



Additive Manufacturing

Your systems, made better

Maximise your production & profitability

MSI 
VIKING

Find out more at msi-viking.com
864.433.9771



Put the power back in your hands, go to market faster and be more profitable with our complementary additive manufacturing systems.

Leveraging our patented Titomic Kinetic Fusion (TKF) technology, we work with you to integrate our custom in-line manufacturing solutions into your production line.

Our systems are specifically designed to your needs and engineered to reduce lead times, maximise uptime, cut material costs and enhance performance. So you can add greater efficiency to your operations and unlock new material possibilities – to maximise production and profitability.

- ✓ Machines
- ✓ Materials
- ✓ Software
- ✓ Training
- ✓ Support

From prototyping to R&D, small-run production and on-demand manufacturing, our fully customisable Titomic Kinetic Fusion Additive Manufacturing (TKF AM) systems bring the limitless possibilities of high-pressure cold spray technology and more to your factory floor – without making your existing equipment obsolete.



Faster output



Less waste



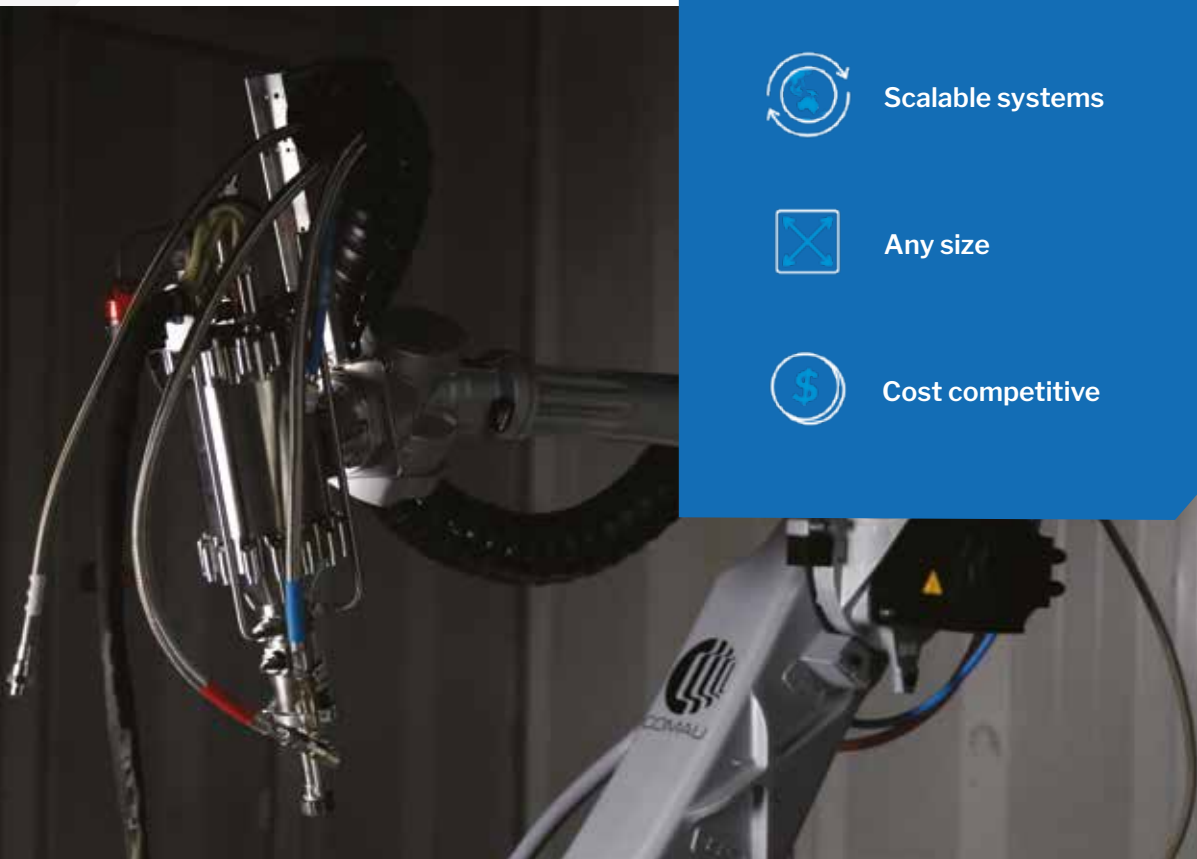
Scalable systems



Any size



Cost competitive



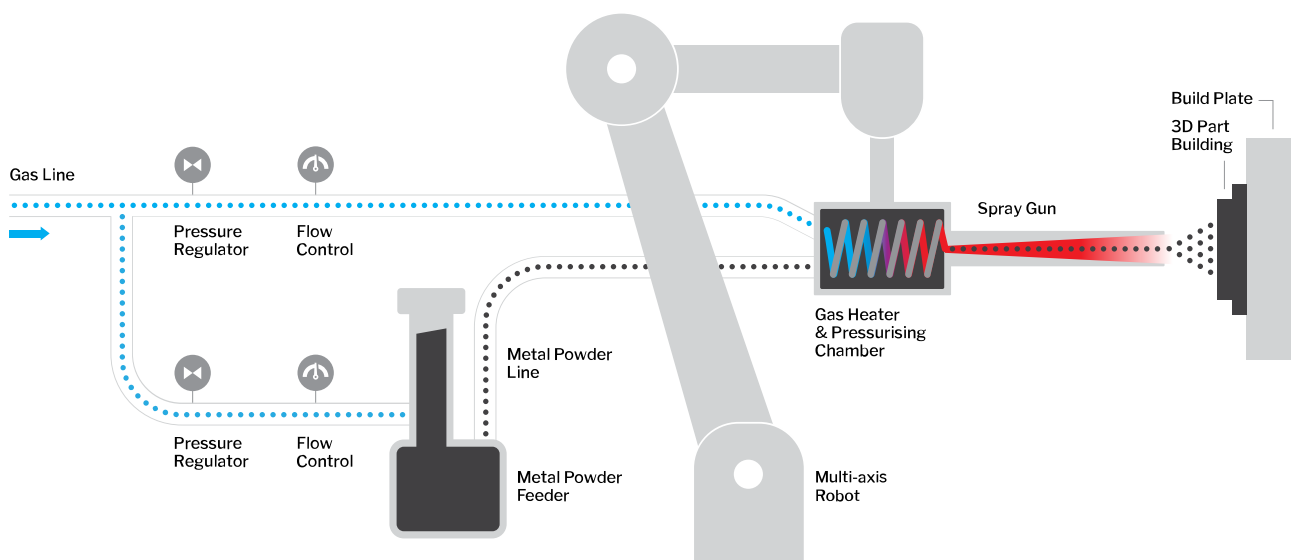


How it works

High-pressure cold spray technology makes it quicker, easier, safer and more sustainable to produce multi-metal, high-performance parts on demand – saving time, costs and waste while reducing risk.

This revolutionary process rapidly deposits strong metals, alloys and other specialty materials at low temperatures. So they retain their intrinsic properties without needing to be melted.

By integrating this advanced technology into your existing systems, you can produce new parts with maximum uptime.



- 1 Metal particles are injected into a gas jetstream.
- 2 The particles accelerate at supersonic speeds.
- 3 The particles exit the spray nozzle.
- 4 The particles collide with the surface and deform, sticking to the surface and to each other.
- 5 The particles build up, developing into near-net-shape metal parts.

This process unlocks **limitless design possibilities** with minimal heat distortion. And because the materials keep their intrinsic properties, they're comparable or superior to cast and wrought materials.

Common applications

Titomic's turnkey TKF AM systems harness cold spray technologies together with machines, materials, software and robotics (backed by training and support) to produce better-performing parts for a variety of applications in high-pressure environments:



BARRELS

Produce large multi-metal barrels that are lighter and offer better corrosion and erosion performance than traditional techniques.



TOOLING

Produce stronger, lighter, thinner and corrosion-resistant near-net shape faceplates – with reduced welding, assembly and lead times.



BALLISTICS

Produce larger, lightweight titanium armour at a competitive price point.



STRUCTURES

Replace complex and costly welded assemblies with single-piece structures.



New & novel materials

In creating heterogeneous alloys, we can combine materials that typically don't go together (such as blending titanium with ceramic, or coating copper with stainless steel without needing to melt it) to reap the intrinsic benefits of each – such as combating corrosion, wear and any other issues impacting your operations.

Next generation materials

With problem solving in our DNA, we can recommend the right materials for the best possible outcome. Together with our technology, the possibilities are limitless.



Near net shape
manufacture



3D freeform
components



MetaMaterials



Functional
coatings



Joining dissimilar
metals

TKF material mechanical properties

Material	Yield strength	UTS	Elongation
Inconel 718 (HT1*)	977 MPa	1,145 MPa	8%
Inconel 718 (HT2*)	680 MPa	1,080 MPa	28%
SS 304L	348 MPa	645 MPa	32%
Invar36	371 MPa	517 MPa	26%
CP Titanium HDH	702 MPa	800 MPa	5.3%
4330 Steel (HT1*)	1,180 MPa	1,300 MPa	8%
4330 Steel (HT2*)	860 MPa	950 MPa	12%

ASTM E8 Standard, *Heat Treatment Profiles are available from Titomic

TKF 1000 modular additive manufacturing system

Faster, simpler on-demand

Ideal for low to mid-size production applications, our modular system offers rapid and agile manufacturing, prototyping, custom parts and pilot runs before mass production.

Because the TKF 1000 can fuse dissimilar metals, it can be used with a wide variety of metals and alloys including titanium, steel, copper, nickel and magnesium.



Manufacturing with advanced materials



Automated robotic production



Fuse dissimilar metals to create custom solutions



Additive manufacturing without distortion or oxidation



Multiple powder feeders allow rapid manufacturing with dissimilar metals



Combine multiple materials in parts



Cost effective digital manufacturing



Industry leading build rates

Specifications

Build Envelope	1 x 1 x 0.75m
Footprint	6.3 x 4.1 x 3.6m
Shuttle Load	750kg

Control / Robotics / Industry 4.0

Controls Platform	Siemens
Interfacing	Profinet or flexible
Offline Robotic Simulation	Extensive path strategy options
Industry 4.0 Platform	Linux NAS server
Digital Dashboard	Custom data visualisation

Process parameter regulations

Gas flow	+/- 0.5% from set point
Chamber Temperature	+/- 3° C
Powder Output	+/- 0.5%

Operation

Max Temp. 1100°	15 minutes to heat, 10 to cool
Max Operating Pressure	60 Bar
Powder Feeder Swap	60 seconds

General maintenance

Nozzle Change	Under 5 minutes
Integrated Downdraft Floor Extraction Area	10.0m ²

Powder feeder system

Operating Pressure	725 Psi
Feed Ratio	10g/min - 330g/min (20kg/hr)
Powder Volume per Feeder	3.7 Litres

System enclosure

- Designed for easy operation and user experience
- Scratch-proof, polycarbonate viewing panels
- Easy access points for connecting services
- Fully insulated composite panel cell walls
- Automate Bi-parting loading door with sealing system

Downdraft extraction area

- Particles and operating gas extracted via floor
- Removable non-slip grating panels
- Connect to existing dust collector with signal interfacing
- Ducted powder feed area for reloading and continuous operation

Vacuum System

- Plug and play integrated housekeeping vacuum
- Hi-vacuum to single collection point
- 5m max anti-static vacuum hose
- 250m³/hr at 15 kPa

Component positioning shuttle

- Counter levered linear bearing mounts
- Component T-slot mounting table
- Precise servo-driven positioning
- Integrated component weight measuring and logging
- Removable stainless steel covers
- Cable chain for carrying component cables

Rotary component positioning unit

- Co-ordinated movement, speed control and positioning
- 500mm table diameter, max. speed 180RPM



Complete customisation

Titomic creates custom systems to fit your exact part, production volume and speed needs – while also being optimised for your environment and easy to integrate into your production line.

Rather than being an alternative solution, our systems elevate and add value to your existing systems, enhancing your existing manufacturing activity.

Custom systems in action

REP KON

At the world's first hybrid additive manufacturing and flowform facility established by Titomic and Repkon, a TKF 1000 and custom TKF 3250R are producing cutting-edge lightweight weapons barrels and tubes for global defence.



At TWI UK, one of the world's foremost independent research and technology organisations, the TKF 1000 will service the aerospace base and be used extensively for manufacturing and R&D.



In a joint venture partnership with Neos, a custom TKF 2200 is used to rapidly repair tooling to save downtime and create tools in days rather than months or years.

Ready to see how we can help solve your manufacturing challenges?

Let's talk.

Together, we can make it possible.



Find out more at msi-viking.com
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