



Designation: D6905 – 03 (Reapproved 2012)

Standard Test Method for Impact Flexibility of Organic Coatings¹

This standard is issued under the fixed designation D6905; 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 a procedure for determining the ability of a coating film and its substrate to resist shattering, cracking, or chipping when the film and substrate are distended beyond their original form by impact.

1.2 This test method does not measure impact resistance but uses rapid impact to improve Test Methods [D522](#), another test method for flexibility. Since the impact of the coating is almost instantaneous, all of the problems associated with time variables in the mandrel tests are eliminated.

1.3 This test method is similar in content but not technically equivalent to Test Method [D2794](#).

1.4 The values stated in SI units are to be regarded as the standard. The values given 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.*

2. Referenced Documents

2.1 *ASTM Standards:*²

[D522 Test Methods for Mandrel Bend Test of Attached Organic Coatings](#)

[D609 Practice for Preparation of Cold-Rolled Steel Panels for Testing Paint, Varnish, Conversion Coatings, and Related Coating Products](#)

[D823 Practices for Producing Films of Uniform Thickness of Paint, Varnish, and Related Products on Test Panels](#)

[D1186 Test Methods for Nondestructive Measurement of Dry Film Thickness of Nonmagnetic Coatings Applied to](#)

[a Ferrous Base \(Withdrawn 2006\)](#)³

[D1400 Test Method for Nondestructive Measurement of Dry Film Thickness of Nonconductive Coatings Applied to a Nonferrous Metal Base \(Withdrawn 2006\)](#)³

[D2240 Test Method for Rubber Property—Durometer Hardness](#)

[D2794 Test Method for Resistance of Organic Coatings to the Effects of Rapid Deformation \(Impact\)](#)

3. Terminology

3.1 *Definitions of Terms Specific to This Standard:*

3.1.1 *impact flexibility, n*—of a coating, the percent area increase required to produce cracking in the deformed coating.

4. Summary of Test Method

4.1 The organic coating under test is applied to suitable thin metal panels. After the coating has cured, a standard weight/indenter is dropped from a measured distance so as to strike the substrate which deforms the coating and the substrate. The percent elongation is the highest area of distensibility in which there is no film breaks that the film can stand.

5. Significance and Use

5.1 Coatings attached to substrates are subjected to damaging impacts during the manufacture of articles and their use in service. This impact resistance test method has been found to be useful in predicting the performance of organic coatings for their ability to resist cracking caused by impacts.

6. Apparatus

6.1 *Impact Flexibility Tester*⁴, assembly illustrated in [Figs. 1 and 2](#). The instrument contains a 1.63 kg (3.6 lb) weight/indenter, a rubber pad and an aluminum pad, [Fig. 3](#). The round rod weight/indenter's two spherical ends (Marked "A" and "B") are shown in [Figs. 4 and 5](#). The dimensions for the Spherical weight/indenter are shown in [Table 1](#). The rod slides

¹ This test method is under the jurisdiction of ASTM Committee [D01](#) on Paint and Related Coatings, Materials, and Applications and is the direct responsibility of Subcommittee [D01.23](#) on Physical Properties of Applied Paint Films.

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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.

³ The last approved version of this historical standard is referenced on www.astm.org.

⁴ The sole source of supply of the apparatus known to the committee at this time is the IM-172-GE Impact Tester, available from the Paul N. Gardner Company, Inc., 316 N.E. First Street, Pompano Beach, FL 33060. If you are aware of alternative suppliers, please provide this information to ASTM International Headquarters. Your comments will receive careful consideration at a meeting of the responsible technical committee,¹ which you may attend.