

# GoProto ventures into new markets with HP 3D HR TPA enabled by Evonik



Data courtesy of GoProto Inc.  
Printed with HP 3D High Reusability TPA enabled by Evonik  
Post-processed with AMT Post Pro chemical vapor polishing



# HP’s new easy-to-process elastomer material for the HP Jet Fusion 4200 3D Printing Solution enables flexible, lightweight parts for a multitude of new applications



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## Introduction

GoProto, Inc. offers customized manufacturing services including prototyping and final part production in both plastic and metal. Since 2016, GoProto has used the latest technologies to help their customers from a broad range of industries go from concept to design to final part as quickly and efficiently as possible.

In April 2017, GoProto was among the first companies in the world to adopt HP Jet Fusion 3D Printing Solutions, and in 2019, GoProto joined the HP Digital Manufacturing Network, a global community of

certified digital manufacturers specialized in the latest innovations to help customers incorporate additive manufacturing and deliver quality and consistency at scale.

“From the beginning, we’ve been working very closely with HP on materials and machines,” said Jesse Lea, President and CEO of GoProto. “We use HP Multi Jet Fusion technology to solve customers’ needs, anywhere from early prototyping, like one-off parts, through production.”

### • Industry

Industrial

### • Sector

Machinery and equipment

### • Objective

To experiment with the capabilities of HP 3D High Reusability<sup>1</sup> (HR) TPA enabled by Evonik and to be able to offer customers an expanded range of application possibilities.

### • Approach

As part of HP 3D Printing’s beta program for this new material, GoProto has been able to test the material’s workability, properties, and functionality, and envision how these features can apply to new applications and new markets.

### • Technology | Solution

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

### Material

HP 3D HR TPA enabled by Evonik

1. HP Jet Fusion 3D Printing Solutions using HP 3D High Reusability TPA enabled by Evonik 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.

## Challenge

Having been in the additive manufacturing industry since 1995, it's been difficult for GoProto President and CEO Jesse Lea to find an elastomer material for prototyping and low-quantity production. Historically, 3D printing technologies have been limited in the availability of usable, softer durometer, elastomeric materials.

**“We have struggled for years with providing clients with usable elastomer parts at low to medium quantities,”**

Lea said, adding that there had been high demand for applications where parts are required to bend, flex, cushion, and conform, often in higher heat or cold environments where chemical exposure is possible.

**“We researched this elastomer material from Evonik and HP, and instantly recognized the massive market potential and the ability for this material to help us provide customers with production-grade parts with no tooling and all of the benefits of 3D additive manufacturing,”** Lea said, referring to HP 3D HR TPA enabled by Evonik.

HP invited GoProto to join their TPA beta program and begin testing the material with the HP Jet Fusion 4200 3D Printing Solution.

## Solution

Lea and his team at GoProto took the opportunity to explore applications with more complex designs, robust parts, and optimal mechanical resistance at low temperatures, like harnesses and fasteners that hold cables in place inside computers and other electronic devices. In the past, such parts have been **“hard to make,”** Lea said. **“They're very hard to prototype. You need parts that can stretch around other parts to hold a cable tight. And that's what TPA can do.”**

According to Lea, markets with these types of applications haven't been well-served in the past by conventional 3D

printing technologies and materials or other bridge solutions like cast urethane or rapid injection molding. Obstacles have included expensive tooling, long lead times, and limitations on manufacturable part geometry or material physical property capabilities. But the material properties of HP 3D HR TPA enabled by Evonik make it possible for GoProto to move into a new customer base.

**“We're not really going after parts we can already produce with conventional methods inexpensively,”** Lea said. **“We are going for applications that have not been able to be addressed before.”**



## Result

GoProto set out to test production-grade elastomer parts that are soft enough to function in places where clients have designed for soft materials, such as in automotive ducting; electrical harnesses; bellows; tubing; athletic equipment and wearables; protective body wear; anatomical and medical modeling; end-of-arm tooling for machinery and robotics; grippers for automated equipment; and customized footwear.

The introduction of HP 3D HR TPA enabled by Evonik **“has enabled us to serve clients with an incredibly powerful new tool,”** Lea said. Fitting the new material into their current 3D printing workflow **“doesn’t require a retooling of our shop or a big change in equipment,”** said Lea. **“It’s easy to adopt.”**

Lea sees major potential for customization with HP 3D HR TPA enabled by Evonik, especially with wearable sporting goods like helmets and goggles: **“Those geometries are really tough and interface with the human body, and every one of us is different,”** he said. **“Being able to make**

**an elastomer part that could be custom-made to you is a really exciting application. That’s a massive area of growth for this material.”**

Overall, Lea anticipates being able to grow business for his current customers and attracting new customers who may not have considered 3D printing previously due to material limitations.

**“The whole idea of being able to dramatically reduce product development cycle time, and then have a production solution or a solution that can be used for production is unbelievably exciting.”**

**“Designers and buyers of elastomer parts can expect to get highly usable parts quickly, [parts that are able] to withstand heat and cold as well as chemical resistance, and all at low costs because we can print directly from CAD files with no tooling cost or associated lead times,”** Lea added. **“It’s a game changer for our clients.”**

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