



Designation: D3768 – 11

Standard Test Method for Microcellular Urethanes—Flexural Recovery¹

This standard is issued under the fixed designation D3768; 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 procedure and apparatus for measuring the flexural recovery of microcellular urethanes.

1.2 The values stated in SI units are to be regarded as standard.

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.*

NOTE 1—There is no known ISO equivalent to this standard.

2. Referenced Documents

2.1 *ASTM Standards:*²

D3040 Practice for Preparing Precision Statements for Standards Related to Rubber and Rubber Testing (Withdrawn 1987)³

E691 Practice for Conducting an Interlaboratory Study to Determine the Precision of a Test Method

3. Significance and Use

3.1 This test method is used to indicate the ability of a material to recover after a 180° bend around a 12.7-mm (0.5-in.) diameter mandrel at room temperature.

3.2 Before proceeding with this test method, reference should be made to the specification of the material being tested. Any test specimen preparation, conditioning, or dimensions, or combination thereof, and testing parameters covered in the materials specification shall take precedence over those mentioned in these test methods. If there are no material specifications, then the default conditions apply.

¹ This test method is under the jurisdiction of ASTM Committee D20 on Plastics and is the direct responsibility of Subcommittee D20.22 on Cellular Materials - Plastics and Elastomers.

Current edition approved Dec. 1, 2011. Published January 2012. Originally approved in 1979. Last previous edition approved in 2006 as D3768 - 06. DOI: 10.1520/D3768-11.

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.

NOTE 2—This test method is applicable to solid urethanes.

4. Apparatus

4.1 *Flexural Recovery Test Fixture*—The test fixture shall consist of a 12.7-mm diameter mandrel mounted to a base equipped with a protractor. A drawing of a typical test fixture is shown in Fig. 1.

4.2 *Timer*, capable of indicating seconds.

4.3 *Thickness Indicator*, accurate to 0.03 mm.

5. Test Specimens

5.1 The test specimens shall be cut from molded plaques or parts. The recommended standard test specimen is 4 mm in thickness, and the minimum specimen thickness shall not be less than 3 mm. The specimen shall be 25 mm in width by 150 mm in length (1 by 6 in.).

6. Conditioning

6.1 *Conditioning*—Condition the test specimens and the test fixture at $23 \pm 2^\circ\text{C}$ ($73.4 \pm 3.6^\circ\text{F}$) and $50 \pm 10\%$ relative humidity for not less than 24 h prior to testing, unless otherwise specified.

6.2 *Test Conditions*—Conduct tests in the standard laboratory atmosphere of $23 \pm 2^\circ\text{C}$ ($73.4 \pm 3.6^\circ\text{F}$) and $50 \pm 10\%$ relative humidity, unless otherwise specified.

7. Procedure

7.1 There shall be at least three recovery measurements.

7.2 Measure the thickness of specimen to the nearest 0.03 mm.

7.3 Insert the test specimen in the lower slot of the specimen clamp and position the end of the specimen flush with the rear face of the bend mandrel. Tighten the clamp while holding the specimen in a horizontal position. (Do not allow the outer end of the specimen to be in contact with the base of the test fixture.) A spacer of approximately the same thickness as the test specimen must be used in the upper slot to ensure proper clamping in the lower slot. A specimen mounted in a test fixture at the start of a test is shown in Fig. 2.

7.4 Make an initial reading where the mandrel edge of the specimen (the surface of the test specimen that is in contact

*A Summary of Changes section appears at the end of this standard