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HP and Siemens:

Industrializing additive manufacturing with HP Multi Jet Fusion technology

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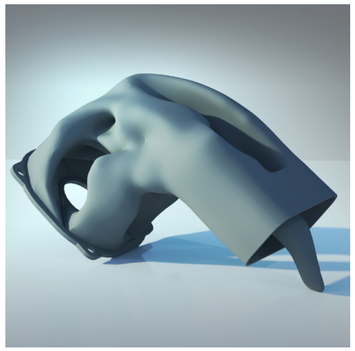
We are at an inflection point in the history of additive manufacturing (AM). Many companies use AM to produce prototypes and tooling. Some leverage AM for part replacement and consolidation. Few, however, have realized the vision of delivering mid-volume production of functionally optimized plastic products—with the requisite speed, efficiency, and productivity. Until now.

Siemens software and HP 3D Printing systems come together in a complete, closed-loop environment that streamlines every phase of the process of developing 3D-printed plastic parts. Siemens software for design, simulation, and 3D printing, along with plant optimization, manufacturing execution, performance analytics, and life cycle management, combines with HP's Multi Jet Fusion technology to enable companies to bring additively manufactured innovations to market faster, more economically, more sustainably, and at higher volumes than ever before.

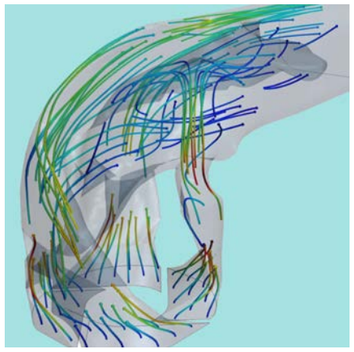
Here's how Siemens and HP help you realize additive manufacturing productivity with HP Multi Jet Fusion technology:

Reimagining products



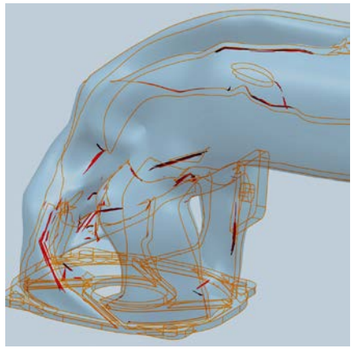
Optimize design

Use Siemens NX design software to reshape conventional parts, optimizing topology based on design constraints and HP 3D Printing material capabilities. Then use convergent modeling to smooth surfaces and add features such as lattice structures.



Predict performance

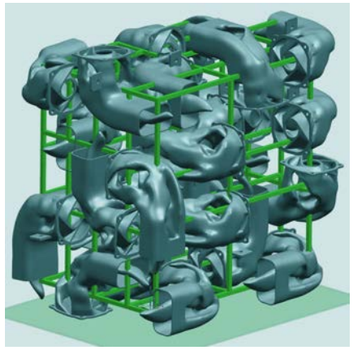
Analyze the performance of your design with Simcenter. Explore a variety of load cases, including strength, acoustics, vibration, motion, flow and heat transfer, factoring in HP 3D Printing material specifications. In addition to optimizing single components, you can assess overall system behavior.



Validate printability

NX offers a variety of validation tools to improve the quality and yield of parts printed using HP Multi Jet Fusion technology: minimum wall thickness for printability, wholly enclosed volume detection, and optimum part features such as snap fits and threads.

Perfecting processes

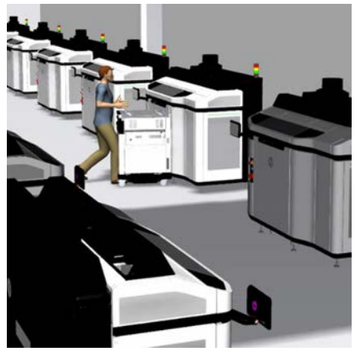


Prepare parts for 3D printing

NX drives the entire print preparation process for parts developed to take advantage of HP Multi Jet Fusion technology, helping you arrange parts in the build tray and the build package for the HP Jet Fusion 3D Printers. With automated nesting, parts are optimally arranged in the build volume to save material and minimize cycle time.

Connect to AM Network

To boost your HP Multi Jet Fusion printing capacity, connect to the Siemens Additive Manufacturing Network, an online collaborative solution for on-demand design and distributed AM production. The AM Network provides a way to facilitate access to a subset of HP Multi Jet Fusion part suppliers.



Optimize factory processes

Tecnomatix plant simulation enables you to model, simulate, and optimize your HP Multi Jet Fusion production, including equipment, material flow, and personnel. With a digital twin of your process, you can run print jobs virtually, eliminate bottlenecks, and streamline throughput—before going to actual production.

Powering production

Orchestrate and trace operations

SIMATIC IT for AM execution ensures production efficiency, quality control, and traceability. With SIMATIC IT, you can manage print jobs and individual parts throughout your HP Multi Jet Fusion production. That includes all operations, materials consumed, equipment used, data collected, exceptions, rework, timing, and e-signatures. This audit trail improves root-cause analysis, for proper containment and resolution.

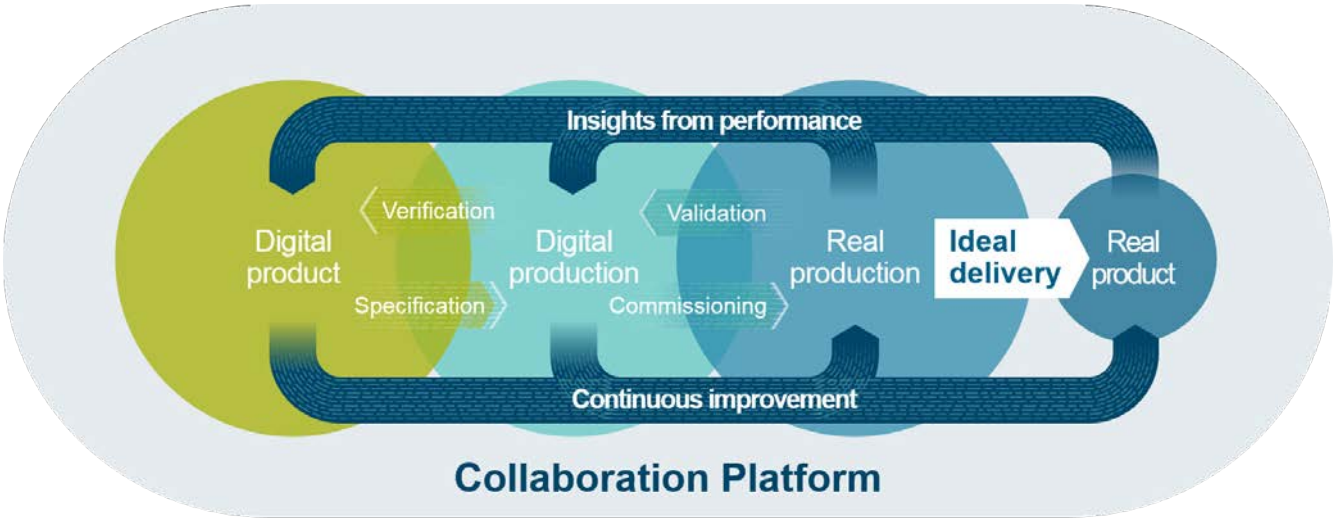
Integrate with HP Jet Fusion printers

Unleash new growth and scale production with HP's most advanced plastics 3D printing solutions, including the recently announced HP Jet Fusion 5200 Series 3D Printing Solutions. These HP devices, integrated with Siemens software, deliver unprecedented levels of manufacturing predictability and breakthrough economics. And this opens new opportunities for mid- to high-volume production applications.

Manage workflows and collaboration

With Teamcenter managing the entire digital thread, you get total operational control of your product development process, manufacturing planning, and print production. Teamcenter connects the bill of process to SIMATIC IT so that design, planning, and execution can be perfectly coordinated and everyone in your additive manufacturing-powered digital enterprise collaborates with maximum efficiency.

Optimizing performance



Refine real production

The Siemens MindSphere IoT platform works with the HP IoT infrastructure to connect your products, printers, and plants so you can harness a wealth of data generated during production. With advanced analytics, you'll gain insights that help you close the loop between your digital production plan and its actual performance.

Rethink virtual production

MindSphere can also interrogate this IoT data pool to feed insights back into the digital twin of your HP Multi Jet Fusion production, so that you can troubleshoot what happens before and after printing with equipment, material flow, and worker performance and thereby optimize processes for future projects.

Reimagine product design

A fully realized digital twin must collect and analyze data from product performance in the field, then feed it back into design and engineering. With MindSphere monitoring your product performance, you can complete this feedback loop and realize continuous product improvement.

Ready to take additive manufacturing to the next level?

HP and Siemens are working to develop applications in a variety of industries, from automotive and aerospace, through machinery, medical and marine, to consumer products, energy, and electronics. We're already meeting with companies to explore ideas, provide guidance, and develop strategies for how you can achieve volume production of 3D printed plastic parts. Applications for personalization, lightweighting, fluid management, and energy absorption are actively being pursued. The end-to-end additive manufacturing solution from HP and Siemens is ready for viewing at the AM Experience Center in Erlangen, Germany. If you're interested in discussing a 3D printing production application for your business, contact:

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