



Designation: D6226 – 21

Standard Test Method for Open Cell Content of Rigid Cellular Plastics¹

This standard is issued under the fixed designation D6226; 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 cellular plastics, which are composed of membranes or walls of polymer separating small cavities or cells. These cells may be interconnecting (open cell), non-connecting (closed cell), or any combination of these types. This test method determines numerical values for open cells. It is a porosity determination, measuring the accessible cellular volume of a material. The remaining volume is that occupied by closed cells and cell walls. Since any conveniently sized specimen is typically obtained by some cutting operation, a fraction of the closed cells will be opened by specimen preparation and will be included as open cells, (see [Note 2](#)).

1.2 This test method provides good accuracy on predominantly highly open-celled materials. By not accounting for closed cells that were opened during specimen preparation, the accuracy decreases as the closed cell content increases and as the cell size increases.

1.3 The values as stated in SI units are to be regarded as the standard. The values in parentheses are given for reference 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, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

NOTE 1—This test method and ISO 4590 use the same basic principles but are significantly different in experimental detail.

NOTE 2—Two procedures for correcting for cells opened during specimen preparation are described in [Appendix X1.1](#).

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.*

2. Referenced Documents

2.1 ASTM Standards:²

[D883 Terminology Relating to Plastics](#)

[D2842 Test Method for Water Absorption of Rigid Cellular Plastics](#)

[D3576 Test Method for Cell Size of Rigid Cellular Plastics](#)

[E456 Terminology Relating to Quality and Statistics](#)

[E691 Practice for Conducting an Interlaboratory Study to Determine the Precision of a Test Method](#)

2.2 ISO Standard:

[ISO 4590 Cellular Plastics—Determination of Volume Percentage of Open and Closed Cells of Rigid Materials](#)³

3. Terminology

3.1 Definitions:

3.1.1 Terms used in this standard are defined in accordance with Terminology [D883](#), unless otherwise specified. For terms relating to precision and bias and associated issues, the terms used in this standard are defined in accordance with Terminology [E456](#).

3.2 Definitions of Terms Specific to This Standard:

3.2.1 *closed cell*—a cell totally enclosed by its walls and hence not interconnecting with other cells.

3.2.2 *open cell*—a cell not totally enclosed by its walls and open to the surface either directly or by interconnecting with other cells.

3.2.3 *volume of closed cells and cell walls*—inaccessible internal volume, consisting of an aggregate of solid polymer volume (cell walls, struts), filler volume, when applicable (solid particles or fibers), the volume of individual closed cells, and the volume of small cell groups interconnected by ruptured cell walls but otherwise inaccessible.

3.2.4 *uncorrected volume of open cells*—the aggregate measurement of both the internal porous volume of the material and the various irregular volumes accessible at the cut-cell surface of the test specimen.

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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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 Available from American National Standards Institute (ANSI), 25 W. 43rd St., 4th Floor, New York, NY 10036.

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