

# Coatings and Polymeric Materials

North Dakota State University

# Characterization Service Center

The Department of Coatings and Polymeric Materials at North Dakota State University is equipped with state-of-the-art spectrometric, microscopic, testing, and application equipment utilized in coatings and polymeric materials science. This equipment is included in our service center and is available for use on a fee basis. A majority of the instrumentation has attachments or modules for advanced measuring techniques. For further information regarding our specific capabilities and/or a price list, please contact Heidi Docktor, Laboratory Manager, at (701) 231-8017 or Heidi.Docktor@ndsu.edu.

## Categories of Materials Characterization

### Spectroscopy

Fourier Transform Infrared Spectrometer (FTIR)	Thermo Scientific Nicolet 8700: many tech. avail. please inquire
Ultraviolet-Visible-Near Infrared Spectrometer (UV-VIS-NIR)	Varian Cary 5000: specular and diffuse reflectance accessories
Fluorescence Spectrometer	Jobin Yvon Horiba Fluoromax-3
Color Spectrometer	MacBeth Color Eye 7000

### Electrochemical

Electrochemical Impedance Spectroscopy (EIS) and Electrochemical Noise Monitoring (ENM)	Gamry Femtostats and PC4 Potentiostats
Scanning Vibrating Electrode Technique (SVET)	Applicable Electronics, Inc.
Scanning Electrochemical Microscope (SECM)	CH Instruments

### Accelerated Weathering

Xenon Arc	Q-Lab Corporation Q-Sun 1000 chamber (2); Atlas MTS Ci4000 Weather-Ometer
Ultraviolet	Q-Lab Corporation Q-UV SE chamber (2): one UV-A, one UV-B
Salt Spray	Q-Lab Corporation Q-Fog CCT chamber (2): one ASTM B117, one Prohesion®

### Surface Characterization

Contact Angle/Surface Tension Analyzer	First Ten Angstroms: FTÅ 125
Atomic Force Microscope (AFM) and Scanning Probe Microscope (SPM)	Veeco DI-3100 AFM: tapping, contact, nanoindentation, conductive, magnetic Veeco Nanoscope IIIa MultiMode

### Mechanical

Tensile Analysis	Instron 5545 Tensile Tester: 100N load cell, environmental chamber
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### Chromatographic/Separation Methods

Gel Permeation Chromatography (GPC)	Waters Corporation: Module system with Refractive Index detector
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### Particle Characterization

Dynamic Light Scattering - submicron sizing	Particle Sizing Systems Nicomp 380: 3 nm to 5 µm
Single Particle Optical sizing	Particle Sizing Systems SPOS 780: 0.5 µm to 2500 µm
Zeta Potential	Agilent Technologies, Colloidal Dynamics AcoustoSizer IIs

### Other Property Techniques

Minimum Film Formation Temperature	Gardco Rhopoint MFFT-90
Hardness	BYK König Pendulum Hardness Tester
Gloss	Gardco Statistical Novogloss Glossmeter

Thermal Analysis techniques (glass transition, crosslink density, etc.), Nuclear Magnetic Resonance, and many other techniques are available from the Materials Characterization Analysis Lab in the Center for Nanoscale Science and Engineering (CNSE) at NDSU. Please contact Heidi Docktor (info above) or Eric Jarabek, MCAL Manager, at (701) 231-5305 or Eric.Jarabek@ndsu.edu for more information regarding their capabilities.