

Case study

HP's Multi Jet Fusion technology helps Biesse achieve its forward thinking mission



How HP's Multi Jet Fusion technology fosters design freedom and improves speed-to-market, helping a maker of industrial equipment meet customer requirements more quickly and more profitably

INDUSTRY SECTOR

Manufacturing (wood and related products)

OBJECTIVE

Accelerate the speed of research and development, while also leveraging technology to bridge traditional manufacturing lead times, enable short-run production, and offer customized products for specific clients

APPROACH

Utilize 3D printing to rapidly prototype mechanical components, create specific tooling, and ultimately manufacture final parts for customer use

TECHNOLOGY

HP Multi Jet Fusion technology
HP Jet Fusion 3D 4200 Printing Solution



Summary

The Biesse Group operates in the market for machinery and systems for working wood, glass, marble, and stone. Established in Pesaro, Italy in 1969 by Giancarlo Selci, the Company offers modular solutions from the design of turnkey plants for large furniture manufacturers to individual automatic machines and workstations for small and medium enterprises.

As a multinational company, the Biesse Group distributes its products through a network of subsidiaries and associates located in leading strategic markets. Its 37 directly controlled subsidiaries guarantee specialised after-sales service to clients while at the same time conducting market research into new product development. At present, Biesse Group has more than 4,000 employees in its main production facilities and in offices located globally. The Group also has more than 300 resellers and agents enabling it to cover more than 100 countries.

The company's namesake subsidiary designs, manufactures and markets a complete range of technologies and solutions for the wood industry, including furniture, windows, and other wood components. Biesse has also recently expanded into plastic processing machines, with solutions designed specifically for this growing market.



Challenge

“Within Biesse, we have a business unit that is fully dedicated to providing machines that enable edge banding,” says the company’s Head of Technical Office and Prototypes, Marco Mencarini. “They allow for the application of plastic or wood to the edges of furniture. As you can imagine, our machines must support a diverse set of assembly needs. To support them, we need to create a wide range of highly customized parts and tools.”

Biesse offers multiple different machines to meet edge banding needs. They range from smaller, semi-automatic machines that enable a range of applications to very large, more automated versions that are purpose-built for specific use cases.

The machines are offered in many different configurations and with accessories that assist with square and round corner edging. They also offer multiple different ways to adhere materials, from glue to an innovative Air Force System that uses compressed hot air to bond the material to its intended surface.

Some of Biesse’s edge banding machines operate at very high speed and are made up of many moving parts that help customer guide the edge through assembly using supports, channels and guides. In many cases these manufacturing aids must be customized based on the edge banding material being used.

“The HP Jet Fusion 3D Printing Solution allows us to do much more”

– Marco Mencarini, Biesse Group, Head of Technical Office and Prototypes.

Solution

“We’ve worked with 3D printing since late 1990’s, primarily for rapid prototyping,” says Mr. Mencarini. “The HP Jet Fusion 3D Printing Solution allows us to do much more, including helping us bridge the lead-time gap of making metal molds and even allowing us to produce final parts, especially in short-runs that would be impossible to profitably manufacture otherwise.”

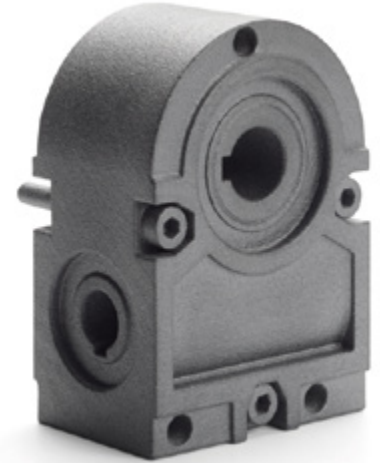
Biesse produces a premium product and technology innovation plays a key role in their ability to remain competitive. As 3D printing has matured, they have continuously evaluated new opportunities. When HP launched its first HP Jet Fusion 3D Printers, Biesse became an early adopter, purchasing an HP Jet Fusion 3D 4200 Printer.

The company chose HP because HP’s Multi Jet Fusion technology satisfies a variety of needs. Beyond simple models, Biesse wanted a more efficient way to create functional prototypes of its machines various mechanical components, including piston rods, pulleys, gear wheels, joints and other parts.

For example, consider the gear box below:



The part originally required multiple manufacturing technologies, including injection molding and Computer Numerical Control (CNC) machining. Biesse’s engineers wanted to evaluate if the part could be redesigned using 3D printing. They optimized the part’s geometry in ways that couldn’t be accomplished with subtractive technologies, creating a part that was more efficient and less expensive to manufacture:



They then compared the steps involved with HP's Jet Fusion 3D Printing Solution (printing, cooling, and finishing) with the time and cost of other technologies, and found it took significantly less time to produce the newly designed gearbox than it would to set up and calibrate for Computer Numerical Control (CNC) machining, in addition to the long lead time needed to create metal molds for injection molding.

Beyond the more common parts used in their machines, Biesse's engineers also evaluated the myriad of customized supports and other tooling required for specific customer applications. They found they were also able to produce these parts directly, in small quantities using the HP Jet Fusion 3D Printing Solution. To date, several support and assembly kits have been 3D printed and sent directly to Biesse's customers.

Result

"Our philosophy is to 'think forward' and it's not just a marketing claim," says Mr. Mencarini. "Biesse was founded on the promise of continuous innovation and cutting-edge technology. Thanks to the work of our technology office, ranging from mechanics to automation, and the capabilities of HP's Jet Fusion 3D Printing Solution, we're able to better anticipate and meet the needs of our customers."

As a result of their efforts, the team at Biesse was able to reduce the lead times needed to create and improve their products. They experienced significant gains in productivity when compared to other 3D printing technologies. This speed-to-market advantage allows them to beta test a series of parts in hours instead of weeks.

Further, the quality of parts exhibit excellent surface quality, allowing Biesse to sandblast and paint parts in ways that are comparable with other parts that are injection molded or Computer Numerical Control (CNC) machined. The design freedom offered by additive manufacturing allowed them to create parts that were more efficient and required less assembly.

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Customer at a glance

Application

- Computer Numerical Control (CNC)
- Injection Molding

Hardware

- HP Jet Fusion 3D 4200 Printer

Accessories

- HP Jet Fusion 3D 4200 Processing Station with Fast Cooling
- HP Jet Fusion 3D Build Unit
- HP Jet Fusion 3D External Tank

Software

- HP SmartStream 3D Build Manager
- HP SmartStream 3D Command Center
- Autodesk® Netfabb® Engine for HP
- Materialise Build Processor for HP Multi Jet Fusion
- 3MF

HP services

- Next-business-day onsite support¹
- Next-business-day spare parts availability,² thanks to HP’s global reach
- 3D printing productivity and professional services

Finally, the lower cost of production allows them to allow Biesse to customize parts for specific applications. Having a low cost way to reiterate the design and test each part, allows them to perfectly match the functionality requirements with client expectations. Once final parts are validated they can be produced in small batches using the very same technology.

The number of parts required for custom applications are typically very low—often measured in dozens. Biesse estimates that for components weighing less than 200 grams, HP’s Multi Jet Fusion technology is less expensive than injection molding at quantities up to 100 pieces.

“Our innovative spirit comes directly from the foresight of our founder, Giancarlo Selci,” says Mr. Mencarini. “He directly sponsored the purchase of our first HP Jet Fusion 3D Printer years ago and saw the technology as a critical tool for innovation and research. Today we’re going beyond, using HP’s Multi Jet Fusion technology to better meet our customer

requirements, while simultaneously operating more profitably.”

Utilizing their HP Jet Fusion 3D 4200 Printing Solution, the Technology Office at Biesse continues to explore new use cases, helping the company achieve its forward thinking mission; creating better and more effective products for customers in their diverse, growing industry.

Cost and time savings based on Biesse experience³ for a series of 100 mechanical parts weighing 50 mg each:

- In comparison to CNC machining, HP Multi Jet Fusion can reduce cost by 67% and lead time from 20 days to 1 day.
- In comparison to Injection Molding, HP Multi Jet Fusion can reduce cost by 86% in the first year, and lead time from 90 days to 1 day. As of the second year, HP Multi Jet Fusion cost is +500% versus Injection Molding, with breakeven point in year 7. Injection Molding lead time is 90 days, versus just 1 day with HP Multi Jet Fusion.

Learn more about HP Multi Jet Fusion technology at

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

1. Within warranty or Care Pack coverage.

2. Next-business-day parts availability in most countries.

3. Refers to plastic parts only.

