

Case study

GoProto Identifies the “Sweet Spot” for HP’s New 3D Printing Technology



How HP’s 3D Printing Technology Supports the Development of New Products

INDUSTRY SECTOR

Hardware

OBJECTIVE

Explore whether HP’s Multi Jet Fusion technology could be used to manufacture the client’s product, and if successful, identify the spot where 3D printing could be most competitive.

APPROACH

Test print the part. If successful, complete a cost analysis to determine the breakeven between digital and mass production.

TECHNOLOGY

HP Multi Jet Fusion
HP Jet Fusion 3D Printing Solution



Data courtesy of GoProto

Summary

GoProto is in business for one purpose: to solve quick turn manufacturing problems for its clients. The company provides solutions for plastic and metal part manufacturing. GoProto’s services include industrial design and rapid prototyping. In addition to additive manufacturing, they also offer rapid injection tooling, casting, and CNC machining. At scale, GoProto provides traditional production parts manufacturing including injection molding, stamping, die-casting, and sheet metal. They also offer part finishing and other services.

The company is a startup, but the leadership team and employees all have decades of experience working in additive and related manufacturing industries. As they planned their new company, the team at GoProto conducted exhaustive research into the equipment they would use. They decided to partner with HP, adding Multi Jet Fusion 3D printing technology to their array of capabilities.

Muscle and Arm Farm was one of the first users of GoProto’s new service. The owner, Dan Vorhis had designed a new product - the NextGen zip tie. Its revolutionary design allows it to be locked, and then released for future use.

The client originally came to GoProto asking them to potentially create a mold for these parts. Due to cost and timing, GoProto recommended they test print the part on their new HP Jet Fusion 3D 4200 Printer.

They had tried to 3D print the NextGen zip tie before, but quality was unacceptable.





Challenge

“Surface finish was of the big reasons we chose to partner with HP. In the past when we’d attempted to 3D print the part, either the definition wasn’t good enough to create the “teeth” in the zip tie or the part was too brittle to flex the way a zip tie should. Our first step was to verify that HP’s process would allow us to create a functional part.” Says GoProto’s President, Jesse Lea.

Mass manufactured zip ties are generally made of nylon, allowing them to be both strong and flexible. The quality of injection molding is excellent.

The locking mechanisms are almost always well defined, and as a result, zip ties rarely fail. The product works as advertised.

For GoProto the first task was to confirm that they could create a 3D printed part that could compete with injection molding. It had to have the strength to remain locked under all kinds of conditions, while retaining the flexibility to bend again and again. If the part could be successfully 3D printed, GoProto wanted to help their client fully understand the value proposition a technology like 3D printing could offer.



“We work with multiple technologies, but Multi Jet Fusion kept coming up as a solution. We were excited to see if it would work with such an innovative new product.”

– Jesse Lea, GoProto’s President.

Solution

“We work with many different customers. We spend a lot of time consulting with them. They’ll send us specifications and ask about the best way to produce a given part. We work with multiple technologies, but Multi Jet Fusion kept coming up as a solution. We were excited to see if it would work with such an innovative new product.” Says GoProto’s President, Jesse Lea.

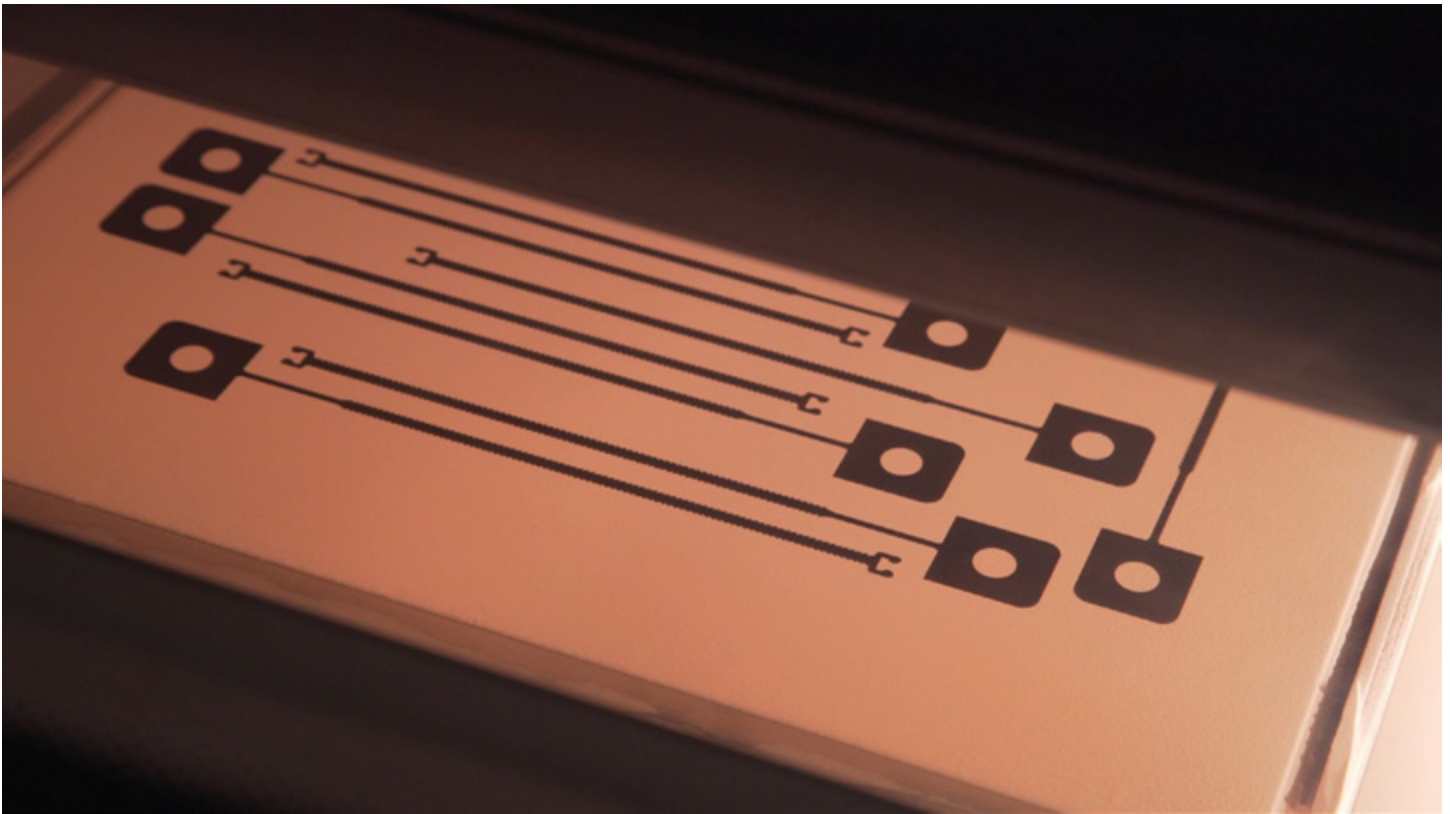
GoProto’s engineers began by running the part on the company’s HP Jet Fusion 3D printer. They were excited to find that the part functioned perfectly. The teeth were strong enough to keep the part locked, while retaining the flexibility of any other zip tie.

They sent the part to Muscle and Arm Farm and waited eagerly for feedback. A few days later they received a video from Mr. Vorhis. It was a demonstration of his product. In the video he mentioned that the part had been created by GoProto and that HP’s Jet Fusion 3D Printing Solution offered the detail, strength and flexibility the part required. Mr. Vorhis also noted that he could, “very reasonably demonstrate the concept without the need for a casting mold.”

This was great news for the team at GoProto. As mentioned above, they’d tried other 3D printing methods. For this application, HP Multi Jet Fusion was stronger than stereolithography (SLA) and was also more precise and flexible than selective laser sintering (SLS.)

Once they knew they could print a part that met the client’s expectations, the next step was to identify the sweet spot. They compared the cost of production with the cost of injection molding to determine where HP’s Multi Jet Fusion 3D printing technology could be directly competitive.

Then they began to look at all the ancillary costs of mass production and noticed that many were reduced or eliminated when using a digital workflow.



Result

“With Multi Jet Fusion 3D printing technology from HP, we were able to meet the client’s need for speed, strength, surface finish and accuracy. With a thorough understanding of the total cost of production we were able to identify a volume band where 3D printing is most cost effective.”
Mentions GoProto’s President, Jesse Lea.

With the help of their new HP Jet Fusion 3D 4200 Printer, GoProto was able to produce their client’s product at a level of quality that was comparable what could be mass manufactured. The part was both strong and flexible.

The cost analysis conducted by the team at GoProto determined that HP Multi Jet Fusion technology could be less expensive than injection molding at run lengths of 1,000 parts or less.

Access to this new technology greatly reduces the barrier to entry. Product designers can go to market with less upfront investment. As demand increases, they can more easily justify the investment in mass manufacturing.

HP’s Jet Fusion 3D Printing Solution allowed Muscle and Arm Farm to both prototype for look and feel while simultaneously creating a functional end-use part that he could produce in shorter volumes before committing to the expense of injection molding.

Now that they know the NextGen zip tie works as designed, they are ready to license and mass-manufacture it.

For GoProto it was a clear example of the opportunities for “bridge production,” filling the gap between old inefficient 3D printing methods and even older mass production technologies.

Each product has its own spot where HP’s Multi Jet Fusion technology is most competitive. Through their analysis, GoProto has found two keys to future growth. Not only can they produce prototypes with higher precision and lower cost, but they can also produce them in the higher volumes that come with bridge production.



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– Jesse Lea, GoProto’s President.

Customer at a glance

Application

3D Printing for Final Part Production

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

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