Ford tests 3D printing of large scale car parts

Ford Motor Company is testing 3D printing of large scale car parts using the Stratasys Infinite Build 3D printer.

The company is exploring how large one-piece auto parts, like car spoilers, could be printed for prototyping and future production vehicles.

Capable of printing car parts of practically any shape or length, the Stratasys Infinite Build system could be a breakthrough for vehicle manufacturing, providing a more efficient and affordable way to produce tooling, prototype parts, or components at low volumes, like Ford Performance vehicles, or for personalised car parts.

“With the Infinite Build technology, we are now able to print large tools, fixtures, and components, making us more nimble in design iterations,” says Ellen Lee, Ford technical leader for additive manufacturing research.

The new 3D print system is located at Ford’s Research and Innovation Center in Dearborn.

An emerging technology for manufacturing

As 3D printing becomes increasingly efficient and affordable, companies are employing this emerging technology for manufacturing applications in everything from aerospace, to education, to medicine. Wider adoption in 3D printing has been driven by recent technology advances, new areas of application and government support, according to Global Industry Analysts Inc.

By 2020, the global market for 3D printing is expected to reach US$9.6bn, the organisation reported.

In the future, 3D printing could have immense benefits for automotive production, including the ability to produce lighter-weight parts, which may help improve fuel efficiency. A 3D-printed spoiler, for instance, may weigh less than half of its metal-cast equivalent.

Additionally, 3D printing is a more cost-efficient way to produce parts only needed at low volumes, like prototypes and specialised parts for race cars. Further, Ford also may use the technology to make larger printed tooling and fixtures as well as personalised components for customers.

How it works

Specifications for the part are transferred from the computer-aided design program to the printer's computer, which analyses the design. Then, the device goes to work, printing one layer of material at a time – in this case, plastic – and then gradually stacking the layers into a finished 3D object.

When the system detects that the raw material or supply material canister is empty, a robotic arm automatically replaces it with a full canister. This allows the printer to operate for hours or days while unattended.

Benefits of 3D printing

Though 3D printing isn't yet fast enough for high-volume production manufacturing, it is said to be a more cost-efficient way to produce parts only needed at low volumes, like prototypes and specialised parts for race cars. In addition, when not limited by the constraints of mass production processes, components can be designed to function more efficiently.

Using traditional methods, an engineer would create a computer model of the part and wait for months for prototype tooling to be produced. With 3D printing, Ford can print the same part in days at a significantly reduced cost. For example, a prototype for a new intake manifold could be produced over a couple of days as opposed to several months, at an order of magnitude lower cost.