

GE announces industrial scale additive manufacturing system

GE Additive has announced that its first Concept Laser M-Line Factory systems for industrial scale additive manufacturing will be delivered to customers during the second quarter of 2019.

Since GE Additive's acquisition of Concept Laser in December 2016, the M-Line Factory's design architecture, system and software have undergone extensive review and redesign to align with established GE processes and in response to beta testing with selected customers.

"The positive impact M-Line Factory can have on our customers' operations and their bottom lines is huge, making it important to provide technologically advanced systems that are reliable and add value to their operations. The M-Line Factory delivers on these commitments," says Jason Oliver, president and CEO of GE Additive.

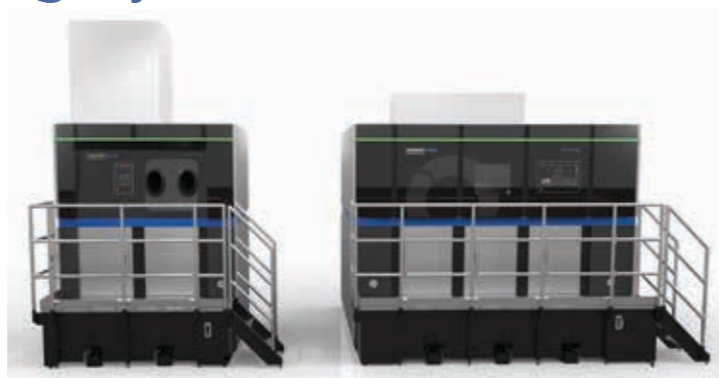
Reliability and repeatability

As additive manufacturing (AM) transitions from prototyping to a production technology, the demand for machines is increasing, as is the demand on production floor space and the number of operators required to run production lines.

Existing standalone machine solutions barely allow for economical series production. In contrast, the M-Line Factory's modular machine architecture offers outstanding automation and reliability, which can be used to drive economical, scalable series production on an industrial scale.

Modular architecture with full automation

During detailed rig and lifetime testing, a number of areas were identified for improvement, and these have since been incorporated into the system:



GE/First Concept Laser's M LINE FACTORY systems enable part production, set-up and dismantling processes to take place in independent AM units operated separately from one another or combined depending on each customer's preference.

Part production, as well as set-up and the dismantling processes will

- Improved in-machine architecture and automation.
- Enhanced serviceability, scalable modular system design and ease of service.
- Increased build volume: the build platform is now 500x500, with a build height of 400 mm.
- Onboard software: Modularised software architecture has been included to offer superior exposure strategies and real-time, in-situ, process monitoring.
- Process control and thermal stability features to control key process variables that dictate part quality.

Part production, as well as set-up and the dismantling processes will



To maximum footprint efficiency, machine modules can be stacked in series alignment. Photos courtesy of GE Additive.

take place in two independent AM units. The units can be operated physically separately from one another or combined depending on each customer's preference. This enables production processes to run in parallel rather than sequentially, which reduces downtime considerably and, in turn, increases the availability and output quantity of the process chain.

Laser 'on time' is increased by separating individual work processes from the pre- and post-processing units, while maintaining a fully integrated system design. Key innovations incorporated into GE/Concept Laser's M-Line Factory AM Laser Processing Station (LPS), materials handling station (MHS) and safety features include:

- A build volume of 500x500x400 mm³ with a further depth increase under development.
- Laserpower of 4x400 or 4x1 000 W.
- A unit core comprising three independent modules: the powder module; build module; and overflow module, all of which can, for the first time, be activated individually as they do not form one continuous unit. These modules are activated automatically via the internal transport system.
- Frontload transport system or automated internal transport system.
- Increased overlap within the build field improves laser productivity.
- Flexible configuration allows build and process time to dictate the laser processing station (LPS) to material handling station (MHS) ratio.
- Ease of transport: uniform size and interfaces on all modules.
- Maximum footprint efficiency: ability to stack machines in series alignment.
- M LINE FACTORY materials handling station (MHS) processing unit for pre- and post-processing and powder management with an integrated sieving station.
- Full powder and inert gas safety containment via an automated module lidding system.
- Contactless powder handling throughout the process.
- No manual handling in the process chamber.
- Water-flood passivation of filters.

The M LINE FACTORY automates upstream and downstream stages of the production process and provides interfaces to conventional manufacturing methods in the form of automation, interlinking and digitisation.

The system forms part of GE Additive's focus to provide additive manufacturing machines that are reliable, repeatable and ready for series production.

Part of the global GE Group, GE Additive is a world leader in additive design and manufacturing, a pioneering process that has the power and potential to transform businesses. "Through our integrated offering of additive experts, advanced machines and quality materials, we empower our customers to build innovative new products. Products that solve manufacturing challenges, improve business outcomes and help change the world for the better," says Oliver.

GE Additive includes additive machine providers Concept Laser and Arcam EBM; along with additive material provider AP&C. □

Digital metrics offering for comminution circuits

Metso is expanding its digital Metso Metrics offering with the launch of a new predictive maintenance solution for mining equipment, aimed to help maximise the uptime and performance of comminution circuits.

The solution was introduced at the Rockwell Automation-hosted Automation Fair in Philadelphia in November, 2018.

Metso Metrics provides global mining customers improved visibility and new insights into their equipment and processes with analytics, condition monitoring and predictive maintenance – all backed by expert support from Metso. The combination of advanced technology and expertise will bring Metso services closer to customers by improving collaboration, asset reliability and process optimisation.

"Optimisation of existing assets and processes is now key to driving productivity at mine sites. This is where digitalisation coupled with expert support really comes into play – connecting the right data with the right people," says Jani Puronta, chief digital officer for Metso. "With innovative digital tools such as Metso Metrics, minerals processing plants can shift from reactive-mode to being proactive and focused on continuous improvement."

The Industrial Internet of Things (IIoT) solution is built on the Rockwell Automation FactoryTalk Cloud platform, powered by Microsoft® Azure™. It securely collects data from hundreds of sensors within Metso equipment, which assess process performance and predict component wear and failure. Metso performance teams analyse the data with the support of advanced machine learning algorithms to help customers optimise equipment, operations and processes. "Mining companies need better visibility of their processes, equipment performance and supply chain to improve safety and efficiency, reduce energy usage and, ultimately, inform business decisions," says Blake Moret, chairman and CEO of Rockwell Automation. "This connected mine solution allows mining companies to derive measurable business value from their operations, enabling better collaboration and increased productivity."

The new mining solution is the latest addition to Metso's digital services. It covers Metso's primary gyratory crushers, cone crushers and vibrating screens. In future, other types of minerals processing equipment, such as mills, will be addressed. The first generation Metso Metrics tools were launched in 2017 to help optimise aggregates production in quarries and at contractor sites. Metso has also developed a similar solution for waste recycling equipment. □

Metso performance teams analyse the data with the support of advanced machine learning algorithms to help customers optimise equipment, operations and processes. "Mining companies need better visibility of their processes, equipment performance and supply chain to improve safety and efficiency, reduce energy usage and, ultimately, inform business decisions," says Blake Moret, chairman and CEO of Rockwell Automation. "This connected mine solution allows mining companies to derive measurable business value from their operations, enabling better collaboration and increased productivity."

The new mining solution is the latest addition to Metso's digital services. It covers Metso's primary gyratory crushers, cone crushers and vibrating screens. In future, other types of minerals processing equipment, such as mills, will be addressed. The first generation Metso Metrics tools were launched in 2017 to help optimise aggregates production in quarries and at contractor sites. Metso has also developed a similar solution for waste recycling equipment. □

The first generation Metso Metrics tools were launched in 2017 to help optimise aggregates production in quarries and at contractor sites. Metso has also developed a similar solution for waste recycling equipment. □

The first generation Metso Metrics tools were launched in 2017 to help optimise aggregates production in quarries and at contractor sites. Metso has also developed a similar solution for waste recycling equipment. □