



Issue 9

Welcome to the Instron® Materials Testing Accessories Newsletter

In This Issue: The Testing of Elastomers

Elastomers are most commonly recognized in automotive and household applications in the form of tires, gloves and upholstered products containing elastomeric foams. However, there are many others, such as hoses, drive belts, seals, building products, anti-vibration mountings, medical products and leisure goods.

Elastomers show characteristics of high elongation, energy absorption and energy storage, and range from natural latex rubber to highly engineered synthetic materials for critical engineering applications.

Mechanical characterization of the properties of rubber and elastomers is critical in the development of materials and manufacturing processes, as well as for quality control. Since the properties of elastomers are greatly affected by temperature, testing must be carried out at high and low temperatures to simulate end-use conditions, such as those found in automotive tires, seals and hoses.

Tensile, compression, tear, peel, damping fatigue and adhesion tests are commonly performed. Instron provides a range of grips, fixtures, accessories and environmental chambers suitable for tests on sheet, film and moulded materials, foams and finished components.

Grips and Fixtures

Tensile testing requires a self-tightening gripping technique because of material thickness shrinkage during elongation. General-purpose 2712 series pneumatic grips maintain a constant gripping force and accommodate any reduction in specimen thickness during testing. The gripping force itself can also be selected by regulating the pneumatic pressure.

Rubber coated jaw faces generally work well with elastomers. 2713 series self tightening or 2713-006 thin film grips are also an excellent choice for elastomers including very thin materials such as latex. Special fixtures are available for testing elastomeric o-rings. The 2717 series o-ring test fixture rotates the specimen to avoid local stress concentrations while tension is applied.

Elastomeric foams can be tested in tension using 2710 screw action, 2712 series pneumatic grips or in compression with 2501 series compression accessories. The 2810-130 foam compression fixture is specially designed to test elastomeric foams and features a self aligning upper compression plate and perforated lower plate to allow air to be dissipated during testing.



Extensometry

Tensile strain measurement is often accomplished with crosshead travel, but this is less accurate due to elongation in the specimen tab ends. A more accurate method is to use a 2603 series long travel extensometer, which provides direct strain measurement. For delicate specimens, the 2663 series video extensometer offers non-contacting strain measurement over a wide range of strains and is ideal for use with 3119 environmental chambers.



Environmental

Testing at non-ambient temperatures can be achieved using environmental chambers. Pull rods, push rods and a range of suitably high and low temperature rated grips, such as 2732 series pneumatic, are available.

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Future Events

- **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
- **European Society Biomaterials:** (Brighton, UK) Sept 9th-12th, 2007

Software

Bluehill® software is ideal for static testing of plastics and polymers, while FastTrack software provides a solution for dynamic testing. Dynamic elastomer software is also available for evaluating the high frequency response of elastomers.



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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](#).

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