

eX5M Education Universal Test System

A hand operated mechanical force/stress tester for Educators



Introduction - ADMET materials testing machines have been used in colleges and universities for many years to teach engineering students about the mechanical properties of materials. Alfred University, UC Irvine, Drexel University, Louisiana Tech, MIT and Virginia Tech are a few of the institutions where the students have gained hands on testing experience while learning about mechanical properties such as ultimate tensile strength, modulus of elasticity, yield strength and elongation. In the past decade a revolution has been taking place in the development of new materials for aerospace, biomedical, consumer and energy applications to name a few. As a result, understanding material behavior under a variety of loading conditions is necessary to their development making materials testing an increasingly important activity.

More recently, STEM educators, high schools, vocational schools and community colleges are incorporating engineering materials and structures into their curriculum. As part of the curriculum, there is a desire to incorporate a materials testing machine so students gain hands on experience in measuring the mechanical properties of materials. However, traditional automatically controlled materials testing systems are beyond the technical requirements and budgets of many of these institutions and so students and labs loose out. It was with this backstory that ADMET decided to launch a brand new product for the Education market – the eX5M Educational Universal Testing System.

What It Does - This new Mechanical Force Tester is a versatile manually operated stand with capabilities to 1,000lb (4.4 kN). With the ability to perform tension, compression and bend tests, the system includes ADMET's intelligent Universal Test Indicator (UTI). Classrooms can now be equipped with an effective piece of technology to stress test structures built by the students or perform frictional analysis in Physics labs. Users can perform the following types of tests with the eX5M:

Adhesive Peel
Compression
Flex
Insertion
Pull Out

Puncture
Stress Relaxation
Tension
Top Load

6.12 mm 104.5 N
 25/min

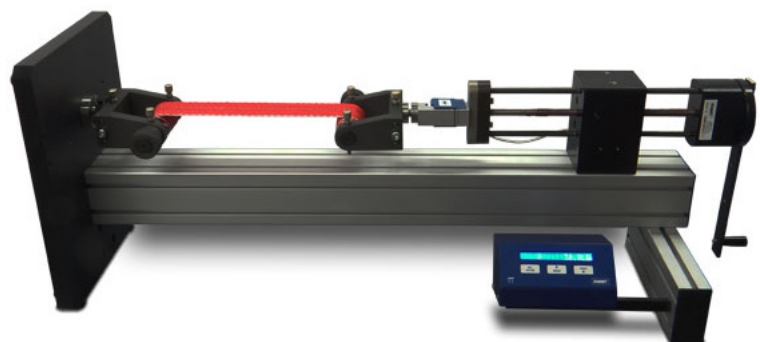
During Test: Indicator displays live force, travel distance and travel rate. Travel rate can be displayed in numeric form or as a graphical pointer.

8.75 mm 0.0 N
 Max 115.6 N

After Test: Indicator displays live force, travel distance and test results. Results are user selectable and include max force, max stress, Elongation at Max, Elongation at Break, Offset Yield and more.

During test, the UTI will indicate live load, travel distance and travel rate. At test completion, live load, travel distance and all active test results are displayed. As an option, ADMET offers its GaugeSafe software which will enable you to upload test information via the USB port to a computer for viewing and printing of results and XY plots.

ADMET's high resolution UTI in combination with a full line of self-identifying plug-n-play load cells provides unrivaled accuracy and flexibility when compared to force gages employed in less precise manual test stands. In addition, all eX5M testers measure travel distance and travel rate to provide additional measurement capability and ensure you perform each test according to specification.



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Features

eX5M hand operated Universal Test Systems come equipped with ADMET's Universal Test Indicator (UTI) which allows you to perform a wide range of material and product tests accurately and efficiently. A number of test modules are included in the UTI so you quickly get the results you need. When a test module is activated, the user only has to define the conditions for the start and end of test and if necessary the specimen geometry and size. During the test, use the rate indicator to ensure the test is performed according to specification. At test completion, the measured mechanical properties specific to the active test module will be displayed on the screen. Following is a list of test modules included in the Universal Test Indicator and the mechanical properties calculated by each module. All test modules are included as standard.

Adhesive Peel Module

Average Load/Width
Max Force/Width

Flex Test Module

Max Force
Modulus of Rupture

Thread/Textile Test Module

Toughness
Tenacity
Max Force
Elongation at Break

Compression Test Module

Free Height
Max Force
Max Stress
Stiffness
Force at Displacement
Displacement at Force

Tensile Test Module

Max Force
Max Stress
Elongation at Max Force
Elongation at Break
Offset Yield

- Select between force units of Lb, N, KN, Kg, g and stress units of psi, MPa, KPa.
- Auto-Test-Reset is standard and automatically enables the indicator for the start of the next test without requiring operator interaction.
- Define and detect the end of test with the Sample Break Detector.
- Transmit via the USB communications port results, XY data, test methods and calibration data to a remote computer running ADMET's GaugeSafe software for Windows 7/8/10.
- The Universal Testing Indicator comes standard with one analog input for measuring force and stress and one quadrature encoder input channel for measuring travel distance.
- Force accuracy exceeds ASTM E4 Standards and in general is better than 0.5% of reading from 1% of full scale to full scale.
- ADMET offers a variety of grips, fixtures and load cells to perform a wide range of tension, compression and bend tests.

System Specifications

eX5M Actuator		Universal Test Indicator	
Capacity	4.4kN (1,000 lb)	Display	2 line x 16 character x 0.4" h alphanumeric LCD
Stroke	216mm (8.5 in)	Force Accuracy	UTI plus Load Cell-Better than 0.5% of reading from 1% of full scale to full scale (Exceeds ASTM E4)
Actuation Type	Hand Wheel	Power	100-240 VAC 50/60 Hz
Travel Rates	2 standard rates available, others available upon request	Single Column Load Frame	
Rate 1	12.7mm (0.5 in) per Revolution Position Resolution: 0.0032mm (0.00012 in) Torque to Generate 1kN Force: 3.1 Nm (27.3 in-lb)	Column Height	916mm (36 in)
Rate 2	2.54mm (0.1 in) per Revolution Position Resolution: 635 um (25 uin) Torque to Generate 1kN Force: 1.3 Nm (11.5 in-lb)	Base	304mm (12 in) W x 381mm (15 in) Dp
		Max Vertical Test Space	760mm (30 in) excluding grips, fixtures and load cell
		Throat Depth	82.6mm (3.25 in)
		Weight	18 kg (40 lb)

eX5M Education Universal Test System

Ordering Codes

Testing System:

eX5M - - - - -

Travel Rate
01: 0.1in
05: 0.5in
16: 0.06in

Stroke

Column Height

Software
N: None
B: GaugeSafe Basic
P: GaugeSafe Plus
L: GaugeSafe Live

Encoder
NON: None
E01: Encoder 100 ppr
E05: Encoder 500 ppr
E10: Encoder 1,000 ppr
E25: Encoder 2,500 ppr

Load Cells:

LC5M -

Capacity (lb)
0010: 10 lb (0.04 kN)
0025: 25 lb (0.11 kN)
0050: 50 lb (0.22 kN)
0100: 100 lb (0.44 kN)
0250: 250 lb (1.1 kN)
0500: 500 lb (2.2 kN)
1000: 1,000 lb (4.4 kN)

All load cells self-identify with the Universal Test Indicator and provide 150% safe overload capacity.

Vise Grips (1pr):

GV-1T 1kN Vise Grip

Opening: 0 - 10mm (with rubber jaws 0-8 mm)
Weight: 0.29kg each grip (without jaws)

Order Code	Surface	Clamp Surface	Wt/pair
GV-1T-B50	Blank jaws	30 x 50mm	0.22 kg
GV-1T-BG50	Rubber jaws	30 x 50mm	0.23 kg
GV-1T-BP50	Pyramid jaws	30 x 50mm	0.21 kg
GV-1T-BW50	Wave jaws	30 x 50mm	0.20 kg
GV-1T-BD50	Diamond jaws	30 x 50mm	0.22 kg



GV-5T 5kN Vise Grip

Weight: 1.30 kg each grip (without jaws)

Order Code	Surface	Clamp Surface	Opening	Wt/pair
GV-5T-B50	Blank jaws	30x50mm	0-30mm	0.22 kg
GV-5T-BG50	Rubber jaws	30x50mm	0-28mm	0.22 kg
GV-5T-BP50	Pyramid jaws	30x50mm	0-30mm	0.21 kg
GV-5T-BV2-50	V-jaws	30x50mm	∅ 2-30mm	0.22 kg
GV-5T-BV5-50	V-jaws	30x50mm	∅ 5-30mm	0.25 kg
GV-5T-BW50	Wave jaws	30x50mm	0-30mm	0.20 kg
GV-5T-BD50	Diamond jaws	30x50mm	0-30mm	0.22 kg

Eccentric Roller Grips (1pr):

1kN Eccentric Roller Grips (Order Code: GS-1RT)

- Tensile force: 1 kN
- Pyramid (serrated) faced roller, 25mm ∅
- Clamping width 50mm, specimen thickness 0 – 7 mm
- Body: aluminum anodized
- Weight: 509 gram each grip

5kN Eccentric Roller Grips (Order Code: GS-5RT)

- Tensile force: 5 kN
- Pyramid (serrated) faced roller, 30mm ∅
- Clamping width 50mm, specimen thickness 0 – 7mm
- Body: aluminum anodized
- Weight: 667 gram each grip



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Rope and Yarn Grips (1pr):



	Order Code	GSP-T-1	GSP-T-5
	Order Code	GSP-T-1+BD	GSP-T-5+BD
Tensile force		1kN	5kN
Ropes / wires max. \varnothing		2 mm \varnothing	5 mm \varnothing
Ribbons max. width		7 mm	8 mm
Jaw surfaces		Rubber jaws Diamond jaws (BD)	
Clamping surface HxW		20x10mm	30x12mm
\varnothing Guide roller		20 mm \varnothing	40 mm \varnothing
Body		Al, anodized	Al, anodized
Weight		0.26 kg each grip	0.8 kg each grip

Compression Platens (1pr):

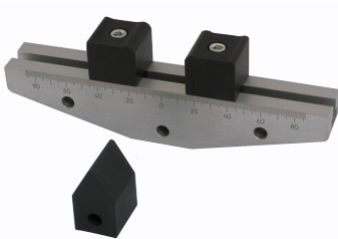


Order Code	Shape	Size	Weight
CPS-150	Square	150 x 150mm	1.23 kg
CPC-156	Round	156mm \varnothing	0.6 kg

All compression platens are rated to 1,000 lb (4.4 kN)

Bend Fixture:

FF-2.5T-3.2-R3.2,5 (Order Code)



- Capacity: 2.5 kN
- Maximum Span: 150mm
- Support Width: 30mm
- Upper Support Radius: 3.2mm
- Lower Support Radius: 3.2mm & 5mm



800-667-3220