Turbomeca introduces additive manufacturing capability for engine components

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World-leading helicopter engine manufacturer Turbomeca (Safran) is setting up new manufacturing capability at its facility in Bordes (France). After years of maturation and prototype testing, Turbomeca has entered serial production of parts using the latest additive manufacturing, or 3D printing process. Bordes facility is one of the first of its kind to serial produce additive components for aerospace propulsion industry in France.

Arrano test and production engines will feature fuel injector nozzles made using Selective Laser Melting (SLM) techniques. This leading-edge manufacturing process will also be used to manufacture Ardiden 3 combustor swirlers. These engines are Turbomeca's latest models and amongst the most advanced turboshafts ever designed.

Additive manufacturing produces parts to a three-dimensional CAD (computer-aided design) model. Unlike traditional manufacturing processes (forging and machining) which are based on material removal, additive manufacturing builds layers, each between 20 and 100-micrometers thick, of fine metal powder to produce complex-shape parts. In the case of SLM, a computer-controlled laser shoots pinpoint beams onto a bed of nickel-based super-alloy powder, to melt the metal in the desired areas.

Additive Manufacturing also simplifies the manufacturing process. A traditional fuel-injector nozzle is made up from dozens different pieces. Arrano component is made from one single piece of material and features advanced injection and
cooling functions. One SLM machine is already in service, and qualified for mass production, with others to be integrated over the coming years.

Rémy Bertrand

Additive manufacturing is part of Turbomeca's ambitious "Future Line" programme designed to improve all its manufacturing capabilities. By introducing new, high-end machine tools and new processes like additive manufacturing and HVOF (High Velocity Oxy-Fuel) coatings, Turbomeca will significantly improve its compressor and turbine blade manufacturing capabilities at Bordes.

Turbomeca (Safran) is the leading helicopter engine manufacturer, and has produced 70,000 turbines based on its own designs since the company was founded. Offering the widest range of engines in the world and dedicated to 2,500 customers in 155 countries, Turbomeca provides a proximity service thanks to its 16 sites, 30 proximity maintenance centers, 18 Repair & Overhaul Centers, and 90 Field representatives and Field technicians. Microturbo, the subsidiary of Turbomeca, is the European leader in turbojet engines for missiles, drones and auxiliary power units.
