

Delivering INNOVATION

ORNL prints iconic Shelby Cobra as lab on wheels

Next-generation manufacturing takes on a 50 year old icon as ORNL researchers transform this classic sports car into a 3D-printed laboratory on wheels. Additive manufacturing enables the seamless integration of advanced technologies with design flexibility and modularity while providing a platform for rapid development and evaluation. The printed car incorporates “plug and play” components such as new engine, battery, and fuel cell technologies; hybrid system designs; and power electronics and wireless charging systems, allowing researchers to easily and quickly test out innovative ideas in a driving laboratory.

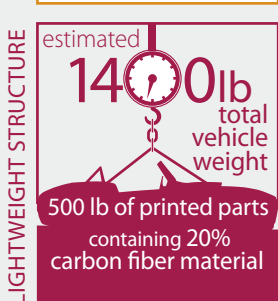
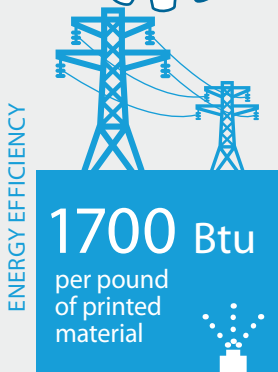
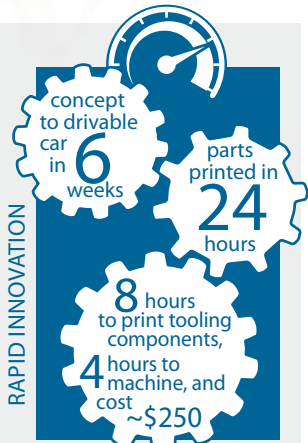
Researchers printed the Shelby Cobra at DOE’s Manufacturing Demonstration Facility at ORNL using the Big Area Additive Manufacturing (BAAM) machine, which can manufacture strong, lightweight composite parts without the need for tooling. The new BAAM system, which was jointly developed by ORNL and Cincinnati Incorporated, is 500 to 1000 times faster and capable of printing polymer components 10 times larger than today’s industrial additive machines—in sizes greater than one cubic meter.

The project was supported by DOE’s Office of Energy Efficiency and Renewable Energy through its Advanced Manufacturing Office.



For more details visit
[www.ornl.gov/
manufacturing](http://www.ornl.gov/manufacturing)

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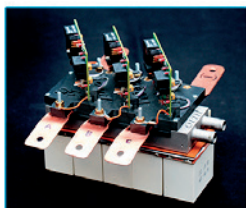
Printed vehicle will integrate new technologies for R&D

ORNL researchers are developing technologies that accelerate the deployment of new vehicles and efficient transportation systems powered by domestic, renewable, clean energy.

Building on core science capabilities, researchers are exploring the unique advantages of additive manufacturing to create new vehicle technologies with higher efficiency and reduced cost.

The printed Shelby Cobra will serve as a real-world laboratory to develop and enhance innovative new technologies, such as novel inverters, new fuel cells, and advanced joining methods for vehicle lightweighting.

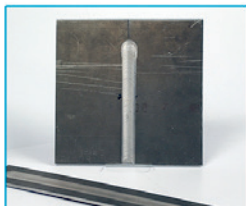
DOE's Vehicle Technologies Office and Fuel Cell Technologies Office support development of these technologies in partnership with industry.



3-D printed inverter



fuel cell membrane



friction stir welding



For more details visit www.ornl.gov/transportation

A Real-World Laboratory On Wheels

Advanced technologies can be evaluated using this flexible research platform

- Motor technologies
- Batteries with extended range
- Advanced combustion engines
- Heat engines
- Fuel cell technologies
- Novel inverters
- Antiwear lubricant additives
- Alloys for efficient powertrains
- Alternative fuels
- Hydrogen storage technologies
- Low-temperature emissions controls
- Multimaterial joining technologies
- Wireless charging
- Hybrid component packaging
- Vehicle systems integration
- Low-cost carbon fiber and composite components
- Grid energy exchange