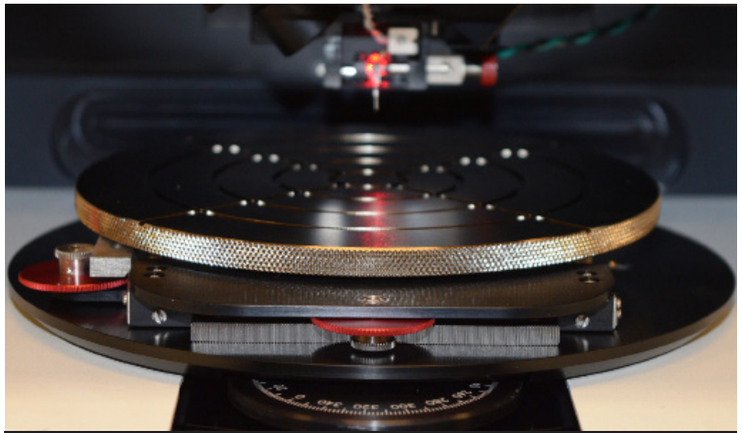
Device Characterization



umass.edu/ials/device-characterization

Located on the 4th floor in the Life Science Laboratories the Device Characterization facility provides gold-standard verification of wearable and point-of-care devices and other medical devices. This lab offers a full suite of mechanical testing capabilities to fully characterize materials, manufacturing processes, and their fabricated devices.

We offer training to users to conduct experimentation for use on a fee for service basis to both internal and external researchers, academic or industry based. Following an initial consultation, covering experimental parameters training and access is arranged through the director.

ACCESS

To request access, training, or additional information please contact Dave Follette follette@umass.edu.

Our rates are competitive and tiered based on needs and usage. Visit our website at *umass.edu/ials/device-characterization* for current listing.

TRAINING

Training for new users consists of:

- lab safety training,
- operation of the instrument and associated software,
- use of data analysis software,
- exporting or presenting data,
- clean up and shutdown of the instrumentation.

Once the training is complete, researchers may schedule their experiments through the director of Device Characterization (David Follette) or online through FOM (Facilities Online Manager) at *fom.umass.edu/fom*

UMassAmherst | Core Facilities

Institute for Applied Life Sciences
University of Massachusetts Amherst
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240 Thatcher Road
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Research and Innovation to Translate Basic Science into Product Candidates

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Revision (01/25/19)

UMassAmherst | Core Facilities

Device Characterization

Institute for Applied Life Sciences
University of Massachusetts Amherst

Gold-Standard Verification of Wearable and Point-of-Care Devices

EQUIPMENT

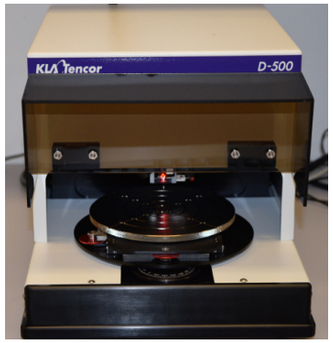
3D Systems Capture

3-D Scanner

The Capture 3D scanner allows rapid characterization of the surface geometry and shape of an object. The scanner allows rapid creation of a digital model of a physical object. Industrial uses include fields as varied as quality control, orthotics, and prosthetics. Though not as accurate as a coordinate measuring machine, the 3D scanner requires no physical contact.

KLA Tencor Alpha D-500

Stylus Profiler



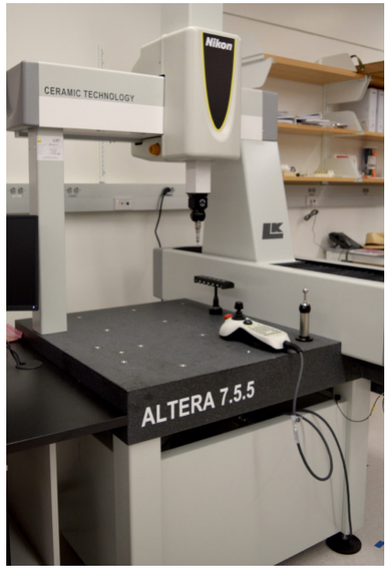
The Alpha D-500 stylus profiler allows high resolution characterization of 2D surfaces. The measurements can be used to ascertain step height, roughness, bow, and shape of a piece, as well as measurement of stress. The device also allows high resolution visualization of surface features. Such measures are used in a variety of fields, including materials research and medical devices.

MASSACHUSETTS LIFE SCIENCES CENTER

A significant portion of core equipment has been purchased through MLSC grant funding support.

Nikon Altera 7.5.5

Coordinate Measuring Machine



The Nikon Altera 7.5.5 allows high precision characterization of device geometry in critical to function locations. Using a 5-axis measuring system and a number of probe options, the system measures with volumetric accuracy on the order of 1.8 microns, allowing a designer to confirm part dimensions to tight tolerances.

Edibon EBVR

Brinell, Vickers and Rockwell Hardness Testing Unit

The Brinell, Vickers and Rockwell Hardness Testing Unit (EBVR) consists of a hardness testing machine that determines the three main types of hardness (Brinell, Vickers and Rockwell).

It can be adapted to determine hardness of ferrous materials (steel, casting pieces, etc.), nonferrous materials (aluminum and copper alloys, etc.), test pieces and alloys.

Instron ElectroPuls 10000

Mechanical Properties Testing

The ElectroPuls 10000 can test material properties under large linear and torsion loads and at high strain. Using the system a material or device's material and fatigue responses can be tested to determine its performance and validate its manufacturing process.

Stress Photonics GFP 1500

Full Field Strain Measurement System

The GFP 1500 allows location specific characterization of stress and strain, allowing a designer to finely adjust their design to withstand loads and validate engineering models. The part is painted with a photo elastic coating, and then illuminated with circularly polarized light. The light becomes elliptically polarized proportional to maximum shear strain at the object surface.

TESTIMONIAL

"The ADDFab and Device Characterization labs together provide the ability to design, control, and evaluate the 3D printing process specific to our requirements for developing the next generation of prosthetic components as well as embed smart sensing structures into the parts. Together the 2-axis Instron testing machine along with the Stress Photonics photoelastic strain measurement system enables the evaluation of new soft sensors we are creating to measure the physical contact between robots and people in collaborative work situations."

– Frank C. Sup, Assistant Professor, Mechanical Engineering