

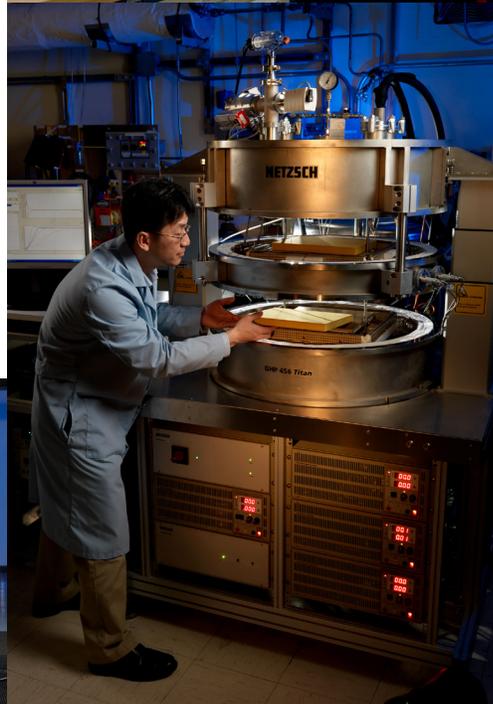


Materials Analysis

Johnson Space Center (JSC) materials laboratories provide analytical capabilities used in the analysis and evolution of space flight hardware. Test and evaluation capabilities include metallography, material properties testing, microscopy, environmental testing, nondestructive evaluation, and analytical chemistry. JSC offers expertise in development, evaluation and test of metallics, polymers, composite materials, and textile and insulation materials.

Services Provided

- Materials properties evaluation and test
- Failure Analysis
- Nondestructive Evaluation
 - Real-time, digital, and film x-ray
 - Automated ultrasonic (conventional and phased array)
 - Fluorescent penetrant
 - Magnetic particle
 - Infrared thermography
 - Eddy current
- Development and test of textile and insulation materials for space environments – evaluation of thermal, mechanical, and comfort properties
- Characterization of nanomaterials
- Chemical analysis
- Thermal analysis
- Metallography
- Scanning Electron Microscopy
 - Cold field emission
 - Variable pressure Schottky



Analytical Chemistry

- Chemical analysis
 - Fourier Transform Infrared Spectrometry
 - Pyrolysis Gas Chromatography/ Mass Spectrometry
 - UV-Vis-NIR
 - Raman Spectrometry
 - Near Infrared Photoluminescence
 - Failure Analysis
- Thermal analysis
 - Differential Scanning Calorimetry
 - Thermogravimetric Analysis
 - Laser Flash Technique (thermal diffusivity)
- Other Analysis
 - BET Surface Area Porosity Analysis
 - Wet chemistry techniques

Metallography

- Abrasive cut-off and precision diamond cutting
- Mounting, polishing, and etching
- Hardness testing
- Inverted, stereo, an upright microscopy
- Reflective brightfield, darkfield, DIC, C-DIC, polarized, and transmitted microscopy

Textiles and Insulations

- Development of textiles applications and suitability evaluation or crew-worn items
- Development of textile and insulation materials for space environments: radiation, dust protection, pressure retention, and puncture/wear resistance
- Measurement of thermal properties, strength, fiber bond, wear, hardness, and stress

Nondestructive Evaluation

- Radiographic Testing
 - Computed Tomography
 - Digital Radiography
 - Standard Film Radiography
- Ultrasonic Testing (UT)
 - Phased Array Ultrasonic Testing
 - C-scan UT
 - Conventional UT
- Infrared (IR) Thermography Inspection
 - Flash Infrared Thermography Testing
 - IR Thermography Testing
- Remote Evaluation Techniques
 - Laser Shearography
 - High Speed Imagery
- Eddy Current Testing (ET)
 - Array Eddy Current Testing
 - Conventional ET
- Liquid Penetrant Testing and Magnetic Particle Testing Inspection – Fluorescent and visible mediums for both methods



Polymers

- Tensile, lap shear, and compressive testing
- Structural testing at elevated or cold temperatures
- Cutting and bonding of nonmetallic materials
- ARAMIS 3D Image Correlation Photogrammetry

Scanning Electron Microscopy

- Secondary/backscatter imaging
- Energy Dispersive Spectroscopy
- Scanning Transmission Electron Microscopy
- Electron Backscatter Diffraction
- Carbon and precious metal thermal/sputter coaters



We have developed customer-friendly agreements to streamline business relationships and are eager to share our unique facilities and expertise with new customers. We invite your inquiries regarding application or adaptation of our capabilities to satisfy your special requirements. Briefings on general or specific subjects of mutual interest can be arranged at JSC or at your business site.



For the benefit of all

For more information:
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