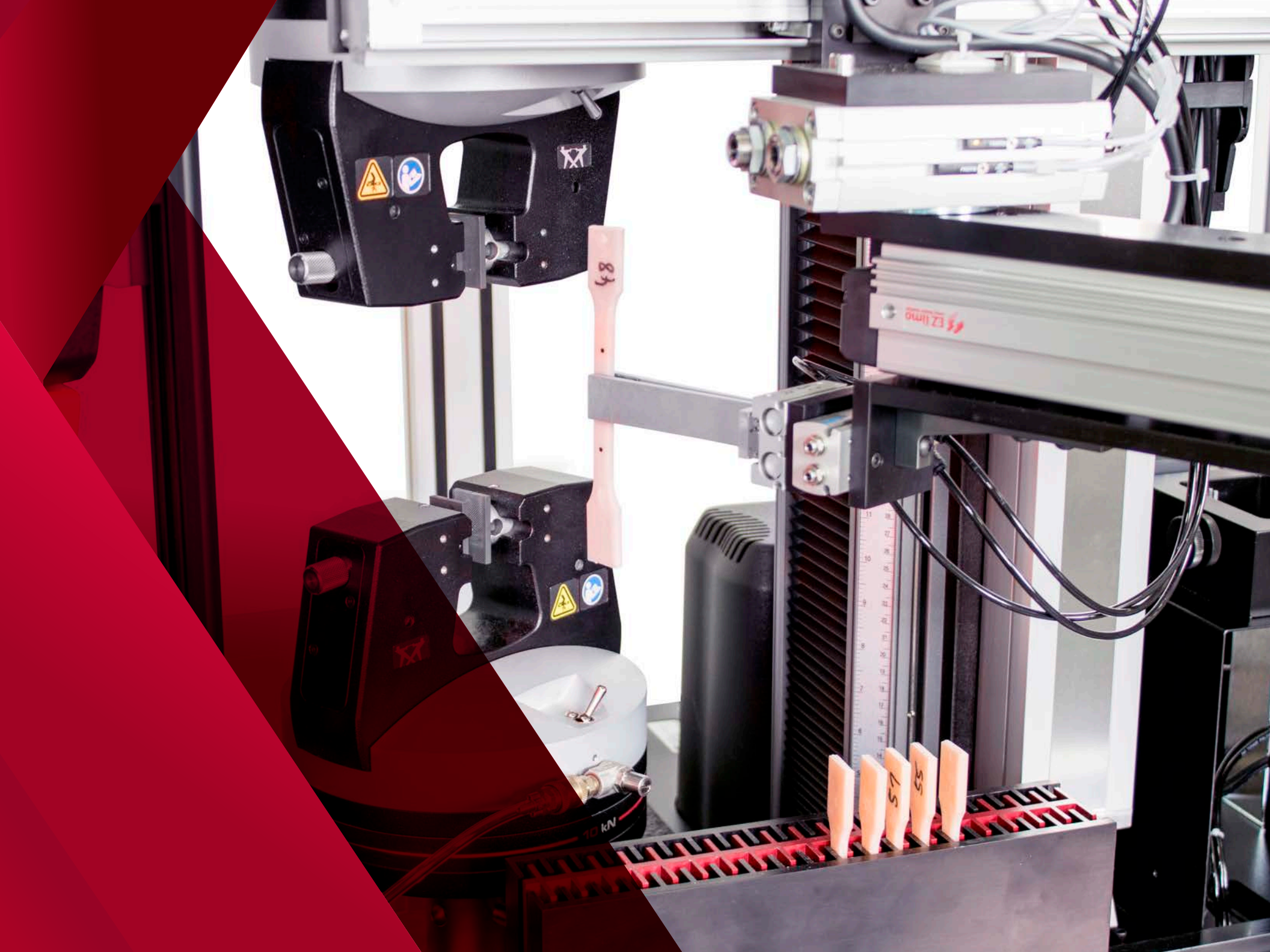


AUTOMATED TESTING SYSTEMS

A New Dimension in Testing Productivity







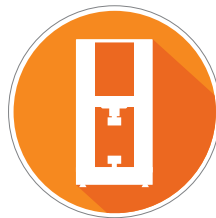
With over **70 YEARS** of materials testing experience, Intron® delivers impactful innovations to enable our users business to thrive. We are committed to delivering services which delight and usability improvements throughout the lifetime of the system.



1500+ Employees
A highly-educated, experienced, and diverse workforce



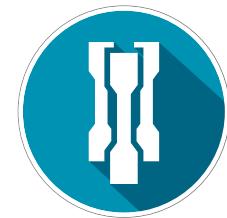
Representing **160 Countries**, speaking **40+ languages**



50,000+ systems installed worldwide



70+ years of engineering and manufacturing testing systems



Diverse product range for nearly all global markets and industries

| AUTOMATION AT A GLANCE

Automated XY and XY-Rotary Stage

Model: AT2 and AT2+

- Commonly used to perform compression, flex, and tensile tests on single and/or multi-surface devices and components
- Standard component/part working envelopes of 150×150 or 150×300 mm

Automatic Tensile/Flexural Testing

Model: AT3 and AT3+

- Commonly used to perform tensile and/or flexural tests on plastics, films, thin sheet metal, and most lightweight materials
- Small overall footprint with barcode reader and in-line measurement capabilities

Robotic Specimen Handling

Model: AT6

- Commonly used to perform tensile, flexural, and hardness tests on metals, plastics, thin films, components, elastomers, and sutures
- Turnkey, complete automation with large storage capacity and capable of overnight runs



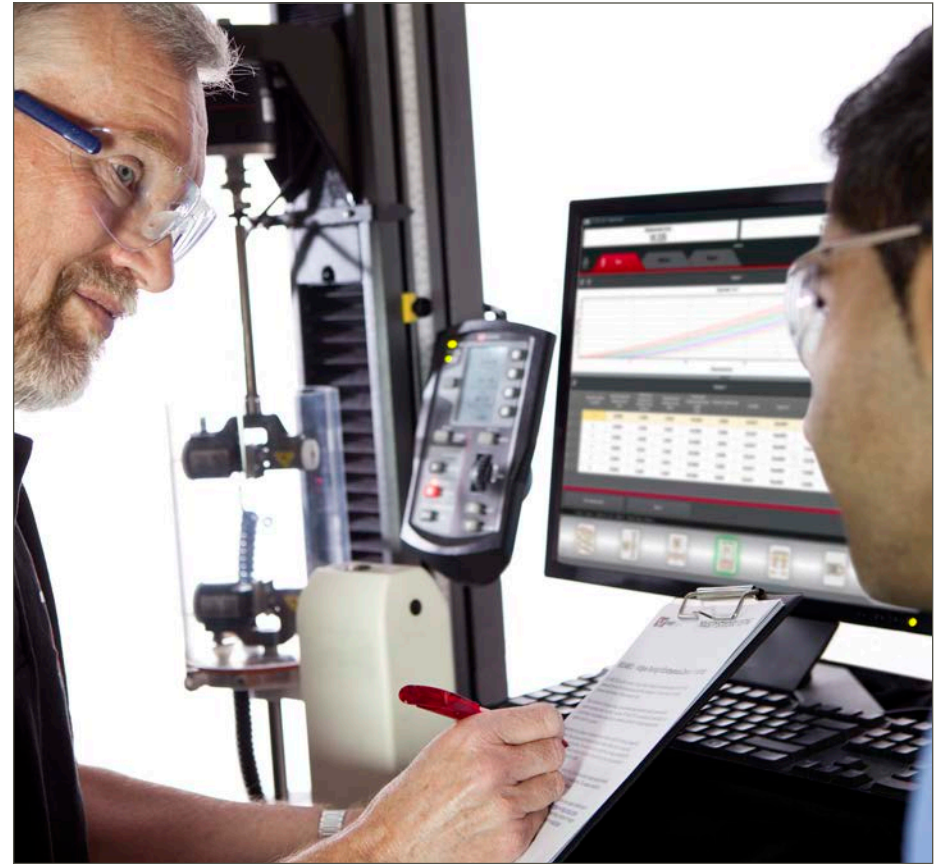


| WHY AUTOMATE?



Increased Operator Safety

Injury-related expenses can be devastating to an organization. Minimizing repetitive movement and reducing the amount of physical interaction with the testing process ultimately reduces operator injuries and saves the company valuable time and money.



Lower Training Expenses

A well trained operator is crucial to ensure the integrity and accuracy of results. When operators change jobs or turnover becomes an issue, significant money is spent training new operators and production time is lost during training. A fully automated system requires minimal training and provides reliable and accurate results.



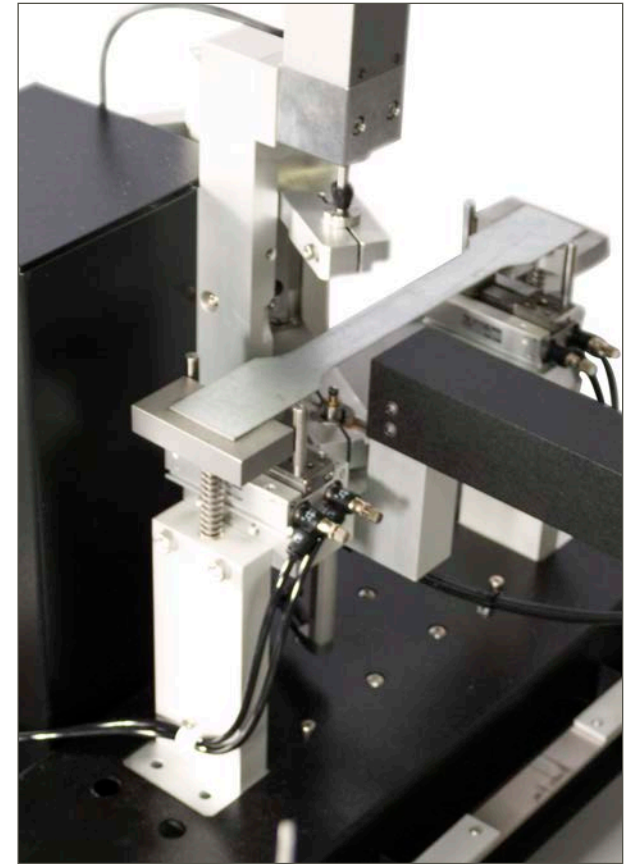
Better Use of Skilled Labor

Some systems can store more than 300 specimens, allowing them to run unattended tests overnight. Labs increase testing throughput without having to pay for additional shifts.



Increased Repeatability

Retesting specimens is expensive – automation removes operator variability, which increases repeatability and reduces or eliminates costs associated with retesting.



Greater Efficiency

Automated specimen handling systems quickly identify those materials that are out of specification. This reduces the amount of products that are scrapped during testing.

CAN I AUTOMATE MY TEST?

In general, the answer is yes.

Available for tensile, flexural, and compression testing, Instron® TestMaster Automated Testing Solutions can improve the safety and productivity of testing for a wide range of materials and specimen sizes, including:



Flexible Materials

Films | Textiles | Fibers | Elastomers | etc.



Rigid Materials

Metals | Plastics | Composites | etc.



Components/Assemblies

Medical Devices | Springs | Buttons | etc.

Visit go.instron.com/automate to learn more and watch videos of different automation tests





- 01 Plastic Tensile Test
- 02 Syringe Compression
- 03 Plastic 3-Point Bend
- 04 Elastomer Tensile

- 05 Button Compression
- 06 Thin Film Tensile Test
- 07 Rubber Testing
- 08 Rigid Metal Tensile Test



AUTOMATED TESTING SYSTEMS

At a Glance

AT2 and AT2+

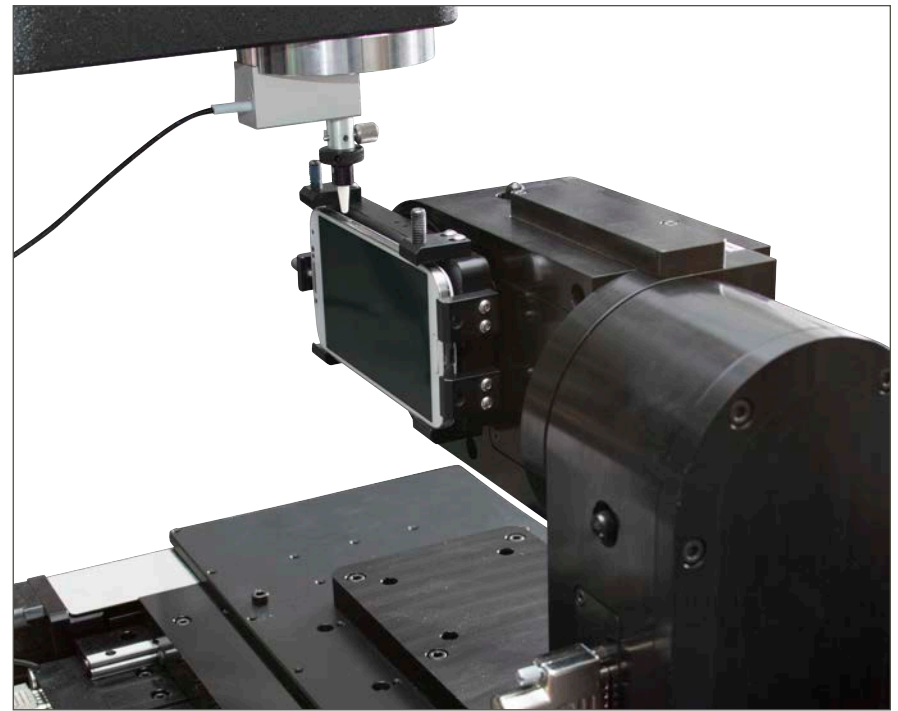
Automated XY and XY-Rotary Stage

The Instron® TestMaster AT2 XY Stage Automated Testing System is ideal for compression, flex, and tension testing of multiple small components, or components with multiple test points. Available with an optional rotary stage, the AT2+ offers an additional degree of control and efficiency, allowing the system to reach test points in different axes.

- Capacities up to 2 kN
- The AT2 is commonly used for compression, flex, and tensile testing of devices and components
- The AT2+ is commonly used for compression on multi-surface components
- In-line specimen detect sensor to maximize efficiency
- AT2+ adds rotary as another degree of rotation
- Flexible interface allows modification of testing parameters to grow and change with product
- Small footprint

* Additional standards may apply





AUTOMATED TESTING SYSTEMS

At a Glance

AT3

Automatic Tensile Testing

The Instron® TestMaster AT3 Automated Testing System utilizes an innovative, three axis design for automatic tensile testing of plastics and other lightweight materials. The compact design of this system offers many of the benefits of our AT6 robotic systems, such as barcode read capability and in-line measurement, but with a smaller footprint.

- Capacities up to 50 kN
- Commonly used for tensile testing plastics and most lightweight materials, such as film and sheet metal
- Typical storage capacity of 80 specimens per test run
- Small footprint (H×W×D): 2.4×1.5×1.2 m (7.5×5×4')
- ASTM D638 and ISO 527
- ASTM E8 and ISO 6892*
- Barcode or Queue Mode capability
- In-line measurement

* Additional standards may apply





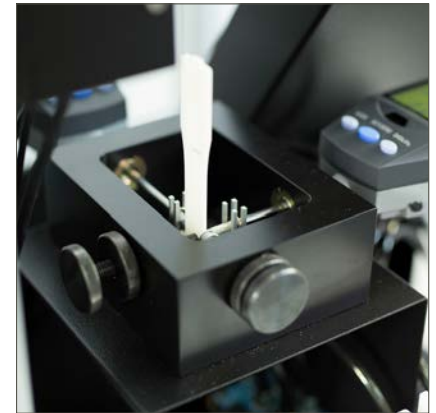
AT3+

Automatic Flexural or Flexural/Tensile Testing

The Instron® TestMaster AT3+ Automated Testing System expands on the AT3 system, offering the capability to perform automatic flexural, as well as tensile, testing of plastics and other lightweight materials by adding an additional axis of motion.

- Capacities up to 50 kN
- Commonly used for flexural and tensile testing plastics and most lightweight materials, such as film and sheet metal
- Flexural testing - 90° rotation of hand added for flex capability
- Typical storage capacity of 80 specimens per test run
- Small footprint (H×W×D): 2.4×1.5×1.2 m (7.5×5×4)
- ASTM D638 and D790, ISO 527 and 178
- ASTM E8 and ISO 6892*
- Barcode or queue mode capability
- In-line measurement

* Additional standards may apply



AUTOMATED TESTING SYSTEMS

At a Glance

AT6

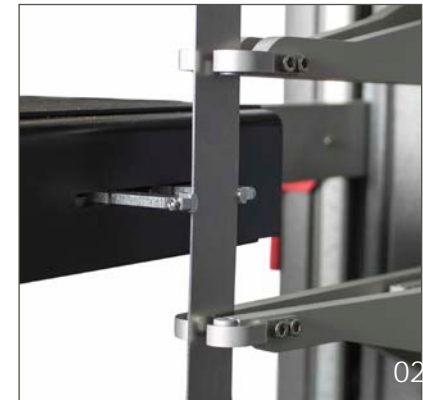
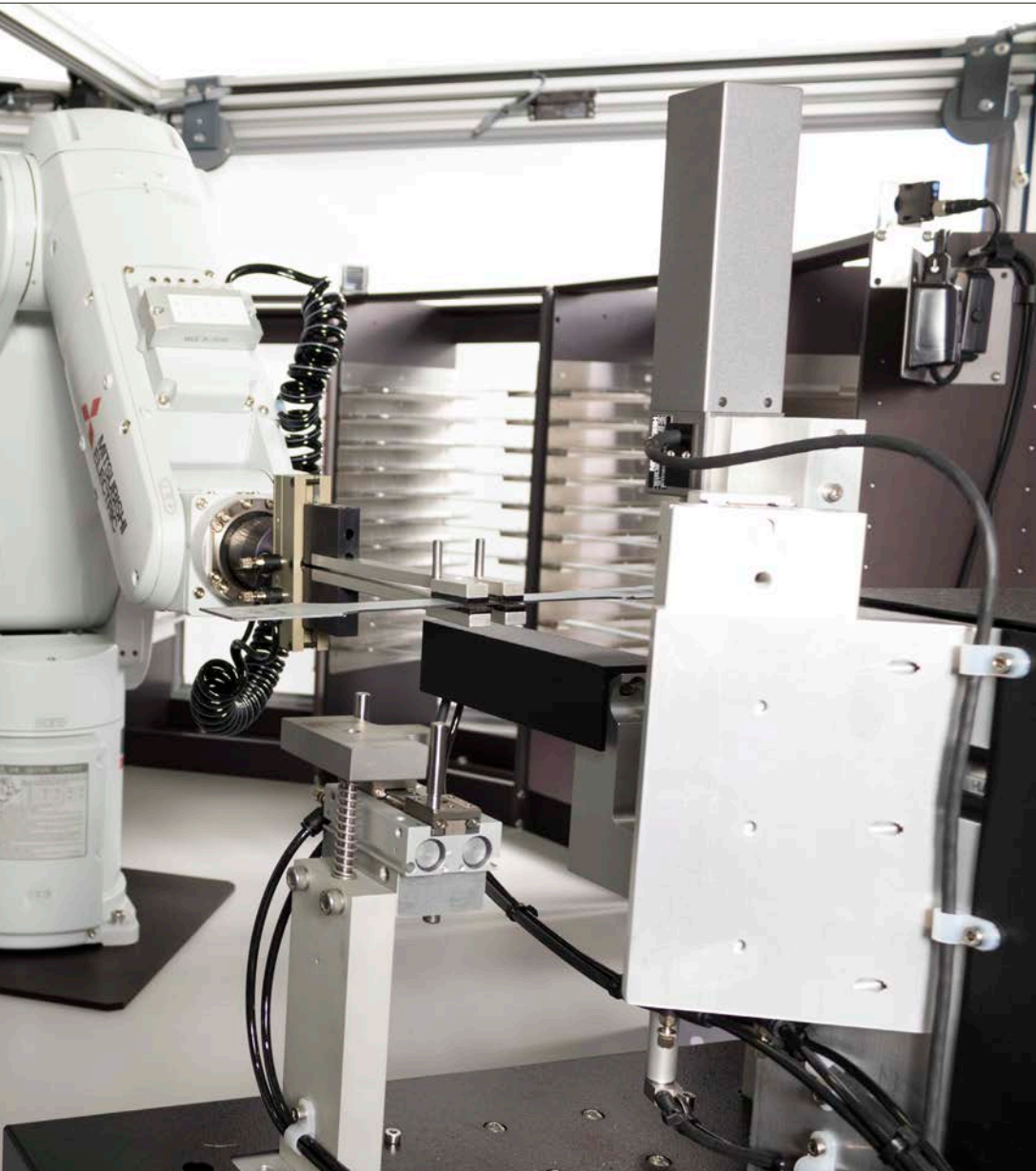
Robotic Specimen Handling

Instron® TestMaster Robot Based AT6 Automated Testing System enables a new dimension in testing productivity. Available as either a complete turnkey solution or installed on an existing Instron testing instrument, the unique modular design accommodates tensile, flexural, and hardness testing. System configurations consist of a robot for specimen handling, barcode read capability, dual-axis measurement device for in-line measurement of width and thickness, and the ability to add on additional 3rd party peripheral devices, such as hardness and chemical analysis.

- Capacities up to 600 kN
- Commonly used to test metals, plastics, thin films, components, elastomers, and sutures
- Roll-away table for easy conversion to manual testing
- Advanced video extensometry and contacting extensometry for axial and transverse strain measurement
- Metals tensile testing (R&N): ASTM E8, EN10002-1, and ISO 6892*
- Plastics tensile and flexural testing: ASTM D638, ASTM D790, ASTM D882, ISO 527-2, ISO 527-3, and ISO 178*
- Composites tensile testing: ASTM D3039 and ISO 527-4*
- Elastomers tensile and tear testing: ASTM D412 and ISO 37*

* Additional standards may apply





- 01 Specimen Measurement
- 02 Extensometer
- 03 Barcode Reader
- 04 Specimen Marking
- 05 Hardness Measurement

TESTMASTER™ SOFTWARE

At a Glance

Displacement [mm] 18.335

Force [N] 5.0217

Test Method Report

Graph 1

testmaster 2

Run Unlines testmaster 2

Setup Name: FLEX Batch Autorack 25

Operator Name: Jack

Start Rack: 1

LOGIN START EXIT

1. Select setup
2. Input operator name
3. Select starting position

It's as easy as 1-2-3

Status Icons indicate the current station

Specimen number (included)	Tensile extension at Maximum Load [mm]	Tensile at (Extension Maximum) [mm]
1	20.00026	0.2000
2	20.00009	0.2000
3	20.00041	0.2000
4	20.00091	0.2000
5	20.00013	0.2000
6	20.00030	0.2000

Zero displacement Return

Stop Start

testmaster 2

PRIORITY PAUSE

Status: Running

Ease of Use

You have the flexibility to modify or create sequencing parameters or use the settings already configured for you. We have made it easy to teach your robot new positions. If a new sample type is introduced to your system and the robot positioning needs to change, we can do that for you or you can set the new positions with the easy-to-use teaching tool interface.

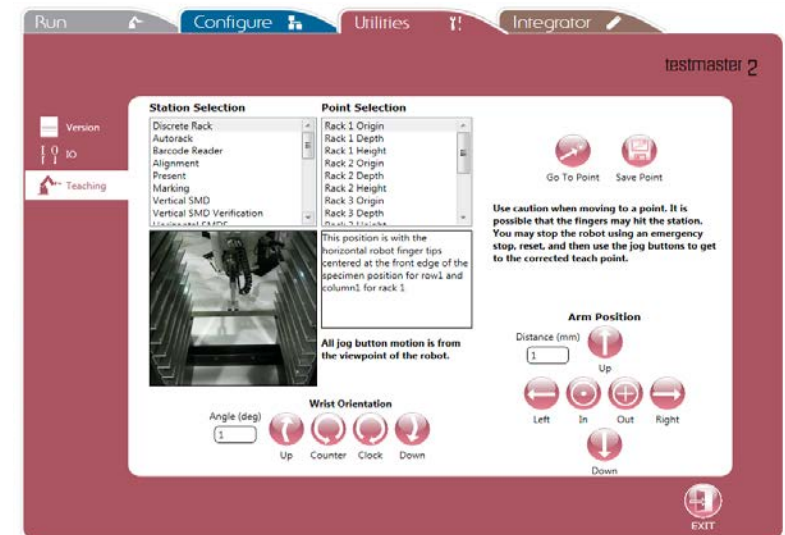
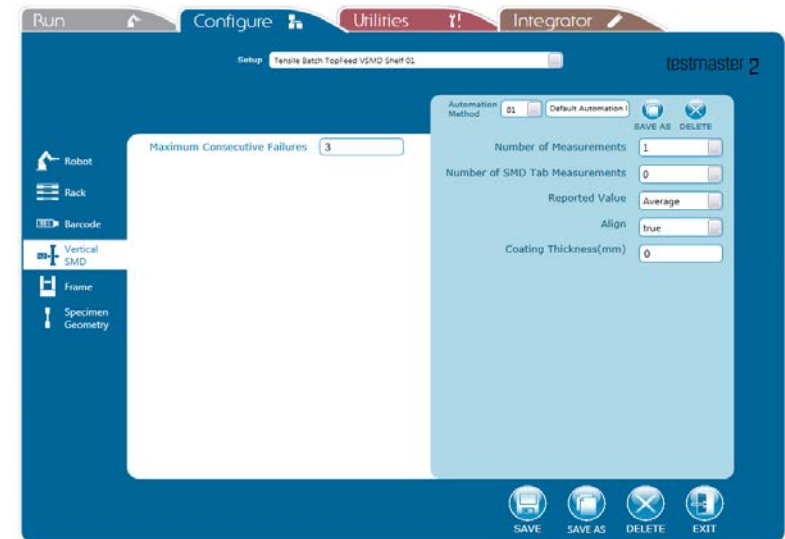
Security

The TestMaster™ 2 Software is integrated into Windows® security. When logged in with “Administrative” rights, the operator has the ability to modify configurations or create new system configurations. As a “User”, the operator is restricted to starting automated testing using existing configurations. Bluehill® Software allows for additional security; multiple user access levels are available to ensure that test methods, results, and reports are only modified by authorized personnel.

Specimen Identification

Two modes of specimen identification are available:

1. Barcode labels attached to the specimen or batch separators
2. Identification by their location in the specimen storage rack with a pre-defined test queue in the database



IMPROVED RELIABILITY

How can automated Testing Systems Improve the reliability of your results?

Eliminate human error by fully automating your testing.
Improve accuracy and consistency of your test results!

What affects the reliability and reproducibility of your data when testing manually?

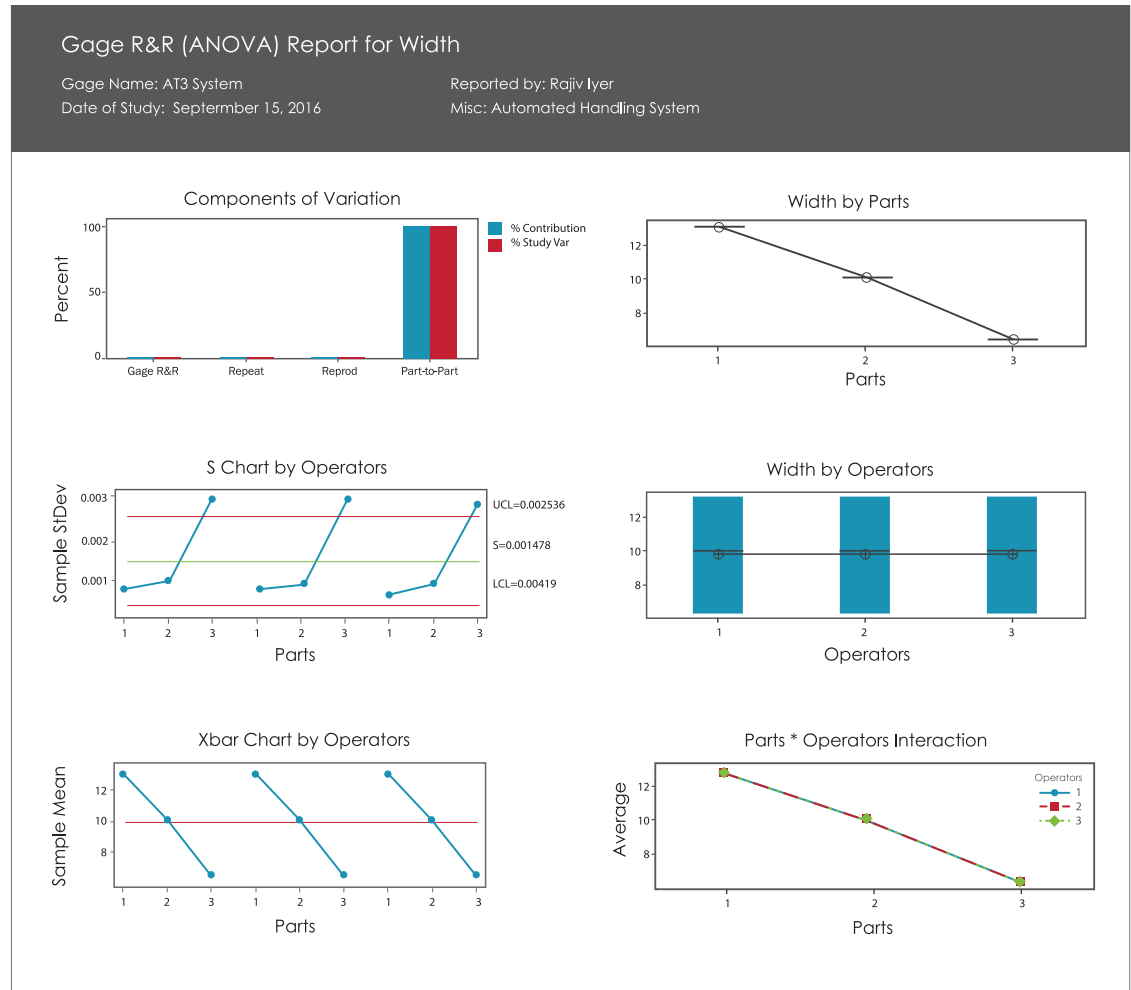
- Specimen alignment
- Dimensional measurement
- Specimen identification
- Operator technique
- Procedural errors

Why is improving repeatability and reproducibility so important?

- Reduces manufacturing costs
- Minimizes disruptions in production line
- Maximizes availability of manpower

GR&R Study

Study shows operator has no impact on variation when automation system is used to measure and test specimens



SAFETY AND ERGONOMICS |



Designed for Safety

Your safety is of the utmost importance to Instron®. That's why every automation system is fitted with extra safety measures designed to meet a variety of international standards, including CSA, UL, and/or CE compliance.

Safety Benefits of Automation

Automated testing systems keep the operator away from the testing areas, protecting the health and safety of your employees.



Decrease in repetitive motion injuries



Elimination of potential pinch hazards



Safe, hands-free removal of debris

EFFICIENCY AND PRODUCTIVITY

Maximize Resources

Automated systems can run unattended tests for hours, allowing operators to execute other value-added tasks while tests are conducted.

Reduce Human Error

Retesting specimens due to human error can be expensive and time consuming. Automated specimen handling drastically minimizes human interaction, which results in a more reliable testing system.

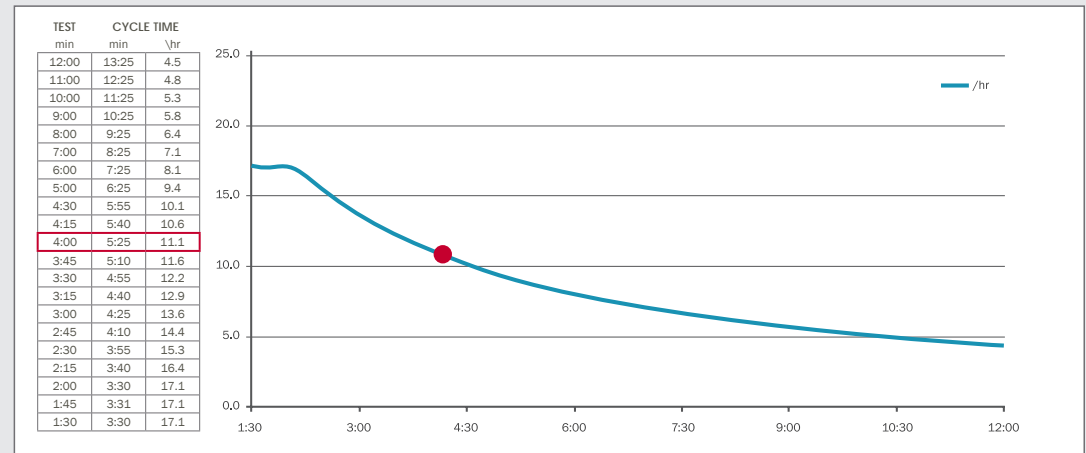
Increase Throughput

Additional tests such as hardness, surface roughness, and chemical analysis, can be integrated into systems. This reduces the amount of specimen handling, which results in a more efficient process that combines multiple tasks and tests.

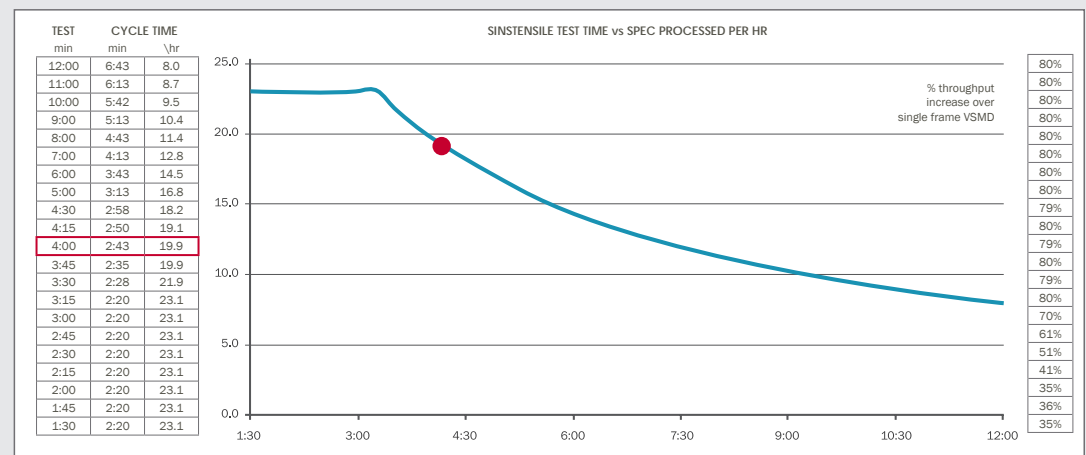
Uninterrupted Testing

An automated system continuously runs uninterrupted tests, resulting in an increase in the number of specimens tested per day when compared with a typical manual system.

Single Frame and VSMD



Dual Frame and HSMD



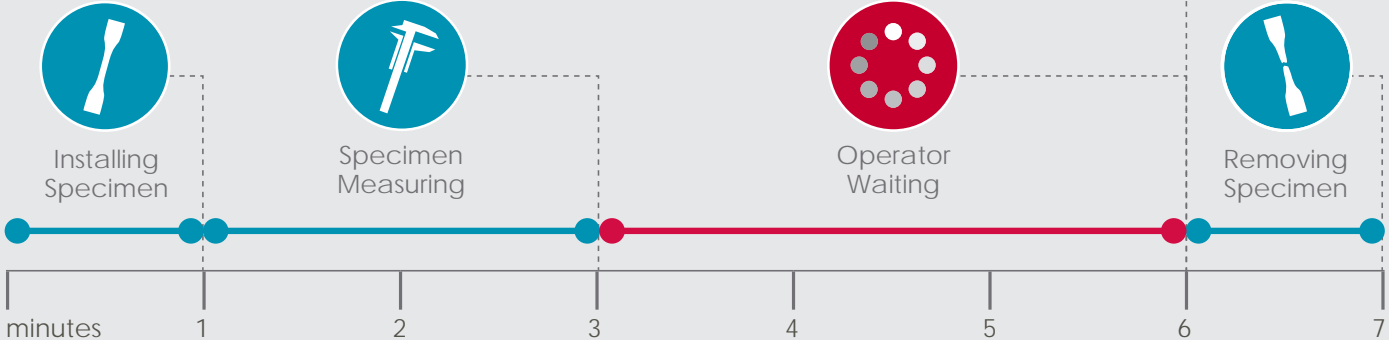
Did you know that an operator will spend approximately **10.3 hours per day waiting** for tests to run in a 24/7 operation; that translates to **72 hours each week** of valuable operator time lost.*



Test Time

Manual Testing System Timeline

- Operator
- Time gained using an automation system
- System Test Time



Daily Savings
10.3 hours gained

Weekly Savings
72 hours gained

Yearly Savings
156 days gained

* Based on 1440 specimens tested per week

Specifications

AT6

System/Load Capacity		Robot Capacity	Max Specimen Weight		Electrical Requirements	Storage Rack Type	Storage Capacity	Measurement Device	System Dimensions overall with vertical sliding doors (H × W × D)	
kN	lbs	kg	kg	lbs					mm	in
1 - 30	225 - 6,750	2	<0.75	1.75	Single phase, 50/60 Hz At least one line must be 220 VAC Remaining either 120 or 220 VAC	Top Feed Rack	40 - 200	Dual Axis Vertical	2190 × 2320 × 2770	87 × 92 × 110
1 - 30	225 - 6,750	4	<0.75	1.75	Single phase, 50/60 Hz At least one line must be 220 VAC Remaining either 120 or 220 VAC	Discrete Position	165 - 400	Single Axis Horizontal or Dual Axis Vertical	2190 × 2320 × 2770	87 × 92 × 110
50	11,250	4	<0.75	1.75	Single phase, 50/60 Hz At least one line must be 220 VAC Remaining either 120 or 220 VAC	Top Feed Rack	40 - 200	Dual Axis Vertical	2190 × 2320 × 2770	87 × 92 × 110
100	22,500	4	<0.75	1.75	Single phase, 50/60 Hz At least one line must be 220 VAC Remaining either 120 or 220 VAC	Discrete Position	165 - 275	Dual Axis Vertical	2190 × 2260 × 2540	87 × 89 × 100
250	56,250	4	<2.00	4.40	Single phase, 50/60 Hz At least one line must be 220 VAC Remaining either 120 or 220 VAC	Discrete Position	165 - 275	Heavy Weight Dual Axis Horizontal	2190 × 2260 × 2540	87 × 89 × 100

AT3

System/Load Capacity		Actuator Capacity	Max Specimen Weight		Electrical Requirements	Storage Rack Type	Storage Capacity	Measurement Device	System Dimensions overall with enclosure doors open (H × W × D)	
kN	lbs	kg	kg	lbs					mm	in
1 - 50	225 - 11,250	2	<0.75	1.75	Single phase, 50/60 Hz At least one line must be 220 VAC Remaining either 120 or 220 VAC	Storage Cartridge	80	Dual Axis Vertical	1524 × 1194 × 2337	60 × 47 × 92

AT2

Frame Models	Max Stage Load Capacity		XY Stage Travel (Maximum)		Total Crosshead Travel (Does not account for any fixture or probe height)		Stage Speed		Stage Position Accuracy		Stage Position Repeatability		Electrical Requirements	System Dimensions Overall (H × W × D)	
	kg	lbs	mm	in	mm	in	mm/sec	in/sec	µm	in	µm	in		mm	in
5942	2	450	150 × 150	5.9 × 5.9	430	16.9	25	1	±40	0.0016	±5	0.0002	Single Phase, 47/63Hz, 120 or 220 VAC	986 × 459 × 650	38.8 × 18.1 × 25.6
5944	2	450	150 × 150	5.9 × 5.9	827	35.6	25	1	±40	0.0016	±5	0.0002	Single Phase, 47/63Hz, 120 or 220 VAC	1383 × 459 × 650	54.4 × 18.1 × 25.6

| Support for the Life of Your Equipment

Instron® is the largest supplier of materials testing machines in the world. Our reliable testing systems can run 24 hours a day, 7 days a week, 365 days of the year. However, if something does go wrong, or you have a question, we offer a variety of resources to ensure you receive the assistance you need as soon as you need it.



You can count on us

- Represented in more than 160 countries, speaking 40 different languages
- Our on-site and laboratory calibration and verification processes are ISO 17025 accredited throughout Europe, North America, Brazil, Australia, China, Japan, Korea, Singapore, India, Thailand, and Taiwan



Enhanced technical support a “touch” away

- Instron Connect provides easy remote screen sharing and service request submissions to reduce support times
- Built in verification reminders in Instron Connect minimize risk for delayed certifications
- Instron Connect allows simple test method and file transfers to keep systems up to date
- Expert consultants provide tailored solutions and traditional hotline access anywhere in the world
- Additional services like preventative maintenance, calibration, training, emergency repair, and service parts insure confidence that you can keep systems running and get date in a timely fashion



Stay at the forefront of materials science

- Training courses available on-site or in one of our Regional Training Centers
- Utilize our Applications Engineering Lab or Custom Engineered Solutions Group for the latest technological advances in materials testing
- Our state-of-the-art Calibration Laboratory offers a comprehensive range of accredited calibration and verification services complying with ASTM, ISO, and Nadcap standards for: Force, Speed, Strain (extensometers), Displacement, Impact, Temperature, Torque, Creep, Strain Gauge Channel, Alignment, and Verification of all CEAST Instruments.

Resources at your fingertips • www.instron.com



- Our *Testing Solutions* section provides answers to your most current testing challenges
- WSA is a dedicated support website, providing web-based delivery of information specific to your system
- Access to our complete online Accessories catalog



“True innovation occurs when product designers and developers show relentless curiosity towards the needs of their customers. This builds an understanding that allows them to anticipate and create a new suite of solutions that are Simpler, Smarter, and Safer.”

Yahya Gharagozlou

Group President
ITW Test & Measurement
(Instron is an ITW Company)