies feature immersive virtual reality technology combined with workshop learning to develop skills and knowledge. They are fully equipped to simulate the workplace, including disability access and parent and prayer rooms.

"We're thrilled to have welcome more than 1100 people to the FutureFit program and more than 500 graduates into permanent



(Image source: Mike Curtain Photography) BHP FutureFit Academy students Britnee Amos and Kael Thompson.

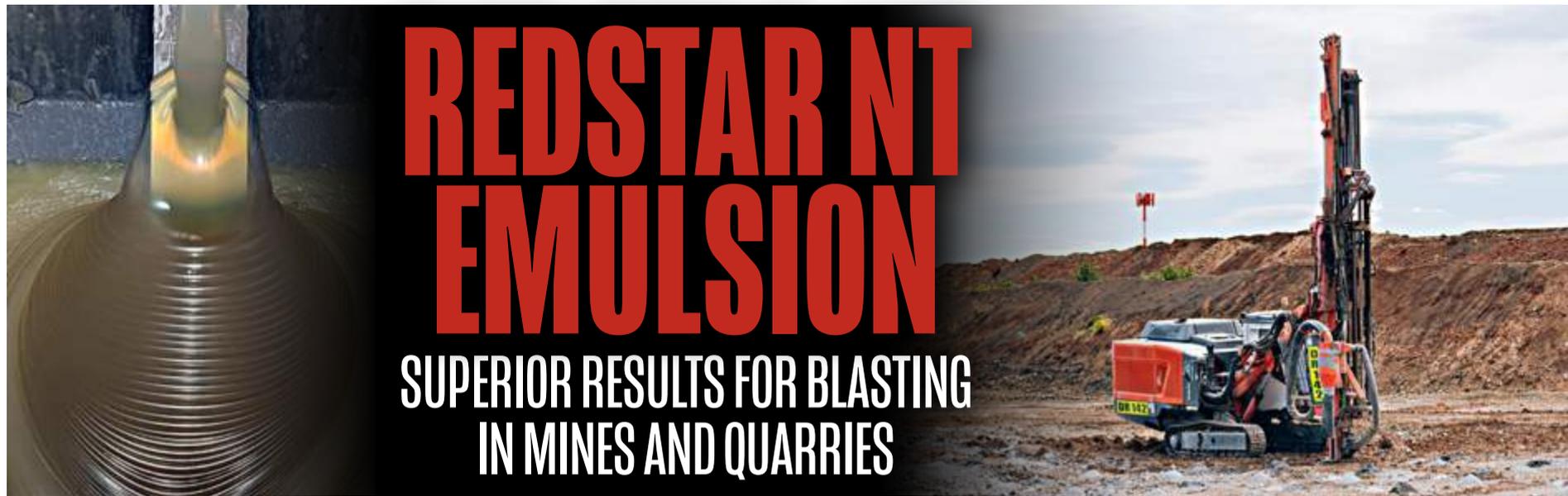
jobs with BHP," Ms Slattery said.

"Through an innovative approach to training and employment, we've opened the door to a more diverse talent pool, especially people from non-mining backgrounds who want to reskill or pursue a new career."

This new BHP FutureFit Academy in For-

restfield is more than double the size of the previous one in Welshpool, with a further 110,000m² of workshop space and capacity for more students.

It also offers an expanded curriculum with high-risk work licensing, maintenance associate and trade programs in auto electrical, fabrication mechanical fitting and heavy diesel. AMR



For mining operations, it's a major drawback to minimise drill and blast costs to optimise the value of the ore. Compared to crushing or grinding, explosive technology provides the lowest cost energy method to break rocks, retrieve ore or remove overburden. Explosives provide chemical energy that is released quickly to break rock and ore so that it can be transported for beneficiation or removal. This works because the high pressures developed immediately after detonation exceed the strength of the ground leading to cracking while the gases separate and move the rock pieces.

Impact Drill and Blast's (IBD's) drilling, blast design and explosive products work synergistically to optimise blasting outcomes while reducing the mine spend. In particular, the combination of IBS's *RedStar NT* ammonium nitrate emulsion (ANE) product and *electronic initiation system* allows for lower quantities of bulk product to be

used while increasing rock fragmentation. **More Integration. Less Headaches. That's IMPACT!**

RedStar NT ANE is a high energy, small critical diameter, dual salt ANE product, that can be chemically sensitised to relatively low densities. The small droplets in the emulsion, with a mean diameter for around 10 micrometres, react much more quickly than the 1-2mm in diameter ANFO prill. Its high velocity of detonation rapidly converts the chemical energy in the explosive to very high temperature gases that give very high blast hole pressures. The shock wave developed in the ground has a higher maximum amplitude and shorter duration, in comparison to ANFO where the pressure peak is reached more slowly. *RedStar NT ANE* also provides other benefits, including superior water resistance, minimisation of nitrogen loss to the environment, and resistance to the generation of post blast fume.

Impact's *electronic initiation systems* provide initiation timing that is precise to less than 0.1 millisecond, irrespective of the delay period it is programmed for. This overcomes the imprecision ("scatter") of pyrotechnic delays. It also allows for constructive shock wave patterns from each fired blast hole to be predicted, controlled, and utilised to maximise fragmentation in the ground from the quantities of explosives used.

Other benefits from the use of the electronic initiation systems are also available, including availability of advanced blast designs (in-hole decking), fewer misfires, and increased security. **More Innovation. Less Waste. That's IMPACT!**

IBD's products and processes provide flexibility on the ground to incorporate new knowledge of the ground after the shot has been designed and drilled. Although ground can be the same mineral-

ogy, the rock strength varies significantly with the type of mineralisation. Generally, the rough rule of thumb is the denser the rock, the higher the powder factor needs to be. Electronic initiation provides the ability to change timing on the fly, while *RedStar NT* can be blended with ANFO or chemically gassed to lower densities, to provide the required bulk strength energy.

IBD's advanced explosives processes and products are analogous to using small, precise, sharp hammer blows to tailor breakage in the blasted rock. In contrast, use of ANFO and pyrotechnic initiation systems is akin to using a sledgehammer to break the rock, with the associated inefficiencies. **More Know How. Less Know All. That's IMPACT!**

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Kelly Carter, Gold Fields executive vice president legal & compliance.

Q&A WITH GOLD FIELDS EXECUTIVE VICE PRESIDENT LEGAL & COMPLIANCE KELLY CARTER

As Chair of the Gold Industry Group and a graduate of the AICD, Kelly's achievements have been recognised as one of the 2018 BMO "100 Global Inspirational Women in Mining", a winner at the 2018 Business News 40 under 40 Awards, and as a finalist in the 2017 CME Women in Resources Awards.

The *Australian Mining Review's* Kathleen Southway speaks with Kelly about the importance of stakeholder value creation in reaching Gold Fields' 2030 global ESG targets.

AMR: What does stakeholder value creation mean to the Gold Fields? Who are the stakeholders and what value is Gold Fields creating?

KC: I think it really talks directly to our purpose, which is to create enduring value beyond mining. What is critically important is that this ambition is experienced by our stakeholders. This motivates us internally. Creating a lived experience for our stakeholders lies at the heart of making sure that we're doing what it is that we're striving to do. We've got a global footprint. And that means our stakeholders are varied and different across the regions in which we operate. Part of our intention is to make sure all of those various stakeholder cohorts are experiencing sustainable benefits from our operations. This refers primarily to creating economic value in the form of salaries, procurement, taxes and jobs, among others but also developing a relationship with our stakeholders based on trust, transparency and respect. We have identified five key stakeholders for Gold Fields: our host communities, First

Nations peoples, which is critically important in the Australian context, our employees, business partners, the governments in the jurisdictions in which we operate, as well as our shareholders. They are all a critical part of the stakeholder framework for an organisation. It's really important that we are demonstrating value across all of those stakeholder cohorts.

AMR: Why is stakeholder value creation important within the gold industry, specifically in Australia?

KC: It really goes to the heart of what sustainability is for an organisation. Whether you look at it through that lens of sustainability or social licence, it is imperative that our operations and our business partner with and provide value to our communities and other stakeholders. I think that in Australia, gold has been an integral part of the country's history. It has tangible demonstrations of being part of Australian prosperity, when there are cities in Australia, like Kalgoorlie, that were built on gold. It is a stable commodity and what is im-

portant is that we demonstrate that value on an enduring basis. One of the criticisms that is often levelled at the resources sector is that stakeholder value creation has peaks and troughs. It's really important that there is a level of consistency to demonstrating value creation. The gold sector has historically not been terribly good at telling its stories, about demonstrating value creation to communities, in particular. This is part of the reason why the Gold Industry Group was formed. It is a collective of gold industry participants – producers, refiners, service providers and explorers – to work collectively to demonstrate that sense of value creation to our external stakeholders, as well as to our own our own people. And we've been very effective in doing that over the last seven years.

AMR: Can you discuss how stakeholder value creation fits in with Gold Fields' global ESG targets?

KC: In December 2021 we launched six priority ESG targets, of which stakeholder

value creation was one of them. These six priority areas have been assigned 2030 targets. With stakeholder value creation, our target is to ensure that 30% of the total value we create benefits our host communities. By 2030, we are also aiming to have six legacy programs in place that benefit our host communities beyond the inevitable closures of our mines. There are a number of ways in which we create community value. In 2022, a total of 27% of all our procurement came from community businesses. A second factor is host community employment, which is a strong focus in Australia. A total of 18% of our employment at our Australian mines is from within our host communities. Naturally, this is not easy given that most of our operations are remote, but we have a significant proportion of our workforce, particularly at our St Ives operation, who reside in the Kalgoorlie area. The remainder of the workforce largely lives in Perth and the southwest of WA, and they fly-in and fly-out of our operations. Between both the employment and the procurement space, we've made some real headway, particularly in Australia. From a procurement perspective, looking at 2022, we had A\$369m of procurement spend from within our host communities. That's 361 different suppliers benefiting from having direct contracting arrangements with Gold Fields, of which 47 of them are female-owned businesses. We're continuing to build our relationships with traditional owners to understand how we can support further opportunities and engagement in that space.

AMR: How are the six flagship programs progressing?

KC: The pipeline of those projects has been framed and conceptualised. We plan to deliver these programs in each of the five countries in which we operate. There will be at least one program in Australia. This is currently in concept stage, and we will be working with our communities and other stakeholder partners to develop that program so that it will be in operation before 2030. We have one of the



Wind turbines at the Agnew mine site in WA.

programs, a dairy supply chain project in Peru, that is now fully scoped and ready to be launched later this year. It is exciting to see how we can help strengthen the dairy farming industry in the rural area surrounding our mine in northern Peru. The nature of these programs is that they are intended to go beyond our social investments in these communities. We are working hard to deliver these transformational and enduring programs for our host communities. In order to achieve that it is critical that we do the development work and engagement work upfront to set them up for enduring success.

AMR: What challenges or potential risks do you see in reaching the ESG targets for stakeholder value creation?

KC: Looking at the current operating environment, there are challenges to our host community employment targets given that mining is increasingly relying on high-level skills that are scarce in many of our operating countries. This is particularly so here in Australia but also at our South Deep mine in South Africa. To address this, we are focusing on the work environment that we're looking to provide. There is a focus on culture as a driver through building a safe and respectful work environment that people really want to work in. Looking beyond salary and income, we find that our broader offerings as an organisation, with the focus on a collaborative and welcoming culture and a strong commitment to ESG, is something that's appears really attractive to local employees. **AMR**

Kelly will be presenting on host community value creation at the 2023 International Mining and Resources Conference + Expo (IMARC) at the ICC Sydney from 31 October - 2 November.

Gold Fields' senior geologists on site at Agnew mine in WA.



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KEMERTON:

AUSTRALIA'S LARGEST LITHIUM HYDROXIDE PROCESSING PLANT

By Ashleigh Melanko



(Image source: Albemarle) A worker inspects shotcrete refractory work during construction of lithium processing trains 1 and 2 at Albemarle's Kemerton lithium hydroxide processing plant near Bunbury, WA. The image shows the feed end of the calcine kiln, along with chain cleats on the internal wall, prior to chain installation.



(Image source: Sarah Henderson) Albemarle Global chief executive Kent Masters with workers at Kemerton.

From humble beginnings more than 100 years ago, Albemarle is now Australia's largest lithium producer and manufacturer.

Headquartered in the United States, Albemarle produces materials and technology critical to the transition to a carbon-free economy.

Its energy storage assets primarily provide lithium for electric vehicles (EVs) and the storage of renewable energy.

Kemerton

In Australia, Albemarle produces sustainable lithium product at its processing plant — Kemerton — near Bunbury in WA's Southwest.

The most modern plant of its type in the world, the Kemerton lithium hydroxide processing plant was completed in 2022 with two processing trains.

With expansion to four processing trains now underway, Kemerton's production capacity will increase from 50ktpa of lithium hydroxide to 100ktpa.

This is enough to support the manufacturing of around 2.4m electric vehicles annually.

Kemerton is designed to process nearly 1mtpa of spodumene ore concentrate from the Talison Lithium mine at Greenbushes, producing up to 100ktpa of lithium hydroxide.

Lithium hydroxide from Kemerton is a highly valued, premium product that benefits from Australia's reputation for strong environmental governance.

In May 2023 when announcing Kemerton's expansion, Albemarle's Global chief executive Kent Masters said the expansion of Kemerton was driven by Albemarle's confidence in future demand.

"Australia is essential to the global supply chain for energy storage and an important part of our diverse portfolio," he said.

"Our decision to expand was driven by our confidence in future demand and allows us to offer customers additional supply from Greenbushes, well known as one of the world's best lithium mines."

So far, Kemerton has created more than 1800 jobs in construction and over 400 in operations, with the expansion set to cre-

ate over 1000 additional jobs in construction and around 400 additional workers when operating to capacity with four processing trains.

To support its expansion workforce, Albemarle is building the \$140m Paris Grove Worker Accommodation Precinct at nearby Australind.

Mineral Resources Partnership

In November 2019, Albemarle and Minerals Resources (ASX:MIN) formed the MARBL lithium joint venture, which followed the completion of the Wodgina lithium project transaction.

The transaction of Wodgina consisted of the sale of 60% of the Wodgina lithium project, the acquisition of a 40% interest in the first two lithium conversion units being built by Albemarle at Kemerton and the establishment of a 60:40 joint venture (the MARBL lithium joint venture) between Albemarle and Kemerton, respectively.

In July 2023, the joint venture was amended with Albemarle taking 100% ownership of Kemerton.

Upon closing, Albemarle is expected to pay Mineral Resources \$568-\$617m (US\$380-\$400m) which includes net consideration for the remaining 15% ownership of Kemerton as well as economic effective date (EED) settlement adjustments.

Pending regulatory approvals from the Foreign Investment Review Board, the amended arrangement is intended to provide greater strategic opportunities for both Albemarle and MinRes based on their global operations and the evolving lithium market.

Australia's Importance in Meeting Global Lithium Demand

During a recent visit to WA in late August 2023, Mr Masters confirmed there was no doubt that Australia would continue to be



(Image source: Albemarle) Aerial view of Kemerton.

a lithium supplier of choice for the world's top electric vehicle manufacturers.

He said that Albemarle's final investment decision, made in May 2023, was made almost a year early to meet global demand for electric vehicles.

"The decision reaffirms our commitment to our operations in Australia and further points to the confidence we have in our local team at Kemerton to expand from two processing trains to four," he said.

"Albemarle forecasts a nearly five-fold increase in global lithium demand from 800,000t in 2022 to 3.7mt in 2030, and the business is acutely aware of the importance of Australia in helping to meet that demand.

"Looking to the future with respect to technology, we are focused on refining process technology within our core business and on the development of new advanced ma-

terials — particularly in batteries and battery materials recycling."

Albemarle Seeks to Expand its Australian Assets

In early September 2023, Albemarle confirmed it had made a best and final non-binding proposal to acquire Liontown Resources (ASX:LTR).

In a statement to the New York Stock Exchange, Albemarle confirmed that, in the absence of a superior proposal, it made the bid to acquire all outstanding shares of Liontown by way of scheme of arrangement for a cash payment of \$3.00 per share.

Liontown confirmed that its board intended to recommend the revised Albemarle proposal to its shareholders, subject to entry into a binding agreement as well as other terms and conditions.

This revised proposal values Liontown at \$6.6b (US\$4.32b). **AMR**



(Image source: Albemarle) Calcine cooler outlet from the Train 1 and 2 acid roast line at Kemerton.



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COLLABORATING ON TRENDS IN MINING, INVESTMENT AND INNOVATION TOWARDS A SUSTAINABLE FUTURE

The International Mining and Resources Conference (IMARC) is where the most influential people in the mining industry come together, delivering ideas, inspiration and serving as a meeting ground for the industry. From ground-breaking technology and world-class content to a vivid showcase of all the elements that make the mining industry great, IMARC is an opportunity to learn from more than 500 mining leaders and resource experts with a program covering the entire mining value chain.

WHAT'S NEW AT IMARC 2023?

Australian Federal & State Mining Ministers' Briefings

As part of the Global Opportunities program at IMARC, State Mining Ministers from across Australia will provide a 10-minute briefing to attendees on ongoing and upcoming opportunities per state. Federal Minister for Resources, the Hon. Madeleine King will also be attending IMARC hosting bilateral and multilateral meetings, doing a meet and greet on the IMARC Expo floor, and also addressing the IMARC Plenary on day 2.

NextGen Program for Students

Our NextGen Senior Program designed for graduates and undergraduates returns in 2023, accompanied by a NEW addition to our 2023 Student Program; IMARC's NextGen Junior Program, in partnership with AREEA, who will be facilitating their hugely successful Bright Future STEM Program on 2 November, bringing 200 school children to Australia's largest mining event.

LETA Low Emissions Technology Pitch Battle

Low Emission Technology Australia (LETA) is proud to present the inaugural LETs Pitch Battle at IMARC 2023, an exciting opportunity for SMEs leading the charge in clean and scalable energy solutions to highlight their solutions in front of three mining judges from the LETA board. Battlers will come with their next big idea that can help transition Australia to a net-zero future on 31 October in the Energy Transition Theatre.

The Mining Pavilion

A new addition in 2023, the IMARC Mining Pavilion is a 4,000sqm attachment to the IMARC Expo featuring over 150 exhibitors and several networking and conference areas related to mining and investment. Within the Pavilion is the Mining and Investment Hub, showcasing 120+ junior and mid-tier mining companies; the SW Investment Theatre and the IMARC Pitch Battle Arena, as well the Traxys IMARC Connect Lounge, hosting 2,000+ meetings over three days.

Unearthed Global Innovation Games

In collaboration with Unearthed, IMARC is excited to host the results and winners from the inaugural Global Innovation Games on 1 November. Since August, Unearthed has been receiving applicants, via its crowdsourcing platform, that can showcase cutting-edge technologies with the potential to revolutionise mining operations, safety, sustainability, and efficiency.

Country Programs & Pavilions

IMARC 2023 will feature 12 dedicated Country and State programs in its Global Opportunities Theatres, dedicated to showcasing the latest trade and investment opportunities within exploration, mining and the industry supply chain from the Asia-Pacific, North America, South America and Europe. These include programs from Mongolia, South Australia, Canada, Quebec, South Korea, Germany, Ontario, Saudi Arabia and more.

10 IMARC **GALA DINNER**
 2 November 2023

Taking place on the evening of Thursday 2nd November, the IMARC Gala Dinner will undoubtedly be one of the event highlights of IMARC 2023. Join the evening emcee **Stephanie Brantz** along with Former Australian Rugby Union Players, **Nathan Sharpe** and **John Eales** in a fireside chat, aptly named Green and Gold: Mining and the Wallabies - A Fireside Chat Between Two Australian Rugby Captains.





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Forging Strong Supply Chains with Bisalloy Steel

For over 40 years, Bisalloy Steels has proudly been Australia's only manufacturer of high-strength, abrasion-resistant, quenched and tempered steel.

They've built a reputation for high-quality, innovative steel manufacturing with products designed to perform in the world's toughest environments – from mining and construction to energy, transport and defence. But what truly sets Bisalloy Steels apart is their expansive network of local steel processors.

Local steel processors play an important role in the Australian mining industry. Heavy mining machinery and equipment requires a ready supply of quality steel plate, specialist skills and equipment. After all, transforming steel into fortified instruments of strength, whether it's for truck bodies, shovel buckets, chutes, large diameter pipes or other mining infrastructure, is not an off-the-shelf order.

The significance of having an established and robust local supply chain in the

vast expanse of Australia's mining and industrial domains cannot be overstated. Each partner brings a unique expertise and skilled workforce to the table.

Bisalloy's extensive network of steel processing partners spans the nation. This network has been built over decades of servicing fabricators, OEMs and maintenance teams across the country.

Specialist cutting and forming of a technically demanding product is available across regions and in cities.

This national network of processing partners provides a local supply chain. And since time is money, that isn't just a luxury – it's a necessity that drives operational efficiencies.

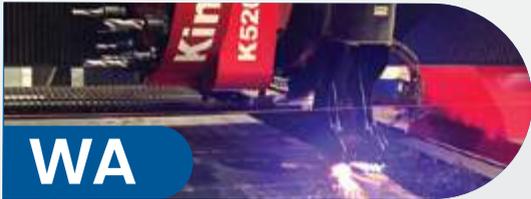
Reduced lead times and seamless communication are the hallmarks of a

localised supply chain, providing Bisalloy's customers with a strategic edge.

The assurance of prompt and reliable support when it is required is a lifeline that ensures uninterrupted activity on your sites. Bisalloy and partners make it easy to get the support you need, when you need it.

The Bisalloy network is proudly Australian-made. It's a great example of the value that emerges when local talent converges to support the industry. These partnerships ripple beyond economic transactions – they strengthen the Australian manufacturing and mining sectors more broadly, driving growth and sustainability.

**Discover why Bisalloy Steel
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WA Cutting

A leader in supplying quality steel processing to Perth and the WA market

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- Additional services: pressing and rolling, stud welding and machining



QLD

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Cronos Steel

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- HD Plasma and Oxy-cutting
- State-of-the-art CNC machinery



NSW

Sydney & Newcastle
Precision Oxycut

Locations in Sydney & Newcastle to cater for the whole state

- Services include: cutting, drilling, tapping, boring, forming and machining
- Oxy-LPG cutting machines capable of cutting 300mm plate



SA

Adelaide
Ferrocut

South Australia's heavy steel plate specialists who excel at complex problem-solving, including:

- Ultra-High Temperature Plasma including bevelling to 3.5m x 22m and 80mm thick
- Industry-leading laser equipment and can cut steel to 2.4m x 6.5m and 20mm thick with tolerances of -1mm or less



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CONVEYORS BEING DOWN GOT YOU DOWN?

A BRIEF LOOK INTO SELECTING THE RIGHT CONVEYOR MONITORING SYSTEM FOR YOUR CONVEYOR APPLICATIONS.

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HAWK's Fiber Optic Sensing System installed on a Conveyor Belt.

HAWK's Fiber Optic Sensing System is modular in design and can monitor up to 80km (50mi) of conveyor in real-time 24/7.

Conveyors by their very nature are large, complex, and have many moving parts. Ask any mechanical engineer and they will tell you that the first point of failure in any system is going to be wear on moving parts.

Thankfully, technology has progressed, and new types of sensors and data analysis techniques have developed to the point that autonomous monitoring of moving, and vibrating conveyor components are now available. The limitation now lies in the practicality of installing, commissioning, and maintaining sensors over long expanses of overland conveyors.

Normally this limitation means that critical pulleys at the head, tail, and return take up are monitored with a smattering of other instruments used at different locations of interest. However, the majority of moving components (Idlers) are not actively monitored and still rely on manual daily inspections (sometimes called belt walks) in order to determine ongoing wear and replacement needs.

Distributed sensing systems are a disruptive technology to multiple ongoing monitoring applications including but not limited to conveyor belts. They are more accurate and reliable than the existing manual inspections. There are many benefits that come with installing a single passive sensing element that continuously monitors all the carry and return idlers on a belt. But first, it is best to learn how fibre optic sensing works.

The general principle of operation of fibre optic sensors can be best described as a combination of time of flight for determining signal origin (similar to a radar or sonar) and backscatter diffraction. In simplistic terms, the energy from vibration and temperature changes the properties of the glass within the fibre optic cable, which change the way light is refracted by at that point in the fibre. By analysing the time of flight and the change in the diffraction pattern, it is possible to determine what is happening at any point along the fibre optic cable with no need for further sensing elements.

Distributed Sensors come in a couple of different configurations; however this articles focus is on fibre optic sensing using Hawk Measurement Systems' Praetorian

Fibre Optic Sensing system. The Praetorian Fibre Optic System utilises Distributed Acoustic Sensing (DAS) for detection of idler vibration and Distributed Temperature Sensing (DTS) for overhead heat and fire detection when used for conveyor monitoring applications.

When determining the best option for autonomous conveyor monitoring, consideration should be given to the combination of acting as a condition monitoring and emergency monitoring system. Primarily a pair of fibres mounted to the stringers of the conveyor monitor idler vibration and a single catenary supported fibre sits above the material under the weather shield which looks for localised increase in air temperature caused by fire on the belt.

By installing these fibres within Hawks HFC (Hawk Fibre Casing) the amount of vibrational energy detectable with the fibre is increased, leading to earlier detection. The fibre is protected mechanically from both interference and impact and from ongoing build-up of dust and other materials.

Subsequently, utilising just a few fibre optic cables, a single system can monitor kilometres of conveyor belt in an autonomous and continuous fashion, determining both the quality of operating condition and monitoring for emergency conditions. This is all done from a single powered unit with a single point of input to DCS or SCADA systems in a simple to understand priority (traffic light) based system. It also uses GPS tag position and historical data that is ready at the touch of a button.

Additionally, HAWK's User geographical information system graphical user interface (GIS GUI) is accessible from any mobile connected device allowing inspectors to look up the date alarm information in the field during their normal duties. Operators and managers can also look at the condition of the belts and place their orders for replacement idlers appropriate to their measured future needs. **AMR**

If your organisation is looking for ways to improve the reliability of new or existing conveyor belts, then contact Hawk Measurement Systems today for a technical discussion and/or presentation or visit

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Accurately Measure Level Through Dust Suppression Sprays

Hawk Measurement Systems (HAWK) is a world leader in level, position, and flow measurement, providing cutting edge equipment to the global industrial market.

With 30 years of experience and a record of success in a wide range of areas including mining/mineral processing, water supply/wastewater, bulk material handling and chemical.

HAWK's on-going commitment is to provide industry leading technology and cost-effective solutions.

HAWK designed and developed a powerful level transmitter that accurately measures level through dust suppression sprays.

HAWK uses Acoustic Wave technology for their non-intrusive, Sultan Continuous Level Transmitter range.

Applications include, Primary Crusher Surge Bin, Secondary and Tertiary Crushers, Process Slurry Tanks, Stockpile Level Control, Truck Detection, Shuttle Conveyor Positioning Transmitter, Anti Collision Controls and more.

The major advantages that Acoustic Wave technology, brings to Mining applications are:

1. Automatic Cleaning of condensation and buildup off the face of the measuring diaphragm, that Radar technologies do not offer.
2. Continuous measurement of solids even when dust suppression sprays are activated.
3. A range of acoustic transmitters. 5Khz, 10Khz, 15Khz, 20Khz, 30Khz, 40Khz, 50Khz frequencies up to a maximum range of 300 feet, integral or remote versions.
4. Foundation FieldBus, ProfiBus PA, HART, integral two wired transmitters or remote transmitter versions.

Acoustic Wave products distinguish themselves from traditional ultrasonic and radar level products by combining low frequency, high power and adaptive gain technology.

In this way, you can measure even the most difficult level applications, such as, Primary Crusher Surge Bins, Process Sumps that suffer from condensation, froth and foam.

These applications have always been problematic on mine sites and by careful selection of transducer frequencies and housing materials, HAWK can offer process application guarantees.

A common application in the mining industry is to measure depth of ore, after a truck has dumped into a ROM Bin.

It is important to maintain a specific level of ore to protect the Apron Feeder and to indicate when the next truck can dump.

This application is challenging because of water dust suppression sprays, dust, build-up, large lump to fines, ore size, grizzly beams etc.

For this application we must always use a non-intrusive level technology that is positioned out of the way of being physically damaged by the truck and the falling Ore.

If a Grizzly is installed a position between two beams in a central position of the ROM Bin is always the best.

Two technologies are available: Radar and Acoustic level transmitters.

Both have the range capability in a dry application, but when Water Sprays are used to suppress dust, the water and dust build-up on the Radar will make it fail.

About Hawk Measurement Systems

Hawk Measurement Systems (HAWK), a world leader in level, positioning, asset monitoring and flow measurement

technology, provides cutting-edge equipment and complete solutions to the mining industry and the global industrial market.

HAWK specializes in reliable and continuous level measurement in storage silos, on conveyor belts, clarifiers, crushers and blocked chute detection with the ability to send real-time data to a computer, control room, or smartphone.

HAWK has a long history of success in the harshest of environments and applications. HAWK has won several prestigious awards for their breakthrough technologies.

Some of these technologies include Acoustic Wave, Ultrasonic, Microwave, Radar, and Fiber Optic Sensing.

HAWK designs and develops innovative measurement technology that is extremely

reliable and accurate, simple to install, easy to operate and offers maximum efficiency.

The mining industry presents unique challenges due to dust, mud, impact, abrasion and build-up of material on sensors and plant, which HAWK has successfully solved for over 30 years.

HAWK is committed to providing best-in-class products, services and technologies that will have unsurpassed value for their customers.

HAWK currently has two manufacturing facilities, headquarters in Melbourne, Australia and the USA manufacturing facility in Medina, Ohio.

For further information, contact Hawk Measurement Systems at inquiry@hawk.com.au

AMR



HAWK's Sultan Acoustic Wave Transmitter accurately measuring rock level in a rugged quarry application.

HAWK's Sultan Acoustic Wave Transmitter features a self-cleaning sensor and automatically cleans condensation and buildup off the face of the measuring diaphragm, that Radar technologies do not offer.

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Safe, Reliable, and Rugged Solutions for the Mining Industry



Hawk Measurement Systems' (HAWK) award-winning products, technologies and complete monitoring solutions help the mining industry to increase profitability and eliminate downtime.

HAWK specializes in reliable and continuous level measurement in storage silos, on conveyor belts, clarifiers, crushers and blocked chute detection with the ability to send real-time data to a computer, control room, or smartphone.

The mining industry presents unique challenges due to dust, mud, impact, abrasion and build-up of material on sensors and plant, which HAWK has successfully solved for over 30 years.

Our ongoing commitment is to develop & provide **industry leading technology** and **cost effective solutions**
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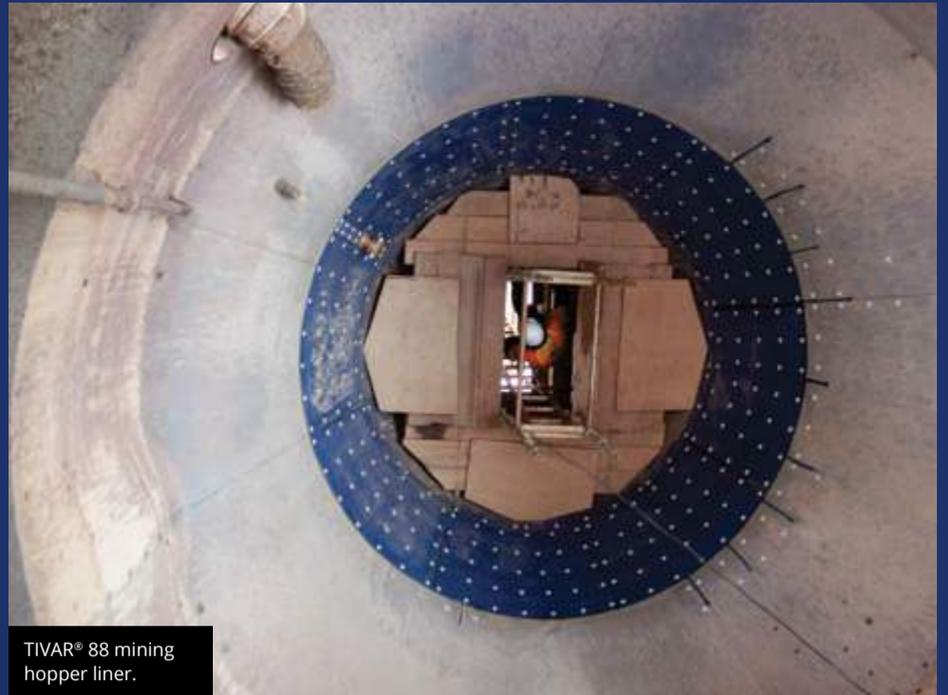


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E-PLAS GETS IT MINING IS TOUGH BUT OUR TIVAR® LININGS PLAY HARD

We get it. Mining is tough! It is hard work and it places brutal demands on vehicles and all kinds of equipment. Failure of which, can lead to lost productivity and great expense. Whether it is due to equipment failure, critical damage or just maintenance, down-time is lost time.

That's why having a product in place that preserves physical integrity is crucial. Ultimately it will increase productivity and you won't need to replace your hopper body, chute, gravel train tipper or carrier ship's hull for a long time – several years even.

That is why we recommend our TIVAR® UHMW-PE linings range and QuickSilver® Truck Lining Systems. These lining materials have been specially modified for performance under extreme conditions.

TIVAR® 88 and TIVAR® 88-2 are designed to provide solutions to many issues that cause destructive damage to equipment, structures and vehicles used in mining applications.

Integrity and quality are critical elements in working together successfully and, in this day and age, that is exactly what our customers have come to expect.

After more than 40 years of service to Australian industry and overseas, E-Plas takes pride in providing that level of certainty to our customers.

Engineering and high-performance plastics have been our forte for decades. Founded by past Managing Director Eric V. Marshall in 1981, E-Plas has continued to grow into one of the biggest and best of its kind.

With offices and warehouses in Underwood, QLD, Seven Hills, NSW, brand new facilities in Pooraka, SA, Belmont, WA, and our Head Office, main warehouse and manufacturing department located in Ravenhall, Victoria, we are well-equipped with outstanding stock holdings and in-house CNC services.

Whether it is lining a truck or a Caterpillar front-end loader or a whole system of hoppers and chutes at a quarry or mine

site, every challenge has a solution and it is always time well spent.

We always work with our clients to get things just right. Honestly, it is really a fantastic feeling when you see your materials installed in a row of giant mineral hoppers standing proud on a dock waiting to funnel tonnes of minerals for GORO Nickel onto incoming ships or admire a huge, metal beast of a concrete chute system that looks oddly like a figure from a Transformer movie and you think, "Wow! That's our TIVAR 88 lining in there!".

Knowing the Burdett's truck next to you on highway carting garden supplies is lined in QuickSilver®, well it's a good feeling knowing our material is there, quietly doing its job; just making things work better.

TIVAR® UHMW-PE linings and QuickSilver® Truck Lining Systems are manufactured by Mitsubishi Chemicals Advanced Materials (MCAM).

These materials are long established as outstanding performers in mining and bulk handling applications although their potential applications are extensive, with several modified varieties containing specific properties including anti-static and UV resistant grades.

TIVAR® 88 is the world-recognised premium lining product for bulk material handling. TIVAR® materials are UHMW-PE based engineering polymers used to solve problems related to friction, wear, material flow and corrosion.

Exemplified by the low coefficient of friction and excellent wear properties. TIVAR® 88 is noted for its performance in promot-

TIVAR® 88 liner
in chute.ed.

ing bulk solids flow of cohesive or non-free flowing materials due to its low surface friction.

This enables reduction or elimination arching, ratholing and erratic material flow challenges in bins, bunkers, hoppers and chutes, railcars and more.

TIVAR® 88-2 is excellent as it is designed so that a virtually seamless lining body can be fabricated and welded to provide a solution for nearly any application – from a seamless, drop-in liner; a framed-in liner or even a replacement liner.

Tivar® 88-2 Drop-in Liners preserve the integrity of your equipment and enhance longevity.

TIVAR® Linings can be used with all manner of harsh substances from bauxite, iron ore, cement plus a multitude of minerals, grains and other substances.

Properties include extremely favourable sliding properties with an extremely low coefficient of friction, it promotes reliable, steady bulk material flow and is resistant to aggressive chemicals.

It has very high abrasion resistance, high impact resistant, high corrosion resistance, no moisture absorption and is water repellent. It retains its properties at temperatures of -269c to +80c. TIVAR® range also includes a variety of specially modified configurations.

Applications include chutes, hoppers, silos, storage bins, surge bins, drag chain and screw conveyors, front-end loader buckets, off-road truck beds, self-unloading bulk carrier ships, reclaimer / dragline buckets, vibratory feeders / bin discharg-



QuickSilver® lining on truck tipping scoria.

ers and slider beds. Other application include wear strips, belt scrapers, conveyor skirting and chain conveyor flights.

QuickSilver® Truck Lining System, is a state of the art, industrial strength UHMW-PE continuous liner. Phenomenal integrated release agents within its premium formula makes it practically self-cleaning – no additional release agents required.

No sticking or carry-back, therefore eliminating tip-over risk. Loads dump clean by 3rd ram stage. Breathe new life into worn equipment whilst dramatically reducing replacement costs.

Weighs less than steel and aluminium, outwears abrasion, as well as impact- and corrosion-resistant. Protects integrity of the original equipment, extending truck body life for years.

Fitted in less than one day with no on-going maintenance. Suits dump and transfer trailers, bottom dumps, gravel trains. For mineral ore concentrate, clay, gravel, coal, fly-ash, salt, limestone, top-soil, sand, phosphate, cement, snow, sludge, hot mix.

We are supported by major internationals including Mitsubishi Chemicals Advanced Materials (MCAM), Rochling Sustaplast, Guarniflon and Palram. We stand firmly behind products. We also carry many other plastics such as Sustarin® Acetal, Sustamid® Nylon, PTFE, PEEK, Polycarbonate and more.

In uncertain times we need to know that our investments are worthwhile. We offer great solutions, backed up with professional service and approachability. Our business partnerships are sound, reliable and worthy of our trust.

You need to know that the products you are putting your money into will deliver and we can help you with that. **AMR**



Our linings really do work.

OLI VIBRATORS

WHERE EXCELLENCE MEETS CUSTOMER-CENTRICITY IN THE GLOBAL ARENA



In the world of industrial vibrators, Oli Vibrators stands as a shining beacon of excellence, with a track record that speaks volumes about its commitment to customer satisfaction and unparalleled product quality. As a renowned global player, Oli Vibrators has firmly established itself as the go-to choice for engineers, industries, and businesses worldwide.

Price to Performance: A Game-Changer

One of the standout features of Oli Vibrators is its remarkable price-to-performance ratio. In an era where businesses are constantly seeking cost-effective solutions without compromising on quality, Oli Vibrators delivers the perfect blend. The value proposition is simple but compelling – top-tier performance at a price that won't break the bank.

Off-the-Shelf Availability: Time is of the Essence

In the fast-paced industrial landscape, time is often the most precious commodity. Oli Vibrators recognises this and has tailored its operations to offer off-the-shelf availability. This means that when you need a reliable vibrator solution for your mining or extractive project, you don't have to wait. Oli Vibrators is there, ready to assist you promptly, ensuring your operations continue without unnecessary delays.

Mining and Extractive Industries: A Perfect Fit

The mining and extractive industries demand precision, reliability, and durability. Oli Vibrators doesn't just meet these criteria; it exceeds them. Whether you're dealing with bulk materials, demanding processing tasks, or challenging conditions,

Oli Vibrators rise to the occasion, ensuring uninterrupted operations and enhanced productivity.

Engineer's Choice: A Seal of Approval

Engineers are known for their meticulousness and their insistence on using only the best equipment. Oli Vibrators has earned their trust by consistently delivering the highest quality vibrators, meeting the exacting standards and requirements of engineering professionals worldwide. It's a testament to Oli's commitment to precision and reliability.

Global Reach with a Personal Touch

Operating on a global scale, Oli Vibrators never loses sight of the importance of personal relationships with its customers. Whether you're in Australia, Asia, Europe, or anywhere in the world, Oli Vibrators

approaches every interaction with dedication and a focus on understanding your unique needs. This personalised approach ensures that customers receive tailored solutions and support, enhancing their overall experience.

In conclusion, Oli Vibrators is not just a provider of industrial vibrators; it's a partner in progress, a symbol of excellence, and a beacon of customer-centricity.

Its unmatched price-to-performance ratio, off-the-shelf availability, adaptability to mining and extractive industries, and the unwavering trust of engineers make it a force to be reckoned with in the global industrial landscape. Oli Vibrators isn't just a choice; it's a commitment to excellence that customers can rely on, every step of the way. **AMR**



THE WORLDWIDE LEADER IN VIBRATION TECHNOLOGY

INDUSTRIAL VIBRATORS

Designed for industrial sectors

OLI is the world's top selling manufacturer of electric and pneumatic vibrators. The high level of customer service, guaranteed by 18 trading subsidiaries worldwide, and long-lasting and performing products make us always ahead.

Our vibrators are designed for industrial applications in all sectors, from the most extreme environments such as quarries, mines and foundries to the food and pharmaceutical.



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FULFILLED BY ADEPT

Have you ever thought that what may have started off in a core tray at some remote location may often find its way into your home of office?

Adept Conveyor Technologies has been involved in producing core tray handling systems in the exploration industry for many years.

From core sample tray conveyors to roller racks and benches to drill core handling systems, Adept designs and manufactures roller racking system solutions for the mining industry and exploration teams at the best price and with the shortest lead time.

Occupational Health & Safety at Site

Adept Conveyor Technologies' mobile roller conveyor racks deliver optimum workflow, efficiency and ergonomics effectively and reliably.

There is no lifting work required by core tray operators as the roller racks can be detached and moved to make other configurations.

The team at Adept can assist in the mitigation of occupational health and safety issues by providing proper hardware solutions in the manual handling of materials handling.

Static and gravity systems offer low inertia and free movement of core sample trays throughout the sampling area with ease of operation for all manual handling staff.

Most equipment requires no external power source to operate, providing the most economical options in system design and startup costs.

The cost of ownership is incredibly low, with the equipment being virtually maintenance-free.

Adept specialises solely in core shed design, using standard stock roller racking parts, and has designed many systems that can meet your exact requirements.

A wide range of gravity roller table conveyors are available to suit any core shed application.

Adept at Warehousing Solutions

The bulk of their business started more than 40 years ago in the warehouse distribution area in both Sydney and Melbourne.

During this time, the business has witnessed many changes and, more recently, the advent of e-commerce in the past 8-10 years.

Whilst many of the major distribution companies have witnessed massive expansion in their distribution warehouses, as they each strive to deliver customer orders on ever shortening delivery frequencies, others will continue to provide the basics that they as a supplier and their customers will require.

In a nutshell, all warehouse facilities will store back-up and replacement stocks of product and retain the facility to despatch the stock as required.

This satisfies the restocking demands of their branch offices and stores, or to the individual customer as a discrete order.

What Contributes to Successful Distribution?

Whilst not all warehouses will prepare smaller discrete customer orders, those that do will benefit from having a system that allows for:

- Efficient processing of orders;
- Simple pick / pack / despatch of goods;
- Optimisation of order flow throughout the warehouse;
- Integrated solution to handle the day-to-day order flow, plus the unexpected or seasonal surge;
- Adaptability to change as the business changes and grows;
- Optimal use of available space to

allow order processing to proceed whilst other warehouse operations are taking place.

Smart Warehouse System

A fully-integrated conveyor system may form part of the modern automated process and can start from a very basic or semi-manual system with the ability to be reconfigured and adapted into a "Smart Warehouse System".

This system comprises automation for:

- smart picking;
- auto-routing throughout the warehouse;
- scanning;
- carton sealing;
- weight check;
- label application and sorting of individual or batch-picked orders into dedicated destination zones for freight and courier pick up.

Generated waste from the picking process can also be quite adequately handled via trash removal conveyor systems to compactors should the volumes of generated trash be large.

Heart and Pulse of Every Business

The heart of each business lies in its stock and inventory, with its pulse dependent on how quickly and efficiently the goods are despatched

Having a fully adaptable and smart warehousing and distribution solution is the lifeblood of any business focused on physical goods.

Adept Conveyor Technologies has for many years taken the tasks presented by each unique warehouse application and designed purpose-built handling solutions to suit specific customer and site applications.

As a supplier with extensive field experience drilling and mine sites, Adept services all exploration and analysis operations at remote sites as well as large and small industrial warehouses.

Adept offers the ability to purchase direct from the manufacturer with full in-house design and engineering expertise, cutting out resellers with limited product and engineering application knowledge.

All parts are manufactured in Australia to quality benchmark standards and all systems are installed and commissioned right around Australia.

Getting to the Core

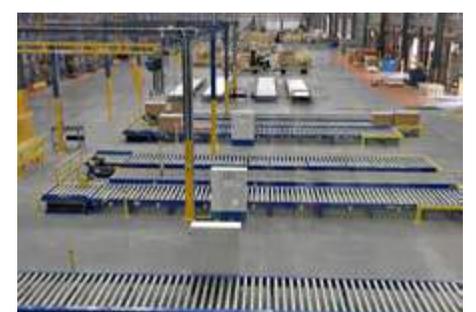
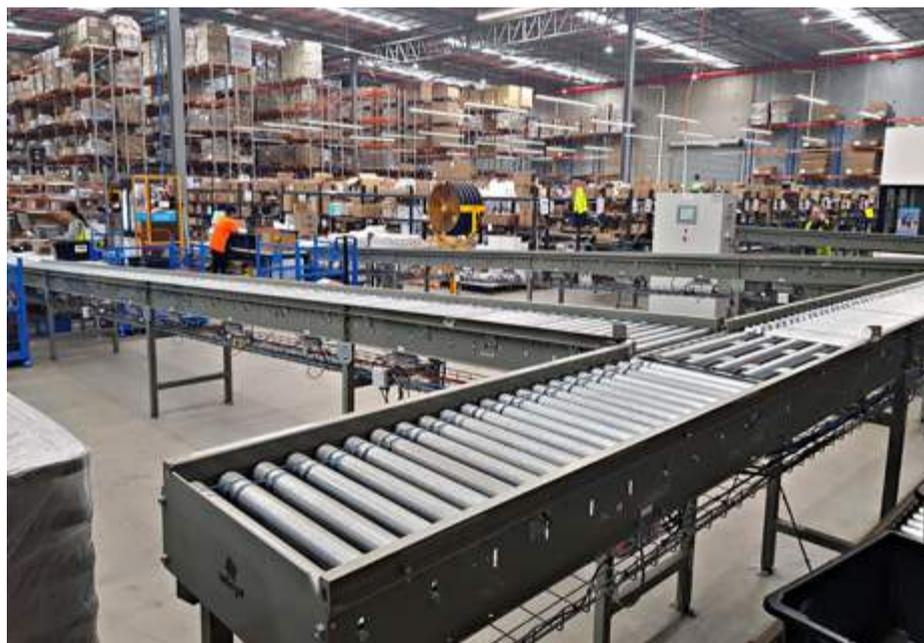
Adept has a comprehensive range of products relating to core sample tray conveyor benches.

Need some more information, or just wish to discuss what the industry is currently doing?

Contact Adept Conveyor Technologies now.

See details in the advertisement next page.

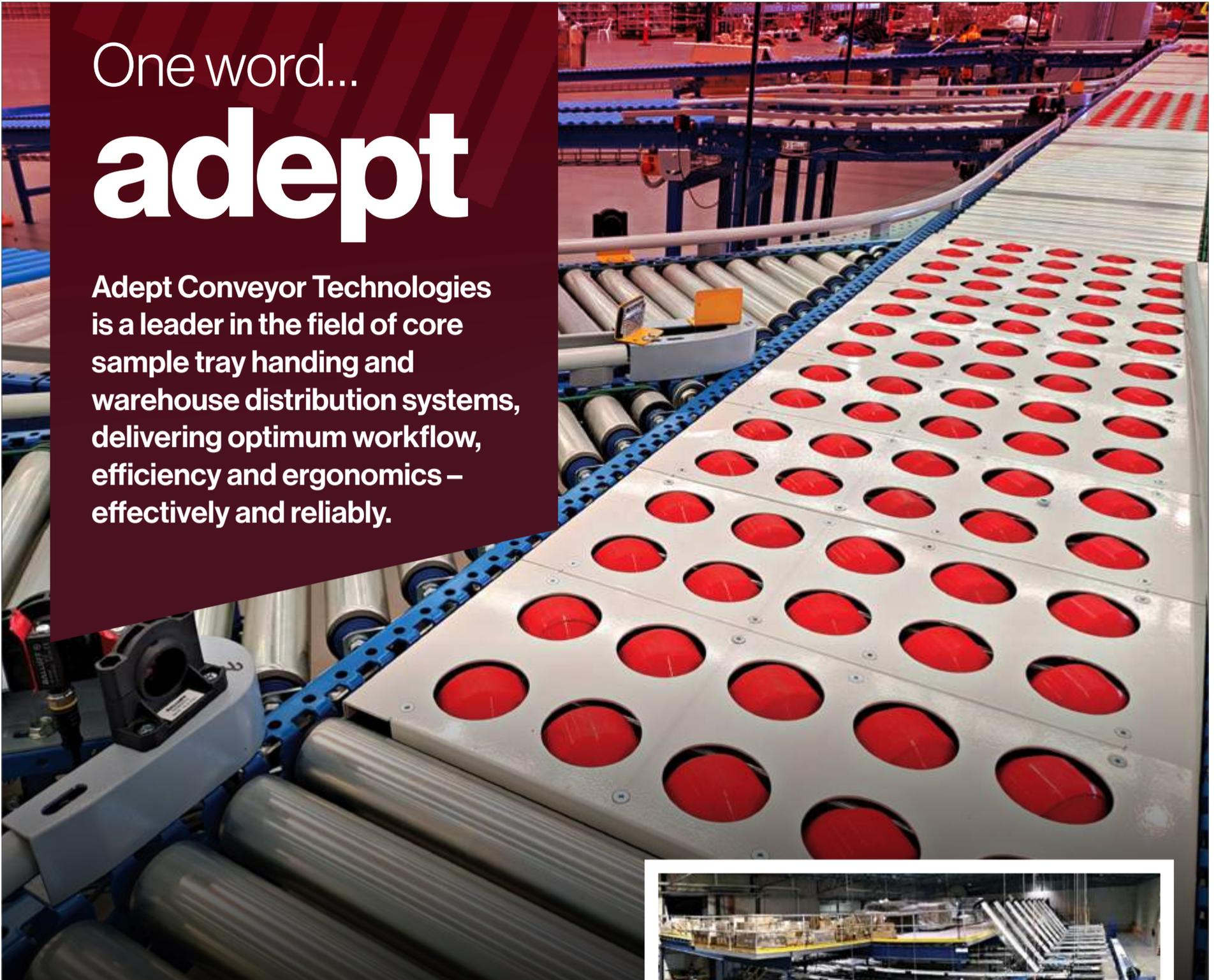
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One word...

adept

Adept Conveyor Technologies is a leader in the field of core sample tray handling and warehouse distribution systems, delivering optimum workflow, efficiency and ergonomics – effectively and reliably.



Solutions for Mining and Exploration Geologists:

For the very best core sample handling in all exploration and analysis operations.

- ✓ Core sample tray conveyors
- ✓ Core tray roller racks
- ✓ Core roller benches
- ✓ Drill core handling systems
- ✓ Static and gravity conveying equipment
- ✓ Handle and store drilling assays with confidence

Solutions for Warehouse Distribution Systems:

Covering all systems, from basic and semi-manual to smart systems, for both large and small businesses.

- Australian design and manufacture
- Leaders in materials handling systems
- Full CAD system design and engineering inhouse
- Broad product range
- Low cost – deal direct with the manufacturer
- Short delivery times
- Special requests to suit customer applications



Talk to Adept now, the conveyor manufacturer with the field experience.

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TOTAL LIQUID CONTROL

The specialised field of liquid management carries a high degree of unknown risk when it comes to mining and industrial applications. Floating, containing, or transporting liquid in different substrates that meet specific sites and processes demands a unique skillset from conception to completion.

For more than 30 years, liquid control specialists Coerco have designed, engineered and manufactured fluid management solutions.

Liquid management has been part of Coerco's DNA since 1993. Its purpose-built floating pontoons, access walkways, water and diesel storage tanks are examples of core products engineered for critical mining and water infrastructure projects in mining projects of all sizes and complexities.

Coerco truly understands what's at play in the realm of liquid management. As a seasoned expert in designing, developing and delivering practical, cost-effective solutions, the company stops at nothing to help asset owners avoid unnecessary downtime and cost blowouts.

With an in-house product design and engineering team responsible for managing the end-to-end process from design to delivery, the company embraces innovative processes and cutting-edge technology in its suite of poly product solutions.

Coerco operates 11,000m² of poly manufacturing and steel fabrication facilities, which adhere to the strictest quality control, compliance and safety standards.

An in-house logistics division also manages the delivery of assets directly to site, eliminating the need to source multiple vendors to successfully execute a complete project scope.

Reliability in an unreliable world

With three key pillars – contain, float and move – Coerco offers clients the most comprehensive solution for their diverse

liquid management requirements. This has strategically positioned Coerco as the go-to partner for mining and civil engineers whose reputations rely on delivering reliable and robust solutions.

Coerco business development manager Daniel Rignall said the company's philosophy has always been centered around water conservation and liquid management.

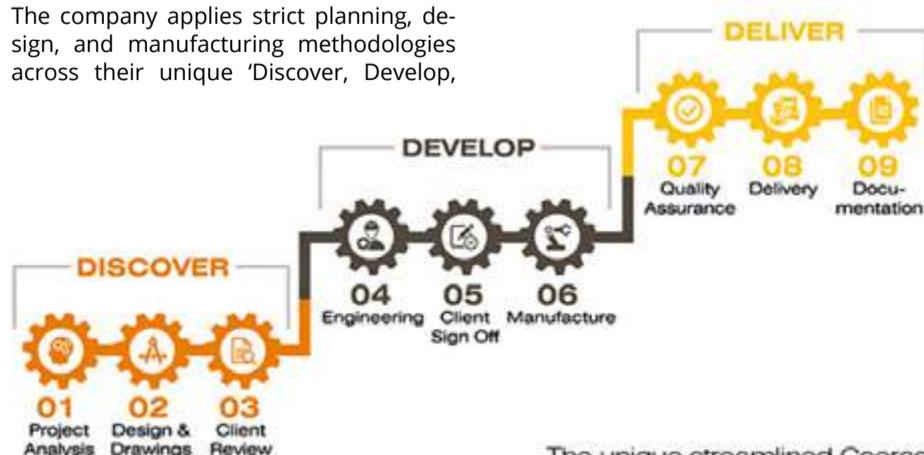
"We understand this better than anyone and is reflected in our product design, development and delivery capability," he said.

We design and engineer solutions for individual projects that are aligned to customer specifications and give them total control of their liquid management. We've been in this business for 30 plus years, and not only experienced huge growth in ourselves, but diversification in the needs of our customers and how they view their liquid management."

Discover. Develop. Deliver.

A methodically planned project is always an ideal formula to achieve a successful outcome. Coerco's carefully curated delivery pathway is one that is designed to de-risk a liquid management project and help clients navigate the complexities at every step of the way.

The company applies strict planning, design, and manufacturing methodologies across their unique 'Discover, Develop,



Deliver' framework, which aim to address one of three problems clients experience when it comes to a major project.

First, time pressures on design where clients are looking to save time on the design aspects of a project, so they can focus on other priorities. Second, skill gaps leading to cost and compliance and risks where

an inability exists to implement a project using internal resources. Third, managing multiple suppliers that adds unnecessary time and money to the equation.

"At Coerco, there's no project too complex or technical for us, and we can engineer solutions of all scales that address any total liquid management and fluid control problem," said Rignall.

"By working with Coerco, you have a single point of contact from the design, engineering and manufacturing stage, all the way through to final delivery and commissioning.

"Our structured pathway supports significant project scopes and addresses design issues with liquid management equipment that are often left unattended until time critical junctures. We essentially developed this process to nurture our clients through the pain points they experience during project delivery."

Smart & Efficient Solutions

In mines where there is a need to effec-

The unique streamlined Coerco Project Delivery Pathway: Fast, to specifics within budget



Coerco will be exhibiting at the **International Mining and Resources Conference (IMARC) in Sydney on 31 October to 2 November 2023. Visit the team at Stand MZ39** to learn more about how Coerco's liquid management solutions can take your project to the next level.

tively manage dam tailings, or support dewatering, sludge pond reclamation and dredging applications, modular pontoons and access walkways are an ideal solution. Rignall says their pontoons are commonly equipped with heavy pumping equipment for miners wanting to perform de-sludging and mining pit de-watering.

"Whether it's a heavy-duty, lightweight poly, or modular setup, the type of pontoon used can be a real game changer in liquid management," he said.

"Our pontoons provide a reliable platform when dredging pumps in high solid industrial pumping applications, whilst offering stable access walkways in remote areas during floods."

Although Coerco has built a reputation for its floating pontoons which are a common sight in many of the country's flagship mines, its bespoke diesel storage tanks are proven workhorses in maintenance sheds.

These fuel tanks are utilised in the ser-

vice of haul trucks where diesel had to previously be removed and offloaded into chemical or hazardous waste storage tanks when close to full capacity, which resulted in significant diesel wastage and site inefficiencies.

"We work closely with major miners like BHP to help streamline their maintenance activities," said Rignall.

"One example was the fabrication of a 5000L diesel transfer tank for use in an onsite workshop, which enabled our client to transfer and store diesel in an external skid, before pumping it back into the fuel tank when the haul truck was ready to be utilised back onsite.

"We designed a 5000L diesel tank that featured a single hose reel with two pumps on a skid. These enabled users to control the valve and select the right pump simultaneously, avoiding the need for two independent systems. The modified design also included the integration of forklift pockets, enabling the fuel tank storage skid to be lifted and moved around their



workshop, either empty or at full capacity. This new storage solution ended up saving BHP around 30,000 Litres of diesel that would otherwise have been wasted."

Coerco have a documented ISO 9001 certified quality management system integrated into all aspects of their operation. This ensures all products conform with relevant Australian and International standards, including all non-destructive factory acceptance testing.

A focus on innovation and quality product design have been key factors behind Coerco's success and ability to build long-term, trusted partnerships with major miners and engineering consultants around the country.

Backed by core values – care, innovate and thrive – the team is constantly pushing themselves and their capabilities to solve client challenges. Coerco is committed to investing in its people, a team that's passionate about bringing liquid management solutions to life, as well as R&D to drive product improvements.

For more information, visit www.coerco.com.au

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IMS have produced another high quality Pugmill Blender to their range of Mobile Track and Modular Electric Pugmill and Blenders. The new PM1200-20TB Track Pugmill-Blender offers twin feed hoppers with separate feed conveyors, both fitted with belt scales for independent blending of the raw material, single or twin powder hoppers offering the ability to blend two powders at once or separately along with the option to add two liquids. The plant is totally PLC automated with an improved programme and reporting system which can be operated through its own Wi-Fi to an iPad up to 100 meters away in a loader or site office.



The twin feed hoppers have a large variation in belt speed and with the front of hopper adjustable flow gates and PLC control offers accurate blending, the feed hoppers are five meters long holding 10m³ each with the option of removing the dividing wall making a single 20m³ hopper. The pughead is 50% longer than the top selling single feed hopper IMS-PM1050-16TB track pugmill to ensure well blended material, with the option of two different augur designs to suit different raw material characteristics along with two water spray bars. The hydraulic drive train is powered by a Cat C7 Motor.



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Crusher & Screen Sales Pty Ltd (CSSH) are the Australian distributors for IMS from Ireland who manufacture a range of plant including mobile and modular high production pugmills and blenders offering up to four full size feed hoppers, two powders and liquids fully PLC automated from an iPad.



IMS – PM1050-16TB Track Pugmill with adding Powder and liquids options, fully automated with production of up to 500 tonnes per hour.



IMS – BP1200-9TB Track Blender with two 5.5 meter long feed hoppers with mixer and production up to 1000 tonnes per hour.



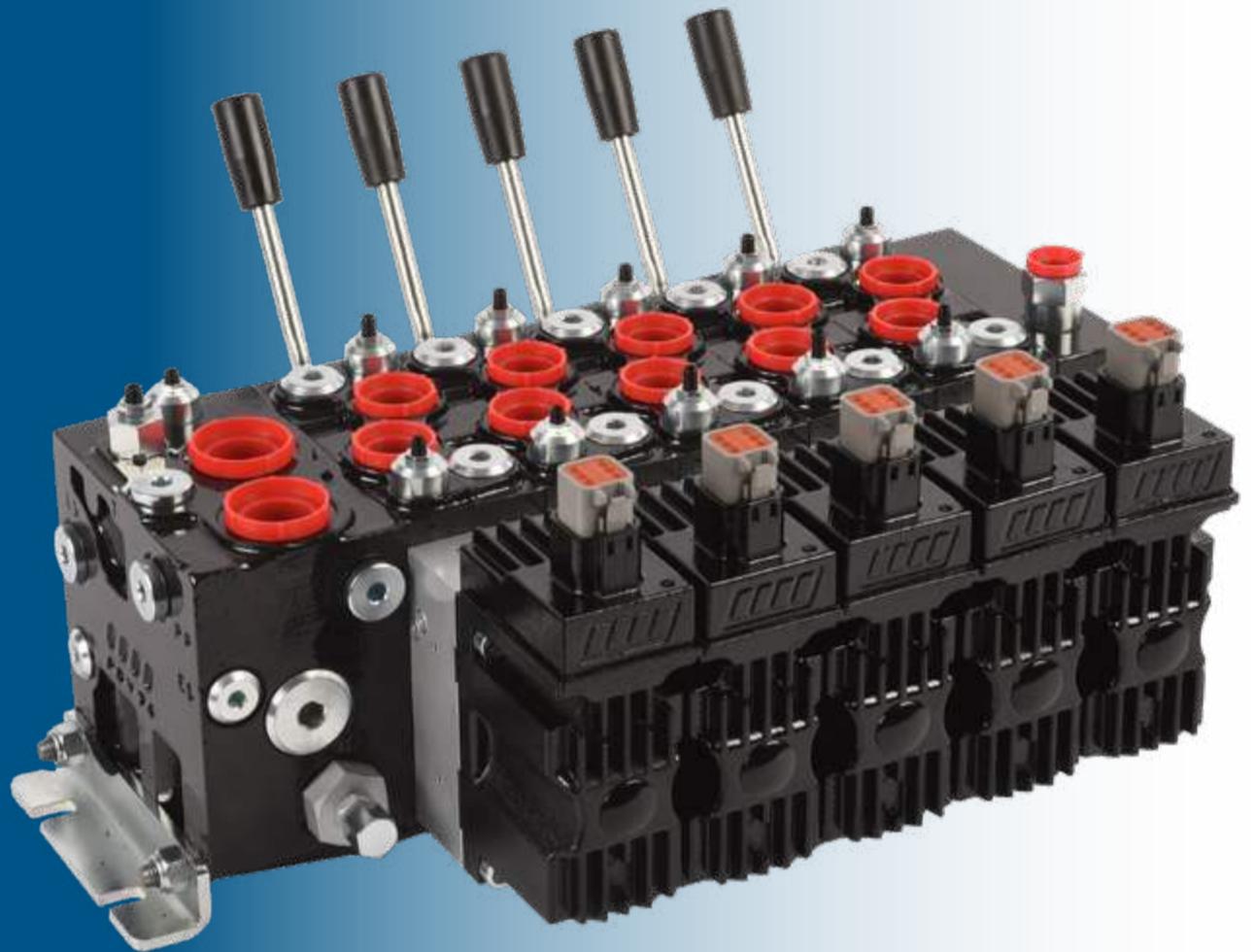
IMS electric modular Pugmill & twin hopper Blender with and 24-meter radial conveyor with auto radial return and auto lift as the stockpile height increases, fully automated and in stock. Option of four hoppers.

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OMFB LAUNCHES HYDRAULIC POWER CONTROL SEGMENT



Established as a family business in 1950, OMFB, which is short for Officina Meccanica Fratelli Bianchi (Bianchi Brothers Mechanical Workshop), got its break by manufacturing spare parts for Italian, American, English and German trucks which were being used for post-war reconstruction efforts. The core business revolved around Power Take-Off units (PTOs), pumps, oil tanks and valves. From there, it has grown into a global hydraulic equipment manufacturer.

The Australian arm of global hydraulics company OMFB has announced its launching a new business segment, Hydraulic Power Control, which will provide local hydraulic solutions, including in-house system design, as well as a new product offering. This shift in market approach is aimed at offering locally supported hydraulic solutions to the Australian mining, agriculture and mobile machinery industries.

Initially, the goal of the new business segment is to provide local engineering support, hydraulic system design and in-house proportional valve assembly with more offerings to come in 2024.

This year the workshop cleanroom was built, allowing OMFB Pacific to assemble, customise and fully test their proportional hydraulic directional valve range, PDV. With an initial stock investment of \$200k in Australia, all components are made in-house at OMFB's head office manufacturing facility in Brescia, Italy.

OMFB's PDV range feature upgraded hydraulic functions that fulfil the ever-increasing market demands for improved machine productivity, safety requirements, energy efficiency and environmental operation.

With flow rates of up to 800L/min, 370 bar operating pressure, ATEX rated components and a wide range of control signal options, the PDV allows for a high level of accuracy with hydraulic and electro-hydraulic controls for high pressure and high flow hydraulic machinery. These features make OMFB's PDV range well suited for

the mining and oil and gas industries as well as a wide variety of hydraulic mobile equipment.

The PDV complements OMFB's existing range of mobile hydraulic products including fixed and variable displacement piston pumps, piston motors, radio remote controls and supporting products such as filters and heat exchangers.

For OEMs and system integrators, OMFB Pacific invites you to reach out and discuss how they can support your business through the offloading of hydraulic system design and component selection.

**For more information,
visit www.omfbpacific.com or
email sales@omfbpacific.com**

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OMFB PACIFIC: GLOBAL HYDRAULIC EQUIPMENT SUPPLIER



The newly launched business, Hydraulic Power Control, provides local hydraulic solutions to offer locally supported solutions to Australia's mining, agricultural and mobile machinery industries.

Providing full hydraulic solutions from initial design work through to the supply of customised kits.



OMFB[®]

For more information visit www.omfbpacific.com, call 03 9330 2694 or email sales@omfbpacific.com.

AUSTRALIAN MINERS POSITIONING FOR SUSTAINABILITY LEAD

HOW 40-YEAR OLD TECH CAN HELP TAKE MINING INTO THE FUTURE

Australian miners are getting into prime position in the move to improve sustainability by shifting operations from to electric power, global giant ABB says.

Globally, multiple forces are combining to push miners to operate more sustainably, including the introduction of emission reduction targets in some markets, changing community expectations and increasing pressure from boards, shareholders and investors.

Miners account for between 4% and 7% of global greenhouse gas emissions¹. The industry's diesel truck fleet, numbering around 30,000 vehicles worldwide, is a major contributor to its carbon footprint.

"Each one of those trucks can consume a million litres of diesel a year," says Mehrzad Ashnagaran, Global Product Line Manager Electrification for the mining industry at ABB.

Diesel has long provided miners with a reliable source of power. But as environmental concerns and fuel costs grow, its drawbacks are getting harder to ignore.

Emissions from diesel are highly carbon intensive, and diesel use underground creates air-quality problems for miners and equipment alike.

Ashnagaran says Australian operators have been quick to show interest in electrification as a replacement for diesel, and are probably ahead of their peers in North America, and to a lesser extent, South America in embracing the change.

In some ways, he says, miners are ahead of the curve, making plans to move to electrification while energy suppliers are still working to bring more renewable power to the market.

In June ABB announced a new collaboration with services group Perenti and miner IGO that's undertaking a study for the design of an electrification program for IGO's Cosmos Nickel project located 30km north of Leinster in Western Australia.

With a shared vision for more sustainable operations, ABB and Perenti have been working closely together on electrification, believing it's the key to cleaner, greener and ultimately safer and more productive mining.

The partners have also collaborated on studies to provide battery-electric solutions to underground and open pit mines. At IGO's Cosmos, ABB and Perenti are examining factors including hauling operations, power distribution, energy efficiency and power management.

Climate-smart mining

ABB sees electrification as one of three major shifts in technology and innovation that together can deliver what it calls Climate Smart mining.

But the benefits aren't just environmental. For example, the ABB eMine Trolley System, which allows trucks to be powered by overhead wires like a tram or train, can cut diesel consumption by 90%. At the Copper Mountain site in Canada, it's helping Copper Mountain meet its final target of zero emissions by 2035.

While the conversion to electric carries an upfront capex cost, operation expenditure can be significantly reduced, ABB's Ashnagaran says. Running trucks on a trolley system can potentially deliver a return on investment in as little as three years, he says.

Not bad for technology that, while greatly refined over the years, first appeared in 1984.

ABB's trolley systems are part of a suite of

eMine solutions it offers under the ABB eMine™ banner, ranging from ultra-fast charging systems for mining battery-electric vehicles (BEVs) to high-power rectifiers and prefab, containerised E-houses designed to host a range of electrical and automation equipment.

Yet while electrification is a key component to making mining greener, it's not the only one.

Miners are also looking to digitalisation to lift productivity, use resources more and lower input costs. Even on sites far from major population centres, miners are making significant strides in digital.

In Chile, Gold Fields is pursuing a full digitalisation project at its Salares Norte project that's located 1300km from Santiago in the remote Atacama desert, up among the highest peaks of the Andes mountain range with elevations of up to 4900m.

At Salares Norte, remote connectivity helps reduce the number of people needed at the site, improving safety and efficiency. GoldFields is working with ABB to combine industrial analytics and artificial intelligence to integrate 25 engineering, operational and information technology systems across functional areas including the mine, processing, geology and exploration, asset management, finance, legal and human resources.

Remote locations and harsh conditions have made the adoption of the third pillar of climate-smart mining, automation, more challenging than in other industries. But technology and innovation are now rapidly overcoming those obstacles, ABB says.

For example, automation, alongside advanced technologies like digital twinning, is helping on-demand ventilation systems cut energy use by up to 50% by only pro-

viding ventilation to parts of the site where there's activity, rather than ventilating the entire site.

"The greenest energy that we have is the energy we don't use," says Max Luedtke, VP and Business Line Manager, Mining at ABB. "There's a lot of energy savings in those kinds of solutions."

ABB's Ashnagaran says there are still challenges to overcome before mines can be fully electrified, but miners shouldn't wait for a perfect solution to suddenly arrive one day before doing anything.

"The changes are going to happen in phases," he says. That means miners should be engaging with electrification early, building their own skills and knowledge base and helping suppliers understand what they need.

By acting now, they'll be better positioned for a more sustainable and efficient future, he says.

Mehrzad Ashnagaran will join Perenti's Darren Kwok and IGO's Chris Carr at IMARC 2023 for an industry panel discussing the 'Going All-Electric: Collaborating to Fully Electrify IGO's Underground Cosmos Nickel Project.'

Also at IMARC, is VP - Business Line Manager for ABB, Max Luedtke will be part of a Keynote Panel Discussion: 'Top Three Technology and Innovation Opportunities for Mining and ABB's Nic Beutler, Global Product Manager, Power System & Charging Solutions, will join a panel discussion on 'Overcoming Electrification Roadblocks - What Challenges Still Exist, and Where to Next?'

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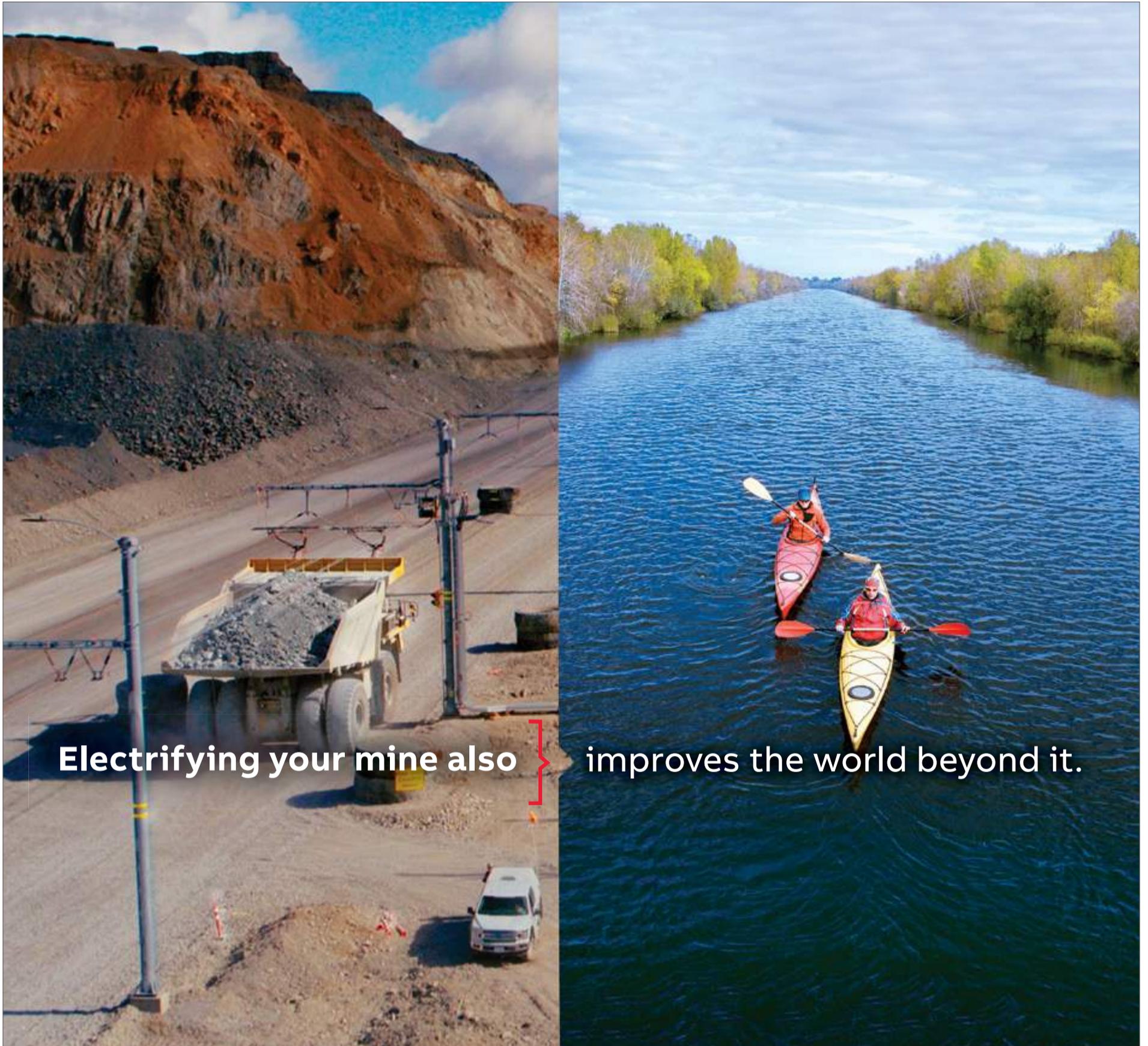
1. <https://www.mckinsey.com/capabilities/sustainability/our-insights/climate-risk-and-decarbonization-what-every-mining-ceo-needs-to-know>



A vision of ABB Ability eMine™ FastCharge with a truck ready for charging.



ABB Ability™ eMine FastCharge.



Electrifying your mine also

improves the world beyond it.

ABB eMine™ Trolley System.

For your world, and mine.

How does Canada's Copper Mountain Mine plan to achieve their sustainability targets? Through fresh thinking, innovation and collaboration. Together with important partners, ABB implemented our ABB eMine™ Trolley System, which has already reduced carbon emissions of the trucks by an astounding 90% compared to the diesel-powered trucks, while doubling the uphill speed. That's a big win for the mine, as well as the world beyond it. See the full Copper Mountain Mine story at new.abb.com/mining/emine

Let's write the future. Together.





The power cable is secured using tailor-made PU straps.



Flexibore is the perfect alternative to rigid pipe.

FLEXIBORE FOR MINE DEWATERING

When the largest coal mine in south-eastern Victoria needed to expand its pit, they chose an easy-to-handle and cost-effective dewatering solution from Crusader Hose.

Mine dewatering is critical in mining operations, especially in open-pit mines that sit below the water table. Dewatering helps prevent flooding and maintains a stable working environment.

Crusader Hose, the water logistics experts, offer water-transfer solutions to keep mines operational with the least amount of downtime.

Loy Yang in southeast Victoria turned to the Bayswater company for their flexible rising main, Flexibore, to handle their dewatering needs.

Flexibore, the easy-to-handle flexible layflat hose, is a proven and trusted dewatering system operating at many mines across Australia. Its many features benefit pump installers by reducing the time

it takes to install it. The engineers at Loy Yang were looking for an alternative to rigid pipe and selected Flexibore as the perfect solution.

The Flexibore solution

The woven polyester textile reinforcement of Flexibore gives the hose high tensile strength and burst pressure capability. It has been designed to hold the weight of the submersible pump and the water column deep into the borehole. The engineered double-coupling clamps are reliable, requiring no safety cable for the pump.

With tailor-made PU straps, the electrical power cable is secured to the side of the hose so it does not rub against the hose within the bore casing. Rated lifting clamps assist in the installation, whether by crane alone or by truck and crane.

Installation Process

At Loy Yang, the 75kW submersible pump was installed by crane. The flexible rising main was inserted into the borehole using a lifting clamp. In its dual role, the clamp also acts as a supporting point by extending across the bore casing.

A second clamp was attached and lifted so the first clamp could be removed; the pump was then lowered further down into the casing. This procedure was repeated until the borecap was finally covering the casing, and the pump was hanging at the required 90 m depth. The ease and speed of installation was comparatively quicker than had it been installed using rigid pipe.

Aussie ingenuity

Knowing the demand is growing for equipment able to manage ultra-deep bores, Crusader Hose have continued to re-

search and develop stronger layflat hose for these requirements. Crusader Hose have now developed the Flexibore 400 series, which has a burst pressure of 100 bar or 1000 m.

"Having the factory in Australia allows us to improve the design, as we have all the equipment and a great engineering team in-house," said Francois. "As we know it, Crusader Hose are the only manufacturer in the world with a 6" flexible riser with a 900 m burst pressure. As mines need to dewater from deeper within the pit, the submersible pumps must be set deeper, so a high-pressure hose is essential."

Accessories

Crusader Hose manufactures not just hose but fabricates many of the Flexibore accessories as well. Lifting clamps are an essential accessory for the safe installation of medium-to-large submersible pumps. The two sizes currently on the market are the 1.2 tonne & 5 tonne.

For installations using the Truck & Crane Method, the installation roller is reported to work a charm. The popular 5-tonne-rated roller has been redesigned with desirable features, ensuring a smoother and more efficient installation.

About Crusader Hose

Crusader Hose has been manufacturing layflat hose in Melbourne for 37 years. They know what makes a successful hose system. They are a reliable and approved supplier to the Australian Army and provide great customer service. Their warehouse has good stock levels and product backup. **AMR**



Lifting clamps are used to lower Flexibore into the borehole.



The installation was completed using a crane and lifting clamps.



Flexibore's high tensile strength supports the 75kW submersible pump.

Reliable. Efficient. Safe. Introducing the MT65 S.

18% increased productivity

Compared to the previous Minetruck MT65



5% less fuel consumed

With the new update

+36,000 operation hours

WE ARE AT IMARC!

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United. Inspired.

Efficient underground haulage for large scale mine operations.

Highly capable, highly engineered. Epiroc's MT65 S combines high ramp speeds with improved energy efficiency to dramatically increase productivity and reduce fuel consumption and overall running costs. A powerhouse in underground operations, the MT65 S boasts the best serviceability in its segment and is the benchmark in safety for underground mining trucks - packed with smart features like automatic brake test, open-door brake-apply function, and neutral brake apply. Experience the difference today.

 **Epiroc**



epiroc.com/en-au

DIGITALISING ORE FLOWS

FOR PRODUCTION AND PROCESS IMPROVEMENT USING SCANTECH ROCKS2DATA ANALYSERS

Pursuit of improvement opportunities inevitably requires more data – data from material flows not currently measured, and high quality data that provides confidence in decisions based on that data. Such data is generated through representative real-time measurement of conveyed material quality at various points between the mine face and mill feed. Real-time data enables effective decisions that improve operational performance.

Scantech International has developed and implemented a range of conveyed based analysers specifically for this purpose.

GEOSCAN GOLD is a premium elemental analyser featuring the highest specification prompt gamma neutron activation analysis (PGNAA) technology available. TBM moisture analysers utilise transmission microwaves to provide reliable moisture measurement in many commodities.

Sizescan is a next-gen 3D Infrared camera technology used in PSD (particle size distribution) and FOD (foreign object detection) applications with many demonstrable advantages over commonly used systems.

GEOSCAN GOLD is proven in multiple commodities to provide multi-elemental data each thirty seconds of conveyed flow at high precisions at throughput rates up

GEOSCAN-SizeScan-TBM for real time multi-elemental, PSD and moisture data.

to 15,000 tph irrespective of belt speed, particle size, mineralogy, dust, moisture or segregation/layering. Many elements from carbon upwards are measured. Moisture data and Sizescan data is available every few seconds ensuring that measurements can be combined and utilised for parameters that may not be directly measurable, such as ore hardness. Moisture data on its own or in combination with particle size data can be used for material flow control (e.g. indicating stickiness and clumping), dust management, dry tonnage determination, metal accounting, dewatering optimisation, and TML (transportable moisture limit) monitoring.

Scantech's Rocks2Data approach ensures operations have access to reliable, frequent, accurate measurement data to manage ore supply quality and hence feed quality and process performance. Improvements in ore quality and consistency of process feed through bulk sorting to remove coarse waste produces major benefits including better process recoveries.

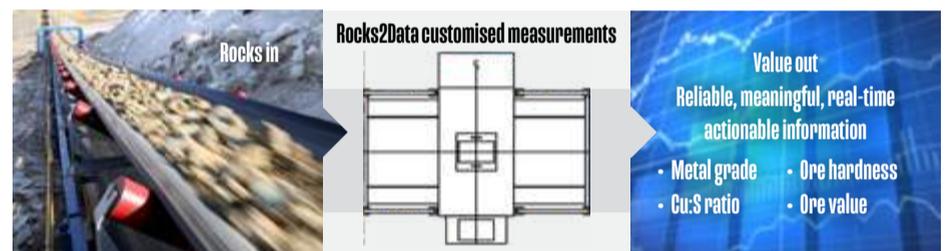
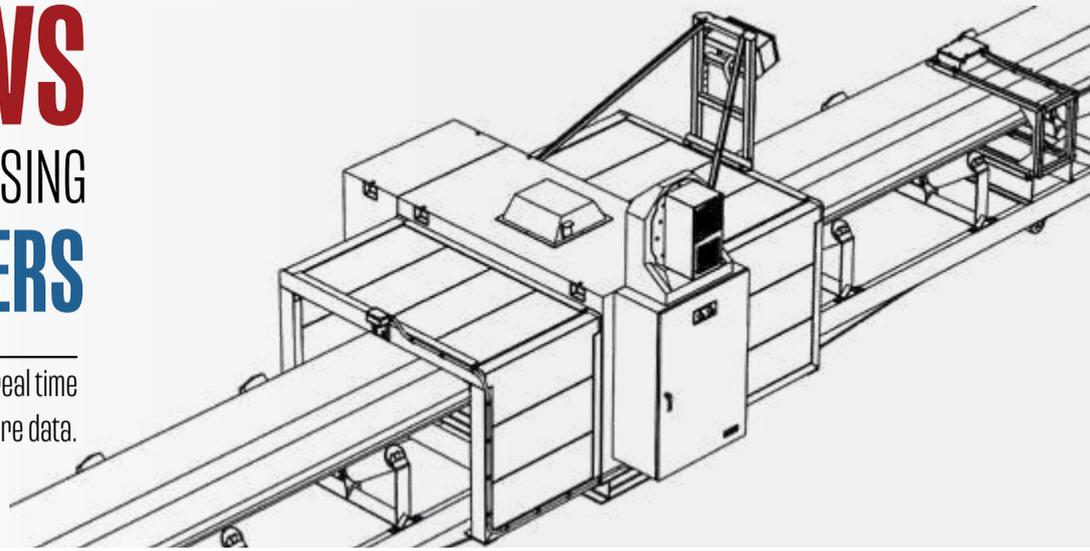
Rejecting waste generates major savings in energy, water, grinding media, and reagent consumption and reduces fine tailings generated per tonne of concentrate or product.

Reducing process feed quality variability alone can deliver up to 10% improvements in metal recoveries as a step change for mining operations. Bulk sorting has been shown to reject 5 - 20% of feed tonnes and increase feed grade by 10 - >20% while conveying material at full production rates. Representative data produced by bulk sensing technologies on post-crusher conveyed flow provides a representative

measurement of mine product and plant feed that enables effective ore reconciliation, metal accounting, ore tracking, ore blending, bulk sorting, feedback to mining teams and feed forward control for process operators.

The enabling technologies are vital for achieving improvements in process performance, resource utilisation, ESG outcomes and sustainability of mining operations.

For more information, visit www.scantech.com.au
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GEOSCAN GOLD

Premium Quality On-Belt Elemental Analyser for Minerals

World first **GOLD** analyser for conveyed ore, unique capability, proven technology, digitalising ore flows through Rocks2data customisation module.



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THE NEXT BIG THING IN MINE SAFETY IS ALREADY HERE.



Digicore's Managing Director Dan Bayley, discussing IVMS 2.0

In-Vehicle Monitoring Systems (IVMS) have been a standard safety measure on Australian mining sites for nearly two decades, delivering vehicle and driver tracking.

IVMS 2.0 is the next evolution of the technology that combines the best elements of IVMS with an AI camera featuring in-cab facing **Driver Fatigue Driver Monitoring (DFDM)**, road-facing **Advanced Driver Assistance System (ADAS)** and data GPS collection to provide unprecedented levels of driver behaviour monitoring.

Digicore is a market leader in IVMS that counts FMG, Yancoal, BHP and Theiss among its many clients. We asked Digicore's Dan Bayley what were the most important things every mine operator, HSE, and HSEQ Manager needs to know about IVMS 2.0.

1: COMBATING DROWSY AND DISTRACTED DRIVING

The big safety breakthrough with IVMS 2.0 is detecting drowsy driving. Everyone who has ever driven a vehicle knows that awful feeling of drowsiness and trying to urge yourself to be alert. The AI in our cameras is amazing. It uses eyelid and other facial movements to detect drowsiness and then sounds an alarm to the driver and also alerts the manager at the control centre.

The cameras will also detect driver distractions such as improper mobile phone usage.

2: DRIVER IDENTIFICATION

Another advantage of the camera is that it uses facial recognition and snapshots to identify drivers instead of traditional ID tags. On sites where hundreds of drivers

cover a huge area, this benefits everyone for a couple of reasons. First, it solves the problem of drivers using another driver's tag or simply not tagging on at all. It also addresses the need to use tags in the first place. With IVMS 2.0, you now have indisputable proof of who, where and how a vehicle was driven at all times, even if the driver is yet to be identified.

3: EVERY INCIDENT IN CONTEXT

With previous IVMS, you got a record of what happened but not the context. So, for example, if a supervisor was alerted to what we call an 'event' such as harsh cornering or breaking, there was no way of knowing the circumstances of that event. With IVMS 2.0, there is no more he said, she said. The AI camera captures a record of what occurred both on the road and in the cabin at the time of an

incident, providing context and proof of what really happened.

We hear from our clients who have moved to IVMS 2.0 that monitoring and detecting driver behaviour and safety concerns on mining sites have never been more accurate, simplifying safety management and compliance throughout the industry.



IVMS 2.0 UNIT & CAMERA



HE'S HOME SAFE. OUR WORK IS DONE.

It's why we do what we do. It's about creating a safer workplace so people working on mines get home to their partners, children, family and friends.

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digicore.com.au

 **Digicore**
PARTNERS IN SAFETY

STRATEGIC ENERGY RESOURCES

AND THE SEARCH FOR THE NEXT MAJOR MINERAL DISCOVERY

Strategic Energy Resources (SER) (ASX:SER) is a specialised undercover mineral explorer and project generator, focused on discovery in the Greenfield frontiers of Australia. SER's science driven, expert technical team leverage collaborations with government and private partners in its search for the next major mineral discovery.

The SER team, which is led by Dr David De-Tata, a highly experienced research scientist, is searching for the next major discovery deep undercover. The search begins with the examination of freely available, pre-competitive datasets released by government to gain first mover advantage in frontier regions across Australia. Advanced geophysics and data processing is key to painting a picture of what lies deep beneath the surface and guides ongoing exploration to unlock greenfield exploration projects across Australia.

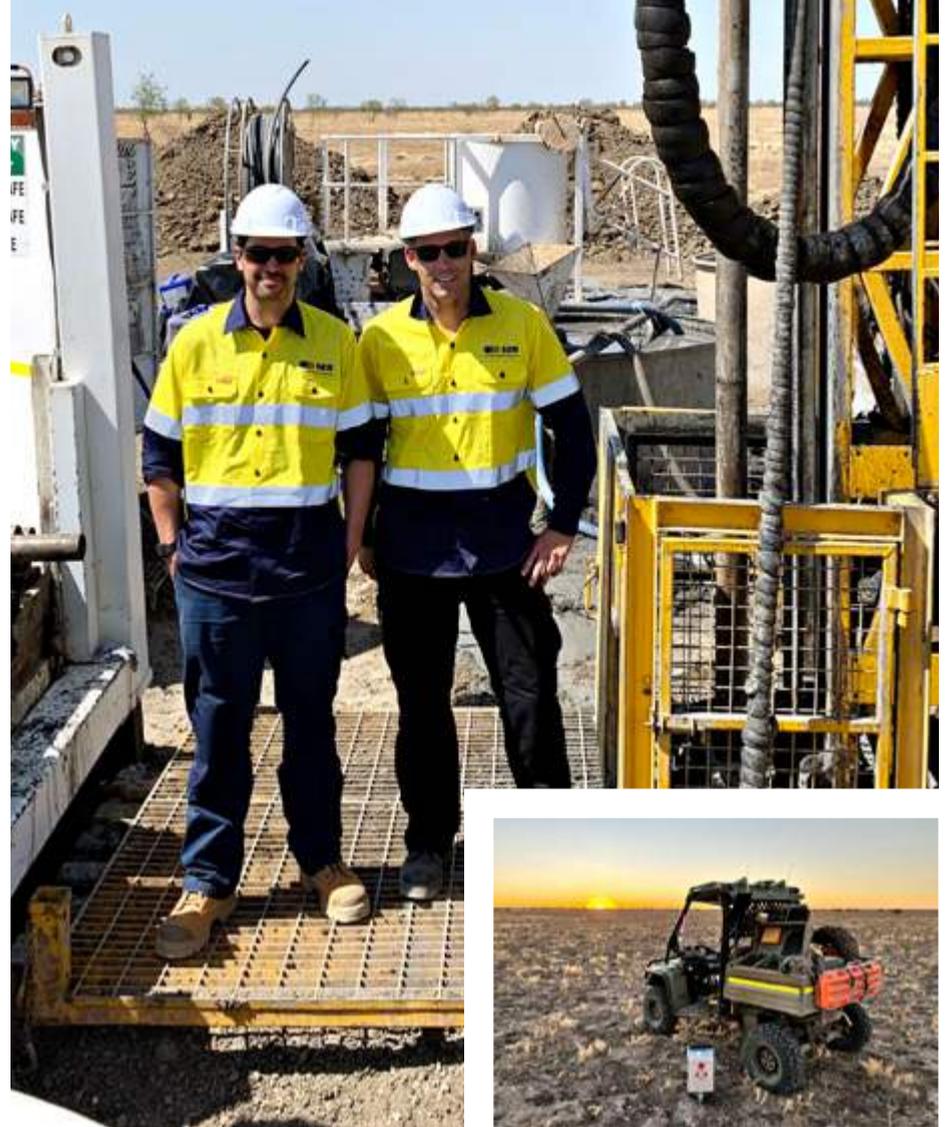
Vital to SER's success is the ability to leverage existing relationships with scientific and government agencies that the Company harnesses to maximise the probability

of exploration success through co-funding grants and collaboration with knowledge experts in the University sector.

SER's strategy is differentiated to that of a major mining company given the high level of risk involved with Greenfield exploration, but it's a strategy that has consistently gained their attention.

A recent example of this is the Farm-In and Joint Venture Agreement with FMG Resources Pty Ltd ("Fortescue"), a wholly owned subsidiary of Fortescue Metals Group Limited, to explore SER's Canobie Project in northwest Queensland. Fortescue will spend up to \$8M over six years to earn up to 80% in the joint venture.

SER has been chosen to operate, enabling drilling to commence this year with a solid program already underway searching for IOCG and magmatic nickel at Canobie. With Fortescue's support, the company is now positioned to systematically test multiple drill targets within the project over the coming years. Furthermore, appointing SER as operator shows strong support



for the team's execution capability while enabling the joint venture to also benefit from Fortescue's substantial technical and advisory capability.

This partnership, and others like it across the SER portfolio, is aligned with the company's strategy of generating, de-risking and advancing high quality Greenfields projects through a science driven approach to exploration and sharing risk and

reward to deliver benefit to all stakeholders.

Beyond Canobie, SER is accelerating exploration programs across its impressive portfolio including a diamond drill survey at the Isa North Project in northwest Queensland, yet another large-scale project along with the IOCG project at Mundi in NSW. **AMR**

SER
Strategic Energy Resources



Specialised Undercover Explorer & Project Generator

Strategic Energy Resources is a specialised undercover mineral explorer and project generator focused on discovery in the Greenfield frontiers of Australia. Our science driven, expert technical team leverage collaborations with government and private partners in our search for the next major mineral deposit.



03 9692 7222

info@strategicenergy.com.au

strategicenergy.com.au



Getting Geared Up

Shute-Upton Engineering is keeping the wheels of the Australian mining industry turning with their first-rate industrial gear services.

Established in 1957, the Queensland based company is a leading manufacturer for all types of industrial gears and gearboxes, performing all design, cutting, grinding and hobbing in-house.

With a dedicated and highly trained staff, the business is able to specialise in all areas of industrial gears precision machining as well as general work and metal fabrication.

On the team are several evaluation and inspection professionals, qualified tradespeople, and support staff, making the 65-year-old company a market leader in mining engineering, design, repair, and gear manufacturing, as well as winches and other industrial parts.

Shute-Upton Chief Executive Officer Ian

Thomas said the company uses materials such as high-strength heat treated steel and advanced manufacturing tools like CNC gear cutting machinery to deliver a durable product.

He said these measures guaranteed a high-quality service and very fast turnaround times.

"To start, clients receive a free quote and project timeframe," Mr Thomas said.

"We have in-house design and reengineering wherever needed and can offer total disassembly, cleaning, inspection and condition analysis when a gearbox needs to be repaired.

"It is essentially a full project management offering, with substantial quality control measures and testing.

"And, because we know a lot of projects operate continuously, we offer blanket 24-hour emergency support.

"You can reach us when you are in critical need at any time."

Among the company's most popular services was the repair, overhauling or refurbishing of existing gear, which has been proven to save project operators on downtime costs.

Comparisons have found gear restoration to original specifications was often cheaper than re-ordering a replacement part, while any upgrading of materials or design parameters could be easily made when necessary.

With some clients in need of parts that have become unavailable or hard to find, Shute-Upton has also added reverse engineering to its service offering. The business can extend the service life of existing industrial equipment and systems by accurately and quickly remanufacturing any industrial gear.

Mr Thomas said Shute-Upton had a pro-

cess based on experience that had been developed for over half a century and was uniquely placed to accommodate the mineral resources sector.

He said operators interested in learning more should not hesitate to get in touch.

"We operate from a large and technologically advanced factory workshop in Brisbane," Mr Thomas said.

"We are a modern workforce of professionals with an unrivalled pool of knowledge.

"Get in touch for all your gear and gearbox needs."

For more information, visit www.shute-eng.com.au
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Get into Gear with Shute-Upton Engineering

- Winch manufacture, design and overhaul
- Manufacture of gears, shafts, splines, sprockets to drawings or samples
- Overhauling all makes of industrial gearboxes
- Ratio changes
- CNC gear cutting and profile tooth grinding
- Heat treatment - hardening of gears, splines and sprockets
- CNC machining and grinding
- Manufacture and machining of any and all parts to keep the mining industry moving

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What makes us different



Emergency 24/7 Service



Free Service Quotations



All Job Dimensions



Over 56 Years' Experience

NORDFAB EXPANDS PRODUCT OFFERING WITH QUICK-FIT DUCTING



In the evolving landscape of business, adaptability and efficiency are key to determine a company's success. One such innovation that promises to enhance these aspects is Quick-Fit (QF) Ducting. This technology is poised to revolutionise the way businesses in Australia manage their ventilation and air quality needs.

Traditional ducting systems can be time-consuming and labour-intensive to install which often results in significant downtime for businesses, impacting productivity and profits. With its modular design and easy-to-assemble components, Quick-Fit Ducting dramatically reduces installation time, resulting in less disruption to business operations and allowing companies to deliver their products and services efficiently.

Traditional ducting systems often require extensive maintenance and repairs, incurring ongoing expenses. In contrast, Quick-Fit Ducting's robust materials and modular

design reduce the need for frequent maintenance. Furthermore, its energy-efficient features can lead to reduced energy consumption and lower utility bills.

Every business has unique requirements regarding ventilation and air quality control, and Quick-Fit Ducting offers a high level of customisability to meet diverse needs. Businesses can easily tailor the system to their specific space, whether it's a small office or a large warehouse.

As poor ventilation can lead to a range of health issues, air quality is a critical factor in maintaining a healthy and productive work environment. Quick-Fit Ducting's advanced filtration and air purification features ensure that businesses have a clean and safe atmosphere.

Quick-Fit Ducting is also sustainable, offering eco-friendly features. Its energy-efficient design reduces carbon emissions, not only satisfying the growing demands



of environmentally conscious customers but leading to government incentives and tax benefits.

The launch of Quick-Fit Ducting presents a promising opportunity for Australian businesses to enhance operations in numerous ways. From streamlined installation and cost savings, to improved air quality, sustainability and operational efficiency, the benefits are clear and compelling.

Quick-Fit Ducting offers a practical and forward-thinking solution that aligns with the needs and values of Australian companies, leading to a brighter and more prosperous future for businesses.

**For more information, visit
www.nordfab.com/en-au/,
email contact@nordfab.com or call
1800 673 828.**

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NORDFAB AND THE LAUNCH OF QUICK-FIT DUCTING



The launch of Quick Fit Ducting in Australia marks a significant milestone in the Dust and Fume industry. This innovative ducting system promises to revolutionise installation processes, making it faster and more efficient for professionals. With its introduction, Australian businesses can now enjoy enhanced ventilation solutions that save both time and resources.

**Visit www.nordfab.com/en-au/
email contact@nordfab.com
or call 1800 673 828
for more information**





LEADERS IN AUTOMATION, MONITORING & CONTROL SYSTEMS

TeleRadio Australia is a leader in automation, monitoring and control systems for the mining industry. From autonomous drill rigs and drill monitoring systems to automated crushing plants and road trains, TeleRadio can devise a customised solution to suit any client.

Telemation is a division of TeleRadio Australia & New Zealand. TeleRadio Australasia's Managing Director Kjell Blom said: "Telemation is specifically applicable to the Australian mining industry and other mobile equipment operators.

With offices in Perth, Victoria, Sydney and Christchurch, New Zealand, TeleRadio is perfectly positioned to develop tailor-made automation and remote-control solutions for a broad range of mining clients. If a client wants something that doesn't exist, we make it for them."

"If a client is running a fleet of trucks, they find that Volvo, Mercedes, Caterpillar and

Komatsu, for example, all have their own solutions, and they have to go to multiple webpages to monitor the assets. We can bring all of them into one cloud so they can monitor all equipment from one place and in one format."

A point of difference between Telemation and its competitors is its ability to offer a total in-house solution.

Water truck solutions

HYDRASET is an advanced and user-friendly automation and control system, which has been purposely built for water trucks. Its remote control and Human Machine Interface systems are designed to simplify operation while providing the operator direct access and control over functions such as:

- Protecting the Pump & PTO
- Operation of the Water Cannon and Hose reels
- Individual Sprayer and Dribble Bar Control

- Mode Selection, Highway mode/Site mode (allowed axel pressure)
- System Status (Water Level, RPM, Oil Level, Pressure, speed, hand breaks)
- System protection (Pressure, Oil, Water Level, Over Speed)
- Current location and route information (Telematics)
- Data Logging and Cloud Upload (Telemetry) or locally stored

The control system software features configurable interlocks, alarms and alerts for preventative maintenance and safer operations. Just about any sensor can be plugged into the system and used as a system diagnostic, safety feature, or for damage prevention control.

Light tower solutions

TeleRadio has a range of different control solutions available to suit the needs of customers with light towers. Its vertical mast and compact light tower control systems are innovative and user friendly

to simplify operations. Its control system software features configurable alarms and alerts for preventative maintenance and safer operation.

The system's hardware allows additional sensors to be installed and used for system diagnostics, as a safety feature or to prevent theft and damage.

Low engine oil or fuel alerts can be provided to site and fleet managers while an angular tilt sensor can trigger an alert when the tower is tipping too far.

An inclinometer can be installed on the tower can provide an early warning of high winds, allowing enough time for a remote command to safely retract.

For more information about Telemation and its unique product range, go online: <https://telemation.com/>

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Elevating Industrial Efficiency

How Telemation Australia Leads the Way in Automation and Control Solutions

As leading providers of automation and control solutions with over 50 years of combined industry experience, we've been delivering innovative remote control and automation solutions to some of Australia's largest companies. Our services extend across a multitude of industries, such as mining, manufacturing, cement plants, coal-fired power stations, airports, food processing, grain, recycling, ports, terminals, logistics, and freight. We work closely with our clients to design and engineer solutions that are tailored to their unique business needs, ensuring that the systems can evolve along with them.

Telemation's adaptable systems are designed for harsh conditions and we only utilise internationally recognised products. This approach ensures that our clients benefit from solutions that have stood the test of time. Given Australia's vast landscape and the remoteness of some operations in sectors like mining, oil, and gas, we've specifically designed our products to tackle these unique challenges. Our aim is to minimise downtime and improve efficiency, solidifying our position as industry leaders in automated solutions. We operate internationally with offices in Western Australia, New South Wales, Victoria, and Christchurch, New Zealand, offering custom solutions to any site.

With the integration of Tele-Radio's advanced remote control systems, we've been able to add an extra layer of efficiency and control to our automation solutions. Tele-Radio, a company with over 65 years of experience, specialises in safe wireless and radio remote control systems. While our core services already aim to reduce downtime and increase productivity, the inclusion of Tele-Radio's technology further refines the seamless operation of machinery and equipment for our clients.

Come visit at the WA Mining Conference & Exhibition Stand E135

TRADING AS:
tele radio
WIRELESS SOLUTIONS
AUSTRALIA

MINING AND BULK HANDLING SOLUTIONS

Treotham Automation and igus® have revolutionised the mining industry with their cutting-edge energy chain solutions and lubrication free bearings designed to address the unique challenges posed by this demanding sector.

Treotham Automation, a leading supplier of industrial components and products, is the official igus® distributor for Australia & New Zealand. Together Treotham and igus® deliver innovative energy chain® systems tailored specifically for mining and bulk handling applications.

Mining operations are characterised by harsh environments, constant vibrations, abrasive materials, and extreme temperatures. Traditional cable management systems struggle to withstand these conditions, leading to frequent maintenance and downtime. In comparison the igus® energy chain system is a robust cable management system that ensures reliable and continuous power supply to the many moving components in mining machinery. What sets energy chain apart is its durable construction, utilising high-performance polymer materials that resist wear, corrosion, and impacts. This makes energy chain ideal for withstanding the abrasive particles and rigorous conditions often encountered in mining operations.

Furthermore, igus® energy chains® are designed with a modular approach, allowing for easy installation, customisation, or expansion. This adaptability is crucial in the

ever-evolving mining landscape, where machinery and equipment configurations can change frequently. Lubrication is generally the only protection for the dozens of components, such as bearings, that make up these complex machines.

Traditionally, lubrication points are maintained manually using cost-intensive 'loss lubrication' systems, which continuously press lubricating grease from the machine's interior to the outside. Maintaining all the required lubrication points on equipment like an excavator not only takes time, but inadequate or irregular lubrication can lead to expensive breakdowns, therefore limiting machine availability.

However, quality lubrication-free bearings are now giving machines and their owners an opportunity to extend component wear life, reduce their maintenance costs and improve their environmental impact.

'Self-lubricating', 'lubrication-free', or 'dry running' plain bearings simply refer to plain bearings that don't require additional lubricants. This means, machines, systems or devices don't need not be stopped in order to relubricate the bearing points to keep the equipment from failing, nor are oil changes or fully-automated relubrication systems necessary.

According to Treotham WA Branch Manager, Tim Robinson, the company's iglidur® plain bearings continue to exceed customer expectations on mine sites around the world."

"The new igutex® TX2 and TX3 range are designed for the toughest applications, and feature new fabric bushings made from high-strength filament fabric," Mr Robinson said. "They are heavy-duty, high performing bearings that provide equipment owners with a cost-effective solution compared to lubricated metallic plain bearings that require grease as part of the system.

The igutex® TX2 & TX3 plain bushings were developed for use in particularly highly loaded bearing locations (e.g. mining and construction machinery, agriculture and plant construction). Due to its incorporated solid lubricants, the high-strength, wound construction ensures low-friction and maintenance-free operation, without the need for external lubrication."

Treotham Automation's partnership with igus® brings a wealth of experience and engineering expertise to any project, whether it be a new build, adding to an existing system or a maintenance program. Their combinations go beyond traditional cable management, incorporating smart designs that reduce maintenance requirements and minimise downtime. This directly translates to increased operational efficiency and overall cost savings. With support personnel and fully stocked warehouses in each state Treotham provides the all important "local support" for immediate contact and quick product supply. **AMR**



igidur® TX bearing range, perfect for heavy equipment.



igus® energy chain for mining.

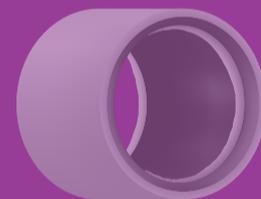
For more information, please visit <https://www.igus.eu/info/fiber-composite-plain-bearings-high-load>

Contact:
Treotham Automation Pty Ltd
www.treotham.com.au
1300 65 75 64



High load-Low wear

Energy Chain & Bearings for mining industries.



Energy Chain for bulk handling

Bearings that keep going.



Link to website pages



Select from the



TX1, TX2 or TX3

igus®

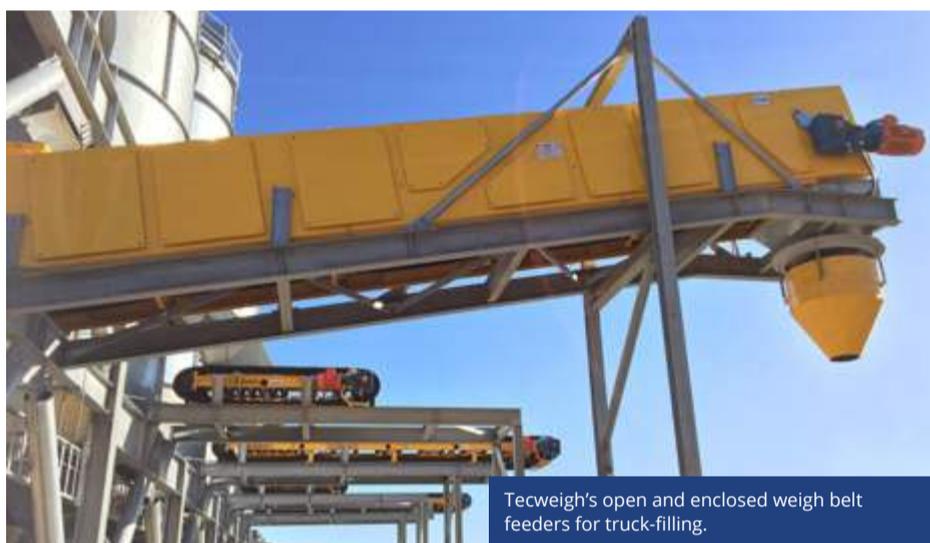
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WEIGH MORE PRECISELY AND RELIABLY



Tecweigh's WY15 conveyor belt scale combines Stainless Steel IP66 load cell technology with rugged long-term accuracy.



Tecweigh's open and enclosed weigh belt feeders for truck-filling.

For a trusted partner in precision equipment, look no further than Tecweigh, the leader in quality bulk materials weighing.

With scales in continuous operation for over 30 years, Tecweigh is your ideal solution partner for weighing and material handling in the mining and aggregate industries.

Tecweigh's professional team works with clients to prepare tailored weighing solutions including on-site service.

All weighing products are manufactured in Australia and there is a full testing, spare parts and repair services team ready to be deployed across the country.

Conveyor Belt Scales

Conveyor belt scales, also known as Weightometers, are integral instruments in the mining industry, designed to weigh products as they flow on a conveyor belt.

Tecweigh is a leading designer and manufacturer of belt weighers and is still experiencing success with its next-generation product, the WY15 Conveyor Scale.

In keeping with the company's tradition of unbeatable accuracy, dependability, and ease of use, Tecweigh's WY15 single idler (+0.5%) or dual idler (+0.25%) conveyor belt scale combines the unique time and labour-saving features of its belt scale calibration with strain gauge load cell technology.

It utilises two hermetically sealed stainless steel IP66 bending-beam load cells, featuring a rigid all-welded construction, making it more reliable, durable and thanks to inbuilt calibration weights is

easier to use than other scales on the market.

Tecweigh's equipment features: powder coated or stainless-steel frame and speed sensor; low voltage input power 9-36V DC; LED scoreboard displays; outdoor stainless cabinets; wireless remote rate/total displays; and industrial network communication protocols (Ethernet, Profibus, DeviceNet, Modbus RTU and others).

Weigh Belt Feeders

Many of Tecweigh's weigh belt feeders have been in operation for over 15 years, making them the most rugged Weighbelt Feeders in the mining industry.

Whether it is used for conveying, blending, loading or batching, Tecweigh's weigh belt feeders can withstand the rough handling and the toughest material, day in and day out, thanks to its rigorous design, testing and construction.

While the standard range for the weigh idler system is from 100kg/hr to 1000t/hr, Tecweigh can custom design for greater capacities, with no impact on its high performance.

Tecweigh's weight belt feeders use stainless steel, hermetically-sealed load cells.

Calibration is quick, easy and safe, utilising self-storing calibration weights that eliminate any bulky chains or awkward hand-on weights.

Being sized for specific applications means these weigh belt feeders provide the most accurate calibration possible and the most exceptional accuracy for clients. **AMR**

Custom engineered weightometers & other weighing solutions

Tecweigh Weightometer



Tecweigh weigh belt feeder



Tecweigh Weightometers or Conveyor Belt Scales are designed to measure accurately your product throughput whilst employing your existing idlers - No Special Weigh Idlers are required.

Tecweigh Weigh Belt Feeders offer an extensive range of models. Available in throughputs from 100 kilograms per hour to 1,000 tonnes per hour, our Weigh Belt feeders are available with a custom design for greater capacities. They can be used for Blending or Dosing together with Truck Filling- Benefit only one trip to the Weighbridge.

Tecweigh Products have Accuracies of +0.5% for a Single Idler Scale and +0.25% for a Dual Idler Scale. Instantaneous and Total throughput is available from the WP20 Weight Processor which can be equipped with an Ethernet/IP Modbus TCP communications option.

This allows your Plant PC/ PLC to access all Scale parameters in real time and control the process optimally.

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HALLITE SEALS AUSTRALIA SOLIDIFIES ITS LEADING MARKET POSITION WITH THE ACQUISITION OF SEAL TEAM AUSTRALIA AND AB SEALS

THE ACQUISITION WILL STRENGTHEN HALLITE'S LOCAL CUSTOMER-CENTRIC TEAM, FOR EXCEPTIONAL CUSTOMER SUPPORT

With the acquisition, announced in March of this year, Hallite Seals Australia gained a local team of experts with extensive polymer engineering experience and seal design knowledge, as well as adding local hydraulic seal testing facilities,

"The objective of this acquisition wasn't just about creating a larger company, it was about setting a new standard of excellence in service for our customers," said John Curtis, Global Managing Director for Hallite.

Hallite is integrating the SealTeam group into its brand, and Neil Tindle, the company's Managing Director, has assumed the role of Managing Director for the combined Hallite Australia operation.

"I am excited to be a part of the team to embark on this new road within the Hallite journey," said Neil. "Our companies share a common mission to provide high-quality products, technical expertise, and nimble services." By joining forces, our teams benefit from Hallite's global support network and the support of Michelin – all while maintaining the fast service offering that our customers choose us for," said Neil.

As a result of this acquisition, Australian customers will benefit from:

Access to enhanced technical and testing capabilities – customers have now access to global testing resources, including material characterisation and endurance-based and benchmark testing

against products and materials, along with in-house testing in Brisbane.

Accurate orders, efficient delivery – Hallite's automated warehouse management system utilises robots to access stock using an energy recovery system during bin lowering and robot braking to reduce electricity costs. This efficient, accurate and reliable inventory storage and robot picking automation mean that orders are accurate and delivered fast.

Direct access to technical experts – Hallite's customer service team are engineers, giving customers access to a technical expert at first point of contact. Along with physical branches across Australia, it means customers always have direct access to mechanical, chemical, design and

polymer engineers for fast technical expertise and advice.

Access to a worldwide range of products – Australian customers have access to more than 105,000 stocked products worldwide, along with access to the largest fleet in Australia of CNC (Computer Numerically Controlled) manufactured seals.

A commitment to sustainable growth Most importantly, Hallite Australia is changing its focus from being carbon neutral to becoming a net zero company. This commitment is underpinned by efforts to reduce its energy consumption by switching to LED lighting, and installing solar panels at all its Australian sites.*

"Hallite Australia also has a significant focus on waste reduction," Neil Tindle said. "As an example, we've introduced process improvements to reduce material scrap, and recycle wherever possible. We've also changed our coolant systems from oil-based to environmentally friendly water-based alternatives."

About Hallite Seals: For nearly 120 years, Hallite Seals has been a leading supplier and pioneer of innovative sealing technologies and engineered sealing solutions for hydraulic cylinders, hydraulic systems, and the fluid power industry. Established in 1964, Hallite Australia has expanded to seven sites in six major metropolitan areas across the continent.

We pride ourselves in giving our customers complete confidence in the performance of their hydraulic cylinders. We produce premium seals, wipers and bearings of proven quality – and deliver them across the world. **AMR**

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to find out how we can help!



AI: The Geologist's New Secret Weapon

The global need for critical minerals is at an all-time high and deposits continue to increase in depth and complexity. Geologists require higher quality data to better understand their deposit but have been limited by the available industry tools – until now.

Based in Calgary, Canada, GeologicAI is a global leader in rock and resource digitization services. Using artificial intelligence and machine learning, their groundbreaking technology helps geologists with the process of analyzing core in a revolutionary, and time-saving way.

Robust, state-of-the-art, onsite trailers utilize a customizable suite of sensors to provide the most comprehensive understanding of your deposit from exploration

to production. GeologicAI uses RGB, hyperspectral (SWIR & VNIR), XRF, laser profiling (LiDAR), and magnetic susceptibility to scan core samples, process the data with AI, and upload to their Digital Core Table (online logging platform) within 24-48 hours.

GeologicAI President David Henderson explains that AI improves a geologist's job immensely. "Our main goal is to help geologists solve their problems with real-time data and an AI-based suite of logging tools," says Henderson. "With our tools they have everything they need to explore and interpret more efficiently, no matter where they are located."

Multi-sensor data is co-located on a pixel level using GeologicAI's Digital Core Table.

This proprietary software gives geologists access to AI-based tools like the Auto-Logger, Sulfide Finder, Low Element Finder ("Gold Finder") and Auto-Sampler to visualize data like never before.

Mineral specific data such as concentrations, estimated assay values, and mineral maps can be used to log consistently and efficiently. Data is easily integrated into industry standard databases and visualization software.

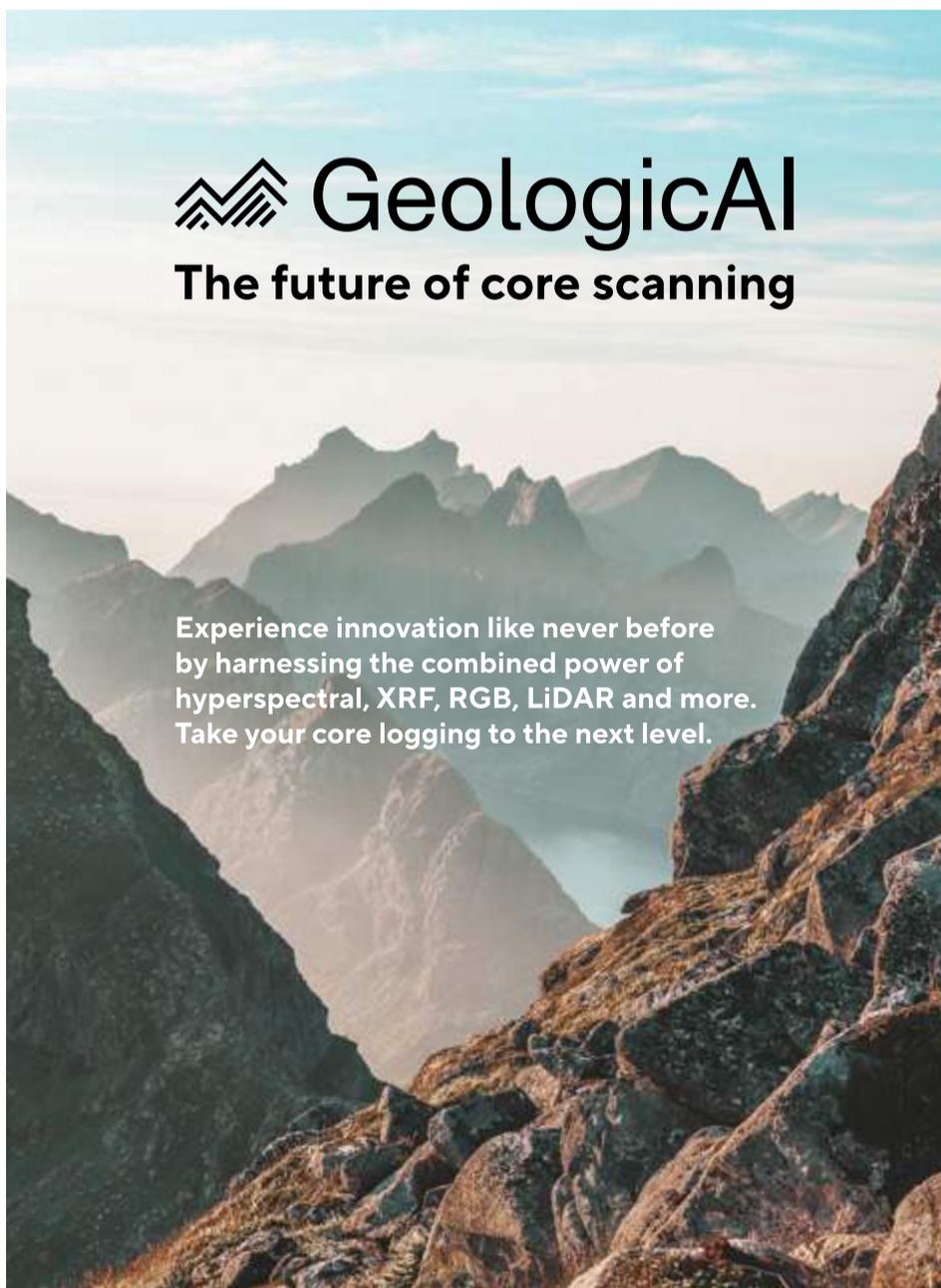
This comprehensive solution provides the fundamental data needed for detailed geometallurgical understanding and 3D modeling. Current clients have seen great success identifying new areas of mineralization, ore sorting, grade control and environmental mitigation.

GeologicAI streamlines workflows, promotes global collaboration, and offers unprecedented transparency in exploration and production mines. These data-driven insights equip geologists with powerful tools for efficient, environmentally conscious resource discovery and extraction.

Grant Sanden, CEO and cofounder, stated, "As AI-based core logging is becoming the industry standard, our focus is to provide the tools and high-quality data for the most in-depth knowledge of your deposit – it's the new secret weapon every geologist needs."

For more information, visit www.geologicai.com

AMR



Discover how our innovative scanning technologies and Digital Core Table are revolutionizing the mining industry.

Book a demo at geologicai.com



GETTING TO KNOW INDUCTION BEND MANUFACTURER: **INDUCTABEND**



Australia's premier induction bend manufacturer Inductabend specialises in high integrity heat induction bending of pipe and other sections for gas pipelines, mining and construction. Generally, if it can't be cold bent, it can be induction formed.

Founded in 1992 by Barry Crouch and Rob Stead, the business has been servicing the mining, oil and gas and building industries in Australia for over 30 years.

Its founders both had extensive experience in manufacturing and engineering, with Barry having previously worked as an engineer for the SEC and Rob owning and operating several manufacturing businesses.

Their first experience working together was running Smithweld, a specialist cold rolling and bending company.

After a few years cold rolling, the opportunity to purchase an induction bending machine, originally brought into Australia to assist with the construction of coal fired power plants, presented itself and thus Inductabend was born.

As managing director, Barry has been involved in the day-to-day operations of Inductabend from the beginning. He and other long serving employees including general manager John Rea contribute to the wealth of experience and knowledge Inductabend has at its disposal to aid its customers in ensuring their bends are made to fit their purpose.

Presently, the business is entering a transitory phase with the directors committing to the long-term future of the business in Australia. This is being done through investing in, updating and upgrading its plant and equipment, as well as continuous investment in research and development of new cutting-edge induction bending (and heat treatment) technologies.

New management is also being implemented with the introduction of Nathan and Jordan Crouch into the business. Both are experienced professionals with backgrounds in civil engineering (utilities water and gas), finance and accounting.

What Is Induction Bending?

Induction bending is a hot bending process specifically designed to produce high

quality pipe bends with mechanical properties equivalent to or exceeding those possessed by the mother pipe the bend it's produced from.

Inductabend has continued to develop and improve its capabilities, product offerings and overall quality as the core value adding proposition for Australia's industrial markets.

"We work with our customers to tailor bend geometries and mechanical characteristics to their needs. In order to ensure consistent performance of our bends we employ a wide range of destructive and non-destructive testing methods to create custom testing programs tailored to our client's pipeline application and risk profile".

Products

Inductabend owns and operates three induction bending machines that cover a wide range of applications. Pipe diameters from DN25 to DN900 with wall thicknesses of up to 100mm can be bent to the purchaser's exact desired angle and radius (generally 2.5D and up) with custom tangent lengths on each end of the bend.

Complex compound bends can also be produced, including S bends and even helical bends for specialist applications.

Induction bending is compatible with a wide range of materials including all carbon steels, alloy steels, high X grade steels, stainless steels, nickel alloys, titanium and other exotic alloys.

Recently, Inductabend internally developed a new world-first method of bending that allows us to utilise induction bending for the forming of bends with radii from 14m and up, allowing for gradual consistent changes in direction to minimise wear on steel pipelines whilst maintaining their desired mechanical properties.

Additional services such as end preparations for welding, Victaulic grooving and coating are also available to customers when placing orders with Inductabend.

Inductabend also owns some cold field benders (up to DN1200 capacity) that are available for dry hire. **AMR**



INDUCTABEND

Shaping Australia for over 30 years

We specialise in applying our

INDUCTION TECHNOLOGY

to solve seemingly intractable problems

- Induction bending of pipe up to DN900, wall thicknesses up to 100mm.
- Carbon steels, stainless steels, clad pipe and other exotic alloys
- High X grade bends
Compound bends
Helix bends
Custom OD mandrels
- Structural steel section bending
- Fully customisable bend geometry
- Other specialist heating applications
- Onsite induction bending (large diameter high volume projects)
- Cold field bending machines also available for hire (up to DN1200)

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Based in Lithgow, NSW, Henry Plant & Equipment Hire is a family-owned company that draws from over 90 years of industry-leading experience, providing earthmoving, heavy haulage and crane hire services nationwide.

As an industry-leading plant and equipment business, Henry continually strives to build long-standing business relationships, with the customer's satisfaction top priority.

Earthmoving Experts

Henry Plant & Equipment Hire specialises in bulk excavations of any material and earthmoving in any given situation.

Operating predominantly throughout NSW, Henry provides various excavation,

earthmoving and general earthwork services.

Machinery includes a range of excavators, augers, hammers, rippers, rollers, dump trucks, bulldozers, wheel loaders, graders, earthmoving compactors and water carts.

Heavy Haulage

Henry can handle any transport requirement you may have from moving dirt and materials to specialist heavy haulage.

To take all the hassle out of your next transport project, all transportation services are carefully planned before to ensure safe and efficient moving, and Henry ensures all legal and permit requirements are in place before beginning transport jobs.

Crane Hire

At Henry, all the necessary heavy lifting equipment is available, from a 4.5T mini crawler to a large mobile hydraulic crew. All are on standby for your specific crane needs.

Their ability to supply a range of cranes to suit any project ensures that Henry Plant & Equipment Hire is a one-stop-shop for all crane and access needs.

Site Rehab

Backed by years of experience and a wealth of knowledge, Henry's team of in-house project managers are available any time to discuss, oversee and design any project that needs to be taken care of.

As experts in the industry, Henry is with

you from initial consultation to design and full project implementation.

They have the experience and the right people to ensure conservation earthworks and site rehabilitation needs are met in a timely and cost-effective manner.

With a focus on zero harm, Henry's full-time workplace health and safety manager delivers rehabilitation services that comply with safety norms.

For more information and to know more about Henry's equipment availability, visit www.henry.net.au, call 02 6351 2486 or email admin@henry.net.au. **AMR**

EARTHMOVING, HEAVY HAULAGE AND CRANE HIRE SERVICES IN CENTRAL WEST NSW



Established 90 years ago, **Henry Plant & Equipment Hire** are a locally owned company servicing the Lithgow NSW region, supporting mining and industry. Henry Plant & Equipment Hire provides heavy haulage, craneage and earthmoving services, in addition to site rehabilitation projects.

Visit www.henry.net.au or call 02 6351 2486 for more information



COMMITTED TO HEALTHY AND SAFETY

Recon Catering is regarded as a leader in contract catering and accommodation services, along with facilities management, for various mining, gas and offshore industries.

An integral service provider to a range of clients across Australia, and proudly 100% Australian owned and operated, the company is passionate about fresh quality food and prides itself on giving the best hospitality and service to customers and clients.

No location is an obstacle as Recon manages set-ups to shutdowns, including rolling camps. It remains focused on catering, accommodation, and all aspects involved, including waste management, janitorial services, wet mess management, village maintenance and aerodrome services.

With a proven track record with all our current clients, Recon Catering has established a reputable work ethic from its

management to the dedicated and qualified staff.

Recon Catering has been established with a fresh and capable approach to fulfill projects on time, on budget, with quality goods and services.

Due to low company overheads and a well-skilled workforce, Recon Catering has some distinct advantages over the competition.

It establishes long-term quality relationships with clients, through high end product delivery and a flexible adaptable attitude and culture throughout the company.

Recon Catering industry competence covers a broad variety of services delivered by experiences, safe, professional, and well-mannered staff, all selected through specific recruitment process and internal training.

The Vision

It is Recon Catering's aim to become an industry recognised mid-tier service provider that delivers tailored facility management services with the flexibility to satisfy every client's personal needs.

Its teams are known for their open and proactive approach and committed to the principles of collaborative contracting. It understands that the delivery journey is as important as the final product.

Each Recon catering team is defined by the project they are delivering, and are chosen on a best-fit basis.

Recon Catering is fortunate to employ a pool of talented people, across all levels of staff from senior management to camp managers.

The core team specialises in key areas such as HACCAP, quality assurance, and environmental management.

Recon is passionate about fresh quality food and prides itself on giving the best hospitality and service to customers and clients.

Ongoing training and development programs keep our staff skills at the forefront of the industry.

The Core Team

Nigel Stevens: Founder of Recon Catering, Nigel has more than 25 years' experience in the hospitality industry, working in remote areas.

Kristina Kolosova: The Operations Manager, Kristina has been in this position for four years. Highly experienced in HR and mining/defence OH&S, she brings a wealth of experience from her six-plus-years in hospitality administration.

Victor Fitzpatrick: The company's Executive Chef plays a pivotal role in the Recon Catering team and has been with Recon for three years. A chef for over 20 years, he has a passion for great food, which is passed on through the team. **AMR**

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MAXIMISING EFFICIENCY AND LONGEVITY:

THE CASE FOR SPECIALIST AFTERMARKET EARTHMOVING PARTS SUPPLIERS



In the realm of earthmoving operations, the pursuit of efficiency and longevity is paramount. While Original Equipment Manufacturer (OEM) products have traditionally been the go-to option, a shift towards specialist aftermarket earthmoving parts suppliers is proving to be a shrewd move for operations of all sizes.

Quality That Stands the Test of Time

One of the prevailing misconceptions is that OEM products are inherently superior in terms of quality and longevity.

Specialised aftermarket earthmoving parts suppliers employ cutting-edge techniques and high-quality materials.

Research has shown that aftermarket earthmoving parts can offer wear life comparable to OEM products, if not better in certain cases.

This is largely due to the focus on refining and improving specific wear parts, with the goal of meeting the unique demands

of different earthmoving operations. Contrary to popular belief, some OEM products may lack the wear resistance required for the rigorous conditions of mining and heavy earthmoving tasks due to inadequate product selection from the outset.

The Specialist Advantage

What sets specialist aftermarket earthmoving parts suppliers apart is their unwavering dedication to a single purpose: supplying the most efficient and durable wear parts and machinery for specific operations. One of the critical factors often overlooked is the impact of Ground Engaging Tools (GET) attachments on wear life and operational efficiency. Specialist suppliers recognise the nuanced effect that correct GET attachments can have on equipment performance.

Their ability to provide tailor-made solutions for specific operations optimises wear life and also enhances the overall efficiency of earthmoving tasks.

Cost-Effectiveness without Compromise

By opting for aftermarket solutions, operations can substantially reduce procurement costs without sacrificing quality or performance.

The cost-effectiveness of aftermarket parts becomes particularly evident when considering the longevity they offer. Reduced downtime, increased operational efficiency, and lower maintenance costs combine to deliver a compelling financial case.

Price does not determine quality and a lower cost alternative should not always be viewed with such scepticism. Pricing can be more competitive when the product is not sold through a variety of dealership models.

Purchasing direct from foundry and sold to market can have a huge impact on the final price and inevitably lead to a huge price saving when compared to a more

traditional sale dealership model.

The Path Forward

The move towards specialist aftermarket earthmoving parts suppliers represents a strategic shift that not only aligns with the financial goals of operations but also elevates their efficiency and longevity.

The myth that OEM products are the sole guarantors of quality and durability is fading, replaced by the reality that specialised aftermarket suppliers are consistently pushing the boundaries of innovation.

As earthmoving operations continue to grow in scale and complexity, the choice of wear parts and equipment becomes an increasingly crucial determinant of success. The intelligent choice is clear: by partnering with specialist aftermarket suppliers, operations of all sizes can secure the highest quality, performance, and value for their investments, propelling them towards a future of unparalleled efficiency and profitability. **AMR**

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PASSING THE TEST

An essential element of working in the mining, construction or demolition industry is having your electrical equipment tested and tagged periodically according to Australian Standards AS/NZS 3760. This is something Test & Tag Training (RTO number: 40604) deals with every day as they essentially teach people how to test and tag safely across the country.

They're now officially the largest test and tag training provider in Australia, conducting courses for businesses across every state, along with providing technical support.

Anyone can learn to Test & Tag

What most people don't realise, especially in the mining industry, is that anyone can learn how to test and tag – you don't need any specific qualifications or electrical experience. What you actually need is to be considered a 'competent person', something that is acquired after successfully completing a 1-day course.

This means businesses can effectively take control of their electrical safety by nominating an employee to test and tag their workplace appliances by placing them through this easy-to-understand course, while also saving money in the long-run. They proudly guarantee that every student will be ready to test and tag after the course, having done so for over 30,000 others.

Online or Face-to-Face

Due to the unprecedented nature of



Covid-19 and how it made classroom-based learning quite impossible, Test & Tag Training had to redevelop how it taught their training. What used to be only face-to-face courses now included an online version which is taught via a virtual classroom experience.

In fact, Test & Tag Training offer the only Online Test & Tag Course that is Nationally Recognised in Australia.

With the online course, you can join in on



the virtual classroom from anywhere in Australia. For others that prefer a face-to-face version, there are Test & Tag Courses available in every state and they run multiple times a month.

The course itself involves both practical and theory, but is heavily hands-on based on learning to inspect equipment and how to use a portable appliance tester.

Lifetime Technical Support

Once you complete the course, Test & Tag Training provide full lifetime technical support that is completely free of charge. So when you're on the job and you're unsure of how to test certain equipment or how to use your appliance tester, you can email or call and a test and tag industry professional will help you out.

This is of course a big reason why Test & Tag Training were rated #1 via Trustpilot for Test & Tag Courses for the last four years running. **AMR**

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ELITE POWERED MIRRORS:

ELEVATING MINING EQUIPMENT PERFORMANCE, UPTIME, AND OPERATOR SAFETY

Mining operations have always demanded innovative solutions to optimise productivity, reduce downtime, and enhance operator safety. In recent times, Elite Powered Mirrors have emerged as a transformative technology in the mining equipment industry.

Utilising strategically placed mirrors with electronic in-cab controllers, operators now have an unparalleled view of blind spots and critical areas surrounding their machinery. This enhanced visibility enables operators to make precise manoeuvres, leading to increased productivity and streamlined mining processes.

By mitigating blind spots, Elite Powered Mirrors facilitate faster and more efficient operations, reducing the time spent on cautious movements and improving spot times. The results in heightened productivity and optimised workflow, translating into higher output and cost savings for mining companies.

Downtime due to equipment damage is a major concern in the mining industry, leading to substantial financial losses. Elite Powered Mirrors play a pivotal role in preventing such downtime by minimising the risk of collisions.



Safety remains the top priority in any mining operation. Elite Powered Mirrors contribute significantly to operator safety by ensuring maximum visibility. With these mirrors, operators can maintain an unobstructed view of their working environment, enabling them to identify potential risks and take appropriate actions to avoid accidents.

Elite Powered Mirrors have revolutionised the mining equipment industry by elevating productivity, eliminating downtime, and enhancing operator safety. Their ability to provide enhanced visibility allows operators to work with greater confidence, resulting in optimised mining processes and increased output. **AMR**



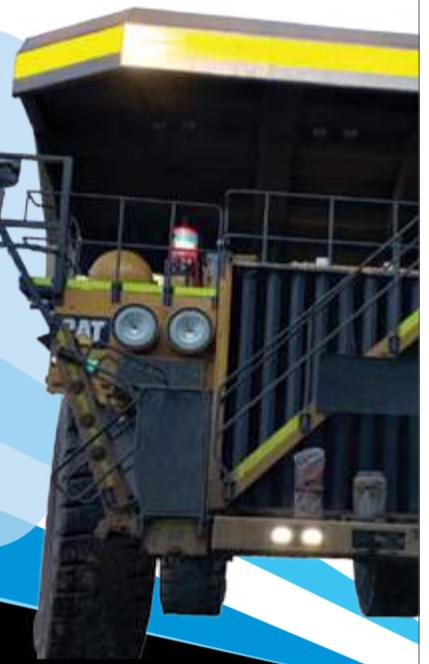
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ADX Energy Limited	M82	Aveniria Ltd	MZ01	Corehesion	PH04
Agnico Eagle Mines Ltd	MZ11	Axis Communications	J13	Coreplan	MZ17
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Alfawest Australia Pty Ltd	F41	Basin Energy	M83	Critical Input Pty Ltd	G49
Alligator Energy	M53	Beacon Events Ltd	MR01	Critical Minerals Group	M35
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Alvi JHA	A14	BHP	MZ07	Damm Australia/Sepura	J41
AMC Consultants	D54	Bisalloy Steels	N18	Dassault Systems	E41
AME Group	N09	Blackstone Minerals	M41	Datamine	B42
Amex Exploration	MZ15	Boadicea Resources	M20	DDH1 Drilling	B13
Ampcontrol	E35	Board of Professional Engineers of Queensland (BPEQ)	K09	Decoda	E29
Andes Agile	J18	Brokk	C01	Deep Yellow	M69
ANSTO	H58	Capgemini	C54	Delta Drone	K24
APC Technology	K18	CarBon	G23	Descartes Labs	C47
Apeiron	R43	Carlson Software Australia Pty Ltd	B12 / H01	Digicore	MZ13
Applied EV	E17	Caterpillar	N29	Dolon	D11
Ark Mines	M46	Chemwatch	N01	Don Kyatt Spare Parts	Q42
AspenTech	H17	Climatex Zero	MZ37	Dredge Robotics	K13
ATCO	K04	Clover	G41	Drivetrain Australia	C23
Atturra	A28	Coda Minerals	M05	Dull Pty Ltd	N14
Aura Energy	M18	Codrus Minerals	M89	Duratray	C05
Aurora Energy Metals	M76	Coerco	MZ39	Dy-Mark	R39

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Global Mining Guidelines Group (GMG)	MZ18
Global Pumps	B14
Godolphin Resources	M61
Golden Mile Resources	M45
Goldpro New Materials Co Ltd	K11
Government of Canada	K36
Government of Ontario	J35
Government of South Australia	N53
Graymont	N23
GroundHog	J19
Hall Water & Tailings	MZ36
Hammer Metals	M28
Handheld	K19
Haultrax	J11
Hawk Measurements	K17
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Hebei TongXiang Conveyor Machinery Co Ltd (TX Roller)	C09
Helix Resources	M54
Hexagon Mining	G17
HINDSITE Industries	C14
Honest Technology Co	MZ55
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Hychem	R33
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Icom Australia	Q44
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RAVENSWOOD GOLD

TRANSFORMS ICONIC QUEENSLAND GOLD REGION

Ravenswood Gold General Manager of operations David Mackay.



It is the tiny gold mining town and region of Ravenswood located in the Charters Towers area of north east Queensland that once boasted nearly fifty hotels.

And although the historic locality first built around the discovery of gold in 1868 flourished for several decades, it was left all but abandoned by 1915 as World War 1 and industrial action took a fatal toll.

Indeed, the most recent Census in 2021 recorded a population of just 297 people.

Yet since April of this year the district is now home to the biggest gold mine in the state - Ravenswood Gold - and it is providing significant economic benefits, jobs and business opportunities for the region.

A joint venture between EMR Capital (EMR) and Golden Energy and Resources Limited (GEAR), the Ravenswood Gold company is behind the rejuvenated site and was established to acquire, develop, and operate the mine as it took ownership in April 2020, inheriting around 160 permanent employees.

The mine had been operational since 1987, although mining activities at the Mount Wright underground mine ceased under prior owner Resolute Mining in October 2019, with the site processing low-grade stockpiles while preparing to return to open pit operations.

In December 2020, Ravenswood Gold commenced a AU\$350 million expansion of the site - dubbed the Ravenswood Expansion Project, which involved developing three large open pits: Nolans East, Sarsfield, and Buck Reef West.

The culmination of three years of toil and a hive of activity saw the grand opening of the expanded site in April, attracting foreign dignitaries and politicians.

Queensland minister for resources Scott Stewart praised the site at its opening, highlighting its importance to the local economy and the benefits of royalties from the operation.

"Not only is this now the largest gold mine in Queensland, but the Ravenswood Gold

project also deserves a gold medal for how it supports locals and local businesses," Mr Stewart said.

"It is providing good jobs, flow on benefits for local businesses and is ensuring a sustainable future for the town of Ravenswood well beyond the life of the mine.

"And all Queenslanders benefits with royalties that will fund our schools, hospitals and roads.

"The resources industry directly supports about 75,000 jobs across the state, particularly in the regions, which account for about two-thirds of all mining jobs."

Ravenswood Gold CEO Brett Fletcher was equally as buoyant.

"This is a major achievement for our team at Ravenswood Gold and for the township of Ravenswood", he said.

"We are delivering huge economic benefits and providing local employment opportunities, with the vast majority of our team living within a two-hour drive of the mine.

"Ravenswood Gold is a great example of local people working together with private business and government to bring real benefits for the State of Queensland," he added.

Gold production at the site has now increased and is on track to produce over 200,000 ounces of gold a year and the life of the mine has been extended to at least 2034.

Expansion Project

The Ravenswood Expansion Project comprised a host of key tasks designed to set the site up for long term prosperity.

Activities encompassed a range of mining, construction, augmentation and site infrastructure projects including:

- The development and mining of the Buck Reef West, Sarsfield and Nolans orebodies
- A bulk, open-pit mining methodology with a large owner-operated mobile fleet

- Upgrading low grade Sarsfield-Nolans ore by beneficiation prior to milling
- Expanding the processing plant sequentially to 7.2 Mtpa (milling capacity)
- Accessing the Sarsfield open pit through redeposition of tailings
- Extending and expanding the existing Nolans tailings storage facility (Nolans TSF) to store process tailings, including those currently stored in the Sarsfield open pit
- New crushing and screening plant
- New Ball mill cyclones and gravity concentrator
- Six new leach tanks
- New second thickener
- New tailings storage facility

According to Ravenswood Gold, 90 per cent of the 420 staff deployed during the expansion are from the Ravenswood, Charters Towers, Burdekin, Hinchinbrook and Townsville areas and the company has a further 280 staff employed through long-term business partners such as Roc-Drill (production drilling), Orica (blasting), SimmCo (rehandle haulage), and Cater Care (catering).

Future Forecasts

Speaking exclusively to the Australian Mining Review, general manager of operations at Ravenswood Gold David Mackay is upbeat about the future of the site and hails the company's hiring philosophy.

"Now that the project is established, we are looking at steady and stable operations while improving the business and growing mine activities - it is the end of the beginning stage at Ravenswood Gold," he said.

"Our hiring policy gives preference to people who live locally, or will relocate to the region, as this brings the most benefit to the area. We also actively promote female participation, with women making up 23% of our total workforce (well above the industry standard), including 43% of our haulage operators.

After three years of expanding operations, Ravenswood Gold is definitely geared towards a long-term future in low-cost gold mining."

The company has also submitted an expression of interest in supplying gold for the Brisbane Olympics in 2032 and if successful would see it producing around 10,000 grams of gold for an estimated 1,700 gold medals. **AMR**



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Woodfield specialises in mechanical repairs to all manner of equipment and regularly performs overhauls and rebuilds on pumps, gearboxes and bearings.

With facilities to fabricate a wide range of structural, plate and pipework, Woodfield are able to provide a range of fabrication services with its certified pressure welders and staff knowledge and experience in mild and exotic steel.

Woodfield also specialises in field machining, crane inspections and precision machining.

These skills have seen Woodfield work on major projects including, the Ravenswood Gold Mine where the company has supplied skilled labour to assist with maintenance, fabrication and machining on and offsite over the last 23 years. **AMR**



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From complex construction projects in remote locations throughout Queensland, to simple installation jobs, Minelec will deliver it safely, efficiently and on budget.

Ravenswood

Minelec used its years of innovative expertise and experience to provide electrical solutions to the Ravenswood Gold Mine Expansion Project.

The plant expansion work involved the installation of over 200km of cables, five switch rooms, over 600 lights and more than 350 instruments. Nealy 150,000-man hours of labour were required to create a

new, highly automated conveying, crushing, screening and milling circuit.

As a result of this expansion, the Ravenswood Gold Mine is now Queensland's largest gold mine.

This work saw Minelec receive the State Award for Industrial Project of the Year and along with Minelec's ongoing pursuit of safety excellence, contributed to them winning the 2023 National Safety award from Master Electricians Australia.

"The safety award came as a bit of a surprise at the time, although it shouldn't as everyone across the company has a genuine attitude towards safety and making sure our people go home to their families every day – so this is great recognition of that focus," Minelec director Brad Stanaway said.

Electrical Maintenance

Electrical maintenance plays an important role in the reliability, longevity and total cost of ownership for any project or piece of equipment.

Since 1991, Minelec has been the industry experts in the maintenance of processing plants and electrical infrastructure.

In business, time equals money and Minelec's team ensures that planned maintenance minimises downtime and maximises efficiency.

High Voltage

Whether it's a commercial, industrial or mining facility, Minelec have the expertise to supply, install and maintain high voltage systems at any location.

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ists in working with high voltage on systems up to 33kV.

They work with trusted industry partners to ensure your high voltage networks remains safe, reliable and conforms to regulatory requirements.

Hazardous Area

Electrical equipment in hazardous locations must meet special requirements and must be installed and maintained by qualified personnel.

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CSF was engaged by Ausenco to steel detail, fabricate, paint and transport 1400t of structural steel and conveyor galleries for the Ravenswood Gold Project expansion.

The company supplied screening and crushing structures, take-up towers, modular conveyors and mechanical steel structures. Steel detailing and painting was completed and managed inhouse by CSF detailing and coatings teams.

Achievements and Challenges

The volume of work to be completed in a

compressed time frame was a significant challenge for the project team. All works needed to be coordinated and phased in accordance with the tight erection schedule and communication was critical to ensure that this project was delivered on schedule and within budget while maintaining the appropriate levels of quality.

A project of this size and complexity required significant planning, organisation and communication with the client to ensure the best possible outcome. CSF's steel detailing team used Trimble Connect to create live models that could be viewed by the design team in real-time to close out requests for information and design coordination.

Due to the volume of steel and the num-

ber of individual items manifesting, accurate delivery information was critical to the success of the Ravenswood project. This was achieved through CSF barcoding, tracking and manifesting software.

About CSF Industries

Established in 1979 as Cairns Steel Fabricators, the company now boasts fully integrated divisions offering design & construction, steel fabrication, roofing & cladding, coating and finishes, engineering, lifting and transport and logistics.

10 years after its foundation, CSF established their own crane company Century Crane and were now able to deliver bigger and better projects with more efficiency and value.

CSF then expanded even further with the creation of the CSF Roofing, CSF Developments, Intrans Logistics and the acquisition of Thomas Steel Fabrications in Townsville.

They are now one of the largest fabrication companies in Regional Australia.

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GOING FOR GOLD IN PAPUA NEW GUINEA

By Ashleigh Melanko

With bilateral trade of over \$6b in 2020, Australia is Papua New Guinea's (PNG) biggest trade partner. Australia is also a major investor in PNG, with investment valued at around \$248b in 2021.

The Australian Bureau of Statistics (ABS) has indicated more than 4000 Australian companies export to PNG and according to the Federal Government's Foreign Affairs and Trade Department, Australia is PNG's largest development partner and main economic and security partner.

Its major export markets include Australia, China, Japan, Taiwan and South Korea with leading products including petroleum gas, gold, copper ore, crude petroleum and rough wood.

Gold mineralisation was discovered at the Lihir gold mine in 1982. A major exploration campaign was then undertaken between 1982 and 1992 by a joint venture between Kennecott Explorations Australia and Niugini Mining.

The Lihir gold operation is located on Aniolam Island, the largest island in the Lihir Island group. Aniolam Island lies around 900km northeast of Port Moresby in the New Ireland Province of Papua New Guinea (PNG).

Under the original project approvals, the Lihir project was transferred to a new company, Lihir Gold Limited (LGL). Rio Tinto (ASX:RIO) then established Lihir Management Company to develop and operate the mine on behalf of LGL.

The Lihir gold operation became wholly owned and operated by LGL in 2005 after Rio divested its interests in the operation.

Five years later in August 2010, Newcrest Mining (ASX:NCM) acquired the Lihir operations following the merge between Newcrest and LGL.

Gold Production

The gold deposit at Lihir lies within the Luise Caldera, a geothermally active extinct volcanic crater. It is one of the largest known gold deposits in the world.

The majority of the ore produced at Lihir is refractory and treated using pressure oxidation before the gold is recovered via conventional leach process.

Between 1997 and 2008, gold production increased from 232,697oz to over 700,000oz. In FY23, Lihir produced 670,000oz of gold at an all-in sustaining cost of \$1466/oz.

The process plant has undergone a major expansion which included the installation of a new crushing facility and upgrades to the ore processing plant. This plant expansion will increase flexibility of the opera-

tion, improve the reliability of the equipment and lower fixed costs per tonne.

Lihir Phase 14A

In January 2023, the board of Newcrest approved the Lihir phase 14A feasibility study, endorsing the project into full implementation.

Phase 14A represents an extension of the Phase 14 cutback that involves safely steepening the walls of the pit by using civil engineering techniques to access existing indicated mineral resources.

It will provide an additional high-grade ore source that will displace low grade stockpile feed which is required as the mine moves through the transitional zone between FY23 and FY27.

Newcrest interim chief executive Sherry Duhe commented on the study at the time.

"The development of phase 14A is another innovative step forward in realising the full potential of Lihir," she said.

"The findings of the study are expected to deliver gold production from an additional high grade ore source which would have otherwise been inaccessible through standard mining techniques."

Ore mined from Phase 14A will displace lower grade ore feed to the processing plant with around 13mt of high and medium grade ore expected to be fed through to FY26 to produce an incremental 400,000oz of gold.



(Image source: Newcrest Mining) Workers working on machinery at Lihir.

The lower grade material will be stockpiled and fed progressively over the remaining mine life.

Phase 14A higher grade ore is expected to be delivered from FY24 and studies are underway to potentially extend the elevated production profile beyond FY31.

At the completion of Phase 14A mining, the high wall is expected to be buttressed with backfill to provide long term stability.

Sustainability and Community

Lihir creates economic value for PNG and local communities, including direct revenues from operations, investment in public infrastructure and services, and supporting local suppliers.

Around 4500 people are employed at Lihir and roughly 90% of the employees are Papua New Guineans.

Where possible, Newcrest supports PNG-based suppliers and businesses, consistent with its commitments to landowners and the PNG Government.

Newcrest also contributes to the local economy by providing public infrastructure and services, including access to health services and providing electrical power and water to local villages.

Since 2003, geothermal energy has been used at Lihir to provide some of the operation's power needs and reduce greenhouse gas emissions.

Further, it maintains an ISO 14001 certi-



(Image source: Newcrest Mining) Birdseye view of the Lihir project in Papua New Guinea.

fied Environmental Management System (EMS), which assists in the planning and implementation of environmental management measures.

Newmont Acquisition

In early February 2023, Newcrest confirmed it had received an offer from Newmont to acquire the company for \$29b (US\$19b).

Newmont president and chief executive Tom Palmer commented on the acquisition and Lihir in a recent presentation.

"Moving up to Papua New Guinea, Lihir is one of the world's great gold mines, a Tier 1 operation by any measure," he said.

"And in addition to Lihir, there is significant gold and copper growth in PNG through the world class Wafi-Golpu project," he said.

"We are committed to building and maintaining strong, proactive, mutually beneficial and long-lasting relationships with the PNG government and local communities while supporting safe and profitable operations.

"As part of this commitment, Newmont plans to establish PNG as a standalone the fifth region in our portfolio with an in-country senior leadership presence."

Newmont has received clearance from the Korea Fair Trade Commission, Papua New Guinea's Independent Consumer and Competition Commission and the Australian Competition and Consumer Commission, while the Canadian Competition Bureau issued a "no action" letter.

Pending approvals include the Australia Foreign Investment Review Board, the Japan Fair Trade Commission and the Philippine Competition Commission.

The transaction is expected to be completed in the fourth quarter of this year. **AMR**

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SAV'S PLUMBING - MINING AND INDUSTRIAL PLUMBING SPECIALISTS

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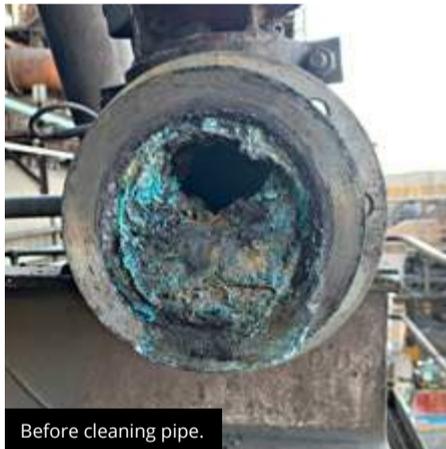
Safety, quality service and the environment are what Sav's Plumbing is all about, strictly adhering to industry regulations and maintaining high standards for the protection of staff and clients.

Sav's Plumbing have provided their services to Thies, Glencore, Telstra and various Government departments.

TANK CLEANING

As crucial as tanks are to various industries, it's easy to forget they need regular cleaning and maintenance.

Depending on the type of tank you have, the cleaning process can differ in difficulty and safety precautions, requiring complex risk assessments to enable the job to be



Before cleaning pipe.



After cleaning pipe.

carried out safely in accordance with relevant safety requirements. For example, fuel tanks must be carefully cleaned to avoid explosion while septic tanks require pumping to prevent sewage backup.

Sav's Plumbing employs state-of-the-art technology for their tank cleaning services, using various high-pressure water jetting equipment to achieve optimal results.

Their remote units feature advanced capabilities, allowing for a 360-degree clean of the tank's interior without requiring entry by the operator.

PASTE FILL PIPE UNBLOCKING

Mining sites rely on paste fill pipes to

transport slurry, and over time, these pipes become blocked, leading to costly downtime and production losses.

Sav's Plumbing paste fill pipe unblocking service is a cost-effective solution and can clean to a vertical depth of 150 metres.

Instead of replacing the entire pipe, they can treat the problem with a high-pressure water jetter and ferret the pipe. This improves flow rates and reduces wear and tear.

HYDRO EXCAVATION

Mining and construction crews often dig in areas where there are underground utilities such as mains power, optic fi-

bre, sewerage and telecommunications lines. Performing these tasks with traditional excavating methods runs the risk of damaging or dislodging the lines, leading to costly repairs or disruptions in service.

Sav's Plumbing offer hydro excavation services that are ideal for diverse applications including slot trenching, pot hole excavation and exposing utilities.

A non-destructive method of excavation, hydro excavation uses high-pressure water to break up the ground and suction to remove the resulting slurry.

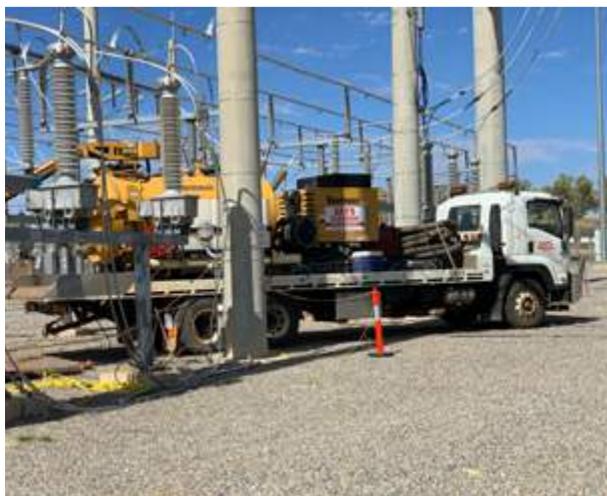
WASTEWATER MANAGEMENT

In compliance with relevant environmental regulations, Sav's Plumbing safely removes all traces of liquid waste from your property.

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For more information, call 07 4743 5144 or visit www.savsplumbing.com.au



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The Amiad DWTP eliminated the need to use bottled mineral water on site, saving between 300,000- 600,000 plastic bottles every year as well as decreasing pollution from their transportation and disposal.

Southern Peru Copper Corporation | Toquepala Mine

The turbidity was less than 0.5 NTU (most of the time even less than 0.2 NTU) and the arsenic level decreased from 80-100 ppb to less than 5 ppb

Lior Avidan | Process Engineer, Amiad Water Systems



www.dmi65.com



DMI-65® FOR ARSENIC REMOVAL

Drinking water treatment plant (DWTP) filtration system for arsenic removal - Toquepala copper mine, Peru

For more information visit: dmi65.com

REMOVAL OF ARSENIC

DMI-65 is a manganese dioxide (MnO₂) infused media whose surface acts as a good oxidant and is effective in removing both arsenite and arsenate, as well as iron/arsenic complexes and precipitants.

IRON AND MANGANESE BUILDUP

Build up of iron and manganese results in very high maintenance overheads, loss of production and potentially system failure. DMI-65® efficiently removes dissolved iron to the almost undetectable levels as low as 0.005mg/L and manganese to 0.001mg/L as well as particulate, effectively removing this risk.

REDUCED COSTS

The total cost of the iron and manganese removal water filtration system is significantly less than alternative solutions, the effectiveness, but relative simplicity, of DMI-65® based systems reduces the upfront capital expenditure on plant complexity as well as the ongoing operational expenditure in chemicals, power and backwash waste water recovery.

HIGH FLOW RATES

The infused technology of DMI-65® promotes the highest oxidation rate of any catalytic filtration media. This permits a significantly higher water flow rate to achieve the same level of iron and manganese removal. DMI-65 can operate at linear filtration velocities up to twice that of conventional media with a corresponding reduction in capital equipment costs.

HIGH LOAD CAPACITY

DMI-65® also has higher iron and manganese load capacity which can extend the duration of filter runs and the time between backwashing, thereby reducing downtime, operating expense and wastage.

REGENERATION NOT REQUIRED

The media operates with a continuous injection of sodium hypochlorite at low residual levels (0.1 to 0.3mg/L) which eliminates the need for Potassium Permanganate.

WIDE OPERATING ENVIRONMENT

Stable and satisfactory performance at pH 5.8 to 8.6 and a maximum operating temperature of 113° F (45°C) reduces the need for investment to alter the operating environment.

LONG LIFE

DMI-65® is not consumed in the process giving it an expected operational life of up to 10 years, providing considerable advantages over other processes or media. The media does not display a decaying capacity to do its catalytic work. Over the 5 to 10 year period, through many backwashing operations of the bed to remove retained solids, an attrition loss of the media occurs by contact between particles and mechanical abrasion.

CONTACT

info@dmi65.com | +61 1300 303 281





WAKE UP TO DAILY PRODUCTION DATA WITH TRIMBLE STRATUS



In today's rapidly evolving mining industry, the ability to access accurate and up-to-date information is crucial for making informed decisions and optimising project outcomes. Trimble Stratus, powered by Propeller is an advanced drone data platform designed to revolutionise site mapping, measurement and information sharing. With its wide range of applications, Trimble Stratus helps mine sites to enhance planning, streamline operations, uncover non-compliance issues and improve overall efficiency.

Trimble Stratus, available from SITECH WA, streamlines the surveying process in mining operations by leveraging drones to conduct surveys more efficiently, covering large areas in much less time compared to traditional surveying methods. The software is compatible with most RTK and PPK drones and enables surveyors to accurately map and monitor mine sites, allowing enhanced visibility into operations with up-to-date aerial imagery to facilitate precise mapping of mine boundaries, protected areas, equipment locations and infrastructure. This information assists in effective planning, resource allocation, tracking material movement and monitoring of mining activities and progress.

A major advantage of Trimble Stratus is the ability to calculate exactly how much material you have in inventory and accurately measure changes in stockpiles on a frequent basis. The user-friendly software allows surveyors to easily and quickly upload images into the system, where the software creates detailed and interactive models which record the usage of material for each stockpile. This allows surveyors and site managers to make sure reconciliations reflect the actual inventory.

Other useful applications of the system include: measuring haul road gradients, generating terrain maps, uploading planning areas to visually track progress based on a 3D location survey, comparing different measurements to see changes over time and faster, better inventory estimates.

Safety and compliance are paramount in mining. Trimble Stratus offers the ability to survey inaccessible or hazardous areas using drones, which reduces the need for personnel to physically enter these spaces, minimising potential dangers. The platform also enables the tracking of changes in slope angles, allowing better management of potential risks like slips and erosion.

Additionally, frequent and detailed images provided by Trimble Stratus assist in demonstrating compliance with regulatory requirements, particularly in terms of environmental responsibilities. For example, the software offers hydrology analysis to visualise how rainfall will affect runoff and closely monitor site conditions, ensuring compliance.

Trimble Stratus is an excellent communication tool as the platform's intuitive interface facilitates seamless sharing of survey data and imagery among team members, contractors and stakeholders. By eliminating information silos and ensuring everyone works from the same up-to-date digital survey data, Trimble Stratus enables faster decision-making, reduces misunderstandings, improves coordination and reduces delays.

The instant access to real-time information amongst collaborators reduces the need for multiple site visits, as stakeholders can track progress and inspect work remotely.

Trimble Stratus is a game-changing solu-

tion for mining professionals seeking to unlock the full potential of drone data in their projects. The platform's advanced mapping, surveying, and data analysis features empower mining companies to make informed decisions, streamline workflows, optimise resource allocation and reduce costly mistakes to drive project success.

As technology continues to rapidly evolve, drone surveying software will become industry standard and those who continue using traditional methods will fall further behind in efficiency. With its comprehensive features and benefits, Trimble Stratus is reshaping the mining industry, driving efficiency and delivering exceptional results.

To learn more about how Trimble Stratus can improve surveying efficiency and reduce costs at your mine site, contact the team at SITECH WA on (08) 9392 8800 or sales@sitechwa.com.au.

Trimble Stratus is easy to set up with 6 simple steps:

1. Place ground control
2. Fly drone over site
3. Upload ground control
4. Upload drone images
5. Dataset is processed
6. Analyse and share site maps and models





SURVEY DONE SIMPLER, SMARTER, FASTER.

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- Remove information silos & increase collaboration across departments.
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Loadrite L2180 systems for MRL, MLG Kalgoorlie Gold Mine.

SMARTTECH DOMINATING AUSTRALIA'S CIVIL AND MINING SECTORS



Sales Manager Craig Foster.

Northern Territory — WA border and all the way down to Esperance and everywhere in between," Craig said.

"It's a big state and a big struggle, but that's why we've got so much equipment and so many people.

"With the more remote sites, the guys are very isolated because you're really only going there for them. We do our best to dedicate some special time for them each year on recalibrations and stuff."

Loadrite

A scale system for client's assets, Loadrite scales are the highest quality on-board weighing system in the market. It dramatically increases production, improves accuracy and lowers operating costs.

Loadrite has been around since the inception of SmartTech and is a core pillar of the company.

All scales need to be recalibrated and SmartTech schedules over 1000 recalibrations per year, in WA alone.

"Basically, it [Loadrite] gives them productivity and visibility. We combine it with software, we've got numerous software that they can utilise," Craig said.

"They [the clients] use it for both safety reasons and for productivity reasons. They can get a clear weight of what the equipment is picking up."

Loadrite scales can be added to a range of machines, including excavators, haul trucks, loaders, conveyor belts, tractors and f-lifts.

With the Loadrite Material Management System (MMS) installed on your computer, you can turn the Loadrite onboard scale into a business management tool. The recorded information can be used for inventory management, product tracking and identifying bottlenecks in the operation.

Improve your waste operation and report accurate information with the Trimble LOADRITE E2750 weighing system that

gives you the information to increase efficiency and maximise profits.

By tracking the weight of each bin, customers receive accurate weights which helps their environmental reporting and helps reduce their carbon footprint by increasing their recycling rate.

For over 20 years, metal mining services company MLG Oz has been using Loadrite with over 100 loaders all running on the Loadrite system.

"MLG have been using the Loadrite system for over 20 years and find it a very reliable and accurate weighing system," managing director Murray Leahy said.

"The Loadrite system is a very accurate and reliable system, the backup support provided by SmartTech has been excellent.

"MLG look forward to dealing with SmartTech into the future."

Growth

With a plethora of solutions, SmartTech will start promoting these to market a bit more now.

"We've got a large safety suite, which is one of the areas that is obviously getting a lot of news at the moment," Craig said.

"It's good to show the market what we've got to make sure they're covering all their statutory requirements in the safety field."

WA Mining Conference & Exhibition

Find SmartTech at booth C101 at the upcoming WA Mining Conference & Exhibition that runs on October 11 and 12.

SmartTech is putting a special stand together this year, but Craig remains tight-lipped about it.

"We're putting together a very special stand this year. We had a nice one last year but we're putting together a very critical comms display which I'm sworn to secrecy on," he said.

"We're hoping to have some very good software demonstrations as well."

For more information on Loadrite, visit www.smarttechaustralia.com.au/

AMR



MLG Oz WA- Loadrite.

Beginning with just four employees in 2017, SmartTech has grown substantially to provide its services all over the country. Servicing Australia's civil and mining sectors, SmartTech's personnel possess the vast experience to call on the industrial sector.

Sales manager Craig Foster spoke of SmartTech's growth and its presence in the country.

"We've got a very large support fleet of equipment and personnel. WA is the largest branch as far as support capability. In WA we've got nine trained technicians, four service trucks which are prime movers and two more on order," he said.

"Nationally, we have 17 service trucks across 13 locations.

"In WA, we have a base where we store trucks and vehicles and equipment, this is in the Goldfields and in the Pilbara as well as Perth."

Remote Work

Servicing mining companies all over Australia, SmartTech is no stranger working in remote areas.

"We have mining companies on the WA — South Australia border, same with the



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ANALYSING CONVERGENCE IN UNDERGROUND MINING WITH ADVANCED TECHNOLOGY

The mining industry is no stranger to technological advancements that have elevated safety standards in recent years. Safety being one of the primary priorities particularly of underground mining, companies across the globe continue to invest in new technologies, whilst delivering positive returns of increased safety and efficiency.

An advanced technology that has revolutionised underground mining is mobile LiDAR (Light Detection and Ranging). Highly versatile, accurate, and easy-to-use, mobile LiDAR has become an indispensable tool for many mine surveyors and engineers. One such example of how mobile LiDAR, and the resulting point cloud data, has changed underground mine surveying is through its use of repeated scans of tunnels to analyse convergence.

What is mobile LiDAR?

Like traditional LiDAR systems, mobile LiDAR employs advanced sensors to rapidly emit laser pulses, measuring the time it takes to bounce off a surface and return to the sensor, commonly known as Time of Flight (ToF) scanning. This then creates a conclusive 3D map of the scanned area. Unlike traditional static LiDAR systems, which work at their best when stationary, mobile LiDAR provides its best results when constantly on the move.

Using complex SLAM (Simultaneous Localisation and Mapping) algorithms, mobile LiDAR devices deliver similar outcomes in a fraction of the time. The results are an accurate point cloud dataset, which serves as the foundation for further analyses in commonly used industry standard surveying software.

Improving safety and risk mitigation

Mobile LiDAR has a myriad of uses in all aspects of mining, making it one of the more versatile tools a mine surveyor can utilise. However, one of the primary use cases globally is for regularly monitoring convergence. Convergence refers to the gradual movement or deformation of underground excavations, including tunnels and stopes. Not monitored correctly, deformed rocks can pose significant safety risks to personnel and equipment, so is of critical concern to mine operators.

By using mobile LiDAR, mine engineers can capture data quickly, and as often as needed. Repeatable scanning leads to more up-to-date information of potential rock deformation, detecting risks early. The highly accurate 3D point clouds generated by mobile scanners provides surveyors with the means to import data into familiar software, to visualise and analyse for quicker outcomes.

Enhancing efficiency and productivity

Though a top priority, it's not all about safety. Mobile LiDAR scanners provide the correct tool for enhancing efficiency and productivity in underground mining operations. Traditional convergence monitoring methods, such as manual surveying, are time-consuming and often require a temporary shutdown of mine production. Mobile LiDAR scanning has the capacity,

in some cases, to be conducted handheld. Therefore, the surveying professional can capture data as quickly as it takes to walk around the area in need of mapping, limiting disruption to daily mining operations.

Mobile LiDAR reduces the amount of time needed to capture data, freeing up valuable time for analysis, ultimately leading to faster decision making.

A cost-effective solution

Point cloud data gathered from mobile LiDAR scanners have several benefits outside of convergence analysis. These include gathering volumetric stockpile data, progress production mapping or shaft inspections.

Mobile LiDAR has the capacity to capture places in the mine that traditional methods of data capture would struggle to do so, due to the versatility and lightweight nature. With that in mind, it quickly becomes a cost-effective solution. One scanner, like the GeoSLAM ZEB Horizon, has the capacity to perform several jobs on one mine, and the ease-of-use means anyone can capture the data.

If used regularly and to its full capacity, the longer-term advantages provide a fantastic return on investment. The optimisation in mine planning contributes significantly to cost savings and increased profitability in the long run.

Prospects and adoption

The adoption of mobile LiDAR technology in the underground mining space is steadily gaining momentum globally. Mining companies that embrace the technology are experiencing improved safety, enhanced productivity, and streamlined

operations. As the technology continues to evolve, advancements in software workflows and hardware capabilities will further enhance its effectiveness and applicability.

Early adopters of the technology from the past decade, like Barberton Mines in South Africa, have seen the efficiency mobile LiDAR provides, streamlining workflows for better returns on investment. Having a full understanding of mobile LiDAR and building processes around the scanner, has made fitting newer models or accessories into a workflow simple.

The Role of VoidMapper in mobile LiDAR-based Convergence Analysis

VoidMapper is a software platform that can automate the process of processing mobile LiDAR data for convergence analysis. The software's goal is to save mines time and money, whilst improving accuracy and reliability of data. The software works by using a cloud-based processing pipeline to automatically extract features from the mobile LiDAR data. These features can then be used to create a 3D model of the mine, which is ideal for tracking changes in the rock and identifying hazards.

VoidMapper is a powerful tool that helps to improve the efficiency and effectiveness of a mine's convergence analysis. As the technology continues to develop, it is likely that VoidMapper will become an even more important tool for mobile LiDAR-based convergence analysis in mines.

GeoSLAM - The smart way to map and understand spaces

GeoSLAM (A FARO Solution), were the first company to release the first handheld mo-

bile mapping system in 2013. They have since gone on to sell thousands of hardware and software products globally and into a variety of markets. Working closely with mining surveyors, GeoSLAM has built solutions with potentially harsh environments in mind, supplying a highly effective scanner for underground mapping.

Scanners, like the ZEB Horizon or ZEB Revo RT, are utilised daily in mines all over the globe, often for a multitude of workflows. GeoSLAM continues to work hard, alongside mining professionals, to continually optimise its hardware through accessories and software through automatic workflows and simplistic processing.

In summary

Mobile LiDAR technology is revolutionising the way convergence is analysed and monitored in underground mining operations. Its ability to provide accurate 3D data, enhance safety, and increased efficiency makes it an invaluable tool for mining companies. By embracing the technology, mining companies can continue to pave the way for a safer and more efficient underground.

GeoSLAM has a wide global dealer network with vast expertise, including Australia-based SLAM specialists Caroni. Visit Caroni's website by clicking the following link to book a free demonstration of GeoSLAM's products or VoidMapper - [Caroni](#).

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Combined expertise



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that your equipment operates safely and at peak performance throughout its entire lifecycle.

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INDUCTION HEAT SYSTEMS FOR SAFER & FASTER HEATING

Feld Machine Tools carries a range of induction heating systems with digital recorders rental units suitable for pre-heating, post weld heat treatment, shrink fits, curing & coating, hot tapping and other custom applications.

Induction heating is a non-contact method of electronically heating conductive materials.

Utilising high frequency, alternating currents in coils creates a rapidly alternating magnetic field.

This magnetic field crosses the work-piece creating a current flow (eddy currents) within the part; heat is then generated due to the resistance to eddy current flow within the material.

Our Induction Heating Units have many applications and benefits over conventional resistance heating methods or propane.

- Our Induction Heating Equipment is safer, up to 20 times faster and more efficient.
- Materials are heated up very quickly. For example 24 Inch x 2.34 inch thick pipe material carbon steel can be preheated to 450F in 7.61 minutes.
- Simple, lightweight and user friendly.
- The Rapid Heat System can also be used for shrink fit of shafts and bearings up to 3 metres in diameter.
- Lower power consumption. In most

cases will operate from 30-amp 415-volt supply as opposed to 63-amp 415-volt supply required for resistance transformers.

- Digital recorder allows storage of all documents for downloading later on to a P.C. Saves time in retrieval and managing documents.
- Eliminates use of propane which creates uneven temperature transfer. In addition, every kilo of gas burned creates three kilos of water – a problem when welding.

The key safety benefits are:

- Our heating cables remain cool to the touch while the material heats from within, making welders work more comfortable and efficient, allowing for reduction in welding times.
- Very little reflected heat.
- No naked flames or exposed elements.

The Rapid Heat 35 is designed to replace open-flame or resistance heating.

- Outperforms propane or radiant heating in efficiency, ease of use and heating uniformity.
- Simple interface can be learned in a matter of minutes and provides operator tutoring.
- Can be used as an air-cooled or liquid-cooled system.
- Easily connected to a range of heating

elements.

- Can be used with or without a temperature recorder.

The Rapid Heat 35 System has a choice of four programmes: Pre-Heat, Bake-Out, P.W.H.T. and Custom. In the programme, you can set the target temperature, soak time/temperature, cool down temperature/rate deg/hr, ramp rate deg/hr, etc. The Rapid 35 controller will then monitor the attached thermocouples to ensure that the heating and cooling rates are not violated during the procedure.

Liquid-cooled heating cables can provide uniform heating up to 788°C (1450°F). They are ideal for both pre-heat and PWHT needs, including Stress Relieving, Hydrogen Bake-Out, Shrink Fitting and many other applications.

Our liquid cooled heating cables come in sizes 30ft, 50ft, 80ft and 140ft. The silicone cable encloses a special copper conductor specifically designed for carrying high-frequency current to maximise efficiency. The cable also carries the coolant, which cools the conducting wire. The cable is reinforced for strength and durability they are reusable and easily installed in a matter of seconds.

The digital recorder is commonly used in stress relieving and critical preheat applications, however, can be used in any process. The recorder stores temperature data based on time.

The Rapid Recorder offers unrivalled input accuracy with a 125ms total sample rate for 18 channels. The input channels are configurable to suite the process requirements. It has a touch screen display for simple programming and use. The colour display enables operators to clearly monitor the heating process in outdoor environment (direct sunlight).

They all have onboard Flash data storage capability, Ethernet communication and Compact Flash. Data is stored in tamper resistance binary format that can be used for secure, long-term records of the process.

Some of our more common applications are:

- Pre and Post Weld Heat Treatment
- Hydrogen Bake Out
- Stress Relieving
- Structural Steel
- Flat Plates
- Vessels
- Fabrication
- Coatings
- Unfreezing Pipelines
- Trace Heating

Due to the flexibility of our systems, we can adapt our equipment to almost any heat treatment requirements. Our induction heating coils are easily wrapped around various shapes and sizes of components. **AMR**



Automatic Parts Cleaning System for all your Mine Maintenance Requirements

Robowash has been supplying its unique cleaning system to the mining, maintenance, engineering and automotive industries for 25 years.

Clean any component

Nuts, bolts, plastic or rubber seals, washers, bearings, alloy components, transmissions, brake and clutch parts, engine blocks or complete engines, electrical components including armatures, stators, rotors and electrical wiring harnesses.

Safe for the environment

No petroleum-based toxic solvents or hydrocarbons.



Choose from a range of products available with varying sizes and load capacities:

- The R1 has a basket size of 895mm, an internal height of 550mm and a weight range of 450kg.
- The R3 has a basket size of 1100mm and 1400mm, an internal height of 600mm and a weight range of 750kg.
- The R4 has a basket size of 1500mm, an internal height of 900mm and a weight range of 1500kg.
- The R5 Robowash machine has a 1800mm basket, an internal height of 1100mm and a weight range of 3000kg.
- The R6 Robowash has a basket size of 2000mm, an internal height of 2000mm and a weight range of 4000kg.
- The R7 Robowash has a basket size of 2400mm, an internal height of 1500mm and a weight range of 6000kg.



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REVOLUTIONISING GEOTECHNICAL MONITORING WITH DIGITAL AUTOMATION

In the world of geotechnical engineering, the ability to monitor and assess the stability of the rock mass surrounding an underground excavation is of great importance. Ensuring the

safety of all underground workers with the ability to monitor, act and protect people, plant, and operations, requires advanced monitoring systems.

Rockfalls initiate as the result of stress redistribution around an excavation. Triggers such as seismic events, dynamic changes in the environment, inadequate or deteriorating ground support can all lead to instability in the rock mass. Rockfalls are a significant hazard to underground worker safety and can cause major financial loss through reduced production and remediation.

Enter Strata Control Technology (SCT) — geotechnical engineers providing consulting, instrumentation, field services and research to the global mining industry since 1989.

SCT supply a range of geotechnical instrumentation to the mining industry and RockSHIELD® is the latest addition to the suite of instruments.

What is RockSHIELD®?

RockSHIELD® is an innovative

geotechnical monitoring system that leverages the power of digitised automation to provide comprehensive insights into the behaviour of rock formations. At its core, RockSHIELD® consists of several key components:

- **Digitised Rock-IT:** At the heart of RockSHIELD® is the Rock-IT, a four-anchor extensometer. This device measures changes in rock deformation with high precision. By digitising the Rock-IT, RockSHIELD® ensures that data collection is not only accurate but also easily accessible.
- **Integrated Sensors:** To create a view of the monitored area, RockSHIELD® incorporates a range of sensors. These sensors detect dilation, deformation, shear and strain.
- **Head Unit:** All data collected by the sensors is transmitted at pre-set adjustable intervals to a central server via a Wi-Fi enabled head unit. This connectivity ensures that geotechnical engineers can access critical information remotely, allowing for timely responses to any anomalies.
- **Software Suite:** The RockSHIELD® package includes user-friendly software applications for use on a tablet underground or via a web platform on the surface. This interface allows engineers to visualise, analyse, and interpret the data collected by the system. The intuitive design stream-

lines decision-making and facilitates efficient project management.

The integration of RockSHIELD® into geotechnical monitoring represents a significant step forward for several reasons:

- **Remote Monitoring:** Traditional geotechnical monitoring methods often rely on periodic manual measurements. RockSHIELD® provides remote data, enabling engineers to detect issues as they arise and take immediate action.
- **Data Accuracy:** The digitised Rock-IT and integrated sensors enhance the accuracy of data collection. This precision is vital for assessing the stability of rock formations and making informed decisions.
- **Cost-Efficiency:** By streamlining data collection and analysis, RockSHIELD® reduces the need for extensive manual labour. This saves time and cost associated with manual data capture.
- **Enhanced Safety:** The ability to monitor rock stability in remotely enhances safety. Engineers can respond swiftly to changes, mitigating potential risks.
- **Design Verification:** Measurement and monitoring provides the most reliable and effective basis for verification of ground support designs. **AMR**



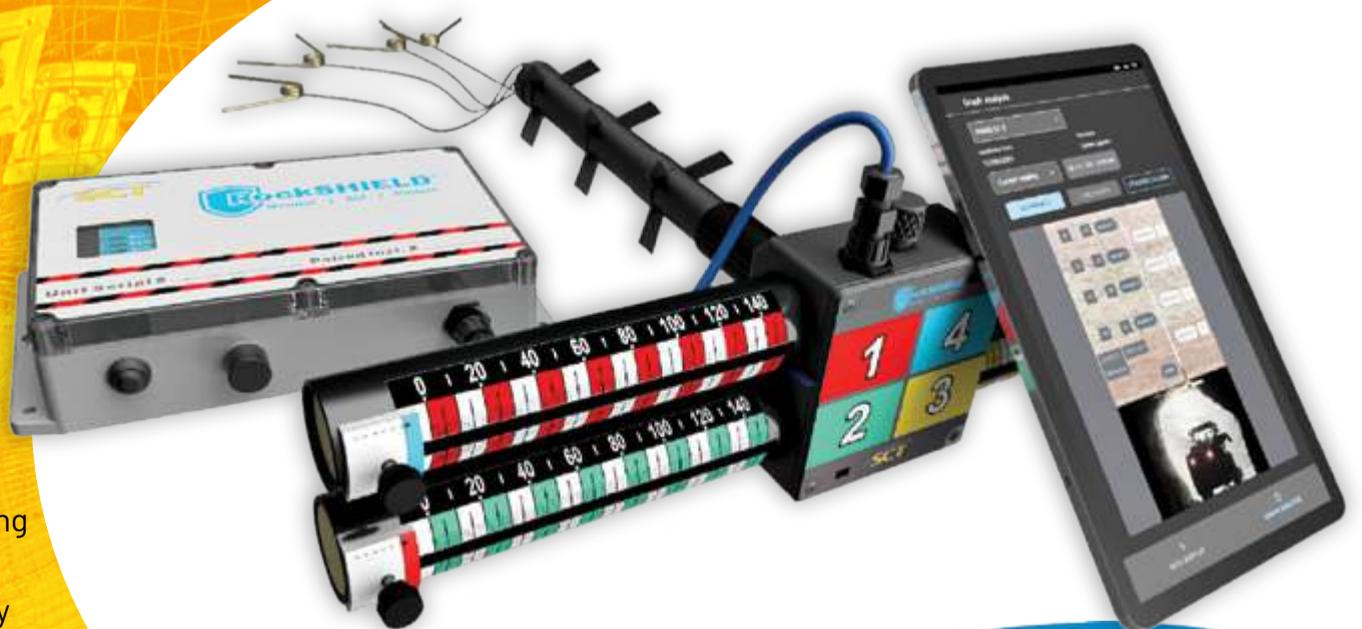
GEOTECHNICAL MONITORING SYSTEM ENABLES REMOTE MONITORING INTO THE ROCK MASS



Protect underground workers and operations from rockfalls with **RockSHIELD**. An innovative geotechnical monitoring system, **RockSHIELD** leverages the power of digitised automation to provide insights into the behaviour of rock formations.

Benefit from:

- Automated and Remote Monitoring
- Enhanced Safety
- Time Savings and Cost-Efficiency
- Accurate Data Reporting
- Ground Support Design Verification



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THE IMPORTANCE OF TEMPORARY WIRELESS COMMUNICATIONS



Until now, wireless connectivity in mining was associated with leaky feeder systems. These systems have been the most common solution around the world for 50 years. In most countries, attempts to upgrade wireless communications using Wi-Fi technology have failed in practice and have been abandoned.

However, leaky feeder technology has several fundamental limitations. First, it relies on fixed installation, which requires specialised equipment and tuning, and it's not feasible for instant implementation. Despite many attempts, it hasn't been possible to develop a system variant for temporary installations that is easily rolled out, doesn't require a station or permanent power supply, and is easily tuned. Cable installations also don't work well on the mining fronts of blasting operations.

In mining, there are several important areas where the use of temporary wireless communications is very much needed:

- rescue operations,
- shaft works,

- ventilation works,
- installation of mining machinery,
- communication on the mining front of blasting operations.

Very often the above tasks are carried out in places where permanent installation of leaky feeders doesn't exist, and its uneconomical or impossible to develop it only for these works.

At present, these needs have lived to see a solution in the form of a dedicated SWAR system. The creation of the infrastructure is carried out by hanging lightweight battery nodes at distances of about 50m, whose uninterrupted operation, depending on the version, can be 3 days (250g), 5 days (500g), 10 days (1kg) or 30 days (5kg) in armored design for operational fronts. The nodes form a radio mesh network completely by themselves. All you need to do is turn on the node and hang it in a specific location.

In the installation area of the temporary network, we get the opportunity to communicate using portable radios. In addition

to the functions of typical voice communication, the radios have a number of additional functions to assist in rescue operations, such as a search for another radio, an immobility alarm, a remote alarm, and a remote siren.

For rescue operations, the system also has a base station, which allows for setting up a connection with the rescue action headquarters on the surface, listening to communications on the surface, locating radios, and monitoring the status of the network. The base station allows the manager of the underground action to communicate with a selected rescue squad or to send simultaneous commands to all.

On the other hand, for communications on mining fronts with blast mining, it's possible to install nodes in armored design. They are hung on pillars from the side, not directly exposed to explosions. After 30 days of continuous operation, the batteries can be replaced with charged ones and the nodes can be rehung with the progress of the front. In this way, the first wireless voice communication system

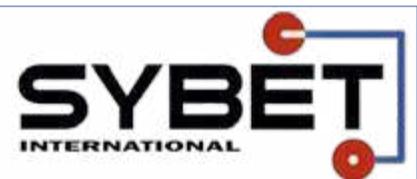
on the blasting operation front can be achieved.

Ventilation or installation work requires frequent coordination at several points, e.g. when connecting power or measurement signals, reconciling material or tool needs, reporting progress, etc. For these purposes, it's possible to use the lightest, most convenient nodes and hang up temporary infrastructure for the duration of the work.

For shaft work, the nodes are equipped with special slings with strong magnets, which help to hang the node securely on wire rope loops. This method of hanging temporary infrastructure in shafts eliminates the risk of dropping the node during installation.

The system is currently in use at the world's largest silver mine. It's used by all the mine's emergency services, and a communication system for the mining front is being implemented. For installation purposes, it's used by companies offering mining services. **AMR**

Experience the ultimate plug & play wireless battery-operated voice communication system with our cutting-edge underground mesh solution



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CUSTOM BUCKLES AUSTRALIA

DESIGN

CREATE

DELIVER



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USE CAMPAIGN CODE
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MORE ON YOUR ORDER

We've been designing, creating and delivering custom products in Australia since 2008.

Custom buckles are our specialty but we also make custom awards, medals, badges, key rings, bottle openers and plaques. Every job we do for our clients is unique and custom made, so you know there is nothing else on the market like it. When it comes to your projects, milestones, special events, suppliers or staff recognition, a custom job really does show your appreciation.

- ✓ **Amazing Detail & Finish**
- ✓ **Really Quick Quotes**
- ✓ **FREE Design Service**
- ✓ **Lifetime Guarantee on all products**



Celebrate key milestones at your mine site with custom-made belt buckles to commemorate significant events.

Whether it's your 40,000th barrel of gold or hitting the ore body in time, Custom Buckles can design, create and deliver custom metal products suitable to your needs.

As Australia's original custom belt buckle manufacturer since 2008, Custom Buckles has produced tens of thousands of individualised and unique belt buckles for momentous occasions.

While buckles are their speciality, the team also make a whole range of custom metal products including awards, medals, badges, key rings, bottle openers, dog tags and plaques.

They are perfect for showing your appreciation for projects, milestones, special events, suppliers or staff recognition.

Every job Custom Buckles does for its clients is unique, with nothing else like that on the market.

Their client approach is straightforward: Design→Create→Deliver.

REWARD AND RECOGNITION IN MINING

**COMBO PACK:
 STARTING FROM \$69**

- ✓ Custom buckle
- ✓ Black leather belt
- ✓ Silver display tin
- ✓ Presentation box

Design

Send your design to the team at Custom Buckles or just your logo and images for the team to do the design work for you.

Custom Buckles will then send you a mock-up graphic design of how your product will look.

Amend the design as many times as you need to get it exactly how you want.

Create

Once artwork is approved, the team at Custom Buckles creates your unique mould and begins production on your custom product.

Enamel paint is injected for colour if required, the metal finish is applied and then the team antiques for the final stage before polishing off.

Only the best quality metals are used and the team ensures each item is perfect, polished and packaged before it is sent out.

Deliver

Each item is individually wrapped and the packaging is tailored to client needs.

The entire order is placed in a solid box and delivered right to the client's doorstep.

The Custom Buckles team understands that no two jobs are the same and will work out a tailored pricing package based on individual client needs.

While production time takes 4-6 weeks depending on quantity ordered and the design detail, the team can also work with clients on delivery time frames.

Buckles generally start from \$35-\$45 each for the minimum order of 30 units.

Key rings, medals and bottle openers start from \$12-\$15 each for the minimum order of 50 units. **AMR**

Coming in several grades, each suited to a particular application, LiquiMix's Tufflon pure polyurea range is made for all heavy-duty applications. Tufflon contains no unreactive diluents, bonds strongly to damp concrete if the concrete is primed, has permanent elasticity, and has excellent chemical resistance. LiquiMix's Tufflon range includes Tufflon-D60, Tufflon-P80, and Tufflon-P90; although their names are similar, these products are formulated for specific applications and have very different properties.

Tufflon-D60

Protect your equipment with the toughest protective coating in Australia. Tufflon-D60 has outstanding strength and proprietary adhesion promoters, which allow for better adhesion of the membrane and protect the steel from atmospheric corrosion. It has nearly 218% elongation, outstanding chemical resistance to a wide range of chemicals and solvents, and can withstand temperatures up to 120°C. With a great combination of flexibility and toughness, Tufflon-D60 accommodates movement in any substrate without cracking or debonding.

Tufflon-D60 is specifically formulated for protecting steel assets in harsh environments and steel pylons and casings in marine environments. Tufflon-D60's impact-resistant properties make it ideal for heavy transport steel and aluminium tipper applications. It can also be used as pipeline protection for mining and gas operations, railcar linings, marine applications, and to protect steel assets against wear and corrosion. Tufflon-D60 can be applied directly to blasted steel without the need for priming.

The Tufflon-D60SL variation incorporates a slip additive that facilitates early release of bulk dry loads; it provides an extremely

durable, slippery finish to allow the movement of the cargo from the trailer to its destination. Tufflon-D60SL is resistant to a wide range of chemicals, including organic acids found in fruit pulp waste. Tufflon-D60SL provides an extended service life compared to other available coatings. Tipper can be primed and sprayed in one day, offering a fast return to service the next day. From a cost-effective and protective standpoint, the Tufflon Polyurea coating range is much cheaper than commonly used HDPE sheet membrane installations (oftentimes costing half as much), and it can offer much better longevity in comparison to all other protective coatings available in the industry.

Tufflon-P80

Proven solution to protect Australian assets for over 20 years.

The entire range of Tufflon pure polyurea products shows high resistance to strong alkalis. Particularly, Tufflon-P80 is a two-component, spray-applied, pure polyurea elastomer coating that has the longest history of use throughout Australia and New Zealand and exhibits a seamless spray pattern when applied with the right equipment. Tufflon-P80 is the product of choice for withstanding copious amounts of pedestrian and heavy-vehicle traffic, and it is ideal for projects where you need a fast application with superior results.

Tufflon-P80, specifically, has passed AS/NZS 4020:2018 standards, which makes it the ideal product to protect water assets and pond lining. Tufflon-P80 also offers a great chemical residency, which makes it an outstanding lining solution for secondary containment bunds. Tufflon-P80 has been specified and used widely around Australia and New Zealand in caustic and fuel bunds especially in the mining sector.

Tufflon-P80's faster development of physical properties, particularly tear strength and its elastomeric properties, makes it ideal for use with geofabric on unstable substrates or where movement in the substrate is expected soon after application, such as when temperatures drop rapidly during the night. Tufflon-P80 also tolerates higher heat, up to 240°C, allowing hot asphalt to be applied directly over it for a short duration. It is the most recommended product for applications that require a fast return to service while protecting the asset for a proven 20+ years, depending on the service conditions.

LiquiMix is your protective coating partner from start to finish.

With over 40 years of history (established in 1980), LiquiMix has a solid background and a proven system to help protect Australian assets. With a sole focus on protective coatings, LiquiMix offers a wide range of services that complement its



great products. The benefits include full specification and coating technical support services, as well as sales and hire of the Graco Plural equipment used to apply the coatings. We also offer technical training as well as application training to ensure the stakeholders involved deliver quality work.

"We will be with you every step of the way, from solution design to application."

LiquiMix is the largest Graco distributor for Plural equipment in the Southern Hemisphere and one of the few local manufacturers of pure protective coatings in Australia.

"Our mission is to continue supporting Australian asset managers to get more from their assets." AMR

LIQUIMIX

construction chemicals

Protective coatings for mining application

Since 1993, our team of highly qualified and experienced industrial chemists have been developing and delivering unique protective coating and construction chemical systems.



Under strong leadership, we empower our team to understand quality, systems, commitment and delivery. We conduct continuous research in the laboratory and in the field, in order to deliver novel systems to meet the changing demands of construction chemicals in civil, transport, construction, marine and mining industries.

- | Australian Made under ISO9001 QMS standard
- | Certified Australian Standard Products
- | Largest Graco Authorised Distributor and Servicer AU / NZ

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Protect Profits and the Environment with Blast Dispersion Modelling

There is no question that blasting is a crucial element of mining practises, integral to the optimisation of yield. It's a process awash with complexities, involving numerous factors to ensure it is both safe and successful. There are many aspects that can be controlled, and then there is the effect of the weather — an eternally mercurial force that can upend your best intentions. Thankfully, we have a solution for the potential of wind to send your plume in the wrong direction or rain to soak your explosives. And we can give you the best tools to support your accurate reading of the local forecast and adherence to legislative requirements.

When meteorological conditions send hazardous materials in the wrong direction

When you blast using a generic forecast, there is a much greater potential for error in the outcome. Concentrated blast plumes blown towards your personnel or over the surrounding community can severely damage both health and the environment. The last thing anyone wants is to make this kind of avoidable error, potentially spreading harm and risking relationships built with the community around the site.

Internal factors, such as the material being blasted, the type and condition of the explosive, and the blast design information, can influence the dispersion of the dust cloud. Then, there is the primary external influence of the weather. Understanding this influence and taking the local forecast into account when running blast simulations promotes certainty. A generic forecast is often built on the observations of weather stations miles from your site; this decreases their accuracy substantially. The most precise weather forecasts, especially for wind speed and direction, come from detailed on-site observations and proven forecasting models. It's this kind of precision — as well as ingesting your on-site parameters and environmental observations — that form the foundation for our blast dispersion modelling.

Blast simulations using environmental monitoring and site parameters

Weatherzone Business, a DTN® company, created [Blast Dispersion Modelling](#) as a solution to the complex needs of the global mining industry. It provides a scientific, visual understanding of blast events, expected trajectory, and pollutant concentrations. This foresight allows you to make informed critical decisions on when to blast. Precise weather forecasts with data points every 250m, both horizontally and vertically, are taken into account. The model is also completely customised to each site. Such customisable parameters include the separation of particle size into different bins, the input of surface

geology at the mine location (fractions of clay/silt/sand), site topography, and your licence and legislative requirements.

Simulations can run before the blast days with a risk outlook for projected outcomes of up to two weeks. It provides real-time, highly accurate dust cloud modelling that allows users to visualise where any lifted particulate matter (such as P10) will be transported to. Integration of dust monitors and tapered element oscillating microbalance (TEOM) help improve forecasting accuracy. You can foresee weather conditions for each simulated blast, confidently determining the optimal blast window that minimises atmospheric diffusion and impact on the local community.

A logical traffic light system guides your planning

You can foresee weather conditions for each simulated blast, confidently determining the optimal blast window that minimises atmospheric diffusion.

An integrated Fume Management Zone (FMZ) tool adds to the depth of your blast planning. A logical traffic light system indicates whether your simulated blast creates pollutants above or below pre-set thresholds at any virtual or existing monitors. You can create FMZs within the system, making it simple to plan and mitigate against risk. All these details are easily visualised in clean and informative reports, allowing you to justify your decision-making on when to blast.

The ability to gain post-blast observations buys precious time. This time can optimise the coordination of dust suppression efforts, improving their efficacy and your site's environmental compliance. Ensuring compliance and reducing the likelihood of particulate matter gone awry will ultimately protect people and the environment, as well as profits. When a blast is detonated, and the conditions are just right, no money is wasted on repeated blasts, lengthy clean-ups, or legal retributions.

Simulations can run before the blast days with a risk outlook for project outcomes of up to two weeks.

You can foresee weather conditions for each simulated blast, confidently determining the optimal blast window that minimises atmospheric diffusion.

Access reporting to meet your licence and legislative requirements

Our cloud-based, fully auditable report trails assist you in fulfilling your licence and legislative requirements.

Our cloud-based, fully auditable report trails assist

you in fulfilling your licence and legislative requirements. Automated generation capabilities bring together the forecast, weather station, and monitor data into clean and informative reports. As blasts are executed, supervisors and managers can add their pre- and post-blast observations, ensuring requirements are met and communication is clear. Blast simulation reports are archived for one month. This allows environmental officers to retrieve previous forecasts to understand the projected conditions and what information underpinned any decisions made. This valuable capability assists with internal audits and provides answers when investigating concerns raised in external complaints. The reports are easy to access and intelligently presented, ensuring complete comprehension.

Choose Blast Dispersion Modelling that drives informed critical decisions

Weatherzone Business, a DTN company, are here to give your site the best chance to detonate safely and effectively. With this entirely customised solution, nothing is left to chance, and decision-making is streamlined. You have complete foresight based on your unique requirements and environmental monitoring. Reduce the environmental, safety, and financial risks associated with the local forecast and gain the power of predictive dispersion modelling. Talk to our industry experts and transform your approach to blast planning, protecting the environment and your profits.

Explore our comprehensive suite of [mining solutions](#), tailored to your site and operational scope. **AMR**

Get in touch

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powering smarter weather decisions

WA'S FABRICATION SPECIALISTS



Specialist steel fabrication company Arch Engineering has been operating since 1970.

With the capacity to complete a wide variety of fabricated steel projects for the mining, process, oil and gas industries, it can manage, implement, and integrate all aspects of complex industry projects from drafting, fabrication through to surface treatment and delivery.

The business, located in Bibra Lake, WA, has a 3000m² facility and employs a skilled workforce with commitment and experience to match all project requirements.

Arch's fabrication team is experienced and possesses strong capabilities to execute wide ranging fabrication projects for mining, oil and gas.

The team is committed to high quality standards and efficiency to ensure client expectations can be met, and boasts quality management system certification to ISO 9001:2008.

Arch Engineering's fabrication workshops are equipped for all type of fabrication and modularisation services.

They incorporate three fully equipped workshops utilising four overhead cranes with up to 20t capacity capable of handling all types of fabrication.

Its mining and mineral processing services include:

- A wide range of structural packages
- Screening equipment
- Crushing equipment
- Conveyors
- Shuttles
- Chutes
- Mining consumables and tools
- Plate work fabrication
- Pipe supports and clamps
- Railway equipment
- Handrails, stairs, walkways
- Trusses
- Silo conveyors
- Monorail structures
- General steel fabrication

AMR



AE ARCH ENGINEERING



9 Rivers St, Bibra Lake WA 6163

P: 08 9418 5088 E: admin@archeng.com.au

www.archengineering.com.au

All workshops are fully equipped for all types of fabrication services.

Facilities incorporate three fully equipped workshops utilising 4 overhead cranes with up to 20 tonne capacity capable of handling all types of fabrication such as:

STEEL FABRICATION

- PLATEWORK
- STORAGE TANKS
- CONVEYORS
- OFFSHORE STRUCTURES
- SUBSEA STRUCTURES

WA'S STEEL FABRICATION SPECIALISTS



A TRUSTED LIFELINE FOR REMOTE SITES.

Established in 1989, Laverton-based Desert Sands Cartage specialises in supplying remote outback and mining projects in regional WA and the Northern Territory with potable water, sand, fuel, and various other bulk haulage requirements.

Desert Sands also offers earthworks and mobile and on-site concrete delivery to clients for various construction projects.

In response to increasing demand for portable concrete supply and delivery, Desert Sands Cartage recently increased its capabilities by adding a Porta-Batch mobile concrete batching plant to its fleet, with a 50-tonne cement silo.

The batching plant can produce more than

32 cubic metres of concrete per hour and can be deployed at most remote locations in the Outback.

This is one of two similar batching plants Desert Sands Cartage has put to work to supply large-scale construction projects in remote areas.

Servicing Remote Regions

Desert Sands director Rex Ryles says his company can mobilise to remote locations to service its clients, whether it be to batch and deliver concrete using its new Porta-Batch plant, deliver earthworks materials and services, alongside many other services for mining, civil, and local government projects.

"We can also provide potable drinking wa-

ter for personnel mobilised on-site for all stages of the mining process, for example, exploration, earthworks, and construction phases," he said.

"No matter where your site is located, we travel far and wide to ensure you and your staff are looked after and have a reliable source of drinking water."

No job is too big or too small for Desert Sands Cartage, with clients ranging from the local Shire to larger operations such as Gruyere gold mine, Anglo Gold Ashanti sites, and various other large-scale mining projects.

A Range of Cartage Solutions

Desert Sands Cartage Contractors provide services including but not limited to:

Side tipper haulage, mobile batching plant/concrete delivery, supply and delivery of potable water alongside diesel and petroleum fuels, screened sands, river rock and blue metal materials.

Other services include maintenance grading, road building, site works, construction and excavator and loader-work.

Desert Sands can also provide contract screening, semi-drop deck hire, front-end loader hire, road maintenance and constructions for local government organisations, general civil works, bulk tipper haulage and much more. **AMR**

For more information, visit www.desertsandscartage.com.au or call +61 8 9031 1326



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- ✓ Side tipper haulage, including concrete, screened sand, dune sand, fuel and potable water
- ✓ Extensive experience in civil works and construction projects

GET IN TOUCH NOW

Rex Ryles 08 9031 1326 | office@desertsands89.com.au | www.desertsandscartage.com.au
Lot 501 Cox Street Laverton WA 6440

CATHODIC PROTECTION IN MINING

ENHANCING RESILIENCE AND ENDURANCE

In the complex and challenging world of mining where the pursuit of valuable resources collides with forces of nature, safeguarding structures takes centre stage. Amidst the endeavours to maximise yield, a critical mission emerges – the protection of mine structures from the relentless grasp of corrosion.

At the core of corrosion prevention for underground and submerged structures lies the intricate technique of cathodic protection, which goes beyond mere degradation prevention.

In the Australian mining landscape, a deep understanding of cathodic protection is critical in helping mine operators defend their assets against the harsh conditions that are synonymous with the Australian mining landscape.

It's not merely a safeguard, but a shield of resilience fortifying mine structures against the unforgiving corrosive forces at play. The fusion of effective design and cathodic protection becomes a formidable solution, shielding mining operations' very foundations from corrosive threats.

As pioneers in corrosion defence for mining structures, BCRC recognises the importance of safeguarding mine structures from corrosion through cathodic protection and design partnerships.

BCRC general manager Marius du Preez explains the symbiotic relationship between design and cathodic protection, and how they assist mine operators throughout this process.

"Our comprehensive approach ensures that mining operations benefit from enhanced resilience and durability," he said.

"When it comes to cathodic protection, we essentially act as the guardian of structural integrity, employing a multifaceted strategy that is far beyond superficial corrosion prevention like simply applying protective coatings. In the context of mine structures, particularly in environments with inevitable exposure to moisture, chemicals, and

corrosive agents, our expertise allows us to orchestrate an electrochemical ballet that diverts corrosion forces away from critical components."

Mr du Preez added that the integration of corrosion prevention solutions in the design stage are a methodical process and ensure the most successful outcomes.

"Our team fosters a collaborative symphony between engineers and designers, ensuring that structural integrity harmonises with corrosion mitigation. Our experts incorporate sacrificial anode and impressed current systems into the design, aligning each choice with material composition and environmental conditions unique to the mining site."

Overcoming Mine Structure Challenges

When confronted with the harsh conditions associated with large-scale mineral processing, knowledge of the unique challenges that mine operators face, including different soil types and exposure to corrosive agents, and what solutions to implement to combat these, demands a unique level of expertise. There is also the hidden

menace of stray currents, which are capable of amplifying corrosion effects. Therefore, you need an expert that adopts a holistic protection strategy, identifying and mitigating the impact of stray currents.

From anode selection to precision monitoring, BCRC integrates cathodic protection into its design, representing a choreography of resilience.

"This involves careful anode selection, considering factors like structure materials and environmental conditions," said Mr du Preez.

"The strategic placement and connection of anodes create a web of protection, directing corrosive potentials away from vulnerable areas. With our approach, reference electrodes play a crucial role. They offer real-time insights into the electrochemical health of the structure, ensuring the quality of protection is established."

Cathodic Protection for Concrete Structures

BCRC adopts a 'submerged strategy' for protecting concrete structures submerged

in water or soil. It offers solutions that extend service life by positioning sacrificial anodes in concrete and transforming them into guardians against corrosive elements. Expert monitoring techniques also assess the effectiveness of cathodic protection as anodes continue their silent battle, and potential difference measurements provide insights into protection status, to support extended structural endurance.

Cathodic protection can also be deemed a sustainable practice posing many benefits within the structural ecosystem of a mine site. Combining BCRC's cathodic protection and design offer extended service life, reduced maintenance costs, operational efficiency, and economic sustainability.

Additionally, from a safety perspective, BCRC's design-driven cathodic protection, fortifies structures against corrosion-induced deterioration, creating a safer environment for both workers and equipment.

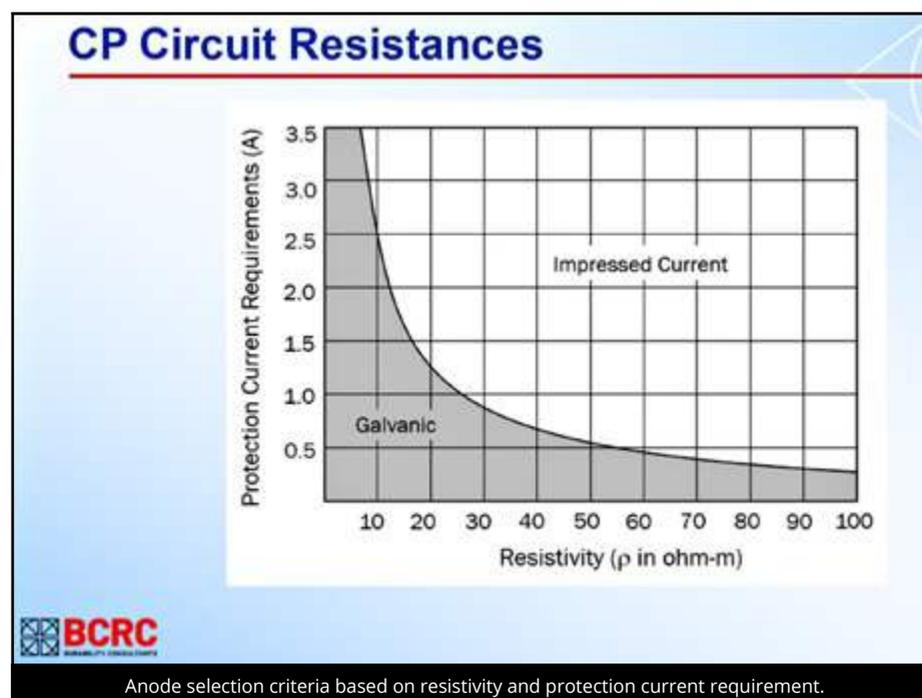
A Forward-Thinking Approach

The evolution of cathodic protection design continues into the future as mine operations embrace new technologies, materials, and predictive design approaches. This is somewhat a legacy of resilience for BCRC as the durability consultants help mine operators strengthen the structural integrity and extend the life of their assets.

The company demonstrates the important synergy between cathodic protection and design that embodies the commitment of the Australian mining industry to maximising the life of structures and ongoing fight against corrosion. In this tale of protection and endurance, BCRC's expertise plays a pivotal role in the journey of mine structures toward sustained resilience and durability.

For more information, visit
<https://bcrc.com.au/>

AMR



 **BCRC**

HEAT TRANSFER REDEFINED

Heat transfer is a very technical field – dealing with commercial industrial coolers, radiators and heat exchangers, you need to have an appropriate level of expertise when carrying out repairs. This is particularly the case in aging heat exchangers, which can not only become safety hazards, but lead to fuel wastage, high energy bills, and long-term problems with machinery.

Since its establishment in 2000, Allied Heat Transfer (AHT) has continued to redefine what the industry has come to expect from heat transfer technology. The business has evolved from a small enterprise into an international group with four global branches.

Today, with over a century of combined expertise among its leadership team, it's no surprise the business has become the trusted partner in heat transfer solutions.

It offers a comprehensive end-to-end service covering all heating and cooling liquids for critical plant and equipment, which are engineered to improve efficiency and reduce energy consumption.

From design to manufacture to repair, AHT has the expertise and capability in everything from thermal mechanical design, recommendation and supply of materials, to repairing and fabricating replacement components.

It also stocks an extensive range of parts for heavy machinery, and everything from small coolers and components, through to large industrial radiators and fans.

Allied Heat Transfer COO Peter Constantine said the strength of AHT's industrial coolers and heat exchangers lies in its experience and technology.

"Our dedicated team of engineers specialise in the design, manufacture, and maintenance of equipment that reduces your energy costs and optimises service life. We offer sustainably built products to our customers that not only lower their carbon emissions, but enable them to run plant facilities and equipment better with service from people who understand the challenges of heat transfer.

"We pride ourselves on being one of the leading providers of high-quality heat transfer products, which are documented and monitored to ensure high levels of performance."

Innovation Meets Sustainability

With many industrial mining, construction and manufacturing operations increasingly looking for more sustainable business practices, while working toward robust ESG goals, its only logical that everything from heavy plant and machinery, to day-to-day site processes that rely on a power source, are methodically assessed.

AHT's state-of-the-art heat exchange and industrial cooler products are not just designed for optimal performance, they are engineered with sustainability in mind.

Mr Constantine highlighted that when you invest in AHT technology, you are investing in solutions that save energy, minimise operational costs, and significantly lower carbon emissions.

"Our clients know that we are committed to only offering the best quality products that are rigorously documented and monitored. All the components that



leave our manufacturing facilities meet stringent standards for performance and durability.

"We're not just providers, but enablers that empower you to run your existing plant more efficiently than ever before. We understand the challenges our clients face, and the intricacies of heat transfer, which is what really sets us apart from the competition.

"We offer far more value than just a prod-

uct. We provide a comprehensive service tailored to specific to your applications. From the moment you consult with our team of heat transfer specialists, you experience our full-scale capability and deep understanding of heat transfer principles."

Whether you have an installation or not, if optimising your existing systems to new levels of efficiency, it's time to choose Allied Heat Transfer today.

AMR

ALLIED HEAT TRANSFER

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Dimpleflo 
TUBULAR HEAT EXCHANGERS



Teralba is an established supplier of thermal solutions including heat exchangers and systems for a large range of industries. Founded over 47 years ago, we continue to take pride in our focus on developing cutting-edge industrial equipment that is efficient, innovative, and of the highest quality.

Our heat transfer experts are dedicated to helping you succeed in your industry by providing customised solutions that meet your unique business and operational needs. With Teralba, you can trust that your equipment will be reliable, efficient, and built to last. In addition to developing standalone systems and turnkey processing solutions for heavy industry, our

service department also handles routine maintenance to maximise the lifespan of our equipment.

We also sell a wide variety of spare parts and accessories, ensuring we're the only partner you'll ever need for heat exchangers and processing solutions. You can rest assured that we'll recommend the best system for your unique requirements. We've remained an industry leader for nearly five decades by always prioritising the needs of our clients.

We always start the process of developing a custom solution for your work environment with a consultation, during which we'll discuss your objectives, take the time

to understand your needs and offer recommendations using our in-depth expertise.

When you're satisfied with our proposal, we'll have the solution manufactured within short lead times, so you can start enjoying benefits ranging from reduced operational costs to boost workplace productivity.

Just some of our most popular heat exchangers include:

- Double tube heat exchangers
- Spiral heat exchangers
- Industrial shell and tube heat exchangers
- Plate heat exchangers

The Dimple Profile

The unique 'dimple profile' of the Dimpleflo tube is used to increase turbulence of the product and service media resulting in a reduction of total surface area arrangement, creating a high heat transfer coefficient without any excessive pressure losses.

The ability to vary the depth and frequency of the dimples depending on the viscosity of the product being pumped through the inner tube means each Dimpleflo can have a smaller footprint (and cost) than traditional tube-in-tube heat exchangers.

AMR

HEAT TRANSFER SYSTEMS FOR ANY INDUSTRY

Teralba

INDUSTRIES

We are an established and trusted Australian based manufacturer of Heat Transfer products including, Tubular, Plate, Shell and Tube Heat Exchangers, and stainless-steel pressure vessels.

Our products enable businesses to monitor, manage and control specific operations in fluid process applications.



Phone: 02 4629 3000 Email: sales@teralba.com Visit: teralba.com

EFFECTIVE PROTECTION FOR STEEL AND CONCRETE COMPONENTS

Steuler's rubber linings provide effective protection for steel and concrete components against chemicals, mechanical attack and organic contaminants.

Depending on the medium and temperature, Steuler uses materials based on natural rubber, halobutyl rubbers, chloroprene and styrene-butadiene rubbers.

Steuler's rubber linings are used at temperatures up to about 120°C. A unique feature is its KERABUTYL HT, which extends the application range of rubber linings up to 150°C.

Rubber linings offer:

- high chemical resistance to a wide range of different media;
- high flexibility, which allows use even with movement in the substrate;
- high resistance to abrasive loads;
- high resistance against diffusion.

As a full-service supplier, Steuler offers the optimum quality for every application, every timeframe and every installation situation.

Steuler has extensive internal tests to assess their rubber lining's chemical resistance and many years of experience in application and external tests, such as technical approvals or confirmation of suitability in the potable water sector.

ON-SITE RUBBER LININGS

Steuler's on-site rubber lining systems are

the means of choice when the application of rubber lining is required directly on-site at the construction site or at our customer's plant.

They are used, for example, when vessels are too large and heavy for transport or vulcanisation would be technically impossible or too time-consuming.

For large or built-in vessels, Steuler draws on a range of rubber linings that can be vulcanised on-site without the need for an autoclave.

These rubber linings achieve similar properties to autoclave vulcanised materials to be lined.

If on-site vulcanisation is not possible, self-vulcanising grades that vulcanise even at ambient temperature can be used. Alternatively, pre-vulcanised grades can be used, which are ready for use just a few hours after bonding.

The focus is on easy transport of the sheets

already vulcanised at the workshop, extremely safe processing with Steuler's new KERATEX adhesive, as well as fast commissioning.

WORKSHOP RUBBER LININGS

For transportable components such as smaller tanks, pipelines and filter plates or mobile units such as transport vessels and ISO tank containers, rubber lining at the workshop is an option.

Thanks to the use of unvulcanised and thus easy-to-process rubber sheets, even highly complex components such as filter plates or fans can be lined without any problems.

The final vulcanisation in the autoclave leads to optimum adhesion in the seams and between rubber and steel.

Steuler's materials for workshop rubber linings are optimised for easy application in combination with maximum chemical and thermal resistance:

From conductive hard rubber linings with

high tolerance to organic contaminants even at temperatures above 100°C to soft rubber linings for the alternating transport of a wide variety of media such as waste acids, mixed acids, chlorine bleaching lyes and rubber linings for pipes subject to high abrasive loads.

In Steuler's portfolio, clients can find the right system for every application.

REPAIR SYSTEMS

Even the best rubber lining can be damaged at some point.

Minor damage caused, for example, during the cleaning of vessels or the installation and removal of scaffolding or built-in parts can be quickly and easily repaired with the help of our repair mortars in order to maintain operations.

Depending on chemical and thermal load, these mortars can serve as a permanent repair or at least provide corrosion protection until the next scheduled period of downtime and repair with the original material. **AMR**

THE **ULTIMATE** IN CORROSION PROTECTION

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www.steuler-kch.com.au

STEULER | Linings

CORROSION PROTECTION FOR MINING ASSETS

For over 70 years, Denso Australia has contributed its efforts to the long-term protection and preservation of valuable client assets within the: Mining, Oil & Gas, Marine & Offshore, Power & Utilities, Civil Engineering, and Water industries.

More recently, the application of Denso's popular Densyl KF Colourtape™ has been instrumental in corrosion-proofing machinery used in underground mine sites around Australia as the fire-retardant tape has served as a cost-effective and easy-to-apply (no primer or overwrap required!) solution for protecting nuts, bolts, and fittings in highly corrosive environments. Denso's Repair Wrap™ has also proven its worth in mining operations as evidenced by its reputation for quickly sealing cracked, fractured, damaged, and leaking pipework both above and below ground.

Whilst Denso are proud of such achievements to date, the team remain adamant that the importance and value of long-term corrosion protection within the mining sector is under-communicated, requiring further education and a greater sense of urgency.

To elaborate, most readers will agree that the issue of corrosion is a well-known problem within the mining industry. Examples of this can be seen in any process-

ing plant worldwide as expensive and key assets are commonly exposed to acidic or alkaline environments, high humidity, abrasive materials, and exposure to chemical agents. When left unaddressed, the combination of these factors can quickly lead to major concerns relating to safety, equipment downtime and replacement, environmental consequences, and operational inefficiency in mining operations.

From a corrosion prevention perspective, the aforementioned concerns can be significantly mitigated through careful product selection, and correct application of an appropriate protective coating. Having researched the corrosion protection needs of the mining industry, Denso Australia believes that the latest addition to their protective coatings portfolio, VISCOTAQ™ - visco-elastic coatings will greatly complement their existing product range providing long-term protection to piping systems, storage tanks, structural steel, machinery, and equipment commonly found in processing plants and refineries.

Incorporated into the Denso portfolio in 2021, the VISCOTAQ™ range represents the next generation of visco-elastic coatings by offering unique benefits no other can match. VISCOTAQ™ has superior stability both mechanically and physically; is truly surface tolerant, easy to apply, doesn't

require a primer, has superb chemical resistance with respect to a wide spectrum of chemicals, and showcases unmatched self-healing coating characteristics. Additionally, Viscotaq's 'XHT' coatings boast a temperature range from -45°C to 125°C and have self-extinguishing, fire-retardant properties built in as a standard property!

Backed by a proven track-record of successfully completed applications to above and below-ground piping systems, tank chime protection and applications under insulation to prevent CUI, Denso's Viscotaq™ range has garnered extremely positive feedback from clients in Australia and internationally. Viscotaq's ease of application ensures minimal disruption to mining operations, whilst its self-healing properties and resistance to chemical and mechanical damage make it an ideal choice for enduring protection.

In June 2023, the Viscotaq products were tested by the Australian Water Quality Centre in accordance with the AS/NZS 4020:2018 standard and were successful in passing all testing criteria.

This Australian and New Zealand standard specifies the requirements and methods for testing products intended to come into contact with drinking water to ensure they do not introduce harmful substances or contaminants.

As a result, Denso Australia are now able to provide assurance that their VISCOTAQ™ products are also safe and suitable for use in drinking water applications.

When asked about the future of corrosion protection within the mining industry, Denso's VISCOTAQ™ Manager, Adam Matthews, had this to say:

"At Denso Australia, our passion for corrosion protection drives us to seek the most innovative, made-to-measure solutions to meet industry challenges head-on. VISCOTAQ's incorporation into the Denso portfolio solidifies our commitment to excellence and ensures that the mining industry has access to the very best in long-term asset protection. We're excited to aid in the preservation of critical assets and the reduction of maintenance costs; we're also excited to create an enduring legacy of continuous, positive contributions to the future of mining."

To learn more about VISCOTAQ™, please visit:
<https://densoaustralia.com.au/product-groups/viscotaq-visco-elastic-products/>

To discuss your next corrosion protection project, please email us at
www.denso@densoaustralia.com.au

AMR



Densyl KF Colourtape™ applied to pipework carrying water.

OCT2023 AMR



Viscotaq ViscoWrap applied to under-insulation pipe system.



VISCOTAQ™

DID YOU KNOW?

THE NEXT GENERATION OF LONG-TERM CORROSION PROTECTION TECHNOLOGY HAS ARRIVED.

VISCO-ELASTIC COATINGS FOR ABOVE AND BELOW GROUND PIPING, TANK CHIME COATINGS AND UNDER-INSULATION SYSTEMS WITHIN THE MINING INDUSTRY.



More than you think!

CONTACT YOUR LOCAL EXPERT NOW

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Campbellfield Victoria 3061
AUSTRALIA

www.densoaustralia.com.au



Denso®
CORROSION PREVENTION



PROTECTIVE COATINGS

Veolia Australia and New Zealand is part of Veolia Group, a group of worldwide companies with over 179,000 employees. With access to the latest methods and technology coupled with a robust quality management framework and a multi-skilled workforce with over 20 years of experience, Veolia is an industry leader in corrosive prevention and maintenance.

- Asset Condition Assessment
- Coating Inspection and testing
- Third party assessment reports
- Abrasive blasting
- Dust free vacuum blasting and steel grit
- Full encapsulation
- Chemical cleaning and coating
- Hazardous coating removal
- Passive fire protection (PFP) coatings
- Pipeline coatings
- Concrete coating and remediation
- Pipe wraps
- Vessel / tank / bund linings
- Waterproofing

FEATURES AND BENEFITS

- Specialists in selecting, preparing, and applying innovative coating systems.
- Protects, preserves and extends your asset's serviceable life
- Latest equipment, robotic technology,
- Robust quality assurance systems.

INDUSTRIES WE SERVE



SCAN TO
LEARN MORE

Contact us: protective.coatings@veolia.com

WE'RE COMMITTED TO EXCELLENCE

always **safe**

This is demonstrated in our Always Safe mantra, and accreditations across a range of standards, including; ISO9001, ISO14001, ISO 45001 and compliance to ISO 31000



CONDITION ASSESSMENT

Protective coatings experts will provide services for conditions assessment for all assets, and provide cost effective and bespoke solutions to reduce asset downtime.



IN SERVICE LIFE EXTENSION

Belzona SuperWrap II offers a new generation repair solution for restoring the strength of corroded, weakened and holed pipe and tank walls. It is comprised of a fluid-grade resin system, a bespoke hybrid reinforcement sheet, and release film to consolidate and finish application.



ACCESS MANAGEMENT

Qualified Advanced Scaffolders will deliver safe work platforms and encapsulation systems, and enable access to a range of infrastructure such as containment of wharves, bridges, tanks and vessels or safe work platforms via suspension scaffolding



QA QC NACE REPORTING

We support the corrosion control industry by offering Corrosion Inspection Services and provide thorough Corrosion Inspection and Corrosion Survey using non-destructive testing on your project to ensure that your structure is safe from damage and deterioration.



SURFACE PREPARATION

The right abrasive blast material is critical in providing quality and conforming surface profiles that meet Australian Standards. Methods include traditional dry and wet abrasive blasting, and high pressure water jetting for situations where abrasive residues cannot be tolerated or could potentially cause environmental contamination.



INNOVATION

For our customers to continue operations, we need to be at the forefront of technology and innovative solutions across our projects. Veolia Protective Coatings continually delivers complex projects for our customers safely whilst minimising our impact on your business.



NON-TOXIC COATINGS

100% inorganic, non-toxic protective coatings. EonCoat technology will outlast all conventional liquid epoxies. As the global movement shifts away from the toxic coatings Veolia is in an ideal position to support our clients.



APPLICATION

Veolia Protective Coatings is an approved applicator and inspector of a wide range of industrial protective coatings in use throughout Australia. Our close relationships with a number of product suppliers including ensure that we have access to the latest information and data sheets, application methods and competitive pricing.

GLOBAL KNOWLEDGE. LOCAL EXPERTISE.

Veolia is a global environmental services company, providing innovative environmental and industrial solutions to some of the region's largest industrial, mining, oil & gas, energy, and municipal organisations.

Our environmental solutions help address the challenges of your sector, including: increasing costs, fluctuating commodity demand and emerging competition, environmental and social responsibility, skills shortages, and new technologies.

Veolia can provide you with:

- Security of supply
- Flexible and highly skilled labour
- Technical innovation
- Specialised and bundled service capabilities
- Social licence to operate



Finished Tank With Top coat.



NanoPrep Tank Coating.

KEY BENEFITS INCLUDE:

- Single Pack Product. Can be applied with airless spray gun
- Significant down time reduction
- Exceptionally safe to use
- Chemically reacts for very high adhesion and top performance
- Quick drying saves valuable time
- Chemically transforms rust and bonds to the substrate
- Nanofusion prevents under film corrosion for long term protection
- Non-hazardous, No VOC's, environmentally friendly and non-flammable
- High tolerance to chlorides
- No Blasting required or heavy PPE
- Suitable surface preparation for many existing compatible topcoats
- Outstanding long-term durability (Estimated 15+ years to first maintenance in many environments)

NANOPREP: THE SAFE AND EFFECTIVE ALTERNATIVE TO GRIT BLASTING

Replace conventional grit blasting with a high-pressure water wash and our reactive primer: NanoPrep

NanoPrep surface preparation technology allows industrial coating applications in areas where it is difficult, cost prohibitive or impossible to perform surface preparation by abrasive grit blasting.

NanoPrep only requires a simple high-pressure wash before the product can be sprayed, rolled or brush applied. NanoPrep is a waterborne, acrylic co-polymer composition that reacts and cross-links with rusted steel surfaces, clean steel, painted steel, aluminium and galvanised steel surfaces to create superior anticorrosive properties. Independent testing has shown very high adhesion results to the substrate whilst also preventing under film corrosion.

NanoPrep's advantages come from the chemical reaction which takes place, creating a layer of iron phosphate. Being an impermeable material, this iron phosphate layer protects the steel from any reaction with oxygen. This is key for stopping any

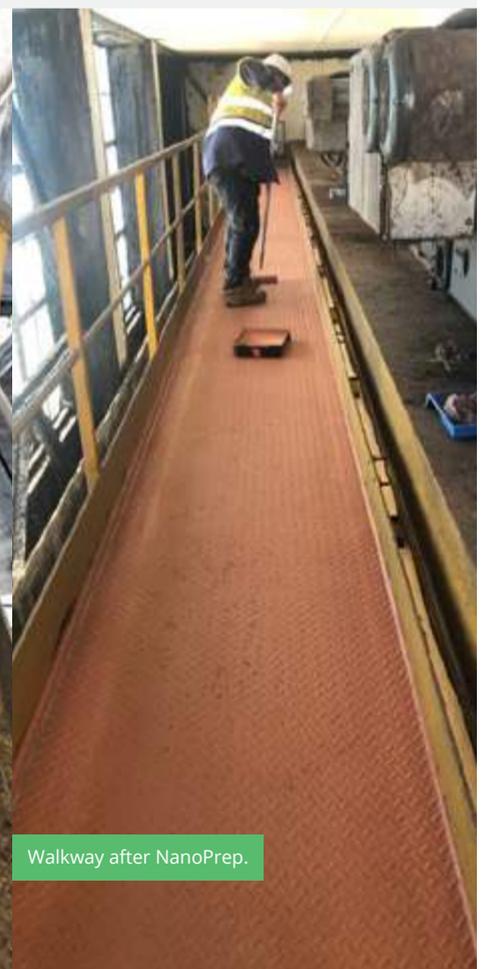
underfilm corrosion. When the coating is damaged to expose the bare steel, the spot will rust, but the rust will be contained to the damaged spot while the iron phosphate around the damaged area will prevent any further oxidation.

Once applied to the surface, "Nanofusion" takes place, enabling deep penetration into the rusted substrate creating a stable, high bond strength base to which many non-solvent based or low solvent content topcoats can be applied. Due to the acid-based nature of the product, NanoPrep has a very high tolerance to any chlorides on the surface, making this anti-corrosion coating very versatile and easy to apply successfully.

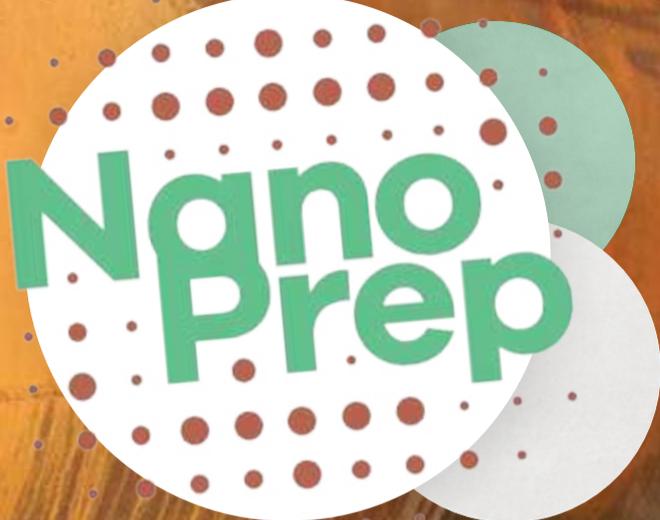
NanoPrep contains no volatile organic compounds (VOCs) and is non-toxic. As a single pack, water-based primer, the product is exceptionally easy to apply for a fast and effective solution to rusting steel on any mining site. **AMR**



Walkway before NanoPrep.



Walkway after NanoPrep.



Nano Prep

Just Pressure Wash & Coat!

Replace Abrasive Blasting with a simple High-Pressure Wash & Coat

NanoPrep is fast becoming the go to product for simple, long lasting, cost effective and safe remediation of corroded structures in the mining industry Australia wide. Looking for a high quality, cost effective alternative to grit blasting? Look no further.

**Revolutionary
Eco-Friendly Anti-
Corrosion Coating
Technology**



Rezitech
Belzona® Protective Coatings | Sponge-Jet Abrasive Blasting
Vacuum Pump Supply and Repair

CONTACT US TODAY FOR YOUR FREE DEMONSTRATION

(03) 8720 8600

info@rezitech.com.au

www.rezitech.com.au



Belzona Protective Coatings and Repair Composites

Rezitech has been supplying the Belzona range of products for over 50 years as the sole authorised distributor in Australia.

Repairing abraded equipment surfaces while keeping a plant in service is difficult. Belzona manufactures wear-resistant repair composites for dry abrasion and immersed conditions. The ceramic coatings and sprayable polymer composites have a proven track record of significantly slowing down erosion and can be applied in-situ while preventing downtime and loss of production.

Solutions For The Mining Industry



Conveyor Belt



Belzona 2211, 2311



Shaft



Belzona 1111



Cold Bonding



Belzona 1111, 1121



Pump



Belzona 1311, 1391S/T



Metal Pitting



Belzona 1111, 1511



Concrete



Belzona 4111, 4341



Pipe Elbow



Belzona 1511



Vessel and Tank



Belzona 1523, 1593





Empowering Mines Worldwide: Discover Belzona Solutions

In the dynamic world of mining, where relentless wear, corrosion, and chemicals can wreak havoc on equipment, Belzona emerges as the ultimate safeguard for durability. Offering a comprehensive range of polymeric metal and rubber repair composites, along with robust protective coatings and linings, Belzona has been a trusted ally to the mining industry for decades.

Reliable Defense in Harsh Conditions

Belzona's unique materials stand as formidable defenses in the toughest mining conditions. Engineered to endure harsh elements, these remedies act as protectors of equipment durability and longevity. Erosion, corrosion, and abrasion are transformed into manageable hurdles through Belzona's cutting-edge technologies.

Cost-Efficient Solutions for Enhanced Uptime

Mining operations cannot afford extended periods of downtime or excessive labor expenses. Belzona steps in with cost-effective measures that eliminate the necessity for equipment replacement. Belzona's solutions are strategic investments in the continuity of operations.

Resisting Abrasion

Belzona's abrasion-resistant linings provide relief from abrasion and erosion. Whether it's pipe elbows, chutes, or hoppers, these linings act as protective shields, absorbing the impact of abrasion and sparing equipment from undue wear. Belzona 1812 (Ceramic Carbide FP), for example, significantly decreases abrasion's effects and offers sub-

stantial savings in terms of time and expenses. Also, Ceramic-reinforced epoxy composites like Belzona 1811 (Ceramic Carbide) are engineered to bring new life into damaged screw conveyors and ensure sustained resistance over time.

Reviving Pumps to Their Prime

Even the most battered pumps can experience rejuvenation through Belzona's expertise. From liquid vacuum pumps to centrifugal counterparts, even those that seem beyond repair can be revitalized. Belzona 1212 seals cracks and gaps in pumps with a cold-curing touch. Belzona 1311 (Ceramic R-Metal), a chemical-resistant coating, safeguards equipment in harsh corrosive environments.



Coatings that Defy Erosion and Corrosion

Belzona offers an array of coatings that serve as a robust shield against erosion and corrosion. At the forefront is Belzona 1321 (Ceramic S-Metal), engineered to provide erosion and corrosion resistance to metal surfaces. Alongside it, Belzona 1341 (Supermetalgilde) demonstrates remarkable efficiency by significantly enhancing pump performance. For new installations, the improvement can reach up to 7%,

while refurbished machinery can experience an astonishing 20% surge.

Precision in Restoration

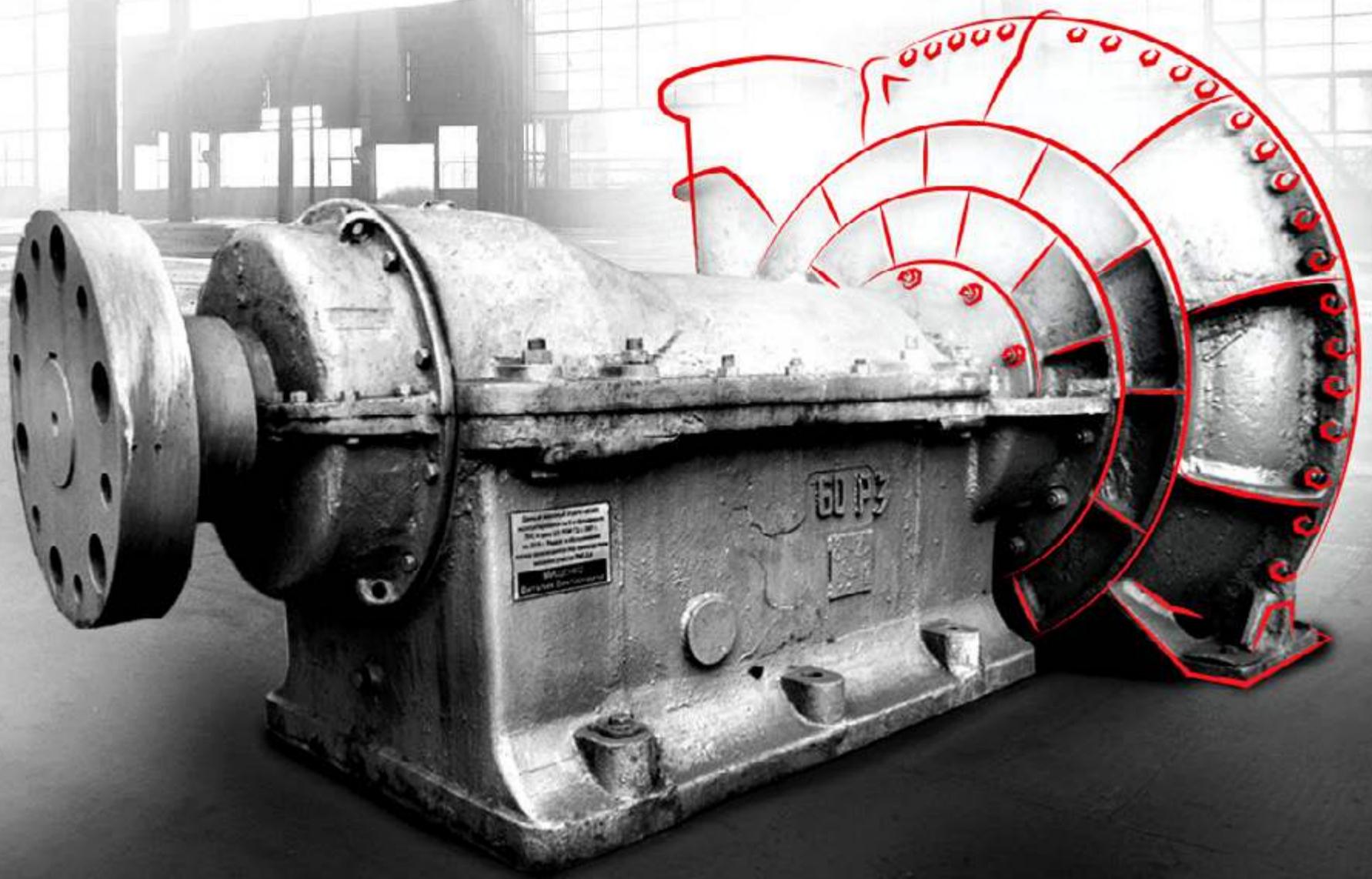
Belzona's range of cold-applied solutions offers effective remedies. Whether tackling bearing issues, wear, or lubrication challenges, Belzona provides solutions that bridge gaps. Notably, Belzona 1131 (Bearing Metal) stands out, establishing a lubrication-rich, friction-free environment. For urgent situations, Belzona 1212 swiftly acts, binding with impressive efficiency.

Tackling Misalignment Challenges

Misalignment, a persistent issue, finds its solution within Belzona's products. Loose bearing pins, shifted bush housings, and resistant components meet their match in Belzona 1111 (Super Metal). When faced with challenging shapes, Belzona 7111 steps forward as a versatile, pourable chocking compound. It effectively evens out uneven surfaces, delivering steadfast support to plants and equipment.

Unveiling a Future of Mining Fortitude

As mines forge ahead, Belzona's solutions remain steadfast as emblems of endurance. More than products, these solutions embody resilience, standing strong against mining's most formidable challenges. Join the other empowered mines around the world—uncover the true potential of Belzona solutions today.



NEW WEAR RESISTANT COMPOUND



Wearing compounds have been widely used as wear resistant protective coatings to extend the service life of industrial equipment by protecting them from corrosion, abrasion, chemical attack and other wear encountered in harsh industrial environments. They can also be used to restore worn surfaces or to protect new parts.

The resin part of wearing compound products is typically composed of epoxy resin, diluent, alumina ceramics, silane coupling agent, and other additives as needed. Its hardener part is mainly composed of aliphatic amine, polyamide, alumina ceramics balls and other additives.

Until now, alumina has been commonly used as the main abrasive ceramic filler for wearing compounds because of its good wear resistant properties and easy supply. However, replacing alumina with silicon carbide has been found to provide both higher hardness and higher toughness than alumina, indicating possible higher wear resistance performance in actual use.

As a result, a new product – LOCTITE® PC 7332™ – has been recently launched.

Developed as a high wear-resistant compound by optimizing both epoxy resin and silicon carbide abrasive filler compositions, outstanding wear-resistant performance and long service time has been confirmed with LOCTITE® PC 7332™ in a slurry pump protection application under a severe wet abrasion environment in a steel plant, extending service life from 6-8 months to over 18 months.

Testing results show that LOCTITE® PC 7332™ possesses the highest level of abrasion performance in dry abrasion tests, slurry abrasion tests, Miller slurry tests and gas jet erosion tests.

LOCTITE® PC 7332™ has been shown to be suitable for use to protect, rebuild and repair high wear areas of processing equipment in power generation, mining and steel plant applications such as desulfurization pumps and ducts, slurry pumps and slag granulation pumps which are subjected to severe wet abrasion.

LOCTITE® PC 7332™ can also be used for particle abrasion under dry conditions in transport elbows, chutes and other equipment. **AMR**

LOCTITE[®]

WEAR CAUSES DOWNTIME. WE KEEP YOU RUNNING.



SCAN HERE

To learn more about our complete line of Wear Protection Coatings.

In the most demanding industries, preventing wear of your equipment is a constant battle; one that usually means unexpected and extended downtime. Get your machines up and running faster, and lasting longer.

Extend the life of your equipment - with LOCTITE[®] - and our exclusive line of high-performance Wear Protection Coatings.



Designed to form a protective barrier that prevents wear.



Extends the life of critical equipment up to 3x vs. competitors.



Faster curing, superior impact and abrasion resistance.



RHINO LININGS

SOLUTIONS FOR ALL YOUR PROTECTIVE COATING REQUIREMENTS



In a world where durability, reliability, and longevity are paramount, Rhino Linings stands tall as a pioneer and leader in the realm of protective coating solutions. With a rich legacy and an unwavering commitment to innovation, Rhino Linings has solidified its position as the go-to brand for those seeking top-tier protective coatings. A deep dive into their offerings, as showcased on their website, www.rhinolinings.com.au, unveils a compelling narrative of excellence that cements their status as the best in the industry.

One of the most significant reasons Rhino Linings shines is their exceptional commitment to research and development. Their cutting-edge technology reveals a company that thrives on pushing the boundaries of protective coatings. Rhino Linings treats protective coatings as not just products, but the embodiment of meticulous engineering and scientific advancement.

Rhino Linings Range of Australian Manufactured Products include, but are not limited to...

Asset Protection – Rhino Linings can be sprayed or cast onto virtually any type of equipment and substrate material regardless of penetrations or shape, whether new or already in service. Rhino polyurea and polyurethane products provide industrial-strength protection because they can be applied significantly thicker than many other coatings in the market from 2mm to unlimited thickness.

Rhino Linings formulations can protect your equipment against chemicals, fire, erosion, corrosion, impact, and abrasion. Assets will be stronger, tougher, and more durable than those coated with conventional elastomers, epoxies, and plastics.

There is also the capability to include "Wear Indicators" that are applied beneath the lining so that Rhino coatings can be economically re-applied before the substrate is exposed, saving mining companies hundreds of thousands of dollars in equipment replacement costs. Why replace when you can rehabilitate to an even stronger standard than the original?

Primary Containment – Rhino Linings offers robust protective coatings for primary containment, ensuring durability and safeguarding against corrosion, abrasion, and chemical exposure in various industrial applications.

Secondary Containment – Discover Rhino Linings' secondary containment solutions, providing advanced protective coatings that prevent leaks, corrosion, and environmental hazards, ensuring safety and compliance across diverse industrial sectors.

Waterproofing Solutions – Rhino Linings offers effective waterproofing solutions for a multitude of applications, from roofs to foundations.

Their innovative coatings ensure long-lasting protection against water damage, enhancing structural integrity and longevity.

Flooring Solutions – Explore Rhino Linings' industrial flooring solutions, designed for durability and safety. These innovative coatings provide reliable protection, en-

hancing workplaces while withstanding heavy usage and wear.

In conclusion, Rhino Linings, an ISO 9001 Quality Assurance certified company, emerges as the undisputed leader for protective coating solutions.

Their unparalleled commitment to innovation, customer satisfaction, quality, and sustainability sets them apart from competitors, making them the ultimate choice for anyone seeking superior protective coatings.

Their [website](http://www.rhinolinings.com.au) serves as a gateway into Rhino Linings' world of excellence, showcasing a brand that is not just a provider of products but a harbinger of trust, reliability, and unwavering protection. As industries continue to evolve and face new challenges, Rhino Linings remains the steadfast partner that will safeguard what matters most. **AMR**

Find out more at
www.rhinolinings.com.au or
phone +61 7 5585 7030.



Rhino Linings®

PREMIUM PROTECTION

- ✓ Flooring
- ✓ Waterproofing
- ✓ Asset Protection
- ✓ Containment Solutions
- ✓ Industrial Strength Linings

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PROTECT YOUR ASSETS FROM WEAR WITH EURODUR AUSTRALIA



With more than 30 years of global experience, Eurodur Australia provides highly wear-resistant specialised coatings, wear protection consumables, and custom ESS-DUR wear pipe solutions for the toughest Australian industries. Our innovative technologies and commitment to quality ensure your equipment withstands even the harshest environments.

Tried and Tested Protection

Our surface-layer welding technologies provide superior durability compared to traditional coatings. The process results in an even distribution of hard carbides across the entire weld metal, maximising wear resistance. Our flux-cored electrodes guarantee consistent high-quality coatings time after time.

Decades of research and hands-on experience solving complex wear problems has made us experts in effective, customised

wear protection. We stay on top of the latest innovations and adapt our offerings to meet your evolving needs.

Custom Protection for Major Australian Industries

We provide tailored solutions for industries including:

- **Mining** – Withstand abrasive ores and extend component lifetime even in extreme environments
- **Cement** – Enhance durability of equipment handling abrasive materials
- **Construction** – Protect high-wear areas on machinery and equipment utilised in demanding projects
- **Agriculture** – Shield harvesters, tillers, and other farm tools from abrasion and impact
- **Manufacturing** – Safeguard molds, mechanical parts, and processing equipment from degradation

- **Energy** – Coat components subject to abrasion in fossil fuel and renewable energy systems Complete Wear Protection Package

We offer specialised coatings, accompanying wear studs, and ESS-DUR wear pipes:

- Wear studs crafted from boron steel, iron-based alloys, and carbides to handle impact, abrasion, heat, and corrosion
- ESS-DUR wear pipes optimised for pneumatic and hydraulic conveyance of abrasive media, with up to 10X the wear resistance of standard steel pipes
- Stud welding equipment and training courses for proper application

- Wide range of welding consumables including flux cored wires, PTA powders, thermal sprays, and more

Rely on our complete wear protection bundle. Contact Eurodur Australia today to extend asset lifetime!

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Contact Eurodur Australia today to learn how our high-performance coatings and solutions can extend the lifetime of your valuable assets and reduce maintenance costs. Our expertise in wear protection is unmatched. **AMR**



PROVIDING HIGHLY WEAR- RESISTANT COATINGS

With more than three decades of experience, our technologies ensure your equipment withstands some of the harshest environments.

We provide our services to the mining, cement, construction, agriculture, manufacturing and energy industries.

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Visit www.euroduraustralia.com.au, call 0425 646 438
or email service@euroduraustralia.com.au

World-Class Bulk Material Handling Systems

Oreflow designs, manufactures and supplies quality conveyor and belting equipment systems to Australia and abroad. Pictured here is the Bald Hill mine.



For world-class conveyor, belt and apron feeder systems, look no further than Oreflow, the industry-leading choice for quality bulk material handling systems.

Oreflow supplies conveyor systems, chute and hopper skirting solutions, belt cleaning systems, air cannons and impact beds, to name just a few, and is renowned for their excellence in plant design, engineering and manufacturing.

As a global supplier of conveyor and belting equipment across a range of commodities, rest assured knowing that wherever you are in the world – Australia, Ghana, Senegal, Burkina Faso, Mali, Tanzania, Indonesia, Philippines and Zambia – Oreflow will deliver quality products, services and solutions for all your mineral processing and bulk material handling.

Rollers, Frames and Idlers

Oreflow offers fully-supported solutions with its conveyor and belting systems.

The company carries and supplies a range of rollers including trough, return, impact, as well as HDPE (poly) rollers on request.

The range of frames to go with these rollers include trough, transition, training frames for belt tracking, return roller brackets and retractable frames on request.

All frames and rollers are made to Australian specifications and are interchangeable to industry standard, originally set by Prok.

Along with delivering conventional steel idlers and idler frames (inline, offset, impact), Oreflow can also customise idlers for specific environments.

Example of these include the provision of extreme duty urethane sleeved idlers.

Since 2012, Oreflow has dealt directly with one factory in China to successfully deliver for all projects.

Oreflow's Australian workshop also has a well-stocked inventory of ready-to-go items, with the capability to order in or locally source through backup suppliers.

Conveyor Belting

Oreflow also sources its high-quality conveyor belting direct from one factory, which it has built up a great working relationship over the past five years.

The flow-on benefits to customers including faster lead times, with belting being manufactured and ready to be shipped in under two weeks from receipt of order.

Backup suppliers are also on-hand locally for emergency or much faster lead times.

Pulleys

Oreflow performs all aspects of pulley design, pulley manufacture, pulley repairs and refurbishments – within Australia.

Whether customers require head, tail, take-up or refurbished pulleys, including pulley lagging (cold bonded, hot vulcanised, diamond groove, to name just a few options), all are manufactured to the very best quality and exactly to spec.

Oreflow collaborates with customers to deliver fit-for-purpose materials handling solutions.

All aspects of conveyor design, manufacture and installation are included in the service by qualified installation and service personnel.

Replacement Parts

Oreflow saves customers time and energy by allowing them to source all replacement parts from one place.

With its large stock of idlers, frames and spillage control equipment always on-hand and in-stock, customers can obtain industry standard spare parts via walk-ins and pick-ups from its Welshpool warehouse in Perth, WA.

Walk-in stock include replacement rollers, belt scrapers, conveyor and feeder frames and brackets, rubber lining cold bonding adhesives.

Order and pick up items include: conveyor rollers and frames, new pulleys, pulley refurbishments, dust containment, belt tracking frames, scrapers ploughs and impact beds, as well as air cannons.

Brelko – Spillage Control

Oreflow is the Australian master distributor of Brelko conveyor products for spillage control, offering a premium range of belt scrapers and skirting systems.

Oreflow founder and technical expert Mel King says Brelko has been part of the company's business for 20 years, supplying customers with high quality products, backed by extensive research and development.

Oreflow delivers Brelko skirting, belt cleaners and impact beds right around Australia, Asia and Africa, servicing the mining industry in a whole range of commodities including iron ore, alumina, lithium, gold, copper, quarries and concrete batching plants, to name just a few applications.

As heavy-duty as they are, Brelko rubber skirting is currently being used by a large Australian company to stop spillage from their railway ballast track machines.

Belt Scrapers - E905 and E205

The E905 is a new head pulley belt scraper, ideal for wet and sticky materials and suitable for all types of conveyor belts and metal fastener systems.

Adjustable Brelko torsion twist tensioners allow the scraper to maintain a constant pressure on the belt while allowing it to deflect away from any obstruction, a significant safety feature.

Specially formulated polymeric blades maximise the life of the scraper while keeping the potential risk of damage to belt repairs, splices and metal fasteners to a minimum.

A V-base blade mounting makes blade changing quick and simple while a streamlined scraper construction prevents material build-up.

The E205 secondary belt scraper is the universal choice for all normal cleaning applications, bar direct mounting onto the pulley head.

This scraper is used in conjunction with torsion arm mountings to accommodate different belt thicknesses and excessive belt movement

Keyskirts – Sizes 2 and 3

Brelko offers different keyskirt sizes to accommodate different types of spillings.

The Keyskirt size 2 provides an effective chute sealing system designed to control spillage at conveyor load areas and is suitable for all belt conveyors carrying material with a particle size of less than 75mm.

The patented mounting track system results in simple installation and skirt rubber replacement while self-cleaning grooves trap spillage allowing it to be carried away by the belt.

The Keyskirt Size 3 is designed to cope with spillage of large lump material larger than 150mm.

Features include a robust and abrasion-resistant polyurethane sealing strip and a mounting system for easy strip replacement.

About Oreflow

Oreflow designs, manufactures and supplies quality mineral process equipment to Australia and abroad.

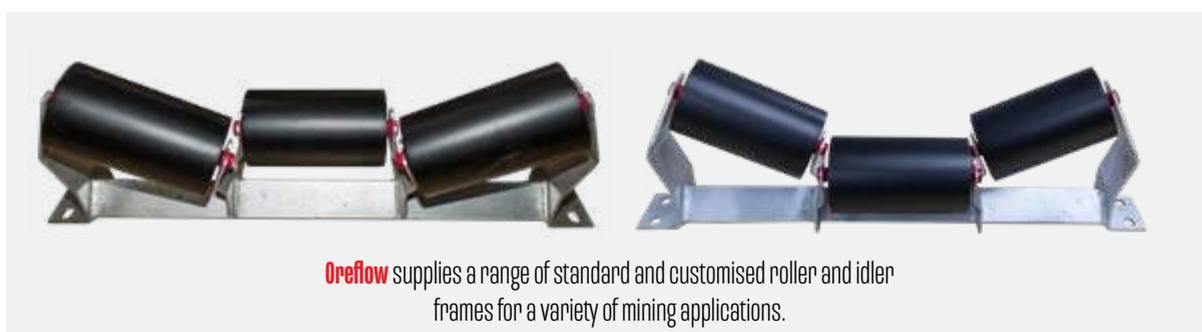
In 2000, founder Mel King and partners formed Minspec, a mining equipment manufacturer.

By the mid-2000s, King partnered with Brelko on the engineering of Encaplock and Keyliner dust sealing and chute lining systems.

In 2013, operations expanded to form OreFlow, supplying rubber products, belt conveyor glues and repair supplies.

Since then, Oreflow has evolved to service all areas of mineral processing systems and bulk materials handling, from design and installation to maintenance and repair.

With over 30 years mining experience, quality tradesmen and specialists are available seven days a week to support with design, engineering, 3D modelling, equipment and circuit application, including specially-trained Brelko scraper technicians. **AMR**



Oreflow supplies a range of standard and customised roller and idler frames for a variety of mining applications.



The E905 poly head pulley belt scraper, suitable for all types of conveyor belts and metal fastener systems.



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CONVEYING FULLY SUPPORTED SOLUTIONS

Oreflow Australia specialise in designing conveyor and bulk material handling solutions capable of operating effectively in even the harshest processing conditions.

As the Australian distributor for Brelko Conveyor Products, Oreflow supplies conveyor systems, chute and hopper skirting solutions, belt cleaning systems and impact beds to Australia.

We supply quality capital equipment both in Australia and abroad, specialising in bulk materials handling and processing plant design and manufacture. We cover a huge range products from apron feeders, conveyors, vibrating pan feeders and much more.

Our products are designed to be fit for purpose, capable of operating effectively in even the harshest conditions and able to be integrated into new or existing plant.

The Oreflow range includes heavy duty Horizontal Linear Motion Screens (HLMS), excited by under and over Uras out of balance motors and available in single or multiple deck configurations.

Customised operating parameters ensure accurate sizing and high quantity processing of materials ranging from ores and rock to mineral sands.

Our screens are manufactured and fully assembled in Western Australia and are widely used in Australia and around the world due to their ease of installation, low maintenance requirements and exceptional performance.

We are now the Australian agents for **AIRSWEEP®**:
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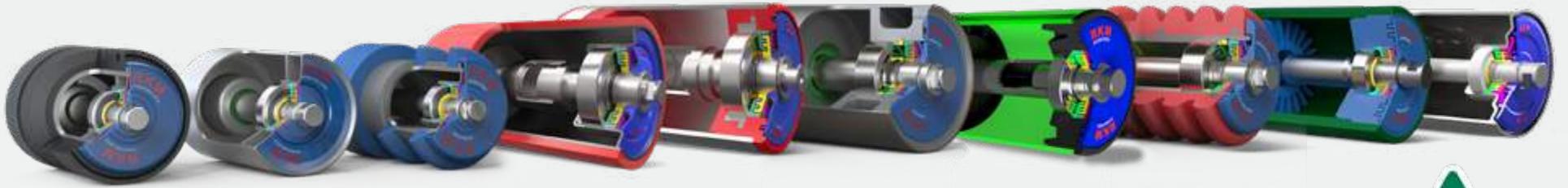


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COMPOSITE ROLLER CUTS DOWN ON ROLLER WEIGHT

RKM Roller Company has developed a new composite roller that is lighter than steel and tough enough to handle the harsh mining conditions.



Rollers on mine sites need to endure harsh punishment, but for major iron ore sites weight was also an issue.

Some mines put a maximum limit on the weight a roller can be, to ensure their staff can handle the equipment safely.

To satisfy this demand, RKM Roller Company began to seek out a partner that specialised in high tech composite materials.

Brett Maiden, RKM director, said the business had been looking for some time to align itself with a supplier of composite plastics that could produce a heavy-duty tube.

"Wagners were the world class leader in the engineering, production and processes, which is why we partnered with them to help design the roller," he said.

"The challenge with previous heavy-duty rollers made of PVC or HDPE was that they didn't have the flexural strength and stiffness to handle the load required on the troughing side of the conveyor which meant they were mainly used on the return side of the conveyor. Steel shells were still required for the trough side.

"Our new light weight composite roller can handle the heavy loads that the trough roller encounters."

The rollers combined with a hollow shaft design can weigh as much as half a conventional steel roller and produce less noise without sacrificing durability, which helps make manual handling change outs on sites safer.

RKM has incorporated its RS seal package, along with a primary heavy-duty nylon protective outer dual labyrinth shield into

the roller. The shield provides additional protection against contaminant ingress and eliminates rock jamming.

The company also uses dynamic balancing machines to ensure the rollers meet AS3709 G16 and achieves the best possible TIR and MIS, reducing any noise generated from the belt running across the surface of the roller.

The fibres are bound together by a unique pull-winding process, high grade glass reinforcement and resin. This provides superior flexural strength and stiffness comparable to steel.

This combination has been used in Power pole cross arms, boardwalks, foot bridges, road bridges, pontoons, jetties, various mine structures, reinforcing (rebar), piping, casing, and tubing.

Key features include:

- Up to 50% lighter than Steel
- Advanced wear properties
- Superior Stiffness and Flexural
- Strength, comparable to Steel
- Low Noise
- High Performance Sealing package
- HD Bearing Housing

The product is not classified as hazardous according to the criteria of the National Occupational Health and Safety Commission (NOHSC) Australia.

The rollers can also be fitted with the Vayeron Smart Idler Technology, which allows the user to predict the lifespan of each roller and receive alerts on upcoming maintenance and changeouts.

RKM manufactures the rollers in its Perth facility, which is equipped with a semi-automated production line.

Maiden said this enables significantly shorter lead times for clients and quick deliveries for all non-standard and special orders.

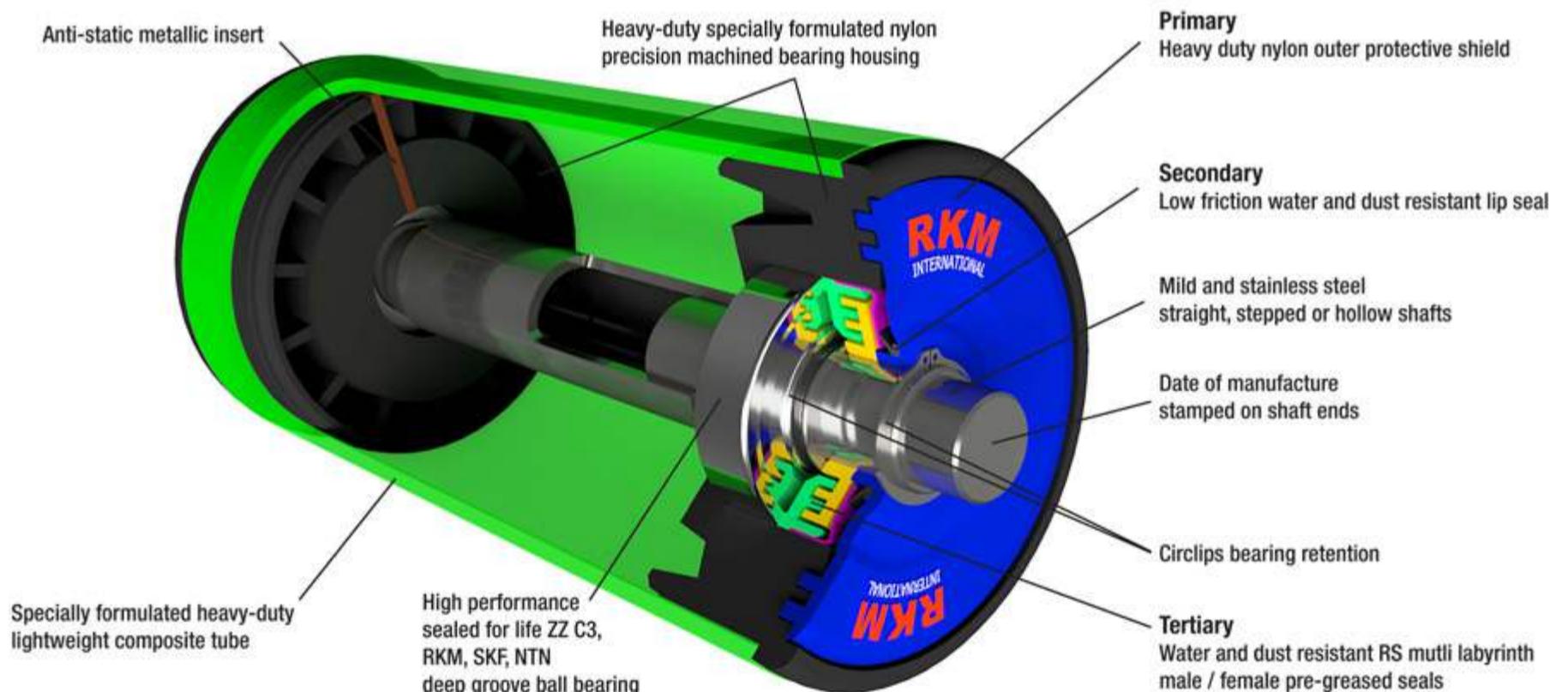
"We have the capability to produce almost any kind of roller, including long life cast poly impact rollers, lightweight heavy duty poly disc returns, heavy duty lightweight composite rollers, and more," he said.

"We have a wide range of products and can even custom manufacture them for any application." **AMR**

RKM now have our very own manufacturing facility right here in Perth to enable shorter lead times for clients and quick deliveries for all non-standard and special orders including our new HD Lightweight Composite Roller. Please do not hesitate to reach out to us for a trial.



RKM Heavy-Duty Lightweight Composite Roller





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ADVANCING THE BULK MATERIALS HANDLING DISCIPLINE WITH TUNRA BULK SOLIDS

World leaders in applied and fundamental bulk solids handling research, **TUNRA Bulk Solids** is an established business of The University of Newcastle Research Associates (TUNRA), and is defined by integrity, innovation, inclusivity, quality and passion.



World leaders in applied and fundamental bulk solids handling research, TUNRA Bulk Solids is an established business of The University of Newcastle Research Associates (TUNRA), and is defined by integrity, innovation, inclusivity, quality and passion.

TUNRA Bulk Solids has been active in the field for close to 50 years as an independent and not-for-profit entity, during which time it has completed more than 5000 projects for over 1000 companies across Australia and overseas.

Their team of experts provide consulting and contract research services to a wide range of industries including mining and mineral processing, power generation, chemical processing, agriculture, food production and pharmaceuticals.

With proven expertise in identifying solutions, TUNRA's specialised services are essential for the appropriate design of efficient materials handling facilities, and include expert site assessment, site performance recommendations, advanced analytics, materials handling testing and full engineering workshop services.

TUNRA's highly qualified, well-trained and specialist staff are committed to delivering excellence. Their laboratory is a state-of-the-art facility located within the Newcastle Institute of Energy and Resources, and all testing is done to industry standards with TUNRA accredited to ISO 9001, ISO 45001 and ISO 14001.

Flow properties testing

The design of efficient bulk solids handling plants requires knowledge of the material behaviour under a range of operating conditions, including varying consolidation pressures and environmental factors such as temperature, moisture and humidity.

The comprehensive laboratory facilities at TUNRA Bulk Solids permit the characterisation of material properties using well-established test procedures to determine the bulk strength, density and friction angles among other properties.

Such testing is important to maximise plant uptime, minimising unplanned shut-downs and improving efficiency and reliability. Flow properties testing can also be used to assess future orebodies or assist with upgrades.

The testing services on offer include dust-related testing, friction and adhesion, transportable moisture limit determination, abrasive and impact wear testing, pneumatic and hydraulic conveying testing.

Belt conveyor components

In addition to characterising the bulk material itself, TUNRA Bulk Solids also offer a range of conveyor belt testing services that cover all types of belting such as textile reinforced belting, steel cord belting and solid woven belting. Also available are testing for conveyor components such as idlers, scrapers and pulley lagging.

Belt testing

Services include splice inspections and testing, cut and gouge resistance testing, ignitability and flame propagation characteristics among others. Furthermore, TUNRA also hosts one of the very few testing rigs in the world for determining a belt's

indentation rolling resistance, essential for the design of energy-efficient long distance conveyor systems. Each testing program is completely customised to suit the individual needs of clients and according to requested national and international standards.

Idler testing

Conveyor idler rolls are integral components of belt conveying systems, given that they provide load support and control of the belt troughing profile.

Between 10 - 20% of the overall rolling losses of a belt conveyor can be caused by the idler rolls. Therefore, care must be taken to choose the best idler roll design for the respective purpose.

Idler roll testing services offered by TUNRA include rotational resistance, idler manufacture characteristics, idler roll noise, seal design effectiveness, fire resistance anti-static and other tests.

TUNRA is also highly experienced in working with end-users and component suppliers in belt and idler tender processes to help customers make informed decisions when selecting components.

Specialised consulting services

Every year, TUNRA Bulk Solids completes between 200 to 250 major industrial consultancy projects which cover the entire spectrum of applications related to bulk solids handling, transportation and storage.

They provide engineering services to industry that include advanced analytics through numerical and computational modelling, stockpile audits, conceptual design, third-party design reviews, bin and hopper audits, feeder design and optimisation, transfer chute design and flow modelling.

Education

In addition to the research and consulting activities, TUNRA has an ongoing commitment to education, providing industry with professional development courses in the field of bulk solids handling, work placement programs and PhD research scholarships.

TUNRA's 12-week Student Industry Placement plays a vital role in providing students with practical experience in their field of study, enabling them to implement their knowledge gained from the classroom into real life industry problems.

Additionally, TUNRA's PhD scholarship allows higher degree research students to work on an industry problem or application or work to further develop TUNRA's testing capabilities.

TUNRA also runs professional development courses which include Bulk Storage, Feeding and Belt Conveying and Transfer Chute Design, Modelling & Optimisation, in addition to customised onsite and in-house training, conferences and workshops to ensure their industry partners continue to grow in their knowledge of the bulk materials handling science.

For more information, visit www.bulksolids.com.au or phone 02 4033 9039.

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Professional Development Course: Storage, Feeding, Transfer and Belt Conveying

2023 Dates: 14th - 16th November (Perth)

2024 Dates: February (online), May (Brisbane), August (Newcastle), November (Perth)



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You'd be hard pressed not to encounter a vending solution on your daily commute or place of work. Gyms, hotels, train stations, hospitals, university campuses, corporate offices or remote industrial jobsites, the rise of intelligent vending machines has seen a full-scale assault on people's cravings well beyond the standard bag of chips, chocolate bar or cold beverage. Now, nothing is off limits – from cashless, cardless and interactive technology, to fresh food, travel, personal hygiene and mini-bar items, there are options to suit everyone.

For over 20 years, Automatic Vending Specialists (AVS) has disrupted the vending technology and equipment market, launching the next generation solutions catered to the mining, hospitality and catering industries. Whether you're a major hotel or remote mining camp, AVS' innovative solutions are designed to enhance the guest and consumer experience, and provide a viable service that operators traditionally could not afford. There are two game changing solutions on offer – the Innovendi Smart Fridge for fresh food products, and mini-bar vending for mini bar items such as travel and personal hygiene items, snacks, non-alcoholic and alcoholic beverages.

Innovendi Smart Fridge

The new Innovendi Smart Fridge is built for hotels and remote operations like mine sites, dispensing packaged healthy salads and ready-to-eat meals, dairy and vegan products, all of which are positioned on shelves, so mines can not only get fresh food around the clock, but also PPE equipment, toiletries, mobile phone chargers and accessories, to name a few.

AVS recently partnered with Youfoodz to deliver a solution that offers delicious, convenient meals made with fresh and real ingredients, and a smart cooler that displays and dispenses the meals.

"Our focus is providing cost-effective solutions and a product range that meets the diverse needs of your site and workforce, no matter your location," said AVS Founder, Basil Hourmouzis.

"Our new Smart Fridge is helping businesses reduce costs, whilst treating their staff to a wide selection of nutritionally balanced meals that satisfy all tastes and preferences. The solution offers 24/7 self-service convenience and complete control of inventory and costs."

When opened, it detects exactly what

product a customer selects and informs them of their choice via an interactive touchscreen, making it easy for them to grab, pay, and go. Innovendi allows customers to pick-up and inspect the product, and can be configured to be chilled/refrigerated or ambient. Its genius is the proprietary product awareness technology which is based on IOT sensors, Artificial Intelligence, and predictive analysis.

Mr Hourmouzis says the company endeavours to make the experience as seamless as possible, one that includes creating a partnership with Youfoodz to provide its customers with great deals and a machine that is stocked quickly and cost-effectively.

"This smart cooler is a completely secure point-of-sale solution that gives your guests and site personnel access to an exciting range of fresh meals and beverage options, any time of the day or night. You are no longer restricted to having a restaurant or chef provide your guests and staff with meals 24/7. Innovendi can be your micro-market that satisfies both your guest's and workforce's needs, as well as your bottom line."

Mini Bar Vending

Mini Bar Vending allows operators to offer all the traditional items normally ranged in a room mini-bar, without all the associated costs. These machines can be configured to dispense travel and personal hygiene items, simple groceries, snacks, nuts, confectionery, noodles, non-alcoholic and alcoholic drinks.

It provides the service and convenience guests need, while saving operators thousands of dollars through reduced labour, disputes, spoilage and theft. The proprietary developed alcohol vending software solution facilitates compliance with RSA and allows establishments to responsibly sell alcohol to those 18 years and over. The software can work on either combination vending machines or stand-alone drink machines, that offer both alcoholic and non-alcoholic products.

AVS distributes and services equipment nationally through a strategic network backed by fully qualified technicians. All of their machines are covered by an 18-month parts only warranty, and in the event of any service needs, the company provides over the phone assistance, or dispatch a technician if necessary.

For more information, visit
www.autovending.com.au

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SAFER TAILINGS WITH BETTER MARGINS

BY MATT PYLE, HEAD OF
TECHNICAL SOLUTIONS, AUSENCO

Improving the storage of fine waste from mineral processing plants is one of the biggest challenges for the mining industry. The current practice of wet storage in tailings dams is an environmental concern, consumes large amounts of water, impacts communities, and is expensive with long-term management costs and liabilities. And – if wet storage tailings dams fail – they can lead to widespread environmental and social disaster, loss of reputation and massive regulatory fines.

The problem really boils down to the water content. Fine tailings tend to retain water and are difficult to dewater below saturation. Saturated fines are geotechnically unstable. Remove water from tailings, therefore, and they become much more stable from a structural perspective, but sulfides and reactive species are prone to oxidation.

The challenge is that dewatering and stacking of tailings is not friendly to project economics. Traditional approaches to tailings filtration require more project capital to develop and operate. Only those projects with very high grade ore bodies (and therefore higher margins per tonne of ore) can afford this route and hence industry uptake is limited.

However, recent developments in dewatering and preconcentration can enable alternative approaches which, when considered across the whole value chain, can actually generate revenue whilst enabling dry stack tailings economics to compete with traditional wet tailings storage. This allows leading mining companies to increase production rates, reduce capital and unit operating costs, and simultaneously minimize the consumption of energy and water, and the environmental impact of their tailings activity.

Why is it so difficult?

As an industry, we can be short-sighted at times. “Mine-to-mill” concepts and understanding is taught in university, yet “mine-to-tailings” does not exist as an industry philosophy. Our industry is often so focused on the detail that we miss the big picture. And as we develop technically as specialists, many forget the value of being a generalist and working across fields of different expertise. The result? Specialists and experts can be guilty of operating in silos, without sufficient understanding of the big picture issues and thus they overlook opportunities and the benefits of a holistic approach. As organizations grow and the potential to impact increases, hierarchies can form, eroding communication and the exchange of ideas and inhibiting progress.

And yet, the answers are right in front of us. We just need to take a step back.

The solutions

Pre-concentration is a key part of the solution, and there are a number of technologies that can be applied in the pre-concentration process. Examples include shovel sensing, bulk ore assaying and ore tracking sensors – all help ensure that sub-economic material is removed between the mine and the mill, and therefore not milled in the first place, effectively reducing tailings management requirements.

In the process plant, screening, bulk sorting and SAG mill pebble rejection approaches reject coarser waste earlier in the process. These technologies are not new, and in some cases, have been used for decades. For example, at Bougainville Copper, coarse and low grade waste was screened off at high throughputs in the 80's. Ravenswood Gold, operating today, recently upgraded its crushing circuit and employs a similar approach. My Isa applied

dense media separation for over 40 years to reject low grade lead and zinc material. Bulk sorting is in operation at Anglo American's El Soldado and Mogalakwena mines, and SAG mill pebbles are rejected at countless sites. At Newcrest's Telfer operation, pebbles are particle-sorted and rejected.

In the process plant, a key advancement is the use of Coarse Particle Flotation (CPF) technologies. Whereas typical milling processes tend to grind material to a particle size of somewhere between 75 µm to 250 µm, CPF technology can enable grind size to be coarsened to around 300 µm to 400 µm, without compromising recovery.

CPF is tested and demonstrated. In fact, back in 2018, we designed the first CPF circuit to be used in a hard rock application at Newcrest Gold's Cadia mine site. Since then, CPF circuits have been installed at Kennecott, El Soldado, Mogalakwena and two more trains at Cadia, with another under construction at Quellaveco.

How does this lead to safer tailings?

Put all of these technologies and approaches together, and the quantity of fine tailings can be reduced by 65% or more. By producing, dewatering and blending coarser wastes, and comingling dry coarse material with wetter fine material in the right ratios, the geotechnical stability of the tailings waste can be massively increased. This allows for higher stacking heights and more robust stacking system operation. It also relaxes the moisture requirements for the fine tailings, thereby making more traditional dewatering approaches (like centrifuging, terraflowing or filtering) more effective.

But is it economical?

The objective of the mine-to-tailings value chain is to improve the overall business

case by rejecting lower value or waste streams at the right time, to the right extent and with minimum effort.

We can improve the economics of the operation by de-bottlenecking the mill constraint and enabling cost-effective dry tailings with reduced financial, reputational and environmental risks (and associated mitigation costs).

Energy savings of up to 30% for every tonne milled are possible. And water consumption per tonne milled can be greatly reduced, providing further savings for some projects in arid regions. For projects with tailings constraints, the ability to stack and store dryer tailings can extend the mine life substantially.

What's slowing adoption?

The “standard” approach has been the lowest cost. Cost structures (energy, water, GHG emissions, closure) are changing and these changes will lead to revision of the “standard” based on the lowest cost outcome.

Once the cost structures change or improve, enabled by technology and capability, human factors such as awareness, understanding and risk management become the rate-limiting drivers.

We can help

We know there is significant opportunity to improve the way tailings are planned, managed and maintained. And believe it can be done in a way that increases production rates, and reduces capital and unit operating costs, while simultaneously minimizing the energy, water and environmental impact of tailings activity.

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Interested in finding out more?
Contact [Ausenco](#).



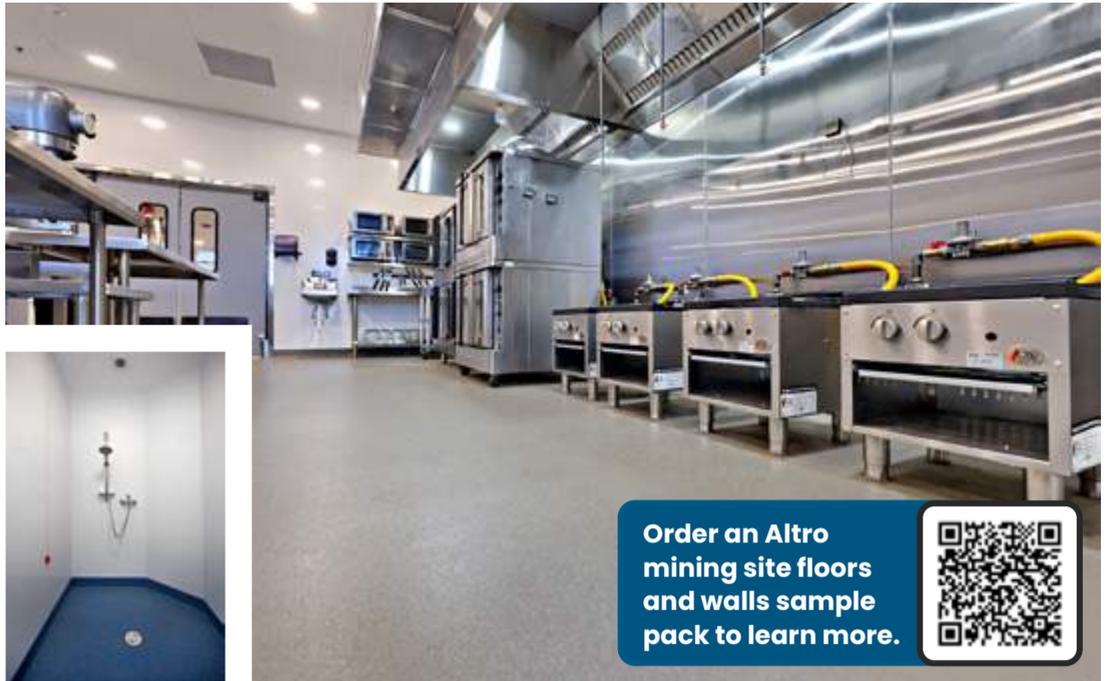
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CHOOSE ALTRO FLOORING FOR MINING SAFETY AND DURABILITY



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When employee safety and material durability are paramount, Altro safety flooring is second to none. Slips and trips are a serious workplace hazard. Safe Work Australia reports that slips, trips and falls are responsible for approximately 21% of all serious claims for workers' compensation.

They are also the second most common cause of work-related fatalities, accounting for 11% of all workplace deaths. With this in mind, preventing slips and trips should be a top workplace priority – and mining sites are no exception.

As the inventor of safety flooring, Altro understands the significant risks associated with trips and slips and how to keep people safe. Since creating our original safety flooring in 1947, we have continued to

lead the way in the development of robust safety flooring, and we now have solutions for all areas, including those found on mining sites - bathrooms, kitchens, offices, accommodation units, laundries, communal spaces and more.

With mining sites operating 24/7 and constant foot traffic throughout, the sheer volume of people and movement means there is a greater risk of injury if the flooring isn't performing or providing the necessary slip resistance. Slip resistance is vital to increasing employee safety and reducing worker injuries. Altro safety flooring is specially engineered to minimise slip risk and provide safe movement in low to high-traffic environments. Our flooring meets the highest Australian safety standards, with slip resistance ratings ranging from R12 to R10 guaranteed for the floor's

lifetime. Altro safety floors are supported by industry-leading product guarantees and offer our exclusive 'One in a Million' slip resistance guarantee.

Altro understands that mining sites present unique challenges due to constant operations, limited time for maintenance and repairs, remote locations, labour scarcity, increasing labour and material costs, and expensive downtime. Altro can help you overcome these issues. Our floors and walls are renowned for their durability, lasting performance, and low maintenance requirements, combining to reduce lifetime costs. We offer fast-install solutions with our adhesive-free flooring, which reduces disruption and downtime, as these floors can be installed, welded and walked on the same day. All our products come with industry-leading guaran-

tees, giving you peace of mind that you are investing in Altro quality and performance. We also offer local technical support and on-site visits.

Altro not only excels in safety flooring, but also offers a variety of wall protection solutions that integrate with our floors to deliver a hygienic and watertight solution. Altro Whiterock PVC wall sheets are a hygienic alternative to tiles and wall vinyl. With less silicon needed, Altro Whiterock is ideal to help combat mining sites' excessive mould challenges and provide a ready-to-clean finish in bathrooms and kitchens.

Invest in durable, quality flooring solutions to improve employee safety and reduce OHS risk.

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Altro makes durable floor, wall and door products for the commercial construction market.

Our vinyl safety floors and PVC wall protection sheets are known for their exceptional quality, durability and easy cleaning and maintenance.

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ROXSET PROVIDING CUSTOMISED FLOORING FOR THE MINING INDUSTRY

After being founded over 30 years ago to resolve production flooring issues, Roxset continues to pioneer a range of innovative solutions to address flooring integrity, employee safety and workplace practices.

With its large in-house team and refined installation process, Roxset offer a 24x7 service throughout Australia, including remote locations.

From its large modern factory facilities incorporating a diverse fleet of trucks — ranging from small utes to HD semi-trailers — Roxset can provide customised tailored flooring to large, small and regional clients.

Roxset services a range of industries including food processing, pharmaceutical, industrial and mining, wineries and hospitality and clubs.

Roxset aims to provide a custom-tailored solution to suit all requirements and has developed a range of unique epoxy flooring and wall solutions called ROXSET SE to meet HACCP, BRC and AQIS Compliance.

The Roxset WS Super Bonding Agent allows for the bonding of cementitious screeds and provides superior bonding and ultimate strength while their expansion joints are made from pourable grade epoxy and provide a flexible result. Roxset's flooring systems have a graded finish

to waste outlets, ensuring liquid is correctly and efficiently drained.

Their flooring covering technology is unique in that it connects walls and floors to create a seamless 'One Surface' solution. By using wall to floor covering, excess waste liquid can be dispersed quickly, avoiding the effect of harmful bacteria growth.

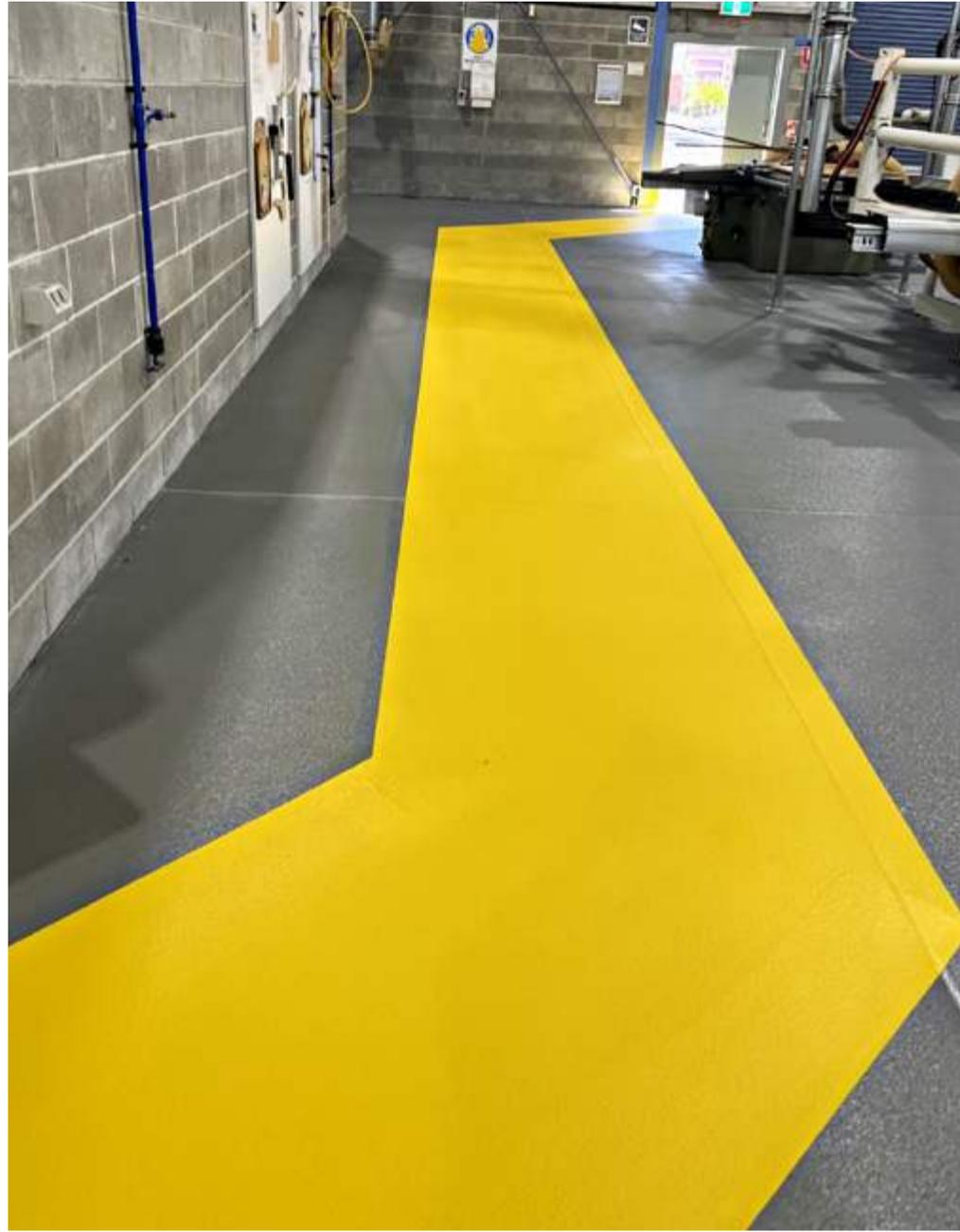
Flooring Solutions In Mining

As they are typically in remote exposed areas that are prone to heat, cold and dust, mining and industrial flooring can often face extreme challenges.

Roxset SE Flooring solutions for industrial and mining applications can withstand a broad range of impact abrasive conditions whether in heavy vehicle workshops, mess halls, kitchens and amenities. Recently, global mining giant Rio Tinto turned to Roxset to provide a long-term fail-safe solution for its vehicle maintenance area.

The Roxset SE heavy-duty epoxy mortar system was installed at 6mm, with minimum downtime and provides a shrink free, highly chemical resistant coating which has excellent thermal and impact resistance.

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Products are manufactured in Queensland with branches internationally allowing world wide access to our product range. Products are shipped world wide via air, sea or road freight.

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Liquid Containment's steel shipping container tanks are a unique system to storage of Potable water, raw water, fire water, Diesel or other liquids. All tanks are built brand new to order in Both 20 and 40 foot GP or high Cube container sizes holding a maximum of 76000 litres.

Ideal for mining , commercial and rental applications our container tanks can be shipped internationally or transported on flat bed trucks for easy installation with many configurations available to meet all customers requirements.

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Commercial Water Bladders

Ranging in sizes from 10000 Litres up to 1million litres, Liquid Containment's commercial bladders are used in military, emergency aid agencies, agriculture, general commercial, mining and aviation.

Liquid Containment's commercial water bladders are ideal for the temporary and long-term storage of various liquids including rainwater, grey water, chemicals, diesel and slurries.

All commercial bladders are made from 1250gsm fabrics or stronger, which are the thickest and strongest on the market today.

The bladders fold up — easy for compact storage — they are self-inflating and pressure draining, and they don't leach a plastic taste into the water.



For more information,
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or visit liquidcontainment.com.au.

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FLEXIBLE AND ROBUST LIQUID CONTAINMENT SOLUTIONS FOR WATER & FUEL STORAGE



We provide flexible solutions for the storage of liquids, air, fuel, water, chemicals, oil and others. Our products are used in the military, emergency aid agencies, agricultural, general commercials, mining and aviation industries. With many years of experience and our proven design methods, Liquid Containment Solutions are sure to meet your needs.

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Our tanks range in capacities from 660L to 200,000L and movable when full up to 4500 liters.

PETRO Industrial offers Fluid Management Systems through our iPETRO Cloud Solutions, as well as on-site Service and Maintenance plans to keep all pumping and dispensing equipment running smoothly.



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BLACK SNAKE (AUST)

AUSTRALIAN MANUFACTURER OF UNIQUE MINING AND VEHICLE RECOVERY EQUIPMENT

Black Snake (AUST) is the proud Australian manufacturer of one of the most unique innovations in mining and military vehicle recovery equipment.

Black Snake (AUST) was established with sales in 2002 to ARB 4x4 Accessories, our first distributor, who continue to export Black Snakes in increasing quantities to this day. A steady acceptance of the concept is what we continue to build our reputation on as innovators.

In early 2003, the fledgling Black Snake business was approached by several major Australian lifting, safety and mining supply companies to expand our concept of a rubber covered recovery strop. The range grew from the 8tonne Nylon 4WD sized Black Snake recovery strops to the huge 300tonne+ strength mining truck and bulldozer specific sizes. Black Snake continues to develop an extensive range of mine specific vehicle recovery strops.

It was soon acknowledged that Black Snakes Recovery Strops, with inbuilt high

strength load bearing Kevlar® fibres, robust, thick industrial rubber skins and heavy-duty eyes incorporating tough bearing points, could find many niche applications in mining.

More than 25% of the over 50,000 strops manufactured so far have been exported. Black Snakes can proudly be found in as diverse locations as Scandinavia, South East Asia and Antarctica to name but a few.

Marc Rinderer, Black Snake's company director and the primary innovator behind the unique Recovery Strop range, began his career as a BHP Iron Ore graduate mechanical engineer and Dunlop mine equipment design engineer. Marc has always been impressed by the acceptance of mining companies to new, innovative solutions which have inherent safety and ease of use at their core.

Marc and his father, Adolf, built all the manufacturing equipment and developed the myriad of designs. Marc has created

a deep knowledge base of the performance of Black Snakes through trials and extensive testing and continues to experiment with new ideas. Access to the company's own hydraulic 400tonne tensile testbed allows for bountiful experimentation and rapid advancement in concepts and new product ranges.

Our success over the last 21 years closely supporting our distributors and their mining clients has been achieved by recruiting our own experts from the national distributors that we support.

John Johnson,
Black Snake (AUST)

Global Business Development Manager, is a 40-year veteran of lifting, safety equipment, wire rope, chain, including shackles and lifting safety accessories. John hails from extensive careers at Bullivants Lifting and Gunnebo Industries, companies which lead the mining and construction industries in safety and quality equipment.

John has led innovation over the past eight years as an integral team member. He has extensive knowledge of mine site requirements, safe vehicle recovery challenges and has been a leader of innovation of the Black Snake range. John introduced the installation of fully embedded RFID tags inside the rubber skin to identify all Black Snake Recovery Strops regardless of the condition of the strops and identifying external tags. The chance to identify the complete history of the Black Snakes prior to repair and identify strops on site has been a very welcome innovation.

The introduction of the Black Snake "Y" Recovery Strop range of mine vehicle twin leg towing equipment was another of John's innovations, backed by several years of customer consultation and testing. Originally designed predominantly for skid mounted equipment such as de-watering pump stations, the Y strops are now being used for larger vehicle recovery. Just recently, they were extensively used by farmers during the NSW, SA and Victorian floods in late 2022. The "Y" strops range now has over 50 distinct designs in service.

Another recent innovative design was achieved at WA maritime docks. A customer, eager to reduce maintenance and repair costs, invited John on site to come up with a salt water and weatherproof, elastic, high strength, safe, long lasting and maintenance free alternative to existing fibre rope assemblies. After a year of on-site trials and discussions with John, Black Snakes have provided a perfect solution by developing a customer specific strop.

A departure from our vehicle recovery range, these devices are more in keeping with Black Snake mooring strops which are exported globally, but that's another story.

Kelly Skenderis has been asked many interesting questions over the years: "Can you make a Black Snake to replace existing broken steel cables, must be only one me-

tre long, support a heavy steel ring, have two legs, fit onto an existing mobile mine recovery rig and have 150tonne break strength?" Kelly's assistants can be seen holding the device following a year of prototype development, testing and approval by minesite safety teams. Kelly receives inquiries like this every other week and assures her customers that if we can do it, we will, because innovation is core to our success.

Kelly commenced at Dunlop Industrial Rubber and Dunlop Mine Equipment in the late 90's and has been with Black Snake (AUST) as National Accounts Manager for over 12 years. Kelly's excellent communication skills, coupled with a fierce determination to provide her customer with a viable Black Snake vehicle recovery solution, helps drive innovation in the office and factories.

Kelly closely manages our ongoing Australian Defence contracts as well as our distributors supplying French Defence contracts. Existing and new overseas clients can be assured of faultless service and dedication by Kelly and supporting staff. This can be a very challenging task, given the complexities of satisfying customer requirements across the globe.

At time of printing, late 2023, Kelly has been able to submit a prototype Long-wall Mining roof support recovery system which is impossibly short, high strength and minesite worthy.

Close consultation with the distributor, a clear understanding of all requirements and challenges of the mine owner and an in depth knowledge of the capabilities of the Black Snakes, sets Black Snake (AUST) as one of the leaders in mine vehicle recovery equipment.

Black Snake (AUST) is nothing without the dedicated manufacturing staff who turn ideas into real products and solutions for real customers. The manufacturing staff are constantly being challenged to develop new procedures, techniques and hand crafting skills to provide an increasingly varied set of Black Snakes. From the brand new 3.5tonne MBS Kevlar® recovery strops to the very imposing 500tonne MBS Kevlar® recovery strops and everything in between, Black Snake (AUST) will find the solution. **AMR**





PREMIUM PROVIDER IN RECOVERY, TOWING, MOORING AND SPECIALTY STROPS

Black Snake (AUST) are all about strength, lightweight, ease of handling, durability and, of course, making products which are purposeful.

We are the proud Australian manufacturer of one of the most unique innovations in mining and military vehicle recovery equipment.

If we can do it, we will, because innovation is core to our success.



W: blacksnakestrops.com | E: info@blacksnakestrops.com | P: 03 9720 7337

grounded.

building tomorrow, together



**To be grounded,
feet firmly on the soil.
Solid in consistency,
thought and action.**



Safety • Wellbeing • Quality • Integrity • Passion • Efficiency

Building secure & comfortable communities for the people of mining, Australia wide.

From design and construction, refurbishment and relocation. We cover every aspect of project management for mining villages and civil projects.

We enhance mining communities by providing all the modern-day necessities required on site. We specialise in the installation of both permanent and temporary modular portable buildings, mining camps, non-process infrastructure, operational facilities and the development of long-term housing.

Our team of qualified, licensed personnel offer all-encompassing construction project management services and are capable of taking on challenging construction projects of various sizes and in various locations. Our expert team is made up of project managers, contract administrators, infrastructure designers, construction supervisors, carpenters, plumbers, electricians, plant operators and concrete workers.



Our team's strong personal connections with contractors enables all Grounded projects to be completed in a timely and cost efficient manner. We will always work our hardest to ensure that a project is run smoothly and that project milestones are achieved with ease.



Let's chat about your next project.

groundedgroup.com.au



QMW BRINGS INNOVATION TO FUEL

For over 40 years, QMW Industries has set the benchmark in custom engineering solutions. Synonymous with innovation, quality and safety, the company's machines are built tough and designed for the most demanding applications.

Whether its retrofitting a truck or excavator cabin, fabricating earthmoving attachments, or designing a custom turnkey vehicle, QMW's equipment is manufactured with performance and safety in mind.

QMW Industries' latest purpose-built fuel delivery and service trucks are no exception. Firstly, for industries that rely on diesel fuel to power their machinery, having a reliable fuel dispenser is essential. QMW fleet pair to ensure optimum flow rates are likes to 'flow pair' matching grease dispensing rates with fuel dispensing rates.

The company's new 6,000 litre diesel ser-

vice tanker showcases real innovation in fuel delivery. Its new HV diesel dispenser solution offers a wide range of features to ensure safe and efficient fuel delivery.

The diesel tanker hydraulic system designed to provide consistent and reliable flow rates. The dispenser's hydraulic components are housed in a weather-resistant cabinet located on the driver's side of the truck. This cabinet also contains the dispensing controls, including a digital flow meter that accurately measures the amount of diesel fuel being dispensed.

The reel system, which is designed to make it easy to dispense fuel to a vehicle at distance, can be easily extended to the desired length, and the freewheel function allows the reel to be walked out to the vehicle without the need for manual winding.

The HV diesel dispenser is the only dispenser that requires the freewheel process to be completed on the reel. It is

equipped with Donaldson filtration to remove contaminants. TRAP and desiccated breathers are fitted to prevent moisture entering the tank. PTO-driven hydraulics provide power to the screw compressor and hydraulic-driven Ebsray V25 vane pump with proportional control over flow rates via PWM controlled proportional valves.

This highly efficient and reliable fuel delivery system is designed to meet the needs of a diverse range of industries. With innovative features for safe and consistent fuel delivery, and a maintenance system that maximises performance over time, the HV diesel dispenser is a must-have for any industry that relies on diesel fuel to power their machinery.

When it comes to heavy-duty industries such as mining and construction, the right equipment is critical to ensuring project continuity and maintaining high productivity. This is where QMW Industries' sec-

ond innovative solution, the mechanics truck, comes into play, with the objective of streamlining onsite maintenance and repairs.

The top-of-the-line vehicle is engineered to deliver exceptional service, fuel, and lubricant transfer capabilities, making it the ultimate workhorse for these tough industries.

If you're in the market for a reliable, versatile, and high-performance mechanics truck, then look no further than the new QMW Industries service truck.

Featuring the latest technology in response to the demands of the modern worksite, this truck configuration offers a range of features that make it the ultimate solution for the onsite repair needs of maintenance personnel.

With six product tanks, the mechanics truck boasts a capacity of 1,400L for die-





DELIVERY AND ONSITE REPAIRS

sel, 10W oil and waste oil, while a 700L capacity is allotted for 30W oil, 15/40 oil, and 20/50 gear oil. Each product comes with a dispensing reel and nozzle, making it easier for operators to handle and dispense fluids with greater efficiency. It also accommodates a 200L grease drum with a dedicated grease pump, gas bottle storage, dispensing reel, and nozzle for hassle-free lubrication.

The truck is also designed to house mechanics tools, kit sets, filter storage, waste filter and oil storage, pry bars, G.E.T and other parts. Bottle storage is integrated to accommodate a G-Size Acetylene bottle and two G-Size Oxygen, Argon, or Argoshield bottles.

A hydraulic-driven air compressor supplies up to 80cfm of airflow to drive the air-driven pumps for oils, diesel, grease, and waste oil, allowing operators to control multiple functions simultaneously for optimal and efficient fluid dispensing.

A combination of diaphragm and piston pumps are utilised across the system, which provide conservative efficiency ratings and a longer lifecycle.

For heavy lifting and manoeuvring operations, the truck features a 3.8T/M crane at the rear deck, with a maximum lift capacity of 2,400 kilograms and a maximum reach of 5.8 metres.

Operated via remote or fixed controls are positioned adjacent to the crane for easy and convenient operation.

The truck offers plenty of storage and

tool compartments, including six large tool drawers, an oil drainage cabinet for storing soiled oil pans and filters, and a heavy-duty cabinet for storing heavy items such as Ground Engaging Tools.

A PTO-driven hydraulic pump is installed on the truck to supply power to the compressor and crane, and the hydraulic pump is load sensing and engages the PTO when power is required.

Operators will also benefit from integrated LED work lamps, which illuminate the cabinets and external work area.

Four lights are installed at the front and rear of the truck, while others have been installed inside the cabinets, ensuring proper visibility and safety for operators.

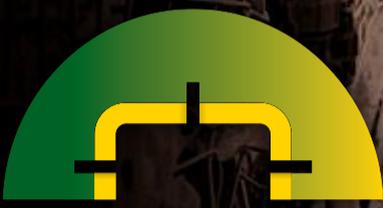
It features Class 2.5 grit blasting on all carbon steel, and a two-pack epoxy coating for superior corrosion and UV resistance, making it ideal for heavy-duty industries where the vehicle is exposed to extreme conditions.

The truck body maximises storage space and allows for tanks to be full, additional payload on rear deck with toolboxes all fitted out with tooling.

QMW's mechanic trucks are packed with powerful and efficient features, providing unmatched servicing capabilities for maintenance personnel and operators for mobile earthmoving and mining equipment.

For more information, visit
www.qmw.com.au/
 or call +61 7 3275 2544





JETCRETE

AUSTRALIA'S LARGEST

SHOTCRETE PROVIDER

By providing unparalleled ground support services across the country, Jetcrete has earned the trust of mining professionals and related industries.

With over 40 years of experience, Jetcrete's knowledge lies in shotcreting — the application of specially adapted materials using cutting-edge techniques.

In an industry that can be both physically and mentally taxing, Jetcrete knows the importance of supporting people, suppliers and clients to help them thrive, as well as provide complete support at every stage of the project.

Shotcreting

Jetcrete is the largest shotcrete provider in Australia, delivering underground and fibrecrete ground support for both the development and rehabilitation of underground mines. In collaboration with key industry suppliers, they have developed several major advances in shotcrete technology to complete difficult shotcreting tasks efficiently and safely.

The first development are the robotic shotcrete units. Up until 30 years ago, shotcrete was applied by hand only and in 1993, Jetcrete attached a shotcrete system to a drilling jumbo rig, enabling a remote-control shotcrete application to undertake overhead shotcrete work safely — thus creating the first robotic arm shotcrete application.

The second development of hydrosaling removed the need for a jumbo rig for scaling to improve mining development in-cycle efficiency.

Jetcrete and Byrnegut introduced this process in the early 2000s and it has since become an integral part of any efficient mining cycle.

The final development of 3D laser scanners improves QAQC thickness verification without the need for additional resources.

Concrete Manufacturing

Jetcrete has been at the forefront of concrete manufacturing since 2003. They own 16 batch plants, enabling mining sites to access 24-hour concrete, CAF and shotcrete manufacturing. This results in increased production, reduced costs and with experienced technical support, a better quality assurance on the manufacturing and delivery process.

Their active involvement with major suppliers helps them develop specialise mixes onsite to meet the requirements of the soft and hard rock mines.

Cable Bolting, Laser Scanning & Resin Injection

Recently, Jetcrete expanded its scope of services to include cable bolting and with a

growing number of projects, has installed an average of 350,000 metres of cables per year.

Jetcrete uses the latest laser scanning technology to measure application thickness of the shotcrete at the site.

This enables the accurate detection of safety concerns with Jetcrete then able to use only the necessary amount of concrete to support the ground, improving safety and efficiency.

An alternative rock support system for underground mining, resin injection provides additional support for encapsulation of TG cable bolts and ground consolidation.

This stabilises rock, coal, sand, gravel, concrete and caved materials, stops water ingress and supports the injection of any cable bolt.

Remote Shaft Lining

Over the past 20 years, Jetcrete has developed a tele-remote system that has eliminated the need for people to enter the shaft during the entire process. They were the first company to introduce an EX-d – Group I compliant shaft liner, enabling safe operations in zone 1 hazardous environments.

A remote shotcrete application can work in vertical shafts from 1m to 6m in diameter and up to a maximum depth of 400m.

Ready Jet Drum Blasting

Jetcrete's latest addition — Ready Jet Drum Blasting — is designed to remove hardened concrete from agitator drums in a safer and more efficient method.

The remote-controlled, high-pressure cleaning system eliminates the need for workers to enter the concrete mixer drum where they are exposed to confined spaces, loud noise, falling debris and respiratory dangers.

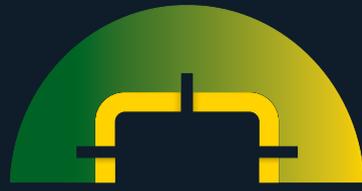
Cleaning is controlled from outside of the drum using a remote control, resulting in significantly reduced health and safety hazards. Not only does this mark a safer way of cleaning the drum, but this method is also faster and only one worker is needed for the cleaning services.

With its comprehensive range of services, which includes shotcreting, concrete manufacturing, remote shaft lining, cable bolting, laser scanning, resin injection and civil construction, Jetcrete has the capacity to support projects of any scale and difficulty. When it comes to ground support work, Jetcrete is the name to trust.

For more information, visit
www.jetcrete.com.au

AMR





JETCRETE

Complete support from the ground up

As Australia's leading ground support specialist to the mining industry, Jetcrete uses the latest techniques and specially adapted placement materials to provide a shotcreting service for clients across the country.

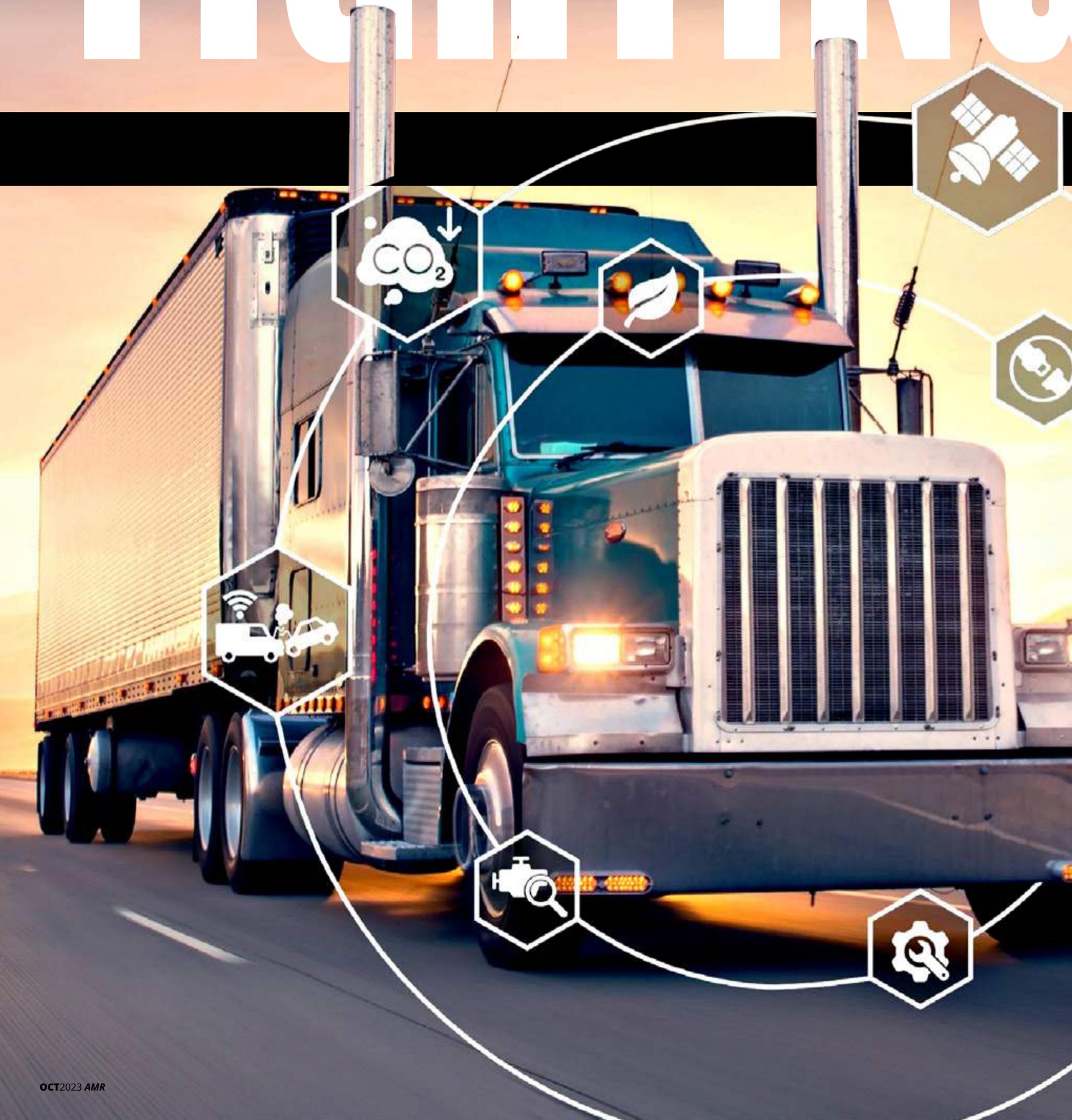
With more than 40 years in the industry, Jetcrete has extensive experience in all aspects of concrete spraying. We are capable of providing a complete service for all stages of underground shotcreting service including onsite concrete, shotcrete and CAF manufacture, delivery and application.

Jetcrete is also capable of delivering specialist ground support services including shaft lining, cable bolting and resin injection.

Find out more about our services and careers, visit:

[jetcrete.com.au](https://www.jetcrete.com.au)

FIGHTING



FATIGUE

How fatigue-management telematics can help miners stay safe

Although Australia's mining industry is among the world's safest, mines are high-risk environments, with workplace dangers ranging from heat stress to being hit by machinery. But it's the mundane threats that claim the most lives.

Separate studies in Queensland and Western Australia have found that vehicle accidents are among the leading causes of death or injury at mines. And among those accidents, fatigue is often a factor.

The industry needs to be constantly vigilant, identifying and minimising risks at every opportunity, and driver fatigue is one area where it is determined to make progress.

New fatigue-management requirements set by Safer Together and several of Australia's leading mining operators will attempt to reduce the number of fatigue-related incidents.

While this is welcome, it could create an additional compliance burden for fleet managers. Fortunately, new telematics solutions could help to prevent accidents while making it easier for fleet managers to enforce fatigue-management policies.

There is a clear business case for using telematics to reduce fatigue-related incidents, for both light and heavy vehicles. While there is an upfront cost to installing new telematics, the alternative could be far more costly.

A bad accident can have a devastating effect on a worker, and it can create unforeseen costs for a business, including insurance excess, legal costs, reputational damage and the additional time it takes to replace equipment and process paperwork.

A study from the University of Queensland found that about 2.5% of all notifiable incidents at mining sites across Queensland, New South Wales, and Western Australia included fatigue as a factor.

But that figure under-represents the risks for fleet managers, because 80% of fatigue-related incidents involved vehicles, with the overwhelming majority occurring in heavy vehicles.

The same report suggests it's highly likely that registered fatigue incidents are under-reported.

The mining industry's current labour crunch could create additional pressure for miners to work more hours. Perth-based consultancy Pit Crew says there's already a shortfall of 28,000 workers in Australia, which could grow to 36,500 over the next two years.

The ABS says that mine workers in non-managerial positions work longer hours than in any other industry.

Against this backdrop, telematics could be a viable solution for companies to reduce their fatigue risk in a methodical and cost-effective manner.

Geotab's new fatigue-management system monitors driver fatigue and distraction in real-time using under-seat vibration and advanced camera monitoring.

Additionally, it includes accident and event camera footage (driver-facing and forward-facing), mobile phone usage detection, and seatbelt monitoring for comprehensive fleet safety and compliance.

It also provides detailed event notification logs. This enables administrators to accurately report on actual fatigue events,

including microsleep incidents, to meet safety requirements.

This is an extremely valuable tool for operations that need to comply with company policies or regulations, which are likely to become more stringent in the years ahead.

It's a flexible solution, offering a choice of in-house management or 24/7 data monitoring services, tailored to meet customer requirements.

Customers will retain full ownership of the footage and data, without the need to request video from suppliers.

Geotab's fatigue-management system can be easily integrated into a suite of other telematics solutions. Geotab's solutions give customers visibility over their fleets and drivers.

They are designed with scalability in mind, offering the flexibility to adapt as fleets grow, all in one platform.

Processing billions of data points a day, Geotab leverages data analytics and machine learning to help customers improve productivity, optimise fleets through the reduction of fuel consumption, enhance driver safety, and achieve compliance with regulatory changes.

This solution is available through Fleet Complete, Geotab's largest reseller in Australia. For more than twenty years, Fleet Complete have been providing mission-critical fleet, asset and mobile workforce management solutions.

It has built a stellar reputation and reach within the local market through an understanding of the Australia's unique economy and work culture. **AMR**



Fleet Complete

Powered by
GEOTAB



CASHCOR EXCELS IN ENGINEERING

Cairns-based general engineering business Cashcor Engineering (CE) are an adaptive and progressive engineering specialist group who have built a reputation in Far North Queensland and the broader region as a “one stop engineering shop”.

For more than 40 years, the Australian business has specialised in bespoke design and engineering solutions in the areas of driveline services; design and fabrication of steel, stainless steel and aluminium products; fitting and machining; section rolling; pipe and tube bending; plate rolling; pressing; guillotine; metal polishing; precision waterjet cutting and are stockists of stainless steel.

In 2013, the business changed hands with Brett Cahill and Tony Cuda taking over the reins and injecting a new energy into the business operations. Their commitment to integrity, quality and responsiveness to supplying their industry with high-quality workmanship is a priority.

Since their inception they have added more services to their repertoire to satisfy evolving customer needs. Therefore, giving them extensive technical leverage to support customers across the mining, civil construction, marine, and engineering sectors, to name a few.

According to CE Director, Tony Cuda, the company prides itself on a con-

cept-to-manufacture capability in relation to its engineering services.

“We work closely with our clients to provide high-quality services and quick turnaround. As the needs of various industries continues to evolve, we embrace the demands and advance our manufacturing techniques through innovation in production and processes, the best machinery and equipment in our workshops, and efficient supply chains.”

CE has cultivated an enviable reputation as not just an experienced operator with integrity, but one that constantly delivers high quality products and services at a reasonable price.

With a breadth of innovative products and services and loyal specialised staff they are able to meet all their clients’ needs and wants.

More than just Fabrication

No job is too big or too small. CE approach every job with the same level of dedication from start to finish, leveraging their in-house technological capabilities to complete precision works promptly. Whether its drivelines, building processing plant equipment, marine refits, on-site plant and machinery maintenance or ute trays, quality workmanship and the ability to fabricate complex steel, aluminium or stainless steel products is their forte.

Their multi-faceted capabilities encompass and enable every stage of the engineering process from concept to design to manufacture. The business can provide tailored solutions to meet each clients’ specific needs and timeframe restraints.

The diverse range of machinery and equipment housed at the workshops allows CE to complete all jobs in-house, without the need to outsource, which is more cost effective for clients and enables CE to maintain quality control on all works. Confirming the company’s status as being a ‘One Stop Shop’ of engineering specialists.

CE provides specialised services to North Queensland companies in the areas of:

- Driveline services
- Design and fabrication of steel, stainless steel and aluminium products
- Fitting and machining
- Section rolling
- Pipe and tube bending
- Plate rolling
- Pressing
- Line boring
- Precision waterjet cutting
- On-site plant and machinery maintenance...and much more!

Specialist Driveline Services

Cashcor’s driveline services are one field where the company has really made a name for itself as the only Far North Queensland provider, servicing Cairns

and the broader region with replacement driveline parts and services for a range of industries.

The business expanded its services in 2013 to include shortening, extending, new and custom builds, repairs and balancing of automotive tail shafts, and now stocks a comprehensive range of flange yokes, universal joints, centre bearings, slip and stub shafts to suit different vehicles. This allows Cashcor to offer replacement driveline parts to locals without having to send them down south.

Mr Cuda says building long-term client relationships is at the heart of what they do and is the driving force behind their team on every single job.

“We are committed to providing the market with superior engineering services. We continue to ensure our delivery capabilities are maintained at the highest levels in line with a client base who are moving with the times and need much more sophisticated and intricate work to be carried out.

“Our diverse range of clients that engage our services understand how we work and exactly what they will get, which is why they end up repeat clients.”

For more information, visit
www.cashcor.com.au

AMR

CASHCOR
ENGINEERING



YOUR ONE STOP ENGINEERING SHOP

From concept-to-manufacture, Cashcor Engineering has provided a suite of workshops and engineering services across Far North Queensland and the broader region for more than 40 years.

Within our workshops we are well equipped to meet our diverse client base services we host machining, metalworking, and specialised machinery and processing equipment capable we are well equipped to meet its diverse client requirements.

We're committed to delivering high quality, cost-effective engineering solutions, no matter the size or technical complexity of a project. From small local businesses to major mining companies, you can be assured our team will prioritise and turn around every job quickly without compromise.



OUR SERVICES

- ➔ Driveline services
- ➔ Marine & General Engineering
- ➔ Stainless Steel Fabrication
- ➔ Aluminium Fabrication
- ➔ Steel Fabrication
- ➔ Design & Drafting
- ➔ Machining
- ➔ Milling
- ➔ Line Boring
- ➔ Remote Machinery Repairs & Maintenance
- ➔ Plant Maintenance
- ➔ Profile Waterjet Cutting
- ➔ Broaching
- ➔ Section Rolling
- ➔ Plate Rolling
- ➔ Material Sales
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- ➔ AusQuip Processing Plant Equipment

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Driveline Services Australia can build it **BIGGER, STRONGER, CHEAPER**

From Toyota light vehicles to the biggest mechanical dump truck in the world.

Driveline Services Australia – the underbody and power transmission specialists, are your one stop supplier for Driveshafts and Universal Joints for any and all applications used across the mining industry.

From heavy duty Toyota Landcruiser shafts, with custom splines and dust boots standard, to the biggest to suit CAT 797F, with larger spline diameter, improved sealing and temperature responsive heat stickers to assist fitters to determine universal joint bearing wear, Driveline's 13 branches complete with workshop facilities are strategically located across Australia in and around the mining sector.

With over 40 years of experience dealing with OEMs, mining and defence vehicles, Driveline know the environmental factors impacting life hours and aim not just to provide a replacement driveshaft, but to offer improved life at a competitive price.

BIGGER, BETTER, STRONGER, CHEAPER is achieved with better sealing for both sliding splines and universal joints where possible, and where swing

diameter permits the Driveline driveshaft design also incorporates larger involute splines, providing improved pressure angles and reduced friction.

With most Driveline branches being in or in close proximity to mine locations across Australia, the company has worked closely with large fleet operators in the pursuit of improved life hours and addressing universal joint failures. Most recently, after exhaustive testing in some of Australia's hottest locations,



Driveline developed a heat sensitive sticker that assists workshop staff to determine bearing wear in universal joints. This innovative addition allows workshop fitters to see evidence of excessive heat generated at the bearing cap, suggesting the bearing is in need of replacement.

The use of these stickers in test fleets has seen a reduction in driveshaft failures that can cause damage to

transmissions and axles and in some cases even result in a machine fire.

These new and innovative products are just a couple of examples of how Driveline remains the country's leading independently owned and operated driveline and power transmission specialist.

Beyond shafts and their components, the company also remains very active in the field of axles and power transmission, as ensuring effective power transmission from engine to wheel requires an operational understanding of all drivetrain components.

As distributors for both Dana and Kessler components, the company holds in country and in stock an extensive range of replacement parts fitted to popular off-highway vehicles.

Many of Driveline's technicians are factory trained and have travelled to Germany to improve their skills and education with latest products and technology.

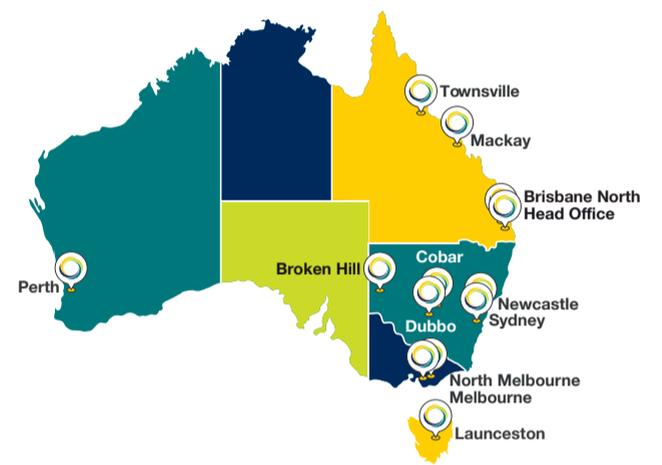
If you are looking to achieve improved life hours or require assistance with failure analysis, talk to the team at your closest Driveline Services Australia workshop, the specialists in drivetrain components and your partner in mining around the country for over 40 years.

Driveline Temperature Indicators



A unique feature of our Universal Joint installation is the use of heat stickers. Driveline heat stickers allow fitters to monitor bearing life and determine component heat stresses.

THE UNDERBODY AND POWER TRANSMISSION SPECIALISTS.



- ✓ Driveshaft design, manufacture, modification, repair and balancing
- ✓ Axle, differential, final drive, drop box, transmission and torque converter testing and reconditioning
- ✓ Complete replacement shafts for most Caterpillar, Komatsu, Toyota and Nissan vehicles
- ✓ Off-highway, fixed plant aftermarket and Original Equipment components
- ✓ Shafts, slips, weld and spline yokes
- ✓ Heavy Duty Landcruiser universal joints, spline sets and shafts

- ✓ Flanges
- ✓ Differentials
- ✓ Manual gearboxes
- ✓ Suspension
- ✓ Steering
- ✓ CV front wheel drive
- ✓ 24 / 7 service
- ✓ Over four decades of expertise
- ✓ National network buying power
- ✓ Custom solutions
- ✓ \$20 million public and product liability insurance

Get in touch today

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DRUMS AND TEETH FOR ANY APPLICATION

There's no questioning the impact the right attachment can make when up against challenging applications in mines or quarries. Earthmovers are all too familiar with how to navigate different structures and surfaces, both above and below ground, and the critical role that equipment like rock grinders and cutting heads play in getting the job done.

Whether it's trenching in hard and compact ground, rock wall and concrete profiling, tunnelling, dredging, demolition, or quarrying, the Simex TF range of Drum Cutters is renowned for its work in finishing operations where high precision, minimum disturbance and aesthetic results are required.

Globally, there is an increasing demand for earthmoving attachments that help

operators cut through tougher surfaces more effectively, with the least amount of effort. In situations where conventional excavation systems are too weak and have little effect, Simex Drum Cutters feature a versatile range of drums and teeth for various complex and specialised applications.

Designed with performance and hard rock in mind, Simex drum options include the standard HP drum for deep penetration in hard materials, the GP drum for wall profiling, and the WP drum suited to profiling and finishing works thanks to its larger width.

Multiple tooth geometries are also available, which are specifically designed for working in different materials. The standard tooth supplied is ideal for mixed

materials, while other optional teeth allow work in extremely hard materials, or finer profiling work. In mining and quarrying works for example, the Simex TF drum cutter is highly versatile, guaranteeing selective breaking of the rock mass to ensure the wall stability open pit extraction. It increases profitability, producing a crushed material that often doesn't require further volume reduction by additional equipment or machinery.

Underground Tunnelling

The deep tunnels below ground are typically dusty and abrasive environments. This is certainly the case in Western Australia's Pilbara region, but throw hard rock and limestone into the mix and you end up with the ultimate rock grinding playground. With mine and operator safety at the forefront, purpose-built attachments and wear resistance are essential in efficient tunnelling work, while maintaining low noise levels and vibrations.

Simex attachments are no exception. They are the perfect partner in underground gold mine portal expansions, and this was proven by Byrnegut Mining in an underground mine in the West.

The team were faced with soft limestone on a slope, ruling out traditional drill and blast processes as blasting would cause the limestone to fragment and become unstable.

Therefore, a modified version of a Volvo ECR235E excavator was chosen for its lower swing radius and manoeuvrability in tight underground working conditions. A dozer blade was fitted to the back of the excavator to leverage the machine into a

level position to help manage the slope incline. A Simex TF850 drum cutter and dust suppression system were also fitted.

Total Rockbreaking Solution (TRS) engineered and modified a section of the excavator arm to accommodate the 360° rotator and the 140° left-right actuator, fitted directly to the machine that met OEM specifications.

The Simex drum cutter helped effectively grind away the soft limestone at the face, while keeping operators comfortable and safe, and noise levels and vibrations to a minimum.

Rock Wall Profiling

When undertaking rock profiling in the Bossarino landfill in the Italian municipality of Vado Ligure, operators looked to major Simex dealer Comai spa in Liguria for an attachment that would meet the demands of the job.

The landfill primarily deals with the disposal of non-hazardous special wastes, the recovery and recycling of materials, and the production of electricity from organic residues.

The rock wall profiling work was required as part of the installation of waterproof geomembranes. Operators needed attachments that were capable of not only crushing rocks, but also achieve precise finishing and enable the correct installation of the geomembranes.

A Simex TF 2100 drum cutter, mounted on a Hitachi ZX350LCN-6, was used for rock wall profiling and earthworks, specifically schist with reduced resistance to excava-



tion due to the high degree of fracturing and weathering. Unlike traditional percussion systems, the Simex TF range combine excellent hydraulic power, generated by the motors in direct drive with the drums, with the selective and controlled breaking of the rock mass. The Simex TF 2100 has an operating weight of 2380 kg, and delivers a nominal power of 120 kW and a cutting force equal to 71 kN.

Quarry Operation

In a flagship South Australian quarry, a Simex TF 3000 drum cutter has lived up to its reputation, delivering a 10 percent increase in yield, and a 20 percent reduction in waste. The quarry operation produces a wide range of aggregates including rock, rubble and sand for concrete, asphalt, backfill, rail ballast, landscaping and other civil construction applications.

Traditionally, drilling and blasting were used to quarry on fractured rock, however proved an inefficient two-stage process, and in winter when it's wet, blasting is not possible. There were also issues with first and second grade materials being mixed together, resulting in high wastage.

Overcoming these challenges required the Simex drum cutter, the largest in the range, to further increase production. The drum cutter was attached to a 46-tonne Volvo excavator, and has been operating for more than 18 months in 10-hour shifts every weekday regardless of weather conditions, to ensure keep levels steady at over 300 tonnes per hour. **AMR**



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AUSSIE PUMPS, BEST IN MINES



Megator Sliding Shoe pump mounted in 'mobile' configuration.

Australian Pump Industries is only 30 years old, yet already has a huge footprint in the Australian and international mining markets.

There is no industry more brutal on equipment than mining. Aussie listens to the miners' feedback, and delivers the hardest working gear available.

Australian Pump has proudly distributed the rugged and reliable Megator and Carver brands in Australia for over 20 years. Two classic workhorses in Australian mines are the Megator range of Sliding Shoe pumps, and the Carver 855 filtrate pump.

MEGATOR SLIDING SHOE PUMPS

One of the key range of products for the mining industry is Aussie's selection of Megator Sliding Shoe pumps. These positive displacement pumps provide exceptional suction performance, versatility and an ability to pump at constant capacity against heads of up to 75m.

Megator's unique design means that the pumps can run dry without harm.

They are self-compensating for wear with a very simple design that has few working parts, and convenient 'single cover access' for maintenance.

In performance principle, they are close to the concept of a positive displacement piston pump but with additional features that include powerful suction and the ability to self-prime.

MIGHTY PERFORMANCE

Developed by Megator, the Sliding Shoe concept allows the pumps to be compact in design, yet they deliver mighty performance. The neat body design makes them significantly more space efficient than either plunger or piston pumps of equivalent ratings. This is achieved by the elimination of gearing and crank mechanisms, which also saves lubrication and maintenance.

"They absorb shock and vibration in pipelines by the smooth laminar flow of the unique Sliding Shoe design," said Aussie Pumps' Chief Engineer, John Hales.

Pump configurations are available in a wide range of materials, and for a number of applications. The pumps are widely used for pumping lubrication in their cast iron configuration, but are also available in bronze or aluminium for corrosive liquids.

Port plates and rotors are made of precipitation-hardened stainless steel which can be coated for even greater wear resistance. Bearings are eccentric-locking with an inner ring of hardened stainless steel, designed to guarantee easy removal and quick access to shaft seals.

The shaft seals themselves are designed to minimise maintenance, as they are exposed to the cooling and flushing effect of the liquid flowing through the pump body.

The pumps are available in either bare-shaft or electric motor, petrol or diesel engine drive. Maximum flow capacity can reach up to 60m³/hr.

Australian Pump offers a purpose-designed relief valve that's capable of passing the full pump capacity. The relief valve

can be arranged to bypass suction, but an open and visible discharge is generally preferable.

SUITABLE FOR OIL SPILLS

Another major advantage of the unique design is that fluid pumped at a given speed, instead of dropping with an increase in head, is practically constant at all heads, and suction lifts within the range of the pump.

"Megator's design is unique" said Hales. "Their ability to run dry when necessary but continue to operate with viscous liquids make them suitable for oil spills. In that application, they can suck water off the surface when used in combination with Megator's unique 'Dolphin' floating strainer."

The pumps are exceptionally robust and can cope with rough conditions and handle a wide range of liquids: viscous or free-flowing, clean or dirty.

Options for mounting assemblies include stationary, skid-mounted & mobile.



Megator Sliding Shoe pumps handle viscous liquids in mining, for fire & rescue, and onboard with the Navy.



Carver 855 filtrate pump is suited for vacuum filtration and dewatering systems with difficult suction conditions.

Australian Pump have supplied Megator pumps to Australia's vital mining industry, as well as Fire & Rescue services, and the Australian Navy.

CARVER 855 FILTRATE PUMP

The Carver 855 filtrate pump was developed as an original concept to minimise component wear and maximise longevity. **It is well suited for vacuum filtration and dewatering systems with difficult suction conditions.**

Carver filtrate pumps are now working on filtrate applications on mines in virtually every State in Australia.

The pump's design is unique in that it has a mounting flange directly to the receiver tank, eliminating suction piping and minimising NPSH issues. This design allows pumping to resume even after short periods of interrupted flow. It's capable of operating in vacuum conditions of up to 26" Hg.

A specially designed open impeller assures pumping, whether a trickle or full capacity, whilst the simple rugged design is dependable and is employed in some of the toughest environments in the industry.

FIRST-RATE ENGINEERING

Aussie's Chief Engineer, John Hales, has worked with Carver over the last 30 years through Australian Pump Industries' Naval Division.

"Carver pumps are fitted to most U.S. Navy vessels," said Hales. "We did a lot of work on Australia's FFG Frigates and that's when we got to really understand how tough they are. Their engineering is first-rate and quality is built to U.S. Navy MilSpec standards," he said.

Carver's 855 unit features a V-belt drive arrangement as standard. By utilising either belt drive or variable frequency drive, performance characteristics can be

fine-tuned to match most system requirements. With a simple, vertically-split case design, the 855 may be disassembled to expose the entire wetted area.

UNIQUE MATERIAL SPECIFICATIONS

The model 855's impeller is an open blade design, domed in shape to eliminate wear and improve performance. The material specifications are unique, including not only copper and stainless steel but also a molybdenum addition.

Standard features include a packed stuffing box with seal water connections provided to ensure lubrication and eliminate vacuum/air leakage. Discharge flanges are machined for both Class 150 ANSI and DIN PN10 connections.

"Carver use corrosion-resistant shafts to eliminate the need for shaft sleeves. The impellers, keyed to shaft, provide a secure fit and protection should momentary reverse rotation occur" said Hales.

Australian Pump have been supporting the Carver products in Australia for more than 30 years. It's noted that Australia's leading mining companies are now moving their filtrate systems to Carver's 855-series. Some operators may still be using the original 850 range as well.

AUSSIE KNOW-HOW AND SUPPORT

Australian Pump has proudly distributed the rugged and reliable Megator and Carver brands in Australia for over 20 years.

Parts, service and expert advice is available from Australian Pump's Sydney Head Office.

For more information call +612 8865 3500 or visit www.aussiepumps.com.au.

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Aussie's Chief Engineer, John Hales, has worked with Carver over the last 30 years through Australian Pump Industries' Naval Division.

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