



Designation: D 5935 – 96

AMERICAN SOCIETY FOR TESTING AND MATERIALS
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Standard Practice for Plastics—Acquisition and Presentation of Comparable Single-Point Data¹

This standard is issued under the fixed designation D 5935; 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 practice identifies specific test procedures for the acquisition and presentation of comparable data for certain basic properties of plastics. In general, each property is specified by a single experimental value, although in certain cases, properties are represented by two values obtained under different test conditions. The properties included are those presented conventionally in manufacturers' data sheets. The test methods and test conditions apply predominantly to those plastics that may be injection- or compression-moulded or prepared as sheets of specified thickness.

1.2 This practice is identical to ISO 10350.

1.3 *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.*

2. Referenced Documents

2.1 ASTM Standards:

- D 5936 Specification for Multipurpose Test Specimens Used for Testing Plastics²
- D 5937 Test Method for Determination of Tensile Properties of Moulding and Extrusion Plastics²
- D 5938 Guide Describing the General Principles for Determination of Tensile Properties of Plastics²
- D 5939 Practice for Preparing Multipurpose Test Specimens and Bars of Thermoplastics by Injection Moulding²
- D 5940 Practice for Preparing Small Plate Test Specimens of Thermoplastics by Injection Moulding²
- D 5942 Test Method for Determining Charpy Impact Strength of Plastics²
- D 5943 Test Method for Determining Flexural Properties of Plastics²
- D 5944 Guide for Describing the General Principles for Determining the Temperature of Deflection of Plastics Under Load²
- D 5945 Test Method for Determining Temperature of De-

flection of Plastics and Ebonite Under Load²

2.2 ISO Standards:³

- ISO 62:1980 Plastics—Determination of Water Absorption
- ISO 75-1:1993 Plastics—Determination of Temperature of Deflection Under Load—Part 1: General Test Method
- ISO 75-2:1993 Plastics—Determination of Temperature of Deflection Under Load—Part 2: Plastics and Ebonite
- ISO 75-3:1993 Plastics—Determination of Temperature of Deflection Under Load—Part 3: High-Strength Thermosetting Laminates and Long-Fibre-Reinforced Plastics
- ISO 178:1993 Plastics—Determination of Flexural Properties
- ISO 179:1993 Plastics—Determination of Charpy Impact Strength
- ISO 291:1977 Plastics—Standard Atmospheres for Conditioning and Testing
- ISO 293:1986 Plastics—Compression Moulding Test Specimens of Thermoplastic Materials
- ISO 294 Plastics—Injection Moulding of Test Specimens of Thermoplastic Materials
- ISO 295:1991 Plastics—Compression Moulding of Test Specimens of Thermosetting Materials
- ISO 306:1987 Plastics—Thermoplastic Materials—Determination of Vicat Softening Temperature
- ISO 527-1:1993 Plastics—Determination of Tensile Properties—Part 1: General Principles
- ISO 527-2:1993 Plastics—Determination of Tensile Properties—Part 2: Test Conditions for Moulding and Extrusion Plastics
- ISO 899-1:1993 Plastics—Determination of Creep Behaviour—Part 1: Tensile Creep
- ISO 1133:1991 Plastics—Determination of the Melt Mass-Flow Rate (MFR) and the Melt Volume-Flow Rate (MVR) of Thermoplastics
- ISO 1183:1987 Plastics—Methods for Determining the Density and Relative Density of Non-Cellular Plastics
- ISO 1210:1992 Plastics—Determination of the Burning Behaviour of Horizontal and Vertical Specimens in Contact with a Small-Flame Ignition Source
- ISO 2577:1984 Plastics—Thermosetting Moulding Materials—Determination of Shrinkage

¹ Precision and Bias This practice is under the jurisdiction of ASTM Committee D-20 on Plastics and is the direct responsibility of Subcommittee D20.61 on USA Technical Advisory Group for ISO/TC 61 on Plastics.

Current edition approved June 10, 1996. Published August 1996.

² Annual Book of ASTM Standards, Vol 08.03.

³ Available from American National Standards Institute, 11 W. 42nd St., 13th Floor, New York, NY 10036.

- ISO 2818:1980 Plastics—Preparation of Test Specimens by Machining
- ISO 3146:1985 Plastics—Determination of Melting Behaviour (Melting Temperature or Melting Range) of Semi-Crystalline Polymers
- ISO 3167:1993 Plastics—Multipurpose Test Specimens
- ISO 4589:1984 Plastics—Determination of Flammability by Oxygen Index
- ISO 8256:1990 Plastics—Determination of Tensile-Impact Strength
- ISO 10724 Plastics—Thermosetting Moulding Materials—Injection Moulding of Multipurpose Test Specimens
- ISO 11403-1 Plastics—Acquisition and Presentation of Comparable Multipoint Data—Part 1: Mechanical Properties
- ISO 11403-2 Plastics—Acquisition and Presentation of Comparable Multipoint Data—Part 2: Thermal and Processing Properties
- IEC 93:1980 Methods of Test for Volume Resistivity and Surface Resistivity of Solid Electrical Insulating Materials
- IEC 112:1979 Method for Determining the Comparative and the Proof Tracking Indices of Solid Insulating Materials Under Moist Conditions
- IEC 243-1:1988 Methods of Test for Electric Strength of Solid Insulating Materials—Part 1: Tests at Power Frequencies
- IEC 250:1969 Recommended Methods for the Determination of the Permittivity and Dielectric Dissipation Factor of Electrical Insulating Materials at Power, Audio and Radio Frequencies Including Metre Wavelengths
- IEC 296:1982 Specification for Unused Mineral Insulating Oils for Transformers and Switchgear
- IEC 1006:1991 Methods of Test for the Determination of the Glass Transition Temperature of Electrical Insulating Materials
- ISO 10350 Acquisition and Presentation of Comparable Single-Point Data

3. Terminology

3.1 For the purposes of this ISO standard, the following definition applies:

3.2 *single-point data*—data characterizing a plastics material by means of those property tests in which important aspects of performance can be described with a single-value result.

4.

5. Specimen Preparation and Conditioning

5.1 In the preparation of the specimens by injection- or compression-moulding, use the procedures described in ISO 293, 294 (Practices D 5939 and D 5940), or 295. The moulding method and the conditions will depend upon the material being

moulded. If these conditions are specified in the international standard appropriate to the material, then adopt them for the preparation of every specimen on which data are obtained using this international standard. For those plastics for which moulding conditions have not yet been standardized, employ the conditions within the range recommended by the polymer manufacturer and for every specimen for each of the processing methods.

5.2 Where moulding conditions are not stipulated in any international standard, record the values used for the parameters in Table 1 with the single-point data for that material. Where specimens are prepared by machining from sheet, perform the machining in accordance with ISO 2818, and ensure that the dimensions of the specimen comply with those for the appropriate specimen in Table 2.

5.3 Carry-out specimen conditioning, including any post-moulding treatment, at $23^{\circ}\text{C} \pm 2^{\circ}\text{C}$ and $(50 \pm 5) \% \text{ R.H.}$ for a min length of time of 88 h, except where special conditioning is required as specified by the appropriate material standard.

6. Test Requirements

6.1 Use the test methods, test conditions, and units specified in Table 2 in determining data. Conduct all tests at $23^{\circ}\text{C} \pm 2^{\circ}\text{C}$ and $(50 \pm 5) \% \text{ relative humidity}$ (see ISO 291) unless otherwise stated in Table 2 or in the ISO standard appropriate to the material.

7. Presentation of Results

7.1 Information that identifies the material together with the information required by Section 5 will precede the presentation of data as shown in Table 2.

TABLE 1 Moulding Parameters

Moulding-Material Type	Moulding Method and Standard (Where Applicable)	Moulding Parameters
Thermoplastic	Injection, ISO 294 (Practices D 5939 and D 5940)	Melt temperature Mould temperature Average melt velocity Hold pressure ^A
	Compression, ISO 293	Moulding temperature Moulding time Cooling rate Demoulding temperature
Thermosetting	Injection, ISO 10724	Temperature at nozzle Mould temperature Average injection velocity Hold pressure ^A
	Compression, ISO 295	Post-cure temperature Post-cure time Mould temperature Dwell time Post-cure temperature Post-cure time

^AThe hold pressure mainly influences the shrinkage of the specimen and is recorded principally for this reason.