



Designation: F736 – 17

Standard Test Method for Impact Resistance of Monolithic Polycarbonate Sheet by Means of a Falling Weight¹

This standard is issued under the fixed designation F736; 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 determination of the energy required to initiate failure in monolithic polycarbonate sheet material under specified conditions of impact using a free falling weight.

1.2 Two specimen types are defined as follows:

1.2.1 *Type A* consists of a flat plate test specimen and employs a clamped ring support.

1.2.2 *Type B* consists of a simply supported three-point loaded beam specimen (Fig. 1) for use with material which can not be failed using the Type A specimen. For a maximum drop height of 6.096 m (20 ft) and a maximum drop weight of 22.68 kg (50 lb), virgin polycarbonate greater than 12.70 mm ($\frac{1}{2}$ in.) thick will require use of the Type B specimen.

NOTE 1—See also ASTM Methods: D1709, D2444 and D3029.

1.3 The values stated in SI units are to be regarded as standard. No other units of measurement are included in this standard.

1.3.1 *Exception*—The inch-pound units in parentheses are provided for information only.

1.4 *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.* For specific hazard statement, See Section 7.

1.5 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

¹ This test method is under the jurisdiction of ASTM Committee F07 on Aerospace and Aircraft and is the direct responsibility of Subcommittee F07.08 on Transparent Enclosures and Materials.

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2. Referenced Documents

2.1 *ASTM Standards*:²

D618 Practice for Conditioning Plastics for Testing

D790 Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials

3. Terminology

3.1 *Definitions of Terms Specific to This Standard*:

3.1.1 *failure (of test specimen)*—failure is signified by the presence of any crack or split in the impact-deformed area that was created by the impact of the falling weight and that can be seen by the naked eye.

4. Summary of Test Method

4.1 The test procedure to cause failure covers a range of impact energies and differs with respect to geometry and support of test specimen Type A and test specimen Type B. Guidelines are established to control drop heights, impact velocity, drop weights, impactor heads, impactor release, impactor rebound, impact location, and specimen configuration which are applicable to a falling weight impact tester designed to accommodate Type A or Type B test specimens, or both, fabricated from monolithic polycarbonate sheet material.

5. Significance and Use

5.1 This practice is applicable for qualitatively evaluating coated and uncoated monolithic polycarbonate sheet material, for monitoring process control, for screening studies, and as an aid in the prediction of hardware performance when exposed to impact service conditions.

5.2 A limitation of Type A specimen testing is that a thick sheet may not fail since the available impact energy is limited by the maximum drop height and falling weight capacity of the test apparatus. Use Specimen Type A for material less than 12.7 mm (0.50 in.) thick.

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.