

VFS AIDS RAPID MANUFACTURING PROCESS FOR U.S. AUTOMOTIVE INDUSTRY

The General Motors Powertrain Division Tapped VFS To Supply A Single Chamber Furnace That Will Help Cut The Manufacturing Of Prototype Tooling In Half.



Vacuum Furnace Systems (VFS) recently sold an external gas quench vacuum furnace to the General Motors (GM) Powertrain Group. The single chamber furnace will be part of a rapid manufacturing process that will help reduce time to market for the automotive industry. GM has partnered with Extrude Hone's ProMetal division since 1996 on this government-sponsored development project.

Intended for small batches, the VFS furnace will be used for sintering and infiltrating prototype tooling. The selection of a VFS furnace for this project is impressive due to the expected impact of rapid manufacturing on the future productivity of the U.S. automotive industry.

"We needed a reliable furnace company," commented Ted O'Bradovich, Contract Shop Manager at Extrude Hone's ProMetal division. "As this technology expands, we wanted a company that could work with us to develop better furnaces for our system. I like VFS because they actually run, operate and understand how their furnaces work in production."

With their rapid manufacturing process called 3-D Metal Printing, Extrude Hone is capable of producing fully functional parts and tools directly from CAD files in a matter of days. Conventional machining methods took weeks or months.

Using a layering technique, the part or tool is built one layer at a time from metal powder that is seven thousandths of an inch thick. A binding agent is applied after each layer in order to keep the intended shape. Once the layering process is complete, the tool goes through a curing process to create better stability. It is sintered to burn off the binding agent and then infiltrated with bronze to make it 100 percent dense.

In addition to quicker turnaround, the new technology permits virtually unlimited design flexibility, complex internal geometries, undercuts, and angled passages. These types of component features are impossible to duplicate with traditional machining techniques.

Speed to market is a pressing issue in the American automotive industry. Funded by the federal government's Advanced Technology Program (ATP), the goal of this initial project between GM and Extrude Hone was to cut in half the time required to produce tooling. As part of the National Institute of Standards and Technology, ATP's early stage investment accelerates the development of innovative technologies within the private sector that promise significant commercial payoffs and widespread benefits for America.



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Long-term expectations are that the rapid manufacturing process will allow automotive companies like General Motors to print actual parts directly from CAD as opposed to simply printing the tooling that machines the parts. Using this innovation called metal printing, America's auto industry can get product to market in a fraction of the time it currently takes to machine and assemble parts. As this technology expands, VFS will aid in the design specification of vacuum furnaces that are best suited for the rapid manufacturing process.

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