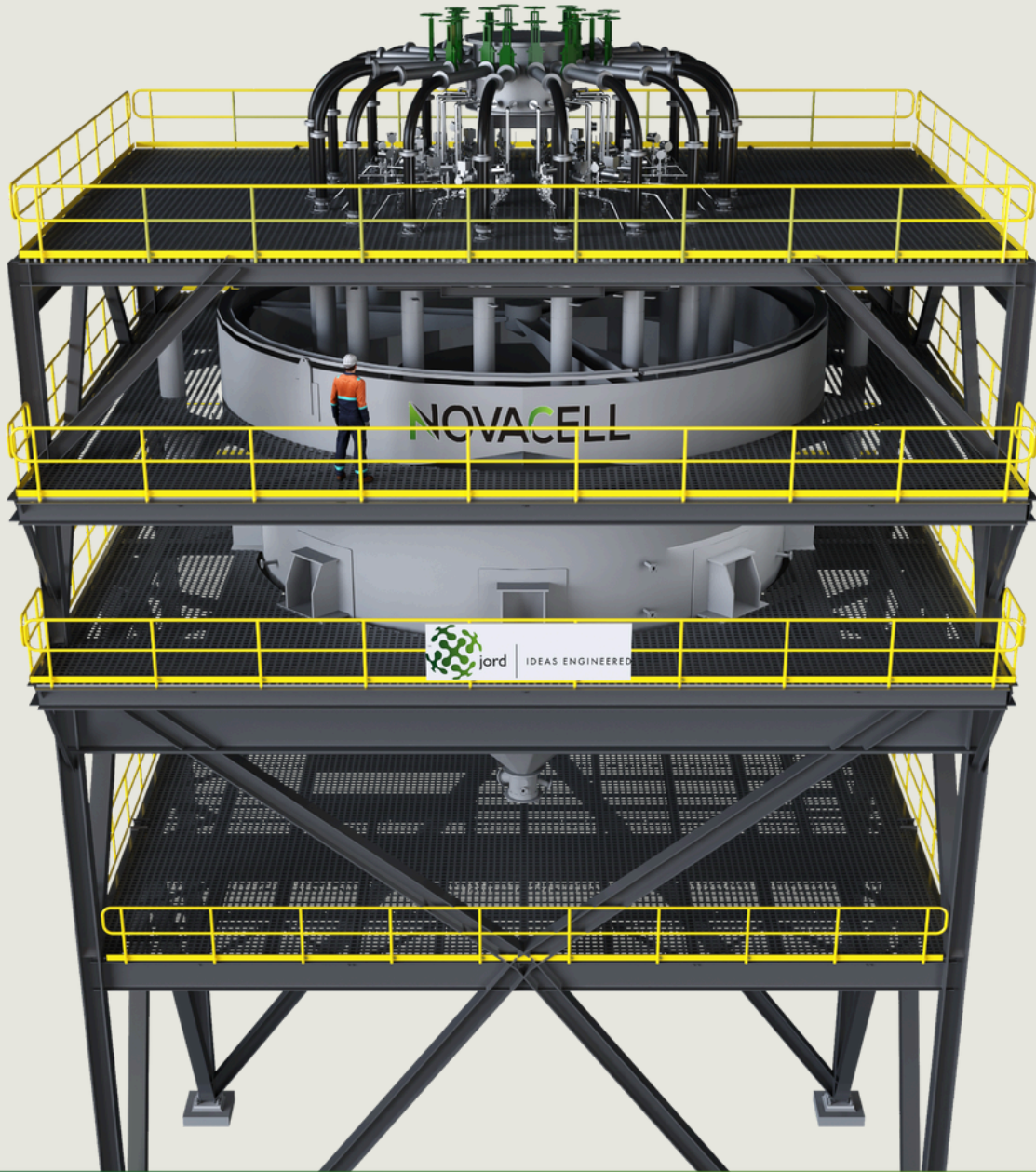




NOVACELL



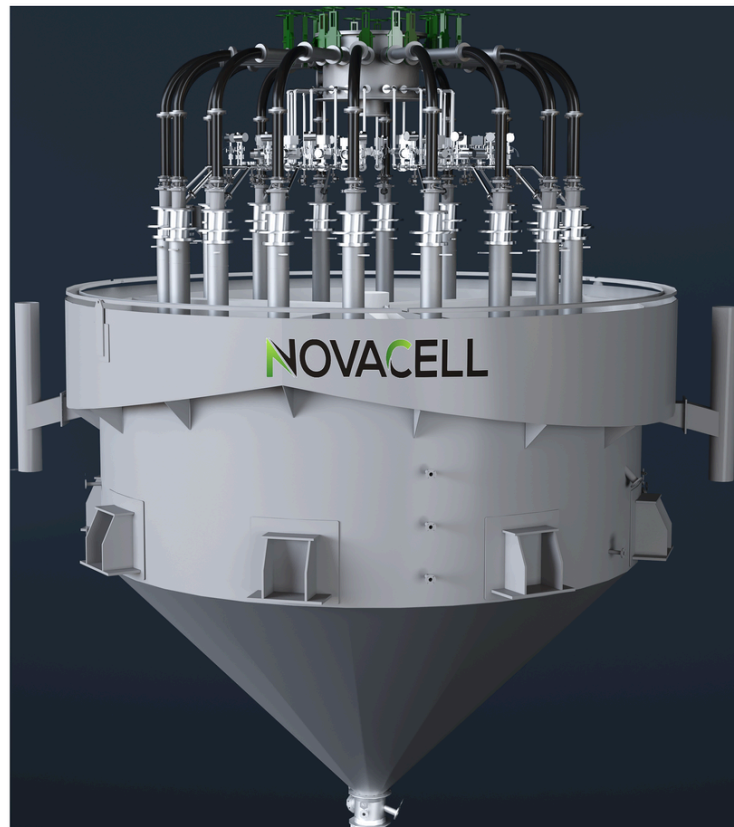
Novel flotation technology for Coarse Particle Flotation (CPF) circuits

jord.com



Introducing NovaCell™

Jord International Pty Ltd. (Jord), together with Laureate Professor Graeme Jameson, have developed a novel flotation machine called the NovaCell™. The NovaCell™ recovers valuable particles from 1µm to 1mm and is suitable for Coarse Particle Flotation (CPF) circuits, targeting lower energy and water consumption.



- NovaCell™ provides optimal conditions for both coarse and fine particle flotation recovery in one device.
- The NovaCell™ CPF circuit is simple to implement, maintain and control, with no need for an upfront de-slime circuit.
- The efficient design significantly reduces energy consumption in comminution circuits and enables the dry disposal of tailings.
- Jord offers test work programs and flexible delivery options.

**For more information, contact
Sherwin Morgan**

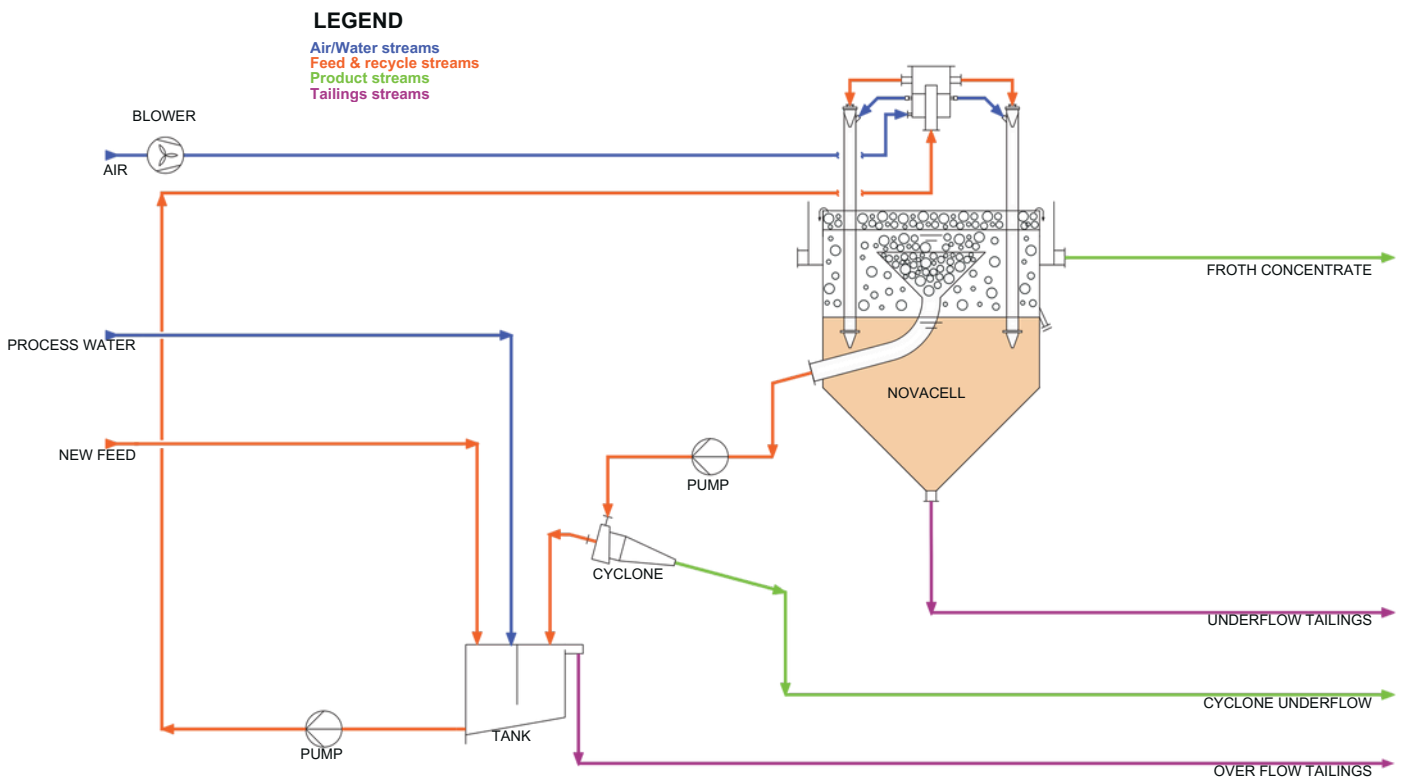
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Efficient Flotation Design

The NovaCell™ has a novel configuration, which produces the best hydrodynamic conditions for both coarse and fine particle flotation recovery. Feed material entering the NovaCell™, is distributed across pressurised downcomers where particles and tiny bubbles collide in the high-shear zone ideal for fine and ultrafine particle recovery. Material exiting the downcomers enters the fluidised bed, where partially loaded bubbles surround particles in a low-shear environment ideal for coarse particle recovery. Both coarse and fine valuable particles rise in the NovaCell™ and are collected as two separate product streams. A high-grade froth concentrate is collected at the top of the cell, whilst lower-grade composite particles are collected in an internal cone. The internal cone discharge feeds a classification circuit, where coarse particles are recovered as the second product stream.

In the simplified NovaCell™ schematic below, the classification circuit is represented by a cyclone. Depending on the process requirements, this may be in combination with a screen.



Technology Benefits



Lower Energy Consumption – The NovaCell™ can process coarse feed material, reducing the energy consumption in comminution circuits by up to 30%. Mineralogy indicates that the NovaCell™ can recover valuable particles with <10% liberation by surface area.



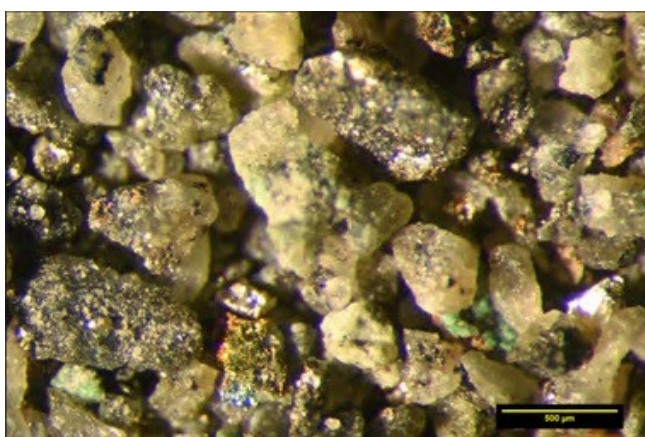
Improved Recoveries – The NovaCell™ produces improved recovery efficiencies across a wider particle size range than conventional mechanical flotation cells. The particles recovered to the product streams are also high in valuable mineral content, confirming good selectivity.



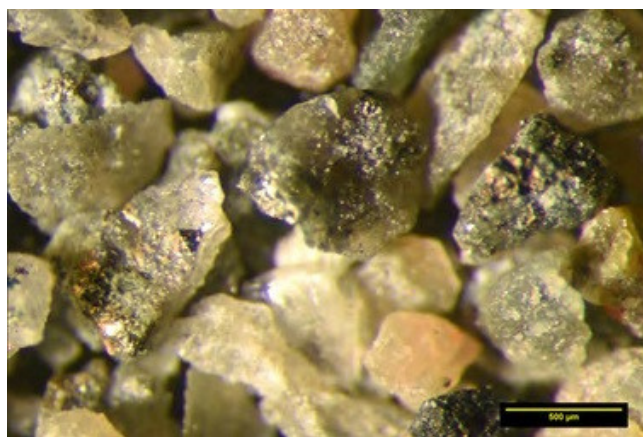
Reduced Environmental Impact – The NovaCell™ produces a coarse tail suitable for dry disposal. This enables the use of modern tailing management strategies such as dry stacking, which increases water recovery, and reduces water consumption.



Lower Capital Investment – The NovaCell™ does not need additional classification and flotation equipment to treat the fine material separately. It can treat the full flotation feed stream, resulting in a circuit that is simple to implement, maintain and control.



NovaCell™ Froth product (x40)



NovaCell™ Classification product (x40)

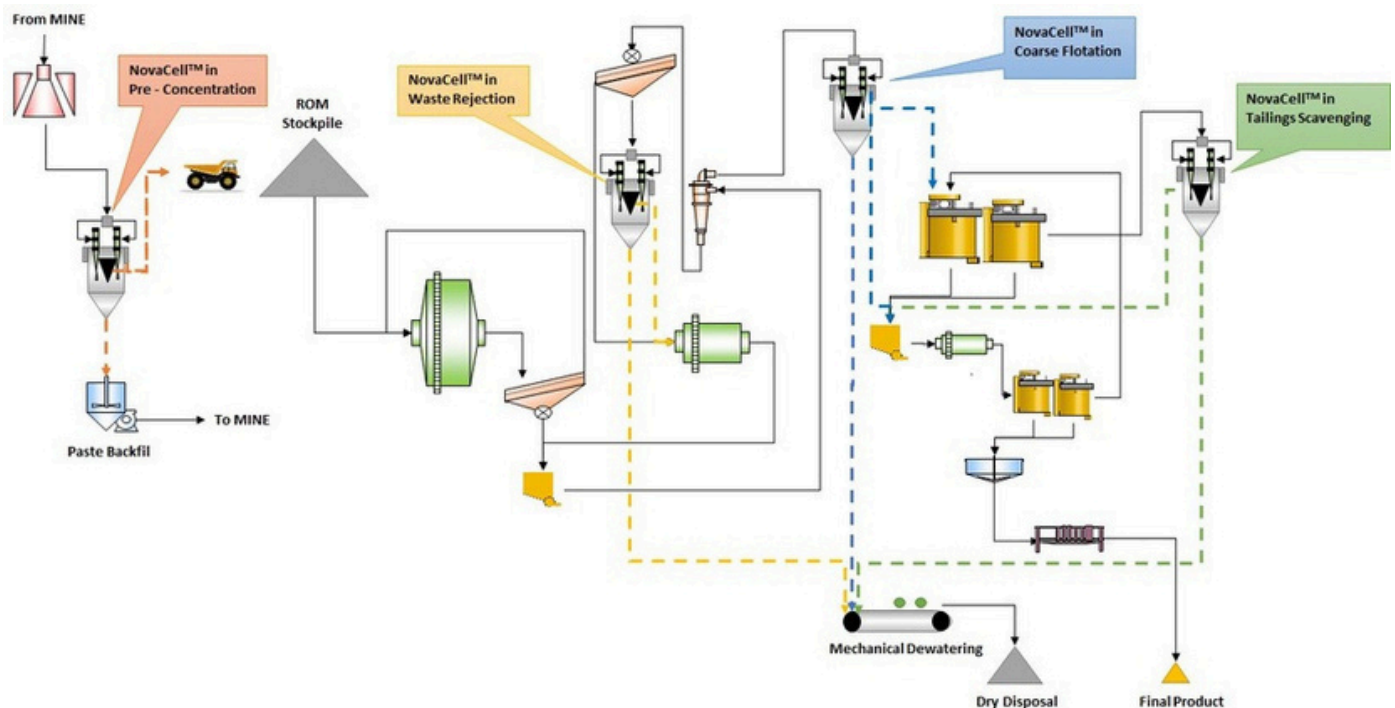
CPF Applications

Pre-Concentration – By maintaining high value mineral recoveries at coarse grind sizes, the NovaCell™ can be used in wet pre-concentration duties. The objectives are to lower ore cut-off grades, reduce carbon emissions associated with material handling and utilise the rejected waste for paste back-fill.

Waste (Gangue) Rejection – Similarly, by achieving high value mineral recoveries at coarse grind sizes, the NovaCell™ can be used to reject waste before secondary milling. The objectives are to enable higher throughput rates, reduce energy consumption per tonne of metal produced, and promote dry disposal of tailings.

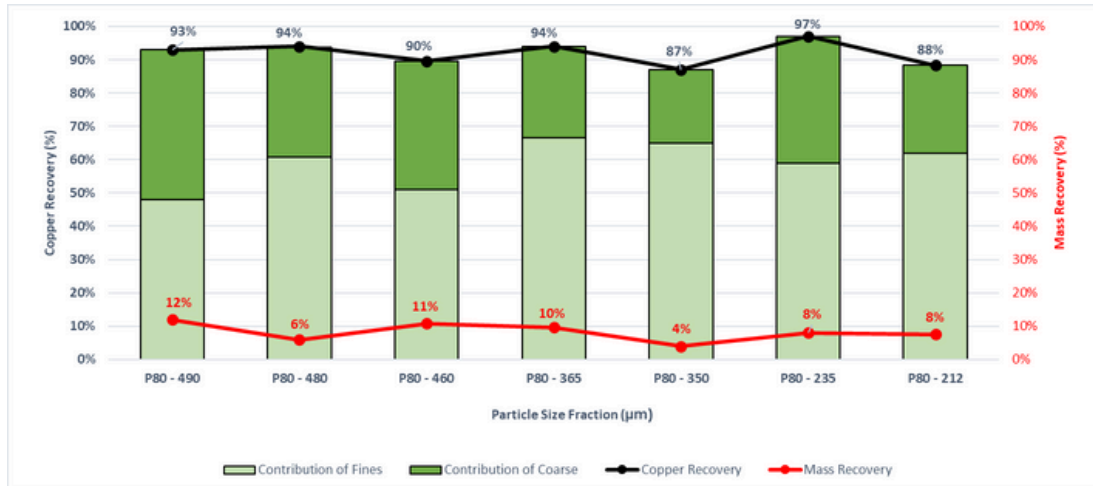
Coarse Flotation – By maintaining high recovery efficiencies across a wider particle size range, the NovaCell™ can be used in the rougher duty of flotation circuits. As in the case of waste rejection, the objectives are to enable higher throughput rates, reduce energy consumption per tonne of metal produced, and promote dry disposal of tailings.

Tailings Scavenging – By recovering coarse and fine valuable particles that are typically lost by conventional mechanical flotation cells, the NovaCell™ can be used for tailings scavenging. The objectives are to increase plant revenues and produce a 'cleaner' tailing with less acid-generating potential for disposal.

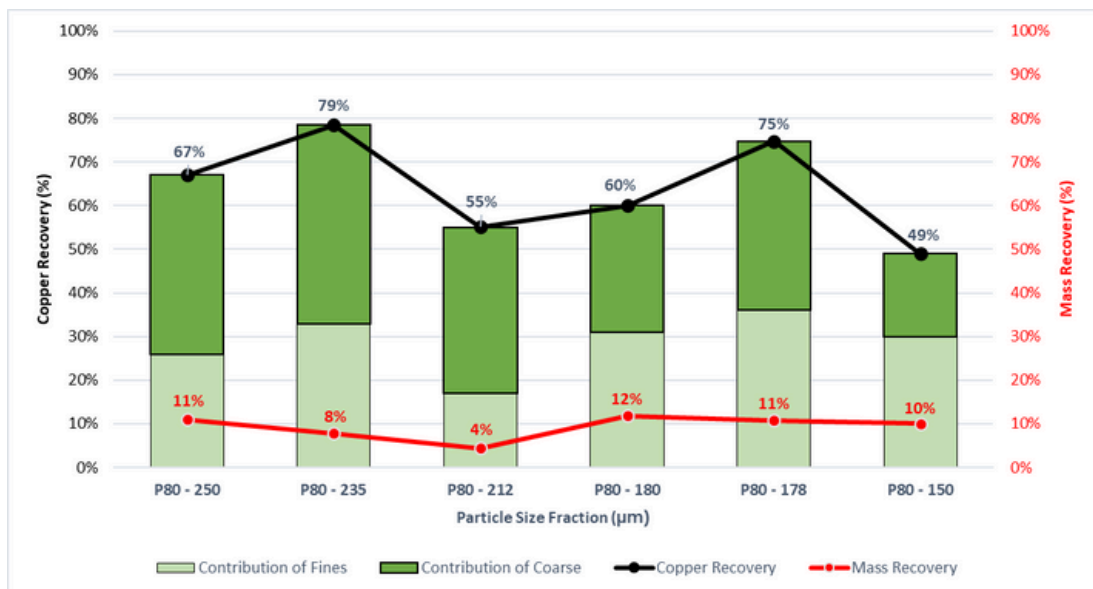


Proven Results

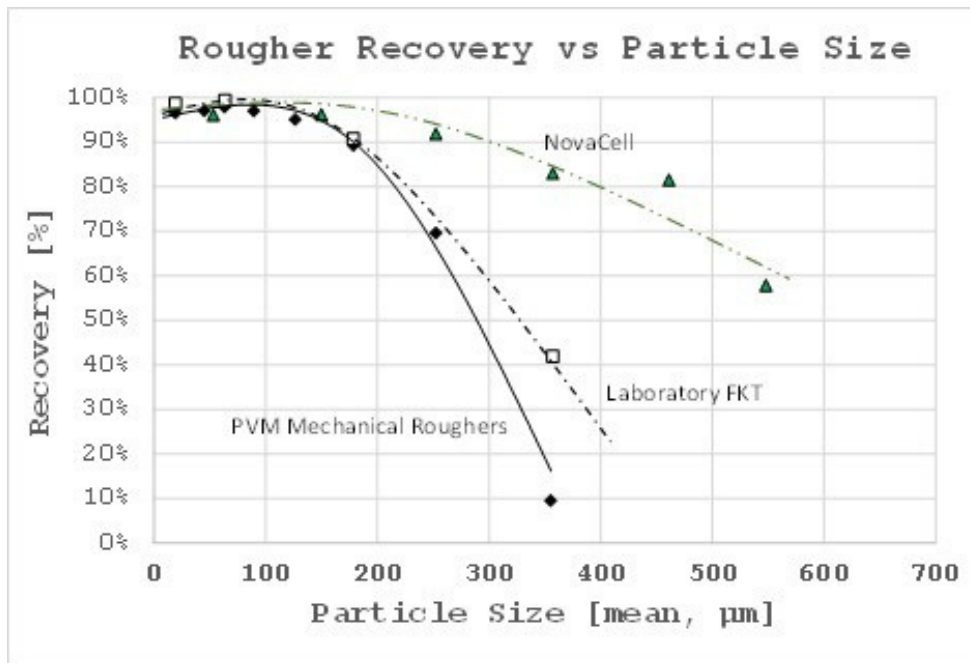
Pre-Concentration/Waste Rejection - The NovaCell™ technology has produced high recoveries at coarse grind sizes for coal, copper, lithium and potash ore bodies. Presented below are results from CPF test work studies, where the NovaCell™ achieved copper recoveries of 87 - 97% at mass pulls of 4 – 12%.



Tailings Scavenging - The NovaCell™ technology has produced high recoveries on plant tailings material at relatively coarse grind sizes. Presented below are results from CPF test work studies, where the NovaCell™ achieved copper recoveries of 79 - 49% at mass pulls of 4 – 12%.



NovaCell™ vs Mechanical Cell - Studies that compared the NovaCell™ to conventional mechanical flotation cells indicate that the NovaCell™ achieves significantly higher recoveries, especially in the coarser size fractions. Presented below are size-by-size chalcopyrite recovery results for the NovaCell™ and conventional mechanical flotation cells (plant and lab scale) at the Pinto Valley Mine in Arizona, USA.



FKT - refers to "Full Kinetics Test". It is a laboratory mechanical float test, developed by Aminpro to minimise coarse particle losses in the froth zone.

Testing Capabilities

Jord offers both NovaCell™ small-scale and pilot-scale test rigs for conceptual and pre-feasibility engineering studies. The small-scale test rigs are located in commercial laboratories, and the work is completed under Jord's guidance.

The pilot-scale rig is contained within 20-foot shipping containers for ease of transport to operating mines. The pilot rig includes a classification circuit, tanks and pumps. It is also supplied with an integrated PLC system.



NovaCell™ small-scale test rig



NovaCell™ pilot-scale test rig

Flexible Delivery Models

Jord has over 50 years of experience in modular design, manufacture and installation of process plants. The business is supported by a well-established global network of fabrication alliances in strategic locations around the world. We can deliver the NovaCell™ technology as equipment supply or as a full turn-key solution, depending on your requirements. The NovaCell™ components are designed to international engineering standards and produced in a clean and controlled workshop environment with Quality Assurance and Quality Control protocols in place.

About Jord

Jord designs, manufactures, commissions and services custom designed process plant and systems. For over 50 years, the Jord Group has served the global energy and resource process industries. From its Australian headquarters, Jord has delivered over \$5 billion of bespoke plant and systems to over 130 countries around the world. Visit www.jord.com.au for more information.

Our Research and Development Program

At Jord, we live by the motto 'ideas engineered'. Jord heavily invests in research and development initiatives with a goal to commercialise new minerals beneficiation technologies for more efficient and more effective liberation of ore. Our goal is to unlock new technologies that provide step-change improvements to current processes in the industry. It's about recovering critical minerals using less energy, using less water, and removing environmental challenges.

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