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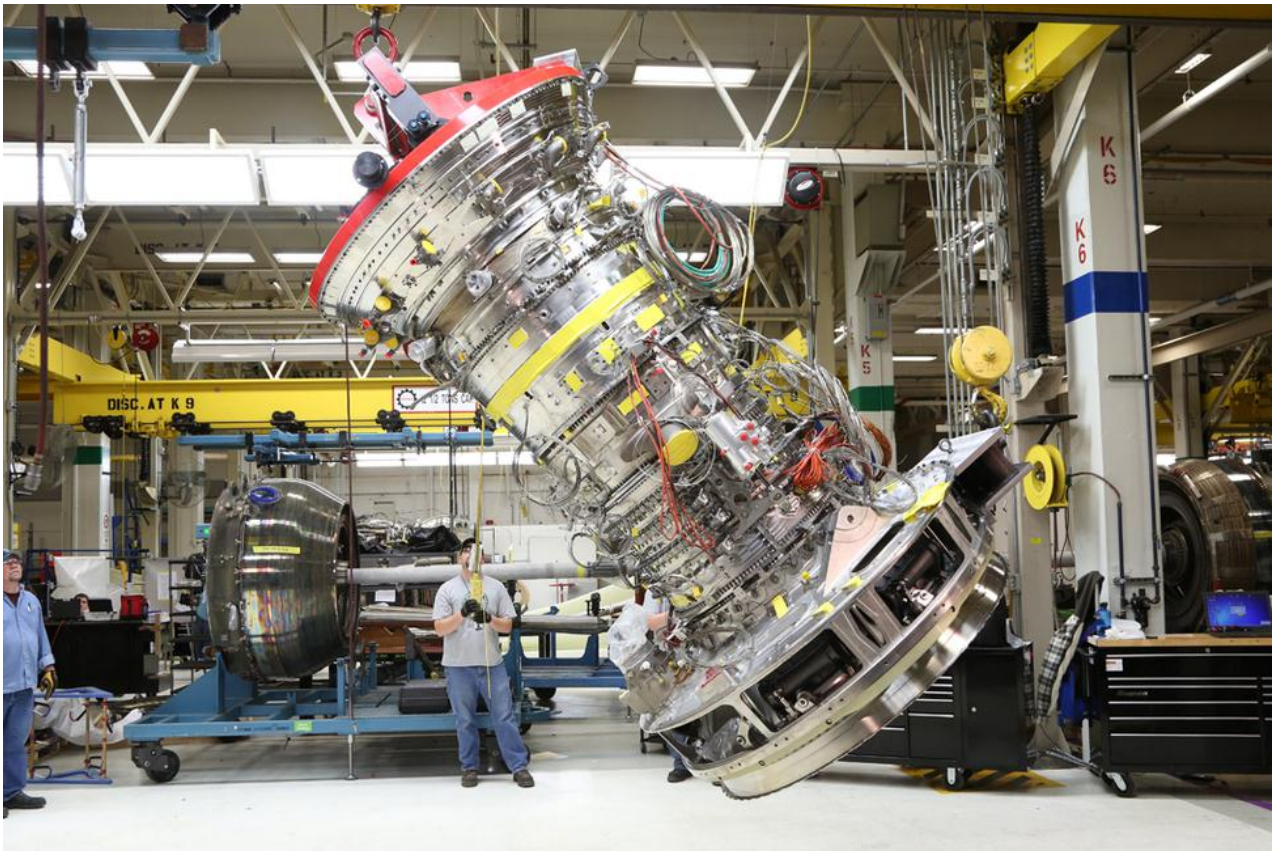
NEWS NEWS

GE demos world's largest jet engine, tests 3D-printed fuel nozzles

By **Kelly Hodgkins** — April 27, 2016

General Electric's aviation division is thinking big — really big– when it comes to its future jet engines. The company last week began testing the world's largest jet engine, firing up the propulsion system that has has a whopping 18-foot-wide inlet duct. Not only is it large, the new GE9X jet engine is also cutting-edge, with 3D-printed fuel nozzles used to power GE's most Fuel-efficient jet engine to date.

The GE9X is a remarkable piece of equipment, featuring 16 carbon fiber fan blades, a combustor and turbine made with heat-resistant ceramic matrix composites, and 19 fuel nozzles that were designed and 3D printed specifically for this engine. Instead of using the traditional casting and welding to create the nozzles, GE relied on additive manufacturing to produce them, using the expertise it acquired when it bought Morris Technologies and Rapid Quality Manufacturing in 2012.



GE turned to 3D printing to reduce the weight of the fuel nozzles and improve their performance. The nozzles were designed with an intricate architecture that uses tunnels and caves to reduce the weight of the material, yet maintain its strength.

“These tunnels and caves are a closely guarded secret,” said Rick Kennedy, a GE Aviation spokesman. “They determine how the fuel moves through the nozzle and sprays inside the combustion chamber.”

The result is a nozzle that is 25 percent lighter and still as strong as existing nozzles. This lighter weight translates into less fuel consumption and monetary savings for airlines that incorporate this engine into their planes.

Besides a weight savings, the 3D-printed nozzles save GE time and money in manufacturing. Because they are 3D printed, the nozzles also can be manufactured at a much faster rate and with less waste than traditional nozzles, which require GE to weld up to 20 smaller pieces to form the

final product. This welding process is time consuming and produces a lot of waste material, which is money lost by the company.

GE has been testing individual components in its GE9X engine over the past few years, but last week's experimental run was the first test of the engine as a whole. The engine was tested at the company's Peeble's Ohio facility which was built for this large-scale testing. To complete the test, GE used two concrete stands capable of suspending the colossal engine.
The GE9X can produce up to 100,000 pounds of thrust and will be the primary engine for Boeing's next-generation 777X jet. The engine is scheduled to enter service in 2020 with more than 700 engines collectively worth $29 billion already on order. Emirates, Lufthansa, Etihad Airways, Qatar Airways, and Cathay Pacific are among the airlines planning to add the 777X jet and GE9X jet engine to their fleet of aircraft.

http://www.digitaltrends.com/cool-tech/ge-3d-printed-jet-engine-2/?&utm_term=DT%20Newsletter%20-%20Daily%20Subscribers#/5

Chi tiết ô tô

*** FDM: Fused Deposition Modeling 熔融擠製成型**
(Công nghệ tạo hình bởi từng lớp nhựa nóng chảy)

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