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AMERICAN SOCIETY FOR TESTING AND MATERIALS
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Standard Test Methods for Flexible Cellular Materials—Slab, Bonded, and Molded Urethane Foams¹

This standard is issued under the fixed designation D 3574; 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 Department of Defense.

1. Scope

1.1 These test methods apply to slab, bonded, and molded flexible cellular products known as urethane foams. Urethane foam may be generally defined as an expanded cellular product produced by the interaction of active hydrogen compounds, water, and isocyanates.

1.2 *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.*

1.3 *This standard should be used to measure and describe the response of materials, products, or assemblies to heat and flame under controlled conditions and should not be used to describe or appraise the fire hazard or fire risk of materials, products, or assemblies under actual fire conditions. However, results of this test may be used as elements of a fire hazard assessment or a fire risk assessment which takes into account all of the factors which are pertinent to an assessment of the fire hazard or fire risk of a particular end use.*

2. Referenced Documents

2.1 ASTM Standards:

- D 412 Test Methods for Vulcanized Rubber and Thermoplastic Rubbers and Thermoplastic Elastomers—Tension²
- D 4483 Practice for Determining Precision for Test Method Standards in the Rubber and Carbon Black Industries²
- E 162 Test Method for Surface Flammability of Materials Using a Radiant Heat Energy Source³

NOTE 1—The specific dated edition of Practice D 4483 that prevails in this document is referenced in the Precision and Bias section.

3. Terminology

3.1 Definitions of Terms Specific to This Standard:

3.1.1 *bonded foam*—a product produced by the adhesion of

small pieces of urethane foam to each other with a suitable bonding agent.

3.1.2 *core*—the internal portion of a molded part, free of skin.

3.1.3 *flexible cellular product*—a cellular organic polymeric material that will not rupture when a specimen 200 by 25 by 25 mm is bent around a 25-mm diameter mandrel at a uniform rate of 1 lap in 5 s at a temperature between 18 and 29°C.

3.1.4 *molded foam*—a cellular product having the shape of the enclosed chamber in which it is produced by foaming.

3.1.5 *skin*—the smooth surface layer of a molded foam product, formed by contact with the mold or surfaces.

3.1.6 *slab*—a section of foam that is cut from the internal portion of a large bun.

3.1.7 *urethane foam*—a flexible cellular product produced by the interaction of active hydrogen compounds, water, and isocyanates.

4. Summary of Test Methods

4.1 Unless specifically stated otherwise between the supplier and the purchaser, all tests shall be made in accordance with the methods specified in Sections 9-124 which include test procedures for the following:

Tests:	Sections
Test A Density Test	9-15
Test B ₁ Indentation Force Deflection Test—Specified Deflection	16-22
Test B ₂ Indentation Force Deflection Test—Specified Force	23-29
Test C Compression Force Deflection Test	30-36
Test D Constant Deflection Compression Set Test	37-44
Test E Tension Test	45-52
Test F Tear Resistance Test	53-60
Test G Air Flow Test	61-67
Test H Resilience (Ball Rebound) Test	68-75
Test I ₁ Static Force Loss Test at Constant Deflection	77-85
Test I ₂ Dynamic Fatigue Test by the Roller Shear at Constant Force,	86-94
Test I ₃ Dynamic Fatigue Test by Constant Force Pounding	95-103
Test I ₄ Dynamic Fatigue Test for Carpet Cushion	104-112
Test J Steam Autoclave Aging	113-118
Test K Dry Heat Aging	119-124

Appendices:

- X1. Suggested Method for Specifying Flexible Urethane Foams

¹ These test methods are under the jurisdiction of ASTM Committee D-20 on Plastics and are the direct responsibility of Subcommittee D20.22 on Cellular Plastics.

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² Annual Book of ASTM Standards, Vol 09.01.

³ Annual Book of ASTM Standards, Vol 04.07.