



# Standard Specification for Fiberglass Reinforced Styrene-Butadiene-Styrene (SBS) Modified Bituminous Sheets with a Factory Applied Metal Surface<sup>1</sup>

This standard is issued under the fixed designation D 6298; 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 ( $\epsilon$ ) indicates an editorial change since the last revision or reapproval.

## 1. Scope

1.1 This specification covers fiberglass reinforced modified bituminous sheet materials which use styrene-butadiene-styrene (SBS) thermoplastic elastomer as the primary modifier, and are surfaced with a factory applied continuous metal foil. These materials are intended for use in the fabrication of multiple ply roofing and waterproofing membranes and flashings.

1.2 This specification is intended as a material specification only. Questions regarding the suitability of the specific roof constructions or application techniques are beyond the scope of this specification.

1.3 The specified tests and property limits are intended to establish minimum properties. In place roof system design criteria such as fire resistance, field strength, impact/puncture resistance, material compatibility, uplift resistance, and others, are factors beyond the scope of this specification.

1.4 The values stated in inch-pound units are to be regarded as the standard. The SI units given in parentheses are for information only.

1.5 The following precautionary statement pertains to the test method portion only, Section 8 of this Specification: *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.*

## 2. Referenced Documents

### 2.1 ASTM Standards:

D 1079 Terminology Relating to Roofing, Waterproofing, and Bituminous Materials<sup>2</sup>

D 5147 Test Methods for Sampling and Testing Modified Bituminous Sheet Materials Used in Roofing and Waterproofing<sup>2</sup>

<sup>1</sup> This specification is under the jurisdiction of ASTM Committee D-08 on Roofing, Waterproofing and Bituminous Materials and is the direct responsibility of Subcommittee D08.04 on Felts and Fabrics.

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<sup>2</sup> Annual Book of ASTM Standards, Vol 04.04.

### 2.2 Canadian General Standards Board Document:

Canadian General Standards Board, CGSB 37-GP-56M Standard For: Membrane, Modified, Bituminous, Prefabricated, and Reinforced for Roofing<sup>3</sup>

## 3. Terminology

### 3.1 Definitions:

3.1.1 For definitions of terms used in this specification, refer to Definitions D 1079.

## 4. Materials and Manufacture

4.1 In the process of manufacture, the fiberglass reinforcement is impregnated and coated on both sides with a SBS modified bituminous coating. The sheet is surfaced with a continuous metal foil except for any selvage. The SBS modified bituminous coating may be compounded with a fine mineral stabilizer.

4.2 The metal surfacing shall be omitted on any selvage. To prevent sticking in the roll, the reverse side and selvage may be covered with a fine mineral or other surfacing that will not interfere with the adhesion or bonding of the lap during application.

4.3 Foil-faced products intended for use where the application is to be by heat welding (torching) shall meet the minimum back surface coating requirement found in Table 1.

## 5. Physical Properties

5.1 The sheet material shall conform to the physical properties prescribed in Table 1.

5.2 The finished product shall not crack nor be so sticky as to cause other material damage upon being unrolled at product temperatures between 40 and 140°F (4 and 60°C).

## 6. Dimensions, Mass, and Permissible Variations

6.1 The width of the roll shall be as agreed between the purchaser and the seller and shall not vary more than  $\pm 1\%$ .

6.2 The area of the roll shall not be less than as agreed upon between the purchaser and seller.

<sup>3</sup> Available from Canadian General Standards Board, 222 Queen Street, Suite 1402, Ottawa, ON K1A1G6.

**TABLE 1 Properties of SBS Modified Bituminous Sheet Materials Surfaced With a Factory Applied Metal Foil**

Description			
Thickness, min mils (mm)		134	(3.4)
Net Mass per Unit Area, min lb/100 ft <sup>2</sup> (kg/m <sup>2</sup> )		80	(3.9)
Back Surface Coating Thickness min, mils (mm)		40	(1)
Maximum Load min. value lbf/in. (kN/m)	0°F	160	(28.0)
	73°F	85	(14.9)
Elongation at Maximum Load min value %	0°F	3	...
	73°F	5	...
Ultimate Elongation min value %	73°F	25	...
Tensile-Tear Strength, min. lbf (kN)		120	(0.53)
Low Temp. Flex max °F (°C)		0	(-18)
Dimensional Stability, max (%)		0.2	...
Compound Stability min passing °F (°C)		225	(107)
Thermal Shock Stability, max. % (mm/m)		0.2	(2)
Water Absorption max (%)		1.0	...
Moisture Content (max %)		0.2	...

6.3 The selvage width shall be within  $\pm \frac{1}{4}$  in. (6.4 mm) of the nominal value and shall not be less than 2.25 in. (57 mm).

## 7. Workmanship, Finish and Appearance

7.1 The finished product shall be completely coated in a continuous, unbroken film and shall be free of such defects as holes, ragged or untrue edges, breaks, cracks, tears, protrusions, delaminations, and indentations.

7.2 The metal surface shall be uniform in surface and texture, that is, free from such defects as holes, breaks tears, protrusions, and indentations (except for intended factory embossing pattern).

7.3 The line of demarcation between the metal-surfaced portion of the weather side and any selvage shall be straight and parallel to the edge of the sheet.

7.4 When unrolled on a smooth plane, the sheet shall be flat, straight, and true so the lap will mate with the adjacent sheet within the tolerance of the lap without wrinkles, buckles, or fishmouths.

## 8. Sampling and Test Methods

8.1 Sample the material and determine the properties described in this specification in accordance with Test Method D 5147 unless otherwise indicated.

8.2 *Ultimate Elongation*—Sample the material and determine the ultimate elongation at  $73.4 \pm 3.6^\circ\text{F}$  ( $23 \pm 2^\circ\text{C}$ ) in accordance with Section 6 of Test Method 5147, and as described herein. Ultimate elongation is defined as the elongation measured on the load-elongation curve at which point the load has dropped to 5 % of its maximum value.

8.3 Sample the material and determine the cyclic thermal shock stability according to CGSB (Canadian General Standards Board) 37-GP-56M with the following exceptions.

### 8.3.1 Sampling and Test Specimens:

8.3.1.1 This test consists of exposing two specimens of  $79.0 \pm 0.2$  by  $3.5 \pm 0.2$  in. ( $2000 \pm 5$  by  $90 \pm 5$  mm) to cyclic variations of temperature produced by infrared radiation. The variation in dimension is measured in relation to the number of cycles and temperature variation.

8.3.1.2 The specimens shall be cut  $8 \pm 0.4$  in. ( $200 \pm 10$  mm) from each edge of the sheet and parallel to the length of the roll.

### 8.3.2 Procedure:

8.3.2.1 Each cycle shall be 6 h and consist of:

8.3.2.2 Four h  $\pm$  10 min of heating at  $160 \pm 5^\circ\text{F}$  ( $71 \pm 2.8^\circ\text{C}$ ) (standardized conditions) 2 h  $\pm$  10 min of cooling at  $70 \pm 3.6^\circ\text{F}$  ( $21 \pm 2^\circ\text{C}$ ). This cycle can be extended to allow for non-monitored periods such as at night.

8.3.2.3 Prior to the first heating cycle measure and record the initial gap setting between the reference points, and use this as the zero point. After each cooling and heating period measure the change in dimension at each end of the test specimen and enter it on a graph. Read and record the number of cycles on the X-axis. Read and record the percent change in dimension of the Y-axis.

### 8.3.3 Interpretation of Results:

8.3.3.1 To pass the test, the variations in dimension (expansion or contraction) shall not exceed 0.1 % in the length of sheet between the 10th and 30th cycles, nor shall it exceed 0.2 % at any time during the test. Wrinkling, buckling, or delamination of the foil surfacing from the modified bitumen compound shall also constitute a failure. Both specimens must pass the test in order for the sample to pass.

8.3.3.2 Report the total movement, movement between first and last cycle, and whether the specimens passed or failed the test, and the mode of failure.

8.3.4 *Precision and Bias*—The precision and bias of this test method has not been established. Round robin test will be conducted to establish these values.

## 9. Inspection

9.1 Inspection of the finished material shall be made as agreed upon by the purchaser and the supplier.

## 10. Rejection and Resubmittal

10.1 Failure to conform to any one of the requirements in this specification shall constitute grounds for rejection. In cases of rejection, the seller shall have the right to reinspect the shipment and resubmit the lot after removal of those rolls not conforming to the specified requirements.

## 11. Packaging and Package Marking

11.1 The finished material shall be furnished as rolls. The

rolls shall be securely wrapped to prevent shifting of material and to permit normal handling. There shall be no manufacturing splices in the roll, and there shall be no more than two pieces.

11.2 Unless otherwise agreed upon by the seller and purchaser, each product package shall be plainly marked with the supplier's name, the product brand, the ASTM designation, the

net coverage area, and the type bitumen if not evident in the label name of the product.

## **12. Keywords**

12.1 glass reinforcement; metal foil surface; modified bituminous sheet; styrene-butadiene-styrene (SBS); thermoplastic elastomer

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