*May 2024 – for immediate release*

**Reflecting on the Additive Manufacturing industry**

Every year, Wohlers Associates releases a report on the additive manufacturing (AM) market, with analysts commenting on current progress and future predictions. Looking back at previous reports, what did we predict the industry would look like today? Here Stephen Crownshaw, Head of AM Sales at global engineering technologies company, [Renishaw](https://www.renishaw.com/en/renishaw-enhancing-efficiency-in-manufacturing-and-healthcare--1030?utm_source=Stone+Junction&utm_medium=OP&utm_campaign=Additive+manufacturing&utm_id=REC621&utm_term=Industry+overview&utm_content=Earned), reflects on how the industry has developed in comparison with predictions and explores how AM will develop in the future.

In 2024, [Wohlers Associates](https://wohlersassociates.com/news/wohlers-report-2024-shows-metal-am-growth-in-new-report/) released its 29th report on the AM industry, feeding on contributions with 110 co-authors in 35 different countries. The insight shared predicted market growth and a growth in users investing in 3D printing technologies.

Looking back at reports over the years, has the industry grown as expected? Back in 2013, for example, Wohlers predicted that industry sales would reach $10.8 billion by 2021. In reality, the 2022 report stated that the industry value reached $15.2 billion by 2021, despite the limited growth during the pandemic. Reports also suggest that additive manufacturing is becoming increasingly adopted for production, with the report estimating that final parts represent 33.7 per cent of AM applications. The 2024 report also shows that the metal AM market continues to grow, reporting that shipment of AM systems for metal parts increased by 24.4 per cent in 2023 in comparison to the year before.

While these figures show that more manufacturers are investing in AM, from my experience of visiting manufacturers it is clear that AM is still an emerging technology. If we want manufacturers to be using AM systems at the scale that they use conventional systems, such as CNC machine tools, we must consider how to develop AM as a tool for mass production in any application.

**Where we’ve seen success**

From my experience, and also detailed in the most recent Wohlers report, the medical industry has been an early adopter of AM and has greatly benefited from the technology. Looking at how this sector has embraced 3D printing could provide insight into how other industries can benefit from the technology and maximise its value.

Healthcare applications often have unique needs and challenges that AM can help solve. Every individual has a unique anatomy, so the customisation and design freedom offered by AM enables manufacturers to develop patient-specific implants, prosthetics, and surgical guides. AM also enables users to develop complex geometries and structures that are not possible using conventional methods. For example, medical implant manufacturers can develop parts using lattice structures, biocompatible materials and specific surface finishes to encourage osseointegration, or bone growth in implants, leading to improved patient outcomes.

As technology continues to advance and more applications are discovered, the synergy between AM and healthcare is likely to expand, leading to further advancements in medical treatments, devices, and patient care.

**Barriers to growth**

If we want to see rapid adoption of AM elsewhere, we must give customers the ability to easily integrate the technology into production and help them understand how to use the technology for their specific application. Currently, many businesses have one or a handful of AM systems on their shop floor. However, to consider this technology a mainstay in production, we’ll need to see manufacturers with similar numbers of machines to their installed base of CNC machine tools.

Health and safety issues are currently a barrier to moving AM from a prototyping tool kept in a remote factory location to a central part of the shop floor. Many additive processes involve the use of fine powders, such as metal or polymer powders. These powders can become airborne during the printing process or handling, posing inhalation risks. Users must therefore wear Personal Protective Equipment (PPE) like respirators, dust masks, or face shields to prevent the inhalation of potentially hazardous particles. To maintain safety, manufacturers therefore keep their AM systems away from shop floor production, making it difficult to upscale their additive capabilities.

Keeping AM systems away from the rest of production can also slow productivity. Build times are reducing, but manufacturers must also take time removing build plates to finish parts and set the system up for a new batch by handling and sieving powder safely and resetting the machine. To ensure that manufacturers can encourage more growth, AM system developers must consider how they can overcome these barriers and develop AM technology to further improve safety and productivity.

**Designing for AM**

One of the largest barriers to mass AM adoption is the design process. Traditionally, manufacturers use subtractive production methods, so naturally design their parts to match the process. Adopting newer technologies requires engineers to adapt every stage of production, particularly design. This happened when manufacturing first moved from manual machining to CNC machining, for example. Younger engineers that were familiar with the technology from their education could program the machine, so knew how to optimise the design for production. Today, CNC is commonplace, and most engineers understand how to design parts for the process.

In my experience, there is still a steep learning curve associated with transitioning from conventional design to designing for AM. While it is possible to replicate existing parts or designs using AM, this application does not use the technology to its full potential. AM offers a lot of design freedom, enabling users to create complex and intricate geometries that were previously impossible to achieve. Designing the part therefore requires a different mindset. With traditional subtractive methods, manufacturers start with a block of metal and cut away material until they have the design they need, often leaving excess material. With AM, engineers can simply develop a part that only uses the amount of material required to make a part functional. Take an aircraft bracket as an example. When using subtractive methods, aerospace engineers will take a metal block and cut it down until the bracket meets the two points it must connect and then use more material to forge it to the aircraft. By using AM, engineers could just design what they need, creating thinner sections and using techniques such as lattice structures to develop strong, yet lightweight, parts. This is especially important to the aerospace industry, where lighter parts will have a lifetime benefit in fuel savings.

**Looking ahead**

Advancements in technologies elsewhere will also positively contribute to increasing AM adoption. By investing in automation, such as installing robotic arms, users can reduce the time lost between builds to move parts and build plates during production, saving time and reducing the need for human intervention. Over time, AM users could use robots to handle a range of tasks, such as material handling, part inspection and surface finishing to gain optimum value from the technology.

Industry reports suggest that more manufacturers are exploring the benefits of AM, but when comparing to conventional technologies it is clear there is still room for expansion. If we want to see manufacturers across a variety of industries using additive technology to its full potential, we must give them the tools needed to optimise part design for AM and streamline their processes. At the same time, manufacturers must continue to improve system safety and productivity while reducing costs to ensure the extensive growth that industry reports forecast.

For further information on additive manufacturing systems, visit [https://www.renishaw.com/en/metal-3d-printing](https://www.renishaw.com/en/metal-3d-printing--32084?utm_source=Stone+Junction&utm_medium=OP&utm_campaign=Additive+manufacturing&utm_id=REC621&utm_term=Industry+overview&utm_content=Earned)

**-ENDS-**

**Notes to editors**

Renishaw is a world leading supplier of measuring systems and manufacturing systems. Its products give high accuracy and precision, gathering data to provide customers and end users with traceability and confidence in what they’re making. This technology also helps its customers to innovate their products and processes.

It is a global business, with over 5,000 employees located in the 36 countries where it has wholly owned subsidiary operations. The majority of R&D work takes place in the UK, with the largest manufacturing sites located in the UK, Ireland and India.

For the year ended June 2023 Renishaw recorded sales of £688.6 million of which 95% was due to exports. The company’s largest markets are China, USA, Japan and Germany.

Renishaw is guided by its purpose: Transforming Tomorrow Together. This means working with its customers to make the products, create the materials, and develop the therapies that are going to be needed for the future.

Further information at [www.renishaw.com](http://www.renishaw.com/)