Discover the RenAM 500 series

Renishaw's range of metal additive manufacturing systems

Productivity | Quality | Flexibility

Additive manufacturing with Renishaw

Renishaw is a market leader in the design and manufacture of laser powder bed fusion (LPBF) metal additive manufacturing systems. Since 2011 we have supplied systems to manufacturers all over the world, in industries as varied as aerospace, tooling, and medical devices.

We believe AM stands to transform the world of manufacturing as a viable serial production tool. The RenAM 500 series offers the ideal system for every stage of the AM journey to volume production. Alongside best-in-class productivity, we offer a range of hardware options, software, expert consultation and training to support your application.

Why choose Renishaw as your AM partner?

- **Vertical integration –** All hardware, software and electronic components of the RenAM 500 series have been designed and built by Renishaw to work seemlessly together.
- **Metrology heritage –** Renishaw's 50 years of metrology expertise allows us to uniquely offer a complete end-to-end solution, including high-accuracy AM systems and world-leading measurement products.
- **Service and support –** Our global team of applications engineers provide in-country support with design for AM, system training, process optimisation, parameter development, and more.
- **Stability and sustainability –** As a global engineering technology group, we have invested in AM for the long term. We aim to become a sustainability leader, working with our customers, suppliers, and local communities to create a sustainable future across our diverse range of products.

Case study: The RenAM 500Q powers mass production of medical components for Permedica

Renishaw collaborated with medical devices specialist, Permedica, to develop additive manufacturing (AM) processes for mass-producing acetabular cups. Permedica purchased a RenAM 500Q AM system, which features four lasers and automatic powder sieving, allowing it to reduce cycle time and benefit from improved mechanical properties. This enabled Permedica to expand its AM production, and the company now operates three RenAM 500Q systems at its facility in Lecco, Italy.

> "The presence of the four lasers effectively puts us in a position to operate with significant production volumes. This expresses just how versatile the Renishaw machine is, making it the crown jewel in our production setup."
>
> **- Permedica S.p.A (Italy)**

Read the full case study here
www.renishaw.com/permedica

Configurable to your production

The RenAM 500 series can be configured with an open-loop flexible powder system, automatic powder recirculation for increasing throughput, or with TEMPUS technology for the fastest build rates.

All variants of the RenAM 500 series can be configured with one, two or four 500 W fibre lasers, each able to access the whole powder bed surface for optimised laser energy usage.

With a footprint of just 2,165 mm (86 in) x 1,236 mm (49 in), the compact size of the RenAM 500 series makes efficient use of factory floor space.

Number of lasers

Q	**With four lasers that can access the whole bed, it's easy to achieve outstanding build rates.**
D	**Dual lasers provide a substantial productivity boost at a balanced price point.**
S	**A single laser system is the perfect starting point to begin building your AM parts.**

Productivity

Ultra	**Ultimate AM capability, with TEMPUS™ technology and advanced process monitoring.**
500	**Integral powder sieving and recirculation system is ideal for volume production.**
Flex	**Optimised for R&D applications with quick and easy powder swapping.**

Material support

The RenAM 500 series supports a wide range of engineering materials including titanium, aluminium, nickel-superalloys and copper. Our open platform means you can develop and optimise material parameters to suit your application.

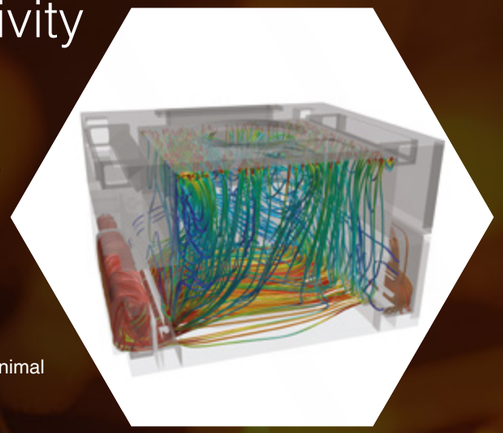
For datasheets on all our supported materials, visit www.renishaw.com/amdatasheets

RenAM 500 series enables exceptional part quality and productivity

Intelligent gas flow design

A high-volume gas system ensures uniform processing conditions and efficient removal of emissions, with an intercooler for thermal control. Precise thermal management further contributes to the stable atmosphere and consistent build environment that leads to better and more consistent metallurgy.

The dual SafeChange™ filter system manages gas flow and pressure, while the sealed vacuum chamber and atmosphere generation system create a high purity argon environment with minimal gas consumption, enhancing powder quality and durability.



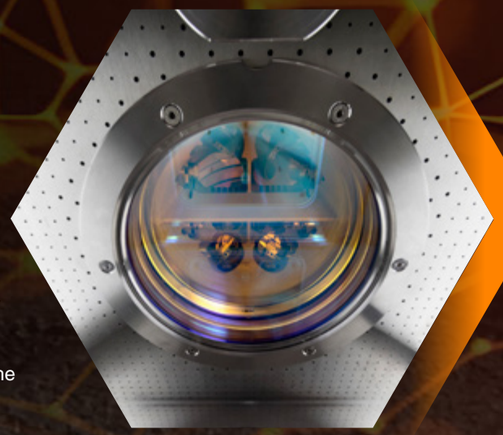
High-precision laser control

The optical system minimises build times by enabling all lasers to precisely and simultaneously address the entire bed.

Includes a monolithic water-cooled galvanometer mounting with tight optical alignment and internal cooling channels. This is a key enabler for precision laser control.

The system also incorporates Renishaw's RESOLUTE™ optical encoder for high accuracy positional sensing and a kinematic recoater mounting for rapid, repeatable positioning of the recoater blade, ensuring accurate part manufacture.

Optical System Verification (OSV) lets you confirm and calibrate the positional accuracy of the lasers in your system (see page 8).



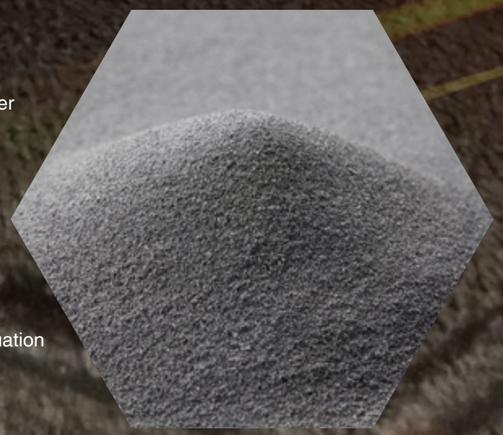
Configurable powder management

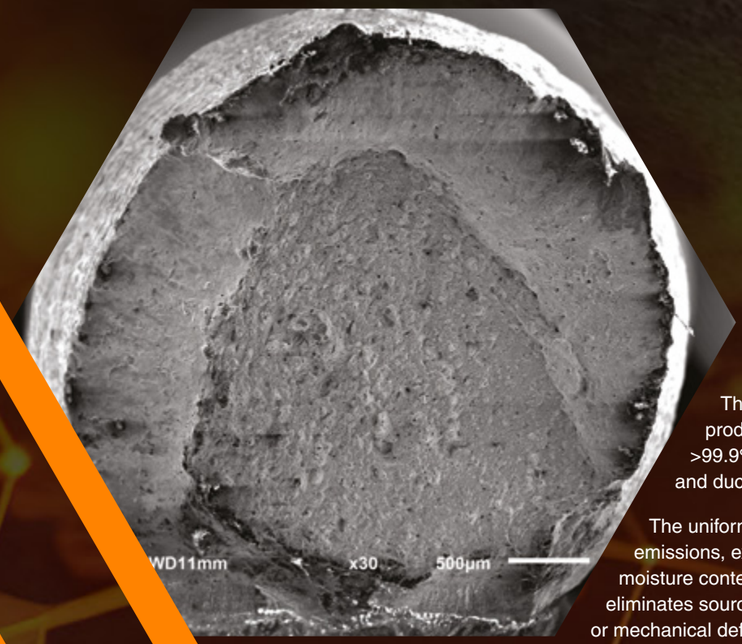
All RenAM 500 systems can be configured with closed loop powder recirculation or an open gravity-fed system.

The closed loop system enhances productivity and reduces costs through reducing operator intervention, while the open system (Flex) allows for easy material swaps.

The Flex system can be converted to powder recirculation for seamless transition from research to production.

We also offer a Reduced Build Volume (RBV) kit for low cost evaluation of novel materials (see page 8).

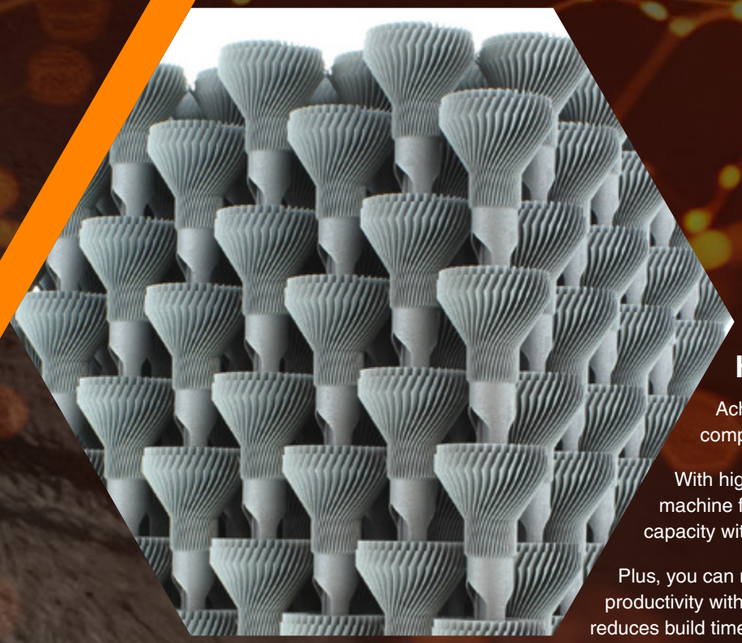




Exceptional part quality

The RenAM 500 series enables production of components with >99.9% density, maximised strength and ductility.

The uniform extraction of process emissions, exceptionally low oxygen and moisture content, and consistent optical control, eliminates sources of chemical, micro-structure or mechanical defects.



High productivity

Achieve lower cost per part, without compromising on quality.

With high laser density in a compact machine footprint, you can increase your capacity without increasing factory size.

Plus, you can now supercharge your productivity with TEMPUS technology, which reduces build times by up to 50%.

Capability upgrades

Renishaw provides a range of ancillary equipment to maximise the capability of its advanced additive manufacturing systems.

Reduced Build Volume (RBV)

For efficient material R&D

The RBV for the RenAM 500 series lets you print with < 0.75 litres of powder, in a self-contained, removable unit. This makes RBV the ideal tool for evaluating novel materials, without using the full powder system, but still benefitting from the RenAM 500's intelligent gas flow and precision laser control.

For more information, visit:
www.renishaw.com/rbv

Optical System Verification (OSV)

For ultimate confidence

To maintain precise control of the lasers within the RenAM 500 series, we have used our extensive experience in metrology and measurement tools to develop our Optical System Verification process.

This toolset and accompanying machine-integrated software allows you to check and calibrate the focal point, positional accuracy and power output of all the lasers in your AM system. This capability not only ensures system performance for producing high-quality parts, but also provides full traceability of the machine performance back to international standards.

For more information, visit:
www.renishaw.com/osv

TEMPUS™ technology

Halve your build times with exceptional productivity

TEMPUS technology is a new innovation from Renishaw exclusively available for the RenAM 500 series. It delivers a substantial increase in AM productivity without compromising on part quality.

This technology synchronises the system lasers with the powder recoater, allowing the lasers to fire whist the recoater is moving across the build area. This can reduce build time by up to nine seconds per layer, and with builds frequently containing thousands of layers, this can reduce total build times by tens of hours. When optimised with Renishaw's QuantAM build preparation software, all geometries can see a productivity benefit – over twice as fast in some cases.

For more information, visit:
www.renishaw.com/tempustechnology

Intelligent software solutions

Streamline your AM process with connected digital tools

For more information, visit:
www.renishaw.com/amsoftware

Design

QuantAM software lets you import CAD files, prepare your parts for AM and preview the laser path before printing. With an intuitive step-by-step workflow and open parameters, you can easily optimise your build.

QuantAM integrates with a wide range of third-party software for a seamless digital process.

Monitor

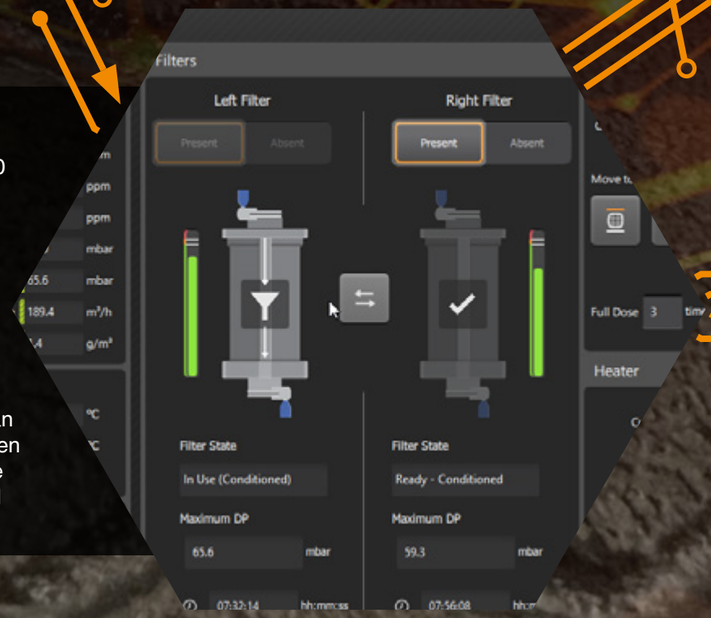
The Renishaw Central smart manufacturing data platformcollects and displays process data from your fleet of machines in real-time. Track key process variables for individual builds and monitor utilisation and job performance over time.

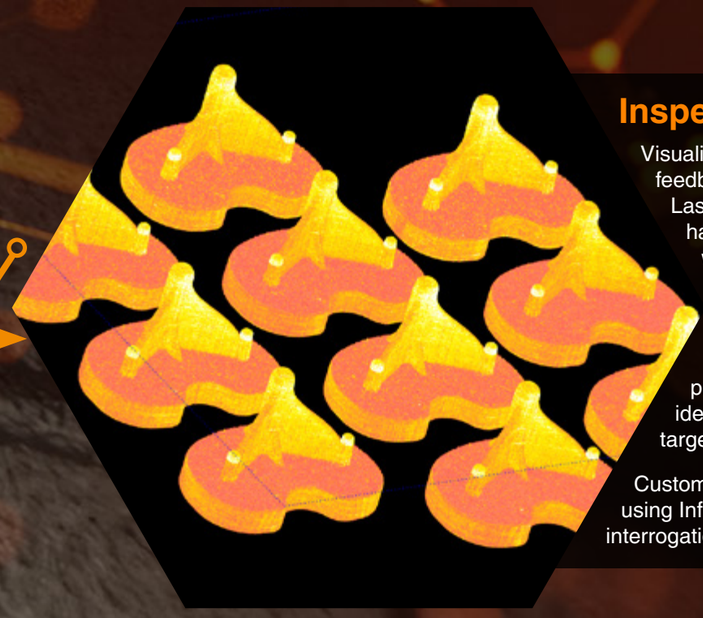
Email notifications provide instant alerts to status changes, and a REST API lets you integrate with your manufacturing workflow.

Build

At the heart of the RenAM 500 series is the MSS operating software. Developed by Renishaw, MSS integrates with our in-house optics, powder, gas and chamber sub-systems for maximised efficiency and control.

MSS has a rich graphical user interface operated from an industrial grade 19” touchscreen and features user configurable access controls and password protection.





Inspect

Visualise and inspect high-accuracy feedback from the melt pool (with LaserVIEW and MeltVIEW hardware), and chamber camera with InfiniAM. With in-line feedback from the laser input, visual and infrared emissions, InfiniAM provides layer and volumetric insight into your process. Quickly detect and identify anomalies and optimisation targets.

Customise your data analysis using InfiniAM plugins for bespoke interrogation, archiving or exporting.

Renishaw support and service

In person, over the phone or online

We know responsive service and knowledgeable support are vital to the success of your business. Renishaw's growing network of local support teams operate across the globe to deliver rapid and effective support directly to you.

For more information, visit:
www.renishaw.com/amsupport

Experts at your service

- **Applications support –** our applications engineers can advise on optimising your product design and build process, helping you reduce development time, production steps, costs and use of material.
- **Maintenance & warranty –** we are committed to supporting customers throughout the world via an extensive network of Renishaw offices and distributors. We offer support packages to suit your exact needs, covering parts, service and labour options.
- **Training –** to help you gain the maximum benefit from investment in additive manufacturing from Renishaw, comprehensive training programs are available, tailored to the needs and experience levels of users.
- **Installation and facility set-up –** we will install and commission the equipment with minimal disruption to your production schedule.
- **Online support –** user guides and other technical documents are available on our website. We also have an online store where customers can directly purchase consumables.

Visit our online store
www.renishaw.com/shop

EMEA centres

- **Bristol (UK)**
- **Dublin (Ireland)**
- **Barcelona (Spain)**
- **Pliezhausen (Germany)**
- **Guntramsdorf (Austria)**
- **Torino (Italy)**
- **Marne la Vallée (France)**
- **Komenda (Slovenia)**
- **Breda, Netherlands (Benelux)**
- **Järfälla, Sweden (Nordics)**
- **Warsaw (Poland)**
- **Istanbul (Turkey)**
- **Yokneam Ilit (Israel)**
- **Dubai, UAE (Gulf)**

○ **Other worldwide offices**

Additive manufacturing technology enables servo valve innovation

Case study: Precision manufacturing

Background:

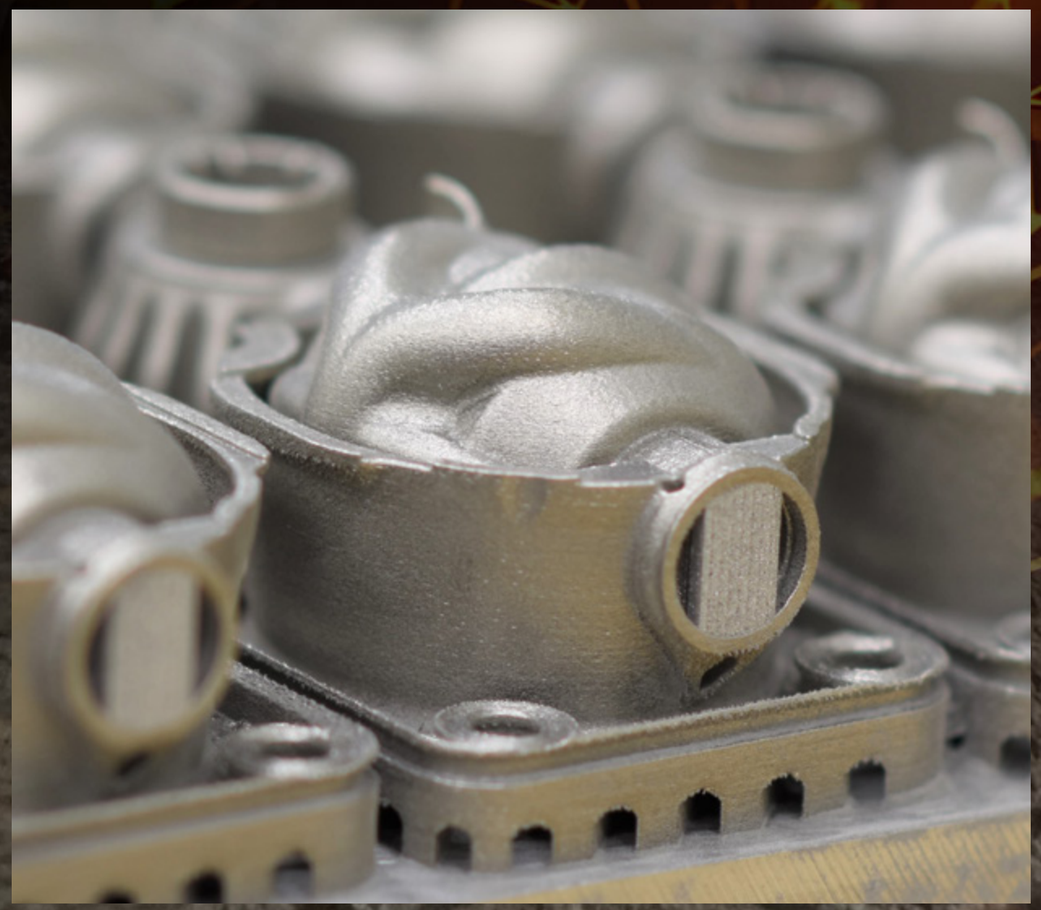
Founded in 2012, in Bristol, UK, Domin is disrupting the hydraulics industry by redesigning servo valves from first principles to achieve a better performing, more sustainable product at a lower price point.

Challenge:

To produce valves in the fluid power sector that are more efficient, sustainable and economical, to ultimately prevent the waste of millions of tonnes of CO_2 per year.

Solution

Domin teamed up with Renishaw to produce their redesigned servo valves using metal additive manufacturing. They selected Renishaw's RenAM 500Q and RenAM 500Q Ultra to achieve significantly higher build rates and secure a competitive route to market.



Despite the potential of AM, it had traditionally been limited to low-volume custom applications in aerospace, medical, and automotive industries. Domin desired a platform that could make AM more viable for high-volume production, and the four 500W lasers in the RenAM 500Q provided the significantly higher build rates, part quality and competitive machine costs needed for their application.

Using complex part geometries not possible with traditional manufacturing, Domin created a range of valves that perform better and costs less to produce than current state-of-the-art products. Renishaw provided additional input on printing strategies to ensure consistent process quality.

Domin aims to improve hydraulic system efficiency by 400%, making a significant impact on global emissions. "Every valve we sell saves over a tonne of CO2 per year compared with alternative products," emphasised Marcus Pont, CEO of Domin.

Due to their success, Domin expanded their operations in 2024 by adding a RenAM 500Q Ultra to their machine portfolio. "The installation of a new Renishaw 500Q Ultra marks another exciting milestone in Domin's growth journey" said Marcus. "Our continued partnership with Renishaw is an example of our commitment to innovation and operational excellence."

> "The productivity of the RenAM 500Q is what enabled us to take our range to market competitively. It significantly drove down cost per part compared with alternative machines"
>
> **- Domin (UK)**

Read the full case study here
www.renishaw.com/domin

RENISHAW
apply innovation™

Applying innovation since 1973

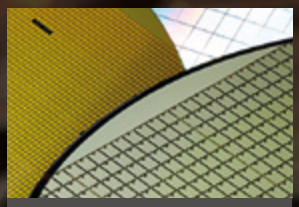
Renishaw is one of the world's leading engineering and scientific technology companies, with expertise in precision measurement and healthcare.

Our worldwide network of subsidiary companies and distributors provides dedicated global customer support, wherever you are.

Our principal markets include:


Aerospace


Automotive


Electronics


Energy


Heavy industry


Medical and healthcare


Precision manufacturing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www.renishaw.com/am

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+44 (0) 1453 524524 **uk@renishaw.com**

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