



Designation: D 5934 – 96

Standard Test Method for Determination of Modulus of Elasticity for Rigid and Semi- Rigid Plastic Specimens by Controlled Rate of Loading Using Three-Point Bending¹

This standard is issued under the fixed designation D 5934; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This test method covers the use of controlled rate of loading mechanical instrumentation for gathering and reporting the modulus of elasticity of thermoplastic and thermosetting resins and composite systems in the form of rectangular bars molded directly or cut from sheets, plates, or molded shapes. The data generated, using three-point bending techniques, may be used to identify the thermomechanical properties of a plastics material or composition using a controlled rate of loading mechanical instrument.² Results obtained from this test method may or may not be comparable to results obtained using D 790.

1.2 This test method is intended to provide a means for determining the modulus of elasticity within the linear region of the stress-strain curve (see Fig. 1). This test is conducted at standard temperature and pressure.

1.3 Apparent discrepancies may arise in results obtained under differing experimental conditions. These apparent differences from results observed in another study can usually be reconciled, without changing the observed data, by reporting in full (as described in this test method) the conditions under which the data were obtained.

1.4 The values stated in SI units are to be regarded as the standard. The values stated in parentheses are for information only.

1.5 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

NOTE 1—There is no similar or equivalent ISO standard.

2. Referenced Documents

2.1 ASTM Standards:

D 618 Practice for Conditioning Plastics and Electrical

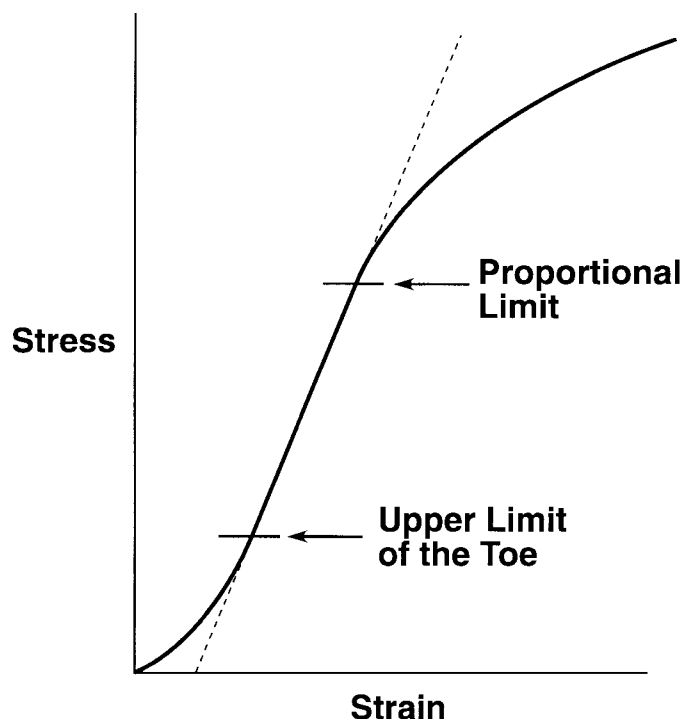


FIG. 1 Stress-Strain Curve (Linear Region)

Insulating Materials for Testing³
D 638 Test Method for Tensile Properties of Plastics³
D 883 Terminology Relating to Plastics³
D 1999 Guide for the Selection of Specimens and Test Parameters for International Trade³
D 4092 Terminology Relating to Dynamic Mechanical Measurements on Plastics⁴
E 177 Practice for the Use of the Terms Precision and Bias in ASTM Test Methods⁵

3. Terminology

3.1 *Definitions:* Definitions of terms applying to these test methods appear in Terminologies D 883 and D 4092, and

¹ This test method is under the jurisdiction of ASTM Committee D-20 on Plastics and is the direct responsibility of Subcommittee D20.10 on Mechanical Properties. Current edition approved Nov. 10, 1996. Published May 1997.

² This apparatus is available from the Perkin-Elmer Corporation, 761 Main Avenue, Norwalk, CT 06859-0256.

³ *Annual Book of ASTM Standards*, Vol 08.01.

⁴ *Annual Book of ASTM Standards*, Vol 08.02.

⁵ *Annual Book of ASTM Standards*, Vol 14.02.