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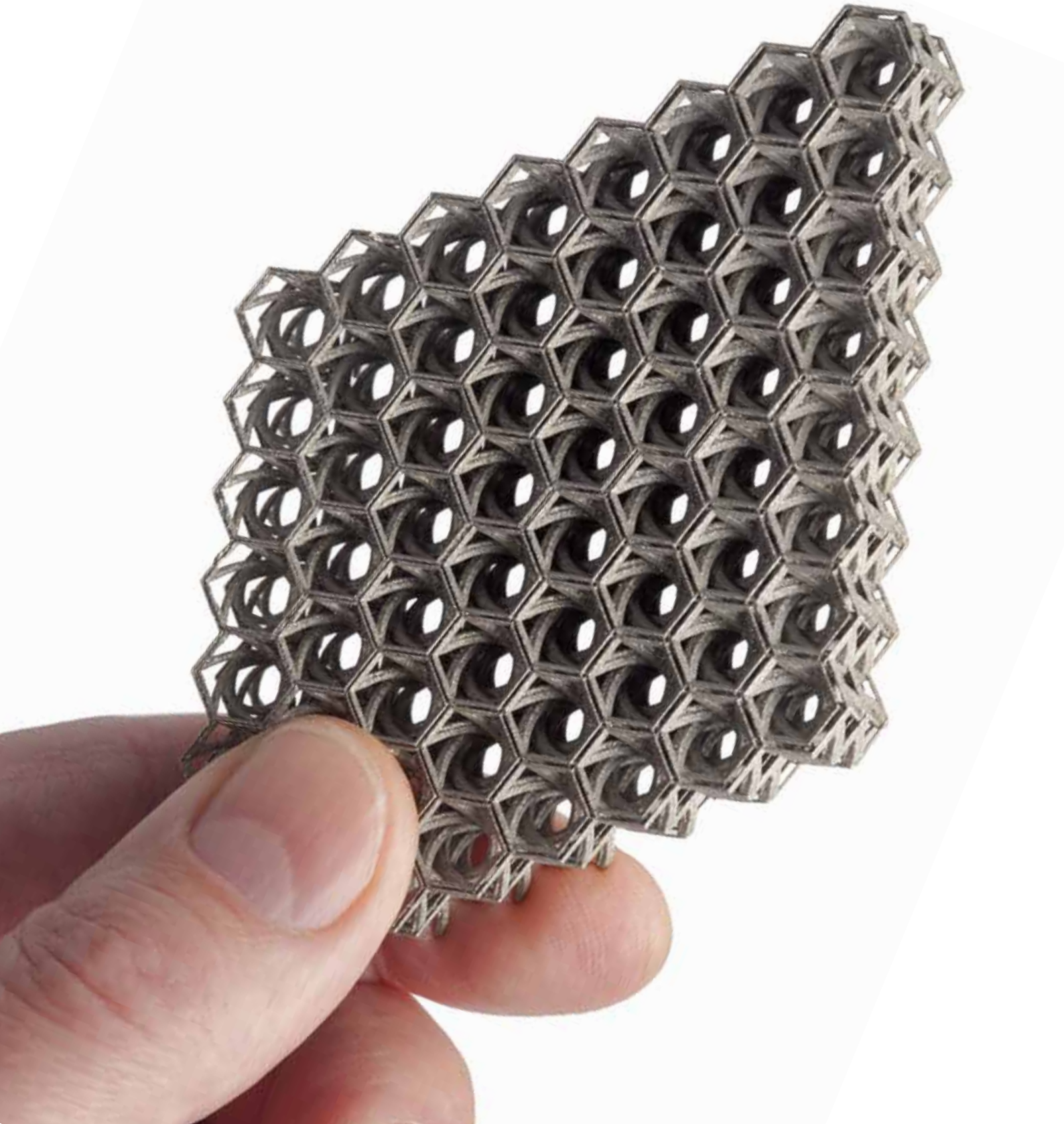
The power of Additive Manufacturing



Design today, build tomorrow

The huge potential for Additive Manufacturing

In the world of manufacturing technology, we occasionally experience breakthroughs that have the potential to transform the industry, enabling existing products to be made faster, cheaper and better, and opening up a world of new product possibilities.

Just like the advent of CNC machining, CAD/CAM, co-ordinate measuring machines and lasers, metal-based Additive Manufacturing will transform part production, but we are only at the start of this exciting journey.

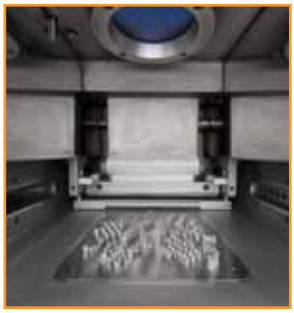
At the core of metal-based Additive Manufacturing is the use of focused laser energy to fuse fine metallic powders to form highly complex functional components that go way beyond the designs of today.

In comparison to other technological advances, lasers are something of a quiet revolution, spanning the last 50 years, but their influence on fields as diverse as bio-medical, surface analysis, electronics, ship building, molecular diagnostics, precision measurement and a multitude of others is immeasurable.

Yet, just like Additive Manufacturing, in their early years, lasers were something of a solution in search of an application - not unusual in disruptive technologies.

Renishaw's laser melting technology has the power to unlock this hidden potential, and in the hands of talented engineers, the full commercial and technical advantages offered by Additive Manufacturing can be enjoyed by manufacturers like you.

Hip implant model



Laser melting machine build chamber

CAD driven direct manufacturing in a wide range of metals

Renishaw's laser melting is a pioneering, additive manufacturing process capable of producing fully dense metal parts direct from 3D CAD, using a high-powered fibre laser. Parts are built from a range of fine metal powders that are melted in a tightly controlled atmosphere, in layer thicknesses ranging from 20 to 100 microns.

The technology is already widely employed for the manufacture of custom medical implants, lightweight aerospace and motorsports parts, efficient heat exchangers, and injection moulding inserts with conformal cooling channels.

The capability to safely process reactive materials such as titanium and aluminium is a standard feature on all Renishaw laser melting machines with safe systems for process emissions and powder handling. Laser melting machine users also benefit from minimal waste product as over 98% of the material is re-usable after refinement in the Renishaw powder conditioning system.

Motorsport component

Tool with conformal cooling

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Your partner for change

Renishaw is a global engineering technologies company with key strengths in machining, metrology and process control. For almost 40 years our innovative products have enabled businesses across the world, from engineering, science and medical sectors, to improve efficiency in manufacturing processes and enrich peoples' lives.

We have over 3300 staff across the globe, and with around 18% of annual sales invested in R&D and engineering, significant numbers of our talented staff are devoted to the development of ground breaking technologies. So we're here for the long haul and we enjoy an excellent reputation for offering strong support to our customers through a network of over 70 wholly-owned service and support offices in 32 countries.

Our experienced staff have the commitment and the applications expertise necessary to ensure a smooth, trouble-free integration of our pioneering technologies into your manufacturing systems. You can also be assured that we'll work with you beyond the initial installation to ensure that you gain maximum benefit from your Renishaw purchase through ongoing applications support and a range of service packages to keep your system in top condition, ready for the next manufacturing challenge.

Global service and support

Renishaw's world-class machine shop in Gloucestershire, UK

Applications

Early adopters of laser melting for medical orthopaedics benefit significantly from the ability of laser melting to manufacture complex geometries and structures in high grade materials, such as titanium.

From patient-specific orthopaedic implants to volume production of medical devices featuring hybrid structures and textures, laser melting has the potential to unlock manufacturing capabilities that combine free-form shapes and intricate lattice structures. This improves osseointegration in orthopaedics, leading to much improved patient outcomes. It also allows aerospace and motorsport companies to 'add lightness' to components in a range of demanding applications.

From tooling inserts, featuring conformal cooling, to lightweight structures for aerospace and high technology applications, laser melting gives designers more freedom, resulting in structures and shapes that would otherwise be constrained by conventional processes or the tooling requirements of volume production. Laser melting is complementary to conventional machining technologies and forms part of a manufacturing system including heat treatment, surface post-processing, and directly contributes to reduced lead times, tooling costs and material waste.

- Shorten development timescales - be first to market
- Reduce waste product and cost - build only what you need
- Enjoy increased design freedom - create complex structures and hidden features

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Renishaw Additive Manufacturing - technical specifications

	AM250
Max. part building area	245 mm x 245 mm x 300 mm (X, Y, Z) (360 mm Z axis by request)
Build rate*	5 cm^3 - 20 cm^3 per hour
Layer thickness	20 µm - 100 µm
Laser beam diameter	70 µm diameter at powder surface
Laser options	200 W
Power supply	230 V 1 PH, 16 A

* Build rate is dependent upon material, density and geometry. Not all materials process at the highest build rate.

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