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## Welcome to the Instron® Materials Testing Accessories Newsletter

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#### The Testing of Plastics and Polymers:

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## Testing Plastics and Polymers

Plastics and polymers find applications in virtually every sphere of human activity, from packaging to automotive, electronics, healthcare and aerospace. Replacement of traditional materials with polymers is largely due to the cost effectiveness and many superior attributes of plastic materials. The electrical insulation, color, strength, and high-speed, high-volume molding qualities of polymers have made them ideal for electrical appliances, automotive and aerospace components, toys and packaging.

Mechanical characterization of the properties of plastics and polymers is critical in the design and development of materials and manufacturing processes, as well as quality control. Since the properties of polymers are subject to change with a change in temperature, it is vitally important to test above and below ambient temperatures with a 3119 series environmental chamber. Strain rate sensitivity should be considered when testing polymers, as speeds can affect elongation.

Common tests include tensile, bend/flexure, compression, fatigue, puncture, shear and impact/high rate. Instron provides a range of grips, fixtures, accessories and environmental chambers suitable for rigid, semi rigid and flexible thermoplastics, thermosetting plastics, films, laminates, foams and finished components.

### Grips and Fixtures

Tension testing can be carried out by using a whole range of grip types, including screw and wedge action, pneumatic, hydraulic and specialist types (thin film or cord and yarn). Generally, serrated jaw faces work well with polymers, but for softer materials rubber coated faces will be more appropriate. Pull and push rods and a range of suitable high/low temperature grips are also available.

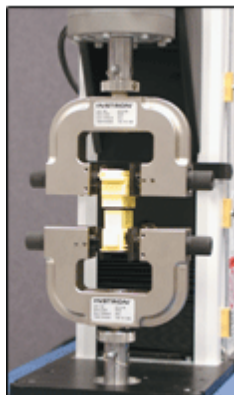
### Plastic Component Testing Using Screw Action Grips

Flexure tests may be performed using the 2810 series bend fixtures. Three and four point upper anvils are available along with a number of different roller diameters. For accurate center point deflection measurement use a deflectometer.

Compression anvils and platens are available in a range of sizes and designs including optional spherical seatings for optimum alignment. Deflectometers can be used in conjunction with compression platens to provide accurate strain measurements.

### Extensometers

Extensometers are frequently used in tensile testing of plastics. Rigid or semi-rigid materials can be used with the 2620 dynamic and 2630 static clip-on type or the 2665 HRD automatic extensometers. Materials showing elongations above 100% can use the 2603 series long travel extensometers, which feature variable gauge length settings.



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### Future Events

- **Medical Device:**  
(San Juan, Puerto Rico)  
Feb 1st-2nd, 2007
- **MEDETEC:**  
(Stuttgart, Germany)  
Feb 27th, 2007
- **Fatigue 2007:**  
The 6th Engineering Integrity Society International Conference on Durability and Fatigue (Queens College, Cambridge, UK)  
March 26th-28th, 2007
- **10th International Conference on Behavior of Materials:**  
(Busan, Korea)  
May 21st-31st, 2007

Use the non-contacting video extensometers for applications where the weight of an extensometer or pressure from knife-edges may affect mechanical properties.

## Software

Static testing of plastics and polymers require Bluehill® software, while FastTrack software provides a solution for dynamic testing.



## For more information on [Accessories](#)

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Please submit an [online request](#) or call us at +1 800 473 7838 (US only) or +44 1494 456815 (Europe only)

Are you testing something a little different? Do you think more people should know about it? Would you like to submit an article for possible publication in the Instron accessories newsletter? If so, please [submit your story](#).

## [What do you think? Tell us!](#)



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