Designation: D6576 – 20

Standard Specification for Flexible Cellular Rubber Chemically Blown[1]

This standard is issued under the fixed designation D6576; 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.

This standard has been approved for use by agencies of the U.S. Department of Defense.

1. Scope*

1.1 This specification establishes requirements for chemically blown cellular rubber.

1.2 In the case of conflict between the provisions of this specification and those of detailed specifications or test methods for a particular product, the latter shall take precedence.

1.3 Unless specifically stated otherwise, by agreement between the purchaser and the supplier, all test methods shall be performed in accordance with the test methods specified in this specification.

1.4 The values stated in SI units are to be regarded as the standard. The inch-pound units 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, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.6 There is no known ISO equivalent to this specification.

NOTE 1—This specification was revised using the updated test methods and specifications in the latest version of Specification D1056.

1.7 *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]

D297 Test Methods for Rubber Products—Chemical Analysis

D471 Test Method for Rubber Property—Effect of Liquids

D635 Test Method for Rate of Burning and/or Extent and Time of Burning of Plastics in a Horizontal Position

D883 Terminology Relating to Plastics

D1055 Specifications for Flexible Cellular Materials—Latex Foam (Withdrawn 2014)[3]

D1056 Specification for Flexible Cellular Materials—Sponge or Expanded Rubber

E176 Terminology of Fire Standards

E177 Practice for Use of the Terms Precision and Bias in ASTM Test Methods

E456 Terminology Relating to Quality and Statistics

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

E2935 Practice for Conducting Equivalence Testing in Laboratory Applications

2.2 *SAE Standard:*[4]

SAE J 1351-1993 Hot Odor Test for Insulation Materials

2.3 *Military Standards/Specifications:*[5]

MIL STD 105 Sampling Procedures and Tables for Inspection by Attributes

MIL STD 129 Marking for Shipment and Storage

MIL STD 293 Visual Inspection Guide for Cellular Rubber Items

MIL R 6130C Standard Specification for Flexible Cellular Rubber Chemically Blown

2.4 *Federal Standards/Specifications:*[5]

PPP-B576 Box, Wood, Cleated, Veneer, Paper Overlaid

PPP-B591 Box, Fiberboard, Wood-Cleated

PPP-B601 Box, Wood, Cleated Plywood

PPP-B621 Box, Wood, Nailed and Lock-Corner

PPP-B636 Box, Shipping, Fiberboard

3. Terminology

3.1 Terms used in this standard are defined in accordance with Terminology D883, unless otherwise specified. For terms

[1] This specification 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] The last approved version of this historical standard is referenced on www.astm.org.

[4] Available from Society of Automotive Engineers (SAE), 400 Commonwealth Dr., Warrendale, PA 15096-0001, http://www.sae.org.

[5] Available from Standardization Documents Order Desk, Bldg. 4 Section D, 700 Robbins Ave., Philadelphia, PA 19111-5094, Attn: NPODS.

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

relating to precision and bias and associated issues, the terms used in this standard are defined in accordance with Terminology E456. For terms relating to fire, the terms used in this standard are defined in accordance with Terminology E176.

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *cellular material, n*—a generic term for materials containing many cells (either open or closed, or both) dispersed throughout the mass.

3.2.2 *closed cell, n*—a product whose cells are totally enclosed by its walls and hence not interconnecting with other cells.

3.2.3 *open cell, n*—a product whose cells are not totally enclosed by its walls and open to the surface, either directly or by interconnecting with other cells.

4. Classification

4.1 *Types*—This specification covers two types of cellular rubber designated as follows:

4.1.1 *Type I*—Open cell (sponge rubber).

4.1.2 *Type II*—Closed cell (expanded rubber).

4.2 *Grades*—Both types are divided into three grades designated by the letters A, B, and C added to the roman numeral prefix.

4.2.1 *Grade A*—Oil- and flame-resistant.

4.2.2 *Grade B*—No requirements for oil, flame resistance, or low temperature.

4.2.3 *Grade C*—Low-temperature resistant (oil and flame resistance not required).

4.3 *Conditions*—Each type and class has been divided into three different conditions. Each condition is based on a specific range of firmness as expressed by compression deflection as follows:

4.3.1	Condition—Super soft	a compression deflection range of	>0 to ≤13.8 kPa (>0 to ≤2 psi)
4.3.2	Condition—Soft	a compression deflection range of	>13.8 to ≤34.5 kPa (>2 to ≤5 psi)
4.3.3	Condition—Soft-medium	a compression deflection range of	>34.5 to ≤62.1 kPa (>5 to ≤9 psi)
4.3.4	Condition—Medium	a compression deflection range of	>62.1 to ≤89.6 kPa (>9 to ≤13 psi)
4.3.5	Condition—Medium-firm	a compression deflection range of	>89.6 to ≤117.2 kPa (>13 to ≤17 psi)
4.3.6	Condition—Firm	a compression deflection range of	>117.2 to ≤172.4 kPa (>17 to ≤25 psi)

5. Significance and Use

5.1 This specification is a revision of MIL R 6130C retaining most of the MIL R 6130C material designations and property requirements while conforming to ASTM form and style. It is intended to establish requirements for chemically blown cellular rubber used by government and industry, and is intended as a direct replacement for MIL R 6130C.

6. Materials and Manufacture

6.1 *Materials*—The materials shall be homogeneous. Except for the following production allowances:

6.1.1 Tears and edge cracks that do not interfere with specified product yield.

6.1.2 Depression and pock marks not exceeding 1 in.

6.1.3 Splices and butt splices.

6.1.4 Laminating sheets to achieve thickness.

6.2 The material shall not include the following:

6.2.1 Cemented, bonded, shredded, or reprocessed cellular rubber.

6.2.2 Grade A cellular rubber shall not contain natural rubber.

6.3 *Form*—Chemically blown cellular rubber shall be furnished as sheets, rolls, or molded shapes as specified, and shall have a uniform cell structure, with thin skin or rind surfaces. Cut or split sheets void of skin or rind surfaces are permitted to be furnished only for Type II material when specified.

6.4 *Skin or Rind*—The surface formed by contact with the mold shall be considered a skin or rind. It shall be of the same compound, and vulcanized integrally with the cellular structure. Type I shall have skin or rind. It is acceptable for Type II to have or not have skin or rind.

6.5 *Cut or Split Sheets (Type II Only)*—When two or more sheets are derived from one thick sheet, the cut or split sheets shall not be required to possess a skin or rind on either major surface.

6.6 *Surfacing*—Cellular rubber shall be backed or surfaced with fabric, adhesive, or other materials, when and as specified in the contract or order or by applicable drawings.

7. Physical Properties

7.1 The various types and grades of cellular rubber shall conform to the physical properties listed in Table 1 together with any additional requirements indicated by suffix letters in the grade designations as described in Section 4 and Table 2.

8. Tolerances on Dimensions

8.1 Tolerances on dimensions of flexible cellular rubber materials are given in Table 3.

8.2 *Molded Shapes*—Tolerance requirements for molded shapes shall be as specified in drawings, contracts, or by the procuring activity.

8.3 *Sheets and Rolls*—Unless otherwise specified, the tolerance requirements for thickness, lengths and width of sheets shall be as specified in Table 3.

9. Test Methods

9.1 Unless specifically stated otherwise, all test methods shall be in accordance with the test methods specified in Sections 10 – 18.

9.2 *Precision and Bias*—See Section 19.

10. Test Conditions

10.1 *Standard Conditions*—Unless otherwise specified herein, conduct the test method at 23 ± 2°C (73.4 ± 3.6°F) and a relative humidity of 50 ± 10 %.

10.2 *Specimen Conditioning*—Unless otherwise specified, condition all test specimens at standard conditions for at least 22 h prior to testing.