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McLaren Formula 1 Racing Deploys Stratasys Additive Manufacturing to Improve 2017 Car Performance

- *Stratasys FDM and PolyJet 3D Printing Solutions are being used to produce final 3D printed race-ready parts for the new McLaren MCL32 race car, as well as manufacturing tooling to advance production*
- *3D printing will also be used at trackside to produce parts and tooling on demand for immediate evaluation during tests and races*
- *Goal is to bring new car developments earlier by moving from idea to component in a shorter timeframe*

MINNEAPOLIS & WOKING, England--(BUSINESS WIRE)-- McLaren Racing is expanding its use of Stratasys (Nasdaq: SSYS) 3D printing to produce components for its 2017 Formula 1 MCL32 race car with the goal of accelerating design modifications and reducing weight to increase performance.

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http://www.businesswire.com/news/home/20170407005040/en/

Hydraulic line bracket for the McLaren MCL32 race car, 3D printed on a Stratasys FDM 3D Printer using Nylon12CF material (Photo: Stratasys)

Some of the 3D printed parts designed to improve performance which have been applied to the 2017 race car include:

- **Hydraulic Line Bracket**
  McLaren Honda has 3D printed a structural bracket to attach the hydraulic line on the MCL32 race car using Stratasys FDM technology, leveraging a Fortus 450mc Production 3D Printer with carbon-fiber reinforced nylon material (FDM® Nylon 12CF). The bracket was produced in just four hours compared to an estimated two weeks to create using traditional manufacturing processes.
- **Flexible Radio Harness Location Boot**
  A new 2-way communication and data system was recently added to the MCL32 race car but the cable proved distracting to the driver. Taking advantage of the Stratasys J750 3D Printer's ability to print in flexible materials, McLaren designed and 3D printed a rubber-like boot to join the harness wires for the communication system. Three different designs were iterated and 3D printed in one day and the final component was 3D printed in just two hours which allowed the comfortable radio harness assembly to be used in the first Grand Prix race of the 2017 season.
- **Carbon Fiber Composite Brake Cooling Ducts**
  To efficiently control the brake component temperatures, McLaren Honda 3D printed sacrificial tools to create hollow composite brake cooling ducts. The wash-out cores were 3D printed using ST-130 soluble material, developed specifically for the application, and then wrapped with carbon-fiber reinforced composite material and autoclave-cured at elevated temperatures. The final result is a tubular structure with very smooth internal surface finishes to ensure the required airflow to brakes, whilst maintaining maximum aerodynamic and car performance.
- **Rear Wing Flap**
  A large rear wing flap extension designed to increase rear downforce was manufactured in carbon fiber-reinforced composites using a 3D printed lay-up tool produced on the FDM-based Fortus 900mc Production 3D Printer. The team 3D printed the 900mm wide, high temperature (> 350°F/177°C) mold in ULTEM 1010 for the autoclave-cured composite structure in just three days, saving time in a critical limited testing period.

"We are consistently modifying and improving our Formula 1 car designs, so the ability to test new designs quickly is critical to making the car lighter and more importantly increasing the number of tangible iterations in improved car performance. If we can bring new developments to the car one race earlier - going from new idea to new part in only a few days - this will be a key factor in making the McLaren MCL32 more competitive. By expanding the use of Stratasys 3D printing in our manufacturing processes, including producing final car components, composite lay-up and sacrificial tools, cutting jigs, and more, we are decreasing our lead times while increasing part complexity," said Neil Oatley, Design and Development Director, McLaren Racing Limited.

To further accelerate design and manufacturing cycles, McLaren Honda will be bringing a Stratasys uPrint SE Plus to track testing and races on-site, enabling the team to produce parts and tooling on demand.

"Formula 1 is one of the world's best proving grounds for our additive manufacturing solutions. As the Official Supplier of 3D Printing Solutions to the McLaren-Honda Formula 1 team, we are working closely together to solve their engineering challenges in the workshop, in the wind-tunnel, and on the track. We believe that this, in turn, will enable us to develop new materials and applications that bring new efficiencies and capabilities to McLaren Racing and other automotive designers and manufacturers," said Andy Middleton, President, Stratasys EMEA.

About McLaren:
New Zealand racing driver Bruce McLaren founded the McLaren team in 1963. At Monaco in 2016, McLaren celebrated 50 years of racing in Formula 1. Since 1966, when it entered its first Formula 1 race, McLaren has won 20 world championships and over 180 grands prix. It is now globally renowned as one of sport's most successful competitors and as one of the world's most illustrious high-technology brands.

The McLaren Technology Group has grown to encompass much more than just grand prix racing: McLaren produced the 1990s' original supercar, the McLaren F1, and, with the launch of McLaren Automotive, has gone on to introduce a series of high-performance cars, including the ground-breaking McLaren P1™.

McLaren Applied Technologies develops strategic business partnerships that harness our expertise in high-performance design, performance-management and simulation systems. It also develops, builds and services control units for the entire Formula 1, Indy Car and NASCAR grids.

The McLaren-Honda team campaigns the 2017 FIA Formula 1 World Championship with double world champion Fernando Alonso and Belgian rookie Stoffel Vandoorne, who scored points on his race debut for McLaren-Honda, in a one-off performance at the 2016 Bahrain Grand Prix.

About Stratasys:
For more than 25 years, **Stratasys Ltd. (NASDAQ:SSYS)** has been a defining force and dominant player in 3D printing and additive manufacturing - shaping the way things are made. Headquartered in Minneapolis, Minnesota and Rehovot, Israel, the company empowers customers across a broad range of vertical markets by enabling new paradigms for design and manufacturing. The company's solutions provide customers with unmatched design freedom and manufacturing flexibility - reducing time-to-market and lowering development costs, while improving designs and communications. Stratasys subsidiaries include MakerBot and Solidscape, and the Stratasys ecosystem includes 3D printers for prototyping and production; a wide range of 3D printing materials; parts on-demand via Stratasys Direct Manufacturing; strategic consulting and professional services; and the Thingiverse and GrabCAD communities with over 2 million 3D printable files for free designs. With more than 2,700 employees and 1,200 granted or pending additive manufacturing patents, Stratasys has received more than 30 technology and leadership awards. Visit us online at: www.stratasys.com or http://blog.stratasys.com/, and follow us on LinkedIn.

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