

AUSTRALIAN MANUFACTURER DELIVERS WORLD-LEADING LIQUID HYDROGEN STORAGE PROJECT WITH LOCKHEED MARTIN

- *Australian composite manufacturer Omni Tanker and its partners are addressing the challenge of storing and transporting liquid hydrogen in space, and on earth*
- *The collaborative project brought together Omni Tanker, Lockheed Martin, the University of NSW, and the Advanced Manufacturing Growth Centre to address the challenge*
- *The project leverages world-first nano engineering solutions, and Australian-developed and patented technology, to store liquid hydrogen and helium in a leak-free composite tank*
- *Successful development of the technology unlocks commercial opportunities for the transport of cryogenic cargoes spanning the space and terrestrial transport sectors.*
- *NOTE: high resolution images available from AMGC Newsroom - [here](#)*

Two years in the making, Australian composites manufacturer Omni Tanker in collaboration with international aerospace giant Lockheed Martin and the University of New South Wales (UNSW) has developed a world-leading solution for the transport of cryogenic and liquid cargoes of hydrogen and helium, with support from the Advanced Manufacturing Growth Centre (AMGC).

The collaborative partnership builds upon Omni Tanker's expansive composite capabilities developed for use across its industrial transport portfolio. The company currently leads global manufacturing in lightweight, composite road tankers for caustic materials that are used and sold locally and exported to Europe, and North America from its Sydney base.

Pairing Omni Tanker's capabilities with Lockheed Martin's extensive aerospace experience led to the development and manufacture of two new tanks including a:

- Type 4, fluoropolymer-lined, carbon fibre composite tank, and a
- Type 5, liner-less, carbon fibre composite tank.

The tanks can store and transport liquid hydrogen, as well as oxygen, hydrogen peroxide, and hydrazine at high pressures under extreme cryogenic temperatures.

In testing, the tanks achieved their performance metrics, particularly when materials were exposed to cryogenic temperatures as low as minus 269 degrees Celsius. As a result of the successful project, operational-scale demonstrator versions of the tanks for Lockheed Martin's LM2100 satellite have now been manufactured at Omni Tanker's advanced manufacturing facility located in Sydney's west.

Omni Tanker CEO and Founder Dr Daniel Rodgers said the \$1.59 million project has taken the company's world-leading capabilities to new heights.

"By leveraging Omni Tanker's capabilities, we have been able to translate our composite road tanker technology to the global space sector – where performance, weight, and cost are of paramount importance", said Rodgers.

“Omni Tanker can develop and deliver composite pressure vessels to meet demanding technical requirements quicker and at a lower cost than exotic materials, such as titanium, which are widely used in the space sector.” Rodgers said.

Christopher Hess, Lockheed Martin Australia’s Head of Industrial Development said, “The global strategic environment is constantly evolving, and Lockheed Martin is committed to working with industry, through exemplary partners such as Omni Tanker, UNSW, and AMGC, to deliver a world-leading space capability.”

Dr Jens Goennemann, Managing Director of AMGC, said the project demonstrates the importance for manufacturers to look beyond their current businesses.

“With the assistance of AMGC, Omni Tanker has done what more manufacturers should do: seek ways to leverage their capabilities across adjacent opportunities, in this case moving from road tankers to spacecraft”, said Goennemann. It’s generally not rocket science – except in this case it is.” Said Goennemann.

Together, the project participants identified a new application for Omni Tanker’s patented OmniBIND solution which links an interior thermoplastic tank to a lightweight composite exterior tank. The use of a nanoengineered additive product, developed by a UNSW, prevented matrix cracks usually present at extremely low temperatures in pressure vessels storing liquefied hydrogen.

UNSW’s Scientia Professor Chun Wang explains, “The collaborative efforts with Omni Tanker and Lockheed Martin Space have been pivotal in transforming this cutting-edge technology into practical commercial applications”, said Professor Wang.

“As a result of extensive nano-engineering efforts, we now have composite structures that can withstand the extreme cold of liquid hydrogen without experiencing microcracking or hydrogen gas leak.” said Professor Wang.

Dr Luke Djukic, CTO at Omni Tanker, said the project represented a significant step forward for the company and a strategic leap in sovereign capability.

“These new material technologies are well-matched to the high-end pre-impregnated composite materials typically used in aerospace yet offer a more economical production method from materials that are readily available,” said Djukic.

“In developing these new products and processes onshore, we have established significant sovereign capability at Omni Tanker. We look forward to leveraging this capability as we move our tanks into operational use across the transport and aerospace sectors here and abroad.” said Djukic.

The co-funded project worth a total \$1.59 million, received co-investment from the Advanced Manufacturing Growth Centre to the value of \$700,000, while in-kind contributions totalled \$194,000. Further information regarding the project is available via www.amgc.org.au/project/development-of-type-iv-and-type-v-carbon-fibre-reinforced-polymer-tanks/

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About Omni Tanker

Omni Tanker is an advanced manufacturer using carbon fibre composite materials to produce innovative safe and lightweight tanks with exceptional chemical resistance. Omni Tanker's patented technology solves the challenges of transport equipment for aggressive corrosive and strong oxidising chemicals, and has been widely recognised by numerous international awards in the transportation and composites industry.

The company has established a dominant position for corrosive chemical transport equipment in the Australian market, where it manufactures and exports bulk liquid transport equipment to worldwide locations including North America and Europe. The equipment is available as road tankers, cargo tank motor vehicles, and portable tank containers including ISO and Swap tanks. For more information visit www.omnitanker.com

About Lockheed Martin

Headquartered in Canberra, Lockheed Martin Australia is a wholly owned subsidiary of Lockheed Martin Corporation. The company employs more than 1,200 people in Australia working on a wide range of major programs spanning the aerospace, Defence and civil sectors.

About the University of New South Wales (UNSW)

The University of New South Wales (UNSW) is one of Australia's leading research and teaching universities. Established in 1949, UNSW has expanded rapidly and now has more than 52,000 students, including more than 14,000 international students from over 130 different countries. UNSW offers more than 300 undergraduate and 600 postgraduate programs, and has developed an extensive network of alumni chapters throughout Asia.

About Advanced Manufacturing Growth Centre (AMGC)

The Advanced Manufacturing Growth Centre (AMGC) is an industry-led, not-for-profit organisation established through the Australian Government's Industry Growth Centres Initiative. AMGC's vision is to transform Australian manufacturing to become an internationally competitive, dynamic, and thriving industry with advanced capabilities and skills at its core.

Through the delivery of its world-leading research, Manufacturing Academy, workshops, and ground-breaking projects, AMGC aims to develop a highly skilled and resilient local manufacturing industry that delivers high-value products – via the integration of innovative technology – to domestic and international markets. <http://www.amgc.org.au>

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