

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 Chunju Gu, Laboratory Manager, at (701) 231-8017 or chunju.gu@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)	Veeco DI-3100 AFM: tapping, contact, nanoindentation, conductive, and magnetic

Mechanical

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

Gel Permeation Chromatography (GPC)	Tosoh Bioscience: Module system with RI, UV, and Viscometer detectors
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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 400 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
Abraser	Taber Rotary Abraser 5155

Thermal Analysis methods (DSC, DMA, TMA & TGA), Raman, Nuclear Magnetic Resonance, Scanning Electron Microscopes, Transmission Electron Microscopes, and many other techniques are available from the Research Operations Recharge Center (Greg Strommen at (701) 231-5339 or greg.strommen@ndsu.edu) and Electron Microscopy Center (Scott Payne at (701) 231- 8435 or ndsu.em.center@ndsu.edu) at NDSU. Please contact Chunju Gu (info above) for more information regarding their specific capabilities.