

## MS&E Dept Teaching Lab Equipment

*This document is under construction, additional information, pictures, and location maps will be added in the future.*

### Metallography Lab (201 MS&E)

Fume Hood

Water filtration (0.2 micron)

Cut-off Saws

Two Buehler Abrisimet 2 10" saw

Mounting Presses

Two Buehler Simplimet II

Two Buehler Simplimet 2

Both normally with 1.25" mold enclosures, but will accept 1" and 1.5" enclosures

Coarse Grinding

Buehler Supermet Grinder (12" 180 Grit, 3600 rpm)

Two Buehler Polimet 12" Platen (120 or 180 grit, variable speed)

Fine Grinding

Four Buehler Ecomet V (twin wheel, 8" 300rpm)

Three Buehler Meager (twin wheel, 8" 300 rpm)

Polishing

Seven Buehler Polimet 8" Platen (14micron - 0.05micron, variable speed) in Buehler Technimet tables.

### Microscopy (202 MS&E)

Microscopes

Six Olympus BH-2 Upright Metallographic Microscopes (5x-100x objectives, brightfield or brightfield/darkfield, transmitted or reflected light)

Olympus SZH-10 Stereo microscope (0.5x and 2x objectives, 0.35-140x eyepiece magnification, transmitted brightfield/darkfield, reflected darkfield)

Two Nikon Epiphot Inverted (5x-100x objectives, brightfield/darkfield, Nomarski)

Digital Cameras

Three Spot Insight cameras (1200x1600, 24-bit color single-pass)

Three Pixera Pro cameras (1280x1024, 24-bit, 4-pass interleaved)

Film Camera

Olympus 35mm and Polaroid camera bodies run from Olympus PM-CBAD camera controller

Printers

HP LaserJet 4

HP DeskJet 2000



## Physical Properties Lab (216 MS&E)

### Macrohardness Testers

- Buehler Macromet II Rockwell Hardness Tester
- Wilson 3JR b RB Rockwell Tester (s/n 12211, ACCO Wilson)
- Wilson 3R Rockwell Tester (s/n 22, Wilson Mechanical Instruments Co)

### Microhardness Testers

- Buehler Micromet II Knoop/Vickers
- Buehler Micromet 2003 digital Knoop/Vickers



### Mechanical Testing Equipment

- Satec SI-1C3 Charpy Fracture Toughness Tester
- Instron 1011 Tensile/Compression tester (1000lbs, 0.01" min travel, 0.01-20 inch/min)
- Instron TTCL M6 Tensile/ Compression tester (10,000lbs, rebuilt with digital data acquisition, 4.6inch minimum travel, 0-2 inch/min)



## X-Ray Lab

### Powder Diffractometers

- Two Phillips PW-1725 generator, 1200W Cu tube, powder goniometer, control software (written in LabView), acquisition range 10-140° 2 $\Phi$ , 1-200 steps/degree, user-selectable sampling time, analysis via WinXPow.
- Inel XRG generator, Inel CPS 120 solid-state detector (under development), 250mm radius detector, 120° 2 $\Phi$ , 4096 pixels full scale (0.03°/pixel)



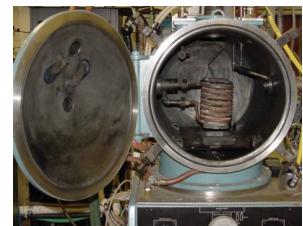
### Film Cameras

- Phillips PW-1725 generator, 600W tungsten, transmission and back-reflection Laue cameras (Polaroid film)



## Heat Treating Lab (105 MS&E)

- Three Lindberg Type 53322 Vertical heating mantles used for molten-salt heat treating (HeatBath Thermoquench 150-540C and No. 800 500C-875C salts)
- Three Lindberg 51445 air atmosphere box furnaces (25-1200C range)
- IPS Eagle HIP, 45000 psi, rebuilt by AIP. Molybdenum (1400C), Graphite (2000C), and Hoskins (1200C partial oxygen capable) furnaces
- Hot Press (1500C, 10ksi linear force), high vacuum (10<sup>-6</sup> torr via diffusion pump), built on campus
- Vacuum Induction Furnace (Inductotherm 20kw Power-Trak 20-95 power supply, Vacuum Industries chassis, 10lbs iron/copper or 3 lbs aluminum capacity) high vacuum (10<sup>-6</sup> torr via diffusion pump) or alternate atmosphere.
- Melt spinner (1/2" wide tape, max, variable rpm, air atmosphere only, aluminum chill)
- Lindberg/Blue M Model STF5543C tube furnace (three-zone, 1200C, 4" max tube dia, 3' long)



**Foundry (142, 146, 150 MS&E)**

Inductotherm Powertrak 200-10 R power supply with taps for four furnaces.

Inductotherm 100lb and 300lb tilt-box furnaces set up for iron/steel.

Inductotherm 70lb(Al)/300lb(Cu) lift coil with two-station base set up for nonferrous metals  
in clay-graphite crucibles

Goff 36" model 36-TB shot blast unit

Milwaukee Molding Machine jolt-squeeze unit

SPO A2-24 jolt-squeeze unit

Beardsley & Piper Model 30 Speedmullor (s/n 30A193560) with B&P MGV-series  
magnaveyor (s/n MGV-108-5607)

Dust collection system

Sectioning equipment

Clark SP-30 walk-behind lift

Clark Carloader-series fork truck (s/n 443422)