



MECHANICAL TESTING SERVICES

The University of Delaware's Center for Composite Materials (UD-CCM) provides composite mechanical testing services to customers across the aerospace, automotive, infrastructure, manufacturing, medical, and materials industries. UD-CCM's expert researchers utilize the center's world-leading facilities to conduct testing on composite building blocks (fibers, resins, sizings, adhesives, and core materials) as well as thermoset and thermoplastic composites laminates, sub-components, and full-scale components. All testing meets ASTM, SACMA, or other composite industry standards. UD-CCM also develops testing methods for non-standard materials, geometries, and configurations, provides thermo-mechanical and cyclic loading tests, and offers quality assessment services including non-destructive sample evaluation, fiber volume fraction measurement, void content analysis, and optical microscopy and X-ray computer tomography (CT) imaging.

Mechanical Testing Capabilities

- High performance fiber tension and compression analysis (filament level), sizing assessment (micro-droplet, fiber fragmentation), and polymer thermo-mechanical characterization
- Tension and all varieties of compression tests, Poisson's ratio, bearing, damage tolerance, compression after impact, v-notch shear/rail shear, lap shear, short beam shear, floating roller peel, climbing drum peel, etc.
- Elevated/Low Temperature Chamber for thermo-mechanical properties
- Environmental Simulation/Conditioning for moisture and UV exposure
- Large-scale drop tower for full-scale impact and damage tolerance tests
- Test matrices to populate Finite Element Material Models for composites
- Non-standard testing services – developing test methods for sub-component, component, and full assembly structures; sensors and data acquisition systems; data reduction methods; and test reports



PIONEERING INNOVATION EXCELLENCE

SINCE 1974

MECHANICAL TESTING SERVICES

Equipment

Impact Towers

Dynatup 8250 Instrumented Impact Tester

Impact Energy: 0.6 to 303 Joules (gravity driven)
Impact Velocity: 1 to 3.66 m/sec (gravity driven)
Load Range: up to 400 N

Dynatup 8000 Instrumented Impact Tester

Impact Energy: 2150 Joules (gravity driven)
Impact Velocity: 1 to 5.2 m/sec (gravity driven)
Load Range: up to 1550 N

Full-Scale High-Energy Drop Tower

Impact Energy: 40000 Joules (gravity driven)
Impact Velocity: 1 to 9 m/sec (gravity driven)
Load Range: up to 10000 N

Instron 9450

Impact Energy: 1800 Joules
Impact Velocity: 78.7 ft/sec
Load Range: 2 to 154 kg

Dynamic Loading Test Frames

Instron 1331

Servo-Hydraulic Actuation
Load Capacity: up to 100 kN

Instron 1332

Servo-Hydraulic Actuation
Load Capacity: up to 250 kN

Strength Testing Load Frames

Instron 4484

Motor Actuated Column
Screws Load Capacity: 150 kN

Instron 5565

Motor Actuated Column Screws
Load Capacity: 30 kN

Instron 5567

Motor Actuated Column Screws
Load Capacity: 30 kN

Instron 5848

Motor Actuated
Capable of Testing Single Fiber Strength
Compatible Load Cells: 5 N, 100 N, 500 N

Instron 5985

Motor Actuated Column Screws
Load Capacity: 250 kN
Compatible Load Cells: 500 N to 250 kN
Extension Rate: 0.00005 to 1016 mm/min
Data Acquisition Rate: 2.5 kHz

Instron 8562

Motor Actuated Concentric Screw
Screw Load Capacity: up to 100 kN

Instron 5944

Load Capacity: 2 kN
Compatible Load Cells: 5 N to 2 kN
Extension Rate: 0.00005 to 500 mm/min
Data Acquisition Rate: 2.5 kHz

Instron 68TM10

Load Capacity: 10 kN
Compatible Load Cells: 500N to 10kN
Extension Rate: 1016 mm/min (50 inch/min)
Data Acquisition Rate: 2.5 kHz

Instron 5982

Motor Actuated Column Screws
Load Capacity: 100 kN
Compatible Load Cells: 500 N to 100 kN
Extension Rate: 0.00005 to 1016 mm/min
Data Acquisition Rate: 2.5 kHz

Structure Testing System

MTS Servo-Hydraulic Test System

SilentFlo 505.30 Hydraulic Power Unit 4
Station Service Manifold
FlexTest 60 Controller
-4 Independent Channels
-4 Stations

Many actuators available in the range of 20 to 150 kips
8 ft x 20 ft Reaction Floor
Fixtures to apply loads along any vector

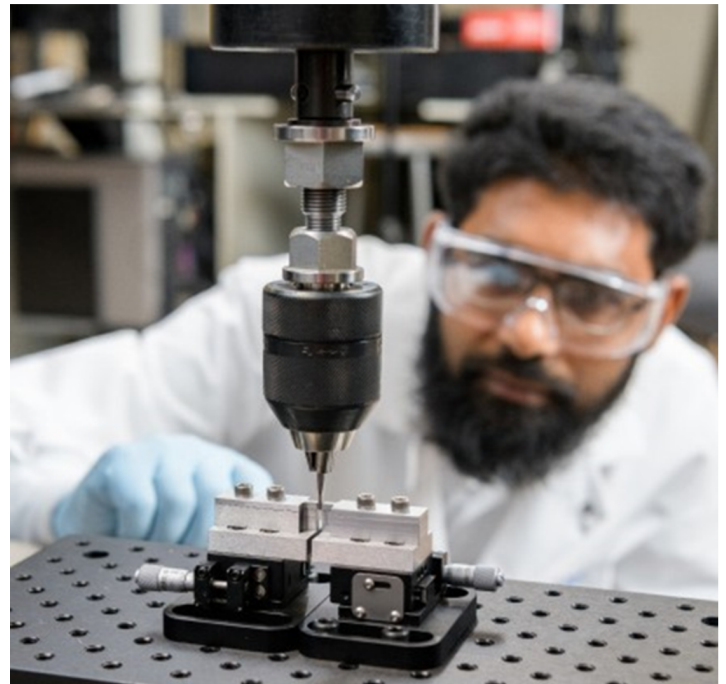
Low and High Temperature Capabilities

Tenny BTRC Temperature and Humidity Test Chamber

Temperature Range: -85 to 338 °F
Humidity Range: 20 to 95%
Closed Cycle Cooling

Thermotron F-4-CH-LN2 Temperature Test Chamber

Temperature Range: -94 to 338 °F
Open Cycle Cooling: CO2, LN2



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