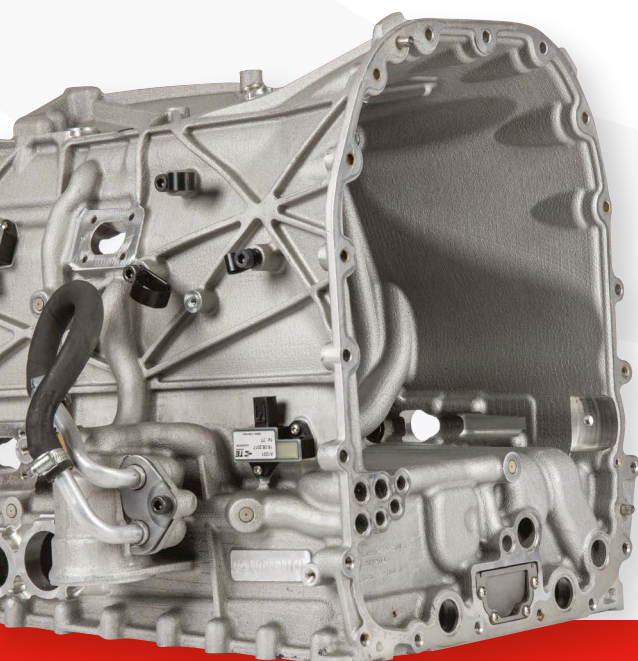
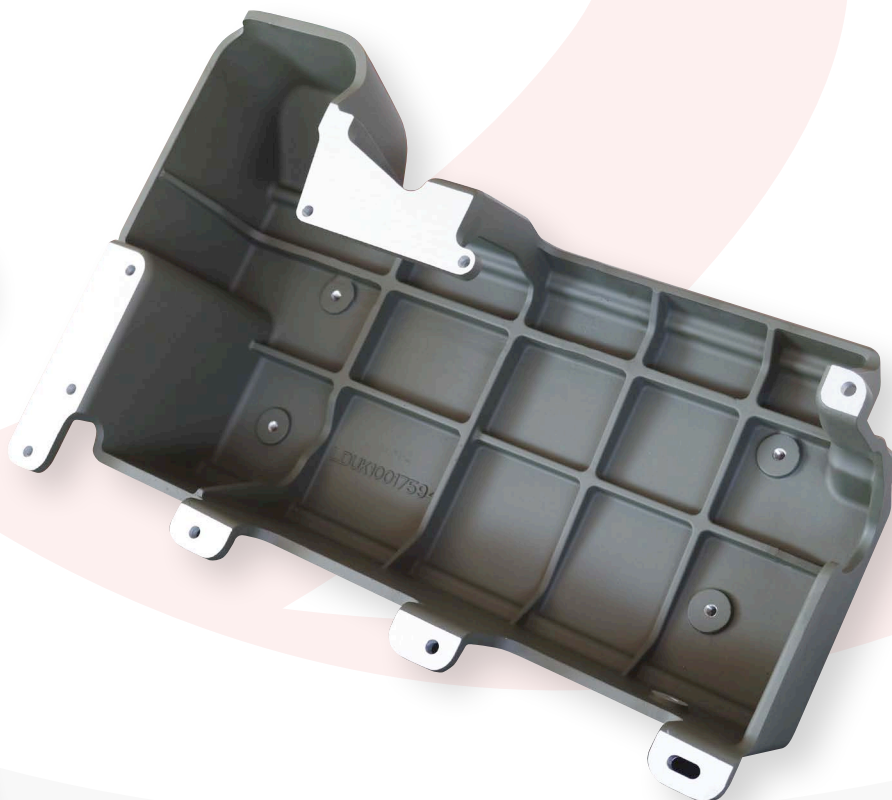




**Europe's Leading Manufacturer of
Complex, Lightweight, High-Integrity
Castings for the Defence Industry**



Certificate Number 3947
ISO 9001



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Find Out More Online



Winner of the UK Cast Metals
Federation Casting of the Year

www.finecast.co.uk



Welcome to Finecast Foundry

Finecast Foundry are a world-leading manufacturer of complex, lightweight, high-integrity sand castings in both ferrous and non-ferrous metals.

We have a highly motivated team who continue to prove to our customers that they are committed to delivering outstanding engineering solutions focussed on the complete manufacture of high quality cast products.

Our extensive in-house high-tech facilities enable us to provide a single source supply route from casting design and development through to fully finished machined components.

Our People

We are privileged to work in partnership with world class customers; companies that lead the world in their respective industries. To continuously support the engineering challenges and demands of our customers, we are proud to employ a highly motivated team of qualified engineers backed up by the latest manufacturing technologies.

Our experienced team of technical engineers, metallurgists, tool makers, casting technicians, machining specialists and talented apprentices support you in the design and feasibility of casting from concept to production. By combining the expertise of our engineers across all manufacturing fields we ensure your engineering requirements are supported from the outset.



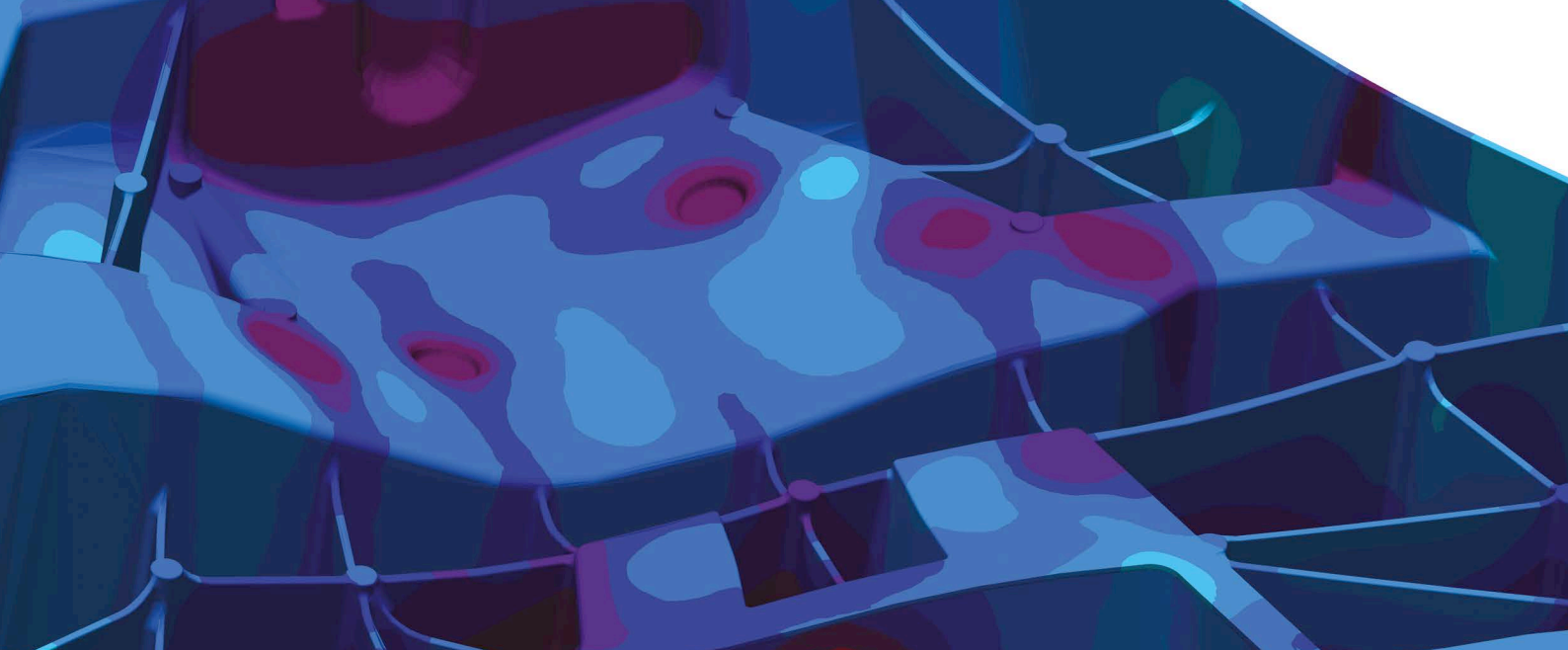
Mould assembly



15 tonne per hour sand mixer



The Finecast team



Magmasoft® Virtual Casting Simulation

The knowledge of our experienced method engineers is further supported by our in-house capability to perform Magmasoft® 32 Core virtual casting simulation.

Information from virtual simulation is used to optimise and qualify our casting method before any manufacturing takes place.

By utilising virtual casting simulation software our aim is to produce castings “right first time” eliminating the need for lengthy sample trials, significantly reducing development costs and lead times.

3D CAD Modelling & Mould Assembly Package Design

Our comprehensive CAD resources allow us to work directly from your finished part data to generate a fully optimised mould pack with machining allowance, radii, draft allowance and add any necessary design changes to assist the casting process.

Data we can receive

CAD System:

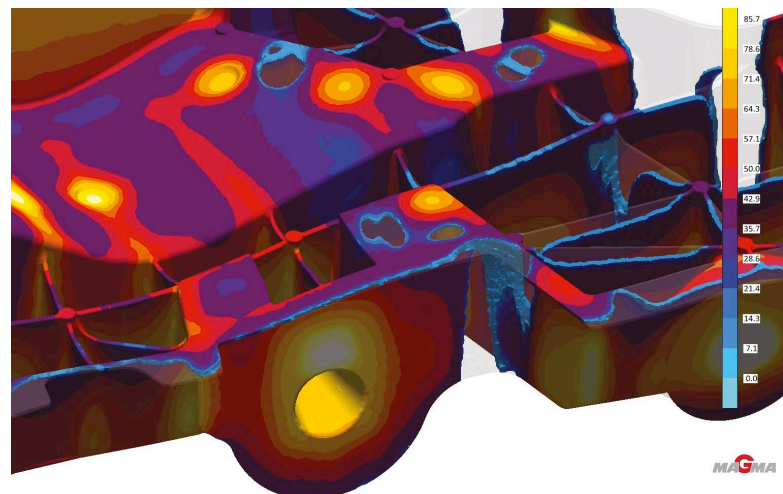
- SOLIDWORKS
- CATIA
- PRO/E

Interface Formats:

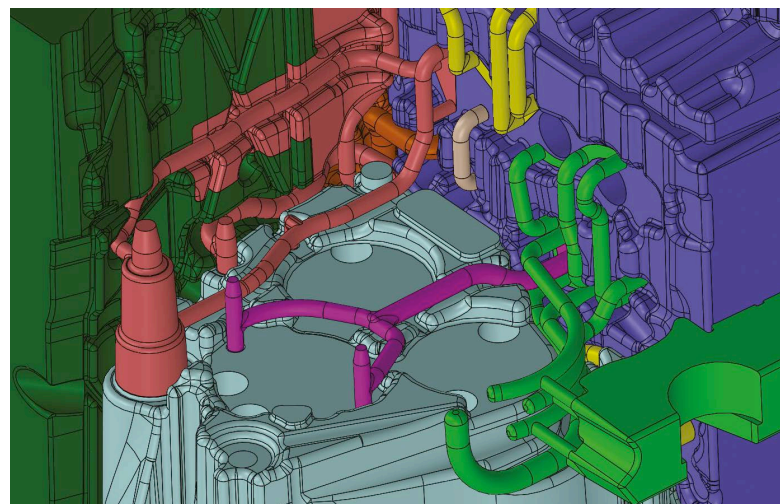
- STEP
- IGES



Magmasoft® virtual casting simulation



Temperature phase analysis



3D mould assembly package



3D sand printing facility in operation

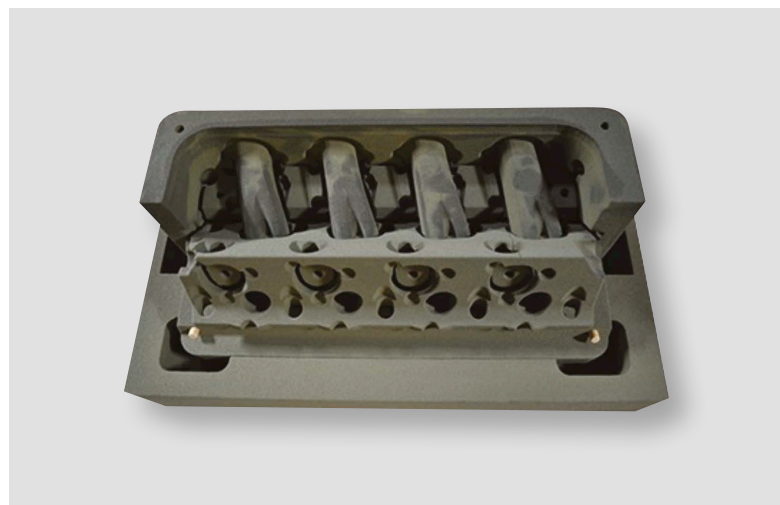
Tool-Less 3D Sand Printing

Finecast Foundry's in-house 3D Sand Printing facility is equipped with the latest cutting-edge 3D sand printing technology, enabling us to produce complex castings within 24 hours from Magmasoft® virtual simulation validation.

3D sand printing provides complete product design freedom, flexibility and rapid processing of moulds and cores, enabling us to push the boundaries of sand casting manufacture and simplify the process of casting complex geometric shapes with undercuts.

This innovative technology offers new optimisation opportunities, including the consolidation of mould parts and cores, greater repeatability, improved accuracy and reduced lead times.

Our technologically advanced 3D sand printers provide the flexibility to print in a wide variety of thermally efficient sand media, enabling us to optimise casting design, tolerances, surface finish and cast in a variety of metals including low-temp aluminium through to high-temp steel and iron.



Cylinder head 3D sand printed mould and core assembly



Cerabead core



Machine cut pattern tooling

Pattern Tooling

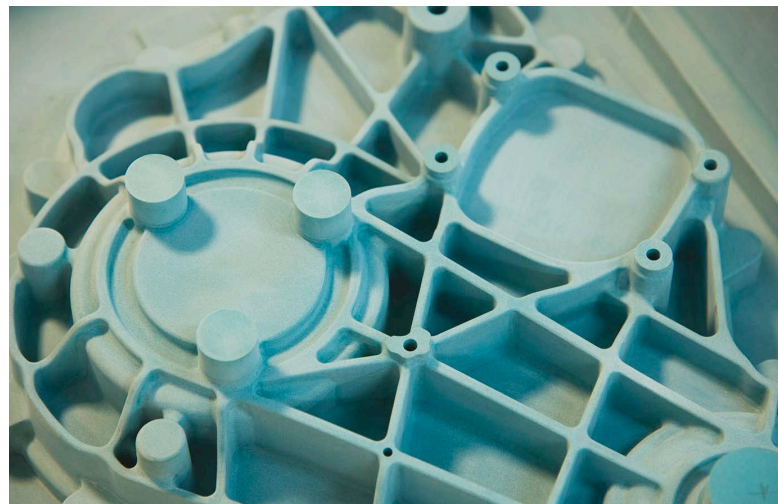
Our in-house pattern shop is equipped with the latest 5-Axis CNC machining centres, operated by our fully qualified, highly experienced pattern makers who are dedicated to producing high precision, dimensionally consistent, close tolerance pattern tooling.

By utilising our pattern tooling and 3D sand printing capabilities, we offer the option of pattern tooling and hybrid tooling with 3D printed cores. To maintain control of quality and lead times whilst being reactive to support customer design changes during development, all foundry tooling is manufactured internally. This capability offers the added reassurance that sensitive customer development designs are manufactured with the strictest confidence.

Continual investment into our pattern making facility allows for close tolerance resin tooling to be high speed multi-axis milled. Should component redesign be required, modifications can be quickly and accurately adapted. Prototype small batch foundry tooling through to suitable production volume of 5000 can be machine cut to rapidly in our facility operating 24 hours per day.



Specialist pattern shop facility



Completed pattern



Two arm 15 tonne per hour sand mixer for extended reach and coverage

Production Volume Sand Foundry

Our purpose-built designated series foundry offers flexibility to support initial production phase builds through to scheduled production volumes up to 5000 units.

Our foundry supports volume production of components where high cast, mechanical integrity and surface finish quality is imperative, predominantly for the defence, automotive and motorsport industries.

Investment into the latest foundry equipment including automated mixers, high speed mould filling and closing stations offer repeatable processing efficiencies for components up to 3m sq. Thermally reclaimed precision sand improves mould quality providing consistent cast tolerances of DCTG7 and excellent surface finishing ranging from 2 RA to 5 RA dependant on size. This method of sand reclamation offers cost benefits and is environmentally sustainable as 95% of the sand is reclaimed.

On-site heat treatment facilities allow for large components to be processed to international or bespoke conditions. To conform to aerospace standards and full traceability of product, heat treatment ovens are fitted with probes to record temperature and cycle times.

Rapid Prototype Castings

Our reputation as the prototype casting leader has been built over years of successfully demonstrating repeatable rapid delivery of superior quality, technically challenging components.

Integrated in-house management of all processes within our purpose-built prototype foundry include 3D sand printing, high speed foundry tooling manufacture and the latest 2D radiographic testing and 3D computed tomography scanning technology for product qualification, guaranteeing only the highest quality without compromise, delivered rapidly in days.

Complete 3D sand printed moulds or hybrid tooled assemblies with printed complex geometry cores can be in synthetic or silica media to an accuracy of $\pm 0.3\text{mm}$, producing highly dimensionally consistent castings conforming to DCTG8 casting dimensional tolerances.

The ability to print in differing sand media allows for a suitable and cost-effective method of producing aluminium and iron alloys from silica and synthetic sand for higher temperature alloys or applications requiring high thermal stress condition or requiring improved cast surface finish for performance.

Specialist Iron & Steel Castings

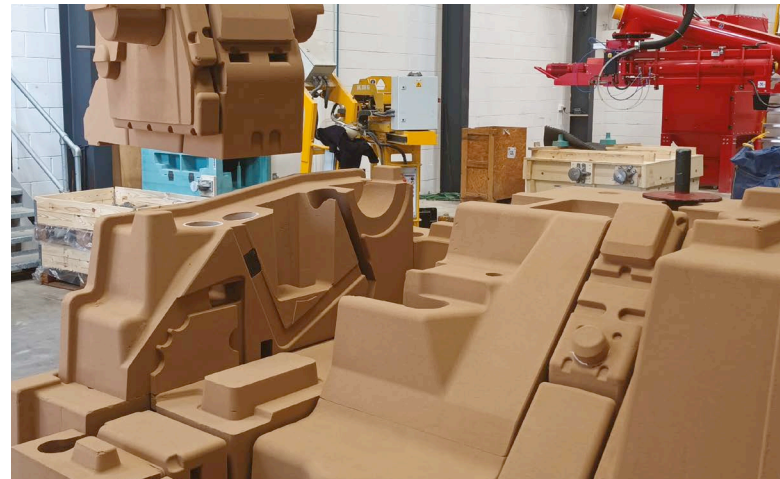
Our experience producing castings is not limited to aluminium alloys. Our capabilities and expertise extend to manufacture of iron and steel alloys including the complete ductile range of SiMo, Ni-Resist, austenitic irons and stainless steel grades to 300 kg weight.

The experience of our metallurgists and ferrous methods engineers ensures that each product is engineered to meet their material and design specification. The application MAGMA Ferrous and Iron simulation software with years of applied process knowledge of using multiple sand media with high thermal efficiency and permeability, refractory coatings to produce exacting repeatable dimensionally accurate castings with a surface finish of 5 RA.

Our internal heat treatment and extensive materials laboratory ensures that casting products are processed and qualified to your specification. Within our laboratory spectrograph chemical analysis, microstructure and tensile mechanical testing is performed by a dedicated team of metallurgist MA qualified.



Pouring austenitic stainless steel castings



Mould assembly of gun turret

Lightweight Engineering

Finecast are pioneering the development and manufacture of lightweight high strength aluminium structural components.

From extensive research and development, we have pushed the boundaries of sand cast components producing the consistent wall thickness of 2.5mm on structural components up to 3m in length.

To support material innovation towards lightweight powertrain and body structure, we have refined high silicon aluminium alloy series to prototype and low volume sand cast production replicating the geometry and mechanical properties of series high pressure die castings HPDC. From high ductility to high strength elongation of 18% with UTS of 300 MPA.

We are at the forefront of new material evaluation after undertaking development and manufacturing components in A2xx aluminium series aluminium. Lightweight structures can now be produced repeatable with mechanical properties of carbon steels offering a sustainable and economical alternate to forging and fabrication of aluminium and steel.



Completion of 2.5 mm wall shock tower castings

Metallurgical Testing & Analysis

Material control is monitored by our MA-qualified Metallurgists through continual metallurgical testing and analysis in our in-house accredited metallurgy laboratory.

Finecast Foundry ensures full traceability of process parameters to validate the composition, mechanical and chemical analysis of the various sand media and cast material using our laser spectrographic units.

The spectrographic analysis of the melt sample is carried out throughout production to ensure the chemical composition of the cast material conforms to the customer's engineering specification.

Complete results collected from our various testing techniques create the foundation for the physical, mechanical, and chemical analysis of your product, ensuring your specification is met in its entirety.

Tensile Testing

Determination of mechanical properties (ultimate tensile strength, % yield strength, elongation %).

Multiple Spectrometers

Chemical composition verification of both ferrous and non-ferrous materials.

Microscopic Inspection

Microscopic inspection of materials with image analysing software.

Dye Penetrant Inspection

Detect surface discontinuities like cracks, fractures, porosity and irregularities in both ferrous and non-ferrous materials.

Nitrogen Analysis

Nitrogen analysis enables us to measure the nitrogen content in ferrous alloys.

Hydrogen Analysis

Real time measurements of dissolved hydrogen in aluminium melts.

Magnetic Particle Inspection

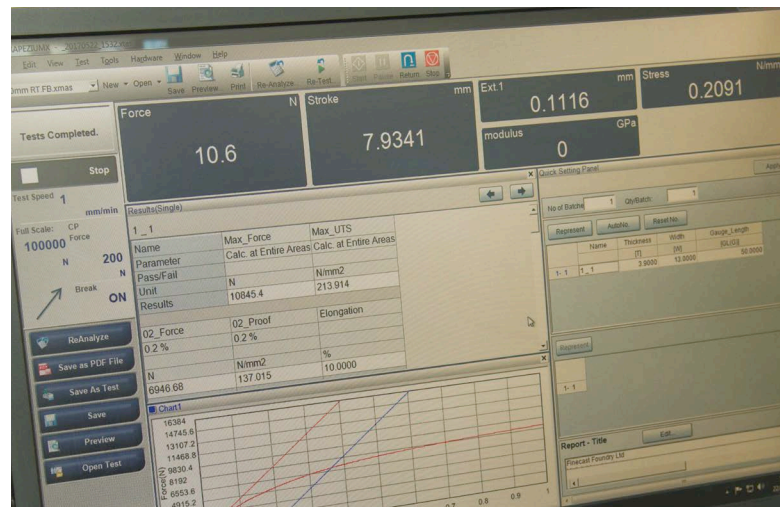
Detection of surface and near-surface flaws in ferromagnetic materials and primarily used for crack detection.

Ultrasonic Testing

To determine the depth of internal flaws and the thickness of parts with parallel surfaces.



Tensile testing of sample test bar



Mechanical test report



Morphology microstructure analysis



Spectrographic analysis of cast test specimen



GE Seifert X|Cube 320KV scanning system

Non-Destructive Testing & Inspection

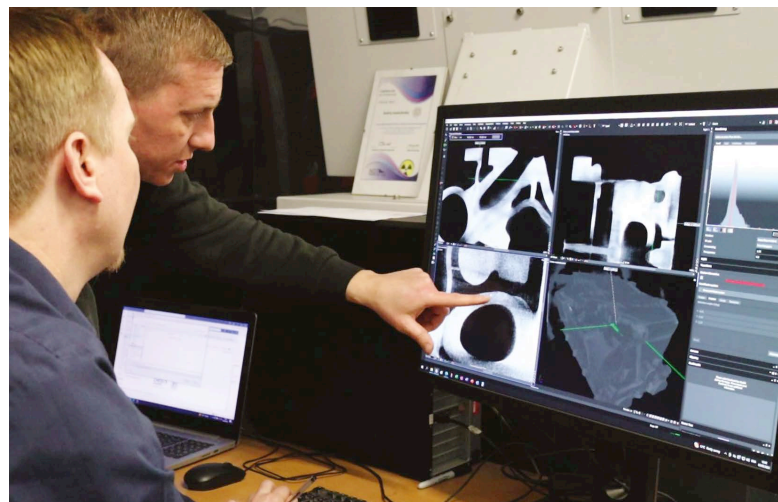
Our advanced non-destructive testing facility is equipped with a GE Seifert X|Cube 320KV scanning system providing powerful 2D radio tomography and 3D computed tomography inspection, enabling us to guarantee the integrity of every casting we manufacture.

This technology allows for a fast and efficient method of identifying incipient cracks, sub-surface defect and dimensional verification in a non-destructive process. As a consequence we have a high level of confidence in the assessment of our quality which results in a continued process of improvement.

- **Defect analysis: Micro-porosity, sand inclusion, dimensional stability, sub-surface cracks and shrinkage porosity**
- **Wall thickness measurement**
- **Internal core location**
- **Reverse engineering**
- **Validate structural integrity before batch manufacture**



Digital radiograph review of cast component



Review of CT scan results



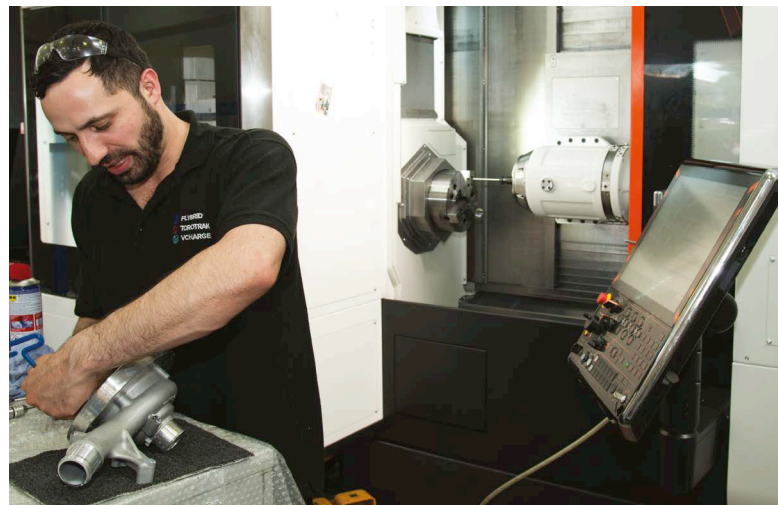
5-axis Mazak Smooth mill / turning machining centre

Precision 5-Axis CNC Machining

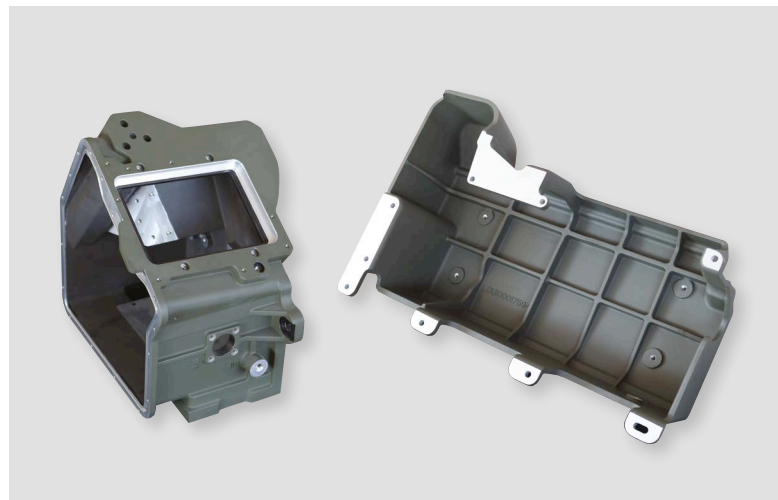
Our state-of-art machining facility is equipped with the latest CNC machining and measurement technology, offering a fully integrated service to deliver fully finished assembled components to your build to lead time. This value-added capability supports our commitment to the complete in-house management to maintain the highest quality and delivery of finished components to reduced lead times.

Equipped with the high spec Mazak CNC machining centres, 3-axis to 5-axis with 12 machining centres in house, our machining facility offers the flexibility to rapidly machine close tolerance components in a variety of ferrous and non-ferrous material specifications from prototype through to production volumes.

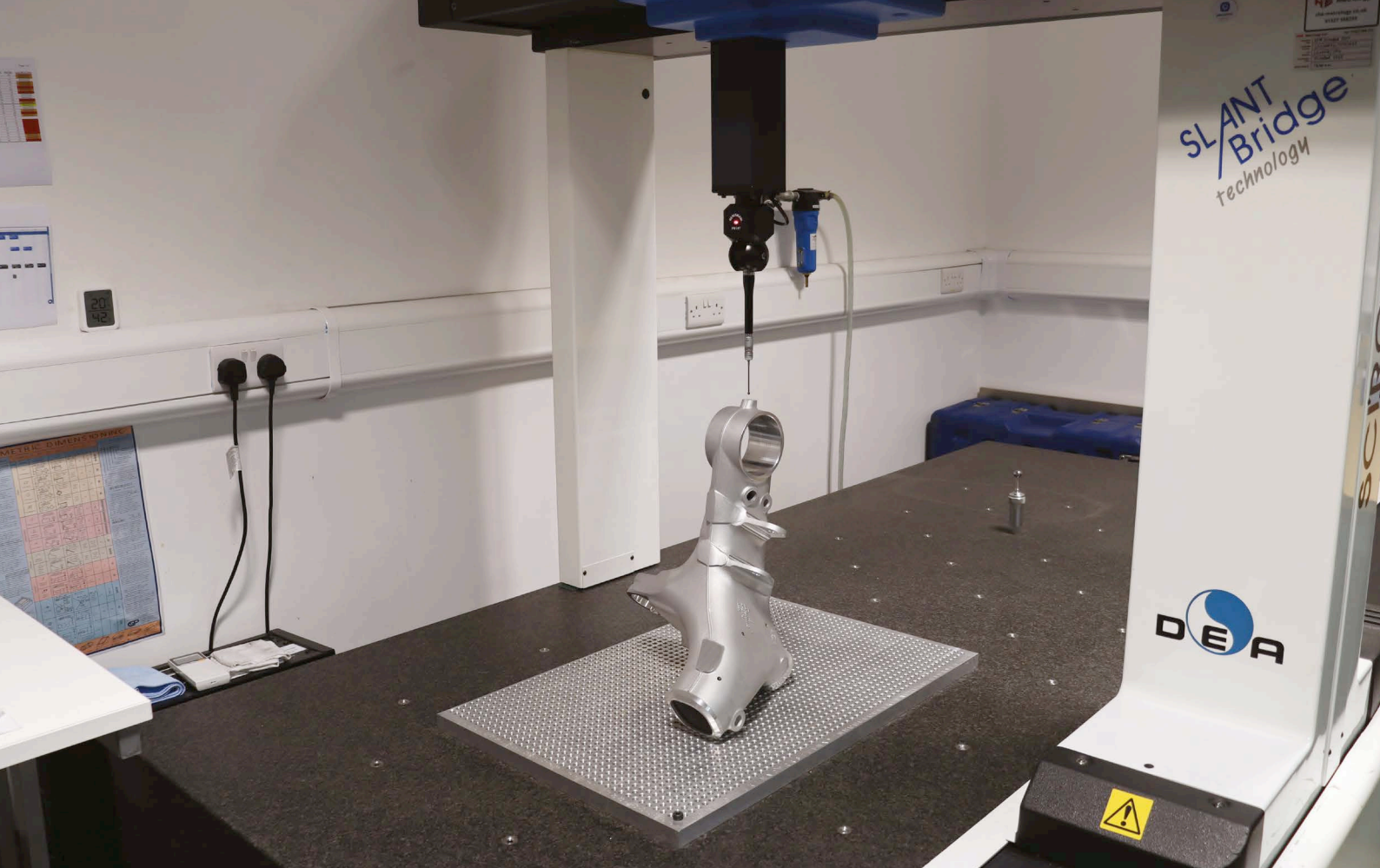
From the outset of product development, our fully qualified, highly experienced team of machinists utilise the best strategy to balance and locate datums using GOM scan reports to achieve high repeatability of machined castings.



5-axis Mazak mill / turning machine in operation



Final review of fully finished castings for the defence industry



CMM measurement of cast node part

Metrological Testing & Verification

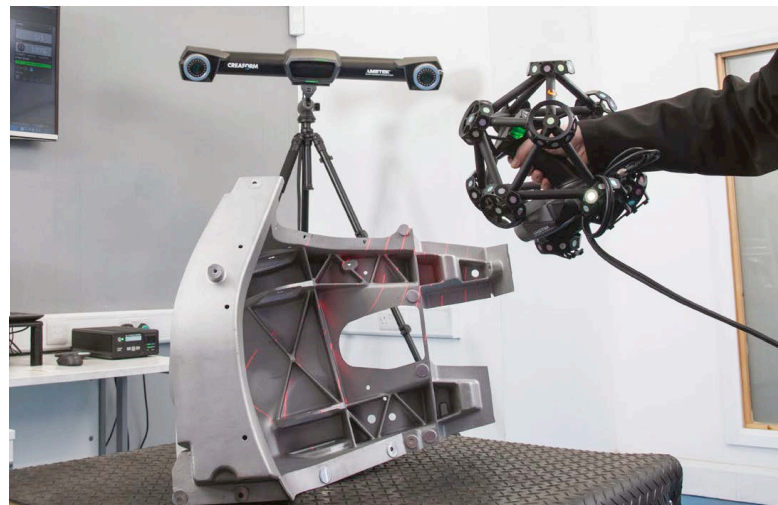
Our on-site facility is fully air conditioned and equipped with our own metrology lab fitted with 3 of the latest high spec CMMs and programming software with programmable probe stations to measure components up to 2m.

Surface finish, contour and angle measurements can also performed rapidly with accuracy using our Hobson Taylor Talysurf.

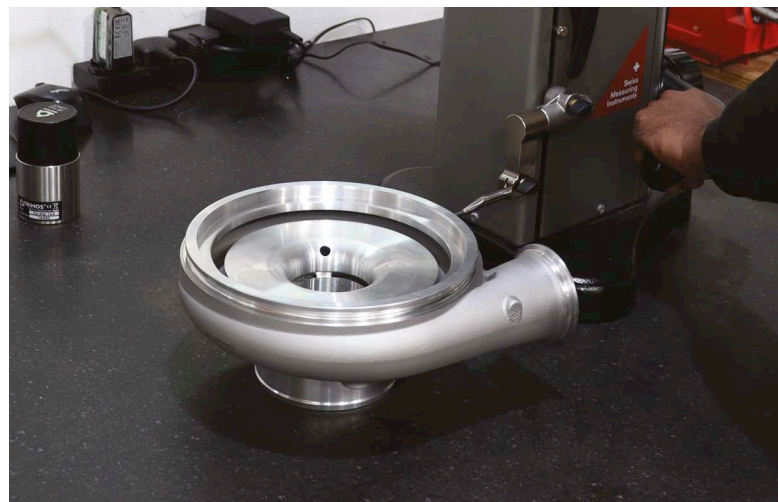
Our portable 3D optical scanner ensures external dimensional accuracy and stability and aids strategic alignment of castings in line with machining datums.

We also utilise our 2D X-ray and 3D CT scanner to capture the internal profiles of castings to guarantee dimensional accuracy in a non-destructive process.

This technology combined with our highly experienced inspection team ensures that customer requirements are met including CPK Indices, SPC analysis, full ISIR and FAIR reports.



Creaform 3D optical measurement of shock tower casting



Surface finish, contour and angle measurements



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