Facilities & Equipment

Key resources and unique technical capabilities

MULTISCALE SYSTEMS

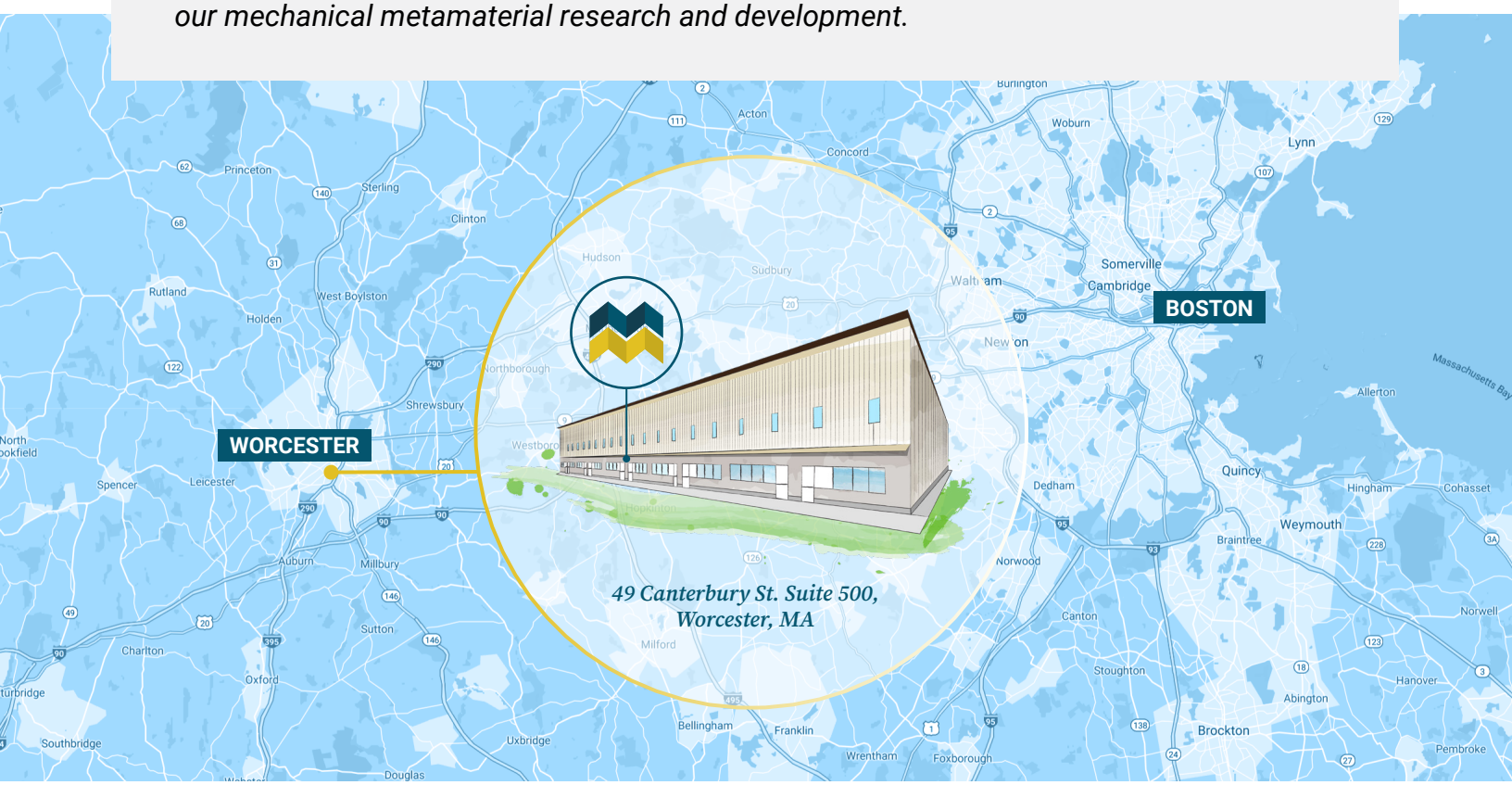
Facilities

Multiscale Systems, Inc. is headquartered in Worcester, MA — New England's second largest city — a growing community that contains a strong advanced manufacturing base and educated workforce.

Worcester is a Massachusetts Gateway City, and our location falls within both an Economic Opportunity Zone and a U.S. Small Business Administration HUBZone.

An hour from Boston, we're centrally placed within the state for convenient access to a number of universities, research institutes, and high-tech manufacturers.

Multiscale Systems' head office is a 4,600 sq-ft workspace outfitted with all essential equipment for the administrative tasks, light machining, and manufacturing that support our mechanical metamaterial research and development.

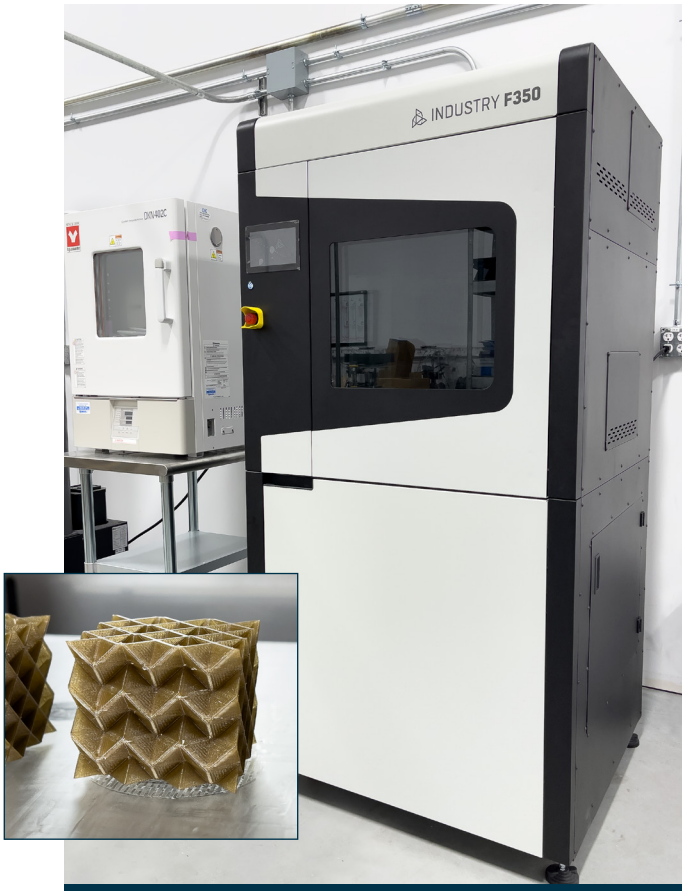


Equipment

3DGence **- Industry F350 printer**
An industrial, dual extruder 3D printer with an actively heated build chamber for high-performance polymers such as PEEK and PC.

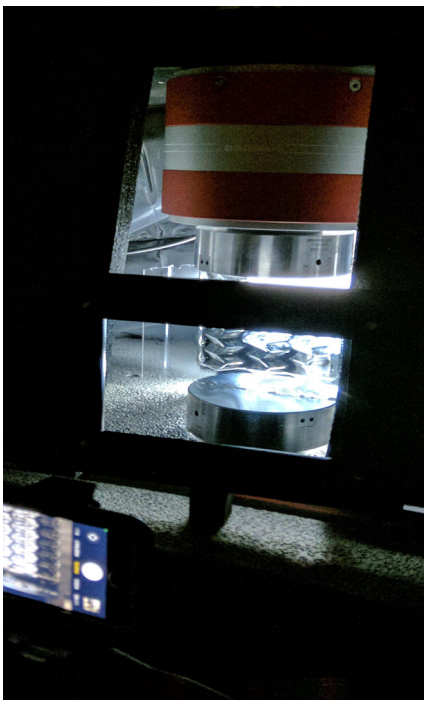
MakerGear **- M3-ID 3D printers**
Six dual extruder 3D printers operating as an in-house print farm running CloudPrint for up to 12 simultaneous print jobs, 6 simultaneous multi-material print jobs, or any combination thereof.

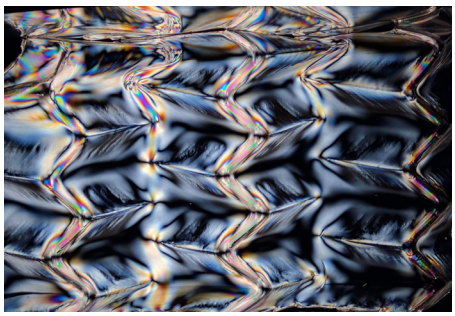
Instron **- 5985 Universal Testing System**
Universal tester for characterizing material properties under compression, extension, oscillatory loading, 3-point bending, or peel testing over a range of loads from 5 N to 250 kN (1.12 to 56,200 lbft). Recording measurements up to 2,500 Hz with software with relevant ASTM standards (convertible to ISO) while allowing for custom testing configurations.



3DGence Industry F350 printer; MetaCORE [MO] prototype produced in PEEK (inset).

Instron Universal Testing System





Left: Contact-free metrology using polarized light and mechanical testing of metamaterials with the *Instron*.

Above: The birefringence produced by this testing method reveals the stress points - seen as the colorful sections - in this thermoformed prototype.

Glowforge - Plus laser cutter
Laser cutter with 20” x 12” bed for rapid production of custom sample-specific mounting equipment and gantries used when conducting characterization measurements.

StepCraft - Q.204 CNC machine
Computer-controlled milling system for thermoformer mold fabrication, utilizing an automatic tool changing system for up to 6 different mill bits per job.

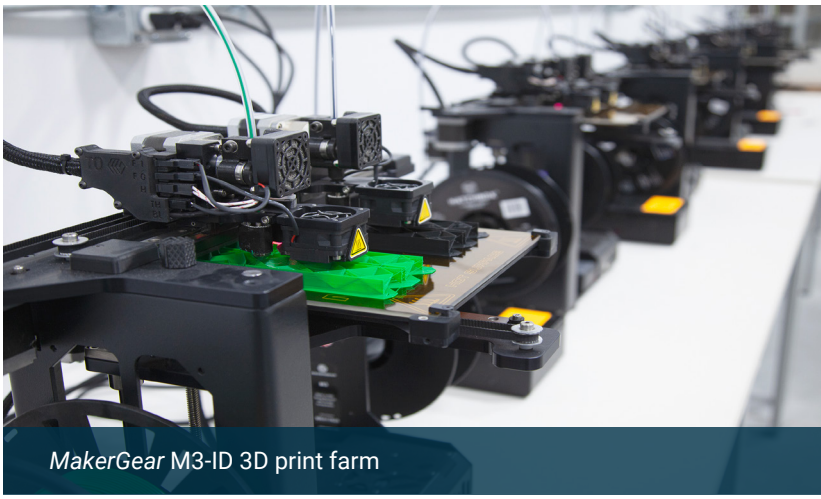
Impact Testing Tower
A 17.5 ft drop tower for impact testing reaching velocities of up to 8.5 m/s, with a MadgeTech Shock300 data logger.

Mayku - FormBox thermoformer
Desktop vacuum thermoform machine for rapid prototyping of mechanical metamaterial solutions.

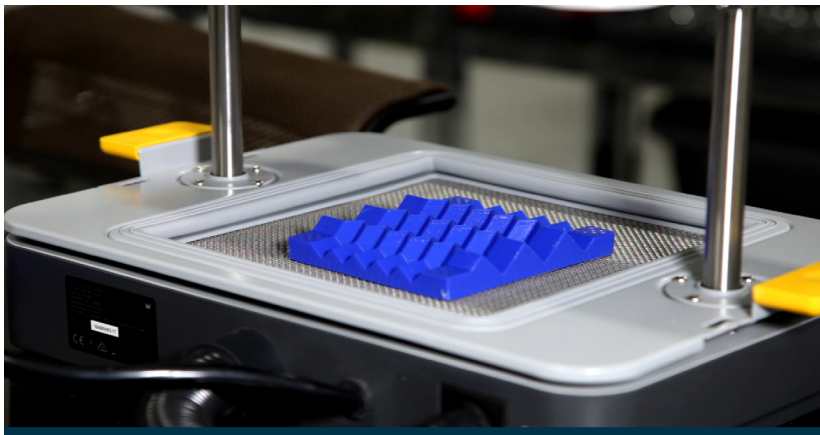
ThorLabs - Optical microscope
Custom assembly for bright field optical setup with 12-48x magnification at 60 fps for full-color characterization and quantification of metamaterials down to the 1 µm scale.

SainSmart - UNI-T UTi80P mini infrared thermal camera
Infrared camera for contact-free thermal measurements, from -14 ℉ to 752 ℉.

Computing
HPC for metamaterial design and FEA analysis; Ansys software; off- and on-site redundant data storange and backup.



MakerGear M3-ID 3D print farm



Mayku FormBox thermoformer

StepCraft Q.204 CNC machine

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