Defence

Industrial Scale Advanced Manufacturing

Advanced manufacturing larger, faster and smarter.

Titomic is an advanced manufacturing company solving complex engineering challenges utilising automation, materials and additive manufacturing. Titomic leverages on patented processes and material science to create high performance, engineered products.

Titomic Kinetic Fusion

This process is based on supersonic particle deposition of metal powders to create industrial scale parts and complex surface coatings.

Differentators

- World's largest metal 3D printer
- Build envelope L 9m x W 3m x H1.5 (40.5m³)
- Rotational build size L 5m x D 2m
- Fastest build rates of up to 45kg/hr
- Deposition efficiency as high as 95-97%
- No heat related distortion or oxidation
- Metal composites for next generation ballistics protection
- Fuse dissimilar metals for multiple performance
- Monocoque seamless complex shape metal parts

Land Vehicles

Land combat systems built from titanium alloys can typically achieve 40% weight reduction, improving ballistics protection, mobility and fuel efficiency.

Capabilities

- Parts manufactured by Titomic Kinetic Fusion can replace forgings & castings
- Wrought properties can be achieved with post heat treatment
- New super alloys which are lighter, stronger and more cost-efficient for land vehicle components
- Upgrade or manufacture of stronger, lightweight applique and spaced armour
- Portable maintenance and repair

Armoured personnel carriers, tanks, military trucks, bridging, Unmanned Surface Vehicles (USV), Unmanned Ground Vehicles (UGV)

Ballistics Coatings

Research, design, testing and production of next generation ballistics coatings to meet North Atlantic Treaty Organisation (NATO) or National Institute of Justice (NIJ) standards

Capabilities

- Ballistics shielding coatings against high-velocity rounds for improved survivability
- Ballistics shielding coatings can be post-applied to components and vehicles
- Lightweight dissimilar metal multi-layer armour plates

Weapons & Armaments

New and advanced materials testing into required hardness for components and full isotropic structural fragmentation to increase lethality.

Capabilities

- Low observable signatures to improve survivability of munition against air defence systems
- Hypersonic coatings for high-altitude & corrosive environments to deliver payloads across terrains
- Fusion of dissimilar metals to achieve different mechanical properties in one structure to achieve mission flexibility

Missiles, rockets, missile and rocket launchers, turrets, rifles, machine guns and support weapons

Personal Protection

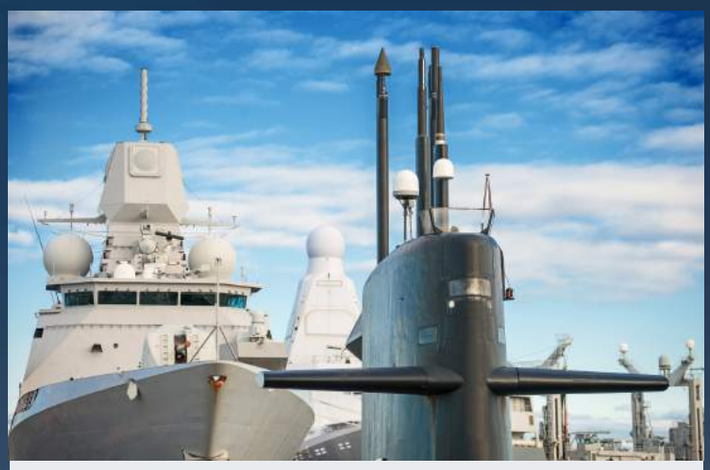
Next generation ultralight body armour personal protection to enable soldiers and law enforcement to complete missions safely and more efficiently

Capabilities

- Reduced weight with modular plates customised to fit in uniform configuration, improving flexibility and protection
- Polymer composites with surface metallisation for various armour protection applications
- Dissimilar metal multi-layer lightweight armour plates
- Electromagnetic interference (EMI) / Radio Frequency interference (RFI) shielding coatings
- Ballistics shielding coatings

Body armour, protection inserts, helmets, head protection systems, exo-skeletons, load carriage equipment, field delivery equipment fleet : trunks and shields. Infrastructure protection: safety cabinets and armoured rooms

Naval & Maritime



Replace traditional manufactured metal parts for naval and marine with industrial scale metal additive manufacturing. Create seamless complex shaped metal parts with improved corrosion resistance.

Capabilities

- High performance anti-fouling and hydrodynamic metal coatings
- Restorative metal additive manufacturing of hulls and worn, corroded parts
- Ballistic coatings of dissimilar metals and metal composites
- Large scale additive manufacturing of marine propulsion, drive shafts, turbine blades, rudders and bearings
- Replace forgings & castings with industrial scale metal additive manufacturing
- Corrosion resistant dual-wall metal piping & valves to replace laser cladding & polymer coatings

Frigates, submarines, landing craft, hovercraft, boats, offshore patrol boats, rapid response boats, Unmanned Underwater Vehicle (UUV), naval equipment, wharves and ports

Aerospace

Next generation super alloy additive manufactured near net shapes, machining away only 10% of material, cutting buy-to-fly ratio by up to 80%, reducing maching time from days to hours.

Capabilities

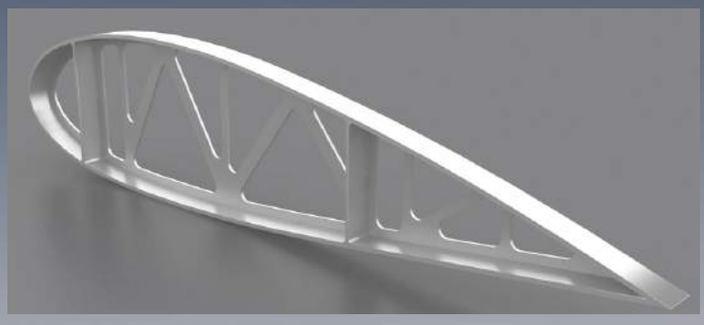
- Low signature titanium alloy unmanned combat aerial vehicles to improve survivability in strike and air combat
- Lighter, stronger, more fuel-efficient UAVs allowing for larger payloads and durability
- Metallise composites such as carbon fibre, allowing the creation of lightweight, super strong components to withstand high stress
- Engineering services, R&D for new superalloys, metallurgy and rapid prototyping
- Seamless fuselage and monocoque complex shape structures
- Metals composites to create hybrid materials such as composite ceramic and hypersonic coatings
- Effective aircraft maintenance of alloy structures to reduce upgrade costs throughout the aircraft's lifetime

Reconnaissance & surveillance aircraft, refuelling aircraft, joint strike fighters, helicopters, Unmanned Aerial Systems (UAS), Unmanned Aerial Vehicles (UAV), satellites

TAUV T Series Armoured UAV
Courtesy of TAUV Systems

Case study

Titomic produced a titanium aerospace component below, demonstrating significant cost, material and time savings.



Comparison between processes	Subtractive Manufacturing	Titomic Additive Manufacturing
Raw material Ti6Al4V	225kg billet	25kg powder
Material machined away	90%	10%
Machining time (approx.) @4.55 kg/hr	44.5 hr	1.5 hr + 1 hr build time
Material cost	**$5,625**	**$2,500**

Partnerships and associations

TITANIUM

CSIRO

VICTORIAN DEFENCE ALLIANCE AEROSPACE

VICTORIAN DEFENCE ALLIANCE LAND SYSTEMS

VICTORIAN DEFENCE ALLIANCE MARITIME

VICTORIAN DEFENCE ALLIANCE SUBMARINES

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