



Designation: D 3576 – 98

## Standard Test Method for Cell Size of Rigid Cellular Plastics<sup>1</sup>

This standard is issued under the fixed designation D 3576; 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 ( $\epsilon$ ) indicates an editorial change since the last revision or reapproval.

### 1. Scope \*

1.1 This test method covers the determination of the apparent cell size of rigid cellular plastics by counting the number of cell-wall intersections in a specified distance.

1.2 Procedure A requires the preparation of a thin slice, not more than one half the average cell diameter in thickness, that is mechanically stable. For most rigid cellular plastics this limits the test method to materials with an average cell size of at least 0.2 mm.

1.3 Procedure B is intended for use with materials whose friable nature makes it difficult to obtain a thin slice for viewing.

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.*

NOTE 1—The annex to ISO 2896 is technically equivalent to this test method.

### 2. Referenced Documents

#### 2.1 ASTM Standards:

D 883 Terminology Relating to Plastics<sup>2</sup>

D 2842 Test Method for Water Absorption of Rigid Cellular Plastics<sup>3</sup>

D 2856 Test Method for Open-Cell Content of Rigid Cellular Plastics by the Air Pycnometer<sup>3</sup>

E 691 Practice for Conducting an Interlaboratory Study to Determine the Precision of a Test Method<sup>4</sup>

#### 2.2 ISO Standard:

ISO 2896 Cellular Plastics, Rigid—Determination of Water Absorption<sup>5</sup>

<sup>1</sup> This test method is under the jurisdiction of ASTM Committee D-20 on Plastics and is the direct responsibility of Subcommittee D20.22 on Cellular Plastics.

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<sup>2</sup> Annual Book of ASTM Standards, Vol 08.01.

<sup>3</sup> Annual Book of ASTM Standards, Vol 08.02.

<sup>4</sup> Annual Book of ASTM Standards, Vol 14.02.

<sup>5</sup> Available from American National Standards Institute, 11 W. 42nd St., 13th Floor, New York, NY 10036.

### 3. Terminology

#### 3.1 Definitions:

3.1.1 Definitions of terms applicable to this test method are given in Terminology D 883.

### 4. Summary of Test Method

4.1 *Procedure A*— The cellular plastic specimen is cut to not more than one half the average cell diameter in thickness on a slicer and the shadowgraph is projected on a screen by the use of a cell-size scale slide assembly and a projector. The average chord length is obtained by counting the cells on cell-wall intersections and converting this value to average cell size by mathematical derivation.

4.2 *Procedure B*— The cellular plastic specimen is sliced to provide a smooth surface. The cell walls are accented by the use of a marking pen. The average chord length is obtained by counting the cell wall intersections and converting this value to average cell size by mathematical derivation.

### 5. Significance and Use

5.1 Several physical properties of rigid cellular plastics are dependent on cell size and cell orientation. Measuring water absorption and open-cell content in accordance with Test Method D 2842 and Test Method D 2856 requires knowledge of surface cell volume, which uses cell size values in the calculations.

5.2 This test method provides an apparent cell size because it assumes that there is no measurable edge to edge or top to bottom variation in average cell size and that the cell size distribution about the average cell size is normal. If the analyst is concerned there may be significant variation in either the average cell size or the cell size distribution more detailed analysis may be required.

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

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



FIG. 1 Razor Blade Cell Size Specimen Slicer

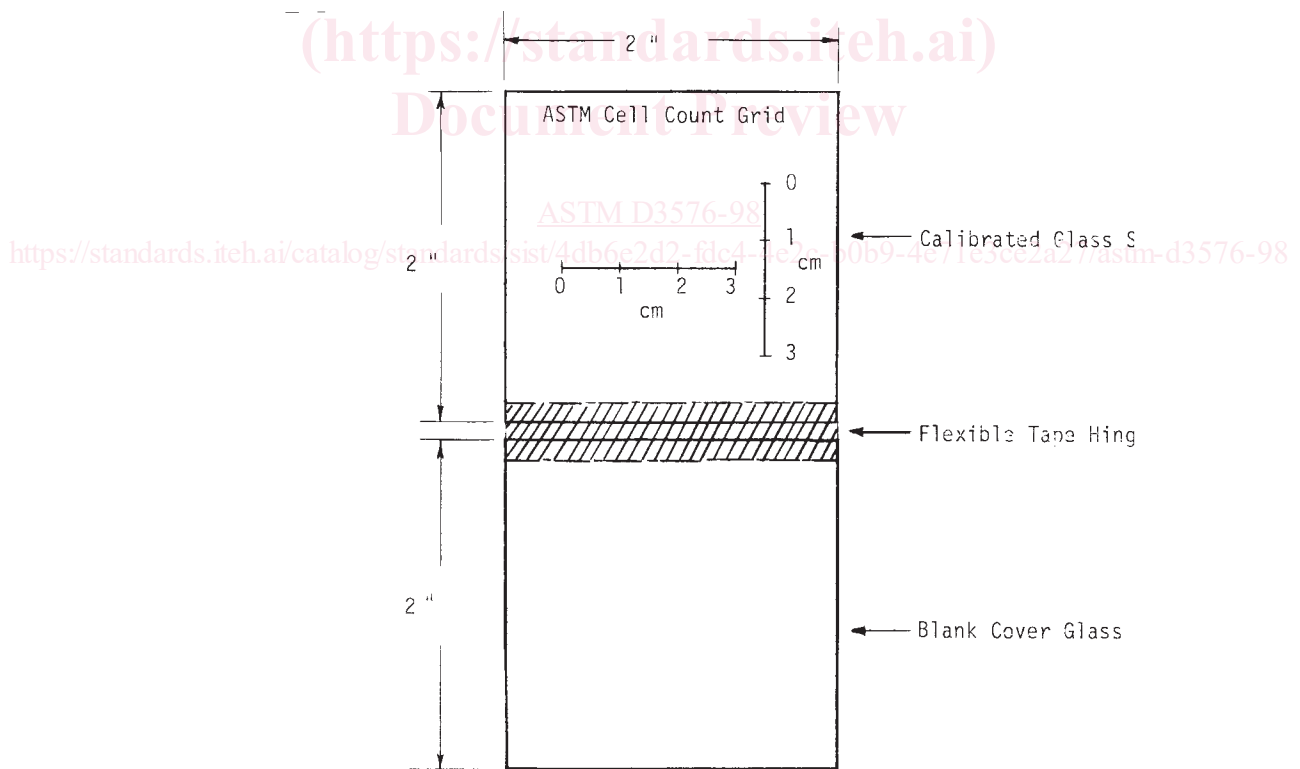


FIG. 2 Cell Size Scale Slide Assembly