Success Story
Aerospace

Sky-High Productivity: EOS and Senior PLC Collaboration Accelerates 3D printing for Aerospace

Burbank, California

EOS and Senior plc's collaboration achieved cost and weight savings of as much as 50% vs conventional manufacturing methods by using innovative industrial 3D printing technology, while also improving personnel safety and enabling superior material management.

Challenge

Quickly automate and optimize material handling

Solution

Implement a materials management system that could meet the high-volume production demands.

Results

Speed and safety improvements were employed to streamline AM workflow.

All manual material handling from production workflow was eliminated.

Trained staff supported the new technology, enabling the automated system to flourish.

Cost and weight savings of additive manufactured parts were as much as 50%.

Sky-High Printing Drives Productivity

EOS and Senior plc Collaborate to Accelerate and Optimize Industrial 3D printing in the Aerospace Industry

EOS, working in collaboration with Senior plc (LON: SNR, "Senior"), an international manufacturer of high technology components and systems,has devised and launched a new collaborative manufacturing process at the Senior Aerospace Advanced Additive Manufacturing Center (AAMC) in Burbank, California.. The center designs and manufactures complex high- and low-pressure environmental control system and engine bleed air components for fluid conveyance and thermal management applications in aerospace, land vehicle and nuclear energy. Historically, this has required either complex castings, machining or welded assemblies.

The Challenge

Senior uses additive manufacturing – more widely known as industrial 3D printing – for critical applications across military and commercial aircraft platforms. This requires safe and efficient management of large quantities of material across manufacturing centers, but research indicated that the manual processing of materials was inefficient at scale. Manual processing also introduced health and safety concerns around possibilities for human error, powder spillages and production downtimes for refills.

Senior has long been interested in additive manufacturing and was an early adopter of this cutting-edge process. For Senior to commit fully to scalable, repeatable additive manufacturing, however, a robust, more automated method to handle and manage materials was needed. The simple solution would have been to allow processes naturally to evolve over time, but after carefully considering options to improve productivity, safety and end-user performance, Senior selected EOS as a partner.

After consultation, Senior Aerospace and EOS set out to both automate and optimize material handling as much as possible while making the process more efficient and replicable across any facility or production application.

Short Profile

About Senior Aerospace
Senior Aerospace provides high technology products and systems for demanding applications in the aerospace & defence and adjacent markets. Our product portfolio spans a wide range of, fluid conveyance, and thermal management components and sub-systems, as well as complex structural parts and assemblies, for fixed-wing and rotary aircraft, aero-engines, spacecraft, and a variety of other industrial applications. With a global footprint, Senior Aerospace manufactures proprietary designed and build-to-print products for customers around the world that meet today's challenges and is actively engaged in developing products and capabilities for a low carbon sustainable future.

About Senior
Senior is an international manufacturing group with operations in 12 countries. It is listed on the main market of the London Stock Exchange (symbol SNR). Senior designs and manufactures high technology components and systems for the principal original equipment manufacturers in the worldwide aerospace & defence, land vehicle and power & energy markets.

Further information on Senior plc may be found at:

www.seniorplc.com

The Solution

Senior's search for a solution coincided with EOS's development of the IPM M Powder Station L (IPM M L), an automated material management system built to meet high volume demands. Using the IPM M L in combination with EOS Printers, Senior was able to eliminate all manual material handling from its production workflow while training staff to support the new technology as needed; a true 'set it and forget it' achievement.

The ability to augment the quantity of material is a game-changer. Now, the EOS M 400-4 connected to the IPM M L automatically refills the dispenser bin and completes full builds without any interruption or user intervention, eliminating manual lifting of heavy powder containers. The system also features innovative safety features, such as a closed powder-storage circuit with an argon gas atmosphere to protect powdered titanium. Keeping titanium separate from air promotes safety and ensures powder longevity, further improving Senior's processes and operations.

Our Combined Results

Senior, with EOS's technology, has implemented a much-improved automated material-management solution for its industrial additive manufacturing processes. This has enabled improvements in productivity, speed and safety that have streamlined the company's end-to-end workflow by taking advantage of automated and optimized material handling. Another key advantage of the new automated system is high-quality, repeatable prints resulting from good powder material traceability.

"A lot of our customers are intrigued by the projected cost and weight savings available from additive manufacturing, but are apprehensive about the process control capability," says Matthew Parker, AAMC Director.

"When we show our extensive dataset to our customers, including our robust powder data enhanced by the capabilities of the IPM M L keeping the powder under argon at all times, thus eliminating the need for direct power interaction by our operators, doubts about process control are rapidly settled.

Senior's investments in the IPM M L have achieved cost and weight savings of as much as 50% vs conventional material removal manufacturing methods of a wide range of Titanium and Inconel parts, as well as improving personnel safety and enabling superior material management.

"Additive manufacturing really has now become part of the DNA of the business, and everyone on the engineering team thinks 'additively".

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