



World's Largest Additively Manufactured Titanium Rocket

- **Additively manufactured using Titomic Kinetic Fusion® (TKF) in just 27.6 hrs**
- **Titomic Kinetic Fusion capability to build a full a scale space rocket in 165 hrs**
- **Worlds first additively manufactured high-performance titanium rocket**

Frankfurt, Germany, November 21, 2019: Titomic Limited (ASX: TTT) ("Titomic" or "Company") Australian digital manufacturing solutions company is pleased to announce that today it unveiled the world's largest additive manufactured Titanium part, a 5.5 meter long rocket at FormNext, the world's premier 3D Printing trade show.

The rocket was manufactured on the Titomic TKF 9000 system, the world's largest and fastest metal additive manufacturing system, at Titomic's Melbourne Production Bureau. The TKF 9000 has a build size of 40.5 cubic meters being 9m x 3m x 1.5m utilising patented Titomic Kinetic Fusion® (TKF®) technology capable of build rates of up to 30 kilograms per hour compared to many melt-based metal additive manufacturing machines which often print less than 1 kilogram per hour.

This 5.5mt long rocket was manufactured in just 27.6 hours using the TKF9000 system and is a smaller-scale version of the Gilmour Space ERIS-S rocket that is 27mt long which will provide customers reliable and cost-effective access to space. Titomic has the capability to build the full-scale Gilmour Space ERIS-S rocket in just 165 hours with the patented TKF® additive manufacturing process utilising its economical high-performance titanium and other super alloy powders that can also be applied to ballistic missiles for defence applications.

Titanium is a highly desirable material in aerospace and defence industries for its lightweight and high strength properties however, due to its limited supply, with Russia being the major world supplier, and the difficulty of manufacturing Titanium parts using traditional methods, it has been commonly too expensive to use.

Today, due to these factors, many high-profile aerospace organisations such as SpaceX, are forced to use less optimal materials like stainless steel 301, a material which is twice the weight and a quarter the strength of Titanium¹. Titanium provides superior mechanical properties of higher fatigue and tensile strength, lower thermal expansion and specific heat capacity compared to stainless steel. Most importantly, Titanium also holds nearly three times the thermal shock resistance in comparison to stainless steel making it highly suitable for building rockets.

Titanium rockets made with TKF® are half the weight of stainless-steel rockets made with traditional manufacturing methods which allows for the rockets to have an increased payload mass and volume capability which opens new possibilities for more economic payload deliveries to space. TKF® allows very large seamless shapes to be produced, highlighting the advances of additive manufacturing not only being improvements in productivity and affordability, but also surpass traditional manufacturing methods.

Mr. Jeff Lang, Titomic Managing Director said:

"Previously, Titanium was more than twice the price of stainless steel but now with our development of new titanium powder supply chains and Australia's significant mineral sand resources of approximately 280M tons of Titanium, Titomic is at the forefront of advancing technology to ensure the future sustainability of the earth's resources whilst reducing carbon emissions for global manufacturing."



¹ **AISI 301 Stainless Steel vs. Grade 5 Titanium**

<https://www.makeitfrom.com/compare/AISI-301-S30100-Stainless-Steel/Grade-5-Ti-6Al-4V-3.7165-R56400-Titanium>

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About Titomic Limited:

Titomic (ASX:TTT) is an Australian public company specialising in digital manufacturing solutions for industrial scale metal additive manufacturing using its patented Titomic Kinetic Fusion® (TKF) technology. The TKF technology provides unique capabilities for producing commercially viable additively manufactured metal products competing directly with traditional manufacturing methods. Titomic provides OEM production and R&D services from their TKF Smart Production Bureaus to the global Aerospace, Defence, Shipbuilding, Oil & Gas, Mining and Automotive industries. Titomic also provides an extensive range of metal powders for 3D Printing especially Titanium and super alloys whilst providing sales and support services for their TKF production systems.

For more information please visit: www.titomic.com

Forward-looking statements:

Certain statements made in this release are forward-looking statements and are based on Titomic's current expectations, estimates and projections. Words such as "anticipates," "expects," "intends," "plans," "believes," "seeks," "estimates," "guidance" and similar expressions are intended to identify forward-looking statements. Although Titomic believes the forward-looking statements are based on reasonable assumptions, they are subject to certain risks and uncertainties, some of which are beyond Titomic's control, including those risks or uncertainties inherent in the process of both developing and commercialising technology. As a result, actual results could materially differ from those expressed or forecasted in the forward-looking statements. The forward-looking statements made in this release relate only to events as of the date on which the statements are made. Titomic will not undertake any obligation to release publicly any revisions or updates to these forward-looking statements to reflect events, circumstances or unanticipated events occurring after the date of this release except as required by law or by any appropriate regulatory authority.