

SilcoTek In-House Characterization Capabilities

Fourier Transform Infrared Spectroscopy (FT-IR): Nicolet model 380

- (https://www.deltacollege.edu/emp/ckim/IR380_SOP_WWW/productPDF_52266.pdf)
- Accessories:
 - Specular Apertured Grazing Angle – for surface analysis
 - Attenuated Total Reflectance – for liquid and solid bulk analysis
 - Transmission – for through-sample measurement

Coating Thickness: Filmetrics spectroscopic film thickness analysis

- Filmetrics F20 – for bulk surface measurements on reflective surfaces
 - <http://www.filmetrics.com/thickness-measurement/f20>
 - Contact probe
 - Sample stage
 - Extension contact probe
 - Spot size 1mm
 - Thickness range = 15nm – 70µm, wavelength range = 380-1050nm
- Filmetrics F40 – for precise, focused measurements on reflective and rough surfaces
 - <http://www.filmetrics.com/thickness-measurement/f40>
 - 15X microscope system
 - Motorized X-Y stage for mapping
 - Spot size = 1µm
 - Thickness range = 4nm – 40µm, wavelength range = 190-1100nm

Electrochemical Impedance Spectroscopy (EIS): Gamry Series G 300 Potentiostat/Galvanostat

- <http://www.gamry.com/assets/Uploads/Series-G-Operators-Manual.pdf>
- Primarily used by SilcoTek to characterize the electrochemical impedance of our depositions
- See <https://www.gamry.com/application-notes/EIS/> for a reference on EIS

Goniometer: ramé-hart model 200

- <http://www.ramehart.com/200.htm>
- Static single-point contact angle measurement
- Polar and non-polar liquids
 - Water
 - Hexadecane
 - Other liquids are possible

Tensiometer: Kruss K100

- <https://www.kruss.de/products/tensiometers/k100/force-tensiometer-k100/>
- Dynamic contact angle measurement on bulk surfaces
- Advancing and receding contact angle for more complete surface energy characterization

- Polar and non-polar liquids
 - Water
 - Hexadecane
 - Other liquids are possible

Cyclic Salt Fog Chamber: Weice Testing Instrument WTS90+C

- <http://www.weicetestinginstrument.com/products/salt-spray-chambers/>
- Typically running ASTM G85 – based cyclic salt fog exposure testing
 - Acidified
 - Non-acidified

Non-destructive metal composition analysis: Niton XRF Analyzer

- Percentage sensitivity detection of 25 elements from S to U.
- <https://www.thermofisher.com/order/catalog/product/10131166>

Testing Companies used by SilcoTek (and specific services we have used – most offer many more):

Matco Services Incorporated

- Corrosion Testing
- Failure analysis
- <http://www.matcoinc.com/>

Nanovea

- Surface tribometric analysis
- Nano-scale testing
- <http://nanovea.com/>

Evans Analytical Laboratories

- Auger Electron Microscopy (AES) depth profiling
- Secondary Ion Mass Spectroscopy (SIMS) depth profiling
- <http://www.eag.com/materials-characterization/>

Massachusetts Materials Research, Inc.

- Mechanical and destructive testing
- <http://massmaterials.com/services.html>

Insight Analytical

- Formerly Harritec LLC
- Analytical systems testing for inertness characterization
- <http://www.insight-analytical.com/>

Pennsylvania State University, [Materials Characterization Lab \(MCL\)](#)