



Designation: D 3768 – 96 (Reapproved 2000)

Standard Test Method for Microcellular Urethanes—Flexural Recovery¹

This standard is issued under the fixed designation D 3768; 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 approval. 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 the 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 similar or equivalent ISO standard to this test method.

2. Referenced Documents

2.1 ASTM Standards:

D 3040 Practice for Preparing Precision Statements for Standards Related to Rubber and Rubber Testing²

E 691 Practice for Conducting an Interlaboratory Study to Determine the Precision of a Test Method³

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.

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This revision includes the addition of the following: an ISO equivalency statement, a materials specification statement, and a keyword section.

² Discontinued—see 1986 Annual Book of ASTM Standards, Vols 09.01 and 09.02.

³ Annual Book of ASTM Standards, Vol 14.02.

NOTE 2—This test method may be applied to solid urethanes.

4. Apparatus

4.1 *Flexural Recovery Test Fixture*— See Fig. 1.

4.2 *Timer*, capable of indicating seconds.

4.3 *Thickness Indicator*, accurate to 0.25 mm.

5. Test Specimens

5.1 The test specimens shall be die cut from molded plaques or parts. The specimen size shall be 25 mm in width by 150 mm in length (1 by 6 in.). The recommended standard test specimen is 4 mm in thickness. Thinner specimens may be used, but shall not be less than 3 mm.

6. Conditioning

6.1 Unless otherwise specified, condition the specimens and fixtures a minimum of 1 h at $23 \pm 2^\circ\text{C}$ and $50 \pm 5\%$ relative humidity before testing.

7. Procedure

7.1 There shall be at least three recovery measurements.

7.2 Measure the thickness of specimen to the nearest 0.25 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.

7.4 Make an initial reading where the mandrel edge of the specimen (the surface of the test specimen that is in contact with the bend mandrel) intercepts the protractor scale. Make a reading to the nearest 1° and record the value.

7.5 Apply force approximately 30 mm (1.25 in.) from the clamp and bend the specimen 180° around the mandrel. Hold the specimen for 5 ± 1 s in the bent position, then release slowly and allow to recover. Start the timer immediately upon release. Do not allow the specimen to drag on the fixture base during recovery.