Manufacturing Demonstration Facility

A National Resource for Industry
Revitalizing US Manufacturing

The Manufacturing Demonstration Facility (MDF), established in 2012, is the Department of Energy’s only designated user facility focused on performing early-stage research and development to improve the energy and material efficiency, productivity, and competitiveness of American manufacturers. Research focuses on manufacturing analysis and simulation, composites and polymer systems, metal powder systems, metrology and characterization, machine tooling, large-scale metal systems, and robotics and automation.

The MDF is a 110,000 sq. ft. facility housing integrated capabilities that drive the development of new materials, software, and systems for advanced manufacturing. From binder jetting to 3D tomography to in situ monitoring, the MDF leverages a range of equipment and expertise designed to deliver results that generate energy efficiency improvements in the manufacturing sector, efficiently utilize abundant and available domestic energy resources, and support the production of clean energy products with benefits extending across the nation's economy.
DOE’s MDF

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Working with ORNL

ORNL works with more than 100 companies yearly for technology advancement and commercialization. More than 20 start-ups have been formed based on ORNL-developed technologies over the past 5 years. Under the MDF Technology Collaborations Program, industry can leverage world-leading capabilities and expertise in short-term collaborative projects approved by DOE. Academia, national laboratories, government agencies, and nongovernmental organizations may also access the facility through a variety of user and collaborative agreements. For more information on how to work with ORNL, visit www.ornl.gov/partnerships.

Composites and Polymer Systems
Additive and high-rate processing of discontinuous fiber composites.

Metal Powder Systems
Microstructure control and ability to 3D-print crack-free, highly nonweldable alloys.

Machine Tool
Additive and subtractive capabilities to produce, measure, and predict machine tool performance.

Large-Scale Metal Systems
Large-scale metal wire arc and laser systems with multi-axis controls.

Metrology and Characterization
Comprehensive powder-to-part characterization for manufacturing born-certified components.

Manufacturing Analytics and Simulation
Computational modeling, in situ sensing, metrology, and artificial intelligence for nondestructive component evaluation.

Robotics and Automation

Future Composites

Systems Assembly

Second Floor

First Floor

Large-Scale Metal Systems

Manufacturing Demonstration Facility

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