



Designation: D 3851 – 97

## Standard Specification for Urethane Microcellular Shoe Soling Materials<sup>1</sup>

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.

### 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 parentheses 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<sup>2</sup>

D 624 Test Method for Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomers<sup>2</sup>

D 1052 Test Method for Measuring Rubber Deterioration—Cut Growth Using Ross Flexing Apparatus<sup>2</sup>

D 1938 Test Method for Tear Propagation Resistance of Plastic Film and Thin Sheeting by a Single-Tear Method<sup>3</sup>

D 3489 Test Methods for Rubber—Microcellular Urethane<sup>4</sup>

### 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.

### 8. Retest and Rejection

8.1 If any failure occurs, the materials may be retested to establish conformity in accordance with agreement between the purchaser and the seller.

### 9. Packaging, Marking, and Labeling

9.1 *Packaging*—The material shall be packed in standard commercial containers, so constructed as to ensure acceptance by common or other carriers for safe transportation at the lowest rate to the point of delivery, unless otherwise specified in the contract or order.

9.2 *Marking*—The shipping container shall be marked with the name, type, and quality of material in accordance with the contract or order under which the shipment is made. The shipping container shall also be marked with the name of the manufacturer and the contract or order number.

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

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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.

<sup>2</sup> *Annual Book of ASTM Standards*, Vol 09.01.

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

<sup>4</sup> *Annual Book of ASTM Standards*, Vol 09.02.