

## Bio-Materials & Technology Lab Schedule of Charges

Bio-Material & Technology Lab  
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### *Characterization and Analysis Instruments*

	<i>Instrument</i>	<i>Description</i>	<i>Internal Charge/hour</i>	<i>External Charge/hour</i>
1	<b>Differential Scanning Calorimeter (DSC)</b>	Glass transition; Melting/crystallization; Denaturation; Gelatinization/retrogradation; Amylose-lipid complexation; Thermal reaction; Physical aging; Non-freezing water.	\$142	\$213
2	<b>Dynamical Mechanical Analyzer (DMA)</b>	Storage modulus, Loss modulus, and Complex modulus; Damping, Tan Delta, Phase angle; Temperature and frequency sweeps; Relaxation; Cure analysis and Gel point	\$135	\$203
3	<b>Thermogravimetric Analyzer (TGA)</b>	Thermal stability; Thermal decomposition; Loss on drying; Thermal reaction.	\$146	\$219
4	<b>Malvern Rheometer</b>	Viscosity; Flow behavior; Creep test, Creep-Recovery test; Compliance; Stress relaxation, Relaxation time; Stress growth; Multiple frequency oscillation; Time and temperature dependent rheological properties	\$156	\$233
5	<b>Brookfield Rheometer</b>	Viscosity; Flow behavior	\$92	\$138
6	<b>Instron Universal Tester</b>	Young's modulus, Tensile strength, Elongation; Compression strength, MOE, MOR; Flexile modulus, Flexile strength; Internal bonding strength; Adhesion strength	\$134	\$205
7	<b>Particle Size Analyzer</b>	Particle size and its distribution	\$107	\$160
8	<b>Optical Contact Angle Meter</b>	Contact angle	\$83	\$125
9	<b>Water Activity Meter</b>	Water activity	\$95	\$142
10	<b>HPLC System</b>	Molecule separation and identification	\$149	\$224
11	<b>Peel Tester</b>	Peel strength, loop tack	\$87	\$130
12	<b>Tensile Tester</b>	Tensile properties, 25 lb load cell	\$87	\$130
13	<b>Atomic Force Microscopy (AFM)</b>	High resolution microscopy	\$111	\$166

### Processing Equipments

	<i>Equipment</i>	<i>Description</i>	<i>Internal Charge/hour</i>	<i>External Charge/hour</i>
1	<b>Injection Molding Machine</b>	The machine has a clamping force of 220 kN, closing force of 17.6 kN, and mould stroke of 200 mm. It is equipped with a 22 mm screw (L/D ratio of 18), providing a specific injection pressure of 1732 bar and theory stroke volume of 30.4 cm <sup>3</sup> .	\$69	\$104
2	<b>Haake Twin-screw Extruder</b>	It has a cylinder with diameter of 31.8/20mm and effective length of 30cm. Maximum available torque: 160Nm; maximum temperature: 400 °C. It has three heating zones and one loading zone.	\$152	\$227
3	<b>Haake Hot-Mixer</b>	The mixer has a gross chamber volume of 120 cm <sup>3</sup> (rotor volume: 51 cm <sup>3</sup> ). The maximum temperature is 400 °C. The gear ratio is 3:2.	\$152	\$227
4	<b>Extrusion Plastometer</b>	The Extrusion Plastometer is designed in accordance with ASTM standard test method D1238. Load level: 2.16 kg and 5.0 kg. Temperature range: up to 450 °C.	\$84	\$127
5	<b>Hobart Stand Batch Mixer</b>	This powerful A200 Mixer is a durable, heavy-duty bench mixer designed to meet the needs of the most demanding operations. It has three-level speed control, and an 18.9 liter bowl size.	\$83	\$125
6	<b>Hot-Press</b>	Desktop Hot-Press: maximum clamp force is 15 ton. Platen size is 6" × 6". Daylight opening is 0 ~ 15". Ground Hot-Press: maximum clamp force is 30 ton. Platen size is 14" × 14". Daylight opening is 0 ~ 12".	\$191	\$287
7	<b>Oil Extractor</b>	The Soxtec HT2 is designed for rapid, safe and economic extraction of solid and semi - solid materials. The extraction system accepts many different solvents can handle two samples at a time.	\$113	\$169
8	<b>Freeze Dryers</b>	The Labconoc FreeZone 6 Liter and 12 Liter Freeze Dry Systems are designed for laboratory lyophilization procedures.	\$82	\$123
9	<b>Centrifuges</b>	It is a refrigerated, high performance centrifuge with a temperature of -20 ~ 40 °C, and speed range of 100 ~ 25000 rpm. The rotors provide a capacity range of 480 ~ 3000 ml, and a maximum RCF 51500 ×g.	\$89	\$134
10	<b>Cyclone Mill</b>	The UDY Cyclone Sample Mill is designed for rapid grinding of a wide variety of soft to medium-hard materials. For wheat, particles generated have an average size of about 100 μm.	\$74	\$114
11	<b>High-temperature Furnaces</b>	The furnaces can be either continuously used for more than 3 hours at a temperature range of 100 °C to 982 °C, or intermittently used for less than 3 hours at a temperature range of 982 °C to 1100 °C.	\$78	\$117
12	<b>Environmental Chambers</b>	The chamber is designed to provide large space for sample/material conditioning/treating at certain temperature and humidity. Temperature range: 20 ~ 50 °C; Humidity range: 30% ~ 90%.	\$70	\$106
13	<b>Fusion UV Curing System</b>	Fusion F300S 6" UV System (D bulb) equipped with LC6B Bench Top Conveyor.	\$94	\$142

Updated 10/10/2014