Dundon Motorsports fast-tracks production of auto racing parts with HP Jet Fusion 3D Printing Solutions

Data courtesy of Dundon Motorsports

In the fast-paced world of auto racing. Dundon Motorsports stays ahead of the competition by 3D printing parts for Porsche GT racecars with HP Multi Jet Fusion technology

Data courtesy of Dundon Motorsports

Introduction

According to Dundon Motorsports' Jamie Bopp, **"The nature of the car has been about freedom, about emotional release, about joy, so Dundon is in the business of taking joyful cars and making them more joyful."**

Dundon Motorsports ("Dundon") goes beyond the concept of a car as a mode of transportation and instead focuses on the emotionally satisfying elements that elate and move their customers. In their early days as a company, Dundon manufactured exhausts and worked on suspensions and engines of Porsche GT automobiles, making the vehicles more appropriate for use on a racetrack.

Today, Dundon supports gran tourer (GT) car customers with exhaust tuning, intake tuning, suspension tuning, brakes, and more. One of their more recent ventures involves Porsche "cup" cars (or ready-to-drive racecars) as well as other cars such as the GT3 R and RSR.

• Industry

Mobility and transportation

• Sector

Automobiles

• Objective

To decrease production times and enhance part performance for Porsche GT racecars.

• Approach

With the HP Jet Fusion 5200 Series 3D Printing Solution, Dundon Motorsports has been able to accelerate production, experiment with new designs, grow their product portfolio, and expand to new markets.

• Technology | Solution

HP Multi Jet Fusion technology
HP Jet Fusion 5200 Series 3D Printing Solution

• Material

HP 3D High Reusability[1] (HR) 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.

Challenge

One of Dundon Motorsports' recent projects involved improving the performance and horsepower of the engine in ready-to-drive racecars and making sure that the necessary elements fit within the confines of the air conditioner, the power steering pump, and the hood, among other parts.

"Finding an innovative way to make all of these parts fit is one thing," said Bopp. "**The second thing is the business side of the situation. If we were able to injection mold or CNC machine these parts, the costs would be stratospheric."**

Bopp referred to a previous price quote of nearly $65,000 for an intake runner mold, a price that would put a huge dent in the budget of a small company with a small production volume.

An intake manifold for the Porsche GT4 takes a solid mass of air and distributes it evenly throughout the six-cylinder engine—called a "flat engine" in Porsche lingo. Because the cylinders need to be hollow and thin, Dundon faced challenges in machining this part as the tooling required for CNC machining is difficult to control due to the long reach of the tool and the vibration on the tool bit, and aluminum isn't an ideal material for an intake because it transfers heat to the intake air very easily. Additionally, because Dundon didn't need to produce high volumes of parts, they couldn't justify the large investment in molds for injection molding.

Instead, they looked to alternative manufacturing methods, like 3D printing.

Solution

Dundon quickly learned how 3D printing could help them both with prototyping and with final part production. After researching the technologies available on the market, Dundon chose HP Multi Jet Fusion technology as their 3D printing solution due to the capacity and repeatability potential.

Bopp was most intrigued and excited about HP Multi Jet Fusion's non-porous materials: **"If you're going to make an intake manifold, it can't be leaking air through the material."**

Most of Dundon's initial use of HP Multi Jet Fusion was for intake manifold projects, but they also experimented with the technology for other projects, such as making cutaways of drawings so that they can more closely inspect casting exhaust flanges.

"With [HP] MJF, we're able to not just make a single-printed usable part, but we're also able to make assemblies that we bolt together to adapt to what we would want to make in the end," Bopp said.

Data courtesy of Dundon Motorsports

Result

Today Dundon produces between 10 and 12 different parts with HP Multi Jet Fusion technology, such as intake plenums, intake runners, and air filter boxes. With the ability to create iterations of parts in a short amount of time, Dundon can to make slight alterations to some of these parts in order to improve functionality.

"I see HP 3D Printing as a disruptive technology in the industry," Bopp said. **"We can draw a part and, within a few days to a week, have that part in our hands and be testing it on a car, when previously it's taken development cycles that were quarters, months, at best cases, weeks. If we need to make a change, we can now make that change in days."**

Dundon's use of HP Multi Jet Fusion technology has led them to an entirely new market segment and a line of products that they hadn't previously considered making, including intake manifolds, runners, and airboxes.

"[HP Multi Jet Fusion] has become an enabler for us," said Bopp. **"It has enabled us to operate and 'punch above our weight class' quite effectively."**

Dundon sees the potential for continued improvements in adding horsepower to Porsche street and racing cars: **"We want to be nimble, with a multi-faceted workforce, and HP MJF really helps us stay that way,"** Bopp said.

Connect with an HP 3D Printing expert or sign up for the latest news about HP Jet Fusion 3D Printing
hp.com/go/3Dcontactus

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

Learn more about Dundon Motorsports at
dundonmotorsports.com

4AA7-7892ENW, July 2020