VELO 3D

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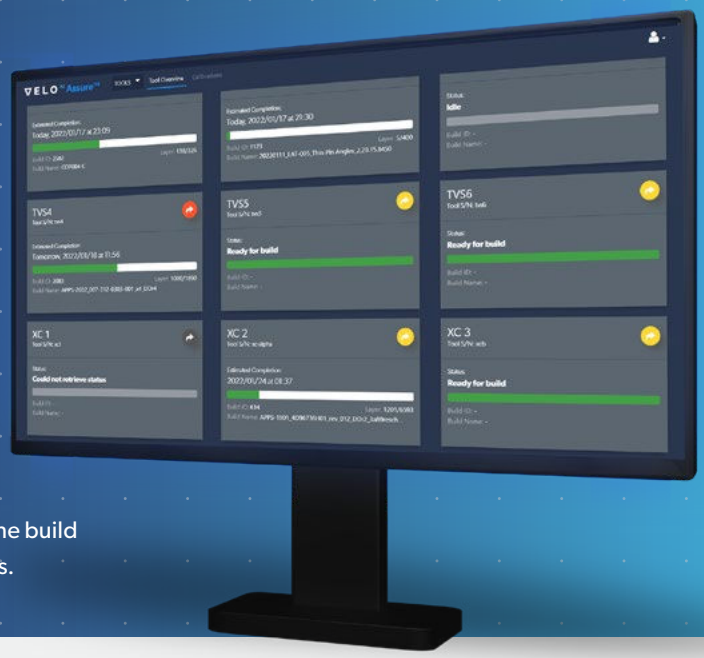
PRODUCT BRIEF

Assure Quality Assurance and Control Software



Provides unprecedented traceability of machine health, part integrity, and build reporting. Working in concert with Sapphire and Flow, Assure, a revolutionary quality control software, enables visibility into every layer of the build through real-time, multisensor, physics-based excursion detection algorithms.

Factory Monitoring

Real-time machine fleet tracking and live build progress status give operators effective oversight of factory performance. Now integrated with Grafana, engineers can create custom graphs and dashboards pulling from nearly 1,000 different sensor readings that reveal detailed insights into the process.

In-Process Monitoring

Provides an overview of basic build performance data (optical health, powder bed quality, build chamber environment, etc.), and lets you drill down to explore specification compliance in detail messages that prevent errors before a build starts.

Tool Health

Automated system calibrations enable each system to replicate parts within geometric and material property specifications. Assure records printer calibration history so that you can quickly identify issues and trends.

Build History Reporting

Easily filter historic records by tool ID number and completion status or search by build file name, work order number, build ID, number of layers and more. Assure's on-demand build report consolidates a vast amount of data into a concise summary of critical build information. View tool calibration status, build data, interrupt reporting, and height mapper images that document deviations.

FLOW
Print Preparation Software

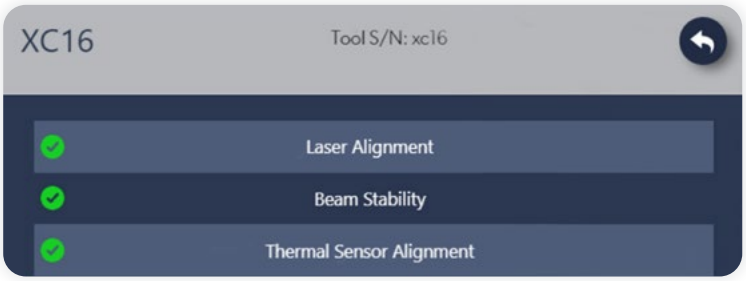
SAPPHIRE
Metal AM Family of Printers

ASSURE
Quality Validation

Assure Capabilities

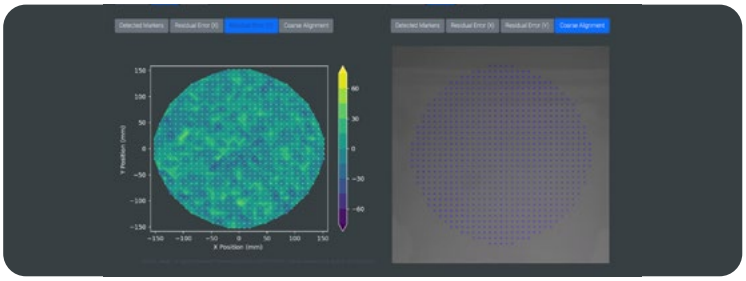
Pre-Print Calibrations

Assure displays Sapphire's automated calibration results that ensure consistent geometric accuracy, surface finish, and validated material properties year-to-year and system-to-system. These in-situ calibrations can be run directly by the user from the printer control screen with no added equipment in a runtime environment. Results of these routines are displayed on Assure and archived for the life of the system for future reference. The main checks composing the Tool Health Checklist (THCL) include: powder bed qualification, focus calibration, laser alignment, thermal sensor alignment, and beam stability.



Multi-Laser Alignment

Pre-build, in-situ alignment ensures high quality overlay between lasers. This fully automated calibration routine runs without additional equipment and validates alignment at multiple locations on the build plate. Additional runtime checks consistently validate alignment at every layer, making on-the-fly adjustments as necessary. This process enhances the surface finish by eliminating part stitch lines and helps to reduce overlay porosity caused by mismatches.

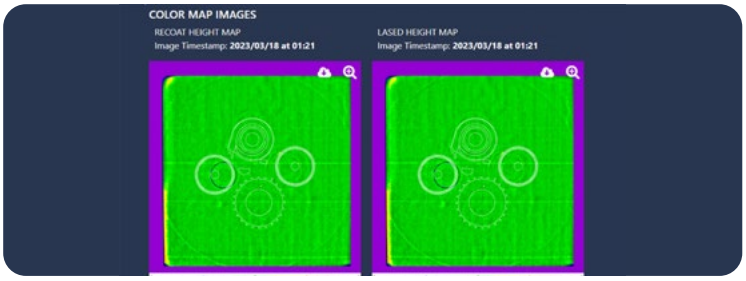


Process Monitoring

During the process, Assure tracks a layer-by-layer validation of atmosphere, consumables, and powder bed health to enable part quality. Throughout the print, factors like oxygen and humidity are tracked to verify that material properties stay consistent. By monitoring consumable indicators, like filter life and powder levels, Assure helps to prevent unexpected interrupts. The system also continuously monitors for part protrusions that may arise from excessive stress or issues related to the build setup.

Height Mapper

Provides a detailed, layer-by-layer view of powder bed quality and lasing behavior. Height Mapper is a 3D structured light scanner that reveals powder bed topography and ensures a conformal powder bed prior to and after each layer. A very powerful tool for troubleshooting a build, this process checks for target layer thickness, smoothness, and part protrusions.



Grafana Integration – Enhanced Transparency

Assure integrates with Grafana giving engineers access to the nearly 1,000 different sensor readings that monitor the printing process. Gain detailed insights and manage the key variables governing your additive part production.