

FAILURE ANALYSIS SERVICES

The McCrone Group offers you expertise in the analysis of failed products and materials. Our team of scientists at McCrone Associates has unmatched experience in solving a wide variety of particle identification and materials problems. The diverse faculty of experts at Hooke College of Applied Sciences can teach you cutting-edge techniques, and the knowledgeable McCrone Microscopes & Accessories sales team will help you configure the instruments to meet the analytical needs in your laboratory. From analysis to education to instruments, The McCrone Group is your premier microscopy resource for the scientific analysis of product failures.



ANALYSIS •  **McCRONE**[™]
ASSOCIATES, INC.

McCrone Associates is focused on solving particle identification and materials problems. The root cause of many material failures often has a particulate basis. Examples include contaminants in the manufacturing process, heterogeneous distribution of alloying inclusions, environmental effects and mechanical defects. Our staff scientists use state-of-the-art instruments and techniques to provide you reliable, confidential failure analysis.

Analytical Services:

Optical Analysis

- Particle Morphology
- Relative Refractive Index Determination
- Presence or Lack of Birefringence
- Color Determination
- Mechanical Artifacts

Chemical Analysis

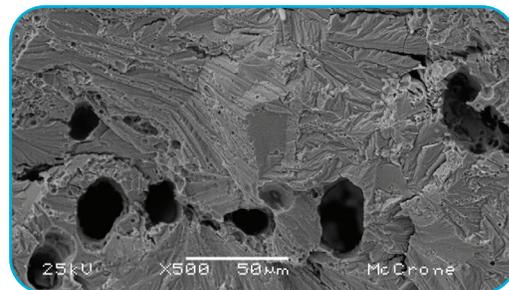
- Elemental Composition
- Compositional Distribution
- Crystal Structure
- Classification of Organic Materials
- Chemical Functional Group Determination

Common Failure-related Problems:

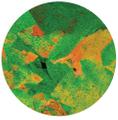
- Metal Corrosion
- Metal Impurities
- Circuit Board Contact Failures
- Glass Impurities
- Hard Polymer Impurities
- Can Coating Defects
- Welding Joint Flaws

McCrone Associates is ISO/IEC 17025:2017 A2LA accredited (certificate #3631.01), and registered with the FDA, GDUFA, and DEA.

We maintain professional and business relationships with a number of other laboratories where additional analysis beyond the capabilities of our laboratory can be obtained.



Stainless steel fracture face showing deep pits from stress corrosion cracking along with transgranular cracking and fatigue striations.



EDUCATION • **HOOKE COLLEGE™**
OF APPLIED SCIENCES

Hooke College of Applied Sciences provides accredited training and education to technicians and scientists from a wide range of industries. Our instructors deliver, via professionally-produced videos, high-quality microscopy and microanalysis online courses that provide the essential skills needed for problem solving back at your own laboratory. Learn new skills and techniques from the experts in microscopy.

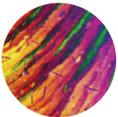
Let us collaborate with you to design a custom course. Depending on the level of customization required and the number of employees to be trained, custom training solutions can often be more cost effective than sending the same individuals to an open enrollment course. As an added bonus, learning activities built into the courses provide great team-building opportunities.

Our online courses:

- Polarized Light Microscopy
- Scanning Electron Microscopy
- Infrared Microscopy



Each Hooke College of Applied Sciences course is taught by recognized experts in their fields and in microscopy, with decades of real-world experience.

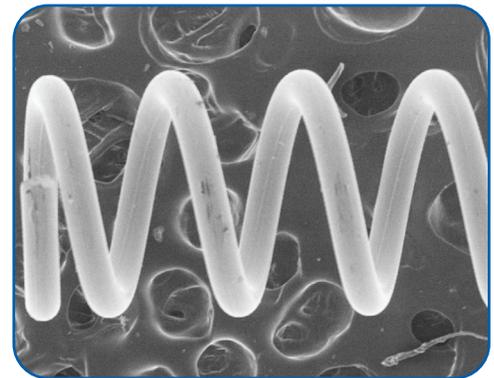


INSTRUMENTS • **McCRONE™**
MICROSCOPES & ACCESSORIES

McCrone Microscopes & Accessories offers you proven microscopy equipment and accessories for a variety of materials analysis applications. Our technical sales team has helped create custom instrument packages to fulfill the needs and specifications of laboratories around the country. We can help outfit your entire lab and provide ongoing product training and support.

Our analysis products include:

- Nikon Microscopes
- Nikon Measuring and X-Ray Systems
- JEOL NeoScope JCM-7000 Benchtop SEM with EDS
- Linkam Thermal Stages
- Timegate PicoRaman
- McCrone Micronizing Mills
- Retsch Mills
- Motic Microscopes
- Hirox Digital Microscopes
- Digital Imaging Systems
- Microscope Accessories/Tools
- Lab Supplies
- Cleaning, Calibration, Installation and Training
- References and Resources



Magnify images from 10X to 60,000X with the compact JEOL JCM-7000 Benchtop SEM, with optional EDS for elemental identification.