

With HP Multi Jet Fusion, **Aereco** can create jigs and fixtures, prototypes, and final parts



Data courtesy of AERECO S.A.



Aereco implements HP Multi Jet Fusion technology at different stages of the product lifecycle



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Introduction

Aereco develops ventilation solutions for residential and office buildings with a key concept: to modulate airflow according to the customer's needs. With this principle applied to specific technologies, Aereco's demand-controlled ventilation systems solve buildings' challenges regarding energy efficiency and indoor air quality.

With a headquarters and factory located in Marne la Vallée, France, Aereco Group has grown more than 450 employees

since its founding in 1984, now with customers in more than 30 countries.

Today, Aereco teams research, design, and conduct tests with innovative tools and products. Aereco has turned to 3D printing to enhance their production processes and develop prototypes more quickly.

- **Industry**

Industrial

- **Sector**

Heating, ventilation, and air conditioning

- **Technology | Solution**

HP Multi Jet Fusion (MJF) technology, HP Jet Fusion 4200 3D Printing Solution

- **Material**

HP 3D High Reusability¹ PA 12

1. HP Jet Fusion 3D Printing Solutions using HP 3D High Reusability PA 12 provide up to 80% powder reusability ratio, producing functional parts batch after batch. For testing, material is aged in real printing conditions and powder is tracked by generations (worst case for reusability). Parts are then made from each generation and tested for mechanical properties and accuracy.

Jigs, fixtures, and tooling – Assembly workstation

As the largest area in Aereco's factory, the assembly line is managed by the Special Machinery team. These engineers ensure the correct functioning of the assembly lines and work to optimize various assembly stations. Each station can feature a single- or multiple-employee workstation that integrates all the tools, jigs, fixtures, machines, elements, and parts needed to execute each assembly step.

When a jig, fixture, or tooling on the assembly line would break, Aereco would often find themselves without spare parts and without the ability to quickly produce a replacement part. Engineers needed a technology that would help them rapidly and affordably solve these types of problems in order to keep production running and reduce downtime.

Nicolas Muris, Project Manager for Aereco, concluded that changes to the assembly workstations were needed and wanted to explore the use of 3D printing to produce parts for the workstations.

To do this, Muris replaced all the milled parts, the support board, and the safety casings with 3D printed parts made from HP Multi Jet Fusion technology. He also used 3D printing to create a variety of new parts, such as custom elastic coupling,

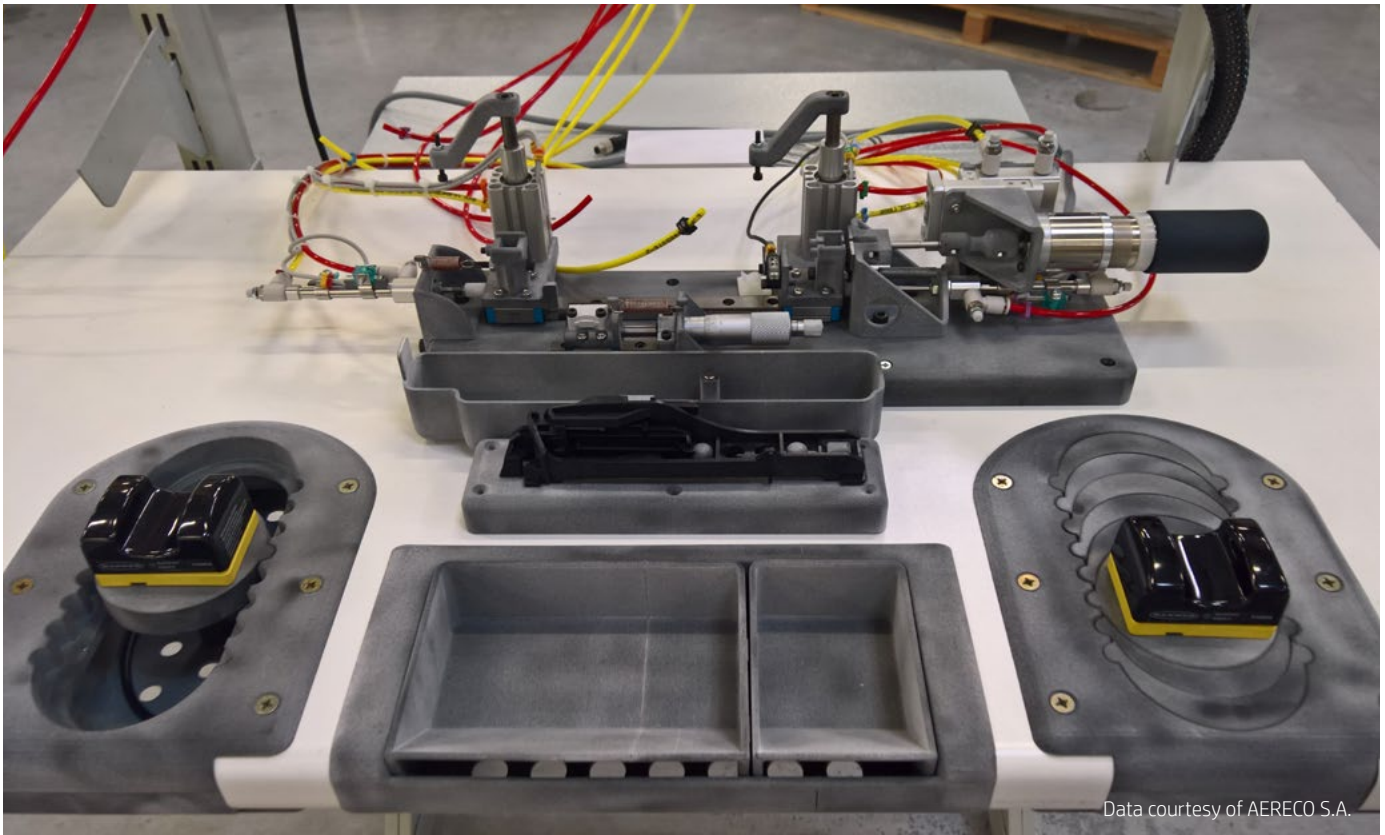
custom-made gripping trays integrated into the board, and a cost-effective adjustable depth system for the buttons.

By 3D printing these elements for the workstation, Muris noticed cost savings of 90%, from 3.000€ with aluminum and stainless steel to 300€ with HP Multi Jet Fusion and HP 3D HR PA 12 material.

HP MJF also allowed for the creation of more complex parts as well as the improvement of user ergonomics (e.g., adjustable start buttons, lighter weight), which not only enhances productivity but also improves employees' comfort and, as a result, performance.

"In our latest workstation designs, we are introducing customizable features that each employee can adapt for better comfort," Muris said.

The design freedom made available by HP Multi Jet Fusion technology meant Aereco was able to redesign the workstation's automatic assembly and combine three different steps into one. The machine is now more durable thanks to the robust properties of HP 3D HR PA 12 material, and also lighter than the conventionally designed machines.



Data courtesy of AERECO S.A.

Prototyping – Exhaust unit cover

Before going to production, Aereco engineers develop prototypes in order to validate designs and test functionality. Creating prototypes was historically very expensive with traditional technologies as it would require engineers to create a mold modification for each design iteration. With HP Multi Jet Fusion technology, the prototyping process, times, and costs have been significantly reduced.

“As with all product R&D teams, the product’s go-to-market time is the most important factor in the development and prototyping stage of the product,” said Pierre Kraus, Manager at Aereco.

To personalize an air extraction wall mount by adding a customer’s logo to the product, Aereco was able to conduct multiple design iterations for this short-run production part using HP Multi Jet Fusion technology, without the need to use expensive metallic molds. Creating a prototype using traditional manufacturing used to take about 2 or 3 weeks, but now with HP Multi Jet Fusion technology, Aereco completes only two printing jobs, which can take just 4 days.

“HP Multi Jet Fusion technology not only allows us to create easier and faster prototypes, but it also pushes us to start thinking from the very beginning of the production process on how to develop optimized product designers, lighter parts, and simplified assemblies,” Kraus said.

Final part – Exhaust unit slider

Exhaust units can be built to meet different requirements depending on the type of building in which they are installed (e.g., public use, industrial use, residential, etc.), each of which has different regulations regarding air quality such as humidity range, flow rate, or CO2 levels, among others.

Aereco’s exhaust unit slider had to be redesigned to meet such regulations, so Aereco engineers used HP Multi Jet Fusion technology to create versatile and agile adaptations of the exhaust unit base model. To make one of these adaptations, they adjusted the actuator, a small inner part of the exhaust unit’s shutter blades that consists of a slider.

“Initially we considered producing the parts with injection molding, but after making some calculations, we realized that for the medium production run, we had to satisfy 300 units

per year in a period of only 3 years,” said Thomas Bourgois, an Aereco engineer. **“The injection molding option was too expensive, did not justify the cost of modifying or creating metallic molds, and did not reach the return-on-investment point. Therefore, we decided to produce the parts with HP Multi Jet Fusion technology, with which we found a more accessible production system and more versatility to implement small and quick changes for further adaptations, while also reducing costs on the manufacturing of these parts.”**

With injection molding, the costs per part are 0.11€, so for 300 parts per year over 3 years, the cost would be 99€, plus 4.000€ for a metallic mold rework. In the end, injecting molding costs would total 4.033€. With HP Multi Jet Fusion, the cost is 0.28€ per part, so for 300 parts per year over 3 years, the total cost would be 252€, for a difference of 3.847€ and a cost reduction of 94%.

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Learn more about HP Multi Jet Fusion technology at hp.com/go/3DPrint

Learn more about Aereco at aereco.com

