



IDEAS ENGINEERED

JORD GROUP

RESOURCE INDUSTRIES

CELEBRATING FOUR DECADES OF SERVICE





IDEAS ENGINEERED

Innovation
Value
Reliability

QUALITY DELIVERED

JORD INTERNATIONAL

People
Partners
Capital
Performance

JORD FOUNDATION

Jord has served the power generation industry for over 45 years, with innovation, value and reliability. We are a privately owned firm that has grown steadily and organically, by solving unique problems with speed and personal service.

Think hard about Jord. We'll be thinking hard for you.

Clockwise from main page : Calcined magnesia plant (Australia), flue gas desulphurisation on a cement plant (Indonesia) and fluoride fume scrubber for a phosphate plant (Saudi Arabia).



Ideas Engineered

Jord custom-designs, manufactures, commissions and services process plant for minerals processing, coal, alumina, sugar and the many other resource industries. We supply individual capital equipment, or integrate various technologies into bespoke modular systems or complete turnkey plant. We collaborate with clients for both greenfield and existing sites, to meet the efficiency and environmental challenges of our times, while delivering innovation, value and reliability.

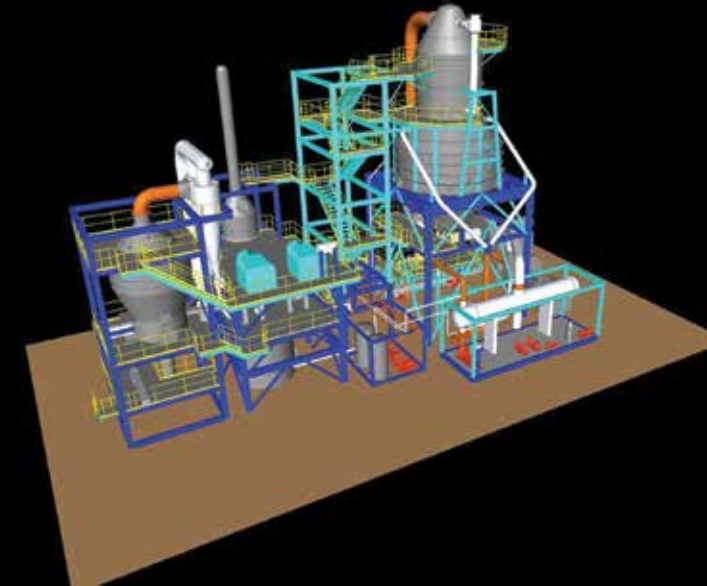
In 2008, Jord was engaged as turnkey contractor to increase capacity of a calcined magnesia plant by 33%. Key equipment were an 8.5m diameter multiple hearth furnace, a 22m rotary cooler, product conveyors and a dust handling system. Plant erection was in modular form, with walkways and handrails installed prior to site erection to maximise safety and minimise site costs.

“ A pile of rocks ceases to be a pile when somebody contemplates it with a cathedral in mind. ”

- Antoine St. Exupery



Zero liquid discharge plant for a Molybdenum effluent stream in Chile.
Facing page : Nickel sulphate crystallisation plant for the lithium ion battery industry (Australia).



Innovation

Jord's motto of Ideas Engineered reflects our pursuit of creative technical solutions that are cost-effective and dependable.

As every project is different, our engineers collaborate with our client's experts to devise, consider and rank options : methodical approaches harnessing open minds and lateral thinking.

Effluent treatment is an example where Jord can turn a perceived environmental problem into an opportunity : harvest the water and recover the by-product for re-use to achieve zero liquid discharge (ZLD).

For a molybdenum plant effluent stream in the desert of northern Chile, Jord and its technology partners engaged in extended laboratory trials to unlock some complex chemistry. Positive results led to Jord being awarded in 2014 a design and construct contract to build a ZLD plant with zero waste streams and zero harm to the environment.

Jord's expertise in effluent treatment has been built over many applications and many decades, from abattoir waste in the 1980s, and nickel smelter effluent in the 1990s through to woolscour effluent in the 2000s.

“ Ideas are like rabbits. You get a couple and learn how to handle them, and pretty soon you have a dozen. ” – John Steinbeck

Clockwise from main page : Paste backfill vacuum belt filter station (Western Australia), turnkey copper concentrate dewatering plant (NSW Australia), membrane chamber filter press station (Saudi Arabia).

Value

In all our projects, we will look to add value, be it to produce a higher grade product, increase plant capacity, reduce cost or operating risk, increase safety, reduce environmental impact, or conclusively prove new industrial processes. Often that value stems from our ability to design and construct turnkey EPC solutions around core Jord technology.

In 2011, Jord proposed a cost effective solution to double throughput of a copper concentrates de-watering facility using existing infrastructure. This turnkey brownfield project allowed the customer to defer capital expenditure and extend the life of the existing plant. On the back of this first project, a larger EPC greenfields project was subsequently awarded to Jord in 2015.

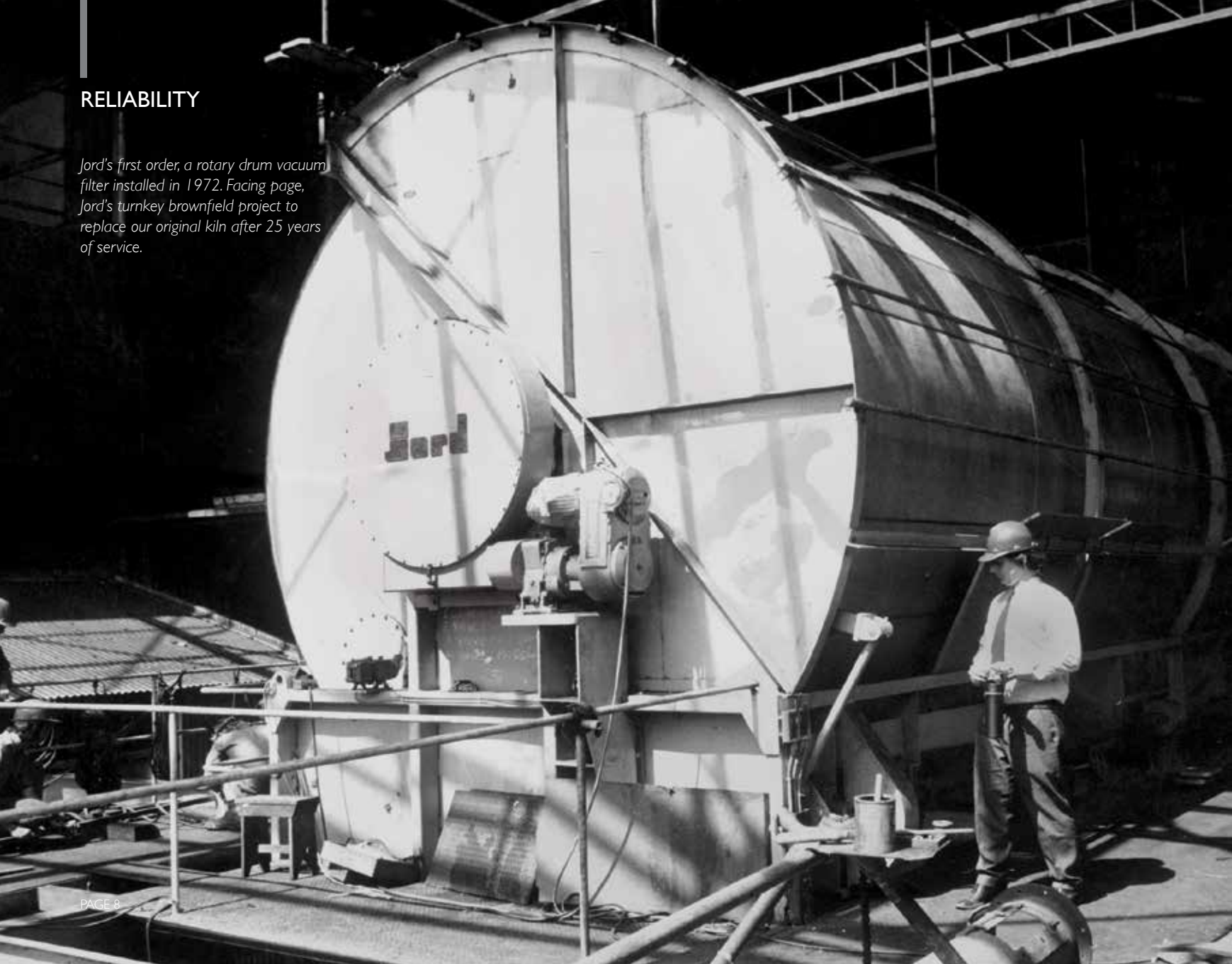
In 2014, Jord supplied a combination of vacuum filtration and belt press filter technology for fine coal concentrate and tailings de-watering at a Queensland coal preparation plant. In 2015, it was membrane chamber filter presses for a Saudi Arabian alumina plant.

“The man with a new idea is a crank – until the idea succeeds.” – Mark Twain



RELIABILITY

Jord's first order, a rotary drum vacuum filter installed in 1972. Facing page, Jord's turnkey brownfield project to replace our original kiln after 25 years of service.



IDEAS ENGINEERED

Reliability

Just as many of our earliest plants will soon reach 50 years of active service, we expect our latest plant to do the same, even in the most challenging of operating environments.

There are many reasons for this. First, we have the technical skills and take the time to understand the full plant in which our system will operate. This allows us to appreciate the risks; ensuring our part of the plant is well designed and manufactured. Second, we nurture exclusive, stable fabrication partnerships that over decades provide consistent quality of manufacture and service. Finally, as a private firm that's here for the long term, we bend over backwards to make sure our systems operate as designed for our clients. We systematically troubleshoot operational issues and work with our customers to optimise performance as process conditions change throughout the life of a plant.

The rotary drum vacuum filter Jord supplied to Queensland's Farleigh sugar mill in 1976 is still in operation today. This is one of hundreds of custom-designed Jord filters, across various resource industries, with decades of continuous operation to bear testament to their reliability.

The longevity of Jord kilns are similarly well proven. In 2014, we completed a turnkey brownfields project to retro-fit a kiln into a Bundaberg sugar refinery, replacing our original unit supplied in 1991.



CASE STUDY - SUGAR REFINING

*Clockwise from main page : Sugar de-colourisation (GAC) plant, India.
Air cooled steam condensers, Algeria.
3D model of Jord GAC plant under construction in Georgia, USA.*



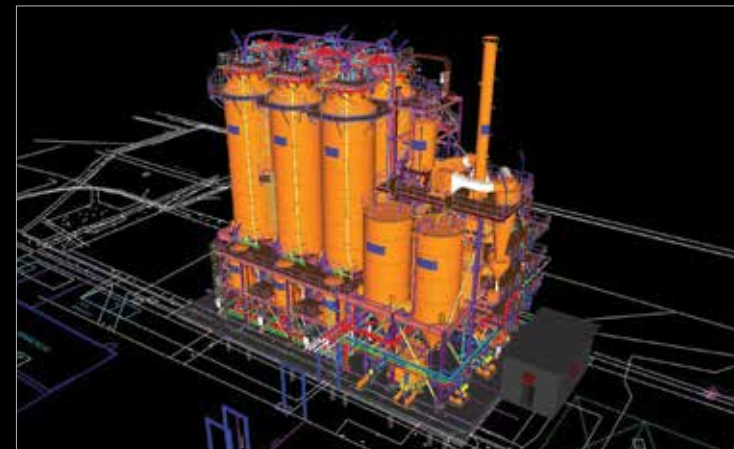
QUALITY DELIVERED

Case Study – Sugar Refining

Jord's record of delivering quality design and construct solutions to the sugar refining industry spans 40 years.

Jord's first sugar decolourisation (GAC) plant was commissioned for a Sydney refinery in 1982. Installations over subsequent decades in Asia, Africa and the Middle East have benefited from enhanced energy efficiency, improved automation to reduce operator input and increased plant availability, and improved colour reduction. Jord's GAC technology enjoys the environmental benefit of 100% water recycle, with no residual liquid effluents to treat.

Environmental benefits are also obtained via use of Jord air cooled solutions for steam condensation to recover water for re-use. This provides far better water efficiency over conventional cooling towers. Jord's air coolers are shop tested and supplied in modular form, to minimise site work and maximise quality control.



**“I can't understand why people are frightened of new ideas.
I'm frightened of the old ones.”**

– John Cage



Jord International

Jord has been serving the global process industries since 1972. Established in Australia, 80% of our business is international. Resources is one of three business divisions, the other two being Oil & Gas and Power. We believe our engineering ideas work because, though they are innovative, they come from a very stable and effective base of people, partners, capital, performance and standards. Our principles of respect and fairness in all dealings have served us well.

Installation of 4.4m diameter granulated activated carbon columns, Thailand.

JORD INTERNATIONAL



1970s

Australian Foundations

Jord formed in 1972 to support the Australian sugar, minerals, oil and gas industries. Core technology in heat transfer and separation.

1980s

Asian Manufacturing

Value added via pioneering a strategic manufacturing alliance in Singapore. This was soon followed with alliances in multiple Asian and Middle Eastern countries.

1990s

Technology Investment

Organic growth generated through the steady broadening of technology and know-how, the investment in ISO standards and the development of a proprietary project execution system.

2000s

Global Growth

The gradual opening of offices across most continents, to locate staff closer to customers and fabrication centres.

2010s

Strategic Alliances

A focus on exclusive alliances that leverage the complimentary skills of Jord and its partners to offer better value to customers.

FUTURE

Continued organic growth in delivering innovation, value and reliability to our customers and partners. FEED studies through to supply of multi-thousand ton modules.



Clockwise from main page : Three of nine vent scrubber modules undergoing Factory Acceptance Testing in Korea, prior to lowering into a horizontal position (opposite top) for export packing and shipping to a polycarbonate plant in Saudi Arabia (opposite bottom).



People

Jord was one of the first Australian engineering companies to support the country's resource boom from the 1970s. John Holden and Phil Blundell attracted and developed the expertise needed for their vision of serving the emerging petroleum, alumina, nickel and sugar industries, drawing in engineers with ability, humility, curiosity and dedication.

Now, the staff who share those same qualities span 10 countries, 25 nationalities and 40 languages. Our average length of service is 10 years, well ahead of the industry average.

Jord offers our people the stability of private ownership, flexible work arrangements to balance long-term commercial, professional and personal ambitions, and a significant share in the annual profit of the business.

One of the best examples of Jord's collaborative team efforts was our 2008 delivery of nine vent gas scrubber modules that removed volatile organic compounds from various process units in a Saudi Arabian polycarbonate plant. This project involved Jord staff resident in France, India, Korea, Singapore, Australia and Dubai.

“The value of an idea lies in the using of it.” – Thomas Edison



“Eventually everything connects – people, ideas, objects. The quality of the connections is the key.”

– Charles Eames

Facing page : Horizontal vacuum filters being installed into an iron ore facility, Western Australia. Above, containerised demonstration plant for nickel beneficiation, allowing fast and cost effective transportation for proving tests in multiple countries.

Partners

Jord fosters and sustains long-term partnerships with international technology leaders, with fabricators and with our customers, to learn from each other, solve challenges and engineer ideas. Many of these partnerships have prospered for decades.

Together, we have custom-built and manufactured well over USD 2 billion of bespoke plant and systems. Most recently, Jord is working with iron ore producers to optimise the treatment and handling of their problematic tailings product. Each project, each technical challenge and each commercial setting is different.

Jord has a long history of partnering with industry leaders to develop demonstration plants to test innovative minerals processing solutions. In the 1990's, Jord was engaged to pilot an indirect heating of nickel slurry that avoided the need to dilute the slurry by mixing it with steam.

In the 2000's, we worked with a leading mining firm to design and supply a series of demonstration plants for treating leach liquors in novel ways using chromatographic separation instead of high pressure acid leach. Jord designed the plant as easily transportable 40 foot shipping container modules, allowing cost effective trial testing to be undertaken in multiple locations across Europe and America.

Seven of 12 flash vessels for a New Caledonian nickel refinery. Each weighing up to 300 tons, the titanium clad vessels had a refractory brick lined lower section. Opposite bottom : Some of 42 various pressure vessels, tanks and decanters, up to 7m dia, Jord supplied to an Australian alumina plant.



Capital

Jord remains debt-free, with both a strong balance sheet and available facilities to ensure the financial demands of large international projects are met. Our conservative fiscal approach has helped us meet these demands despite four major global economic disruptions over our 40 years.

Retaining stable, private ownership during this time has also allowed Jord to invest in its staff for the long-term.

Performance

Annual revenues of up to \$200 million has been generated through steady, organic growth rather than 'bolt-on' acquisitions -- our customers trusting us with ever bigger and more complex projects. Our most satisfying projects are the ones where challenging circumstances are overcome and customer expectations are exceeded.

Jord's quality guarantee is backed by over 20 years of ISO accreditation; our systems are fully integrated to ISO9001, 14001 and 18001. We have developed our own custom-built, web-based "Horizons" project execution system and knowledge centre. Horizons gives our globally spread staff and customers real-time project information and performance data.



Jord Environmental Trust

The Jord Environment Trust ("JET") was established in 2007 with a charter to donate funds to international causes that help foster a biologically diverse and sustainable planet.

Over \$2 million of capital has been steadily accumulated out of Jord annual profits, the interest from which is donated to various not-for-profit causes.

Most recently, JET supplied pro-bono services and funding to deliver various clean water and clean (solar) energy projects to nature reserves being managed in outback Australia by the world renowned Bush Heritage Trust.



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