

Case study

# HP's Multi Jet Fusion technology helps IAM 3D Hub develop the tools needed to automate assembly



**HP's Multi Jet Fusion technology enables design freedom, allowing IAM 3D Hub to develop new robotic components and tooling to further automate Continental Spain S.A's, Assembly Operations**

**INDUSTRY SECTOR**

Product development service

**OBJECTIVE**

Utilize the design freedom associated with 3D printing to customize products for specific clients, improving their performance versus traditionally manufactured parts.

**APPROACH**

Redesign mechanical components to benefit from the unique capabilities of 3D printing, helping them make better use of space while also performing more effectively. Rapidly prototype to improve product development cycle times and reduce costs by producing parts in short runs.

**TECHNOLOGY**

HP Multi Jet Fusion



Data courtesy of IAM 3D HUB

**Summary**

IAM 3D Hub aims to accelerate the adoption and development of 3D printing technologies in the European Union's manufacturing sectors. Located in Spain's Catalonia region, the Hub helps integrate and coordinate activity in the additive manufacturing ecosystem and provides its customers with an alternative way to design, develop and manufacture new competitive products and services.

IAM 3D Hub was formed as part of a collaboration between several industry giants, including HP and Renishaw, Coniex, which provides process consulting, and LEITAT, which is a non-profit research organization that specializes in material, device and production technologies. In addition to additive manufacturing, the Hub also provides support with materials science and engineering.

The company supports clients in many different industries including: automotive, aerospace, locomotive and other transportation companies, in addition to leaders in energy, healthcare, and consumer goods, among others.

IAM 3D Hub addresses the potential of 3D printing throughout a product's value chain, from design, to production and ongoing maintenance and support. Some of the applications it offers include conceptual models, prototypes, tooling for traditional manufacturing processes, end-use products, spare parts and more.





Data courtesy of IAM 3D Hub

### Challenge

“At IAM 3D Hub, we’re helping companies look at 3D printing as an alternative way to design, develop and manufacture new, more competitive products,” says IAM 3D Hub’s Technical and Scientific Director, Magi Galindo. “Robotics are a vital tool for manufacturers who are automating their workflows. Assembly tasks are often unique to the product being made, and as a result the robots themselves must be highly customized.”

Continental Automotive Spain S.A is one of IAM 3D Hubs’ clients. They have two factories in Spain. One is focused in manufacturing and assembling used in instrument panels. The other is devoted to injection molding, making plastic parts that are used in the construction and assembly of dashboards, center consoles, and other interior automotive components.

As a global Tier 1 supplier in the automotive sector, they are under constant pressure to reduce costs and operate more efficiently. While humans are still necessary for some operations, many others are completed with the help of robotic systems. As components move through the factory on their way to final assembly, customized robotic systems are frequently used in handling and unloading operations.

Coupled with robotic arms and control systems, grippers are utilized to grab, position and transport the various parts that make up a final component. Grippers themselves include many different elements from power, signal and control modules to air and vacuum pipes, connectors, suction cups, and magnets, among others.

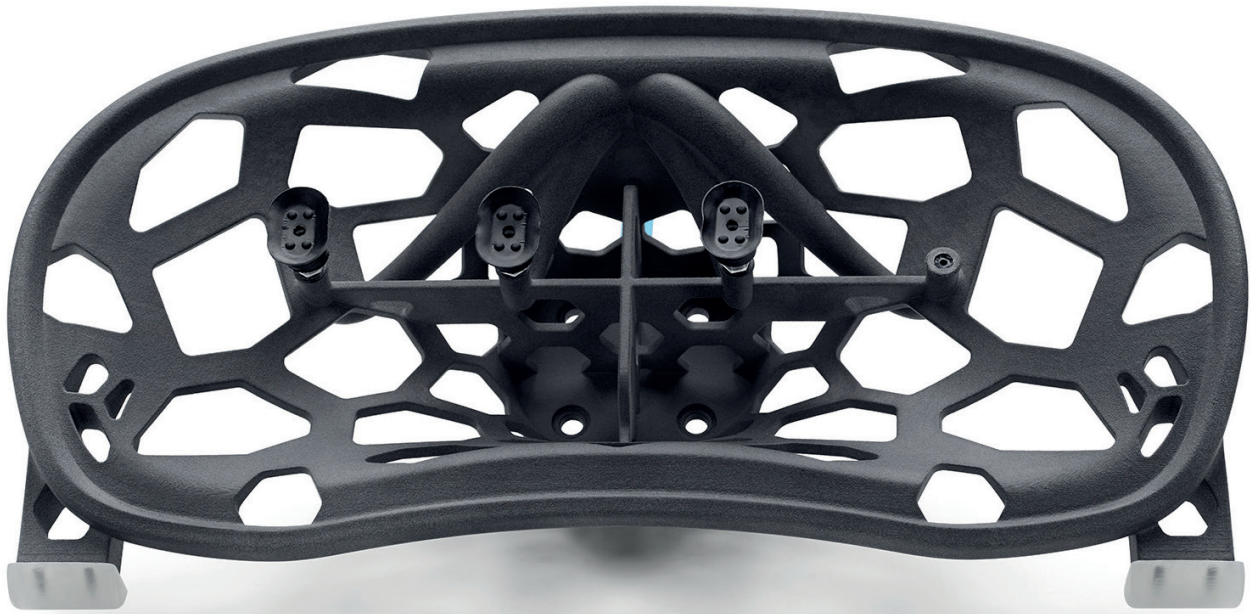
Automotive interior components are typically heavy and bulky, while also often requiring precise movement and placement, which can increase the complexity of a robotic system’s function. Based on standard components, typical robotic systems feature grippers with high inertias (due to their weight) and a large number of components. The complexity of these systems can lead to higher acquisition costs while also increasing the risk of failure due to a need for additional maintenance and ongoing, constant adjustment.

Given their complex nature, final finishing and assembly operations are mostly performed manually by human operators. Continental, however recently began studying how these tasks could be automated by combining new types of jigs and fixtures with robots using specialized grippers. Specifically, the newly designed grippers would be used to greatly reduce the amount of time required to carry out the assembly, coupling, calibration and maintenance of the tooling - both in the implementation of a new production activity and in during changes between different work processes.



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– Magi Galindo, IAM 3D Hub’s Technical and Scientific Director.



Data courtesy of IAM 3D Hub

### Solution

“With HP’s Jet Fusion 3D Printing Solution we had the ability to simplify both the operation of the grippers and the tooling required for final assembly,” says Mr. Galindo. “We could design parts with much less complexity, in some cases reducing the number of components by 80%. Further, we could create less expensive parts that were more robust and reliable, in addition to being easier to connect and control.”

As IAM 3D Hub studied the problem, it became evident that simpler solutions were required to solve the complex challenges associated with final assembly. While the grippers needed to be optimized for very specific functions, they also needed to be robust and reliable enough for use in a production environment. In addition to working with collaborative robots, they had to be compatible with the usual 6-axis robotic arms and gantries that are typically installed in injection cells.

New grippers and tooling were designed in Solidworks and Rhinoceros and were produced using HP’s Jet Fusion 3D Printing Solution. The new grippers were capable of obtaining and using the tooling required for each task that needed to be carried out. The robustness of their design minimized maintenance and eliminated the need for calibration. Further, they were also less expensive to produce and reduced the weight and inertia by more than 80%, enabling the customer to use more affordable robots with a lower load capacity.

### Result

“The grippers and tooling designed by IAM 3D Hub will help Continental Spain continue to automate its workflow, solving one of the biggest challenges in the construction of automotive interior components,” Says Mr. Galindo. “Final assembly is an expensive and time-consuming process. With this breakthrough at their factories in Spain, Continental now has a best practice they can apply at other locations in their manufacturing network. Further, it validates the adoption, integration and implementation of additive manufacturing for production tooling across the automotive industry.”

As a result of their innovative thinking, IAM 3D Hub is helping Continental Spain, S.A further digitize their operations. Working in synergy with other technologies, including robotics, machine learning, sensors and the Internet of Things, 3D printing is playing an important role in helping them achieve this transformation.

The new design strategies employed by IAM 3D Hub helped decrease the amount of time it took to create the new grippers by 30%. HP’s Multi Jet Fusion technology also played an important role, helping replace the complex and intricate design of previous grippers with newer organic structures that reduced their weight by more than 85%.

Producing the grippers additively also helped reduce the number of parts in each gripper, including conduits, connectors, magnets and



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## Customer at a glance

### Application

- 3D Printing for Final Part Production

### Hardware

- Currently IAM3DHub has 8 MB3 HP Jet Fusion 3D 4200 Printers

### Accessories

- 5 HP Jet Fusion 3D 4200 Processing Stations with fast cooling loaded with different materials
- HP 3D High Reusability PA 12 (x3), HP 3D High Reusability PA 12 Glass Beads(x1) & HP 3D High Reusability PA 11(x1)
- 19 HP Jet Fusion 3D Build Units
- 5 HP Jet Fusion 3D External Tanks

### Software

- HP SmartStream 3D Build Manager
- HP SmartStream 3D Command Center
- Rhinoceros, grasshopper, SolidWorks, Catia.
- Materialise Build Processor for HP Multi Jet Fusion
- 3MF, STL, STEP, STP, \_XB, \_XT, IGS 3DM, OBJ, PLY...

### HP services

- Next-business-day onsite support
- Next-business-day spare parts availability, thanks to HP's global reach
- 3D printing productivity and professional services

## Learn more about HP Multi Jet Fusion technology at

[hp.com/go/3DPrint](https://hp.com/go/3DPrint)

Connect with an HP 3D Printing expert or sign up for the latest news about HP Jet Fusion 3D Printing:

[hp.com/go/3Dcontactus](https://hp.com/go/3Dcontactus)

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– Magi Galindo, IAM 3D Hub's Technical and Scientific Director.

other elements, by more than 80%, while simultaneously reducing the space required for the system to operate. With the inclusion of new a new coupling mechanism, the new design also facilitates a faster connection with the robot, reducing the process and installation time by 40%.

“HP's Multi Jet Fusion technology allows organizations to completely rethink their approach to complex workflows,” says Mr. Galindo. “Our advice to other companies in the manufacturing industry is to start using it now and begin taking advantage of the opportunities that 3D printing provides.”

