

Physical Mechanical Lab: Tensile, Flex, Compression

Principle	A universal testing machine (UTM) can be used to test various material mechanical properties. Tensile tests measure the force required to break a material in tension and can measure the amount of elongation the specimen can withstand before yield or the breaking point. Flexural tests measure the force required to bend a beam under three point loading conditions. Compression tests measure the material's ability to withstand compressive loads before fracturing.
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Capabilities

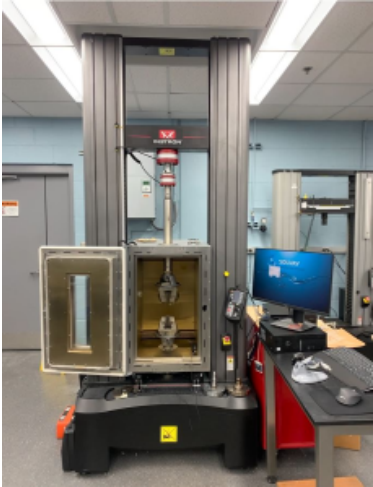
Tensile, Flex, Compression

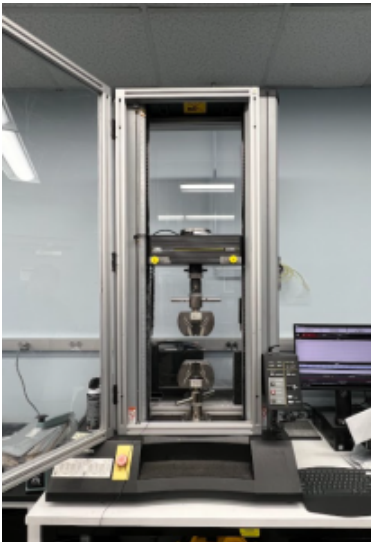
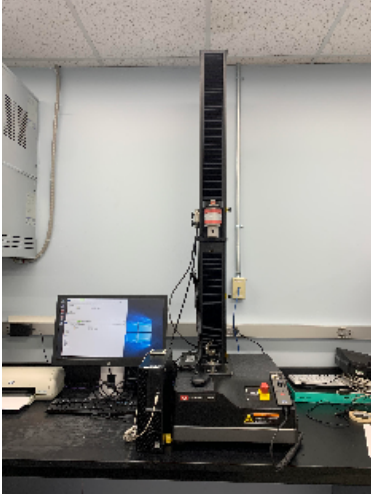
- Tensile - ASTM D638, ISO 527, ASTM D1708 (microtensile), ASTM D882 (film tensile)
- Flexural - ASTM D790, ISO 178
- Compression - ASTM D695
- Testing temperatures (-40°C to 250°C)

Specimen/Sample Types

- ISO - Type IA
- ASTM - Type I, IV, V, 1BA, microtensile, film

Equipment

	Equipment Type	Information
	Tensile/Flex Zwick Automation System	• Kuka robotic arm • 1 UTM for tensile • 1 UTM for flex • 1 CMU (cross-sectional measurement unit) • Routine ASTM and ISO testing at room temperature
	Instron 5982 Universal Testing Machine	• 100 kN load capacity • Environmental chamber (-40°C to 250°C) • Primarily used for non-ambient tensile, flex and compression testing

	Instron 68TM50 Universal Testing Machine	• 50 kN load capacity • Environmental chamber (-40°C to 250°C) • Primarily used for non-ambient tensile, flex and compression testing
	Instron 5569 Universal Testing Machine	• 50 kN load capacity
	Instron 68SC Universal Testing Machine	• 5 kN load capacity • Extended height • Small part, film, specialty testing

Test Codes

AP-RD-MECH-TENSILE

AP-RD-MECH-FLEX

AP-RD-MECH-COMPRESSION