



Standard Test Method for Chip Impact Strength of Plastics¹

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1. Scope*

1.1 The purpose of this test method is to provide an impact test that can be performed on small specimens of plastics of different thicknesses. This test method is especially suited for observing the effects of microcracks caused by weathering, or by exposure to solvents or other hostile environments, on the surface of plastic materials. It is not meant to be used as a replacement for any existing impact test, but can be used to measure impact on coupons machined from finished parts that cannot be tested by the drop-weight, Izod, or Charpy method because of shape or thickness limitations.

1.2 The chip-impact test is run on small, flat, unnotched specimens using a standard pendulum-impact device. The test places the impacted surface in tension and, for notch-sensitive materials, is extremely sensitive to the presence of surface microcracks. Thus, for plastics that develop surface cracks when exposed outdoors, the chip-impact test is a severe test of the weathered impact strength.

1.3 Round-robin testing has indicated that materials that break at total energy values of less than 0.17 joules (1.5 in.-lbf) have within-laboratory coefficients of variation of approximately 30 %. Therefore, such values are considered out of the normal testing range for this test.

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

1.5 There is no known ISO equivalent to this test method.

1.6 *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:²

- D256 Test Methods for Determining the Izod Pendulum Impact Resistance of Plastics
- D618 Practice for Conditioning Plastics for Testing
- D883 Terminology Relating to Plastics
- D1600 Terminology for Abbreviated Terms Relating to Plastics
- D4066 Classification System for Nylon Injection and Extrusion Materials (PA)
- D5947 Test Methods for Physical Dimensions of Solid Plastics Specimens
- E691 Practice for Conducting an Interlaboratory Study to Determine the Precision of a Test Method

3. Terminology

3.1 *Definitions*—For definitions of plastic terms see Terminology D883 and for abbreviations see Terminology D1600. There are no terms in this test method that require new or other-than-dictionary definitions.

4. Significance and Use

4.1 The chip-impact test is a variation of the Izod impact test described in Test Methods D256.

4.2 The specimen geometry has been chosen to fit three basic criteria as follows:

4.2.1 The specimen is relatively thin and is struck on the broad surface so that the test result is sensitive to the condition of the surface,

4.2.2 The specimen is relatively small for efficient utilization of space in accelerated testing media or devices and to minimize amounts of material needed for testing, and

4.2.3 The specimen can be tested using a standard Izod pendulum tester.

¹ This test method is under the jurisdiction of ASTM Committee D20 on Plastics and is the direct responsibility of Subcommittee D20.10 on Mechanical Properties.

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² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.