Automated Specimen Handling

A New Dimension in Testing Productivity

INSTRON®
Is Automated Specimen Handling Right For You?

Instron® testmaster™ 2 Automated Specimen Handling Systems enable a new dimension in testing productivity. Available as either complete turnkey solutions or installed on existing Instron testing instruments, each option is tailored to your testing operations and throughput requirements. The unique modular design of the systems provides the broad control and handling capability needed to fulfill a wide range of applications.

Automated Specimen Handling at a Glance
Can Instron provide a solution for me?

Flexibility
Can I automate my tests?

Reliability of Results
How will automated specimen handling improve my results?

Efficiency and Productivity
How will automated specimen handling improve efficiency and productivity, while lowering my testing costs?

Service and Support
What about after-sales support?
At-a-Glance: Automated Specimen Handling

Robotic Specimen Handling for Metals, Plastics, Composites, Elastomers, Components and more

- Capacities up to 600 kN
- 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) (E8, EN10002-1, ISO 6892)*
- Plastics tensile and flexural (ASTM D638, ASTM D790, ASTM D882, ISO 527-2, ISO 527-3, ISO 178)*
- Composites tensile (ASTM D3039, ISO 527-4)*
- Elastomers tensile and tear (ASTM D412, ISO 37)*

* Additional standards may apply
Carousel and Rotary Specimen Handling for Films, Foils, Textiles, Medical Tubing, and Components

- Capacities up to 50 kN and higher
- Customized carousels to accommodate various specimens, geometries, and sizes
- Removable carousel facilitates quick loading and unloading of specimens
- ASTM D882, ISO 527-3*

* Additional standards may apply
Can I Automate My Tests?

The modular design of testmaster™ 2 makes it easy for you to configure a system that meets your specific needs. Systems can be dedicated to one type of test or configured to conduct multiple tests such as tensile and flexural testing.

testmaster 2 systems utilize a plug and play technology that makes incorporating peripherals — such as hardness machines — very easy. Peripherals can be purchased separately or added at any point in time.

You can configure the system to communicate with a Laboratory Information Management System (LIMS) or use the testmaster 2 independently. The data and results are produced in a variety of forms including CSV, Microsoft® Word, PDF, HTML, and database formats.

A variety of specimen storage racks are available to accommodate hundreds of specimen types and sizes. Priority rack locations for urgent test requirements can be configured and are available upon request.

For additional information about automated specimen handling solutions, including video demonstrations, and pictures, contact your local sales member or visit www.instron.com.
Additional products for automating my test

- Hardness Tester
- Marking Station (used with Video Extensometer)
- Vertical Specimen Measuring
- Barcode Scanner
- Automatic Extensometer
How Can Automated Specimen Handling Improve the Reliability of Your Results?

Eliminate human error by fully automating your testing.
Improve the 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 does improved repeatability and reproducibility matter to you?

- Reduction in manufacturing costs
- Minimize disruptions in production line
- Maximize availability of manpower

Gauge repeatability and reproducibility studies (GR&R) suggest that operator error is the most common source of variability within results; much more so than variability from the testing system or from the specimen.
How Reliable is Your Data?
Did you know that there are more than 30 different sources of potential error and that human error accounts for many of them?

Common Sources of Error
- High degrees of repetitive testing, causes fatigue and boredom, which ultimately leads to operator error

Method
- Method set up | Software version | Calculations used | Algorithm | Testing procedure | Inadequate specifications

Measurement
- Calibration | Drift and noise | Dynamic effects | Thermal effects | Data acquisition | Specimen measurement | Resolution

Operator
- Procedural errors | Technique | System set up | Specimen handling

Material
- Handling | Properties | Geometry

Machine
- Damage and wear | Mass and stiffness | Alignment | Machine Control | Backlash | Interface with accessories

Environment
- Temperature and humidity | Power | Vibration | Air quality | Installation

A Case Study
- Automated vs manual testing systems.
- Greater variance within width measurements.
- All stress-related calculations, including modulus and tensile strength are dependent on accurate width measurement.

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<thead>
<tr>
<th>Auto Width (mm)</th>
<th>Manual Width (mm)</th>
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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.

No downtime
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.

Efficiency and Productivity
Automated specimen handling improves the efficiency of a testing operation resulting in improved productivity and turnaround times, as well as lower testing costs. Production lines flow smoothly; quality control improves; and product ships faster. These improvements result in greatly enhanced customer satisfaction levels.
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.*

* Based on 1440 specimens tested per week

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**Manual Test Time**

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

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**Daily Savings**
10.3 hours gained

**Weekly Savings**
72 hours gained

**Yearly Savings**
156 days gained

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* Based on 1440 specimens tested per week
Reduce Test-Related Costs

Improve throughput without increasing staff or additional shifts; automated systems run unattended tests around the clock.

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.

Reduce human error and eliminate rework
Retesting specimens is expensive — introducing an automated testing system into your lab reduces or eliminates these additional costs.

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 their training. A fully automated system requires minimal training and provides reliable and accurate results.

Reduce injury-related expenses
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.

Decrease scrap with a more efficient QC environment
Automated specimen handling systems quickly identify those materials that are out of specification. This reduces the amount of products that are scrapped during testing.
testmaster™ 2 Software

Runs seamlessly behind our Bluehill® materials testing software.

It's as easy as 1-2-3
1. Select setup
2. Input operator name
3. Select starting position

Status Icons
Indicate the current station
What else do I need to know?

You have the flexibility to modify or create sequencing parameters or use the settings already configured for you. We have also 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 teaching tool. This easy to use interface to the robot allows you to modify robot positioning (shown in the lower left image).

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. Either through 1) barcode labels attached to the specimen or batch separators, or 2) identification by their location in the specimen storage rack with a pre-defined test queue in the database.

Communication

The testmaster 2 software can also be extended to operate as a client to a customer data network (LIMS). It communicates with the server after reading the barcode label and retrieves the test information from the LIMS system. On completion of the test, the data is passed back to the LIMS system.

The testmaster 2 supports various Windows network communication protocols and is capable of supporting multiple languages.
Intron® has a global infrastructure that is local to you and remains committed to being the leader in mechanical testing instrumentation.