

# PLASTICS TESTING SOLUTIONS

Trusted by Scientists, Engineers, and Quality Managers Worldwide



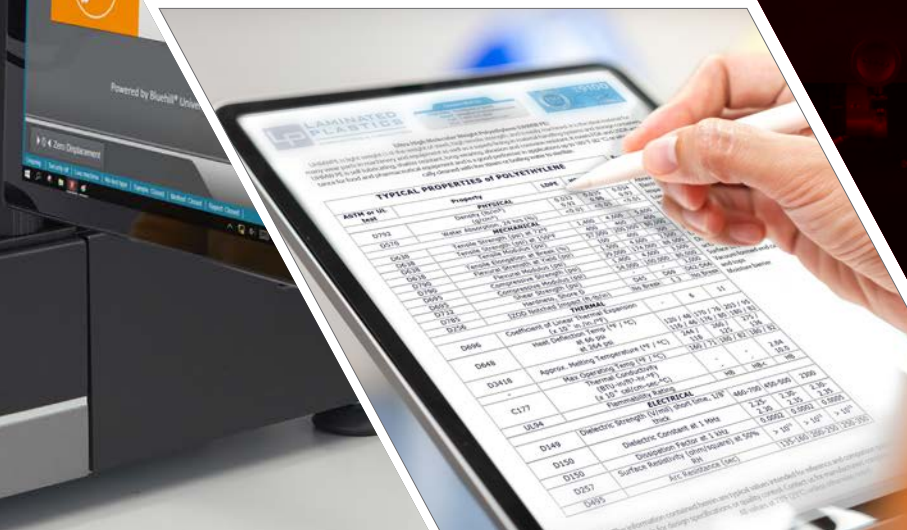


## LEADER IN PLASTICS TESTING SOLUTIONS

As a global leader in mechanical testing, Instron® partners with most of the world's largest plastics manufacturers to implement and optimize their testing programs. Our applications experts are well-versed in current plastics standards while our global service organization is ready to provide support to your laboratories at the local level, no matter where they are in the world.







Tension and  
Compression



Melt Flow and  
Rheology



Fatigue and  
Fracture



Impact

## OUR PRODUCTS

Our extensive suite of testing equipment enables you to perform all testing necessary to accurately produce and verify material data sheets, including melt flow and HDT / Vicat testers; drop weight impact testers, universal testing machines for tensile, compression, and flexural testing; dynamic systems for high-cycle fatigue and slow-speed static testing; and pendulum systems for Charpy, Izod, and tensile impact testing.

# PLASTICS TESTING SOLUTIONS

For Every Part of the Process



## HDT AND VICAT TESTING

Instron's HDT and Vicat test systems are used to characterize the behavior of plastic materials at high temperatures, complying with a variety of ISO and ASTM standards. Available in multiple sizes to fit a range of throughput requirements, these systems are designed to increase productivity, offering oil degradation control, melt protection, and efficient cooling.

ASTM D1525 • ASTM D648 • ISO 306 • ISO 75



Reduce the risk  
of running invalid  
tests thanks to  
oil degradation  
control





## RHEOLOGY TESTING

Instron's capillary rheometer systems are designed for both R&D and advanced quality control of thermoplastic materials, and accurately determine the rheological properties of polymer samples over a wide range of shear rates and testing conditions. This includes melt strength, die swell, and PVT behavior, allowing you to simulate processes such as injection molding, extrusion, blow molding, and film blowing.

ASTM D3835 • ISO 11443



## MELT FLOW TESTING

Instron's MFi Series melt flow index testers are specifically designed for easy and accurate measuring of melt flow rate (MFR) and melt volume rate (MVR) according to melt flow rate testing procedures determined by ASTM D1238 and ISO 1133 standards.

ASTM D1238 • ISO 1133 - 1 • ISO 1133 - 2



Unparalleled  
accuracy and  
reliability

# PLASTICS TESTING SOLUTIONS

For Every Part of the Process

## TENSILE, COMPRESSION, FLEXURE TESTING

Instron's latest generation 3400 and 6800 Series universal testing machines are highly adaptable to perform tensile, compression, bend, peel, tear, shear, friction and puncture testing. These systems are compatible with hundreds of interchangeable accessories, such as grips, fixtures, extensometers, and environmental chambers for testing at non-ambient temperatures.



ASTM D1004 • ASTM D1621 • ASTM D1708 • ASTM D1894 • ASTM D3574 • ASTM D6272 • ASTM D638 • ASTM D695 • ASTM D790 • ASTM D882 • ASTM F1306  
ISO 11897 • ISO 178 • ISO 527 • ISO 604 • ISO 6383-1 • ISO 8295

Adaptable to  
meet a wide  
range of standards  
and throughput  
requirements







## OPTIMIZE YOUR THROUGHPUT

Instron's automated testing systems empower labs to improve throughput, repeatability, and safety while freeing up skilled operators to focus on more complex and creative tasks. Available as either a complete turnkey solution or as modules fitted to existing Instron testing instruments, both options are tailored to your program's specific requirements. Instron automation solutions provide the broad control and handling capabilities needed to test a wide range of applications and comply with common plastics and film testing standards.



Capable of  
testing up to  
500 specimens  
unattended

# PLASTICS TESTING SOLUTIONS

For Every Part of the Process



## PENDULUM IMPACT TESTING

The 9050 Series is capable of performing Charpy and Izod tests according to international standards. Instron pendulums are designed to meet the growing demand for accurate and repeatable impact testing on a wide range of materials and finished products for both QC and R&D.

ASTM D1822 • ASTM D256 • ASTM D6110 • ISO 179-1 • ISO 179-2  
ISO 180 • ISO 8256 • ISO 9854-1



## DROP WEIGHT IMPACT TESTING

Designed for R&D and advanced quality control, Instron's 9400 Series drop weight impact testing machines are used to determine the energy required to break or damage a material from a specific height and with a specific impact energy and velocity.

ASTM D2444 • ASTM D256 • ASTM D3763 • ASTM D5628 • ASTM D6110 • ASTM D7192  
ISO 11343 • ISO 179-2 • ISO 180 • ISO 6603-2 • ISO 7765-2 • ISO 8256



Precision  
meets  
adaptability





## DYNAMIC AND FATIGUE TESTING

Instron's ElectroPuls systems use patented linear motor technology to perform high-cycle fatigue and low-speed static testing on a wide variety of specimens and components. ElectroPuls systems are designed to test plastics at both ambient and non-ambient temperatures to all major national and international standards.

ASTM D7774 • ASTM D7791 • ISO 18489





# THE BLUEHILL® ADVANTAGE

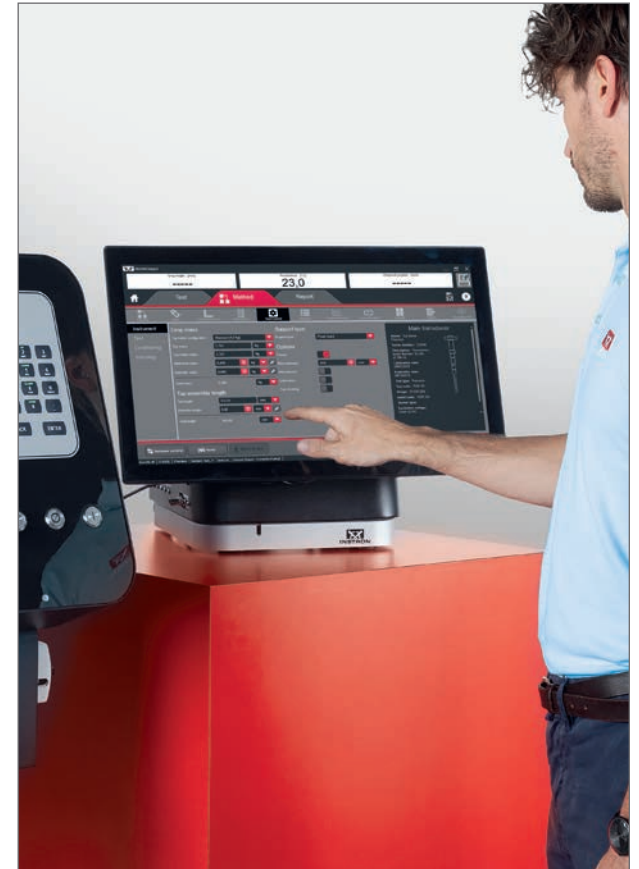
Intuitive Workflows Across All Your Testing Systems

## Common Software Interface

Many of Instron's plastic testing systems are operated with Bluehill software – a built-for-touch architecture designed with large touchpoints, easy-to-understand icons, and intuitive workflows to make it easy to train new operators across a wide range of equipment







## The Power of Bluehill

Where intuitive design meets advanced capability, Bluehill software delivers simplicity and power to elevate your testing. Access a library of pre-configured methods for common ASTM and ISO standards - including ASTM D638 for tensile testing, ISO 179 for Charpy impact, and ISO 1133 for melt flow. Take control with step-by-step workflows for greater repeatability, customize your workspace, enforce security with configurable permissions, and customize export settings for seamless reporting.



# STRAIN MEASUREMENT

Extensometers for Plastics Testing



## Non-Contacting Video

The AVE3 non-contacting video extensometer measures deformation optically by tracking the movement of two marks on the specimen. It meets the requirements of the most common plastics testing standards – such as ASTM D638 and ISO 527-2 – while offering compatibility with environmental chambers and digital image correlation software. Suitable for everything from rigid plastics to high-elongation polymers.



## Automatic Contacting

The need for increased specimen throughput has created a demand for faster, more reliable, and more accurate materials testing routines. Automatic contacting extensometers provide this capability by enhancing productivity with automatic gauge length positioning and specimen attachment. The AutoX750 complies with the requirements of plastics testing standards such as ISO 527-2 and ASTM D638.



## Clip-On

Clip-on extensometers for static testing offer speed of attachment and ease of use. Their light-weight, rugged cross brace design eliminates errors caused by physical distortion, while built-in protection prevents damage from over-extension. Conforming to key plastics testing standards – including ASTM D638 and ISO 527-2 – these extensometers deliver reliable performance across a wide range of materials, including those with hard or smooth surfaces.



# NON-AMBIENT TESTING

Instron's 3119-600 Series environmental chambers provide extensive temperature testing capabilities for evaluating material properties under non-ambient conditions.



Test materials at  
temperatures  
ranging from  
 $-100^{\circ}\text{C}$  to  $600^{\circ}\text{C}$

# FLEXIBILITY BY DESIGN

## Application-Based Testing Solutions

Instron universal systems are compatible with hundreds of grips and fixtures found in Instron's expansive accessories catalog, with specific configurations designed to perform many of the most popular ASTM and ISO tests.

01 Pneumatic Side Action Grips

02 Mechanical Wedge Action Grips

03 3-Point Bend Fixture

04 Compression Platens

05 Variable Angle Peel Fixture

06 Self-Tightening Roller Grips

07 Fatigue-Rated Wedge Action Grips

08 Coefficient of Friction Fixture

09 Long Travel Extensometer

10 Puncture Burst Fixture

SCAN THE QR CODE  
to see Instron's full  
Accessories Catalog.



01



02

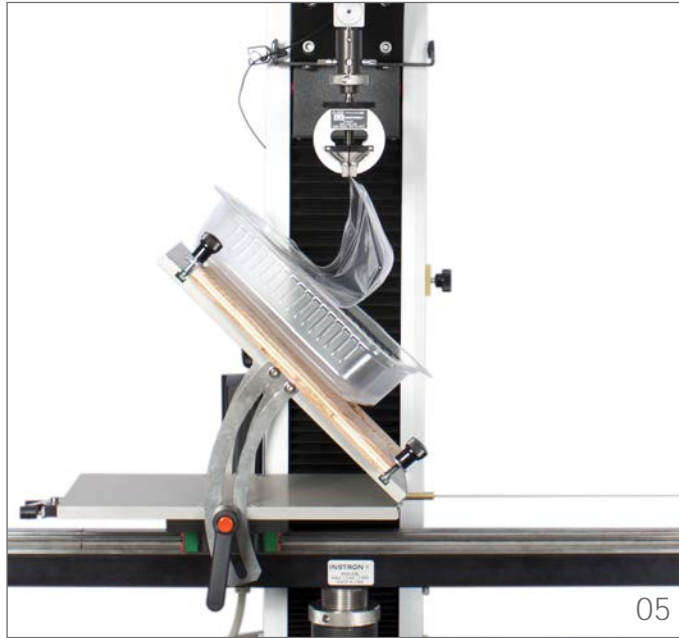


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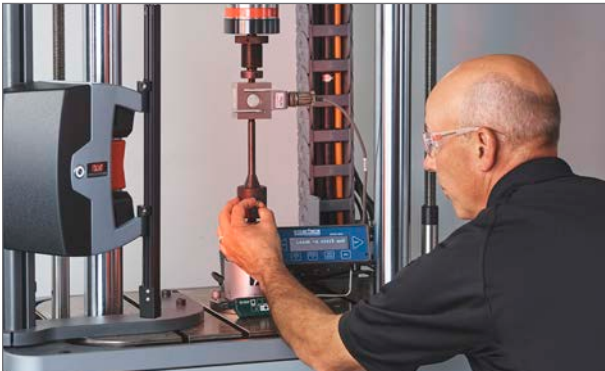
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# OUR PROMISE: WITH YOU EVERY STEP OF THE WAY

With over 300 field service engineers spread across every major market, Instron has all the tools, services, and staff needed to offer you exceptional personalized support. Our global team is on hand to help you achieve your objectives, from regular preventative maintenance and calibration of testing instruments to application support and training. Partnering with Instron will extend the life of your investment, minimize downtime, and reduce the cost of equipment ownership while streamlining your testing processes and helping to future-proof your testing.



CALIBRATION



PREVENTATIVE MAINTENANCE



TECH SUPPORT AND TRAINING



CONNECTED SERVICES



REPAIR AND REFURBISHMENT



SYSTEM UPGRADES AND RETROFITS



# GLOBAL COVERAGE, LOCAL EXPERTISE

We are regionally close to our customers  
with **1,500+** worldwide employees

We speak **40+ languages** with  
documentation in 20+ languages

Sales in **120** countries with **300+ field**  
service engineers globally

○ Manufacturing + Sales & Service Office

● Operations + Sales & Service

■ Office Sales & Service Office

## FIELD SERVICE ENGINEERS AROUND THE WORLD

**129**  
AMERICAS

**80**  
EUROPE & UK

**100**  
ASIA



# SUPPORTED PLASTICS TESTING STANDARDS

For Every Part of the Process

The many standards referenced within this brochure are not intended to be a complete and comprehensive worldwide list of standards; but a list of the most prominent and widely-used in the materials testing industry. Many of the testing solutions discussed are closely related to standards defined by other national, international, and industry-specific standards organizations. For further information, support, or application expertise, please contact your local Instron® office.

## HDT AND VICAT TESTING

<b>ASTM D1525</b>	Standard Test Method for Vicat Softening Temperature of Plastics
<b>ASTM D648</b>	Standard Test Method for Deflection Temperature of Plastics Under Flexural Load in the Edgewise Position
<b>ISO 306</b>	Thermoplastic Materials — Determination of Vicat Softening Temperature (VST)
<b>ISO 75</b>	Determination of Temperature of Deflection Under Load

## RHEOLOGY TESTING

<b>ASTM D3835</b>	Standard Test Method for Determination of Properties of Polymeric Materials by Means of a Capillary Rheometer
<b>ISO 11443</b>	Plastics - Determination of the Fluidity of Plastics Using Capillary and Slit-Die Rheometers

## MELT FLOW TESTING

<b>ASTM D1238</b>	Standard Test Method for Melt Flow Rates of Thermoplastics by Extrusion Plastometer
<b>ISO 1133 - 1</b>	Determination of the Melt Mass-Flow Rate (MFR) and Melt Volume-Flow Rate (MVR) of Thermoplastics - Part 1: Standard Method
<b>ISO 1133 - 2</b>	Determination of the Melt Mass-Flow Rate (MFR) and Melt Volume-Flow Rate (MVR) of Thermoplastics - Part 2: Method for Materials Sensitive to Time-Temperature History and/or Moisture

## TENSILE, COMPRESSION, FLEXURE TESTING

<b>ASTM D1004</b>	Tear Resistance (Graves Tear) of Plastic Film and Sheeting
<b>ASTM D1621</b>	Compressive Properties of Rigid Cellular Plastics
<b>ASTM D1708</b>	Tensile Properties of Plastics by Use of Microtensile Specimens
<b>ASTM D1894</b>	Static and Kinetic Coefficients of Friction of Plastic Film and Sheeting
<b>ASTM D3574</b>	Standard Test Methods for Flexible Cellular Materials - Slab, Bonded, and Molded Urethane Foams
<b>ASTM D6272</b>	Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials by Four-Point Bending
<b>ASTM D638</b>	Tensile Properties of Plastics
<b>ASTM D695</b>	Compressive Properties of Rigid Plastics
<b>ASTM D790</b>	Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials
<b>ASTM D882</b>	Tensile Properties of Thin Plastic Sheeting
<b>ASTM F1306</b>	Slow Rate Penetration Resistance of Flexible Barrier Films and Laminates
<b>ISO 11897</b>	Packaging - Sacks Made From Thermoplastic Flexible Film - Tear Propagation on Edge Folds
<b>ISO 178</b>	Determination of Flexural Properties
<b>ISO 527 - 2</b>	Determination of Tensile Properties - Part 2: Test Conditions for Moulding and Extrusion Plastics
<b>ISO 527 - 3</b>	Determination of Tensile Properties - Part 3: Test Conditions for Films and Sheets
<b>ISO 604</b>	Determination of Compressive Properties of Plastics
<b>ISO 6383 - 1</b>	Film and Sheeting - Determination of Tear Resistance - Part 1: Trouser Tear Method
<b>ISO 8295</b>	Film and Sheeting - Determination of the Coefficients of Friction



## PENDULUM IMPACT TESTING

ASTM D1822	Standard Test Method for Determining the Tensile-Impact Resistance of Plastics
ASTM D256	Standard Test Methods for Determining the Izod Pendulum Impact Resistance of Plastics
ASTM D6110	Standard Test Method for Determining the Charpy Impact Resistance of Notched Specimens of Plastics
ISO 179 - 1	Determination of Charpy Impact Properties - Part 1: Non-Instrumented Impact Test
ISO 179 - 2	Determination of Charpy Impact Properties - Part 2: Instrumented Impact Test
ISO 180	Determination of Izod Impact Strength
ISO 8256	Plastics - Determination of Tensile-Impact Strength (Method A)
ISO 9854 - 1	Thermoplastics Pipes for the Transport of Fluids - Determination of Charpy Impact Properties - Part 1: General Test Method

## DROP WEIGHT IMPACT TESTING

ASTM D2444	(Type A, B, and C) Determination of the Impact Resistance of Thermoplastic Pipe and Fittings
ASTM D256	Standard Test Methods for Determining the Izod Pendulum Impact Resistance of Plastics
ASTM D3763	High Speed Puncture Properties of Plastics Using Load and Displacement Sensors
ASTM D5628	(Method FA, FB, FC, FD, FE) Standard Test Method for Impact Resistance of Flat, Rigid Plastic Specimens
ASTM D6110	Standard Test Method for Determining the Charpy Impact Resistance of Notched Specimens of Plastics
ASTM D7192	Standard Test Method for High Speed Puncture Properties of Plastic Films
ISO 11343	Determination of Dynamic Resistance To Cleavage of High-Strength Adhesive Bonds Under Impact
ISO 179 - 2	Plastics - Determination of Charpy Impact Properties - Part 2: Instrumented Impact Test
ISO 180	Plastics - Determination of Izod Impact Strength
ISO 6603 - 2	Plastics - Determination of Puncture Impact Behavior of Rigid - Part 2: Instrumented Impact Testing
ISO 7765 - 2	Plastics Film and Sheeting - Determination of Impact Resistance by the Free-Falling Dart Method
ISO 8256	Determination of Tensile-Impact Strength

## DYNAMIC AND FATIGUE TESTING

ASTM D7774	Flexural Fatigue Properties of Plastics
ASTM D7791	Uniaxial Fatigue Properties of Plastics
ISO 18489	Determination of the Resistance Against Slow Crack Growth Under Cyclic Loading - Cracked Round Bar Test Method

Scan the QR Code  
to visit our **PLASTICS  
TESTING HUB** and  
learn more





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## THE WORLD STANDARD

We stake our reputation on the integrity of data. From the measurement of primary test data to result generation, we design and manufacture the full data integrity chain (e.g. load cells, sensor conditioning, and software). Additionally, we calibrate more than 90,000 of these sensors annually with the lowest accumulated uncertainty.

**30,000+**

We service and calibrate more than 30,000 Instron systems in active use worldwide every year.

**96%**

96% of the Fortune 100 list of the world's largest manufacturing companies use Instron test systems.

**18,000+**

Instron systems have been cited in more than 18,000 patents since 1975.

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