

Case study

Jabil sees the future of manufacturing with HP 3D printing



Global manufacturing services

Industry

Consumer manufacturing

Objective

Stay competitive by speeding time to market for manufacturing customers

Approach

Digital manufacturing—using 3D printing for final part production

Technology

- HP Multi Jet Fusion



Summary



As a consumer, it's more than likely that you own at least one item made by Jabil, Inc. Headquartered in the U.S., Jabil is the world's third largest contract manufacturer, working with most major consumer brands across its 100 facilities located in 25 countries. Keeping its customers competitive requires Jabil to stay on the cutting edge of engineering, prototyping, and manufacturing. "Product companies are all trying to get to market faster," says John Dulchinos, Jabil Vice President of Digital Manufacturing. "And they're all trying to do it at a lower cost point and higher level of quality." After 30 years of relatively unchanged manufacturing technologies, Jabil is now using 3D printing in a way that many analysts forecast is the beginning of the fourth industrial revolution. Dulchinos concurs. "We think that HP Multi Jet Fusion Printer technology is really one of the first technologies that can move 3D Printing from a prototyping tool to a production tool. That's a huge leap forward."

Challenge

Dulchinos and Jabil's lead manufacturing engineer, John Buffington, have seen it all. They preside over an encyclopedic collection of prototyping and manufacturing technologies at Jabil's Blue Sky facility in San Jose, California. Here, Jabil has over 15,000 CNC machines and countless molding machines—plus every 3D printing technology on the planet.

"How do we take 3D Printing—and really, the broader category of additive manufacturing—and disrupt the traditional manufacturing industry?" Dulchinos asks, immediately answering: "By being able to make products at a higher level of customization, with more complex geometries, at a cost that's competitive with traditional manufacturing processes."

Buffington, who is something of a connoisseur of additive manufacturing technology and possesses deep experience in Polyjet, SLA, SLS and FFF, elaborates: "Cost is the number one concern of our customers, followed by quality and then repeatability—that is, how can we deliver in volume?" While Buffington acknowledges that additive manufacturing has slowly evolved in recent years to deliver better quality, he says that cost and scale still remain limiters for 3D printing's role in manufacturing.

Solution

Buffington has an affinity for powder-bed 3D printing systems. He picks his words carefully when talking about 3D printing, a category he describes as "ripe for hype." But after bringing his first two HP Jet Fusion 3D Printers online for Jabil, he's convinced that he's seen the future. "In terms of speed, cost, and large-volume manufacturing, the HP 3D printing technology possesses a truly unique advantage. It's really new and it's very strategic, and we see it having a significant impact."

Dulchinos shares his colleague's enthusiasm over the technology's potential for his industry. "HP's 3D printing technology is one of the few in the world that has the ability to produce parts at speeds—and at levels of quality—that make it competitive with traditional manufacturing processes. That's a game changer for Jabil and for manufacturing."

Among several technical attributes, Buffington credits HP's innovation around the modular HP Jet Fusion 3D Build Unit as a key productivity driver for the HP Jet Fusion 3D Printing Solution. "HP put a lot of work into materials handling. They found the best way to do it for larger-volume production, and that really helps increase uptime on the printers."

Additionally, he says that HP Jet Fusion 3D 4200 Processing Station - HP's enclosed, semi-automatic materials handling solution - not only greatly reduces the mess associated with 3D printing, but also adds a new level of consistency to parts production. "With other systems, you have to do it all by hand, which means you can't really guarantee whether your parts are functionally going to come out with the right material properties. HP has taken care of that for us—you simply wheel the build unit directly into the printer, and it immediately knows what materials you used, what blend or ratio you mixed them at, and when you did it."

The versatility of the build chamber also aids with Jabil's production velocity. "The ability to mix and match whatever we put into each build tray gives us complete flexibility to produce a wide set of different parts in each build. That allows us to really balance our production," says Dulchinos. "You can build 20 different things on the same build tray."

Buffington cites the extremely high reusability of HP's PA 12 material as another factor driving overall efficiency in the HP 3D printing workflow. "Being able to reclaim and reuse every ounce of powder off of those parts helps drive down to that lower cost point."



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— John Buffington, Manufacturing Engineering Lead



Jabil's Blue Sky facility in San Jose, California

Result

Producing parts on a 3D printer that meet or exceed traditional manufacturing's cost, quality, and speed gives Jabil's customers a new edge in the ultra-competitive consumer products market—a benefit that's especially important to Dulchino. "HP Multi Jet Fusion technology brings together those characteristics in a way that allows us to create parts that are thousands—and in some cases, tens of thousands—of units of volume at a price point that's competitive with traditional manufacturing processes. It enables us to help our customers be successful."

For Buffington, the most important benefit is speed. "A build that would take days for other technologies you can now do in a matter of hours with HP Multi Jet Fusion. When we can prototype designs on the exact same technologies that we're going to use to produce the parts, we can essentially flip a switch: one day, we're making the prototype—the next day, we're producing the part."

In some applications, the quality and consistency of the HP 3D-printed product actually exceeds that of traditional manufacturing. "Maybe you're trying to test functional snaps or threads, and stuff like that," Buffington explains. "Once you go and mold them, you're designing for a different

process. But by side-stepping the creation of custom fixtures and custom tooling, we can now produce lower part quantities at competitive prices. We're able to pull those parts out of the powder, blast them off, and they're functional."

In addition, overall parts integrity of 3D printed products is improved over products traditionally made from piece parts. The reason is simple: traditional manufacturing requires a secondary process to assemble and test products made from piece parts; with HP Multi Jet Fusion technology, Jabil is now able to create these former piece-part products as a single printed object.

HP Multi Jet Fusion technology also has what Dulchinos describes as a very large work envelope—15 x 11.2 x 13.7 inches. "One of the real powerful attributes of the platform is that every layer takes the same amount of time, no matter how complex or how much is in the print bed. That gives you the ability to create a very densely packed bed, and to produce all that in the same amount of time as it would take to produce one part. Compared to traditional SLS process [at Jabil] HP Multi Jet Fusion is 25 to 50 times faster."

Looking to the future, both Dulchinos and Buffington are excited by HP's materials roadmap and its novel Open Platform approach for materials, which they say will accelerate the pace of materials innovation.

"The idea that we can control each Voxel, the color of it, maybe the diameter of the material or other characteristics, is a really powerful concept," says Dulchinos. "Once designers understand the power of that, it will open the door to a whole new class of

parts and products." For example, Dulchinos says that engineers are already talking about the ability to create wear bars by using color bands inside 3D printed parts like shoes or gears, and other high-friction parts.



"We think we are at the very beginning of the next renaissance in manufacturing. Custom fixtures and custom tooling will be less and less important in the manufacturing process. And a fully digital manufacturing environment will allow us to move seamlessly from one product to the next at the speed of digital files."

— John Dulchinos, Jabil Vice President of Digital Manufacturing

Customer at a glance

Application

3D printing for prototyping and short-run manufacturing

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 5 units Bundle

Footnotes:

¹ Within warranty or Care Pack coverage.

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

Software

- HP SmartStream3D Build Manager
- HP SmartStream3D Command Center
- Autodesk Netfabb with HP Engine
- 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

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