



ASTM D638 Testing Fixture

ASTM D638 tensile tests measure the force required to break a plastic sample specimen and the extent to which the specimen stretches or elongates to that breaking point.

Tensile test procedure:

Specimens are placed in the grips of the universal tester at a specified grip separation and pulled until failure. For this fixture the test speed is determined by the material specification. An extensometer is used to determine elongation and tensile modulus.



Testing Fixture - Drawing

Elevated or Reduced temperature test procedure:

A thermal chamber is installed on the universal test machine. The chamber is designed to allow the test mounts from the base and crosshead of the universal tester to pass through the top and bottom of the chamber. Standard test fixtures are installed inside the

chamber, and testing is conducted inside the controlled thermal environment the same as it would be at ambient temperature. The chamber has internal electric heaters for elevated temperatures and uses external carbon dioxide gas as a coolant for reduced temperatures. The size of the chamber places a limitation on the maximum elongation that can be reached, and extensometers are generally limited to no more than 200° C.

Specimen size: The most common specimen for ASTM D638 is a **Type I tensile bar**.



ASTM D638-B Testing Fixture - Assembly

Referenced Documents

ASTM Standards

- D229 Test Methods for Rigid Sheet and Plate Materials Used for Electrical Insulation
- D412 Test Methods for Vulcanized Rubber and Thermoplastic Elastomers-Tension
- D618 Practice for Conditioning Plastics for Testing

- D651 Test Method for Test for Tensile Strength of Molded Electrical Insulating Materials
- D882 Test Method for Tensile Properties of Thin Plastic Sheeting
- D883 Terminology Relating to Plastics
- D1822 Test Method for Tensile-Impact Energy to Break Plastics and Electrical Insulating Materials
- D3039/D3039M Test Method for Tensile Properties of Polymer Matrix Composite Materials
- D4000 Classification System for Specifying Plastic Materials
- D4066 Classification System for Nylon Injection and Extrusion Materials (PA)
- D5947 Test Methods for Physical Dimensions of Solid Plastics Specimens
- E4 Practices for Force Verification of Testing Machines
- E83 Practice for Verification and Classification of Extensometer Systems
- E132 Test Method for Poissons Ratio at Room Temperature
- E691 Practice for Conducting an Interlaboratory Study to Determine the Precision of a Test Method
- E1012 Practice for Verification of Testing Frame and Specimen Alignment Under Tensile and Compressive Axial Force Application
- **ASTM D638 A**