

OVERVIEW

From 3-D printing high-tech jet engine parts to producing carbon fiber, Alabama advance materials sector is growing and creating opportunities for companies that build other products or supply the tools and materials needed to make them.

HIGHLIGHTS

Carpenter Technology Corp in Athens manufactures super alloy powder for aerospace industry.

Carpenter Technology Corp. announced plans for adding a \$52 million Emerging Technology Center at its campus in Limestone County.

GE Aviation in Auburn additively manufactured engine components where more than 40 additive machines operate around the clock daily.

Kennametal in Huntsville manufactures tungsten heavy alloy parts for aerospace, medical, mining and ordnance applications.

GE Aviation in Huntsville manufacturers silicon carbide (SiC) materials for jet engines and land-based gas turbines.

This plant is critical in enabling GE Aviation to produce CMC components in large volume.

Hexcel and Toray Composite Materials manufacturers PAN (precursor to the production of carbon fiber) and Carbon Fiber.

GKN Aerospace's Tallassee facility focus on design and development of advanced composite technologies for rotorcraft.

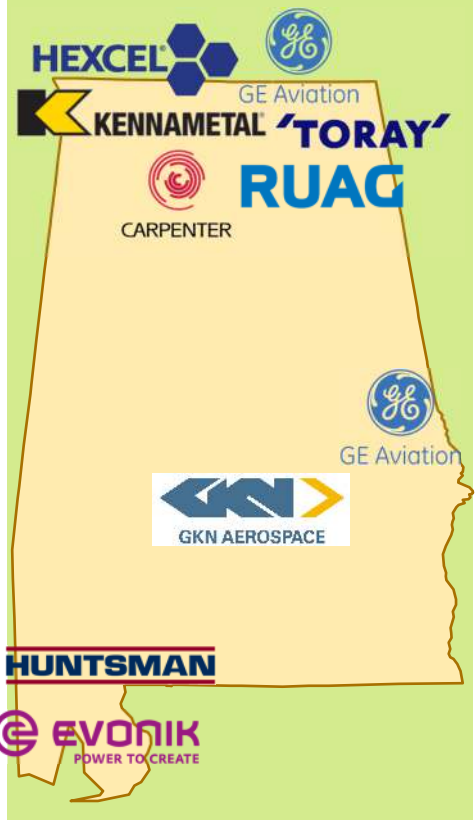
Evonik in Mobile produces structural foam based on based on polymethacrylimide for the aerospace and automotive industries.

RUAG's plant in Decatur, AL



Composite molding will be used for payload fairings to protect satellites.

Image courtesy of Morgan Co EDA





ACADEMIC PARTNERSHIPS

Academic partnerships and top-ranked educational institutions offer world-class engineering programs, labs, and research assistance to composite manufacturing.

The **Center for Advanced Materials** at Tuskegee University are involved in basic applied research on needs of a variety of defense, recreational, healthcare and commercial areas.

The **FAME Lab** at Auburn University consists of faculty and students that perform research on the additive manufacturing of fatigue-resistant materials by establishing their process-structure-property-performance relationships.

Auburn University's **National Center for Additive Manufacturing Excellence (NCAME)** train and educate the next wave of additive manufacturing (AM) specialists, researchers, technicians, end-users, innovators, and more.

Center for Polymer and Advanced Composites at Auburn University bring together industry and university researchers in collaboration.

Advanced Composite Materials Laboratory at University of Alabama includes facilities for manufacturing, characterization and modeling of advanced composites and nanostructured materials

Structural Composites Laboratory at Univ. of Alabama at Huntsville is designed to adequately support research in the behavior and manufacturing of advanced fiber composites and cementitious composite materials.

University of Alabama in Birmingham **Materials Processing & Applications Development (MPAD) Center** serves the automotive, transportation, defense, infrastructure and energy industries for advanced engineered plastics and composites design, analysis, processing, mfg and product dev.

The Alabama higher education system consists of 28 four-year colleges and universities and 24 two-year community and technical colleges strategically located throughout the state providing Alabamians with educational opportunities to meet the emerging needs of industry.

GE Aviation chose Auburn University as one of eight universities to participate in the **GE Additive Education Program**.

Auburn University offers Masters and Doctorate in Polymer and Fiber Engineering.

17 completions during the past 5 years.

Additive Manufacturing Accelerator

in Auburn aids manufacturers and entrepreneurs in the creation and development of new products or production solutions through the use of advanced additive manufacturing methods in metals and polymers.



The University of Alabama's Metallurgical and Materials Engineering program grants Bachelor, Masters and Doctorate degrees. Faculty and students in the programs are also involved in research in the areas of metal matrix composites, mechanical properties of materials and metals, and metal processing.