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Standard Specification for Urethane Microcellular Shoe Soling Materials[1]

This standard is issued under the fixed designation D 3851; 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.

ε[1] NOTE—Editorially added Test Method D 2240 for reference in March 2003.

1. Scope*

1.1 This specification covers urethane microcellular materials for shoe soling applications. It provides properties and dimensional requirements and test methods for specific properties.

1.2 SI units are to be regarded as the preferred units of measurements for values. The inch-pound values in brackets can be used if there is an agreement between the contractual parties.

NOTE 1—There is no similar or equivalent ISO standard.

2. Referenced Documents

2.1 *ASTM Standards:*

D 412 Test Methods for Vulcanized Rubber and Thermoplastic Rubbers and Thermoplastic Elastomers— Tension[2]

D 624 Test Method for Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomers[2]

D 1052 Test Method for Measuring Rubber Deterioration—Cut Growth Using Ross Flexing Apparatus[2]

D 1938 Test Method for Tear Propagation Resistance of Plastic Film and Thin Sheeting by a Single-Tear Method[3]

D 2240 Test Method for Rubber Property—Durometer Hardness[4]

D 3489 Test Methods for Rubber—Microcellular Urethane[5]

3. Classification

3.1 This specification covers three grades of microcellular urethane materials that may be selected for use according to abrasion resistance, cut-growth resistance, and other physical properties. The grades are classified as Grade 1, Grade 2, and Grade 3.

4. Ordering Information

4.1 Any product represented as complying with this specification shall meet all the requirements listed herein for its particular classification.

5. Physical Requirements

5.1 The material shall conform to requirements for physical properties prescribed in Table 1.

6. Test Methods

6.1 The physical tests shall be in accordance with Test Method D 3489.

6.2 *Material Shrinkage*—After removal from the mold, allow the part to cool to room temperature. Measure the largest dimensions of the part and the mold at room temperature to the nearest 0.02 mm or 0.001 in. Calculate the percent change as follows:

$$\% \text{ change in length} = \frac{L_m - L_p}{L_m} \times 100 \quad (1)$$

where:

L_m = length of mold at room temperature, and

L_p = length of molded part at room temperature.

NOTE 2—An alternative method for determining material shrinkage is given in Annex A1.

7. Inspection

7.1 Inspection of the material shall be agreed upon in writing between the purchaser and the seller as part of the purchase contract.

7.2 Testing for conformance to requirements shall be done in accordance with this specification and Test Methods D 3489.

[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.

Current edition approved March 10, 2003. Published May 2003. Originally approved in 1980. Last previous edition approved in 1997 as D 3851 – 97.

This revision includes the addition of an ISO equivalency statement and a keyword section. It also establishes SI units as the preferred units but allows for the use of inch-pound units.

[2] *Annual Book of ASTM Standards*, Vol 09.01.

[3] *Annual Book of ASTM Standards*, Vol 08.02.

[4] *Annual Book of ASTM Standards*, Vol 09.01.

[5] *Annual Book of ASTM Standards*, Vol 09.02.

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