

# THE AUSTRALIAN MINING REVIEW

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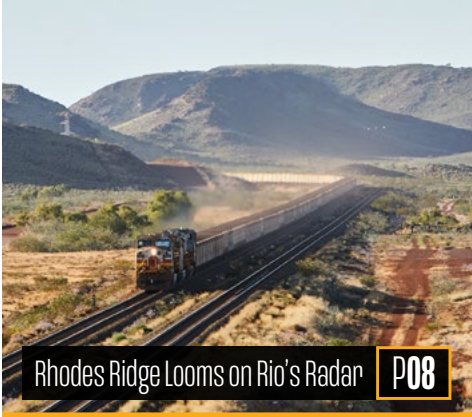
2022 | November

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Rhodes Ridge Looms on Rio's Radar **P08**



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## LIGHTEST, TOUGHEST TRAY COMES TO PLAY



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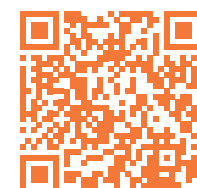
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# Wanamaker Assays Shine Bright for Strickland Metals

Strickland Metals (ASX: STK) CEO Andrew Bray was positively salivating over assay results returned from drilling at the company's flagship Millrose gold project in the Yandal Greenstone belt of Western Australia.

Bray described assay result from MRRC329, which delivered 7 metres at 22.2 grams per tonne (g/t) gold from 72m, as "one of the most impressive assays returned to date from our flagship Millrose gold project."

"The oxide mineralisation we are seeing at Wanamaker is arguably more impressive than what has been historically intersected at Millrose, particularly if it continues opening up to the north," Bray continued.

"The high-grade gold is consistent across the 7m intersection. We are now seeing a very impressive and continuous zone of oxide mineralisation, which currently extends

from Wanamaker in the north to the southern portion of Millrose. The footprint of the oxide mineralisation is now over 3.2km long."

The headline drillhole, to the south of another hole located just 50m north of the initial Wanamaker discovery holes and to the south of another hole, MRRC335, returned two metres at 11.3g/t gold from 86m.

With assays due at the end of November 2022 and an updated mineral resource flagged for the first quarter of 2023, Strickland said the latest assay results continued a streak of recent intersections that were announced in August and September.

The company said an accumulation of recent results had extended gold mineralisation 400m north of the current Millrose Mineral Resource, with a further 7 diamond holes below this horizon targeting the pri-



Massive sulfides (predominantly pyrite and sphalerite, Zn sulfide) in a section of infilling altered meta-sandstone breccia

mary Wanamaker Lode.

Strickland said it had also successfully defined three high-grade primary lodes, in the form of Millrose Central, Millrose North and Wanamaker (south to north), with each zone displaying varying alteration and mineralisation styles.

Strickland controls over 100km of strike

along the prodigious Yandal Greenstone Belt, the vast majority of which has not been explored. The tenements contain a total gold Mineral Resource of 603,000 ozs Au (11.7mt @ 1.6g/t Au<sup>2</sup>).

The Millrose gold project lies approximately 30km due east of Northern Star Ltd's (ASX: NST) world class Jundee gold operation. **AMR**

# Yin Drilling Delights Dreadnought with High-Grade Gourmet

Dreadnought Resources Limited (ASX: DRE) revealed that assays have continued to confirm thick, high-grade rare earth elements (REE) mineralisation at its Yin discovery, located within its 100% owned Mangaroon Project in the Gascoyne, Western Australia.

The Perth-based explorer said assay results from 91 holes of 120 RC holes drilled along the first ~3kms of Yin had been reported. The RC rig has moved on to the C1-C5 carbonatites where first-pass, pattern drilling is ongoing. The diamond rig continues to drill twin holes at Yin in preparation for an initial JORC Resource due in the December quarter of this year.

The latest results received for an additional 7 RC holes continued to confirm thick, high-grade, rare-element mineralisation at the Yin ironstone discovery.

**Significant intercepts included:**

- YINRC086MET: 54m @ 2.07% TREO from 24, including 17m @ 4.10% TREO (30%

NdPr:TREO) from 41m

- YINRC087: 38m @ 1.84% TREO from 48m, including 23m @ 2.70% TREO (31% NdPr:TREO) from 57m
- YINRC085: 30m @ 1.82% TREO from surface, including 17m @ 2.87% TREO (31% NdPr:TREO) from 8m
- YINRC086: 43m @ 0.93% TREO from 6m, including 17m @ 2.87% TREO (30% NdPr:TREO) from 33m

Dreadnought's Managing Director, Dean Tuck, said: "Yin continues to deliver exceptional REE results. With 91 of 120 holes reported, we remain on schedule to deliver our initial JORC resource at Yin in the December 2022 quarter. Importantly this initial JORC Resource will only cover ~3km of the interpreted ~16km of strike of Yin. RC Drilling of C1-C5 carbonatites and diamond drilling at Yin is progressing well with updates expected shortly." **AMR**



Ausdrill RC Rig 14 drilling at Yin.



Chip tray from YINRC001 showing mineralised oxidized ironstone from 1-34m and grading into dark fentic alteration.

# High-Grade Gold Puts Selkirk on the Cusp of a Revival

Kingwest Resources Limited (ASX:KWR) has released high-grade gold mineralisation results from infill drilling at the Selkirk Deposit, taking the historic Menzies Gold Project (MGP) a substantial step closer to revival.

A total of 21 RC holes comprising 1,109m were drilled as part of the infill drilling programme by BML Ventures. BML has a 50:50 profit-sharing agreement with Kingwest at the Selkirk Deposit and is finalising test work aimed at facilitating a processing agreement to expedite the rejuvenation of mining at the site.

"BML is making excellent progress as we move towards the recommencement of pro-

duction at Selkirk and these results give us more confidence in the resource as well as underpinning viability of the proposed cut back of the pit," Kingwest Executive Chairman Greg Bittar said.

"The restart of commercial mining at Menzies after more than 20 years since open cut mining finished will be significant and we expect this to be the first of a number of low-capex mining operations at Menzies that could deliver attractive short and medium-term cashflow to KWR."

Results of the drilling campaign delivered the following to confirm the high-grade nature of the deposit: 7m @ 24.8 g/t Au from 43m in 22SKRC029 (including 1m @ 167.00

g/t Au from 47m), 6m @ 19.96 g/t Au from 41m in 22SKRC036 (including 2m @ 54.80 g/t Au from 41m), 2m @ 12.93 g/t Au from 42m in 22SKRC038, 2m @ 7.43 g/t Au from 43m in 22SKRC037, 1m @ 13.85 g/t Au from 51m in 22SKRC031.

Mineralisation remains open at depth with several of the more significant intersections near the base of the current mineral resource estimate.

The MGP is located 130km north of the globally significant gold deposits of Kalgoorlie and covers a contiguous land package over a strike length in excess of 15km. Within the MGP a series of structurally controlled high-grade gold deposits have been historically mined that are believed to display extensive exploration potential for high-grade extensions.

Kingwest, which acquired the project in 2019, has deployed modern exploration techniques that were not in existence when the mine closed 20-years ago. The MGP lies on the Goldfields Highway, has power and water and is within trucking distance of numerous gold processing plants.

Prior to closure the MGP recorded historical production of 643,200 oz @ 22.5g/t Au<sub>3</sub> from underground between 1895 and 1943 and 145,000 oz @ 2.6g/t Au<sub>3</sub> from open cut between 1995 and 1999, for a total of 787,200 oz @ 18.9g/t<sub>3</sub> Au.

The MGP is hosted within the Menzies Shear Zone. All deposits lie within granted mining leases and are 100% owned by Kingwest. Current JORC mineral resources total 505,100 oz @ 1.33 g/t Au<sup>2</sup> using a 0.5 g/t Au cut-off. **AMR**



The Selkirk Deposit



# Drilling Intersects Significant Sulfides for Native Mineral Resources at Maneater Hill

Native Mineral Resources Holdings Limited (ASX: NMR) has intersected polymetallic (Fe-Zn-Cu-Pb-Ag) sulphide-bearing breccias, as well as a heavily altered (phyllitic) felsic intrusive, drilling towards a deeper target core at Maneater Hill in North Queensland.

The company was completing a 700m-deep diamond drill hole into the core of the polymetallic sulfide-bearing breccia pipe when it intercepted the edge of the breccia at approximately 200m downhole.

The principal target is a mineralised breccia pipe located approximately 100km west of Cairns and 35km northeast of the estab-

lished mining town of Chillagoe in Northern Queensland.

NMR's Managing Director, Blake Cannavo, commented: "NMR is delighted to report that drilling has intersected an altered intrusion - a key signature of other significant breccia deposits in this region. This is significant as it helps support a magmatic origin for the mineralised system at Maneater Hill. "As drilling continues, additional zones of brecciation containing massive sulfides with zinc-copper- and lead-bearing sulfides adds to the excitement surrounding this target. We are not yet at target depth, but these initial outcomes are highly encouraging. We look forward to ongoing updates and deliv-



ering the first batch of assays as quickly as possible."

NMR said the intrusion is an important part of the breccia story as they typically form a part of the mineralising system and therefore represent a key ingredient for breccia

pipe-types deposits in other parts of Queensland. The altered intrusion was also strong evidence in support of the interpretation that the breccia is a magmatic-related hydrothermal system, which helps account for the pervasive alteration throughout the rocks drilled to date. **AMR**

# Lithium Lights Up for Trek at Tambourah



Spodumene confirmed in lithium-bearing pegmatite dyke from Tambourah North



Derek Marshall

Trek Metals Limited (ASX: TKM) says an expanded field exploration program at its 100%-owned Tambourah Lithium Project (E45/5839 & E45/5484) in the Pilbara region of Western Australia, had confirmed the presence of spodumene within an extensive pegmatite system.

Trek CEO Derek Marshall said: "The Tambourah Project is an exceptional greenfields lithium exploration opportunity, located in the heart of one of the world's premier mining districts. Despite its Tier-1 location, the Project has never had a single drill hole into

it - a remarkable opportunity for Trek.

"Confirmation that we have multiple pegmatites of significant scale on the tenement is an exciting development, and we are looking forward to fully evaluate this potential. We know there is lithium in outcrop, the lithium potential is further supported by the historic stream sediment samples and rock chip fertility ratios, and the district is currently seeing a big increase in lithium exploration by ASX-listed companies such as Riversgold, Infinity and Minrex.

"We are looking forward advancing the project to the next stage with the definition of drill targets and progressing agreements and approvals required to get a rig turning as soon as practicable. Given the current and forecasted demand for lithium, we intend to elevate this Project as a priority opportunity for Trek within our battery metals focused portfolio."

Trek said that four rock chip samples were analysed by Raman spectroscopy at The University of Western Australia's Centre for Microscopy, Characterisation and Analysis

(CMCA), with all samples confirmed to contain spodumene.

"This is of particular importance as spodumene is a highly valued lithium ore mineral within hard rock lithium mines, such as the world class Pilgangoora Deposit, located approximately 70km to the north-west in Pilbara region of WA," Trek said.

A total of 66 rock chip samples were taken targeting LCT pegmatites across both Tambourah licences and have been submitted for analysis with assays pending. **AMR**

# Historic High-Grade Norseman Gold Project Still in the Spotlight

Tulla Resources (ASX:TUL) has announced results from Phase Two Drilling at the Mainfield South area of the Norseman Gold Project.

Tulla Resources' Executive Director, Mark Maloney, said: "While production has now recommenced at Norseman, we continue the phase two drilling program to seek additional high-grade ore reserves to extend the life of mine. The Mainfield has historically been a source of high-grade ore with significant future potential."

Tulla has a 50% interest in the Central Norseman Gold Project, a historic gold province near the town of Norseman in the Goldfields of Western Australia, which commenced operations in 1935. The other 50% is held by Pantoro South, which is also the manager of the JV. The Project comprises 155 near continuous mining tenements (including pending applications) over approximately 70km of strike covering approximately 750km².

The project has produced in excess of 5.5Moz of gold since 1935 and is considered

one of the highest-grade, large-scale gold projects in Western Australia. The total-current Mineral Resource for the Norseman Project (100%) is 4.8 million ounces of gold with an ore reserve of 973,000 ounces.

The focus of the JV has been to bring the project back into production, which holds the view that excellent exploration results centred on the Scotia Mining Centre bodes well for future exploration and production growth potential.

Key highlights of the Southern Mainfield drilling results were:

- 2 m @ 13.25 g/t Au
- 3 m @ 11.05 g/t Au
- 5.0 m @ 9.82 g/t Au including 1.0 m @ 35.8 g/t Au
- 1.0 m @ 22.7 g/t Au
- 4.0 m @ 5.60 g/t Au
- 2.0m @ 6.03 g/t Au

Pantoro Managing Director Paul Comelec commented: "With operations at Norseman now underway, Pantoro has continued with its strategy of identifying additional ore to

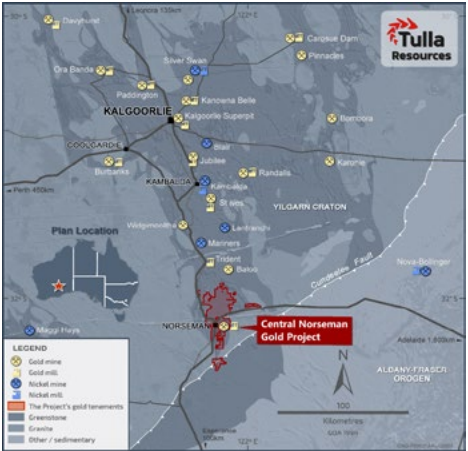
continue to grow the mines ore reserve. Additional high grade ore sources are of particular interest with a view to increasing mill head grade, and therefore gold production from the processing facility as new mines are able to be developed.

"The current focus at the southern end of the Mainfield fits the bill and has the advantage of relatively easy access via the existing Viking Decline, which was developed at a suitable size for current underground mining fleet requirements."

Drilling is ongoing in the southern end of Mainfield targeting the Mararoa Reef at Butterfly South and areas around the historic Royal Standard Cross Link which are capable of being accessed from the Viking Decline.

A first pass six-hole RC program targeting the Mararoa Reef at Butterfly South returned the following significant intersections:

- 4 m @ 5.60 g/t Au.
- 2 m @ 6.03 g/t Au.
- 4 m @ 2.03 g/t Au.



The results to date have confirmed and reflect the nuggety nature of the ore where historically CNGC reported that drilling may typically intersect high grade mineralisation (>10 gram-metres) in approximately 30% of the drillholes in order to identify a potential zone of economic mining blocks.

In September the JV was given the green light by the Environmental Protection Agency and the Department of Industry and Regulations to construct a 1 million-tonne-per annum processing plant at the Norseman gold project. **AMR**



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# Komatsu Rolls Out Fleet of Automated Haul Trucks for BHP

In early June, the first four of a fleet of 41 Komatsu 930E haul trucks, all controlled by a purpose-built control facility on site, began autonomous operations at BHP's South Flank iron ore mine in the Pilbara region of Western Australia.

The transition to autonomous haulage is expected to be completed at South Flank by September 2023.

Since July 2020, a fleet of Komatsu 930E au-

tonomous-ready haul trucks, configured as conventionally driven trucks, has been moving iron ore and materials.

In January 2022, BHP approved moving the US\$3.6 billion mine to autonomous haulage, to be phased in across five Autonomous Operation Zones (AOZs), from June 2022.

"All 41 of the 930E's on site are now in the process of being upgraded to fully autonomous operation at the rate of four a month,"

said Garry Povah, Komatsu's General Manager Mining Automation.

According to Povah, Komatsu is on track to have over 430 autonomous trucks operating in Australia by the end of 2022, in mines across Western Australia and Queensland.

"Komatsu's autonomous technology helps drive job creation, with a focus on safety, diversity, upskilling and an innovative flexible work force that meets the needs of peo-

ple and communities with business goals," says Sean Taylor, CEO & Managing Director, Komatsu Australia.

"Not only does Komatsu's autonomous haulage technology have a proven record in safety, productivity and lower haulage costs, but we pride ourselves on our ground-breaking contributions to autonomous technology solutions in the industry." **AMR**

# Epiroc Wins Large Mining Equipment Order in Australia

Epiroc has won a large mining equipment order from CITIC Pacific Mining in Australia.

CITIC Pacific Mining has ordered a fleet of Epiroc Pit Viper 271 XC blasthole drill rigs with advanced automation features for use at the Sino Iron open-pit mine in the Pilbara region in Western Australia.

The powerful Pit Viper drills will be used to drill for magnetite, one of the main iron ores.

The equipment order was booked in the third quarter 2022 and is valued at more than MSEK 300 (AU\$43 million).

"Epiroc delivered Pit Viper rigs to the Sino Iron site in 2019, and we are proud to continue this productive partnership as CITIC Pacific Mining is expanding the mine while optimizing productivity and safety," says Epi-

roc's President and CEO Helena Hedblom.

"In the last three years, Epiroc has provided satisfactory after-sale services to help the three Pit Viper 351 drill rigs perform to expectation and has also successfully established mutual trust with CITIC Pacific Mining," says Xianglin Cheng, General Manager - Mining at CITIC Pacific Mining. "The confidence and trust are the major reasons for us to choose Epiroc."

The Pit Viper drills are manufactured in Texas, United States. They will be installed with automation features including AutoDrill, which allows for up to 100% of the hole drilling cycle to be in automatic mode with high consistency and reliability of operations; and AutoLevel, which minimizes the time it takes to level and delevel and hence provides more time drilling.

Delivery will begin in 2023. **AMR**





# THE EVOLUTION OF PLANTMAN® OVER 30 YEARS

*Plantman celebrates its 30th anniversary this year*

**F**ounded by Michael Elliot in 1991, Plantman has become a staple provider to the Western Australian resource sector, serving mining, earthmoving, construction and civil.

During this time, Plantman established itself as a leader in offering customised, high specification mobile earthmoving and mining equipment for sale and rental, together with maintenance, parts, engineering and fabrication services - building a reputation as pioneers of custom-built Service fleets.

Mining has long been a cornerstone of the Australian economy. Through booms and busts, the entire Plantman team feel nostalgic to reach this milestone while dealing in and servicing an industry that is the backbone of Australia. According to The Chamber of Minerals and Energy of Western Australia, WA mining and resources contributes \$100 billion to the Australian economy, and Plantman plays a significant role within it.

## THE EARLY DAYS

Michael Elliot's experience in sourcing world-class equipment started in his position at the Caterpillar dealership and held him in good stead to go out on his own.

In 1990 Michael started 'Plantman' with the business management support of Shaaron Whitton, first opening the head office and workshop in 1991 Perth, Western Australia.

"In the first five years, we had a small group of key personnel (some of which are still with us today) and a hand full of machines in our fleet. We focused on importing equipment from Europe and North America for re-sale, which

quickly developed into forming our own rental division for dry hire of machines with maintenance contracts, Australia wide," says Michael.

The resources boom saw a worldwide short age of equipment, a pivotal time for Plantman who opened its doors to a workshop and service department to maintain its expanding rental fleet. By 1998, Plantman had become a fully equipped one-stop-shop offering a wide range of services to meet high demands.

Plantman's success can be attributed to their ability to achieve a return on their investments. While competitors were having to replace end of life machinery more often, Michael followed Caterpillar's second life philosophy of implementing high quality repairs and maintenance overhaul of equipment, resulting in lower operating cost per hour and longer life for expensive capital assets.

Plantman capitalised on this demand for businesses who did not budget to buy new equipment, offering the option to rent high specification machines instead of purchasing outright.

## INNOVATION PUTS PLANTMAN ON THE MAP

While maintaining a highly productive and reliable fleet of earthmoving equipment, Plantman sought out an efficient method of helping maintain productivity on client sites. Plantman's custom built Service fleet is a prime example of innovation and the offering that would set them apart in the late 90s.

Unique to the earthmoving industry at the time, the Service truck was the first standardised and production-based service vehicle in development.



Sales Manager - Frank Lee, Managing Director - Michael Elliot, Maintenance Manager - Mark Holyoake and Ashley Elliot - Business Development Manager - Plantman, Bellevue

"We watched clients come up with makeshift solutions, such as drums and tanks of diesel and lubricant thrown on to the back of tray trucks, operating in remote conditions to service their equipment fleet. There was a range of issues around capacity, design, safety and environment."

Reorganising the inadequacy of this approach, in 1997 Plantman developed specialised service modules specifically designed for the maintenance of earthmoving fleets that would maximise efficiency and improve the quality of fuel and lubricant cleanliness during the storage, transport and transfer process.

Plantman produced its first P5000 Service truck, a multi-purpose on/off-road vehicle capable of carrying 5000 litres of diesel fuel and multiple types of grease and lubricants suitable to maintain a range of equipment, among other unique features.

This soon caught the attention of mine/maintenance managers and orders flooded into the office.

"We set up a production line to ensure we had a range of choices available to meet the demand. The high specification product far exceeded what was currently on the market... we had found our niche."

This division flourishes today with more than 26 models designed and manufactured at the Bellevue facility including service trucks, diesel tankers, water trucks, crane trucks, drill support trucks and much more.

## 30 YEARS ON

Fast forward to today and Plantman has 75 employees and a 200-strong rental fleet to support the mining, earthmoving, construction and civil industries, with strict upkeep policies to keep equipment current on a five-year replacement program.

Like every business, Plantman has persevered through the ups and downs. "We downsized during the GFC as necessary and managed our way through COVID needing to introduce new health policies for employees and cope with the affected availability of equipment, labour and parts. However, we expanded our facilities in times of economic growth. The future will bring high interest rates, inflation, experienced labour shortages but we are prepared for anything that comes our way."

Family remains at the core of its culture with both Michael's sons, Jordan and Ashley Elliot, who take on new responsibility and opportunity that come their way. Jordan, a seasoned veteran with over 20 years of experience in sales and rentals and Ashley a future driven individual with a vision for innovation and technology.

Michael considers the committed, long-term employees as integral to this family culture, valuing the hard work, high quality customer service and dedication of the entire team that has helped the business grow over 30 years.

With such leadership and commitment, Plantman is well positioned to handle the challenges of another 30 years in business.



Series 1: P5000 Service Truck - Pilbara

1995



Series 6: P8000 Service Truck - Perth

2022



Business Development Manager - Ashley Elliot and Sales Manager - Jordan Elliot - Plantman, Bellevue



# AMEC Chief Cites Worker Shortage Crisis as One of the Worst in Living Memory

**A**MEC Chief Executive Warren Pearce says the Federal Government must immediately ease skills migration caps to alleviate the pressure on mining companies straining under one of the worst worker shortages in Australian history.

Pearce said many Australian miners had been unable to take full advantage of billowing commodity prices as a result of the worker crisis that had forced them to downgrade guidance and cancel or defer a range of new projects.

In July this year the Australian Resources and Energy Employer Association released a report stating that over the next five years the mining industry would need 24,000 new workers to sustain new projects. In the midst of the biggest human resources crisis in living memory, Pearce said the impact was already being felt across the board.

"The worker shortage issue has gone past the point of critical. What we are seeing is a lack of skills and labour right across the board. The prospects of finding desperately needed labour is extremely difficult as there are so many other industries facing similar pressures ... with literally thousands of jobs needing to be filled tomorrow," Pearce said.

"With the entire workforce under so much pressure, these are the reasons Australia needs to open up skills migration to attract people needed to fill hundreds of vacancies. It's widespread with mining contractors also under pressure, filtering down to every part of the chain."

In October shares in St Barbara dived 20% after the gold miner fingered labour shortages for waning production at its flagship Gwalia mine in WA, which dropped 20% to 34,078oz for the quarter. The company

said a contractor had not been able to find enough maintenance staff to keep equipment running.

Big coal players BHP and Whitehaven have both lobbied the federal government to expedite skilled migration incentives, citing labour shortages as a key reason for coal sales slumping 38% and 32% respectively. Pearce said that labour shortages had not only impacted guidance and production, but also capital costs for future growth initiatives.

"Project costs have gone up substantially across the supply chain and the cost of materials is also putting the commercial viability of new projects under pressure. It's much harder to get projects started when you can't find the workforce, operating in an environment where there are also huge challenges relating to retention of people.

Companies are lifting wages to attract workers but poaching between companies comes

at a pretty big cost, causing significant turnover of staff, as high as 20% in some cases, and the additional costs involved in finding someone else."

Pearce said the combined impact of the Covid-19 pandemic, lockdowns and subsequent inflationary and supply chain pressures had produced a near perfect storm of challenges for the mining industry.

"As a general rule of thumb, the cost of materials has gone up by approximately 50%. It's not hard to see how that happened considering high commodity prices, notably iron ore, which returns as fabricated steel comes at a pretty steep price. But right now you are waiting much longer than a year ago to find the staff and materials to put it all together. Longer time frames mean expanded costs and a lot of things are just stacking up on top of one another."

Pearce said there was a key difference between the workforce shortages compound-

ed by the Australian LNG and mining boom in the pre and post Global Financial Crisis era and today's labour crisis.

"In the first instance you had a range of LNG and major mines constructions projects all coming to the boil at the same time, and the crisis was really about skills and people in the construction phase. This time you had Covid pressures early on in the cycle and the subsequent knock-on effect of labour shortages that has been more severe, as it has spread all over industry, all across construction and operations, and you can't find skilled or semi-skilled personnel.

"The immediate solution would be to open up the skilled migration cap to draw in skilled people, but we would still be competing for human resources with rivals all over the world. Longer term we need to look at education and training needs to ensure that younger people keep feeding into our industry." **AMR**







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# Rio Tinto and Wright Clear a Path to Developing Rhodes Ridge Iron Ore Project

Redefining long-haul, a Rio Tinto train in the Pilbara.

**R**io Tinto (50 per cent) and Wright Prospecting Pty Ltd (50 per cent) have agreed to modernise the joint venture covering the Rhodes Ridge project in the East Pilbara in Western Australia, home to one of the world's largest and highest quality undeveloped iron ore deposits.

The binding joint venture updates an existing agreement between the two parties dating back to 1972 and now provides a pathway for the development of the Rhodes Ridge deposits utilising Rio Tinto's rail, port and power infrastructure.

The participants have commenced an Order of Magnitude study, conducted by Rio Tinto, which will consider the development of an operation before the end of the decade

with initial plant capacity of up to 40 million tonnes annually, subject to the receipt of relevant approvals.

Rhodes Ridge, located 40km north-west of Newman, contains 5.8 billion tonnes of high-grade Mineral Resources at an average grade of 62.3% Fe. The project's total resource, 6.7 billion tonnes at an average grade of 61.6% Fe, represents approximately one-third of Rio Tinto's existing Resource base in the Pilbara. A resource drilling program is currently underway to support future project studies.

Rio Tinto Iron Ore Chief Executive Simon Trott, said: "Rhodes Ridge contains one of the biggest and best undeveloped iron ore deposits on the planet with proximate ac-

cess to existing infrastructure. We are very excited we have been able to strengthen our relationship with Wright Prospecting and have a pathway to bring this high-quality resource to market.

"With its significant resource base, the Rhodes Ridge project has the potential to underpin production of the Pilbara Blend in the decades ahead.

"We are committed to working closely with the Traditional Owners, the Nyiyaparli and Ngarlawangga People, to ensure sites of significant cultural, environmental, and biodiversity value are protected as part of any future development at Rhodes Ridge. Consistent with our revised approach for new operations, a co-management approach to

any future mining activity will be developed in partnership with traditional owners."

A spokesperson for Wright Prospecting, said: "We are delighted to have reached this important milestone for the Rhodes Ridge project. We look forward to partnering with Rio Tinto to develop this asset with a world-leading focus on climate, biodiversity and heritage."

The joint venture will utilise Rio Tinto's existing rail, port and power infrastructure, including the planned instalment of 1 gigawatt of renewable power assets in the Pilbara. **AMR**



Simon Trott







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## ON FIRE RACING RAISES THE STAKES

**T**here are a lot of similarities between mineral exploration and owning a racehorse.

The next hole you drill may strike golden riches. Your next race starter might just turn out to be the next Australian turf champion.

That is certainly the belief of brothers Nathan and Jarred Kersten, the founders and driving force behind On Fire Racing.

Their passion for the horse racing industry started over 20 years ago with shares across multiple syndicators and dozens of horses. Over the years they became deeply involved with several stables at ground level, particularly with trainers, to fully understand the industry from the inside out.

It was during this time, the dynamic duo had a dream of creating their own team of horse racing enthusiasts. This would see the owners become members of the inner circle and establish a family like environment where everyone felt part of the journey.

And... 'they're off!'. In 2015, On Fire Racing

was born. Offering syndicated racehorse ownership across South Australia, Northern Territory, Queensland and Western Australia, On Fire Racing now syndicates a stable of horses, and proudly displays the striking red and black silks at most tracks around Australia.

As part of a broader community of horse racing enthusiasts, On Fire Racing's mission is to provide the best racing experience possible for people of all ages. There's nothing better than experiencing the thrill of racing together and making lifelong friends along the way.

Specialising in social racehorse shares and horse racing syndicates to suit all budgets, from 2.5% to 25%, buying a stake in a horse has never been more cost-effective. The On Fire Racing team simply make it easy to become involved in owning a quality racehorse.

**To check out what the company has in their stable or to contact the team, visit <https://onfireracing.com.au/>**

AMR




ON FIRE RACING



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# FIRST COAL SHIPPED FROM BROADMEADOW EAST

**B**owen Coking Coal Ltd (ASX:BCB) has railed first coal from the Broadmeadow East Mine (BME) through to Dalrymple Bay Coal Terminal (DBCT), near Mackay, in a move that further cements the company as Queensland's next independent coal producer.

BME is the first pit to come on-line as part of BCB's greater Burton Complex, in Queensland's Bowen Basin. It is the company's second operating mine, following first production and sales from the Bluff mine in June 2022. Coal production commenced at the BME pit in July this year and is expected to ramp up to steady-state production of between 0.8Mtpa and 1.1Mtpa ROM in the next quarter.

The train containing 10,426 tonnes of coal

has been sold under a spot arrangement with the company's 50:50 Marketing Joint Venture with M Resources. Initial sales are being completed on a train-by-train basis through Fitzroy's Carborough Downs facilities during the ramp-up phase, while the company's own train load out facility at the Burton Complex is being refurbished.

Bowen Managing Director and CEO, Mr Gerhard Redelinghuys, said the shipment of Bowen's first coal from BME was another significant achievement for the company, following two shipments from the Bluff Mine, in the southern Bowen Basin, earlier in the year.

"Having two mines producing in different parts of the Bowen Basin and using alternative infrastructure, spreads risk brought on

by the unseasonal wet weather" he said.

"It also demonstrates the company's technical ability by bringing two mines into production in one year, whilst simultaneously refurbishing the Burton Complex. I would like to thank the whole Bowen team, alongside our valued consultants, contractors and infrastructure partners, who all played an important role in turning BME from what was essentially a paddock in May this year into a revenue generating operation within just five months.

"It is a marvellous achievement for the company, demonstrating our ability to move quickly and overcome obstacles as we ramp up to our production target of five million tonnes Run-of-Mine coal per annum by 2024." **AMR**



Gerhard Redelinghuys

## Higher Mining Taxes Will Curtail Australia's Investment Recovery

**A** new study released by the Mineral Council of Australia (MCA) shows that uncompetitive tax rates have already dragged Australia's investment effort over the past seven years, hampering productivity and wages growth.

The report suggests that to maximise its share of this investment, Australia cannot further increase its already globally high tax rates or introduce changes to workplace relations or regulations that stifle new opportunities.

The report, written by the University of Calgary's Philip Bazel and Jack Mintz, underlines that at 30% Australia had the third highest company income tax rate of OECD countries in 2021, slightly below Portugal and Japan (and tied with Germany and Mexico) and well above the OECD GDP-weighted average of 26.3%.

Australia also has the third highest effective tax rate on marginal investments once accounting for differences in company tax write offs and other taxes on capital investment (such as stamp duties, real estate transfer taxes and capital levies).

Australia's effective tax rate on marginal investments is 28.1%, three points higher than the G20 GDP-weighted average of 25.1% and almost four points higher than the OECD GDP-weighted average of 23.8%. Australian mining companies pay royalties as a percentage of value of production to state governments that generally range from 4 or 5% to 7.5% for iron ore and over 8% for coal. While these rates are often lower than those in China and India, they are well above effective mining tax levies in Canada and the United States.

In the last decade (between 2011-12 and 2020-21), Australia's mining industry contributed \$254 billion in company taxes and royalties (\$142 billion and \$112 billion respectively).

Given Australia's higher effective company income taxes and stamp duties especially on real estate transfers, it is therefore not

surprising Australia's mining companies typically pay more tax and mining levies on their gross profits compared to Canadian companies and, in the case of copper, gold and iron ore, the United States.

Leaving aside Brazil, China, India and Russia, Australia's fiscal system is less competitive than most countries for copper, gold and iron ore. This needs to be addressed to ensure that mining continues to be the largest contributor to Australia's economy (accounting for 10% of GDP), our largest source of export income (with a new record high \$413 billion in resources exports last financial year) and supports over 1.1 million jobs at mine sites and in supply chains across the country.

The report recommends that two types of reform are considered to encourage more investment in the Australian mining sector: company income tax rate reduction from 30 to 25% (which would be close to OECD average rate) and machinery expensing available to all companies on a permanent basis. Demand for commodities such as lithium, copper, nickel and rare earth elements will be essential to the technologies the world needs to drive lower emissions with recent estimates suggesting over \$4 trillion of investment in mining and minerals processing will be needed by 2050.

**Australia needs more investment, not taxes**  
At a time when there is pressure on the federal budget, mining is making a significant contribution to government revenues and the broader economy.

The return to the community from Australia's mining industry has again hit record levels with a combined \$43.2 billion in company tax and royalties paid in financial year 2020-21, a 16% increase from the \$37.3 billion contributed in the previous period.

Company taxes paid reached a new record high of \$26.5 billion and royalties also reached a high of \$16.7 billion in 2020-21 contributing significantly to federal, state and territory governments at a time when they needed it most during the

COVID-19 pandemic.

Australia needs to attract more investment in exploration, mining, minerals processing and mining-related manufacturing if the economy is going to benefit from growing global demand for minerals and metals. There is strong competition for this investment from other mining countries.

The call for extra taxes on mining profits, proposed by Rod Sims, disregards the fact that mining investment is highly uncertain and subject to periods of high and low revenues over a mine's life.

The effective tax rate on Australian mining investment is already high relative to many mining jurisdictions in other countries.

Rather than proposing piecemeal changes to taxes based on short term conditions that will lead to perverse outcomes, Australia needs comprehensive reform of the tax and transfer system to enable the economy to deliver the growth, incomes and jobs that underpin the nation's prosperity.

The mining industry delivers benefits for all Australians via the tax and royalty revenue it pays to governments each year. It has been paying tax consistently for years and record amounts over the last decade.

The record company and royalties payments are highlighted in an Ernst & Young report commissioned by the MCA which also shows that in the last decade (between 2011-12 and 2020-21), the mining industry contributed \$254 billion in company taxes and royalties (\$142

billion and \$112 billion respectively).

Company tax and royalties payments are expected to continue increasing in 2021-22 in line with increases in export earnings. This is driven by a positive outlook in the price and quantity produced of metallurgical and thermal coal coupled with a robust year for iron ore, gold and base metals.

The industry in Australia continues to pay the highest average wages, the most company taxes, delivers the most export revenue and is critical to supporting regions and communities – supporting 1.1 million jobs in the mining industry and its supply chains.

Mining companies also support thousands of regional businesses around Australia and their workers who provide essential services that keep the industry operating. In addition to new jobs across the nation and paying its fair share of taxes and royalties, the mining industry has been supporting local communities through the COVID-19 pandemic, providing substantial donations to hospitals, charities, child care centres. **AMR**







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# PETER BRADFORD

an “Innovative, Inspirational leader” who Made a Difference

The mining industry has paid tribute to IGO Limited (ASX: IGO) Managing Director & CEO, Peter Bradford, who passed away suddenly on Saturday 15 October at the age of 64.

IGO expressed its deepest sympathy to Pe-

ter’s family and friends and said he would be dearly missed.

“Peter was an inspirational leader, an innovative and strategic thinker and a compassionate mentor, who transformed IGO into the company that it is today - a globally rec-

ognised, ASX100 listed company focused on creating a better planet. His passion for mining and resources, and his personal drive to raise the bar across the industry, was unparalleled,” IGO said in a statement.

“Peter was passionate about climate change and the role our industry can play in the transition to a clean energy future and was equally passionate in engaging others on these important issues.

“Peter was adamant that he and the team at IGO could make a difference - locally, nationally, and globally.”

In addition to his role at IGO, Peter championed the mining industry in Western Australia. He was the President of AMEC, an active mentor for Women in Mining WA (WIMWA), and a former WA Mining Club committee member and Vice President.

IGO Non-executive Chair, Michael Nossal commented: “On behalf of the Board, I wish to extend our sincerest and heartfelt condolences to Peter’s wife Vicki and his children and everyone who was fortunate enough to know Peter as we did. The news of his death is devastating to everyone at IGO. We greatly admired Peter for not just his vision and

commitment to delivering on our purpose but also for his endearing humility and enormous humanity.”

The IGO Board has appointed Matt Dusci to the role of Acting CEO, effective immediately. Matt will be supported by the Executive Leadership Team and the broader IGO leadership group. Matt will continue in this role while the board conducts a formal search process for a permanent CEO.

Matt has over 25 years’ experience in the mining industry. He joined IGO in 2014 and was appointed Chief Operating Officer in early 2018, having previously served as IGO’s Chief Growth Officer. Working alongside Peter, Matt has been a driving force in the Company’s transformation over recent years and key to its strategic direction. Matt is committed to IGO’s purpose and will continue to successfully deliver the Company’s strategy.

Michael Nossal commented: “The Board has every confidence that Matt, the Executive Leadership Team and everyone at IGO, will remain steadfast in the face of this challenge and will not waiver from maintaining the continuity and success of our business.”

AMR

## Basin Energy Appoints

# ODILE MAUFRAIS

as Exploration Manager



Basin Energy Limited (ASX:BSN) has announced the appointment of Odile Maufrais as Exploration Manager.

Maufrais, an exploration geologist with over 13 years’ experience, brings an extensive understanding of the uranium exploration and mining industry into the role - having worked at ORANO, one of the largest global uranium producers for 12 years on various assignments in Canada, Niger, and France.

Basin Energy said it was critical that Odile has significant Athabasca Basin specific experience, being involved in over 15 greenfield and brownfield uranium exploration projects located throughout the Basin.

Her most recent roles for ORANO comprised leading various uranium exploration campaigns and being an active member of the ORANO research and development team which worked on trialling and implementing cost effective and streamlined drilling techniques within Athabasca Basin.

She played a key role in the update of the National Instrument 43-101 compliant mineral resource estimate for the Midwest Main and Midwest A deposits. Maufrais holds a Master of Science from Montpellier II University, France.

Basin Energy’s Managing Director, Pete Moorhouse, commented: “On behalf of the Board of Basin, I welcome Odile as part of the team. We were delighted to have an exploration manager of her calibre contributing direct relevant technical and operational skill sets to the company.”

Basin Energy said the timing of her appointment was ideal with exploration work well underway at Geikie as the company prepares for its Maiden drill campaign in the first quarter of 2023.

Maufrais, commented: “I am pleased to join the Basin Energy team and look forward to applying my experience in the Athabasca Basin to the company’s exciting portfolio of exploration projects.” AMR

## TAMBOURAH APPOINTS EXPERIENCED GEOLOGIST AS MD

Tambourah Metals Limited (ASX:TMB) has appointed Caue (Paul) Araujo as Managing Director.

The company said Araujo was a a qualified geologist with over 20 years of International and Australian exploration and technical experience in a range of roles who will work with the board to develop the company’s gold and critical minerals portfolio in Western Australia.

Araujo was a partner at Hatch Advisory, as Australia-Asia Regional Director of Investment and Business Planning. He managed strategic decision making in M&A, lending, and capital allocation through to the provision of services related to business analysis, valuation, risk/opportunity review, market studies and risk management.

Clients included banks, governments, private equity, investment funds, pension funds, financial advisors, producers, explorers in natural resources, energy, and infrastructure.

Executive Chairperson Rita Brooks said: “It is a pleasure to welcome Paul to the full-time role as Managing Director. The company plans to accelerate exploration and development opportunities in the critical minerals sector. Paul has over 20 years of international exploration, management and consulting

experience across multiple commodities including lithium and nickel-PGE-Cu.

“The lithium industry has undergone unprecedented global growth and Tambourah is focused on the development of their critical minerals portfolio. We are fortunate to have secured someone with Paul’s industry experience and broader corporate leadership skills. The board and I look forward to working with Paul and we are confident that this next stage of growth is going to be very an exciting time for the company.” AMR



Caue Araujo

## REZ APPOINTS DANIEL MOORE AS NEW CEO

Resources & Energy Group Limited (ASX: REZ) has announced the appointment of Daniel Moore as the company’s Chief Executive Officer. Moore was previously a Non-Executive Director of REZ.

Resources & Energy Group Chairman, Gavin Rezos, commented: “Dan is a seasoned executive with over 20 years’ experience in financial markets and developing assets in Australia and we are pleased he will lead REZ as we continue to unlock the value of our WA gold assets.”

Moore added: “I have been involved with the exploration and development of the Menzies Goldfields project for many years and remain excited by the opportunity its large tenement holdings in an under-explored but historically high-grade region within the Norseman-Wiluna Greenstone Belt of Western Australia.

“Following the successful Granny Venn mining program with resultant gold production, we are now looking to undertaking similar mining and gold production programs at Menzies. We will also simultaneously continue to assess the full extent of the gold and other critical minerals at depth or along strike zones from the many historic gold mines in areas held by REZ.” AMR



Daniel Moore





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# THE ALPHA & OMEGA

## OF THE ECONOMIC MINING BEDROCK IN THE PREMIER STATE



Paul Toole

New South Wales Deputy Premier, Paul Toole, knows that the size of the prize is substantial, which is why he and his government are targeting a treasure trove of mining riches waiting to be unlocked in The First State.

Mining is already a key driver of prosperity in NSW and a major contributor to the strength and stability of many regional communities across the state. The industry provides direct jobs for more than 28,000 people and tens of thousands of indirect jobs, as well as stimulating income and investment.

During the past 10-years mining's direct contribution to the State Economy has averaged 2.7% of NSW's Gross State Product, which averages about \$13 billion a year. However, mining's direct contribution does not include royalties, which in 2021-22 hit a record \$3.5 billion from the launchpad of record coal prices, which are expected to remain buoyant in the short term.

New South Wales, however, isn't resting on its laurels and the message coming out of Toole's office is that the state is open for business and has set its sights on summing new pinnacles of mining excellence.

In the midst of an exploration boom reflecting NSW's considerable potential to develop its resources, Toole said: "I am working to make NSW the number one investment destination for mining and advanced manufacturing.

"The NSW Government has allocated \$130 million in funding to accelerate investment in critical minerals and hi-tech metals projects to deliver a vibrant, investment-ready industry, ensuring NSW is ready to meet the rapidly expanding global market and giving a vital economic boost to our regional economies.

"Combined with highly skilled workers and world-leading safety and environmental standards, NSW is well positioned to be a major producer of responsibly sourced and value-added critical minerals and high-tech metals.

"The state is rich in critical minerals and

high-tech metals, such as rare earths, cobalt, copper, antimony, and scandium, which are crucial for the manufacture of electric vehicles, solar panels, wind turbines, defence technology and more."

The NSW Government has committed itself to responsible mining in a fast-changing world rapidly adapting to new technologies and sciences.

With a long and illuminating legacy, high-quality and abundant coal reserves from NSW have played a proud role in producing steel structures for infrastructure projects all over the world. One of Sydney's most famous landmarks, the Sydney Harbour Bridge, boasts 52,800 tonnes of

steel which was produced in Newcastle prior to the celebration of a feature that was hailed as an outstanding icon of engineering and construction on its completion in 1932.

Mining has been a bedrock of the NSW economy and future initiatives have put the spotlight on the state's gold, copper and zinc commodities that will help drive the production of smartphones, battery technology and essential renewable energy products such as wind turbines and solar panels.

With a sharp focus on sustainability, the NSW Government recently announced that each year \$25 million of coal royalties would

be used for the Royalties for Rejuvenation Fund. This fund will help coal mining communities diversify and develop other industries for their long-term economic security.

With much to celebrate, the NSW mining industry was able to come together at the NSW Parliament in October for the NSW Minerals Council Industry & Suppliers Awards Dinner, which was held for the first time since the Covid-19 pandemic.

Over 250 people attended the Awards Dinner, including Premier Dom Perrottet, Deputy Premier Paul Toole and Shadow Minister for Natural Resources Courtney Houssos.

NSW Minerals Council CEO, Stephen Galilee praised the outstanding finalists and all working in mining across NSW who have contributed so much to the industry and the economy on the road to recovery from the COVID-19 pandemic.

"The last few years have been tough for communities right across NSW. Despite these challenges, our world-class miners have continued to operate safely and responsibly, protecting jobs, supporting local communities and maintaining our contribution to NSW," Mr Galilee said.

"Our Industry and Suppliers' Awards acknowledge our high achievers in mining in NSW and our award winners are critical to the ongoing pursuit of excellence in our industry," Mr Galilee said.

### THE WINNERS WERE:

**Supplier of the Year:**

Nautitech Mining Systems

**Young Achiever of the Year:**

Tristah Allen (Glencore)

**NSW Mining Operation of the Year:**

United Wambo Joint Venture

(managed by Glencore)

**Small Business of the Year:**

SafeGauge Luke Dawson CEO

Outstanding Contribution to Mining award: Fiona Robertson - Non-Executive Director Whitehaven Coal, Founding Chair, Women in Mining Network NSW.

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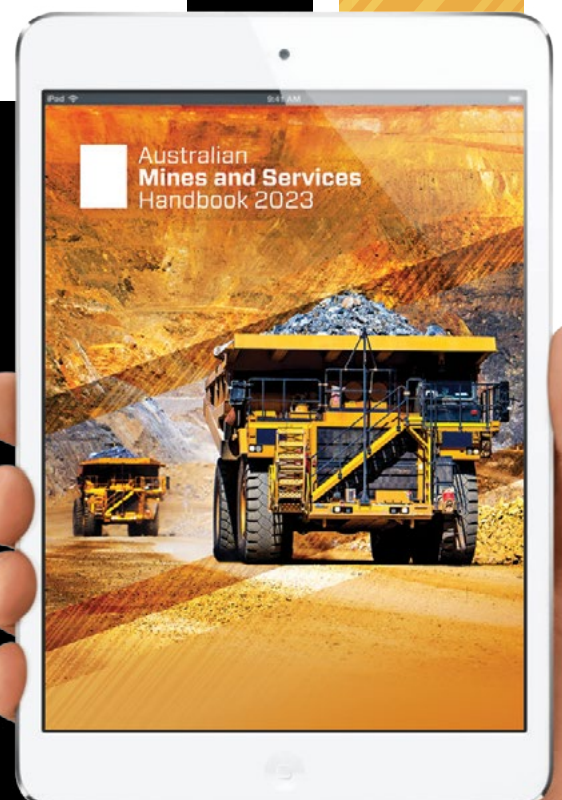
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# KOMATSU

## Named Large Employer of the Year in NSW Training Awards

Recognised for award-winning focus on innovative apprentice training and employee recruitment.

**K**omatsu's dedication to recruiting and training the best employees and apprentices has seen it win both national and global recognition.

The industry leader in mining, construction and earthmoving was named 2022's NSW Large Employer of the Year, for their unrivalled companywide Learning and Development programs, and in the same week, for the second consecutive year, they were also named a global leader in employee recruitment, placing in the top three of the Global Talent Board's 2022 APAC Candidate Experience (CandE) Awards.

"Being recognised as the Large Employer of the Year for 2022 is a proud achievement. It highlights the great efforts we go to as an organisation to develop our people to be industry leaders, equipped to tackle the future challenges facing our industry," said Komatsu Australia Managing Director & CEO, Sean Taylor.

Komatsu's National Technical Capability Manager, Matthew Tosolini was on hand to receive the award and commented, "We view our training programs as more than just education programs. We invest in our people as long-term team members for the success of our business and industry."

Komatsu's innovative Apprentice Development System (ADS) program is at the centre of the successful submission. It has seen more than 600 apprentices and train-

ees participate in a holistic program that extends beyond the 'traditional' vocational education training framework.

"In 2009 we ran our first pilot of our ADS program designed around our commitment to train, develop and engage apprentices nationally, despite the fluctuations brought on by industry peaks and troughs. The first intake of the new program completed their qualifications in 2013 and many of them continue with the business today," Tosolini explained.

As part of this new approach, Komatsu wanted to equip apprentices and trainees with important life skills. These included mental health awareness, public speaking, road safety and fatigue management, drug and alcohol awareness and a variety of business skillsets.

Through partnerships with leading expert providers such as Toastmasters, STEM-Punks, NextWorld and local police agencies, Komatsu's ADS has set a new national standard for the way the industry trains its apprentices and trainees.

"We have received feedback that this program has become a benchmark for training nationwide. It has produced measurable results and a higher standard of learning outcomes.

After the apprentices have finished their qualifications and are employed as skilled

technicians, their training continues to remain a focus of the Komatsu Training Academy and Technical Capability Team.

"Our Technical Capability Team track their training against courses they attend with ongoing workplace-based assessments to make sure that they have retained the knowledge and are competent.

"We have designed a professional development program that is adult-learning centric. It comprises 70 per cent job experience, 20 per cent practical assessment and 10 per cent classroom-based learning," Tosolini said.

Another point of difference is the way Komatsu incorporates technology into their training. Engaging third-party virtual reality specialists, NextWorld, helps them educate apprentices and trainees on potential workplace risks and the implications if workplace safety practices aren't followed.

"Additions like this to our program allows us to create simulated events that cannot be reproduced safely in a real-life environment. Giving trainees these virtual experiences allow us to reinforce our safety principles whilst creating valuable and memorable reinforcement of safety principles."

Adding to the success are the rigorous recruitment methods to enable better hiring decisions, including targeting various age groups and life experience diversity.



In recognition Komatsu has again been awarded as a global leader in employee recruitment in the Global Talent Board's 2022 APAC Candidate Experience (CandE) Awards.

"It has never been a more competitive landscape for trying to attract the best employees, and we take pride in making sure that each and every candidate, across the diverse roles we have on offer, are given a really great Komatsu brand and candidate experience," says Taylor.

The US-based Talent Board, which has been running its Candidate Experience Awards (CandE Awards) for the past 10 years, is a non-profit research organisation focused on the elevation and promotion of a quality candidate experience against industry benchmarks that highlight accountability, fairness and business impact. The Talent Board and its CandE Awards are widely recognised globally as the pre-eminent organisation for candidate experience.

"Ultimately, sitting behind these great achievements are the wonderful staff who live our culture and make up our brand DNA," says Taylor. "These awards are a great testament to the hard work and dedication of our passionate employees who deliver on the Komatsu brand promise of creating value together." **AMR**





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# MANITOU

## YOUR HANDLING SOLUTION PROVIDER



**L**eading Rough Terrain Materials company introduces light compact telehandler to its mining product range for the Australian Market.

World leading rough terrain materials handling company, Manitou, has introduced a 'light Mining' version of the MT 625 HA machine specifically designed to meet the needs of the Australian Underground Mining environment.

The MT 625 HA Mining machine is compliant to both AS10896.1 (Telehandlers) and AS1418.10 (Mobile Elevating Work Platform) and the standard package is supplied with fork carriage and 2m x 1.8m work platform.

The machine has been specifically developed to meet the basic needs of the underground mining environment which includes SAHR wet disk brakes on all 4 wheels and dual circuit braking for front and rear axles.

Other additions include battery and starter isolators, jumpstart receptacle, guarding to all lights and cabin protection.

The machine also utilizes a stage 5 Kubota engine with DPF systems in order to minimize particulate matter in the underground mining environment.

The machine provides an extremely versatile and compact offering with the base machine measuring 3.83m long, 1.8m wide and just 1.9m high and turning radius of 3.3m.

When fitted with the work platform, the package is capable of 365kg / 3 person lift to 7.6m working height and 4.2m forward reach when fitted with a generous 2m x 1.8m of working space.

The machine is capable of operating in platform mode on longitudinal gradients of 30% and lateral 7% maximum on tyres, which will

be ideal for performing light maintenance activities to overhead infrastructure etc.

When fitted with forks the machine can lift 2,500kg at 600mm loadcentre to 5m and 2000kg to 5.8m with a forward reach of 3.4m which easily facilitates handling of ICB's and palletized loads in small spaces like underground workshops etc.

The machine can also be supplied with an optional jib attachment that provides 2500kg lift to 5m high, 2000kg to 5.95m and 900kg at maximum forward reach of 3.16m.

Manitou Australia Mining Product Manager Dion Smith said the aim of developing the MT 625 HA in a 'Light' Mining variant is to provide underground mines with a very versatile and compact machine.

"We wanted it to meet the basic requirements of the mining industry at a very com-

petitive price point whilst complying with all Australian standards for Telehandlers and Mobile Elevated Work Platforms.

"Also in accordance with the safety guidance notes released from the EWPA on safety requirements of Telehandlers and ITC Loaders fitted with work platforms.

"This machine is one of the biggest sellers globally, proven in the marketplace and we are aiming to take this popularity to the underground mining environment," he said.

For more information, visit  
**Manitou.com**  
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## NEW MANITOU MT 625 HA MINING BASKET 365 KG - 3 PEOPLE



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**CAPABLE** - 365 kg, 3 person basket capacity, 2500kg fork capacity  
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# HOSING DOWN THE COMPETITION

**M**arket leading company the Powell Group is uplifting Australia's mining industry with their unparalleled hose management program – a combination of services that keep a project's hose systems pumping smoothly.

With 13-branches across Australia, the Powell Group has positioned itself as the leading supplier of integrated Industrial and Hydraulic Hose and Fittings Packages.

The Australian-owned company provides its client-base with an extensive distribution and supply network that spans some of the industrial sector's most well-known, trusted, and reliable brands.

Powell's General Manager Darren James said that while the products were next to none, the company's experience and understanding of client needs set his team apart.

"Our knowledge and expertise allow us to deliver the most innovative and highest-quality products on the market," Mr James said.

"Plus, our extensive problem-solving experience across multiple industries and applications enables us to share innovations over our entire product offering.

"This means we can deliver unexpected solutions and advanced improvements in situations others can't.

"I think this is particularly evident in our Hose Management Program, which is tailor-made for mineral resources' sector clients."

The Hose Management Program is a mature

service that provides condition reporting, e-testing, refurbishment schedules, test charts and test certification reports.

It tracks the total life cycle of hose assemblies, assists with maintenance and schedules hose assembly replacement programs before failure.

Hose assembly history and re-certification timelines can be viewed in real-time online, and the Program can be customised to suit any business or operation.

Mr James said ultimately, the Program was a risk management tool designed to prevent fluid injection injuries, keep workplaces safe and minimise downtime.

"All our branches across Australia are equipped with various hose assembly manufacturing and testing equipment to support clients and market demands," Mr James said.

"These hose manufacturing facilities produce various assemblies for the mining industry from high-pressure high-risk areas such as underground longwalls, through to small bore hydraulic assemblies for metaliferous mining, all meeting the MDG41 and RS23 standards.

"Our comprehensive mining package also includes a full range of industrial hose and hose assemblies for air, water, material handling, stone dust, methane drainage and drilling applications, to name a few."

Particularly important in the Powell offering is the hose testing, including visual inspections which identify mechanical damage,

corrosive damage or wear and tear.

Each hose assembly is inspected for kinks, loose covers, bulges, ballooning, soft spots, cuts, broken wires, or any obvious defect in the hose.

The fittings and attachments are also thoroughly examined for any type of visual defect that may affect performance.

Powell's eye for detail has kept them ahead of the curve in the Australian market, particularly New South Wales where they have maintained a presence since 1979.

The company has locations in Sydney, Newcastle and Hunter Valley to support the State's mining districts and provides mobile hose operations to support clients that require on-site service or containerised workshops.

Mr James said Powell's position as a market leader was also underpinned by the company's strong partnerships with manufacturers and its commitment to continuous tech-

nology advancement.

He said research and development was the cornerstone of the Powell Group and the company invested heavily in facilities that kept the team at the cutting-edge.

"These R&D facilities are at the forefront of our business and have direct involvement with our sales staff and customers," Mr James said.

"They ensure Powell is at the cutting edge of integrated hose and fittings development exceeding the performance requirements asked for by the industry.

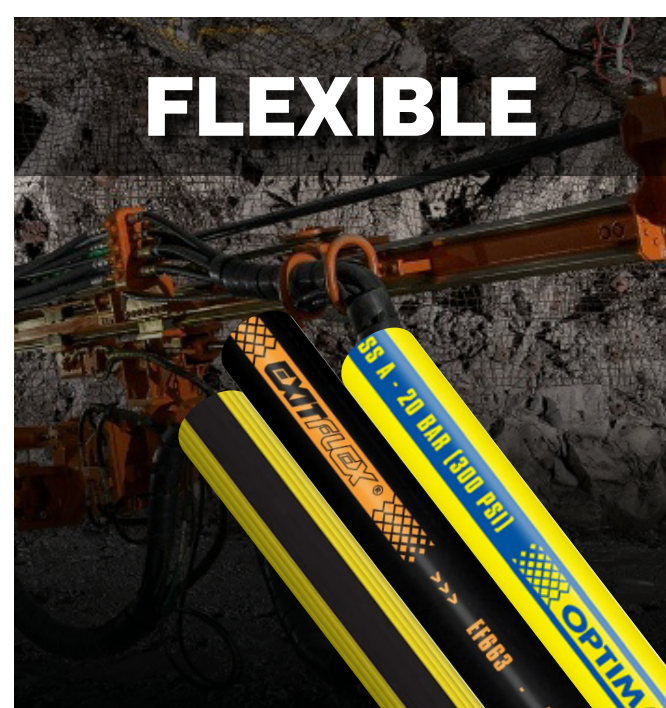
"Powell will continue to be a market leader and strive to expand our product range, providing improved life cycle of the products, exceeding industry working pressures and increasing safety standards."

For more information, visit [www.powellindustrial.com.au/home.html](http://www.powellindustrial.com.au/home.html)

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# TELFER'S LUCKY 8



**N**ewcrest Mining has approved \$214m for the West Dome Stage 8 cutback at its Telfer gold and copper mine, extending operations into early FY25.

The cutback is adjacent to the current West Dome Stage 2 and West Dome Stage 5 pits, with first ore production expected in the December 2022 quarter.

Newcrest managing director and chief executive Sandeep Biswas says the company is delighted to further extend the life of its Telfer operation.

"[This highlights] our ability to maximise the full potential of our assets through our strong technical expertise," he said.

"Telfer is strategically positioned in the highly prospective Paterson Province and we are continuing to progress several potential

options to expand the resource base in the open pits and underground to unlock additional value."

## **Telfer Mine**

The Telfer mine is about 400km from Port Hedland in WA's northwest in the Great Sandy Desert of the Pilbara.

It is fully owned by Newcrest Mining and comprises both open pits and underground mines.

In FY22, a total of 407,500oz of gold and 13,904t of copper were produced.

The Newcrest Board approved \$185m in the West Dome Stage 5 cutback works in August 2021.

Telfer's guidance for FY23 remains 355,000-405,000oz gold production.

## **Exploration**

The Telfer mine contains a number of exploration targets in the surrounding areas.

These include a number of other prospective gold and poly-metallic deposits in the area covered by Newcrest's existing mining and exploration tenements.

Nearby at the Havieron project, key contracts have been awarded for the Feasibility Study, which is expected to be completed after the December 2022 quarter.

High-grade extensions to the mineralisation at Havieron's Eastern Breccia, South East Crescent Zone and Northern Breccia have also been identified, with seven drill rigs in operation as part of the site's extensive drilling program.

## **Processing**

The Telfer mine has a large, dual train, com-

minution circuit followed by flotation and cyanide circuits, which produce gold dore and a copper-gold concentrate.

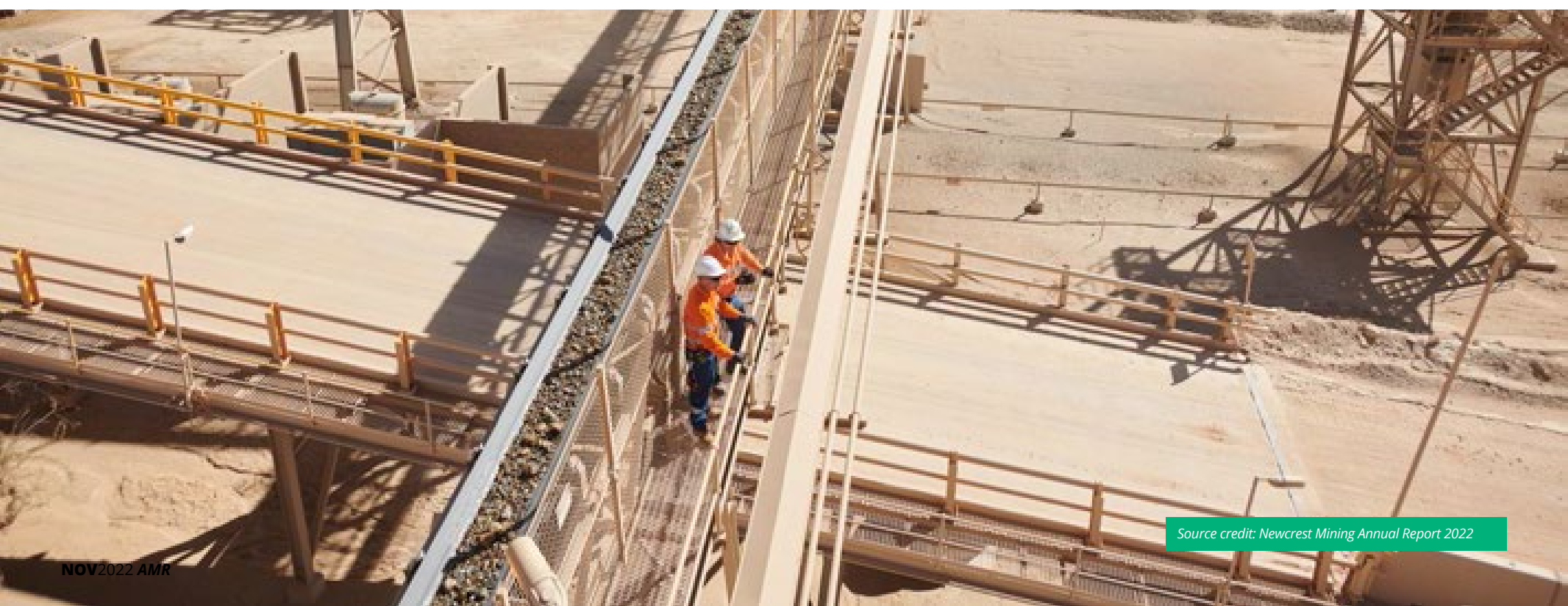
The gold-copper concentrates that are produced are trucked to Port Hedland and exported to various smelters, mainly to the Eastern Asia region.

The gold dore from Telfer is refined at the Perth Mint in WA.

## **Cyanide Management**

Cyanide is used as part of the process for recovering gold in the processing plant and the management of cyanide is a key environmental issue at the Telfer mine.

Newcrest is a signatory to the International Cyanide Management Code for the Manufacture, Transport and use of Cyanide in the Production of Gold, and Telfer is certified under this Code. **AMR**



Source credit: Newcrest Mining Annual Report 2022





# ENGINEERING THE WAY

**G**R Engineering Services Limited (GRES) is a leading process design and engineering company which supports mining developments from study to operation.

The ASX-listed company provides fixed price Engineering-Procurement-Construction (EPC) and Engineering, Procurement and Construction Management (EPCM) project delivery services to the mining and minerals processing industries internationally.

The innovative engineering solutions developed by GRES enable its clients to confidently move into development with the knowledge that the outcomes from study work will be reproduced in the operation of their projects.

GRES has a proven track record of delivering integrated project solutions, having provided services in more than 20 countries and across a vast range of precious metals, bulk mineral concentrates and industrial commodities projects.

GRES has a presence in the Americas via its wholly owned subsidiary Hanlon Engineer-

ing & Associates, Inc. (Hanlon), based in Arizona, USA.

In the hydrocarbons industry, GRES also has a presence via its wholly owned subsidiary, Upstream Production Solutions (Upstream).

In mid-2021 GRES acquired MIPAC who were founded in Brisbane in 1997, a leading global provider of control systems engineering, automation and technology services.

GRES has successfully completed feasibility studies, process and engineering designs and construction for projects of various scale covering a diverse range of metalliferous and mineral commodities.

The company has delivered mineral processing, hydrometallurgical facilities and infrastructure for a range of clients, both in Australia and internationally.

With extensive experience across a range of commodity types, including gold, copper, lithium, graphite, iron ore, lead and nickel, the company is equipped to provide solutions for all types of mining projects.

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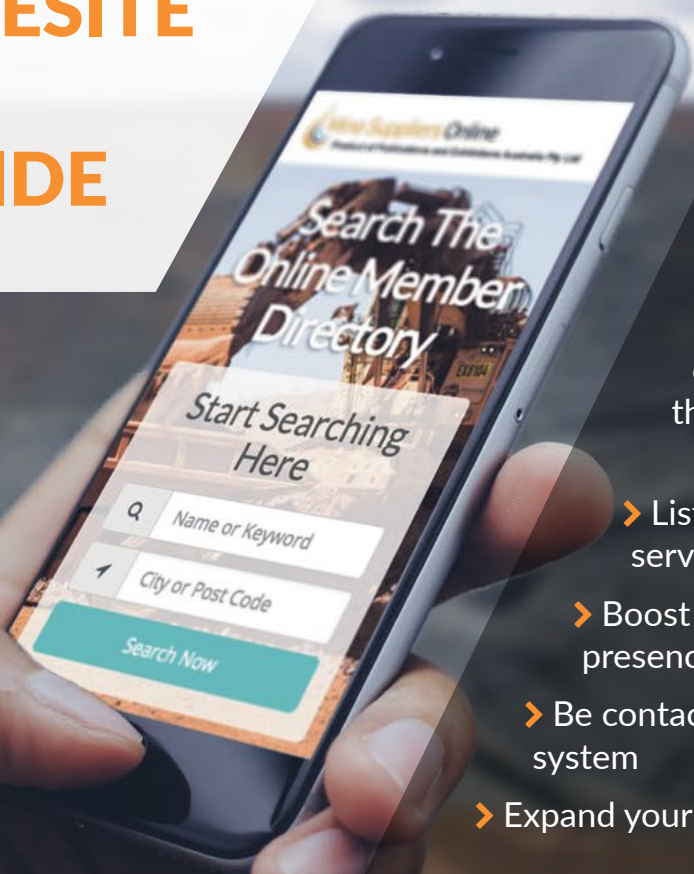
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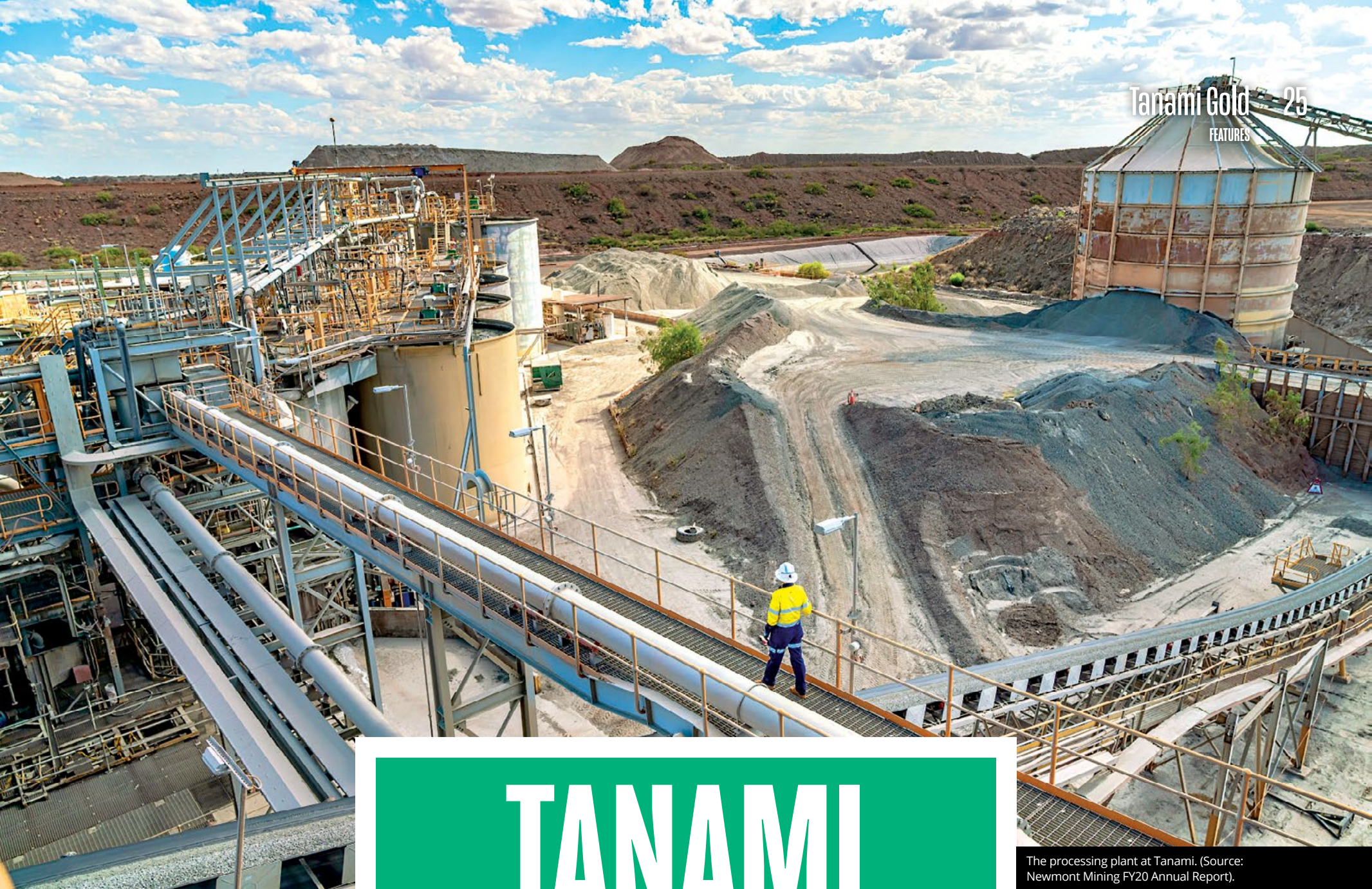
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The processing plant at Tanami. (Source: Newmont Mining FY20 Annual Report).

# TANAMI TAKE-OFF

**N**estled deep amongst the rust-coloured earth of the remote Tanami Desert lies one of the most productive gold mining areas in the world.

The Tanami gold mine is hardly a stone's throw away from the town of Alice Springs in the Northern Territory at a distance of about 540km from the township.

This gold mine is a long-life, world-class asset that has been fully-owned and operated by Newmont Mining Corporation since 2002, following a merger with Normandy Mining Limited.

Two decades on, the Tanami mine is about to be cast into the league of the top 10 gold mines in the world by production.

It currently produces an average of 500,000oz of gold per year and, once its Tanami Expansion 2 (TE2) project is completed in the first half of 2024, gold production will increase around 150,000-200,000oz per year for the first five years.

The TE2 project will not only see the mine producing up to 700,000oz gold per year, it will also extend the mine life beyond 2040 and reduce operating costs by about 10%.

According to data from S&P Global Markets Intelligence, the top 10 producing gold mines globally in 2021 included NSW's Cadia gold mine at 800,000ozpa and WA's Boddington gold mine at 700,000ozpa.

Tanami is not far off those figures with commercial production from the TE2 project expected to be in early 2025.

The main scope of the project involves the construction of a headframe and vertical hoisting shaft to a depth of 1,460m, which will be used to transport people and ore.

Supporting infrastructure will also enable the processing of 3.3mtpa of gold and provide a platform for future growth for Newmont.

Development costs to-date, excluding capitalised interest, since approval were \$451m, of which \$167m related to the first three quarters of 2022.



The Tanami gold mine began first production in 1983.

The underground mining infrastructure and operation is located at Dead Bullock Soak, while the processing infrastructure is located about 40km east of the mining operations at the Granites.

Ore is transported by road train from Dead Bullock Soak underground to the processing facility at the Granites.

Newmont, itself, has the mining industry's largest reserves of gold at 92.8moz.

In 2021, a total of 6moz of gold was produced across all its 12 managed operations.

Newmont Mining president and chief executive Tom Palmer says the company benefits from its integrated operating model, a leadership team with deep operational experience, world-class operations and an organic project pipeline that is the best in the industry.

"In 2021, Newmont produced 6m attributable ounces of gold and 1.3m attributable



gold equivalent ounces from other metals," he said.

"Going forward, Newmont has a portfolio of operations and projects that will produce nearly 8m attributable gold equivalent ounces per year for at least the next decade — the most of any company in our industry.

"And, Newmont's reserves base continues to be a further differentiator, with reserves of nearly 93m gold mineral ounces and 65m gold equivalent ounces, as well as measured and indicated gold resources of 68.3moz and inferred gold resources of 33.2moz.

The company's culture of continuous improvement sees it focusing on a lower-carbon future through cutting-edge, innovative mining systems.

On 10 November 2021, Newmont announced a strategic alliance with Caterpillar (CAT) to deliver a fully connected, automated, zero-carbon-emitting, end-to-end mining system.

As part of this, Newmont will invest an initial \$100m to plan, build, test and deploy the

gold industry's first fully autonomous battery-electric haul truck fleet for both surface and underground at its Cripple Creek and Victor (CC&V) mine in Colorado, US, and Tanami operations in the Northern Territory.

Mr Palmer says that the continued reinvestment in innovation and technology is the key to delivering value for its stakeholders.

"Boddington, Western Australia's largest gold mine, successfully implemented the gold industry's first fully autonomous haulage system in record time," he said.

"Learnings from the implementation will be foundational to our recently announced strategic alliance with Caterpillar Inc.

"The alliance will transform mining with a comprehensive mining system including an all-electric zero emitting autonomous haulage fleet for safer, more productive underground and open pit operations beginning in 2023."

An automated haulage fleet of up to 16 vehicles will be introduced at the CC&V mine in Colorado, US, after which they will all be fully electrified.

Tanami will also test and develop new battery electric haulage technology for underground mining, followed by the introduction of battery autonomous technology – an industry first.

The deployment at Tanami includes a fleet of up to 10 battery-electric underground haul trucks, supported by CAT's advanced electrification and infrastructure system.

This includes first-of-a-kind battery-electric haulage technology for underground mining in 2024 and the introduction of battery autonomous technology in 2025, with full deployment in 2026.

The collaboration with CAT aims to improve safety and support Newmont in reaching its greenhouse gas (GHG) reduction and emissions targets for 2030 and 2050. **AMR**



# GOLD-CLASS HAULAGE

**Australia Wide Haulage is a family-owned business located in Hazelmere, Perth. Trading for over 30 years where they pride themselves on the ability to deliver a personal and professional service along with being flexible and responsive for all client requirements.**

Over the 30+ years in the industry they have broadly expanded their Prime Movers and Trailer fleet to accommodate transporting the variety of freight. Ensuring it reaches the remote locations safely and on time.

The Australia Wide Haulage team service the Pilbara, Kimberley, and Darwin regions weekly with 3 services into Broome, Port Hedland and Karratha.

Australia Wide Haulage provide a weekly service out of Perth into the Tanami region and surrounding mines of the Northern Territory. Servicing locations for the likes of Coyote Gold Mine, Granites Gold Mine and Dead Bullock Soak Mine. Departing Friday afternoon for the following Thursday arrival.

Australia Wide Haulage have a team of expert drivers that strive for the remote locations where they take pride in receiving and delivering cargo with safety as the main priority.







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Mining is thirsty business and Desert Sands Cartage Contractors has the solutions.

**E**stablished in 1989, the Laverton-based company specialises in supplying the remote outback and servicing mining projects in regional WA and the Northern Territory with potable water and cartage.

But the maintenance of trucks and machinery is a key part of making this possible.

Realising this need, Desert Sands Cartage recently built a new workshop with the aim of reducing downtime, maintenance costs and ultimately improve production and reliability for its clients.

Its team of trained technicians are highly specialised in diagnosing faults, performing repairs and rebuilds and thinking outside the box in resolving challenges associated

with industry work in remote locations.

Desert Sands director Rex Ryles says his company has the capabilities to head out to remote locations with its new porta batch mobile batching plant and carry out large pours to mine construction and for remote community upgrades.

"We can also provide potable drinking water 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."

With clients including the Gruyere gold mine site to Anglo Gold Ashanti sites, Downer EDI, Gold Fields' Granny Smith mine site, Poseidon and more, Desert Sands Cartage is well equipped to look after all jobs big and small.

The company also has extensive experience in hauling concrete, screened sand, dune sand, potable water and fuel to some of the most remote and isolated areas in Australia.

Desert Sands Cartage Contractors provide services including but not limited to:

- side tipper haulage;
- mobile batching plant / concreting;
- supply and deliver potable water;
- supply and deliver diesel and petroleum fuels;
- supply and deliver screened sands, river

- rock and blue metal materials;
- maintenance grading;
- road building and construction;
- excavator and loader works.

Other specialty services include 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.

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# MINING... IT'S A DIRTY BUSINESS



*Contributed by John Hales, Chief Engineer, Australian Pump Industries. John has observed and played a major role in the development of high pressure water blaster equipment for the mining industry. Part of that has been associated with the demand for not just cold water wash, but also hot wash and steam machines.*

*Today, that gear is regarded as being an integral part of every wash bay for plant and transport equipment of any kind. When time is money, getting the job done promptly, safely and efficiently is what this story is all about.*

**A**s a Cadet Engineer in the Barber Greene asphalt finisher and bucket-wheel excavator division of Tutt Bryant in the sixties, we got to not only use a boiler driven steam cleaner but to watch it in action almost continuously. We traded crawler dozers, road rollers and motor graders and scrapers on brand new Allis Chalm-

ers, Barber Greene and Raygo equipment. Those trade-in machines were given simple mechanical repairs before heading to the outdoor steam cleaner!

It was rough and ready, had very little pressure and a lot of steam. After that, they went straight to the paint shop, where they got a quick coat of yellow paint and went to the market. In those days, we were operating from a 40 acre site at Rydalmere that backed onto the Parramatta River. There were 8,000 people in the company and it was the biggest and best earthmoving machinery company in the southern hemisphere. I was privileged to be a part of it and worked with mentors in both engineering and management and learnt lots of other life lessons as well.

**Tutt Bryant experimented with a number of notable high pressure cleaning challengers that became failures. One**

**was the Morrison Champ, a UK made double diaphragm pump operated from hydraulics to pressurise the water. The only problem was occasionally the diaphragms would crack and the customer would find themselves spraying the gear with high pressure 800 psi oil. Other contenders were the Steamin' Demon. They had very limited capability, possibly 200 or 300 psi, but were able to provide a satisfactory product for automotive repair shops.**

Later, Tutt Bryant introduced the Cat Pump to Australia, possibly the first effective high pressure piston pump to reach the Antipodes. But again, limited by its size and capacity when it came to cleaning big equipment.

We experimented with an 800 psi Challenge Cook machine from the States that delivered 80 gallons a minute. It had its own water tank and was trailer mounted. Pull-

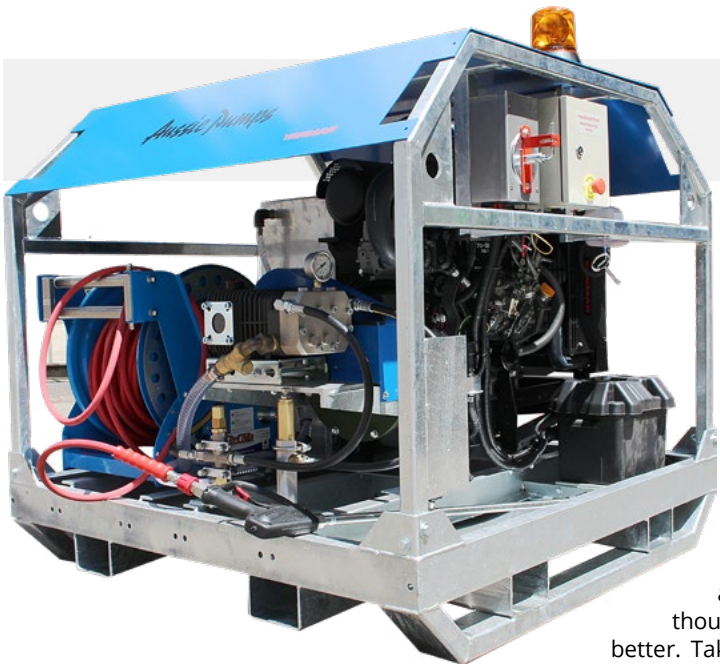
ing the trigger knocked the operator of his feet. It was simply the wrong combination of pressure and flow!

## HIGH PRESSURE WATER BLASTERS... THE ITALIAN REVOLUTION

It was around the late seventies that we saw major Italian corporations like Bertolini from Reggio Emilia start developing piston pumps that were capable of the type of pressure cleaning capability required by earthmoving and mining plant. The company started building big double header pumps that delivered 120 lpm and pressures up to 2,000 psi.

Still a mighty challenge for the operator but, pumps that worked very well. Many are still operating today in a wide variety of applications. When it got down to it however, for practical purposes, it was pressure cleaners in up to 3,000 psi and 15 to 25 lpm that proved to be popular. They were being





built with electric motors at first but the Italians soon developed gearbox drives that enabled slow speed pumps to be driven from appropriate diesel engines.

We watched the development of these products and Australian Pump got started with making machines in the early nineties. They were relatively primitive but, we learnt fast and it was operators who taught us what was required.

#### TIME IS OF THE ESSENCE

We realised by talking to earthmovers, many of whom our team had known for years, that the real requirements of a cleaning job are simple.

1. Do a good job.
2. Do it fast.
3. Be safe

Nobody wants to drive a high pressure water blaster gun to clean mud and schist of the tracks of a crawler dozer, especially if it's baked on, and do it for five or six hours at a time.

**We quickly learnt that using a turbo and upping the pressures to 4,000 and even 5,000 psi made a huge difference to the efficiency of getting the job done fast. That solved the problem of cleaning plant.**

The final evolution of those machines, developed into the Aussie Scud range and our Raptor series with a 500 bar, and planned 750 bar and 1,000 bar big brothers. Those machines wound up working on many huge projects including Gorgon Gas and similar jobs where there was demand for results and efficiency.

Although we were able to clean big plant fast, it didn't serve the purposes of quickly washing away build-ups of grease and oil. Dealing with oil leaks in engines or hydraulic equipment was a new challenge. Those leaks were magnets for dust and dirt, sometimes hiding what were in fact urgent service requirements.

#### AUSSIE'S STEAM CLEANERS HIT THE MARKET

We learnt a lot from talking to operators. Many complained that there simply wasn't equipment on the market what would clean big gear fast enough. For example, giving a steam wash to a Cat 16 motor grader, if done correctly it's not a five minute job. The operator needs to be meticulously working through the machine to get it back to a condition suitable for service.

When it comes to the engine, drive train and hydraulics, steam is required to melt the grease so you can see what's going on underneath. I remember seeing an engine with oil leaks absolutely caked with dust on a big grader. The operator almost had to scrape the top surface off before we could start effective cleaning.

European machines also have their weaknesses in terms of fundamental designs. Polypropylene chassis might be okay in civilised environments. Both these and poly prop covers have their weaknesses. Machines mounted on rear wheels and front

## Aussie's high pressure cleaners go all the way to 500 bar.

castors are also a no-no. It doesn't take much to break the castor off a 110 kilo steam cleaner if you hit a concrete lip or dip in the floor of the shop!

They beat the hell out of the old Steamin' Demons but at Aussie Pumps we thought we could go one better. Taking a practical look at Australian applications meant using the technology developed in Europe for high pressure steam cleaning. That is a heating coil mounted after the high pressure cold water pump, with a fuel pump providing the heat. The water is heated as it travels through the coil before exiting through the high pressure hose and gun.

We came up with a radical new design that had the machine mounted on a steel chassis, with four wheels and a stainless steel cover. We also elected to never compromise on the quality or performance of the machine and that meant only making slow speed pump motor combos that would run at 1450 rpm.

Those big heavy four pole motors are still a primary part of our design. Now, we use heavy duty triplex pumps with solid ceramic pistons and drive them through a coupling, rather than close coupling the pump to the motor. The coupling drive really works because it's cooler and facilitates the service function if there is a need to disconnect the pump from the motor.

#### PROTECTING THE MACHINE AND THE OPERATOR

**Demands from the mining industry always wanted more performance and faster cleans. By 2005, we developed hot water turbos, that operate at up to 130 degrees C.**

They could make a major difference by using both the heat and the impact of the turbo to achieve good results.

**The steam, developed then could also be operated through a complete cycle of ambient water temperature all the way up to 130 degrees C. We tell operators not to run machines flat out! That burns a lot of fuel without gaining any benefits.** Operating at 90 to 105 degrees gives you

the same result but huge savings in fuel and convenience. Nobody wants to have to stop the machine every couple of hours and re-fuel the tank. For best results, operate the turbo at 60 degrees C.

#### 4,000 PSI UPGRADE

**Consistently working with users, we found that getting jobs done faster was still a problem. Our solution was to come up with a bigger pump with 4,000 psi capability that would give more substantial whack to the job, but at the same time operate with flows over 15 lpm and temperatures up to 130 degrees C where required. That was a lethal combination and made an immediate impact on the market.**

We experimented with specific jobs and found that mines particularly liked this combination for wash bays. Again, the big Aussie Admiral 4,000 is a mighty machine weighing in at 190 kilos. It has a big slow speed four pole IP56 motor, running at 1450 rpm. It runs an equally large and heavy duty slow speed triplex pump with brass head, ceramic pistons and top quality stainless steel valves.

Stainless steel is an option to the mild steel coil but both come with free extended warranties of three and two years respectively. All the machines also feature detergent injection so the operator can spray the job briefly with chemical before washing it off with either steam or warm water. The Admiral also comes with a bumper built into the heavy duty chassis and a stainless steel cover to protect it from the elements!

We decided plastic covers were for much more sophisticated markets than Australia. We like the idea you can panel beat a stainless cover but you can't fix a worn plastic cover.

The Admirals also came with Timed Total Stop and safety thermostat to protect the pump. A low fuel sensor and warning light is also supplied as well as the low water cut out. The machine is built like a tank and suitable for tough wash bays in everything from plant hire to mine process plant washdown.

That 4,000 psi steamer is the crowning glory of our electric drive steam machines at this stage. We see it as being the answer to challenges on a mine or construction site and even the army is now interested in these heavy duty machines.



#### MOBILE HOT WASH

We took the challenge here and started building machines in Australia that combined some US technology. These diesel engine drive steam cleaners have capacities up to 5,000 psi. Built into heavy duty trailers with one or two 1,000 litre water tanks, these mobile machines can tackle any cleaning task in the field.

Now widely used on open cut coal mines for cleaning plant in the field, the Aussie Hydrotek range has been tremendously successful. We even make 'Clean and Capture' versions that are able to suck up the used cleaning water, filter it and reuse it.

#### TRAINING OPERATORS

We believe that all operators of high pressure cleaning equipment should be trained. Although the Standards Association has drawn a line between Class A and Class B machines, the break point being 5,600 bar/litres, we think that operators must understand the basics of the principles of high pressure piston pumps and be conscious of the dangers of component failures, particularly guns and high pressure hoses.

Ninety percent of our machines today are Class A and do not require operator certification by an RTO. On the other hand, we provide a free Class A training course to anybody who wants to take it, provided on the basis that a Class A machine at 5,600 bar/litres is just as dangerous as a Class B machine of 6,000 bar/litres.

**It's that particular preoccupation with safety that separates us from most of our key competitors. The free training program also is accompanied by Aussie Pumps 'Aussie Blasters Service Fundamentals' handbook. This is also a free document which can be accessed from our website.**

**Our plan is not to hoard information but rather to dispense it freely for the good of the industry. After all, it's the mining industry that keeps this country afloat, for which we should all be grateful.**

Further information including copies of Aussie Pumps key documentation on plant maintenance and safety is available free from Australian Pump Industries  
**02 8865 3500**  
**www.aussiepumps.com.au**  
AMR





# The Future of GET Maintenance is Here

CR is taking steps to give miners more control over mining asset maintenance, from making scheduled maintenance more efficient to reducing instances of unscheduled maintenance.

As the GET experts, CR constantly seeks to innovate and improve GET and its related maintenance practices. With an ethos of continuous innovation, GET maintenance was the natural place to start developing products for the future of mining.

## GET Maintenance Practices

Site maintenance is defined into two types - scheduled and unscheduled.

Scheduled maintenance is practiced universally to avoid far more damaging unscheduled maintenance. The mine site dictates scheduled maintenance practices on machines and parts at regularly prescribed intervals. This practice risks components and assets being changed out prematurely, costing sites the additional, unnecessary purchase of unneeded GET.

Unscheduled maintenance events occur when GET is lost because of breakage or loosening due to mechanical attachment failure and pre-emptive wear.

Along with the risk to production, these events come with significant safety hazards.

## Keeping Workers Safe

Hot work in the pit may be needed to repair high-value assets or attach lifting points to worn GET. Using hammers to remove and fit components poses the risk of metal sharding-related and repetitive stress injury to staff. It's estimated that 32% of surface mining injuries are caused by strenuous movement caused by heavy equipment interaction. Suspended loads are an ever-present risk of crushing and pinch points.

The solution: minimise worker interaction with GET as much as possible.

CR's mining safety solutions, like the GRIPAssist™ GET handler, allow mines to

eliminate human contact with GET during installation and removal.

The GRIPAssist is a hydraulic arm system that interacts with GET. Developed to fit any track-based skid steer or telehandler with a lifting capacity of over 950kg, there's no need for additional machinery or tooling.



GET maintenance and changeout is not the only safety risk.

Lost teeth and GET significantly impact operations, from lost productivity to unplanned asset maintenance due to damage. Should it get jammed in a crusher, catastrophic safety risks and production delays can be caused.

Digging after losing a GET component also exposes high-value assets to premature wear and damage, from bucket lip wear to the premature failure of wear plates and potential conveyor damage.

The GET Trakka™ system is a series of sensors embedded within GET that provides immediate GET loss alarms and the ability to locate lost components on the ground.

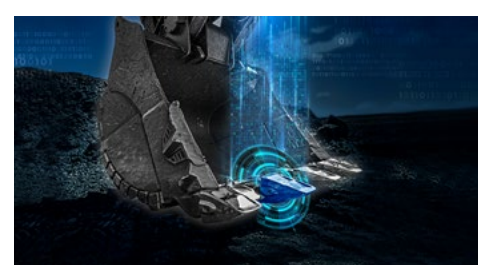
GET Trakka alerts operators to stop operation immediately, avoiding unnecessary asset damage, minimising unplanned maintenance, and preventing GET from entering the crusher.



The system collates data and reports on individual loss events, including times and locations. Mines are provided access to data around GET usage, component reliability, changeout intervals, and predicted changeout times. This data can be used to understand why GET was lost or broken.

## Taking Steps Towards Zero Entry Mining

In The Business Case for Zero Entry Mining, Knights & Yeates identified five essential levers that drive value improvement toward zero entry mining, including "enhancing safety (through removing people from exposure to hazards)" and "reducing Operating cost (through improvement of labour, consumable and equipment productivity, utilisation, and/or the elimination of waste)." (Knights & Yeates, 2019, pp. 3).



These levers can be addressed if the GET Trakka system's GET usage reporting to improve scheduled maintenance plans is paired with the GRIPAssist system for safer and faster GET changeouts.

By implementing systems that are accessible, regardless of the systems creator, like GRIPAssist and GET Trakka, that can work with any manufacturer and GET, mines can ensure that their entire site is interoperating.

This, coupled with a predictive maintenance process and a scheduled maintenance strategy, will ensure the campaign life of consumable parts for greater productivity and sustainability.

## Safe Mining is Our Mission

Zero Harm is at our core. Want to find out how you can implement mining safety solutions and technology that puts your people's safety first? Get in touch with us to start the conversation. **AMR**

1. Knights, P. and Yeates, G. (02/2019). The Business Case for Zero Entry Mining. In G. Yeates & B. Editor (Eds.), Title of proceedings. ResearchGate.





MINING BY NUMBERS

# Safer and more sustainable mining? Challenge accepted.

The alignment of global mining safety and CR's Zero Harm values make us passionate about keeping people and the environment safe while using our innovative products. That's why we're always working with sustainability and safety experts to design solutions that are ready to meet the challenges of a modern mine. Mine smarter with CR.

SCAN ME



CRmining.com





# POWERING AUSTRALIA'S TOUGHEST PROJECTS

**W**hen you've earned the trust from companies like Snowy Hydro and Fortescue, it's no wonder Australia's top tier companies look to Viking Industrial for reliable, high quality solutions.

As Australia's largest fixed speed diesel specialists, Viking Industrial continue to set the benchmark in its trade, offering custom equipment to suit specific asset requirements.

Whether it's powering accommodation camps in innovative world-first projects, purpose-built solar trailers and fuel storage for remote mine sites, or portable industrial lighting towers built for the harshest environments, no challenge is off limits.

Viking Industrial offer convenient rent or buy options across their entire product range, which gives clients flexibility to meet dynamic project and budget demands. Being independent of engine manufacturers means it's uniquely positioned to source equipment directly and build bespoke power solutions aligned to client applications.

According to Viking Industrial BD and Brand Manager, Simon Luu, the company provides the complete package, from a comprehensive equipment range to a delivery strategy to meet project lead times.

"We offer installation, commissioning, training, and servicing, ensuring equipment is well maintained and productive while in use," said Simon.

"Our modern fleet gives our clients peace of mind they're receiving equipment in excellent condition."

"Our core business is really to provide reliable and cost-effective power to Australian projects at every stage. We aim to keep each project running safely, efficiently and on time – that is our promise."

The Australian Mining Review recently spoke with a few members of the Viking Industrial team to shine a light on some of their exciting projects.

#### Joel Keep – GM Sales

As part of the CPB-Ghella JV project in NSW, Viking Industrial supplied a range of power and lighting solutions for Station Boxes and Tunnelling (SBT) works on the Sydney Metro Western Sydney Airport line.

"Fourteen of our reliable VSLT 240 solar LED lighting towers were supplied to the project, along with six new generators ranging from 60kVA to 100kVA, plus some existing machines from the M4/M5 project, including one of the new 100kVA generators fitted with a custom exhaust purifier," said Joel.

"It's a real buzz watching our team operate, from planning and sizing a project, assembling and testing the equipment here in our workshop, and then finally seeing it arrive on site.

"As we enter the end of 2022, we are proud of how many large-scale projects we are supporting with fixed speed diesel power, solar lighting, fuel cells, cables and pumps. Additionally, our service team continues to be best-in-class, offering 24/7 national support and qualified electrical and mechanical expertise."

#### Will Fisher – West Coast BDM

Viking Industrial have powered all critical equipment to-date for BCI Minerals' Mardie Salt and Potash Project, the largest solar salt evaporation project on the Pilbara coast.

"We initially supplied four gensets and two fuel systems to power their 400 person camp, including power packages for their borefields, and standby power for critical administration amenities," said Will.

"We are now powering the first seawater primary intake pump station, which will be pumping seawater into the salt ponds.

"Thanks to the service team at our Karratha branch, we are located in close proximity to the site, allowing us to provide 24/7 service and maintenance for all our equipment."

#### Simon Luu – National BDM

The new Anglo American Aquila coal mine situated near Middlesbrough has supported Viking Industrial's expansion into the heart of North and Central Queensland.

"We tendered directly with Anglo American to provide a 2.5mVA generator and 40-foot self-bunded fuel cell to the site," said Simon. "Along with the huge genset, our service team provided full testing, commissioning, and transportation to the site."

#### Luke Rennie – Rental Director

"We've helped power Oz Minerals' new West Musgrave mine site in Western Australia,

and their team has been an absolute pleasure to work with," said Luke.

"What's impressed us is the level of awareness the company brings to their project, from working with local Indigenous communities and environmental organisations, to having a positive impact on the region."

"Oz Minerals have truly set the bar for how these types of projects can operate in harmony with local communities."

Viking Industrial have delivered four 500kVA generators to power initial living quarters and other critical infrastructure, as well as bore pumps and refuelling pumps.

"The mine site is fairly remote and situated near the borders of WA, SA and NT. Our team at the Karratha branch did a fantastic job getting the work over the line, and the Pilbara location has become crucial for us in

serving our Northern WA clients in the best way possible," he said.

Viking Industrial are a privately owned 100% Australian company, providing world-class diesel plant and equipment solutions.

It's footprint is growing with more branches strategically located around the country to deliver efficient serviceability to critical client projects. It has recently established new facilities in Cooma and Karratha extending its national footprint to six dedicated branches.

It offers a range of solutions from power, air, and water, to lighting and fuel storage with the flexibility to fully customise products to meet projects of all sizes.

For more information, please visit  
**[www.vikingindustrial.com.au](http://www.vikingindustrial.com.au)**

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# A Cut Above the Rest

**H**D Plasma and Laser Cutting Services provides an innovative and dynamic profile cutting service to all steel manufacturing industries within Australia.

The purpose-built, multi-function, steel processing business located in Bibra Lake, WA, is seen among the leaders in the steel cutting industry.

**Laser Cutting**

The technology of the HD Plasma and Laser Cutting Services machines delivers superior performance, giving the ability to provide clients with exceptional quality, together with 24-hour operations, shorter lead times compared with other conventional laser cutting machines.

- Cutting table size 4000 x 2000mm
- Capable of processing up to 20mm thickness mild steel
- Capable of processing up to 20mm thickness QT Material
- Capable of processing up to 32mm thickness aluminium
- Capable of processing up to 25mm thickness stainless steel

**Plasma Cutting**

HD Plasma and Laser Cutting Services operates three plasma machines - one Kinetic K4000 and two Kinetic K5000. These state-of-the-art, heavy duty combination plasma/oxy/machine centres can process a wide variety of materials at an extremely fast rate.

The 62m plasma cutting bed, together with 24-hour operations, allows high volumes of cutting to be achieved with short lead times.

- Counter sink/counter bore
- Drilling – 3mm up to 60mm
- Plasma cutting – 3mm up to 50mm
- Oxy-cutting – 60mm up to 300mm
- Bevelling – up to 50mm with maximum of 45°

**Steel Plates**

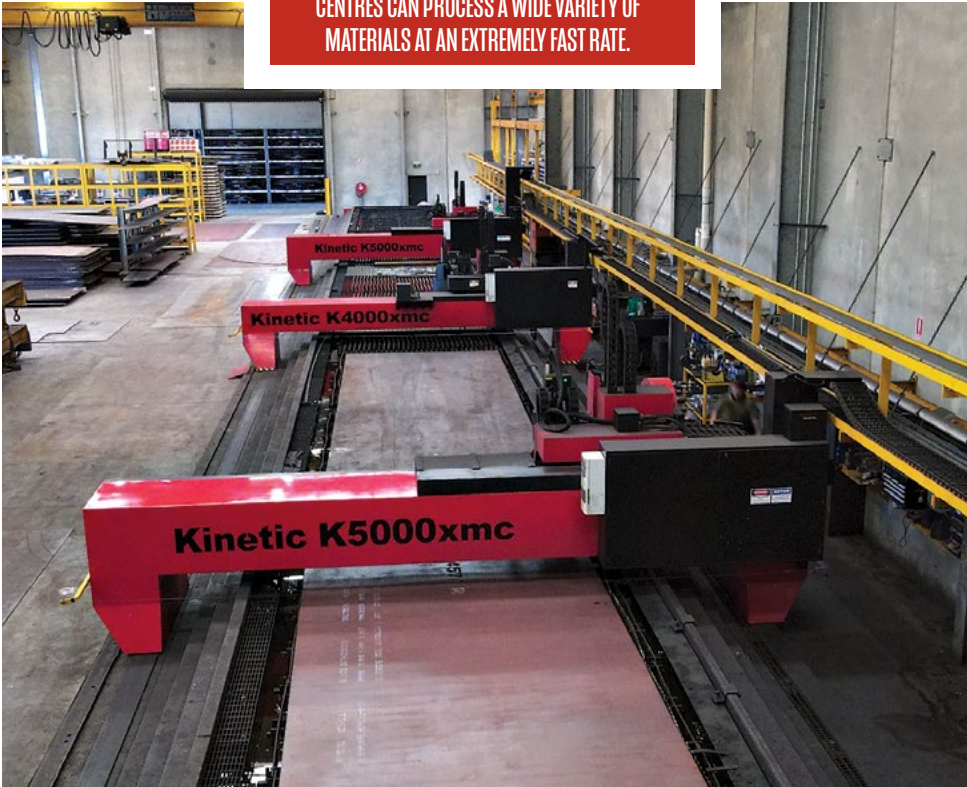
HD Plasma and Laser Cutting Services holds steel plate in stock.

Plate is sourced from quality local and imported steel mills, to cut a wider range of materials at a greater thickness range than most of its competitors. **AMR**

GRADE	THICKNESS (mm)
AS 3678-250 .....	UP TO AND INCLUDING 300mm
AS 3678-350 .....	UP TO AND INCLUDING 300mm
FLOOR PLATE M/S .....	UP TO 10mm
BOILER PLATE - ALL GRADES .....	UP TO 80mm
QUENCHED AND TEMPERED .....	UP TO 80mm
CARBIDE OVERLAY .....	UP TO 40mm
ALUMINIUM PLATE .....	UP TO 32mm
PGI, ZINCANNEAL, GALVANISED & COLORBOND .....	UP TO 6mm
STAINLESS STEEL - ALL GRADES .....	UP TO 40mm



THE STATE-OF-THE-ART, HEAVY DUTY COMBINATION PLASMA/OXY/MACHINE CENTRES CAN PROCESS A WIDE VARIETY OF MATERIALS AT AN EXTREMELY FAST RATE.



# A cut above the rest



HD Plasma & Laser Cutting Services Pty Ltd is a purpose built, multi-function, steel processing business located in Bibra Lake, Western Australia.

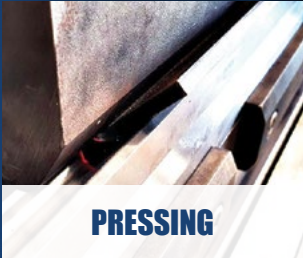
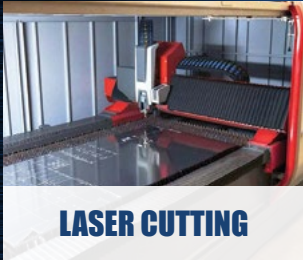
We can deliver an innovative and dynamic profile cutting service to all steel manufacturing industries within Australia.

HD Plasma & Laser Cutting Services philosophy of progressive service to our customers is what is bringing us to the forefront of the steel cutting industry.

A continual process of system and service development and refinement is where our key advantage lies. We constantly find new ways to add value to the service we deliver to you.

Progressive service and quality is about staying one step ahead.

## Services



PHONE: +61 08 9418 8462  
[www.hdplasmacutting.com.au](http://www.hdplasmacutting.com.au)

81 Discovery Drive, Bibra Lake WA 6163  
Email: [sales@hdplasmacutting.com.au](mailto:sales@hdplasmacutting.com.au)





# Wellmaster

FLEXIBLE RISING MAIN SYSTEM

Wellmaster is the Industry Standard Flexible Rising Main for all types of ground water extraction and well monitoring operations. Its simplicity of installation makes Wellmaster the cost-effective alternative to rigid pipe.



Angus Flexible Pipelines Australia Pty Ltd. 5/48 Business Street, Yatala, Queensland 4207.  
> Main contact: +61 (0) 7 3256 7624 > Email: [sales.australia@angusfire.com](mailto:sales.australia@angusfire.com)



## Wellmaster

- > Lightweight highly versatile flexible riser with UV impregnation
- > Exceptional hydraulic performance
- > Corrosion and scaling resistant
- > High Safety Margin in physical parameters
- > Long operational lifespan



Angus Flexible  
Pipelines  
Australia



**Tim Eklund**  
Managing Director  
Aust, NZ & PNG



**Jay Fong**  
National Sales  
Aust, NZ & PNG



**Michael Houldsworth**  
National Technical Manager  
Aust, NZ & PNG

## Super Aquauct

A flexible layflat pipeline for all emergency and temporary drinking water delivery operations, offering major cost savings and performance advantages over conventional rigid pipe.

- > Layflat pipeline for all water transfer applications with UV impregnation
- > Can be used in emergency situations for loss of potable water
- > Rapid deployment and retrieval capability
- > Easily stored and transported
- > Low operating cost



## Flowmaster™

Flowmaster is a flexible layflat drag hose for all types of irrigation applications.

- > Ideal for remote/emergency transfer scenarios available in lengths up to 400m
- > Highly flexible for minimum pressure loss and maximum efficiency
- > Rapid deployment for emergency situations
- > Rapid deployment and retrieval
- > High performance capability



## Chemicoil

A cost-effective flexible layflat hose for fuel and chemical delivery operations.

- > Flexible solution for fuel and chemical transfer
- > Static discharge capability with UV impregnation
- > High pressure fuel delivery (28 Bar)
- > Exceptional chemical resistance
- > Rapid deployment for emergency situations



## Offshore 850

A flexible layflat hose for all types of marine and offshore supply operations.

- > Floating fluid transfer flexible pipeline
- > Rapid deployment and retrieval
- > High performance capability with UV impregnation
- > Ideal for remote/emergency transfer scenarios
- > Designed for the marine and offshore supply operations sector



Angus Flexible Pipelines Australia Pty Ltd. 5/48 Business Street, Yatala, Queensland 4207.  
> Main contact: +61 (0) 7 3256 7624 > Email: [sales.australia@angusfire.com](mailto:sales.australia@angusfire.com)



# Why Local After-Sales Support Matters for Your Decanter Centrifuge

Building on more than 95 years' market presence, Alfa Laval continues to invest in people and service capabilities close to you, so you can focus on your operations.

**C**ost, environmental and safety concerns are driving the shift towards solid bowl centrifuge technology, helping mining companies reduce or eliminate tailings and waste-water streams with a smaller footprint than conventional dewatering technologies.

Using G force, centrifugation is highly effective at removing the heavier particles from waste streams to produce a cake with a low moisture content for dry stacking. Solid bowl centrifuges run continuously, and like any other mining equipment in heavy duty applications, require regular maintenance and repair.

## Unrivalled Service Footprint Across Australia

Not all centrifuge equipment suppliers are the same. Alfa Laval is a true value provider with a distinctive service culture covering the entire lifecycle of decanter centrifuges from start-up, maintenance and support to improvements and monitoring services over time in Australia.

Building on more than 95 years' market presence, Alfa Laval service centres offer services close to you, to help you maximise uptime, performance and efficiency of your equipment.

Harvey Foroush, Mining Account Manager at Alfa Laval Australia explains that Alfa Laval's vast capabilities for rotating equipment are performed by highly experienced service technicians in local service centres based on Alfa Laval global service standards, which includes inspection, repair, welding and balancing of solid bowl centrifuges.

"Balancing of a rotating equipment is chal-

lenging - ensuring the equipment rotates smoothly at high speeds, and preventing consequential damage or accidents as well as extending the lifespan of equipment."

"Our service technicians enjoy an unrivalled reputation for their product and application know-how," adds Peter Foster, Service Centre Manager, Alfa Laval Australia. "Our people are our greatest asset, working tirelessly to bring you performance and peace of mind."

Alfa Laval's field service technicians travel to even the remotest sites to commission, service and repair equipment onsite, using the latest digital technology for trouble-shooting and remote support.

When you turn to Alfa Laval for services and parts, you experience readiness and reliability that save your time and money - while making a responsible choice for safety and environment.

## Top Tips for Maintaining Solid Bowl Centrifuges

1. Ensure the key operating parameters (speed, solids density, feed rate) match the original design specifications.
2. Monitor the machine daily. Check vibrations and bearing temperatures. Look for leaks and investigate any abnormal noise.
3. On a weekly and monthly basis, check the casing for any solids build up (and remove if necessary).
4. Periodically check all automatic monitoring systems and shut-off devices for correct operation.
5. Every six months or 1000 hours, check - and adjust - gearbox oil level. V-belt tension is recommended every 4000 hours of operation.
6. Grease the conveyor bearings every 1000 hours of operation based on operating manual. Use only the approved brands of grease and oil.
7. Keep service area and decanter surroundings clean. Always clean parts thoroughly before assembly. Tighten screws to the correct torque levels.
8. Use only genuine OEM-supplied tools for service and maintenance and store the tools in a clean, dry location.
9. Use only genuine spare parts for guaranteed performance, reliability and equipment life. Maintain a stock of key spare parts like grease, oil, intermediate and major service kits.
10. Gain full control over your maintenance budget while minimising the risk of unexpected breakdowns with an Alfa Laval Service Agreement

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Alfa Laval is a true value provider with a distinctive service culture covering the entire lifecycle from start-up, maintenance and support to improvements and monitoring services over time.



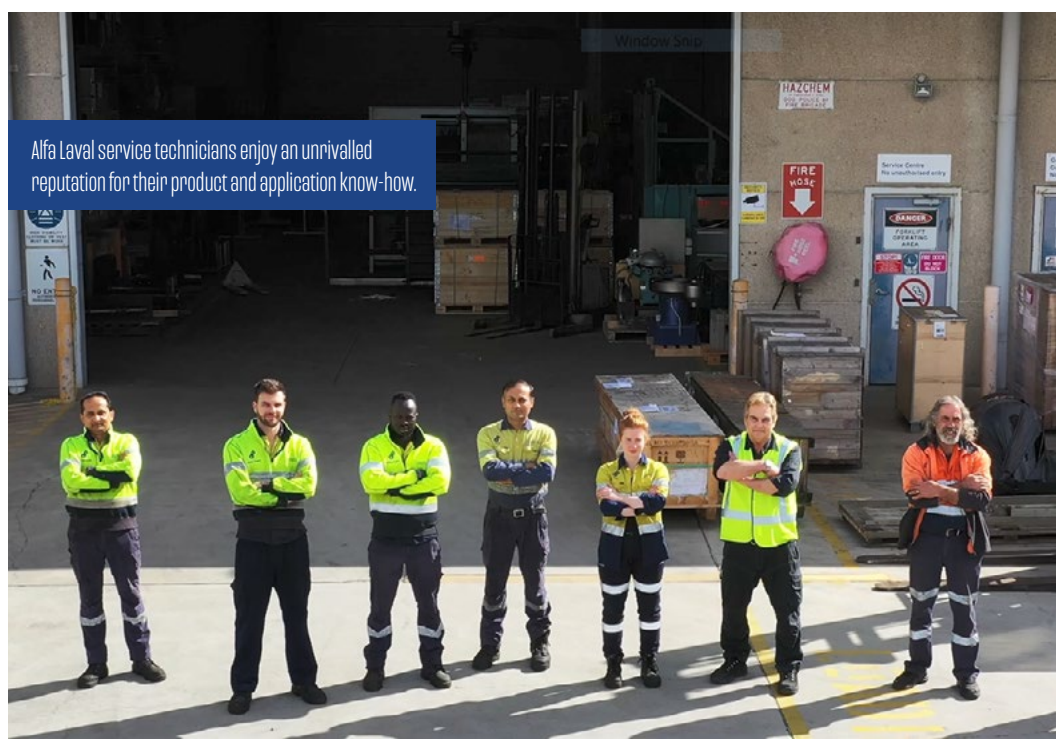
Centrifuge repairs including welding are performed by highly experienced service technicians in local service centres.



Balancing of a rotating equipment ensures the equipment rotates smoothly at high speeds, and preventing consequential damage or accidents as well as extending the lifespan of equipment.



Alfa Laval Mining Account Manager Harvey Foroush.



Alfa Laval service technicians enjoy an unrivalled reputation for their product and application know-how.





Celebrating  
95 Years  
in Oceania



## Discover Alfa Laval's unrivalled centrifuge service & support in Australia

>> Watch the video



[www.alfalaval.com.au](http://www.alfalaval.com.au)

Our local Service Centres and field service engineers across Australia help you maximise uptime, performance and efficiency

Building on more than 95 years' direct market presence, and an indirect presence going back to the 19th century, Alfa Laval offers after-sales support and technical services close to you.

Our vast capabilities for rotating equipment are performed by highly experienced service technicians in local service centres based on Alfa Laval global service standards, which includes inspection, repair, welding and balancing of decanter centrifuges.

Choose Alfa Laval as service partner for your business.





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Industrial IoT



Weather



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- Installation and commissioning
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Crusader Hose demonstrating the reel systems at the open day.

# THINK OUTSIDE THE CIRCLE, THINK LAYFLAT

**Crusader Hose** is Australia's leading manufacturer of layflat hose and reel systems. In their new campaign, Think Outside the Circle, Crusader Hose highlights the many benefits of using layflat hose over poly pipe. Ease of handling, one of the key benefits, is now enhanced by the use of their newly designed reel systems.

Crusader Hose, current leaders in Australian layflat hose manufacturing, are now rising leaders in engineered reel systems. New technology and design engineer experts have increased the company's capabilities in creating reliable hose deployment equipment.

Last month, Crusader Hose launched their new campaign, Think Outside the Circle. To Think Outside the Circle is to think outside the circle of poly pipe and think layflat hose!

The campaign launch took place during their Open Day at the factory. Out of the invited guests, 31 attended from 19 registered companies. Everyone was impressed with the facility, demonstrations and factory tour. The campaign video was screened to much applause.

Crusader Hose has been offering dewatering solutions using layflat hose to mines across Australia for many years to keep them operational. Its layflat hose system has been hailed a cost- and time-saver.

With the company's new engineering and fabrication know-how, handling large-diameter layflat hose for rapid in-pit dewatering and emergency flood assistance has never been easier. The new reel systems take the effort out of handling large-diameter layflat pipelines.

The Rapid In-pit Dewatering System consists of Waterlord® layflat hose and Hamersley™ Reel System. The tough and robust PU-extruded high-pressure Waterlord® hose comes up to 12" with volumes up to 500L/second. The Hamersley™ Reel System is the simplest, fastest and most compact system available for delivering layflat in the field.

The hose is wound onto interchangeable hose reels, which are then locked into the reel drive unit. The quick-connect hydraulic couplers of the reel drive unit attach to your excavator or similar plant, enabling the system to be ready for use. The Flange couplings make connecting multiple lengths of hose simple.

Setting up the Rapid In-pit Dewatering System is straightforward. As the hose comes wound onto the reels placed on pallets, lifting the pallets off trucks is quick and easy. There is no need for complicated large machinery as you do when handling long lengths of large-diameter poly pipe. Many kilometres of layflat hose wound onto the reels have a much smaller footprint than similar lengths of poly.

The flexible nature of the hose takes on the contours of the terrain, eliminating the need for digging trenches to accommodate the rigid nature of poly. Not just easier to handle but also much kinder to the environment.

When an in-pit dewatering pipeline needs to be moved, a layflat pipeline is easily retrieved with the reel system and deployed to its new spot. Moving and resuing poly pipe is much more complicated.

If trucks need to get to the other side of the pipeline, they can. You can drive over layflat hose, however, care needs to be taken. You

can't drive over poly pipe.

With their new capability, Crusader Hose calls on the water management experts to think of using a layflat hose and reel system instead of poly pipe when planning rapid in-pit dewatering systems or requiring emergency flooding assistance.

Managing Director of Crusader Hose, Francois Steverlynck, maintains layflat hose pipelines can easily replace rigid poly pipe in many dewatering applications.

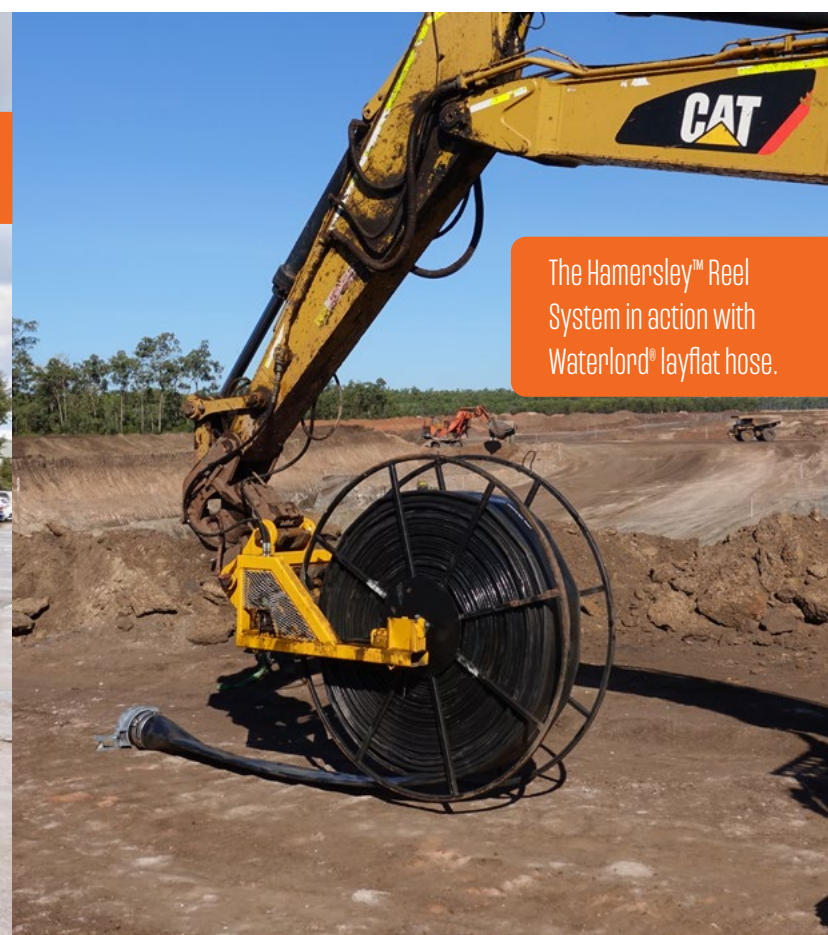
"We have worked with many mines in finding solutions for their dewatering projects and have seen first-hand the many benefits of using our layflat hose," he said.

"One major benefit is the rapid deployment of long lengths up to 200 m, which can be easily assembled into kilometre lengths without the need for specialised welding machinery," Francois continued.

"We have always known that to have the mining engineers seriously consider using a flexible layflat pipeline instead of poly, we'd have to offer a complete system including reel deployment equipment," said Francois, "and I'm proud to say, now we can. Our new reeling systems have been designed in consultation with industry to fulfil their requirements. Deploying layflat pipelines has never been easier." **AMR**



Palletised reels of hose ready for delivery.



The Hamersley™ Reel System in action with Waterlord® layflat hose.



# A Portable Valve Actuator for the Mining Sector

**B**y definition, open-pit mines are often located in remote areas, and can be large or even gigantic (some mines are much larger than large cities).

The process of operating a mine is complex and involves many industries.

The infrastructure (electricity, clean water, wastewater, roads, etc.) is comparable to that of a large city, not to mention the industrial infrastructure itself.

Water is a resource that is used extensively in all areas and its supply is critical. It often comes from far away and is transported by large pipelines.

Whether in the water pumping stations at the ocean's edge, on the route of the pipelines or, above all, in the mine itself, the water networks are complex, with enormous flows and consequently large valves.

Often, these valves are manual and, given their size and the torque required, require several thousand turns of the hand wheel to open or close them, which represents a very long operating time.

## Modec Portable Valve Actuators are Used for Preventive Maintenance

- Drastic reduction in operating time.
- Reduced fatigue, risk of accidents and occupational illness.
- Protection of the valve itself with our power, speed and torque control systems.
- Increased valve service life due to shorter, easier and therefore more regular maintenance operations.
- The valves are of course located in remote and sometimes very isolated locations.

This is where the Modec range is of particular interest due to the possibility of using portable battery-powered actuators (with a continuous autonomy of up to 90 minutes), or actuators with combustion engine (in this case the autonomy is limited only by the size of the petrol canister taken by the operator).

For the numerous valves located in pumping stations or water treatment complexes (most often equipped with a compressed air network), a particularly powerful and light pneumatic compressed portable actuator can also be used.

It is also possible to use one of the battery-powered actuators directly connected

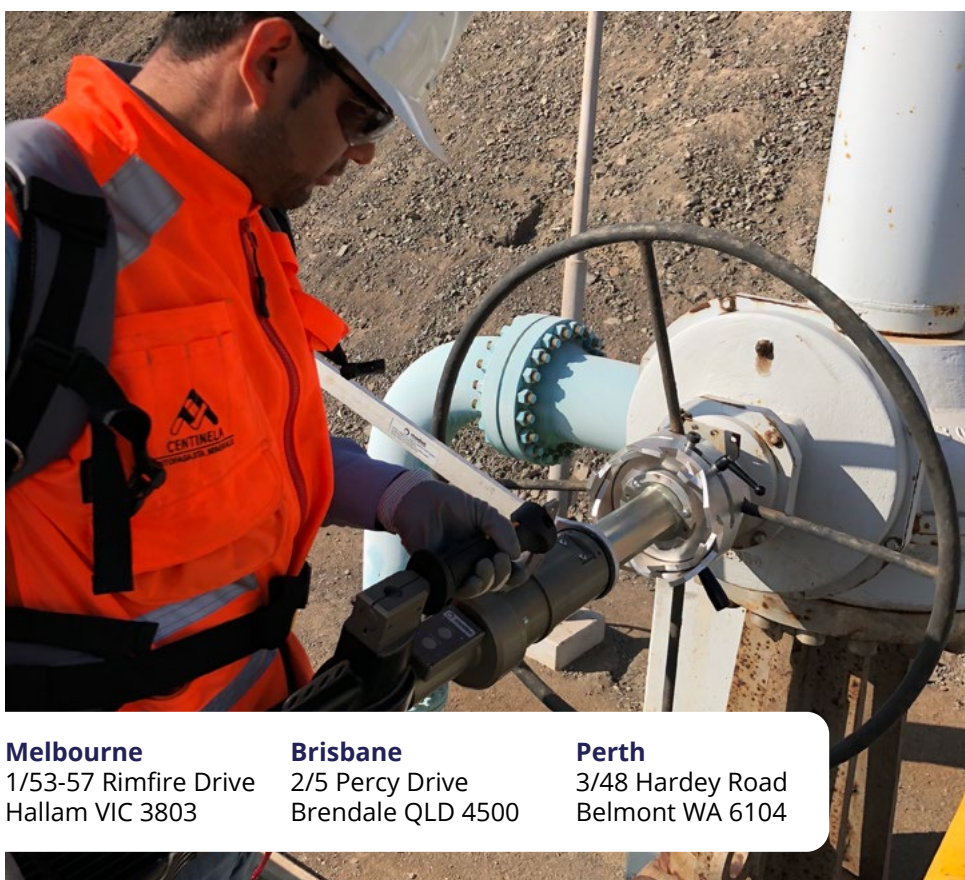
to the mains for total autonomy.

- **Simple installation:** The portable actuator and flying adapter can be installed in seconds.
- **Ease of use:** The device is intuitive, safe, lightweight and can be used safely by anyone. Robustness: Portable actuators do not require any special maintenance and are particularly suitable for demanding environments.
- **Versatility:** With only 5 models (2 pneumatic, 2 battery, 1 gas) and a few adapters, any valve can be handled in any environment. Whether the need is

to save time by going faster or to gain strength for difficult valves, our devices are there for you.

- **Associated gains:** It is not necessary to look far to see the gains brought by these portable actuators – saving time (and therefore money), reduction of accidents, sick leave and occupational illness which cost the company a lot of money, reduction of drudgery (operator satisfaction and improved productivity), drastic improvement of equipment maintenance and consequently its lifespan.

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# DRONE INNOVATION DEEP DIVE INTO WATER SAMPLING

In the last decade drones have truly exploded, both for recreational and commercial applications.

Technological advancements from leading manufacturers such as DJI enterprise and their innovative propeller technology has opened the door for drone surveying to soar to new heights.

The Commonwealth Department of Infrastructure, Transport, Regional Development and Communication in October 2020 issued a comprehensive report into the Economic Benefit Analysis of Drones in Australia.

This report summarised that:

- There is a wide range of 'compelling use cases' for drones in the nation
- The potential for drones to achieve cost savings and other benefits will 'drive' the use cases
- Incremental growth in the Australian drone industry and cost savings for end use industries over the period 2020 to 2040 was estimated to be \$31b to \$51b.

As the market matures the use cases are growing requiring drone service providers to focus on areas of expertise.

As more and more businesses realise the potential, capabilities, and scale of global reach, they are utilising drone surveying services in conjunction with traditional methods.

Drones can offer significantly faster and more efficient way of conducting small to mid sized surveys, quickly becoming one of the most used applications of drone technology to date.

For some applications, drones are in direct competition with traditional manned aviation capturing large areas and data sets.

However, speed is not necessarily what defines a good survey, it requires accuracy and quality to ensure the useability of the data obtained. This is where RemSense are leading the charge.

A current example on the innovative usage of drones was the water sampling project just undertaken by RemSense.

Water sampling in decommissioned mine sites is critical in allowing environmental teams to understand and monitor water conditions to mitigate any potential environmental impacts.

As the world demands a stronger focus on environment, sustainability and accountability, the future need for water sample collections will only increase.

With an increase in demand comes the need for faster yet reliable solutions.

The problem is, most traditional water sampling methods of remote sites are logistically complex (if not impossible to reach), time consuming and require use of water-crafts or other vehicles which can incur substantial costs and propose increased safety risks for crews.

This is where the use of drones plays a big role, but, simply using a remote piloted aircraft, is not enough.

"Water sample collection is critically important and more difficult than it sounds, possible tether snagging is an additional operational risk, where accurate water depth of the sensors another complexity," explains Adrian Hollis, General Manager Operations at RemSense.



"Furthermore, on this project, the kind of collection we were required to do was more complex and challenging than surface sampling" he says.

The client requirement was to collect water samples from a non-operational pit.

Samples were required from the bottom, and at various depth intervals to identify pH, density, salinity, metal/contaminants.

During the project, RemSense had sample distance up to 500m and minus 200m AGL down from the controller area.

"As you can imagine, being able to collect samples without touching the ground and risk contaminations, is a challenging job. That's why, together with our engineering and innovation team at RemSense, we've been able to develop a disruptive solution" Adrian Hollis adds.

RemSense developed two innovative devices operated remotely via the pilot's controller able to enhance the performances and safety of the DJI M300 drone for its operation.

In this instance the solutions are an active payload safety release device, which will be triggered in an event of emergency when it will be necessary to decouple the sampling probe from the drone (such as in a case of snagging) and a remote sensing when the payload has reached the lake floor.

Additionally, due to increasing water sample depths by the client, and a hard ceiling height requirement for flying the drone, ruling out the use of a fixed length tether, RemSense further developed a novel method of increasing and decreasing the payload height during deployment.

After some concept analysis and design, it was determined the need to implement a winching system to suit the scope of work.

Due to COVID's impact on the international supply chain RemSense were not able to use any of the off the shelf product to meet the required delivery schedule for the project, so the Engineering and Innovation team produced a solution.

In a period of 2 weeks, they design developed, prototyped, and manufactured a custom gearbox and drive train to allow the project to be delivered on time, reducing the delivery time of the off the shelf solution by 10 weeks.

The high reduction gearbox and drive train were manufactured in house using RemSense's 3D Printing and manufacturing facilities delivering a quality, fit for purpose product to meet the client's delivery schedule.

Combining the payload winch in addition to an integrated flight control Radar, allows for accurate water sampling at depths with increased positioning and altitude of the RPA above the water.

RemSense used its technological uniqueness to come up with an innovative solution, that solves an industry issue and ensure consistent, reputable, and replicable data capture processes.

Ultimately, RemSense is set to support the achievement of both existing and future clients' goals.

**RemSense Technologies Limited**  
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AMR







# Water Management in Mining Operations

**K**ELAIR Pumps Australia have provided pumping solutions to many major mining organisations throughout Australia and specialise in pumps for mineral processing and hard rock mining.

Pumps play an integral role across the mining sector, essential in moving material from one point to another. In the world of hard rock mining, this is done with the aid of water or other solutions.

In this edition of Australian Mining Review, we offer solutions to several significant areas of application within the mining sector.

Key applications and types of pumps

## 1. Dewatering

According to Kelair Pumps Australia General Manager Myro Bratkovic, the ideal pump for harsh mine dewatering applications would be one that is lightweight, resistant to corrosion, easy to maintain and able to pass large solids through the system.

Mr Bratkovic identified the Sandpiper HD20F as the next generation in mine dewatering. "The design combination is unique and has all the advantages of a Sandpiper metallic flap valve pump while being free from corrosion," he said.

Flap-check valves and unique side access ports not found on any other dewatering pump allow access to the pump without dismantling it allowing for simple maintenance while the very low air consumption in comparison to other major brand 2inch plastic pumps offers significant energy savings.

## 2. Wastewater systems

Mine sites with any amount of workers on-site need efficient, safe and straightforward sewage treatment systems.

Kelair Pumps is revolutionising sewerage treatment with the Kelair-Blivet, a stand-alone packaged sewage treatment plant that quickly turns effluent into usable irrigation water.

With a footprint of only 10.9m x 2.27m, multiple units can be installed in a staged manner to cater for increased demand as the project expands. This unique system comprises primary settlement sludge storage, aeration via the aerator drum system, an aerobic zone, and final settlement (humus tank).

"Low power use, simple installation and portability make this an attractive system, especially for remote locations," Mr Bratkovic said.

## 3. Fire safety pumps

Mine sites generally have a large workforce and costly operation critical equipment in harsh conditions that are in vast, difficult to access environments.

With a dedicated Building and Fire Division, Kelair Pumps recognises the importance of a site-specific fire safety system and offers an extensive range of pump sets that are fully compliant with each mine site's requirements.

Kelair Pumps Australia Regional Sales Manager Michael Charnley highlighted Kelair Pumps containerised units as a key choice for mining operations. "Some of these fire pumps are placed into containers, including sea containers, requiring a high level of engineering based on what has to be built; its robustness and durability; and the delivery over long distance."

Compact, prefabricated and completely packaged, these containerised pump sets are easily mobilised and transported to site. Kelair offers on-site commissioning and testing together with ongoing field support and maintenance for the life of the product.

## 4. Abrasive tailings transfer

Because of their highly abrasive and harsh chemical properties, the transfer of tailings and waste along with the large volumes of water used in tailing applications, mining operations face significant environmental



Kelair's fully packaged fire pumpsets are factory tested as a complete assembly to the requirements of ISO9906 Grade 1U and AS2941.

and economic pressures.

For the efficient handling of paste and mud tailing Abel Pumps offer two pumping design alternatives, the SH and HMQ series. Both pumps can handle conventional tailings, cemented and uncemented tailings pastes with yield stress values of more than 350pa. The maximum flow rate for the Abel HMQ is up to 450 m3/h and pressures to 230 bar. The Abel SH has a maximum flow rate up to 110 m3/h and pressures to 160 bar.

## Kelair Pumps

Since 1975, Kelair Pumps have specialised in providing pumps and pump packages to mining operations across Australia.

While the mining sector has diverse needs, Kelair Pumps Australia has the diverse range, first-class service, and expert knowledge to meet any mine sites pumping requirements. **AMR**

**Kelair Pumps Australia**  
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The Sandpiper range of plastic-bodies flap-check valve pumps are ideal pumps for mine dewatering applications: one that is lightweight, resistant to corrosion, easy to maintain and able to pass large solids.

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Refining, smelting and milling process.  
Water treatment. Dewatering.

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You've just found them.

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We know the importance of choosing the right equipment. With our extensive range of pumps, first class customer service and ongoing comprehensive support, Kelair Pumps Australia are second to none when it comes to your pumping requirements.



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# 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.



**F**or 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 ordered 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.

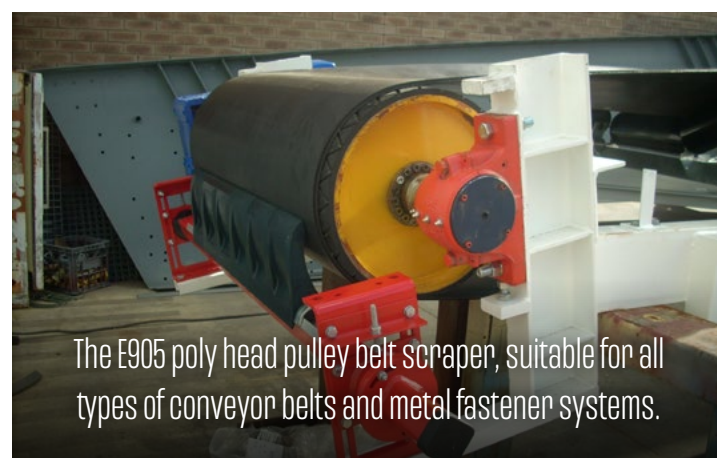
In 2013, operations expanded to form Oreflow, supplying rubber products, belt conveyor glues and repair supplies.

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**

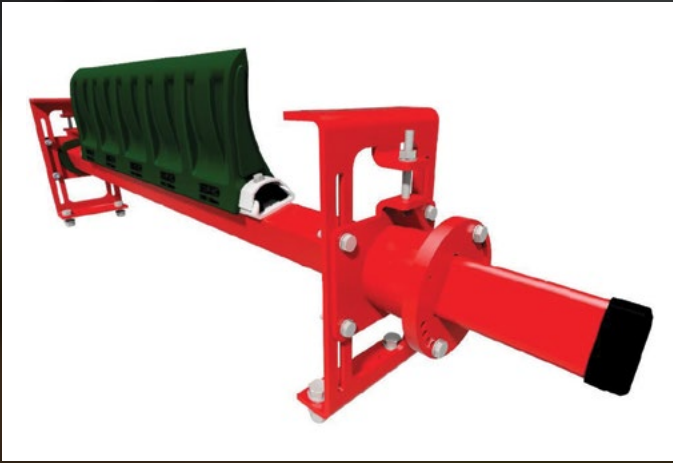


**Oreflow** supplies a range of standard and customised roller and idler frames for a variety of mining applications.



The E905 poly head pulley belt scraper, suitable for all types of conveyor belts and metal fastener systems.





## ONE OF AUSTRALIA'S LEADING MINING EQUIPMENT SUPPLIERS

### 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.

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# CRUSHING IT

Long-time service contractor to the mining industry, Rapid Crushing & Screening Contractors, has two massive Jonsson L160 mobile tracked jaw crushers, the biggest of their type available for hire in Australia, with one on each side of the country.

**T**hese 'monsters' weigh in at nearly 200 tonnes apiece and are regarded as an absolute game changer to the contracting of crushing & screening services in Australia.

In purchasing the first of the machines, Rapid became the only privately owned contractor in Australia to own one of these units.

The first of them was brought to Australia from the manufacturers in Sweden by Rapid in 2020.

The first contract for the machine, nicknamed the 'Jumbo' and fittingly assigned our asset number of E747 (Boeing aircraft naming reference) was for Ravenswood Gold Mining Operations in Queensland – quite a distance from Rapid's headquarters in Maddington, Western Australia but with operations in Mackay, Queensland, Rapid was able to accommodate.

Despite their weight and immense size these machines are actually not as difficult to transport as one would imagine.

This is because they break down into modules to fit on two flat deck floats and two in-gauge trailer loads.

The portion with the jaw crusher has the

ability to jack itself up so the trailer can simply be driven out from under it.

Thanks to clever design all site-based assembly can be done in days rather than weeks and with little more than a Franna crane.

The performance of the first to be purchased was so impressive it prompted Rapid to obtain a second one which arrived in Fremantle in late February 2022.

This unit has been referred to as 'Jumbo2' and has the internal asset number E777, to follow on with the originals Boeing Jumbo asset numbering theme.

For those wanting a little more information, these machines are powered by CAT 455kVA Dual Power, perform their work with a Metso Nordberg C160 Jaw Crusher and have a feed opening of 1600mm x 1200mm.

These high-capacity machines are ideal where a large amount of work is needed in a tight timeline, giving a high level of output with cost efficient productivity.

They can also slot straight in to most mine operations, in a very short time frame should a major failure or prolonged shut down occur.

## From small beginnings...

Rapid Crushing & Screening Contractors, a West Australian privately owned company began operations in 1978 as Irvine Engineering – initially servicing and repairing mining equipment before taking on the role as a crushing & screening service contractor.

One of the key motivations for the Principal, Neil Irvine, to enter the contracting area of the business was that he found he was able to substantially modify imported machinery to make them better suited for the hot dusty conditions of remote Australian mine sites where so much of the crushing and screening activity takes place.

Furthermore, Rapid developed a unique capacity of being able to configure its plant specifically to the layout of an operational site - a major difference to the lack of flexibility that existed at that point.

With machinery that was vastly more reliable – and with the ability to service it themselves in the event of any breakdowns, Rapid's services took off to the point that it has become the largest privately owned crushing & screening services contractor in Australia.

The company works in the crushing and screening of all types of materials.

This includes lump and fines hematite iron ore, gold, manganese, nickel, lithium, special class site preparation and fill materials on major construction projects, as well as concrete and road aggregates, road base, rail ballast and armour rock.

Not only do they operate with the mighty Jonsson L160s, they have an extremely wide range of high-production crushing, screening, and conveying plants.

These include mobile plants and modular plants that are capable of handling up to 1000 tonnes per hour.

Clients have included Fortescue Metals Group, Hanson Construction Materials, Talison Lithium, Ravenswood Gold, Fitzroy Oz Mining, Saracen, Goldfields, Woodside, Rio Tinto, BHP, Chevron, Moly Metals, Karara Mining Limited, Galaxy Resources and many more.

The company has highly specialised workshops in Maddington Western Australia and Mackay, Queensland.

**See our advertisement next page for contact details.**

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# ADVANCE YOUR PROJECT

**A**dvanced Engineering Group is keeping supply chains local with their comprehensive range of screens and accessories – products specially made for the quarrying and mining sectors.

Established in 1995, the company is fast becoming a key supplier of screen media to the South Pacific, underpinned by manufacturing hubs in Brisbane, Melbourne, New Zealand and a distributor in Perth.

With a strong presence in Australia, Advanced Engineering Group has positioned itself as the partner of choice for mining operators looking for durable, reliable, and purpose-built products.

Company Founder and Managing Director Dave Hastie said clients also appreciated the commitment to local manufacturing, which he said enabled his team to offer products that meet demands of local industry.

“We’re proud to produce products in Australia, including woven wire screen mesh, rubber and polyurethane products, self-cleaning screens and our solid range of poly and rubber modular screen panels,” Mr Hastie said.

“It’s no secret that locally manufactured products have a number of advantages, including quick turnaround times.

“We actually make sure to carry around 400 tonnes of screen media in stock across our branches.

“It means we’re ready for immediate delivery – whenever you need a screen or an accessory product, we’ve got it.”

Mr Hastie said Advanced Engineering Group’s strong stockholding was further enhanced by a significant spare production capacity that enabled the manufacturer

to produce an additional 100 tonnes per month if required.

This flexibility has allowed the company to remain responsive to changing needs of the mining and quarrying industries and centre the client in product development and delivery.

At present, Advanced Engineering Group has screen media for a wide variety of applications, including mineral processing, aggregate processing and sizing.

Each product is made and distributed in a heavily environmentally managed chain, with sustainability considerations considered pivotal to all existing and new projects.

Mr Hastie said environmentally friendly processes were considered crucial throughout the industry and Advanced Engineering Group was committed to complying with current regulations and exceeding expectations.

“We’re always keeping our eye on industry expectations, including what clients expect from their supply chains” Mr Hastie said,

“This means we’re also always looking to raise the bar in terms of quality, delivery and cost through regular improvements and conversations with clients.

“Ultimately, we want to support our clients by providing superior products and services with value, that can in turn assist them to gain a competitive advantage in their own markets.

“We strive for excellence in operational performance and we strive to be the industry standard in screen media and accessories.”

**For more information, visit**  
<https://advanced-engineering-group.com/about-us/>  
**AMR**



**AEG have manufactured and supplied all types of screen media to the quarry and mining industry for over 25 years.**



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# THE COMPLETE CRUSHING AND SCREENING SPECIALIST

**C**rushing Services Australia (CSA) is a crushing and screening specialist, and a major player in the country's largest mining projects. The contractor not only services and maintains mining equipment, but it offers plant and equipment for hire.

When it comes to mobile crushing and screening, CSA deliver a complete, purpose-built solution designed to meet specific targets and project delivery timelines, safely and on budget.

One notable project the CSA team are working on is Woodside's Pluto Train 2 project, which is an expansion of a second LNG train at the existing Pluto LNG onshore facility near Karratha. Activities include early works, crushing and screening, to produce a specific grade of road base for the installation of the Train 2 plant.

It also produces materials for large West Australian mine sites such as iron ore lump and fines, subbase and road base materials. CSA's fleet of plant and equipment has grown exponentially with crushers, screeners, stackers and material handlers all built to perform in the harshest Australian conditions.

According to CSA Director, Edward Kelleher, keeping up-to-date with the latest technology is critical to optimising results for its clients, while improving safety and reliability.

"We now have six complete crushing trains available, with an electric crushing plant currently in the design stage," said Edward.

"Having several crushing plants ranging from 400 to 1,000 tonnes per hour, combined with an incredible team in our Perth workshop, we continuously hit project targets."

A competitive advantage for CSA is their in-house developed cost-effective solution for processing SCAT material, which offers greater efficiency and safety, and is capable of exceeding 2,500 tonnes per shift in throughput. The company's Perth based workshop has also designed a customised plant, which has proven one of the most efficient steel and mill ball removal plants in Australia.

"Since our first steel removal project, we have removed over 5,000 tonnes of steel and mill balls while crushing and screening over 400,000 tonnes of feed material," said Edward.

"Additional projects have been completed safely, on time and without damage to our crushing plant as a result of tramp metal."

CSA prides itself on a team that thrives on hitting and exceeding targets safely, and a passion for completing projects on time and within budget.

This level of commitment and passion for setting benchmarks has seen the company create crushing plants capable of processing in excess of 800 tonnes per hour.

With a solid project pipeline and a relentless focus on being the safest, most efficient and cost-effective mobile crushing contractor in Australia, it's no surprise CSA is on the radar of young talent wanting to establish a career in the crush-

ing and screening industry.

"We are always on the search for new talent to join our team and encourage apprentice fitters and trainee operators to apply with CSA," said Edward.

"We understand the importance of investing time in training programs that not only develop specialist skills and future leadership opportunities, but also add value and strength to our existing team."

"We value each team member and recognise the hard work our team puts in each year." For more information, visit [www.crushingservicesaustralia.com](http://www.crushingservicesaustralia.com)  
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## DELIVERING A COMPLETE SOLUTION

# CSA



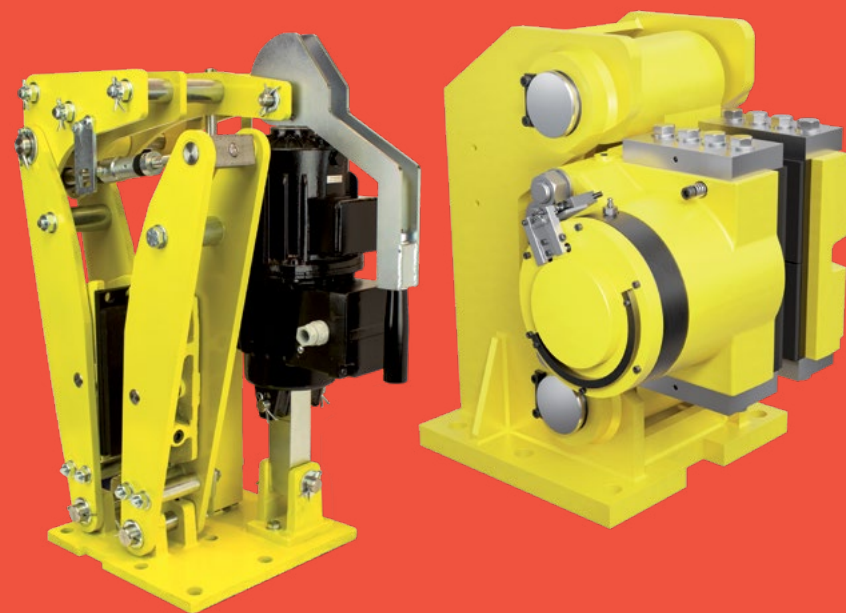
Crushing Services Australia (CSA) is a crushing and screening operation that specialises in the crushing and screening industry across Australia. In addition, CSA services and maintains mining equipment as well as offering plant and equipment for hire. CSA was established in 2018 after a need for a competent crushing contractor was identified in the market that could safely meet targets and deliver on time.

At CSA the focus is on building a team armed with a depth of knowledge and experience to operate crushing and screening equipment. CSA offers constant on the job training through mentoring and the sharing of knowledge. This ensures the team of fitters, electricians and operators at CSA are highly skilled and knowledgeable in their field.

Learn more at [www.crushingservicesaustralia.com](http://www.crushingservicesaustralia.com)



# A One Stop Shop for Mechanical Power Transmission Products



**R**INGSPANN is a leading technology manufacturer of power transmission products such as freewheels, backstops, brakes, clamping fixtures, shaft-hub connections and overload clutches. It also leads in precision clamping fixtures and remote controls. The company has nine manufacturing facilities in Germany and across the globe.

With almost 500 employees in more than 25 countries through dedicated offices and distributing companies, RINGSPANN prides themselves on providing the latest and reliable high tech products to an abundance of customers worldwide in the field of industrial gears and geared motors, mining, machine tools, food and packaging machines, energy generation, material handling, marine, rail, aerospace, vehicle construction, pulp and paper as well as in general machine building and plant construction.

While headquartered in Germany since 1944, the company had been expanding its presence in Australia through other distributors. It made a conscious decision to set up a dedicated Australian office in 2018 located in Melbourne and is now well-established as a leading technology manufacturer with the team there ready to service and tailor their products to suit applications and optimise solutions and will continue to service the market with a mix of existing and new products introduced every year.

## Freewheels

Setting the global standard for almost 50 years, RINGSPANN freewheels of the FXM series launched in 1971 and have become a standard feature on numerous international machines and plant constructions. Precision and compact design of the internal elements is a pioneering development of the RING-

SPANN design and engineering department. They offer low maintenance "fit and forget" solutions on industrial drive trains and being equipped with the legendary "Sprag Lift-Off Type X", they offer low lift-off speeds and wear-free continuous operation and can even be used with friction reducing solid lubricants.

The whole FXM series, comprising of more than 40 standard sizes, have race diameters from 31 to 750mm. Depending on the variant, the torque they generate can range from 110Nm to 1,230,000Nm. They do not have their own bearing support and are typically used as backstops on intermediate shafts of spur gearboxes in conveyor pulley drives or as overrunning clutches in the gearbox units of bucket elevators, automatically engaging and disengaging main and creep drives. The FXM series is continuously being redeveloped and designed to meet the demand of today's applications.

Design and development engineers can find technical data sheets, 3D CAD models and installation instructions for all FMX Freewheels in the company's online portal: [www.ringspann.com.au](http://www.ringspann.com.au).

## Brakes

Under the RINGSPANN brake portfolio the company boasts an extensive range, spanning pneumatic brake calipers, electromagnetic brake calipers, manual brake calipers, clamping units and accessories along with hydraulic and electrohydraulic braking and control systems. Our spring activated Hydraulic release brake cal-

ipers can deliver up to 560kN clamping force. Wind turbines and other demanding mining applications can achieve higher braking forces through RINGSPANN's hydraulic brake calipers.

For the mining industry, RINGSPANN can supply calipers along with a Hydraulic Powered unit (HPU) with pressure valves and regulating PLC's that can be controlled remotely.

Some of the installations in drive technology and machine construction requiring smaller braking torques up to a maximum 8000Nm are covered by RINGSPANN'S compact and lightweight electromagnetic disc brakes. The brake calipers from their new series DT, FEA and H-ST are much slimmer in design than conventional industrial drum brakes. The key reason for this is a constructional variation that saves an enormous amount of space.

The RINGSPANN electromagnetic disc brakes range rank among the essential components of countless drive systems in mechanical engineering and plant construction. It's various DH, DV, EV and EH series are well received globally for various braking applications. These can be deployed for stopping, control and holding and cover a wide range of braking torques from 94Nm to 6590Nm.

Users can access the RINGSPANN developed online brake calculation tool that is free for anyone after registering on [www.ringspann.com.au](http://www.ringspann.com.au). This tool allows users to determine braking torque and clamping force on a specified disc diameter thus selecting a suitable and efficient braking system for the application.

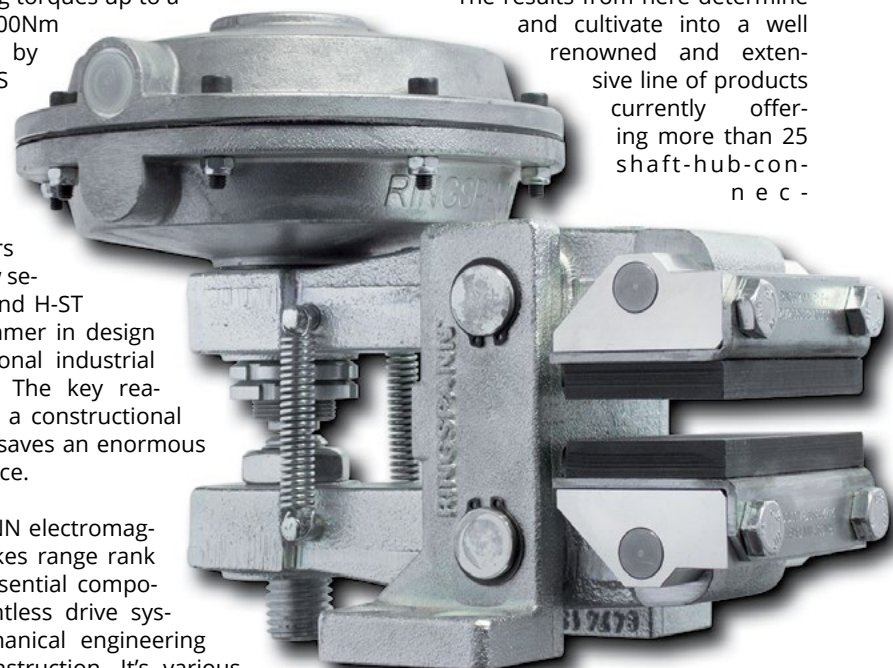
## Locking Assemblies

With a collaboration with universities coupled with decades of practical experience from key users all around the world, RINGSPANN stays committed and devoted to the

ongoing further development of the frictional locking principle.

As a long-time manufacturer of locking assemblies, RINGSPANN possess a well-founded design procedure within this industry and have their own testing facility for fundamental research and quality assurance.

The results from here determine and cultivate into a well renowned and extensive line of products currently offering more than 25 shaft-hub-connections.



tion series for torque ranges from 0.16Nm to 4,225,000Nm. This product portfolio comprises of locking assemblies, shrink discs, cone clamping elements, rigid shaft couplings as well as clamping systems for mounting torque motors.

RINGSPANN's three-part shrink discs were introduced to the successful standard series RLK603 S which are ideal for conveyor systems, stirrers, mixing plants, construction machinery and wind turbines, offering powerful externally clamping connections for the play-free connection of hollow shafts with their extremely high torque capacity across a range from 18Nm to 156,700Nm.

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## Custom-made Solutions

Australian miners have also turned to RINGSPANN for it's custom-made solutions. Its not just about supplying standard products but supplying solutions. Customers can talk to RINGSPANN about their applications and what they require and the team can assess and provide a solution to meet the customer's needs. This may include interaction with the finest industry engineers and designers in the world that are part of the RINGSPANN family and they will reach to great heights to provide the best solution to the application.

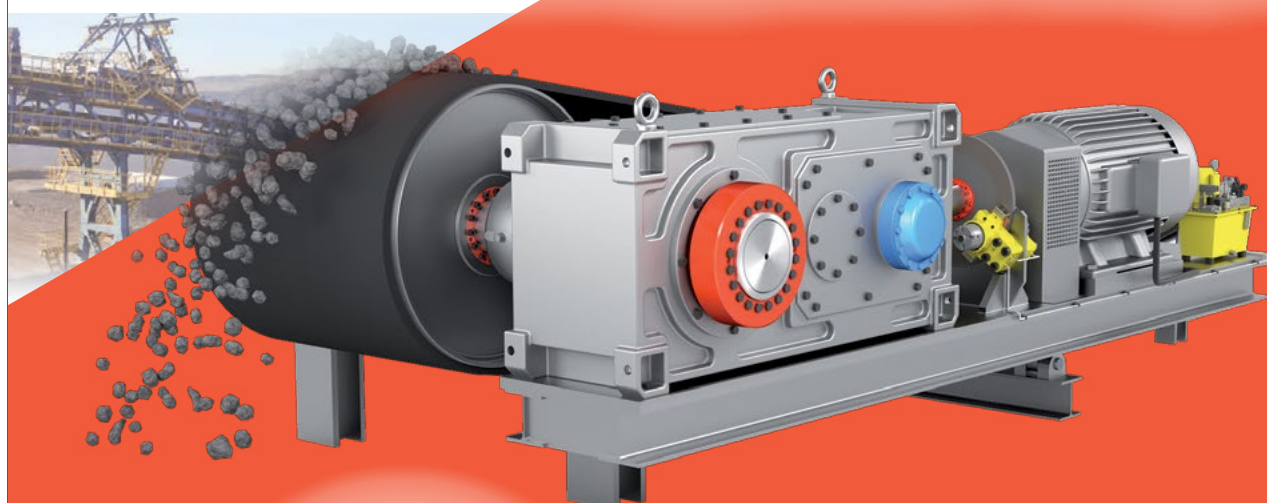
RINGSPANN will continue to strengthen its foothold in the Australian and Global mining as well as the manufacturing industries. Whether their solutions are made in Germany or in RINGSPANN factories worldwide, we offer the same quality and uniform engineering standards, which is our strength.



# RINGSPANN®

Your benefit is our motivation

## Power Transmission Equipment for Conveyor Pulleys



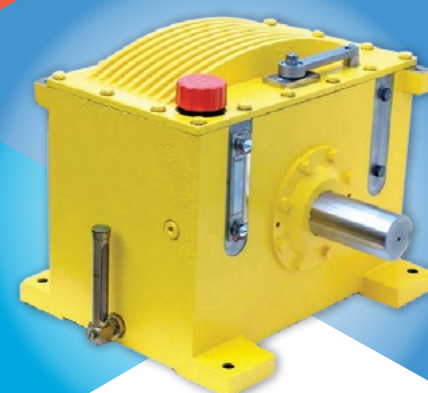
### High Speed Backstops

Installed on gearbox to prevent reverse motion



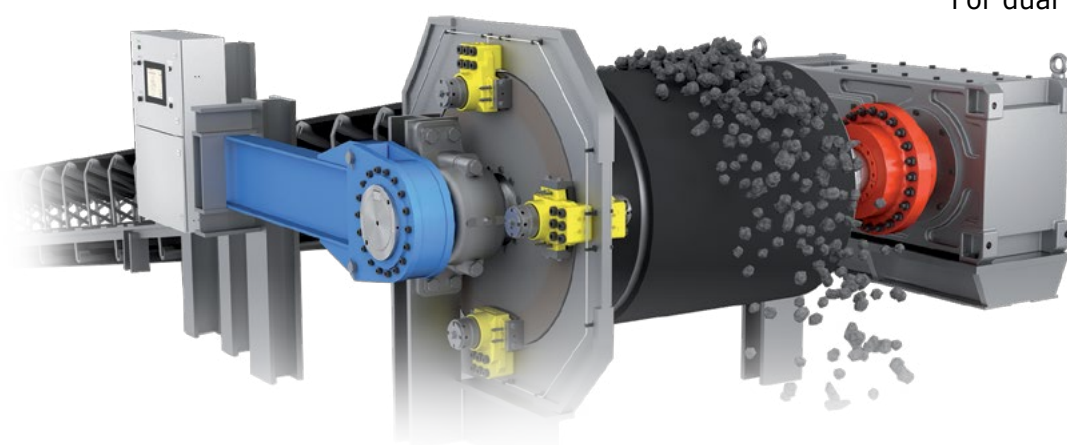
### Low Speed Backstops

Installed on conveyor pulley end to prevent reverse motion



### Housing Freewheel FH

For dual drive applications



## ABOUT US

RINGSPANN® is a leading manufacturer of power transmission components for belt conveyors, bucket elevators, bucket wheel excavators, stackers and reclaimers, for mine hoists and crushers.

RINGSPANN® high speed backstops integrated into the intermediate shaft of gearboxes have long since become a benchmark of drive trains in the Australian mining industry. Equipped with the now legendary

sprag lift-off type X, they impress with maximum torques of up to 1,230,000 Nm, low lift-off speeds and wear-free continuous operation.

RINGSPANN® is also a quality supplier of Low Speed Backstops, for nominal torques up to 900,000 lb-ft and bores up to 21 inches.

Our Low Speed backstops with torque arm support and Taconite

seals on the conveyor pulley side are designed for use in inclined conveyorbelts, elevators or pumps.

Our products also include freewheels, brakes, shaft-hub-connections overload clutches and couplings.

Contact us in Australia for any of our product lines. Our Technical team is available to discuss your application requirements.

GERMAN  
ENGINEERED

**RINGSPANN® Australia Pty Ltd**

[www.ringspann.com.au](http://www.ringspann.com.au)





# LEEAA RAISES THE BAR AT LIFTEX 2022

**L**ifting Equipment Engineers Association (LEEAA) continues to lift up industry standards for members around the world, keeping members in pole position when it comes to lifting equipment inspections and safety.

As the global association for the lifting equipment industry, it was no surprise LEEAA Regional Manager for Australia and New Zealand, Justin Boehm, travelled to Aberdeen in Scotland to attend LIFTEX 2022.

LIFTEX is the only dedicated exhibition for the lifting equipment industry, and special-related industries globally.

The events welcomed representatives from Sweden, USA, Egypt, France, China, Germany and New Zealand, showcasing technologies to end users in oil and gas, energy, construction, engineering, manufacturing, cargo and bulk handling, defence, and utilities sectors. Thousands were in attendance across the two-day event, with the LEEAA Awards hosting 250 guests on Wednesday 5th October.

The Regional Council of Australia and New Zealand was recognised for their work in raising industry standards and their commitment to ensuring LEEAA members are promoted as the industry's best.

LEEAA CEO Ross Moloney and Comedian Jarlath Regan presented the Member of the Year Award to Justin Boehm, Steve Flint, Andy Campbell and Ashley Thacker, all of whom attended on behalf of the broader council.

LEEAA Australia and New Zealand Regional Manager Justin Boehm said a key project the regional council has spearheaded includes the development of an industry based vocational training package.

"This is a major piece of work that will change the way lifting equipment inspectors are deemed as qualified," said Mr Boehm.

"The integration of LEEAA's existing training into this package is a significant endorsement of our global qualifications."

"The award recognises LEEAA's development in Australia continues to strengthen. As we progress our agenda into 2023, we kick-off the year in March with our Back-to-Business event in Sydney.

"The event will be a smaller version of LIFTEX, allowing us to showcase our industry, and the work the regional council has delivered to our members and wider end-users. We look forward to giving further details of

the event in the coming months."

## About LEEAA

Backed by more than 75-years' experience, LEEAA is a globally recognised trade organisation that supports companies and their people in the lifting equipment industry.

LEEAA is tasked with raising the bar in industrial lifting safety and limiting workplace risk with first-class training and recognised certifications.

LEEAA plays an integral role within the industry to ensure members remain compliant with national standards and legislation no matter where a project is located around the world.

"Lifting can be hazardous work across all industries in Australia, but the recommended safety standards are actually voluntary," said Mr Boehm.

"At LEEAA, we feel it's important to address this with adequate training and certifications, so operators can feel confident LEEAA trained professionals tasked with doing the inspections are incredibly well-trained and capable.

"Maintaining safety standards at work is crit-

ical – particularly when it comes to the stringently monitored mineral resources sector – and we believe lifting work should have to meet thoughtfully considered criteria, too.

"We are well known and highly regarded across the globe both within the industry and with end users, who are increasingly expecting LEEAA membership from their suppliers."

Originally established to service England some 75 years ago, LEEAA now has locations worldwide and has been operating in Australia for more than a decade.

The company works alongside a variety of vision-driven partners in Australia to enhance their service offering, including national peak employer organisations and national peak bodies.

LEEAA also closely works with the country's leading independent standards organisation Standards Australia, the National Offshore Petroleum Safety and Environmental Management Authority and the WorkSafe departments of multiple state governments.

For more information, visit <https://leaa.com.au/>

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# EDUCATE, INFLUENCE, AND ENABLE SO THAT BEST PRACTICE IS EVERYDAY ACTION.

## We are LEEA

We are the globally recognised trade association for all involved in the design, manufacture, hire, repair, maintenance and use of lifting equipment.

Our members have unrivalled access to the latest technical, legal and safety information needed to operate successfully and credibly in the lifting industry.

Our range of instructor-led and online training courses transform teams into experts on the inspection and examination of lifting equipment and best practice.

## Get in touch with us today

 [www.leea.com.au](http://www.leea.com.au)  
 [info@leea.com.au](mailto:info@leea.com.au)  
 0400 001 000







**ASHBURTON CRANE HIRE**

**PORT HEDLAND - 10 YANANA ST WEDGEFIELD - 08 9148 1770**

**PERTH - 10 IMPERIAL ST HIGH WYCOMBE - 08 9454 7000**



**A**shburton Crane Hire is strengthening the Pilbara's mining industry with a new Port Hedland location – a new move designed to better support projects in the epicentre of the domestic mineral resources sector.

Based in Western Australia, the wholly-owned Australian company has more than 17-years' experience servicing the mining, energy, marine, logistics, construction and oil and gas industries with a wide range of products and operational support.

The business offers crane hire, crane operators, rigging, transport and safety management services, along with a team of highly professional and experienced operators, riggers and support staff.

Ashburton Crane Hire Managing Director Guy Black said his team were nationally accredited and certified, while working with well maintained and fresh equipment.

"We're constantly upgrading our cranes to offer the latest in technology and performance," he said.

"This is to increase operator efficiency and reduce risk.

"Staying ahead of the curve is important to us, as well as meeting the needs of Western Australian mining projects.

"That's why we've recently invested in a new Port Hedland operation.

"We want to better service the mining industry in the Pilbara, an important sector for the State and the wider country."

Mr Black said among his most popular services was the General Taxi Crane Hire – a taxi fleet with lifting capacities stretching from 12-300 ton.

The service constitutes obligation-free site inspections and quotes, as well as being available round-the-clock.

Similarly popular is the dry hire crane services, spanning pick and carry Franna cranes and a Grove rough terrain crane that can be used in urban areas or remote bush sites.

The company's Rigger and Dogman hire meets standards of third-party VOC assessments and holds the appropriate Worksafe High-Risk Licenses.

Mr Black said Ashburton Crane Hire's rigging, lifting and crane consultants have also been purposefully trained to support clients that need future project and logistical help. He said the technical team were trusted to provide unbiased reviews and deliver recommendations that would enhance project performance.

"You can also rely on us for your transport requirements, as we provide flat top, drop deck with ramps, extendable and float capabilities," Mr Black said.

"Basically, we supply a full range of general or specialised lifting equipment, accessories and services to suit jobs both large and small."

Established in 2005, Ashburton Crane Hire has since supported numerous projects in Western Australia and still has a thriving client base.

"Our family-run business prides itself on providing a turnkey, professional and reliable service for its customers with a key focus on safety and project management that is delivered through our experienced management team," Mr Black said.

"Ashburton Crane Hire continues to provide quality technical and engineering support services to all its clients.

"These services include high-quality lift studies that can be read by all lift personnel whilst also ensuring lift projects can be completed incident-free, on time and within budget."

**For more information, visit Ashburton Crane Hire - Reliable Safe Crane Hire Perth ([achcranes.com.au](http://achcranes.com.au))**

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# SERVICE SETS US APART



### CRANE HIRE

ACH operates a modern fleet of Liebherr and Demag all-terrain cranes, Franna pick and carry cranes and Grove rough terrain cranes. Whether your project is big or small Ashburton has the right crane for the job.



### RIGGERS

ACH has been a trusted source within the industry for rigging services in WA. Our riggers have extensive industry experience. ACH aims to provide our clients with the ability to complete any job, anywhere at any time.



### TRANSPORT

ACH offer heavy haulage road transport across Western Australia. Ashburton provides a modern fleet of trucks, floats, drop decks and flat tops as well as light trucks.



### SAFETY MANAGEMENT

Safety is not expensive, it's priceless. At Ashburton Crane Hire we are committed to occupational health and safety. Ashburton Crane Hire upholds its position as a West Australian leader in safe crane operations.

Ashburton Crane Hire is a family business striving to provide exceptionally reliable and flexible crane services for clients across the mining, energy, domestic and construction industries in Western Australia.

PORT HEDLAND - 10 Yanana Street, Wedgefield - 08 9148 1770  
PERTH - 10 Imperial Street, High Wycombe - 08 9454 7000

 [achcranes.com.au](http://achcranes.com.au)





# Australian Mines and Services Handbook 2023



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**BOOK NOW!**



[australianminingreview.com.au/amr-handbook](https://australianminingreview.com.au/amr-handbook)



# HIGHLIGHTING UNIVERSAL CRANES' LR1300

**U**niversal Cranes' Project & Heavy Lift division has been busy working throughout Australia in a variety of markets including Industry, Resources, Renewables, Oil and Gas, Mining, Construction, Civil, Marine, Petrochemical Plants and Wind Farms.

With access to a crawler crane fleet of 34, the team can deliver the most cost-effective options within tight timeframes for any large, heavy and/or complex lift and project requirements.



We have two LR1300 and one with a W (wind kit). Additions to the set up include:

- Derrick
- Luffing fly
- Fixed fly
- Narrow track
- Wind jib

So what has our LR1300 been up to?

#### December 2020 – January 2021

We used our two LR1300s with luffing fly and main boom configurations to construct the Ship to Shore crane in Townsville. In ad-

dition to crane hire we provided operators and supervision, transport equipment, wet hire, and supply of miscellaneous equipment.

#### April 2021

For this renewable energy project, our LR1300W equipped with 110m main boom Derrick and suspended ballast tray was on site at the Mt Emerald Wind Farm, located approximately 50km outside of Cairns in Queensland doing various maintenance works.

#### June 2021

In Central Queensland, supporting the oil and gas sector, we dry hired our LR1300 to construct a wash plant using our Derrick and suspended super lift tray.

#### June 2021

On the Palm Beach to Tugun Highway Upgrade, we used our LR1300 with main boom configuration to safely operate a fly drill.

#### 2022

We swung our two LR1300s on the Hay Point upgrade (SARB), assisting with the Berth Replacement.

The LR1300 is a versatile machine and with the additions of extra components it can work on a variety of projects across a variety of sectors.

It can reduce mobilisation and rental costs due to the cranes increased capabilities with the Derrick attachment which allows the crane to operate in the 400t Crawler crane class. **AMR**



LR1300W conducting maintenance work on Mt Emerald Wind Farm

## EXPERTS IN NATIONAL LIFTING



**40+**  
CRAWLER CRANES



**110+**  
MOBILE CRANES



**2.5t - 600t**  
CAPACITY RANGE OF  
CRANES IN FLEET

**Any lift, anywhere, any time.**



**UNIVERSAL  
CRANES**





# AUSTIN'S LIGHTEST-EVER TRUCK TRAY LAUNCHED

*HPT promises significant payload advantage*



DAVID  
SINGLETON

**G**lobal mining products business Austin Engineering Ltd has just launched its High Performance Truck Tray (HPT) range to the market.

The HPT is the Company's lightest tray ever produced and promises a suite of improved efficiencies and advantages for Austin's mining customers.

Perth-based Austin partners with mining companies, contractors and equipment manufacturers to create engineering solutions such as truck bodies, buckets and water tanks for multi-commodity underground and open cut operations.

It is the world leader in customised design, build and sustainment of mine site haul trucks trays, delivering trays to mining clients from its bases across Asia-Pacific, North and South America. It currently delivers around 600 truck bodies annually with capabilities and functions to suit multiple commodities and terrains.

Austin has made considerable investment in new products in the last 12 months, with its engineering teams using the latest innovation and technology to improve safety, productivity and reduce environmental footprint. The investment has led to the creation of the HPT and the lightweight and linerless JEC

High Performance (HP) bucket range.

The key features of Austin's HPT design have improved the overall strength of the tray, the weight and overall stability and efficiency of the product with more payload and less carryback. These have been achieved through adjustments and reconfigurations to the floor styling, load height, ground clearance, side support, and side and front walls of the tray.

On payload advantage, Austin estimates 10 - 15 per cent mass savings over comparable Austin designs, significantly improving productivity, and potentially fuel usage, for the end user.

All of Austin's products are design-flexible, fully customisable and compliant. The HPT can be adapted to suit any mine

specific application and OEM make or model. Interchangeability also exists in regard to standard OEM componentry and machine attachment.

"Austin is known and recognised for its lightweight truck trays, but this is our lightest tray yet, and we're extremely proud of our engineering and manufacturing teams on this design to meet the requirements of our customers. One of the biggest advantages is the HPT's extra payload capabilities.

One of our major customers reported 7.3 tonnes more payload per journey. The customer calculated that it could carry \$2.8 million dollars of ore per truck tray, per year, which is a significant impact efficiency and dollars-wise for mining companies," said Austin Managing Director and CEO, David Singleton.

While Austin reported a lift in both tray and bucket sales in full year 2022, the new product ranges are expected to boost sales globally. Austin's customer

base will be broadened through the recent acquisition of private Australian mining equipment manufacturer, Mainetec Pty Ltd, which has added the Hulk range of high performance mining buckets to complement its JEC HP range.

## First HPT trays in operation by end of month

The first production run of HPTs is now commencing manufacturing in Austin's major Kewdale facility in Perth.

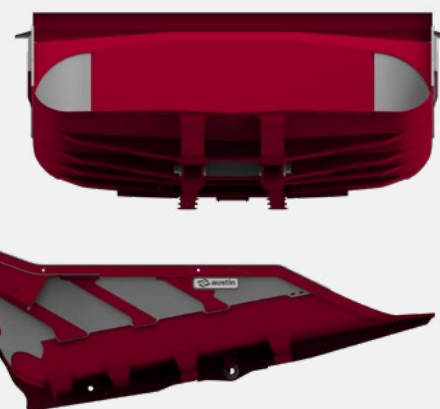
The first trays will be being fitted to Komatsu trucks before delivery to customer mine sites and into operation by the end of November 2022.

## Maximising fleet capabilities

For more than half a century, Austin has been designing and manufacturing loading and hauling solutions for the mining industry. Its major manufacturing sites in Australia, Indonesia, North America and South America produce Austin's major haul truck body brands including Westech, Westech PREMIER, JEC, JEC-LD and the popular ULTIMA tray range.

For more information on the HPT or any of Austin's product range, please visit [austineng.com](http://austineng.com) | **AMR**

This cutting-edge tray is the company's lightest and most advantageous ever.



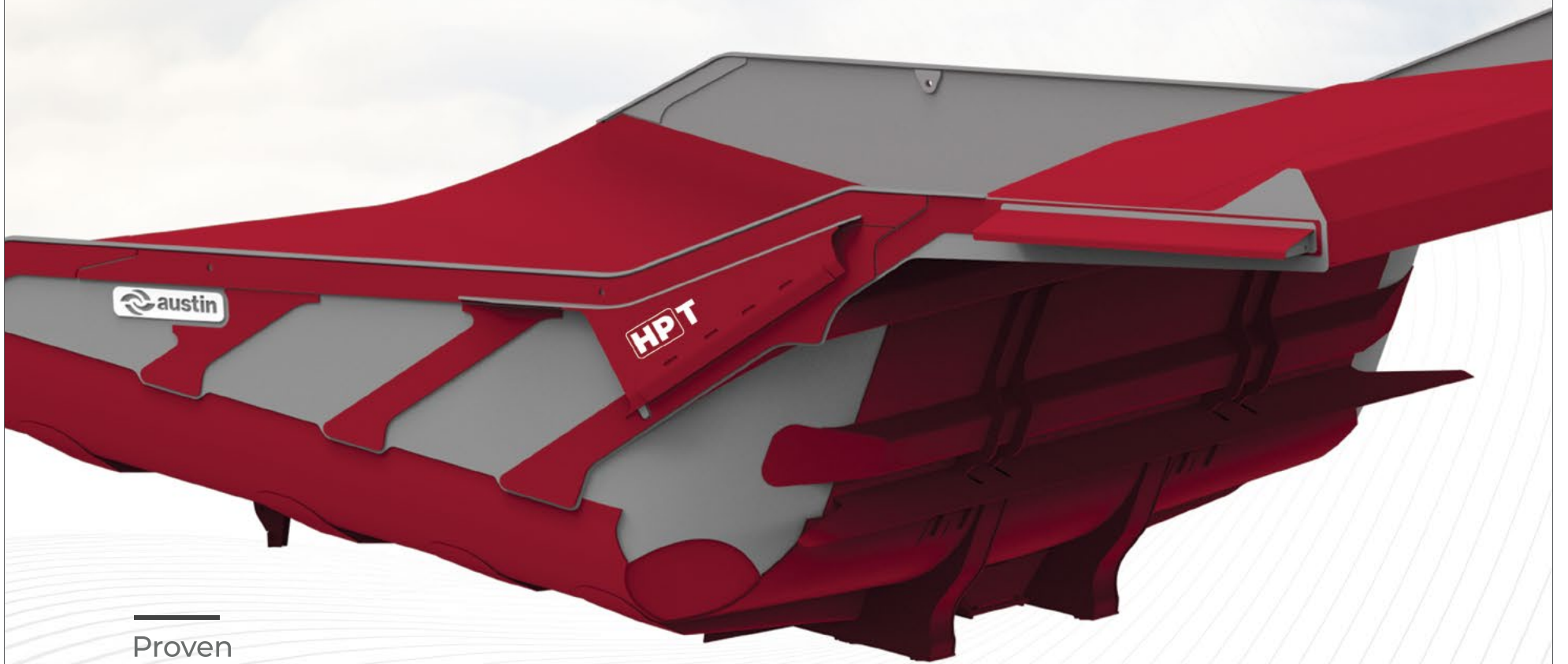


# HP T

## OUR LIGHTEST EVER **TRUCK TRAY**

Our ULTIMA lightweight truck body changed everything increasing mine payloads and transforming haul efficiency.

After over 700 ULTIMA trays delivered – We have done it again.  
Introducing the HPT. Our lightest ever.



Proven

**17%**  
more payload

CE • PROVEN • EXPERIENCE  
**40**  
YEARS

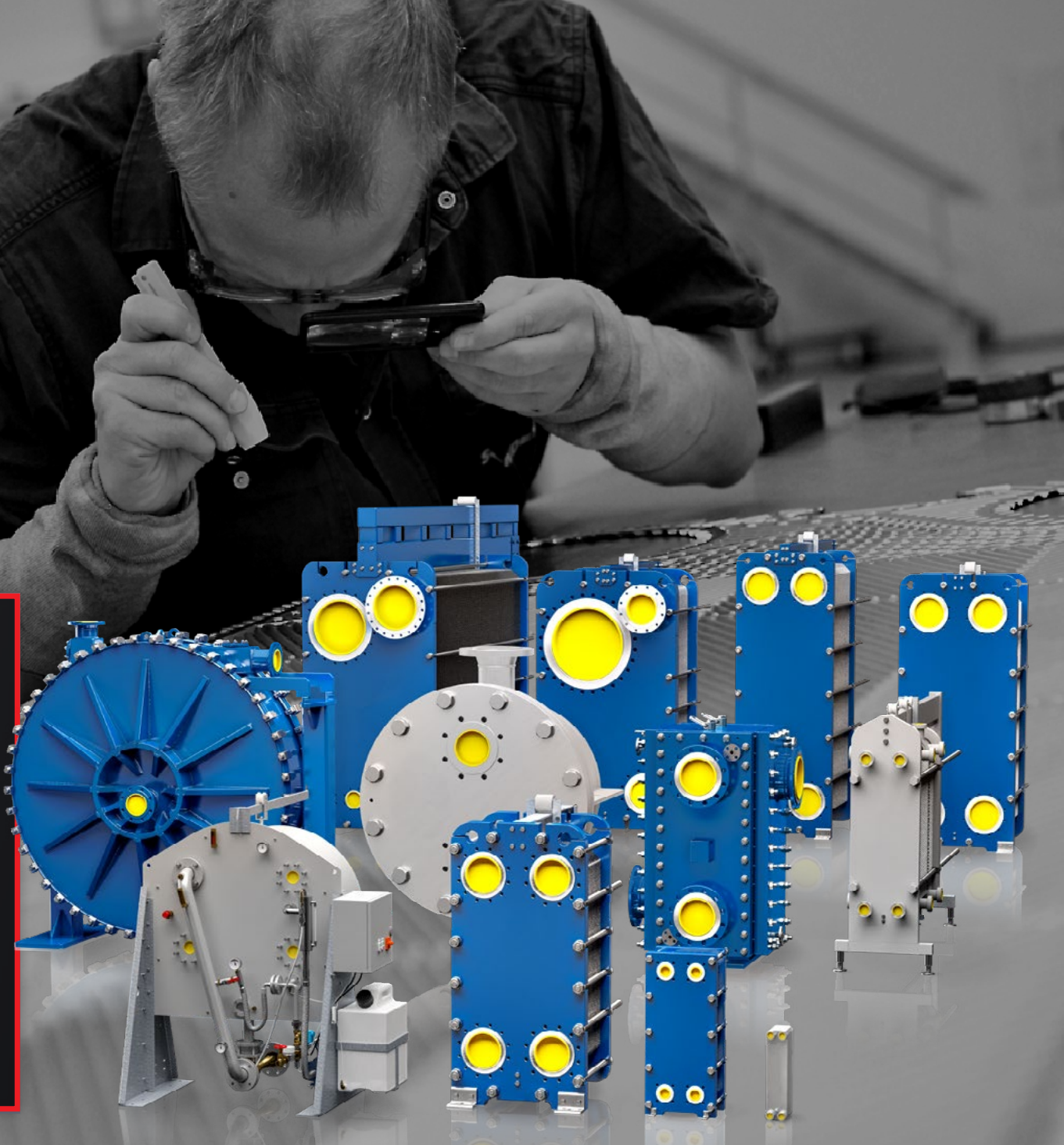
design matters | [austineng.com](https://austineng.com)





## When it comes to Heat Exchange, you can't beat experience

Danfoss's extensive heat exchange product portfolio with stronger and more efficient plates to help customers reduce their carbon footprint.



ENGINEERING  
TOMORROW

*Danfoss*

### Danfoss Leverages Global Expertise to Upgrade Hex Technology

With a history of innovation spanning almost 90 years, Danfoss is paving the way as one of the world's leading suppliers of engineering solutions providing sustainable smart technologies and energy efficient products.

Founded by Mads Clausen in 1933 in his parents' farmhouse in Nordborg, Denmark, Danfoss is a Danish multinational company with more than 40,000 employees globally. The company has grown from a solo enterprise into one that is now renowned for its significant contribution to the Green Restart.

Today, in the Pacific region, Danfoss employs 175 staff members and has offices in Melbourne, Sydney, Brisbane, and Perth, as well as an office in Auckland, New Zealand.

Danfoss is a key industry player with focus on mineral and mining applications and is constantly evolving and upgrading its product portfolio.

As specialists in the development and manufacture of genuine OEM parts, Danfoss heat exchangers produce their own tooling, hydraulic presses, and gaskets in-house. This improves quality control practices, reduces dependency on sub-suppliers, and helps establish price leadership.

### Heat Exchanger Innovation

When it comes to creating a unique and efficient heat exchanger solution, it is no surprise that Danfoss is once again leading the way.

Danfoss' engineers recently improved the way heat exchanger plates are designed with the introduction of stronger and more

efficient plates. Drawing on years of experience within heat transfer technology and deep application knowledge, the company has made significant upgrades to the traditional Fishbone plates to truly redefine the way we think of compact heat exchangers.

When it comes to heat exchangers, size matters. Having one of the widest heat transfer plate portfolios allows each design to fully utilise the allowable pressure drop and also ensures that pipework costs are significantly reduced by offering less heat exchangers.

Maximising both performance and product life cycle costs is a milestone and continually moves Danfoss plate heat exchanger technology into a new era of advanced, yet simple solutions.

The Australian Mining Review recently spoke with Jatinder Masson, Head of Climate Solutions Pacific, about the future of heat exchanger technology and the difference between a plate heat exchanger and other heat exchangers.

He explained that plate heat exchangers have been around since the 1920s and revolutionized methods of indirect heating and cooling of fluids. They were developed as an alternative to Shell and Tube technology in some industries and applications with many 1000's installed worldwide.

For most heat exchangers the working principle is the same in that two media are separated by a metal plate and exchange heat.

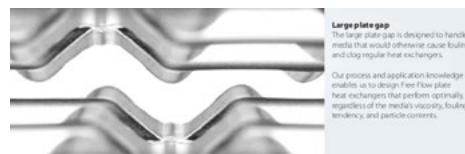
"The difference is in the heat transfer plates. Within a gasketed heat exchanger, the plate material is thinner, so heat transfer is higher, resulting in a high heat transfer coefficient," says Jatinder Masson, "Each channel plate has an efficient distribution area and plate chevrons that fully utilise the pressure drop

and ensure a high mechanical strength. High turbulence occurs due to the plate configuration leading to high wall shear. The upside of turbulent flow is minimised fouling on the plate surface. Added to this is an exchanger that is easy to maintain with low hold up volumes and smaller carbon footprint.

Just as important is our global footprint which ensures continuous customer support through the complete lifecycle of the products and services that we provide.

Lastly Danfoss has a comprehensive sustainability program which supports our business ambition and serves as an enabler for our ambition to achieve sustainable growth and deliver products that fulfil our customers' need for energy efficiency and improved performance. More details can be provided"

The Danfoss heat transfer portfolio extends beyond conventional gasketed heat exchangers into Free Flow heat exchangers which are an interesting product for mining and metals.



**Large plate gap**  
The large plate gap is designed to handle media that would otherwise cause fouling and clog regular heat exchangers.  
Our process and application knowledge enables us to design Free Flow plate heat exchangers that perform optimally regardless of the media's viscosity, fouling tendency and particle contents.

The range also including Spiral, Block as well as plate & shell heat exchangers for use in condensation and steam applications.

This wide portfolio ensures that many processes can be addressed with the different heat transfer technologies that Danfoss provides.

### Sustainability at the Core

Danfoss has an uncompromising focus on

quality, reliability and innovation that helps it deliver smart and energy efficient products, services, and solutions.

It's comprehensive climate solutions program helps it achieve sustainable growth and deliver products aligned to their customers need for energy efficiency and improved performance. Customers also benefits from greater thermal efficiency, streamlined maintenance, low hold-up volumes and better environmental footprint.

The company decarbonises urban energy networks by making them more resilient and energy efficient. This includes a reduction in CO2 emissions in commercial buildings, and cost-effective smart heating technology for residential property owners and tenants.

As the original inventor of both the radiator thermostat valve and the automatic differential pressure controller, Danfoss continues to be at the forefront of ground-breaking heating solutions.

Today, its product and services portfolio support customers across the complete lifecycle to meet a vast number of applications — from creating comfortable, sustainable, and smart buildings to laying the foundation for integrated district energy infrastructure.

To learn more about how Danfoss' smart heating technologies are empowering communities and industries, visit the following website;

(<https://heatexchangers.danfoss.com/gasketed-heat-exchangers/sondex-standard-plate-heat-exchangers/>)

AMR



# More than a **heat exchanger**

At Danfoss, we are extending our wide portfolio for mining to include plate heat exchangers. The new series of semi-welded plate heat exchangers is optimised for mining applications and include extensive improvements.

With Danfoss, you get much more than just a high-quality heat exchanger. You also get all the benefits from partnering with a world-leading supplier in the mining industry. All to help professionals achieve and maintain a safer and more energy efficient operation.



Learn more about  
Heat Exchangers



Keep Updated

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United. Inspired.

## A complete reverse circulation drilling solution

Reverse circulation drilling is a quick and efficient method to retrieve the high-quality mineral grade samples. Our RC30 reverse circulation drilling rig seamlessly combines automated sequences and embedded interlocks to eliminate live work around the rig. Compatible with our RC45 hammer and bits you are guaranteed high performance, exceptional reliability and dependable support.

 **Epiroc**



[epiroc.com/en-au](https://epiroc.com/en-au)



# Health & Safety Flooring

## Multi purpose Flooring applications for the Mining Industry

Mining & industrial facilities can often face extreme challenges as they are typically in remote exposed areas that are prone to heat, cold, dust as well as constant wear and tear with large teams running 24/7 operations while living on-site.

Roxset offer a unique range of flooring solutions specifically designed for hard wearing industrial usage.

Our flooring applications can stand a broad range of impact and abrasive conditions, have a high chemical resistance, are non-slip, durable and long lasting.

### Durable, Hard Wearing & Impact Resistant



#### Features

- Non-Slip Surface Finish
- Safety Area Line Markings
- Hard wearing, Easy to Clean
- Cover Large Expansive Areas

#### Key Areas:

- Vehicle Workshops
- Canteen Areas
- Kitchens / Wet Mess
- Amenities & Wash Bays
- Change / Locker Rooms
- Corridors & Walkways



#### The Roxset Difference

- Ability to service remote areas
- Fast Installation 24/7
- 30rs Experienced Crew
- Tested Certified Product
- 15+ yr warranty



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**Roxset**  
HEALTH & SAFETY FLOORING



# SAFEGUARDING THE WORKPLACE

## THE SYSTEM TRUSTED BY MAJOR MINING COMPANIES TO PROTECT WORKERS AGAINST DROPPED OBJECTS.

Pro3 Safety Director and co-designer Simon Noack.

**A**ll workers deserve to go home injury-free at the end of the day. Reducing dropped object risks, injuries and deaths should form part of any good plant design and safety management program.

Investing in dropped object prevention can also prevent damage to vital equipment and disruption to production schedules.

The Dropped Object Prevention System (DROPS) by Pro3 Safety tackles this risk head-on in a cost-effective way.

It offers a simple life-saving solution and provides the best protection for employees, contractors, and visitors against the risk of injuries, falls and dropped objects.

Pro3 has developed RetroGUARD™, RetroTREAD™ and RetroSTEP™.

These solutions can be retrofitted to existing stairs, platforms and handrails and are designed to fit various handrail dimensions, shapes, and configurations.

Pro3 Safety director Simon Noack says the

company is Australian-owned and its products are designed and manufactured locally with Australian steel.

"We are committed to supporting other Australian companies and jobs while providing a quality finished product that saves lives," he said.

"Our products are designed and tested for tough Australian conditions and have stood the test of time.

"We have guarding which has been providing protection on sites for over 10 years in the harshest parts of our country like out-back South Australia."

Pro3 Safety director Andrew Crothers says his team can easily customise the products to clients' needs.

"Our integrated products are fast to produce, easy to install and require no drafting, surface preparation or hot works.

"Our products are protecting people on building roof tops, bridges, at mine sites, in warehouses, processing and manufacturing

plants, power plants and at airports both in Australia and overseas."

The company is committed to continually improving safety in the workplace and setting new standards in dropped-object prevention solutions and systems.

### RetroGUARD™

The RetroGUARD™ Safety panel system can be retrofitted to existing handrails while maintaining the existing handrail integrity.

It adapts to all types of platforms, stairs and walkways and can be quickly and easily removed to provide vital access to areas for maintenance works.

RetroGUARD™ is engineered to prevent injury from dropped objects and falls from personnel leaning through, standing or stepping onto handrails.

It maintains three points of contact during access and egress, it is fitted entirely from inside the safety barriers of the platform or stairs.

The flexible design of RetroGUARD™ gives complete coverage, even for internal and external corners.

### RetroSTEP™

RetroSTEP™ barricades areas above and below stairs. The mesh covers the opening between existing steps.

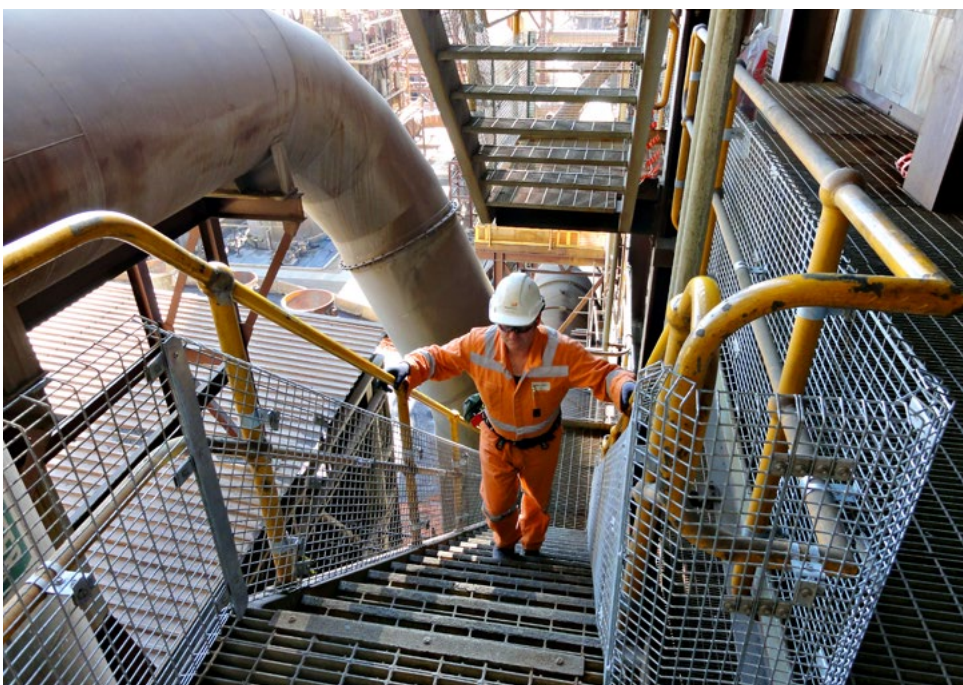
Fast, affordable, and easy to install, no hot works are required during installation and no interruption to production schedules.

When combined with RetroGUARD™ and RetroTREAD™, it reduces dropped object risks from open stairs and walkways.

### RetroTREAD™

RetroTREAD™ allows for fast and safe installation of safety flooring, with a clamp designed to clip to existing grid mesh floor,

Slip resistant floor sheets are quickly secured to the RetroTREAD™ clip, barricading areas above and below each platform level, preventing the risk of injury from falling objects. **AMR**





# Pro3 Safety<sup>TM</sup>

Pty Ltd

Filling the gaps in Safety

**Contact us today:**

**Simon:** 0421 635 518

**Andrew:** 0400 446 167



**RetroGUARD<sup>TM</sup>**

## SAFETY PRODUCTS FOR HANDRAILS, PLATFORMS & STAIRS



**RetroSTEP<sup>TM</sup>**



**RetroTREAD<sup>TM</sup>**

**Pro3 Safety supplies a comprehensive and integrated Dropped Object Prevention System.**

Our safety products are retro-fitted to new or existing handrails, platforms and stairs providing a cost effective, life saving solution to dropped object injuries and fall prevention.

We offer great service with site assessment and guidance with product selection, to provide you with the ideal safety solutions and a quality product to meet today's modern work place standards.

Join with Pro3 to protect your team. Reduce falls and prevent dangerous or fatal DROPS injuries.

***Developed, designed and manufactured in Australia for Australian conditions.***

**RETOGUARD<sup>TM</sup> | RETROTREAD<sup>TM</sup> | RETROSTEP<sup>TM</sup> ARE IDEALLY SUITED FOR USE IN:**

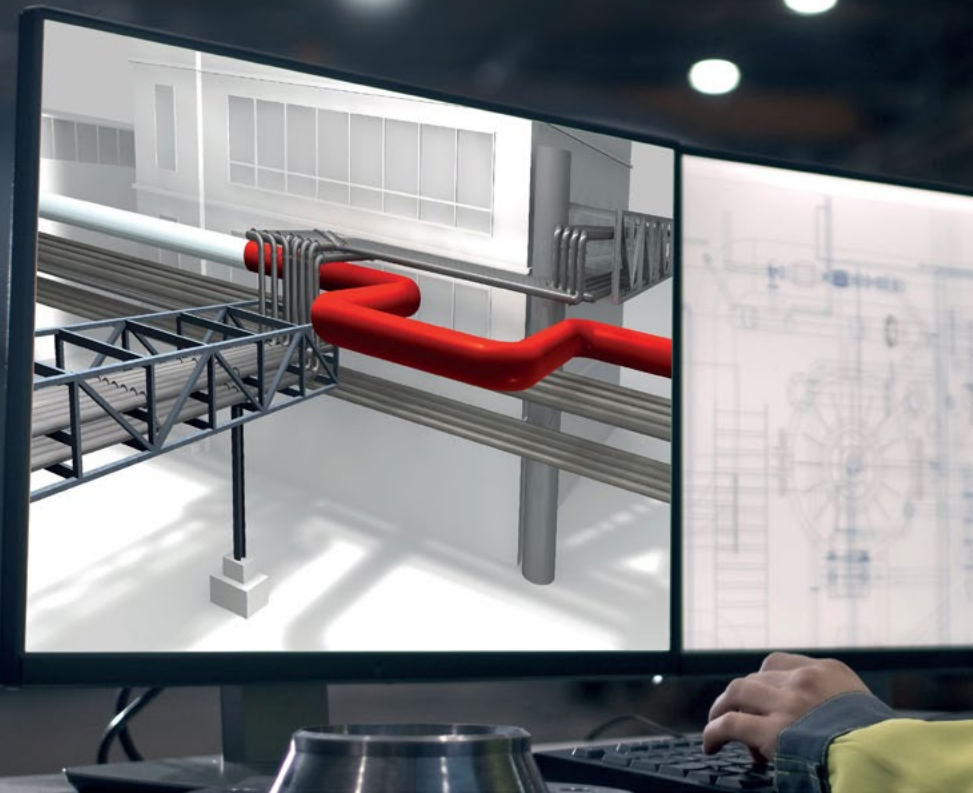
- Greenfield construction or existing plants
- Factories, Warehouses and Storage Facilities
- Mining, Coal, Oil and Gas processing plants
- Drilling Rigs of all types
- Manufacturing plants

**MADE IN AUSTRALIA | SUPPORTING AUSTRALIAN INDUSTRY.**

**pro3safety.com.au**



# Dual Laminated Piping Systems



**T**he question of which materials to use when it comes to process equipment, vessels and pipes that are subjected to high chemical and thermal stresses is a recurring theme.

In the past, there was often no other option than to use exotic metals making construction very expensive or implement solutions that offered a substantially reduced service life.

Today Steuler Linings design and manufacture dual laminated piping systems using state of the art materials.

Dual laminate process is a manufacturing technique that allows the outstanding mechanical strength of glass-fibre reinforced composite materials to be lined with the high chemical resistance of a thermoplastic liner material to make a structure with high strength-to-weight ratio and superior corrosion resistance.

Glass-fibre reinforced composite materials are highly resistant to chemicals and do not require any additional corrosion protection measures, such as external coatings that may degrade and fail.

As a composite system, they withstand extreme temperatures without the thermoplastic lining separating from the supporting FRP laminate and provide convincing alternatives to other materials wherever strict safety requirements must be met and large mechanical or chemical loads must be managed with.

Our dual laminated piping systems compete with titanium and stainless steel within corrosive applications.

They are superior to systems where the thermoplastic liner cannot be adequately bonded to the pipe material, such as steel,

in such cases high thermal contraction and expansion can lead to mechanical failure of the lining.

In addition, the exterior of the steel pipe-work is still susceptible to corrosion and a comparable steel pipe is considerably heavier.

The advantages dual laminated pipes have compared with other piping systems used in corrosive environments include:

- Superior chemical resistance.
- Light weight construction.
- Excellent mechanical and thermal strength.
- Good abrasion resistance.
- Able to be used in vacuum applications due to excellent bonding of liner and FRP.
- No requirement for external coatings
- Ability to perform site weld joints, reducing flanges and the subsequent risk of leakage.

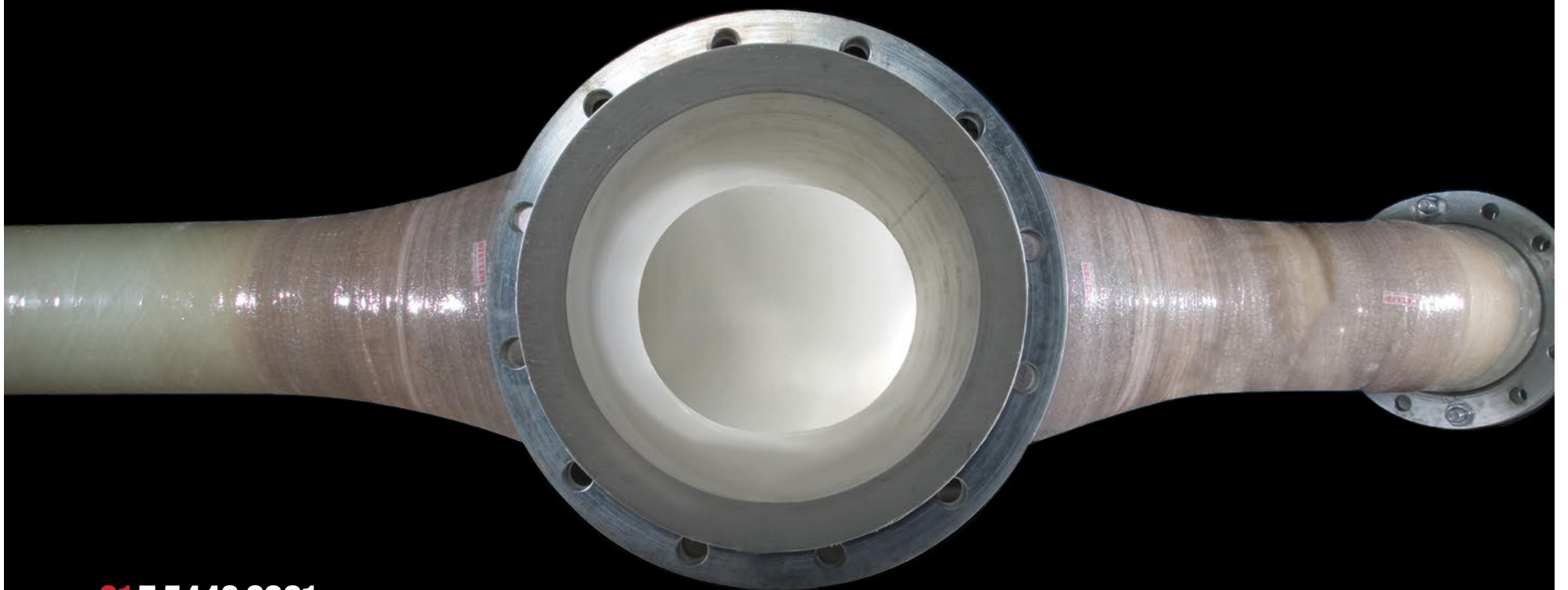
These are just some of the reasons why modern and innovative FRP composite materials continue to displace metallic materials, especially in the chemical industry.

Thanks to our own application technology, engineering, production and assembly team, we deliver the highest quality and efficient solutions – with the added bonus of in-house project planning, static calculations, installation and maintenance.

Individually tailored to your needs, our engineers and technicians design and construct FRP piping systems, process vessels, storage tanks and special components.

For more information on our FRP COMPOSITE MATERIALS FOR PIPING SYSTEMS contact us at [enquiries@steuler-kch.com.au](mailto:enquiries@steuler-kch.com.au)  
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## THE **ULTIMATE** IN CORROSION PROTECTION



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**STEULER** | Linings



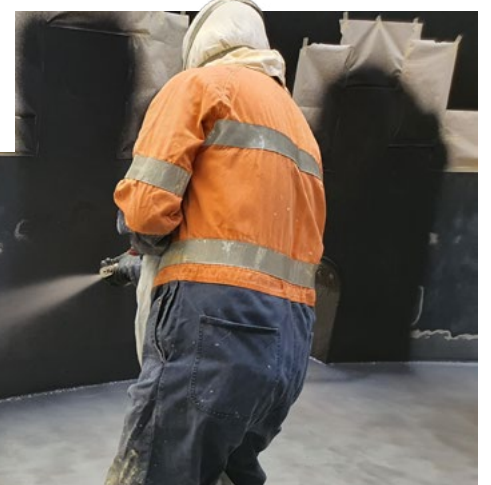
re-applied as needed, before the substrate is exposed, saving mining companies hundreds of thousands of dollars in equipment replacement costs.

Rhino's flexible coatings adhere to almost any substrate regardless of the shape or size and can expand with thermal expansion/contraction changes.

Rhino Linings (an ISO 9001 Quality Assurance certified company) has been developing and manufacturing premium protective coatings that have repeatedly dominated the protective coatings market for retail, commercial and industrial applications since 1988.

If you are looking to reduce maintenance costs, shorten repair and equipment downtime, add years of life to equipment effected by corrosion, impact, abrasion and abuse from the elements, Rhino Linings industrial coatings will have the best solution for your needs.

Find out more  
at [www.rhino linings.com.au](http://www.rhino linings.com.au)  
or phone +61 7 5585 7030



- Covering bunds to prevent spillage and damage from corrosive liquids.
- Coating structures and equipment to extend their life and provide long term asset protection.
- Coating various equipment to reduce hang-up and improve efficiency.
- Reenforcing vehicle windscreen housings which are prone to corrosion and cause a serious workplace health and safety hazard.

There is also the capability to include "Wear Indicators" that can be applied beneath the linings so that Rhino can be economically



# RHINO LININGS HAS YOUR ASSETS COVERED

Unfortunately, expensive replacement parts are part and parcel of running a mining operation as much of the equipment is not only exposed to continual abrasion and impact, but also to highly corrosive elements.

It is far more cost effective to have your assets protectively coated for long term use rather than replacing old for new and you also gain a superior asset that will outlive most new replacement parts.

Rhino Linings have Applicators worldwide that specialise in spray applied protective coating systems. The process usually involves cleaning and profiling the substrate, priming if required then spray-applying Rhino Linings TUFF STUFF to the recommended thickness. TUFF STUFF is one of the most utilised Rhino Linings products, but they also offer many other protective coatings to perfectly compliment the task at hand.

"In an era of recycling and environmental awareness it is a refreshing sign to see just how many mining companies are embracing the need to rejuvenate their assets rather than replace, which will also save them money in the long term" Rhino Linings Australasia General Manager, Peter Morgan, says.

With supply chain problems occurring worldwide it is reassuring to know that Rhino Linings can minimise the impact with most of their products being manufactured within their own Australian premises. This means that they can make it today and distribute tomorrow which saves a lot of turn-around and downtime.

"Having a local supplier is also beneficial for mining companies by not having to outlay cash resources up front for the product and then having to wait months for it to get shipped from overseas." Peter also stated.

With most mine sites in Australia having at least one piece of equipment being protected by Rhino Linings Coatings; it goes without saying that the mining industry has understood the benefits of utilising the coatings for various purposes.

Some of the more common uses for Rhino Linings protective coatings include...

- Coating Truck fuel tanks to prevent damage from debris projected by the wheels and general corrosion.
- Coating storage tanks to prevent leaks from damage and corrosion.



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The Experts Choice For Protective Coatings







# TYRE HANDLERS

## DESIGNED FOR HEAVY LIFTING



QMW Industries offer a range of tyre handler grab attachments to suit all varieties of heavy equipment used in the mining and quarry industries in both underground and open cut applications.

The dual-arm tyre handler design is suitable for use on all wheeled equipment such as trucks, wheel loaders, IT carriers etc. covering the range of production and ancillary earthmoving equipment.

### FEATURES:

- » Range of widths to suit specific operations
- » Integrated control system providing interlocks
- » Visual and auditory outputs
- » Stability testing conducted to standards
- » Hose burst protection valves incorporated into the installation
- » Site specific - fit for purpose testing
- » Certified AS1418.8
- » Custom designs up to 15,000kg



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- Autonomus Remote Oil Sampling
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# NEW KASHI HI-VIS GLOVES IMPROVING HAND PLACEMENT AND AWARENESS

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It's time to put your hands up and say, "I want to be seen by others, and I also want to see myself".

If that applies to you in the workplace, the new PROSAFE Kashi General Purpose Work Gloves can help.

The need for workers to be visible in hazardous workplaces is fundamental to worker safety.

That is why we see more and more workers wearing Hi-Vis clothing, which is often PPE, in all sorts of situations.

Wearing suitable gloves is part of the safety solution, whether it be in mining, construction, firefighting, emergency rescue, traffic direction, dirty or low light environments, or many types of work in general.

One of the biggest benefits of Hi-Vis gloves is 'hand placement'.

The glove wearers know exactly where their hands are, as do their colleagues who are working with them.

To be seen, is to be safe.

This is relevant in many workplace situations, including when using machinery or high-impact tools such as hammers.

*"It's the very reasons why we've developed the Kashi Hi-Visibility Work Glove. It's critical in the prevention of accidents and injuries in the workplace. They also allow HSE (Health, Safety & Environment) team members to easily see that workers are wearing hand protection,"* says Nic Williams, Own Brand & Product Development Manager.

The PROSAFE Kashi General Purpose Work Gloves include:

- 15 gauge seamless Hi-Vis yellow knit liner
- Hi-Vis yellow foam nitrile pam coating that enables grip durability and

abrasion resistance while also allowing touchscreen compatibility, reducing the need to take gloves off to use devices.

Nic went on to say, *"Whatever colour they are, all work gloves should be fit-for-purpose, providing the user with the right balance of protection and dexterity to properly complete the task or application without needing them to be removed."*

*"The new PROSAFE Kashi gloves are perfect for light-duty material handling, assembly, maintenance applications or any tasks that require extra grip and agility whilst helping keep hands clean and visible."* AMR





# SAFETY

## SPOTLIGHT

OCTOBER 22 EDITION **OUT NOW!**

EXPLORING TOPICS THAT  
ARE CRITICAL TO KEEPING  
YOUR TEAM SAFE ON THE  
WORKSITE, INCLUDING:

- // Workwear fit for women
- // The changing face of respirators
- // Upping the ante of fall prevention, and much more!

SCAN TO  
VIEW NOW!



**Blackwoods**



# Quality Ice Machines

## Durability At Its Finest



**R**eliable ice machines are critical for catering purposes in remote mining regions where extreme temperatures are the norm.

AJ Baker & Sons are the exclusive importer of the Manitowoc Ice range of ice machines and dispensers for over 40 years ago.

Manitowoc's range of ice machines are available in a variety of sizes, from smaller machines with an ice production capacity of 31kg, up-to large, industrial high capacity machines which can produce up to 950kg of ice.

Paired with the industrial machines the

large capacity dispensers are equipped with an auger that rotates to lift the ice and push it through the chute automatically, eliminating the need for staff to lean into an ice storage bin and scoop the ice out, reducing the risk of contamination.

A selection of Ice Dispensing Machines for site cafeterias and catering stations feature a hinged door and a sealed food zone to prevent contamination of ice as well as food.

With hygiene a key requirement, smaller ice dispensing options include a touch-less ice dispenser with a storage capacity of up to 54 kgs of ice. **AMR**



# BAKER

REFRIGERATION

## ICE MACHINE & DISPENSER

Industrial sized ice dispensing with a foot pedal controller

Indigo NXT Ice Machine with the Kloppenberg 500 Ice Dispenser

Bin storage up to 250kg



## HEAVY DUTY ICE MACHINES FOR THE MINING INDUSTRY

## ICE MACHINE & STORAGE BIN

Easy to operate with 3 simple controls: on, off & clean

Indigo NXT Ice Machine with the D570 Ice Storage Bin

Bin storage up to 195kg

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**Manitowoc.**



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# Committed to Healthy and Safety

Recon is passionate about fresh quality food and prides itself on giving the best hospitality and service to customers and clients.

**R**econ 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.

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**

From Set-up to Shutdown...

# Quality Catering & Camp Management

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# INDIGENOUS COMPANY ENRICHES LIVES AND INDUSTRY

**E**astern Guruma is a highly regarded Australian independent Indigenous Company, enriching the communities and clients it serves through growth, sustainability and diversity.

Eastern Guruma Pty Ltd has been in operation for 15 years as a successful and respected Aboriginal owned business, providing services in construction, landscaping, facilities management, traffic management and more.

EG is 100% owned by members of the Traditional Owner group, Muntulgura Guruma, the lands of which surround Tom Price in the Pilbara region of WA, the team has delivered services to Australia's largest mining companies, Rio Tinto, BHP, and Fortescue Metals Group.

Its facility management services alone provide cleaning and maintenance services for mine sites, Eastern Guruma Pty Ltd employs opportunities to 80 plus staff with a 40% of that being Aboriginal people across 25 different language groups. Opportunities are created through the jobs directly available, including traineeships, apprenticeships, cadetships, scholarships and

graduate program.

Eastern Guruma Pty Ltd Facilities Management kicked off in April 2017 with only a staff of 40 a 5+5 year contract for facilities management between Eastern Guruma Pty Ltd and Rio Tinto fuelled jobs and growth in the Pilbara region while keeping the site's mine site facilities clean and sanitised.

A full list of past and current projects can be found on Eastern Guruma Pty Ltd's website.

Tania Stevens and Samantha Connors are the owners and directors of Eastern Guruma Pty Ltd. Ms Stevens has been the company's owner since its foundation in 2004, she is an Eastern Guruma Pty Ltd Traditional Custodian of the Muntulgura Guruma in the Pilbara of Western Australia.

General Scope of the contract is commercial cleaning, mine site cleaning, township vacate cleaning, general gardening, landscap-

ing and gardening maintenance and rubbish removal. EG also have an environmental arm affiliated with the contract in terms of weed spraying and eradication of weeds and pests.

The contract currently has been running over 5 years and is now in the final stages of a 10 year renewal and will grow in terms of geography, staffing and scope of work.

Eastern Guruma Pty Ltd's service division, Eastern Guruma Pty Ltd Facility Management (EGFM), operates in the Tom Price and Paraburdoo area undertaking cleaning and gardening services for Rio Tinto facilities across Western Turner, Paraburdoo, Marandoo and Tom Price mine sites.

Tasks include maintaining grounds and gardens and cleaning all site facilities including offices, crib rooms and ablutions. Successes of the Rio Tinto contract have included improved cleaning standards in all areas and integration of EGFM processes and procedures with an exceptional safety record.

EGFM also operates an off-site business providing pool supplies, pool services, gardening and cleaning services to business

and residential customers in the Tom Price and Paraburdoo area. The business aims to grow its service division through the Paraburdoo store and increase the number of local and Indigenous employees working in the business.

As an Indigenous organisation, Eastern Guruma Pty Ltd is dedicated to providing employment, training and skills improvement to Indigenous people. Eastern Guruma Pty Ltd's Indigenous Training and Employment Policy outlines their commitment to Indigenous development within their business.

Our success in partnering with other businesses and aboriginal businesses to provide traineeships have led to long term careers for Aboriginal people within the facilities management, civil and mining, landscaping, drilling, telecommunications and pastoral industries.

For more information or to apply for current vacant and future positions please see below email address or visit Eastern Guruma Pty Ltd website  
[www.easternguruma.com.au](http://www.easternguruma.com.au)  
[hr@easternguruma.com.au](mailto:hr@easternguruma.com.au)

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**WE ARE EASTERN GURUMA.**

We're a civil and mining contractor, run solely by traditional landowners from the region. We proudly partner with Indigenous groups to work on specific mining and civil projects and create career opportunities for Indigenous Australians.

**WE DELIVER...**

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- traffic management
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- landscaping
- drilling



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# SENSING A SHIFT IN TEMPERATURE WITH MIDWEST

**M**iners are always on the hunt for technology that offers greater accuracy and stability in their various applications. This is certainly the case in coal mine operations where Resistance Temperature Devices (RTD) are used to monitor bearing temperatures on pulleys and rotating shafts.

RTD's have proven to be far more accurate, stable and repeatable than thermocouples when it comes to temperature readings.

An RTD sensor is a device that tracks the temperature of an application by measuring the change in resistance of the sensor in relation to temperature. This change in resistance is predictable, depending on the resistance curve of a certain RTD, and can be measured in order to calculate the temperature the RTD is sensing.

The RTD sensor is made of a pure metal like platinum, copper, or nickel. Platinum is generally the preferred material for delivering both the most accurate results, but also its versatility when used across a wide temperature range.

Since 2001, Midwest Valves and Controls has become a leading supplier of industrial valves, pumps, hoses, process instruments and pneumatic products. It continues to expand its product offer and introduce new technologies within different industries. For the past four years, Midwest has been reselling RTD sensors and associated fittings to a company specialising in conveyor support and maintenance for coal mines in NSW.

According to Midwest Owner and Chemical Engineer, Peter Willis, RTD's are more widely used than thermocouples and play a critical role in applica-

tions such as conveyor systems.

"It is vital that mines have shafts rotating as per design and by sensing the temperature of bearings within rotating equipment, to avoid costly failures on their conveyors or other gear," said Peter.

"Our client has been using 15 metres of triple wire cable, which is normally a sufficient length along the conveyor."

"It is usually protected by a stainless steel sheath in order to withstand harsh mine site conditions."

"An external electronic device such as a temperature transmitter is used with the RTD sensor to deliver a milliamp or voltage output to the control system."

## Pressure Valves in Mining

As a specialist supplier of industrial valves in the mining industry, Midwest has built strong partnerships with trusted manufacturers such as Ebro Armaturen Pacific Pty Ltd and Bray Controls Pacific Pty Ltd. Bray is one company that is fast becoming an industry leader, notably due to its safety driven product designs that has miner protection in mind. Midwest supplies the Bray Series 768 bidi-

rectional knife gate valve, which is designed for slurry applications, and features a two-piece bolted wafer body for easy maintenance. A protective stem cover is standard increasing cycle life in hazardous environments, and a fully encapsulated J-ring provides sleeve reinforcement and memory assist, guaranteeing bidirectional zero leakage performance. In the open position, the energized sleeves shield all metal components from direct contact with the flowing process media.

It has a maximum allowable operating pressure of 10 bar for sizes DN 50 to 400, while the maximum allowable operating pressure is 6.2 bar for DN450 and 600. The standard body material is ductile iron with gate materials in 304, 316, 317 Stainless Steel, SAF 2507, SAF 2205, 17-4PH, Hastelloy® C, Monel®.

The Bray Series 740 bidirectional knife gate valve provides repeatable bidirectional shut-off in a rugged, single piece cast body. The valve features a replaceable steel reinforced elastomer seat for enhanced sealing, and is easily automated for on/off applications in mining processes.

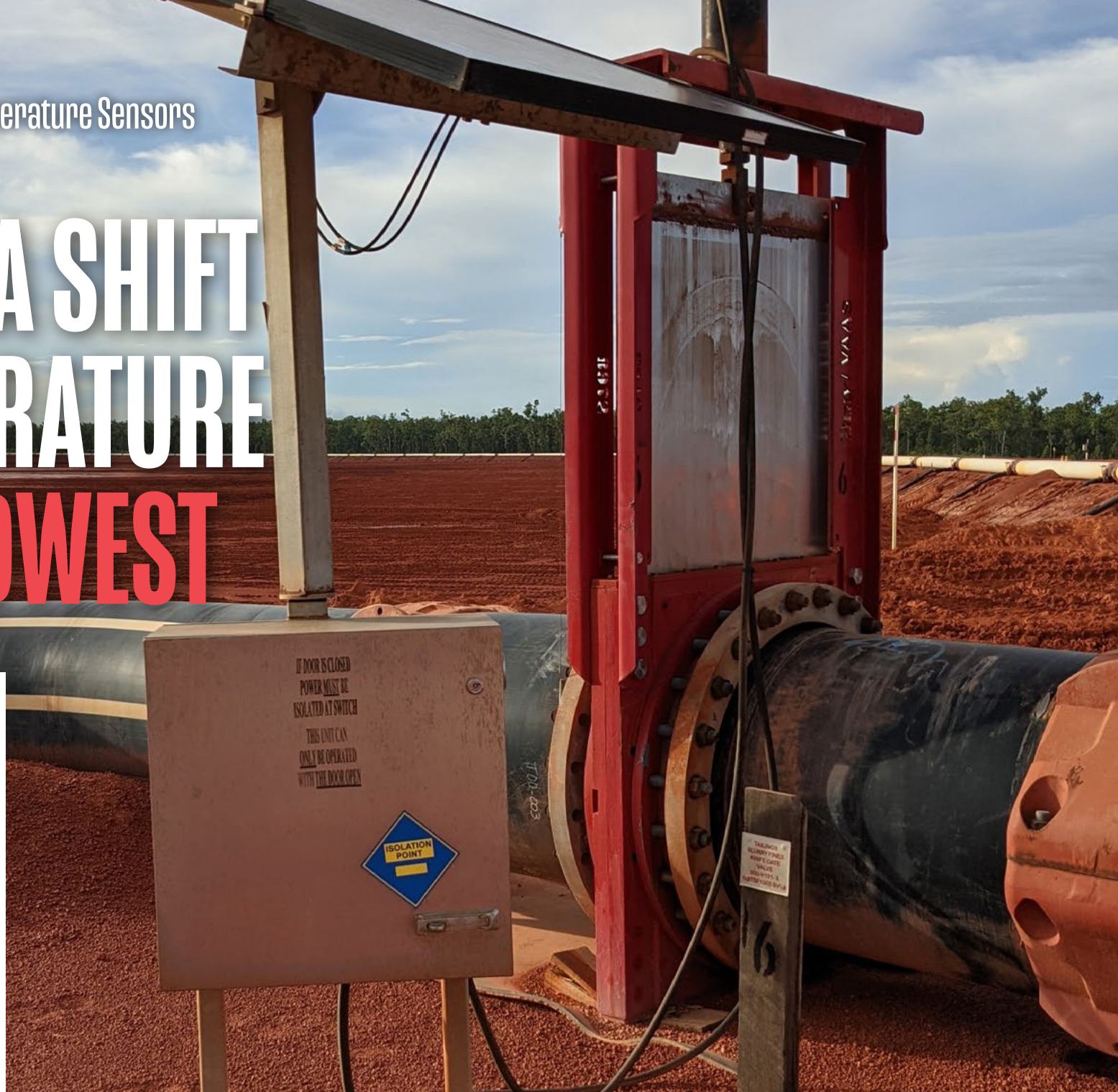
The Series 740 valve is also designed for easy, quick conversion between manual and

pneumatic actuation, and features a lubricant injection port for continuous, smooth operation with minimal maintenance. The clevis design and horizontal bolting stabilizes gate ensuring proper alignment, and a standard multi-layer square packing provides exceptional gland sealing.

It has a maximum allowable operating pressure of 10bar for sizes DN 50 to 600, while the maximum allowable operating pressure is 7 bar for DN750 to 900.

When other valves reach their physical limits, the Ebro HP111 butterfly valve is the ideal high performance solution for high pressure and extreme temperature applications.

The Ebro valve is available in DN50 to 1200 and is suitable for the shutoff of gaseous and liquid media. Its double eccentric valve disc design features centering pieces that can be used as an installation guide. DN50 to 150 bar valves have a maximum operating pressure of 40 bar, while the valves greater than DN150 have a maximum operating pressure of 25 bar. **AMR**





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- Weekly Mines Activity Report (Operational Activity specific to Mine Sites)
- Directory listing on Mine Suppliers Online



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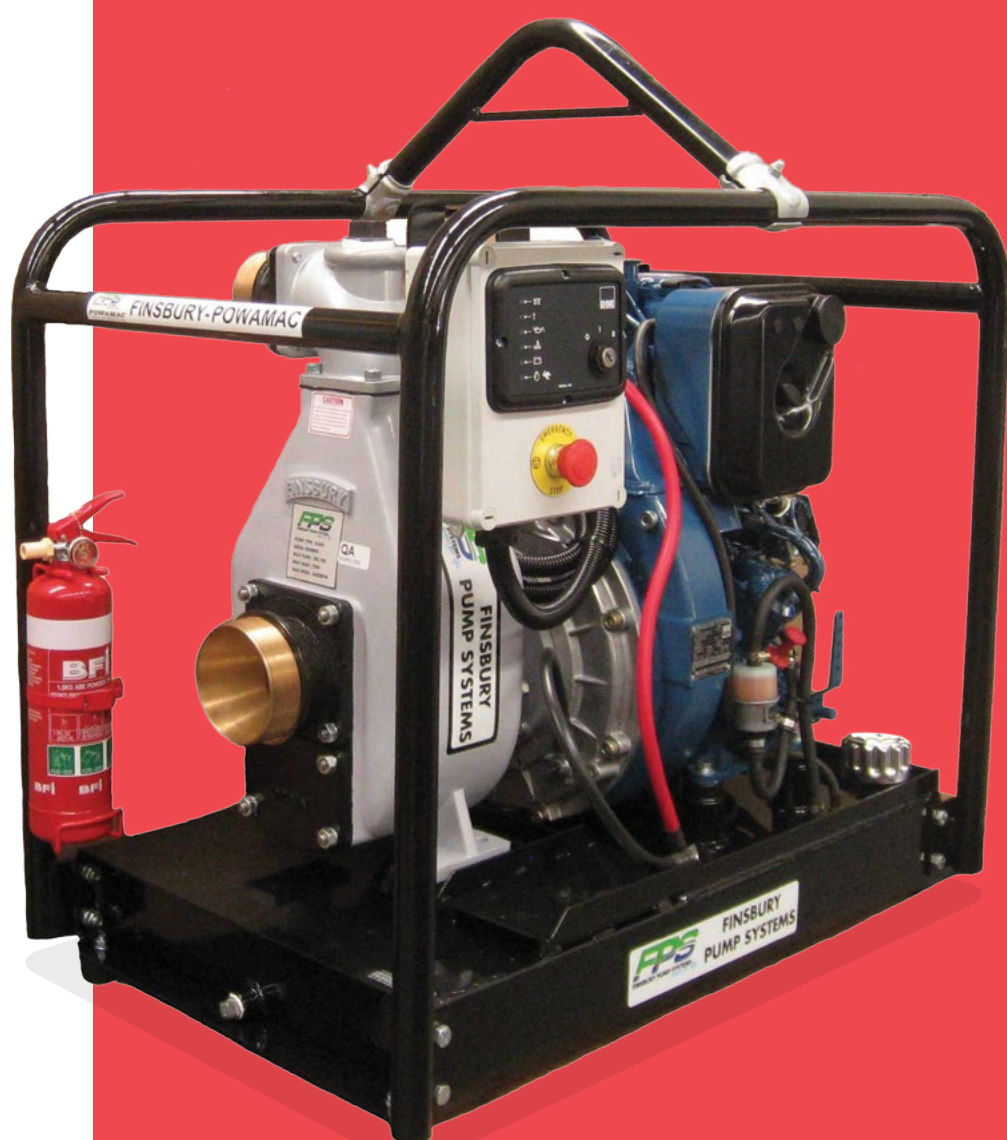
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# HEAVY MINING APPLICATIONS DEMAND HEAVY-DUTY VACUUM SOLUTIONS

In heavy industries like mining and mineral processing, productivity and safety have never been more important. The inability to effectively control and recover dry material spills can be detrimental, particularly at high spillage areas such as conveyor transfer points.

One company that is pushing the boundaries to create cleaner, safer, and more productive worksites around the country is Australian Industrial Vacuum (AIV).

The company has fast become a market leader in supplying the toughest range of industrial vacuum solutions used in the removal of dust, fumes and by-products that accumulate in heavy industrial applications. AIV is the exclusive distributor of the quality Italian made Delfin brand in Australia. It's renowned for supplying a high performance vacuum range that are long-life, powerful and a cost-effective maintenance solution for challenging industrial environments.

Designed for intensive use, the DHV range has unrivalled suction performance and collection capacity, enabling it to handle large quantities of dusty or dense materials.

According to AIV Managing Director, Ken Schafer, aside from our world-class filtration, the DHV range was built to last and capable of intensive and continuous use.

"Our solutions provide safe and efficient handling of large quantities of dusty or dense materials in heavy industries and are especially useful in dry recovery," said Mr Schafer.

"The systems are typically deployed in settings prone to spills of cement, stone, abrasive materials, foundry sand or woodchips where spills are 1 cubic meter or larger.

Project operators also use the vacuums to control and recover spills at conveyor transfer points and for the quick discharge of debris into bulk bags or large bins," he said.

#### Best In Class

When it comes to power and reliability, the vacuum's self-cooled lobe pump delivers maximum airflow and suction performance. The suction unit is protected by polyester filters and class M safety cartridges, for dust as small as 1 micron.

The DHV units also offer soundproofing to minimise noise levels, while improving operator acceptance and safety issues associated with noise ratings.

Maximum filtration efficiency is achieved in these units due to an automatic alternating chamber filter cleaning system, while upgraded HEPA H14 filtration ensures the safe handling of fine and toxic dusts.

The DHV units are equipped with detachable containers that can be easily moved by means of a forklift, which provides users with simple, yet safe operation, where the material is unloaded via the activation of safety bars.

Mr Schafer said DHV systems were considered an essential part of the overall maintenance and cleaning work in heavy industries, due to their ability to provide maximum suction performance.

He said their on-job reliability and durable design meant they were the ultimate workplace health and safety solution.

#### Ducting Efficiency

Due to the sheer scale of mine sites, ducted networks are often a viable option.

The ability of DHV units to be part of a ducted network within a site is a key differentiator between AIV and its competition. Its tailored ducted layouts are designed in-house by a local, qualified engineering team.

Mr Schafer said the DHV's can be used in a centralised vacuum system for the easy and safe handling of large quantities of material, even over long distances and from different points of the same plant, with debris all ending up in the one collection unit.

"Conveying material with a piping system from all areas of the same plant into a single collection point guarantees the highest efficiency and optimisation of space, whilst reducing injury risks and improving safety for all workers," he said.

"In order to determine the ideal solution for a specific customer, depending on the location our in-house engineering team will conduct a free in-depth technical assessment of a mine site. This includes a description of the product that needs to be vacuumed including density, smoothness, grain size, and conductivity.

"Floor plan measurements will be taken, as well as all site parameters, potential obstructions, and customer preferences noted as part of the process.

"Factors such as these are considered in conjunction with air flow calculations to ensure we use correctly sized connection piping, and the right type of vacuum unit, to maintain pressure and power, whilst remaining cost efficient."

#### About AIV

Victoria based Australian Industrial Vacuum has established itself as the industrial vacuum supply and maintenance partner of choice for the mining and resources sector.

Their high-performance industrial vacuum cleaners contribute to a cleaner, safer workplace that requires less manpower than other market alternatives.

The products can be used for hours at a time and are purpose-built for challenging conditions, enabling them to remain operational, no matter what the debris.

The company sources their innovative products from quality global manufacturers, and they are the exclusive national distributor of the popular Delfin range.

Mr Schafer said AIV's core mission was to offer high quality, reliability, efficiency and effortlessness across their products and services, delivering the best, most efficient industrial vacuum cleaner available.

"If you are looking for the best performing industrial vacuums, look no further than AIV for great choices and professional expertise." **AMR**





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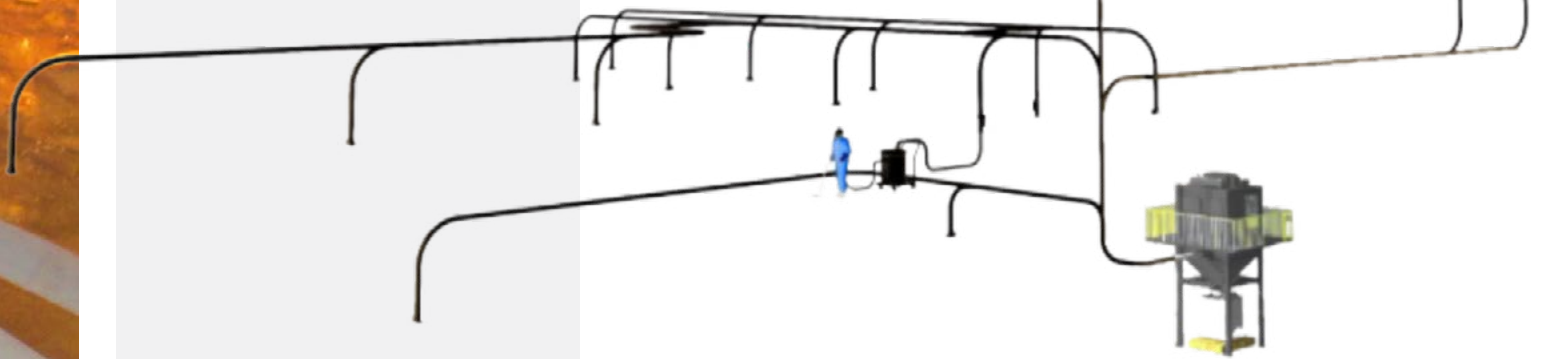
### Our Promise To You

When you buy from AIV, you can trust in a qualified team to find a tailored solution for your needs. Whether you require an industrial vacuum solution for material recovery, spills, wastage, product transfer or more we are here to help. Australian Industrial Vacuum is Australia's leading family-owned industrial vacuum supplier. From humble beginnings we offer genuine and reliable advice and are passionate in our solutions.

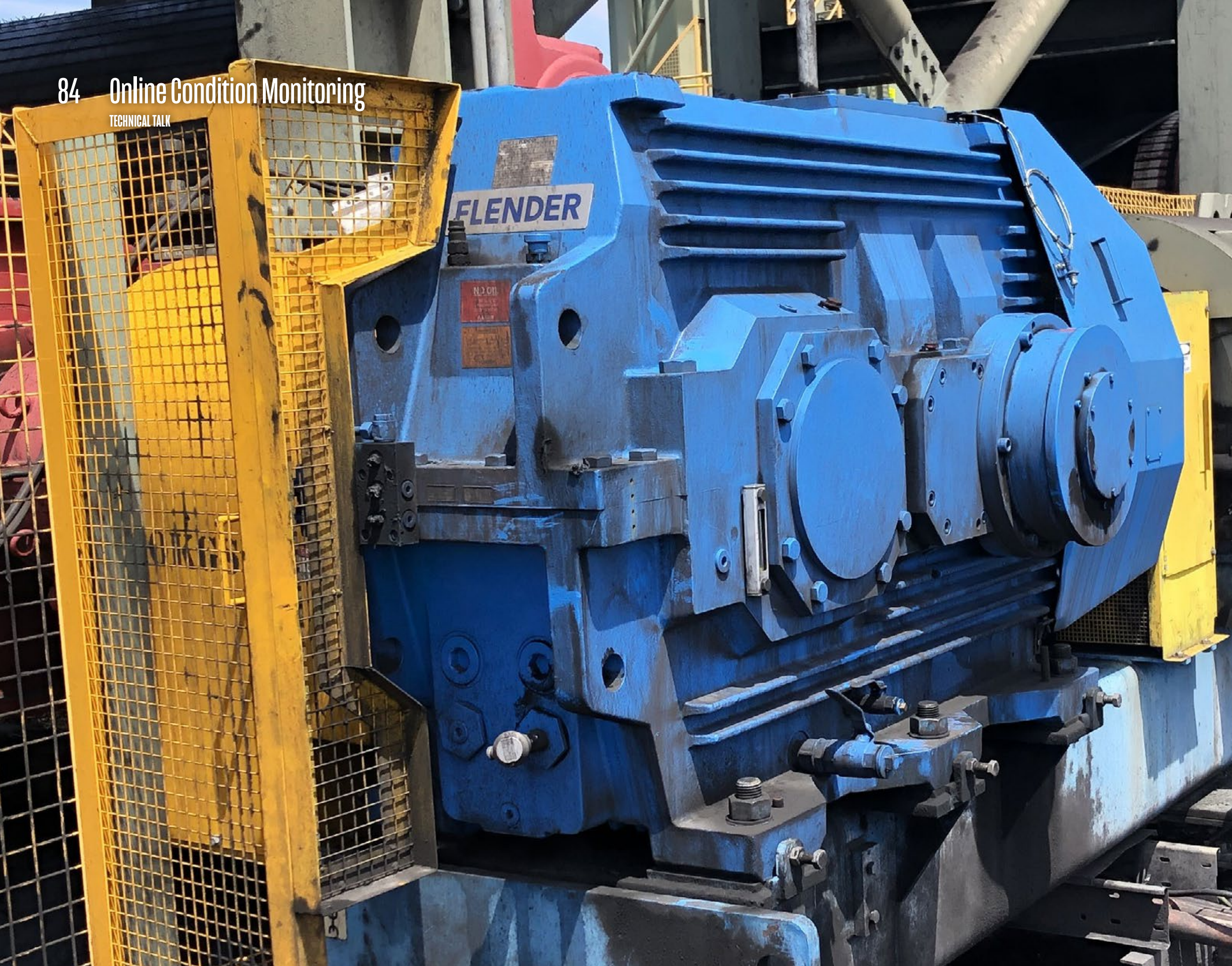
Enjoy peace of mind knowing your needs will be heard and adhered to the best way we can.

With years of experience, we understand the difference a quality industrial vacuum can make in heavy industries and we work to ensure your investment improves efficiency, safety and will stand the test of time.

**For more information on the innovative range of high powered vacuum solutions, contact Australian Industrial Vacuum today.**







# NES OCMaaS - ONLINE CONDITION MONITORING AS A SERVICE

Online condition monitoring systems are becoming reliable, affordable and easier to deploy with the rapid expansion of technology within mining and manufacturing sites. However, they often become defective over a period of time for a number of reasons.

First, insufficient time, or a lack of focus on system management such as software updates, sensor or communication issues.

Second, limited specialist knowledge in the area of troubleshooting, and interpretation of diagnostic data. This includes converting data into specific and reliable corrective actions, using terminology that maintenance staff can understand and action accordingly.

Third, changes in staff and the impact on program priorities, which can reduce when key team members leave or reassigned to a different role.

The final issue commonly seen by consultants during regular site visits is associated with factors such as budgets and parts availability.

For over 25 years, the team at Noble Engineering Services (NES) has been at the forefront of condition monitoring, helping clients overcome such issues.

The company services industrial operations also providing mechanical engineering expertise, non-destructive testing, and metallurgical services.

Promoting a safe, reliable industrial environment is a key focus for NES where strategic solutions serve to maximise productivity. The company services multiple assets spanning mine sites, industrial plants, and mechanical and fabrication workshops.

## NES approach to OCMaaS

NES is currently rolling out a service model for online system deployment where the responsibility of the aforementioned issues remains with NES. Customers only pay a fee over an agreed period to manage the relevant systems.

"The advantage for our customers is that the reliable condition monitoring services are provided by qualified and experienced analysts," said NES Online Systems Manager, Tarun Motwani.

"The customer receives consistent information to help them achieve the high ROI from the system implementation. In addition, it creates greater value from the initial capital expense," said Mr Motwani.

As a brand neutral service provider, NES consultants choose the best system based

on the type of equipment and service expectation.

Consultants also incorporate operational and site-specific conditions in their selection and configuration of the online system, including any special antenna and boosters to counter site wireless or GSM connection restrictions. This provides affordable and reliable sensors and system for the site.

Online systems provide an indication of problems in the very early stages, and provide inputs for simple early-intervention in the prevention of impending system failures.

These actionable insights relate to lubrication, balancing, base stiffness, operational parameters, to name a few.

The online system also tracks the fault deterioration, and helps with planning of any necessary actions in advance.

The system also helps improve the safety of both maintenance personnel and the plant equipment, providing data to support site-based continuous improvement initiatives.

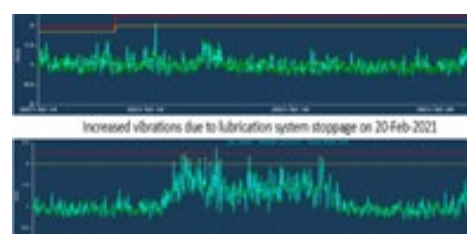
NES believes there is added value in online systems having the ability to substitute portable data collection programs, with many advantages.

Mr Motwani said the continuous online monitoring systems offer far more information compared to a portable system, including operational and process abnormalities.

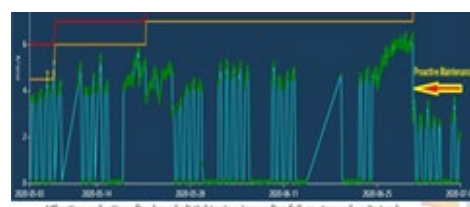
## NES OCMaaS Installations



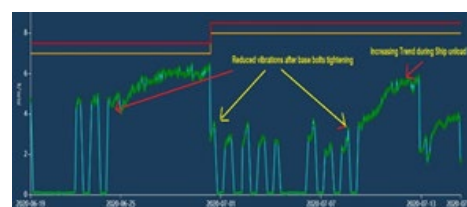
Diagnostic features of the system



Lubrication system stoppage notified

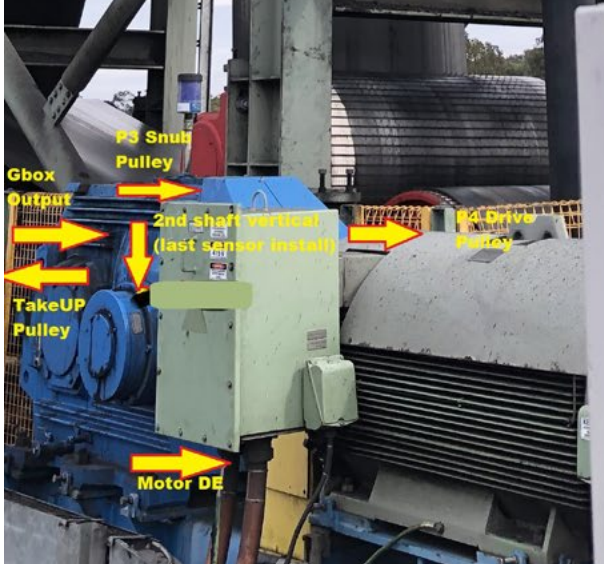


Base bolt looseness identified and corrected



Trends of normal and abnormal behaviour





"It can really help extend equipment service intervals and reduce their lifecycle costs," he said.

He also mentioned there were a number of salient features of the customisable NES OCMAaaS offering which deliver real benefits, from equipment reliability to operational improvements.

"Our customers get access to 24/7 monitoring for detection, diagnosis and alarm triggers with cost-effective, customisable condition monitoring, alarm setup and safe online surveillance.

"Individual fault tracking with frequency band selection is available, and customers have access to a comprehensive document repository and event history at machine level.

There is essentially a zero IT footprint at site, and ease of installation options," he said.

#### OCMAaaS Implementation

Prior to making decisions on the appropriate system and sensor layout, NES adopt a customer centric approach by understanding the equipment design and operational conditions of the equipment that is to be monitored as part of the OCMAaaS program.

"We review failure history and FMECA of the critical machines to ensure adequate system configuration and monitoring parameters to cover these failure modes," said Mr Motwani.

"The location and mounting methods for sensors and gateways based on site conditions are determined, which includes ambient conditions, potential risk of water or contaminant ingress, Wi-Fi signal strength, and GSM connectivity protocols.

"Before we deploy the technology to site, we rigorously test the system for integrity and reliability under site conditions.

This ensures we achieve the desired connectivity, and our antennas and gateways deliver reliable data uploads.

"Following system deployment, we fine-tune alarms on an ongoing basis to account for operational variations. Any equipment abnormalities and site communications are logged on the monitoring system webpage.

"Our goal is to tune our communications with a site based on their specific requirements and system setup, with view to utilise the full potential of the OCMAaaS implementation.

For more information, visit  
<https://www.nobleeng.com.au/>

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# ANALYTICAL TECHNOLOGIES



**W**ith the rapidly growing electric vehicle industry, there is a surge in demand for research, development, and manufacture of a new generation of enhanced-performance batteries.

In this article, Dr. Kapil Khullar, Senior Director of Growth Strategies and Application Excellence, Chromatography and Mass Spectrometry for Thermo Fisher Scientific in Asia Pacific and Japan speaks with Australian Mining Review about the vital role that analytical technologies play in the battery manufacturing continuum and its lifecycle.

While the world makes big strides toward a sustainable, zero-carbon future, the spotlight falls on lithium-ion batteries which play an increasingly crucial role in everything from handheld electronics to electric vehicles.

The manufacturing continuum for lithium-ion batteries ranges from the extraction and processing of raw materials, through quality assurance in the production line. It also includes material recovery in recycling, as well as assisting with the research and development of next-generation batteries.

## In this manufacturing continuum, how would technologies from Thermo Fisher Scientific be utilised?

Thermo Fisher Scientific is in the business of serving science. We are focused on helping our customers who are laboratory professionals including scientists, researchers, chemists, and technicians. These professionals have an essential role in helping businesses in the manufacturing contin-

uum to accelerate insights and answers to achieve technology advancements and meet essential sustainability goals.

We offer technologies, products and solutions that enable our customers to advance scientific developments by pushing the boundaries of innovation. More importantly, we take pride in our mission which is to enable our customers to make the world healthier, cleaner and safer.

In practice, this means that we provide solutions for battery material analysis at every step in the manufacturing supply chain to ensure that you can meet your battery research, development and production goals.

## How would your solutions help the mining industry?

Battery manufacture requires a dedicated supply chain, incorporating the mining and extraction of raw materials, production of purified feedstocks such as lithium hydroxide, cathode active material formulation, electrolyte manufacture and anode production. In addition, recycling of

used batteries and environmental analysis relating to manufacturing and recycling processes is also essential.

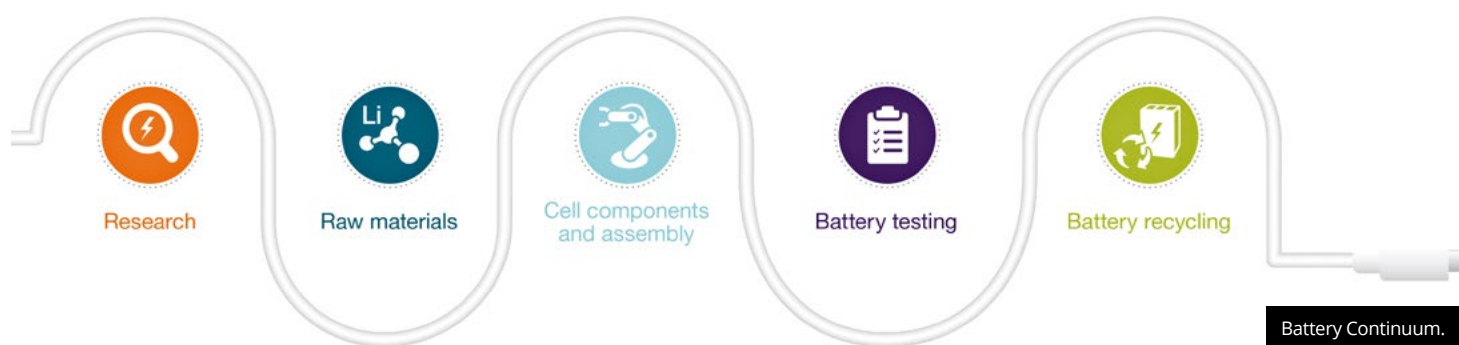
For the mining industry part of this supply chain, in particular, our elemental analysis and ion chromatography solutions enable accurate elemental composition and impurity analysis in raw and refined lithium mineral and brine samples, as well as in other battery cathode raw materials such as nickel, manganese, cobalt and iron minerals. It is not just cathode material composition and purity analysis that is required; there is also a need to make similar measurements in mined anode materials such as graphite, as well as in the copper and aluminium used in the electrode substrate materials.

## This is interesting. Do you have an example to share?

Yes, I do. Our solutions are used to help laboratory professionals in analyses ranging from quantifying lithium concentrations in ores and brine to routinely confirming the composition of cathode active materials in a QA/QC environment.

Our experts have also developed a robust and reliable method for the determination of elemental impurities in graphite powder samples for lithium-ion battery anodes, using the Thermo Scientific™ iCAP™ PRO X ICP-OES Duo instrument.

You see, for lithium-ion batteries, the negative electrode (anode) material is generally made from graphite powder. Graphite powder is suitable for this application primarily because it is an easily molded, chemically stable, and non-metallic material with good electrical conductivity and high temperature, oxidation, and corrosion resistance. It also has a large lithium-ion diffusion coefficient with a high lithium insertion capacity and does not change volume with the insertion of lithium ions. In addition, graphite powder can be modified through various oxidation and pyrolysis processes to generate a core-shell structure that can improve its charging/discharging performance and increase the anode lifetime. Graphite powder has become the main lithium-ion battery anode material in use today in smaller consumer goods, such as mobile phones, as well as in electrical vehicles.





# THAT HELP BUILD BETTER BATTERIES



Through optimisation of the sample pre-treatment process and plasma parameters, together with a rigorous selection of the most suitable analyte emission lines, a robust, accurate and reliable ICP-OES analytical method for the determination of 13 trace elements in graphite powder materials for lithium-ion batteries was developed.

With our iCAP PRO X ICP-OES Duo, laboratory professionals gain the advantages of high sensitivity, good stability, fast analysis speed and low operating costs required for all aspects of elemental analysis in the lithium-ion battery workflow.

**Apart from this example, would you be able to discuss the other solutions or technologies that you have?**

In the earlier example, the main solution area I discussed was *elemental analysis*. Essentially, long before lithium-ion batteries are developed or produced, laboratories need to use elemental analysis to determine the purity of lithium salts, which will eventually be processed into lithium-based materials and battery components. These materials also require elemental analysis to ensure their composition and purity before use, since the presence of impurities significantly degrades the charge-carrying capacity of the battery.

Another solution area that I briefly mentioned is ion chromatography. By using *ion chromatography*, researchers and scientists can gain insights into the fundamental processes and degradation mechanisms associated with anionic materials in lithium-ion batteries to ensure product quality during manufacturing.

In addition to these techniques, *liquid chromatography* is also used. Whether you are analysing electrolyte solvents or working to achieve the next breakthrough in battery recycling, our liquid chromatography solutions can improve your productivity, deliver a maximum return on your investment, and when coupled with mass spectrometry provide confident insights to drive business decisions.

This leads us to talk about *mass spectrometry*. When studying lithium-ion battery components, mass spectrometry dramatically improves your ion and liquid chromatography system capabilities and provides several benefits. These benefits include higher sensitivity and accurate quantitation, peak confirmation and evaluation of chromatography peak purity, improved resolution of complex samples, and seamless integration of mass spectrometry data into ion and liquid chromatography workflows.

We also have gas *chromatography-mass spectrometry* systems that can reach lower detection limits and obtain richer information with accurate detection of mass-fragments and molecular ions. By identifying and quantifying compounds formed during electrolyte aging, gas chromatography-mass spectrometry systems can provide new insight into lithium-ion battery degradation.

Finally, we have software solutions, which are required to meet an ever-growing demand for effective, data-driven decision-making and more efficient QA/QC confirmation in battery production operations. With market-specific software platforms to empower rapid data processing, interpretation, reporting and management, our software



enables you to easily access and share valuable insights from your data sets. By bringing all your data together, our software can help uncover hidden value, provide the most comprehensive information, and help you fully characterise your samples to advance your research.

**We have learned a lot from you today. Can you sum up the discussions for our readers?**

Yes, the main message that we want to share with AMR's readers is that Thermo Fisher Scientific's solutions empower them to see the unseen. What this means is that our state-of-the-art chromatography and mass spectrometry solutions enable them to improve safety, charging speed, power output and longevity of lithium-ion batteries.

Overall, I would say that our solutions help in several ways including providing

customers with superior stability for quantifying major elements, such as lithium, nickel, manganese, iron, phosphorus and cobalt; electrolyte composition and purity confirmation; characterisation of battery aging and performance; fast, robust, accurate and precise detection of trace level impurity elements; and enabling users of all skill levels to confidently obtain reproducible, high-quality results.

For businesses in the battery manufacturing continuum, Thermo Fisher Scientific offers the broadest instrument portfolio for advanced battery technologies to help you drive actionable business outcomes.

Learn more at  
[www.thermofisher.com/battery-solutions](http://www.thermofisher.com/battery-solutions)  
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