HTML Equipment List

HIGH TEMPERATURE MATERIALS LABORATORY

The High Temperature Materials Laboratory (HTML)* welcomes your participation in its User Program.

Please complete the following form. It is strongly recommended that while drafting your research proposal, you contact the appropriate HTML research staff as listed below.

User Center Contacts

Diffraction — Dr. Andrew Payzant (865-574-6538) payzanta@ornl.gov

Materials Analysis – Dr. Larry Allard (865-574-4981) allardlfjr@ornl.gov

Mechanical Characterization & Analysis – Dr. Edgar Lara-Curzio (865-574-1749) laracurzioe@ornl.gov

Residual Stress – Dr. Camden Hubbard (865-574-4472) hubbardcr@ornl.gov

Thermography & Thermophysical Properties – Dr. Ralph Dinwiddie (865-574-7599) dinwiddierb@ornl.gov

Tribology Research – Dr. Peter Blau (865-574-5377) blaupj@ornl.gov

Final research proposals should be submitted via e-mail to:
htmluser@ornl.gov

Contact information:

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*Sponsored by the U.S. Department of Energy
Assistant Secretary for Energy Efficiency & Renewable Energy
Vehicle Technologies Program

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www.html.ornl.gov

Diffraction (Neutron & X-Ray) – Andrew Payzant (865-574-6538)

Instrument	Type
X-ray Diffraction	
.....	High-Temperature
.....	Low-Temperature
.....	Room-Temperature
Neutron* Diffraction.....	1600°C Vacuum Furnace
.....	Controlled Atmosphere Furnace - 1200°C (air)
.....	Room Temperature
Synchrotron High-Flux Beam Line (X14A at NSLS)	
.....	RT Capillary Mount
.....	Buehler Furnace
.....	Capillary Furnace

**Joint-venture facility with primary funding for the High Flux Isotope Reactor from DOE's Basic Energy Sciences*

Materials Analysis – Larry Allard (865-574-4981)

Instrument	Type
Hitachi HF-3300 cold FE-STEM/TEM *	
Hitachi NB-5000 dual-beam FIB Micro Mill	
Hitachi S3400 Environmental SEM	
JEOL 2200FS-AC Aberration-corrected FE-TEM *	
JEOL 8200 Electron Microprobe	
K-Alpha X-ray Photoelectron Spectrometer	
Phi 680 FE – Scanning Auger Nanoprobe	

**Remote access available, check if required.*

Mechanical Characterization & Analysis – Edgar Lara-Curzio (865-574-1749)

Instrument	Type
Biaxial Test System (Torsion/Tension-Compression)	
Dilor XY800 Raman Microprobe	
Dynamic Mechanical Analyzer	
Electromechanical Test System	
Flexure Test Facility	
Hardness Tester	
Micromechanical Test System	
Nanoindenter	
Resonant Ultrasound Spectrometer	
Servohydraulic Test System	
Tensile Test Facility	
Test machine for automotive crashworthiness (TMAC)	
Thermal Shock Test Facility	
Thermomechanical Analyzer	
Ultrasonic Modulus System	

Residual Stress/Texture – Cam Hubbard (865-574-4472)

Instrument	Type
Neutron* Diffraction Residual Stress Mapping (Macro)	
.....	Large Specimen XYZ Stage
.....	2-Circle Orienter
.....	Load Frame

.....1600°C Vacuum Furnace
Neutron* Powder Diffraction (High Temperature Furnace/Microstresses)
.....Controlled Atmosphere Furnace - 1200°C (air)
.....Room Temperature
XRD X'Pert pro with Anton Paar Hot Stage – Rotating anode
XRD Polycrystal-Texture-Stress Goniometer – Standard X-ray tube
Synchrotron High-Flux X-ray Beam Line (at NSLS)
XRD TEC Large Specimen Goniometer

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Thermography & Thermophysical Properties – Ralph Dinwiddie (865-574-7599)

Instrument	Type
Differential Scanning Calorimeter	
	.....High Temperature DSC
	.....Low Temperature modulated DSC
Dilatometer	
	.....Dual Push Rod (1500°C)
	.....High Speed Quenching, Deformation, or Cryogenic Cooling
Electrical Resistivity (4-point in-line probe)	
High Temperature Seebeck Coefficient/Electrical Resistivity	
Thermal Analysis	
	.....Simultaneous DTA/TG
	.....High Mass TGA
Thermal Constants Hot Disk System	
Thermal Diffusivity	
	.....LaserPit in-plane
	.....Laser Flash
	.....Xenon Flash
Thermography – IR Camera (*available for offsite research)*	
Hyperspectral Imaging (*available for offsite research)*	
Thermosonic NDE	
Total Hemispherical Emittance	

Tribology Research – Peter Blau (865-574-5377)

Instrument	Type
Compact Grindability Test System (high-stress abrasion)	
Continuous Loop Abrasion Test (low-stress abrasion)	
Coordinate Measuring Machine	
Durometer – Elastomer Hardness Tester	
Hardness Tester, Rockwell and superficial scales, ASTM compliant	
Image Analyzer (optical microscopy)	
Microindentation Hardness Tester	
	.....High temperature
	.....Room temperature
Multi-mode Rolling/Sliding Friction & Wear	

continued on next page

Tribology Research – Peter Blau (865-574-5377) – *continued*

Instrument	Type
Optical Comparator	

Oscillatory Scuffing Tester, High temperature
Pin-on-Disk
- ..... High temperature
- ..... Room temperature

Precision Roundness Measurement
Reciprocating friction/wear
- ..... High-load
- ..... Low-load

Repetitive Impact Testing System
- ..... High temperature
- ..... Room temperature

Scanning Acoustic Microscope
Scratch Test, Instrumented (Revetest)
Subscale Disk Brake Material Tester
Surface roughness measuring system, 2D, Mechanical stylus type
Surface topography imaging, 2D and 3D
- ..... High resolution with image stitching
- ..... Non-contact, laser-based