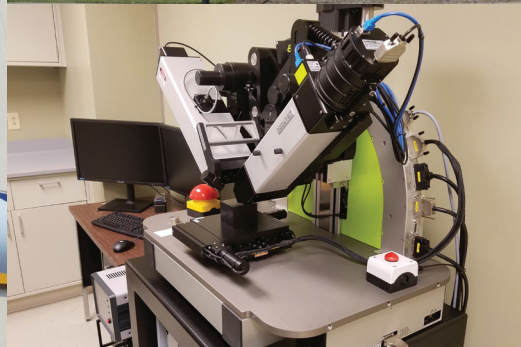




"Predict, Prevent and Manage"

Materials Characterization



THERMAL PROCESSING AND ANALYSIS

Setaram Setsys TGA-DTA/DSC - provides simultaneous measurement of weight change (TGA) and true differential heat flow (DSC) on the same sample from ambient to 2400 °C.

- Temperature range: Ambient to 2400 °C
- Heating rate: 0.01 to 100 °C/min
- TGA / STA Balance capacity: 35 g / 100 g
- TGA / STA Balance resolution: 0.03 µg / 0.3 µg
- TGA, DTA and DSC interchangeable rods
- TMA resolution: 0.2 nm
- Zero force TMA capability

X-RAY DIFFRACTOMETER

NCERCAMP

The National Center for Education and Research on Corrosion and Materials Performance (NCERCAMP), located at The University of Akron, was launched in 2010 with a grant from the Department of Defense.

The center is focused on predicting, preventing and managing the nation's destructive corrosion and materials degradation problems.

Working with industry, government and academia, the center's more than 30 interdisciplinary professors and technicians can help you solve your corrosion and materials degradation issues.

"Predict, Prevent and Manage"

The University of Akron

264 Wolf Ledges Parkway
Akron, OH 44325-9006

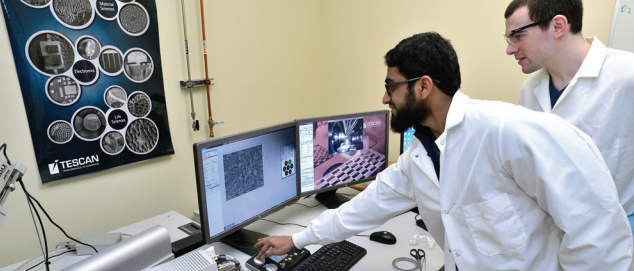
Email: ncercamp1@uakron.edu
uakron.edu/NCERCAMP

The
University
of Akron



The University of Akron
NCERCAMP

The National Center for Education and Research
on Corrosion and Materials Performance



MATERIALS CHARACTERIZATION

Materials Characterization labs offer analytical instrumentation for liquid, powder, surface and bulk materials analysis and characterization. These resources are available to UA faculty and students, outside researchers and industry.

Capabilities and Characterization Techniques

SCANNING ELECTRON MICROSCOPY

Tescan LYRA₃ XMU Scanning Electron Microscope (SEM) with Focused Ion Beam (FIB-SEM)

- Combined FE-SEM/FIB microscope
- High resolution Field-emission-SEM and FIB imaging
- Standard Secondary Electron (SE), and Back-Scatter Electron (BSE) detectors
- EDAX EDS and EBSD detectors for elemental analysis and examination of crystallographic orientation of materials
- Gas injection for both etching and deposition of both conducting and insulating materials
- Precise preparation of cross-sectional samples for transmission electron microscopy (TEM)
- 3D tomography: 3D visualization with nanometer-scale resolution
- High vacuum resolution: 1.2 nm at 30 kV
- Low vacuum resolution: 3 nm at 30 kV
- Accelerating voltage: 0.2 kV – 30 kV
- Magnification: 2x – 1,000,000x at 30 kV
- Sample preparation equipment including Pt deposition is available in the laboratory.

Hitachi TM3030Plus Tabletop Microscope (SEM) with SE, BSE, and EDX Detectors

- The detectors can be effectively operated under low-vacuum conditions and can support SE and BSE image observation without a metal coating.
- The TM3030Plus can be used to view BSE images, SE images and mixed images.
- Magnification range: 15x to 60,000x (up to 240,000x with digital zoom)
- Accelerating voltage: 5 kV / 15 kV / EDX
- Equipped with an energy dispersive x-ray spectroscopy (EDX) detector for elemental analysis

MICROFOCUS X-RAY SYSTEM

Nikon XT H 320 LC X-ray computed tomography (CT) system

- Provide high resolution (micrometer scale), 3D and 2D images of a sample's interior and exterior information non-destructively
- Four different X-ray sources: 225 kV micro focus multi-metal (W, Mo, Ag, and Cu) reflection target, 180 kV nano focus transmission target, 225 kV rotating target, and 320 kV micro focus target
- Minimal focal spot size of 3 μm
- 5-axis sample manipulator, 50 kg maximum weight
- Manipulator max travel of 510 mm in X, 610 mm in Y and 800 mm in Z
- Largest sample size for digital radiography: 600 mm wide x 675 mm high
- Largest sample size for computed tomography: 300 mm swept diameter x 300 mm high

3D OPTICAL MEASURING SYSTEM

Alicona InfiniteFocus Microscope (IFM) G5

- A rapid non-contact optical 3D measurement device
- Perform "Profile Analysis", "Area Analysis", "Form Analysis", "Volume Analysis" and "2D Image Analysis"
- Provide topographic measurement of distances, radii, step heights, volume of voids or protrusions on a sample, etc.
- Vertical resolution and lateral resolution down to 10 nm and 400 nm, respectively

OPTICAL MICROSCOPY AND METALLOGRAPHY

- Olympus BX63 fluorescence microscope system with DP80 digital color/monochrome camera and cellSens software with deconvolution module
- Olympus FluoView 1000 Confocal Microscope
- Olympus Stereoscopic Microscope SZX16
- AmScope Phase Contrast Inverted Microscope

ATOMIC FORCE MICROSCOPY

Bruker Multimode 8 AFM with high-speed ScanAsyst and Nanoscope V controller

- Display and capture up to eight images simultaneously
- In air and in liquid imaging
- Electrochemistry and STM
- Temperature control: -35 to 250 °C