About Us - Magnium Australia

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Magnium Australia is constructing the world’s first decarbonised magnesium metal plant. Magnium’s breakthrough technology combines Australian feedstock with renewable energy to produce zero carbon Magnesium metal ingots of >99.8% purity.

Magnesium is the lightest of the structural metals with the greatest strength-to-weight ratio. As a result, magnesium is a critical strategic metal used in lightweight alloys, hydrogen storage, electronics, medical implants, and defence applications. Magnesium components are 75% lighter than steel components. As an example, every kilogram of magnesium used in motor vehicles is estimated to reduce carbon dioxide emissions by 50 kilograms over the motor vehicle's life.

Over 87% of the world’s magnesium is produced in China through a carbon-intensive process, significantly contributing to climate change. Traditional refining uses a great deal of energy and releases sulphur hexafluoride – a greenhouse gas 22,800 times more effective at trapping infrared radiation than CO2.

Magnium Australia is the cornerstone of a green critical metals cluster, bringing together minerals’ extraction, manufacturing, and supply chain resilience while tackling climate change and creating jobs in regional Australia.

Magnium’s process was derived from a breakthrough in rocket science which enabled unprecedented efficiency and low emissions for the production of magnesium through a carbothermic reduction – when carbon is using carbon as a reducing agent in metal oxides.

Rocket nozzles ensure supersonic shock quenching of magnesium vapour. The application of carbothermal reduction of magnesium combines proven technology with a novel application.

Australia’s aluminium industry imports 99% of its magnesium requirements from China. Magnium’s first production plant will produce 1,000 tons of magnesium a year - half of Australia’s current magnesium imports.

Supporting material for the advancement of the national science agency developed technology globally includes 25 December 2020 China State funded research which states interalia:

To solve this critical problem, Australia's national science agency, CSIRO developed the Magsonic™ carbothermal technology based on carbothermal reduction technology with supersonic quenching, and has obtained magnesium powder by this technology. However, this technology has not yet been commercialized. https://www.sciencedirect.com/science/article/pii/S2213956720302589

References:

https://www.epa.gov/f-gas-partnership-programs/magnesium-industry

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Indigenous Engagement Strategy

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