

**CLEMSON UNIVERSITY
FY 2023-2024 BILLING RATES**

DEPARTMENT NAME : **Materials Science and Engineering**

Description of commodity or service :	Unit of Billing	FY 23/24 PROPOSED RATE
Analytical Testing Laboratory		
Sample Preparation	per hour	\$ 141.88
Extractions (Soxhlet)	per sample	\$ 141.88
Extractions (ASE)	per sample	\$ 94.84
Data Analysis	per hour	\$ 247.38
FTIR/ UV/Vis/NIR - Instrument (Avg 20 Min/Sample)	per instr. hour	\$ 293.40
GC/MS - Instrument (Avg 40 Min/Sample)	per instr. hour	\$ 247.38
Chromatography GC, SFC, HPLC - Instrument (Excludes Method Development)	per instr. hour	\$ 141.88
NMR - Operator	per hour	\$ 247.38
NMR - Instrument	per instr. hour	\$ 35.65
Thermal Analysis TGA, DSC, MDSC	per instr. hour	\$ 175.84
Thermal Analysis DMTA (DMA OR TMA) - Instrument (Avg 60 Min/Sample)	per instr. hour	\$ 222.57
Physical Testing Laboratory		
Skein Break D-1578	per sample	\$ 79.07
Tensile (Grab) Warp & Filling - D-5034	per sample	\$ 91.65
Tensile (Modified Grab) Warp & Filling - D-5034	per sample	\$ 91.65
Single End Yarn Break - Statimat 11 - D-2256	per sample	\$ 91.65
Single End Yarn Break - Instron D-2256	per sample	\$ 91.65
Tear Test (Tounge) D-2261	per sample	\$ 91.65
Tear Test (Trapezoid) D-5587	per sample	\$ 91.65
Tensile 1" Strip (Instron or Scott) D-5035	per sample	\$ 91.65
Single Fiber Break D-3822	per sample	\$ 131.16
Resistance to Slippage of Yarns in Woven Fabric - D434	per sample	\$ 131.16
Bursting (Ball) - ASTM D-3787	per sample	\$ 91.65
Hydrostatic Head (FX 3000) - 127 AATCC	per sample	\$ 79.07
Air Permeability (FX 3300) - D-0737	per sample	\$ 52.31

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Water Repellency - Spray Test - 22 AATCC	per sample	\$ 66.00
Water Repellency - IPA/Water AATCC - 42	per sample	\$ 79.07
Abrasion - StohID-3885/D3886	per sample	\$ 79.07
Abrasion - Yarn - CTT	per sample	\$ 108.76
Abrasion - Taber (Cost Plus Wheels)	per sample	\$ 197.53
Abrasion (Wyzenbeek) D-4157	per sample	\$ 131.20
Pilling (Rotary Tumble) - 3 Repeats D-3512	per sample	\$ 79.07
Tear Test (D-1424) Elmendorf	per sample	\$ 70.09
Weight - D-3776	per sample	\$ 52.31
AOS (EOS) Geotextile	per sample	\$ 131.20
Moisture Regain/Content D-2495	per sample	\$ 91.65
Colorfastness to laundering (Home& Comm: Acclrtd) - AATCC 61 - 3A Test	per sample	\$ 658.81
Color Fastness (Crocking) AATCC 8:	per sample	\$ 52.31
Colorfastness to Light (Carbon-Arc Lamp) 16 AATCC Sec. 1 D	per sample	\$ 101.65
Colorfastness (Washing)	per sample	\$ 132.07
PH % - 81	per sample	\$ 52.31
Scour Greige Goods & Dye	per sample	\$ 393.29
Dimensional Change (Shrinkage) 3 Repeats/Sample - 135 AATCC	per sample	\$ 263.04
Fabric Durable Press Rating 3 Repeats - 124 AATCC	per sample	\$ 263.04
Flammability (45 degree Angle) FTM 5908 ASTM- D-1230	per sample	\$ 79.07
Verticle Flammability ASTM D-6413	per sample	\$ 79.07
Barre' (Redye)	per sample	\$ 327.59
Barre' (Yarn Pull & Weigh)	per sample	\$ 196.69
Barre' (Yarn Pull & ReKnit)	per sample	\$ 196.69
MacBeth Color Eye - Spectrophotometer	Per hour	\$ 293.40
Microscopy/Image Analysis	per hour	\$ 165.19
Crimp Per Inch (Fiber)	per sample	\$ 52.31
Cross-Sections sample preparation(microscopy separate)	per sample	\$ 91.65

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Fiber Denier (Microscopic Measurement)	per sample	\$ 79.07
Fiber Staple Length	per sample	\$ 52.31
Uster AFIS (Neps, Length & Diameter & Trash)	per sample	\$ 79.07
Yarn Denier/Count by Weight	per sample	\$ 39.86
Yarn Shrinkage (Boiling Water) D-2259	per sample	\$ 131.16
Yarn Tension	per sample	\$ 157.72
Yarn Filament Count	per sample	\$ 66.00
Yarn Inspection (Pulled from fabric)	per sample	\$ 27.46
Uster (Yarn Evenness) D-1425	per sample	\$ 91.65
Yarn Twist (ILS) D-1423	per sample	\$ 70.16
Yarn Appearance (EIB) D2255	per sample	\$ 52.31
Fabric Width D-3774	per sample	\$ 52.31
Fabric (Construction Ends/in., Picks/in., etc., D-3775	per sample	\$ 91.65
Fabric Streak Analyzer (Replicas)	per sample	\$ 42.15
Thickness - SAE J-1355	per sample	\$ 52.31
Thickness (Shirley) FTM 5030	per sample	\$ 52.31
Loop Strength ASTM D2256-5 (YARN)	per sample	\$ 91.65
Pore Distribution & Bubble Point (PMI)	per sample	\$ 356.86
General Laboratory Usage (no equipment usage)	daily	\$ 1,096.46
Benz oven use and Latex Trials	per day	\$ 1,646.45
Non-Wovens Laboratory Usage (Rando Machine)(except fiberglas)	daily	\$ 1,864.43
Hills Extruder (Room 236 Sirrine) (single extruder includes winding & drawing) (1/2 Day Min.)	daily	\$ 3,288.02
James Extruder (Room 305 Rhodes) double extruder without winding and without drawing (1/2 Day Min.)	daily	\$ 2,190.35
Atomic Force Microscopy	per hour	\$ 182.58
Surface tension of different liquids	per hour	\$ 107.94
Surface energy of planar substrates, fibers and contact angles	per hour	\$ 107.94

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Rheological analysis of complex fluids	per hour	\$ 92.98
Characterization of compression properties of fiber and films (Kawabata compression tester)	per hour	\$ 117.92
High speed imaging of droplet sreadling and absorption into fibrous materials	per hour	\$ 162.75
Characterization of magneto-optical properties of transparent materials (verdet constants)	per hour	\$ 121.22
CERAMICS & MATERIALS ENGINEERING		
External Rates		
X-ray Diffraction	per hour	\$ 109.62
Total Particle Size Analysis	per sample	\$ 327.60
PSD(Horiba)	per sample	\$ 327.60
Thermogravimetric Analysis (Netzsch)	per sample	\$ 327.60
Differential Thermal Analysis	per sample	\$ 327.60
Dilatometry(air) ((Netzsch)	per sample	\$ 219.24
Dilatometry(controlled atmosphere)	per sample	\$ 437.96
AMRL		
Optical Fiber Draws	Per day	\$ 4,636.44
Optical Characterization	per sample	\$ 320.01
New View (White Light interferometer)	per hour	\$ 103.88
Microthermal analysis	per hour	\$ 310.78
Viscosity Measurements	per sample	\$ 169.60
MCVD preform fabrication	Per day	\$ 5,126.30
Stacking	Per day	\$ 3,394.55
AMRL-NMR (Nuclear Magnetic Resonance)	per instr. hour	\$ 102.72