Designation: ~~D6162/D6162M – 16~~ D6162/D6162M – 21

Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using a Combination of Polyester and Glass Fiber Reinforcements[1]

This standard is issued under the fixed designation D6162/D6162M; 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 prefabricated modified bituminous sheet materials reinforced with a combination of polyester fabric and glass fiber, with or without granules, which use styrene butadiene styrene (SBS) thermoplastic elastomer as the primary modifier and are intended for use in the fabrication of multiple ply roofing and waterproofing membranes.

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

1.3 The specified tests and property limits used to characterize the sheet materials 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 material specification.

1.4 The values stated in either SI units or inch-pound units are to be regarded separately as standard. The values stated in each system may not be exact equivalents; therefore, each system shall be used independently of the other. Combining values from the two systems may result in ~~non-conformance~~nonconformance with the standard.

1.5 *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]

D1079 Terminology Relating to Roofing and Waterproofing

D5147/D5147M Test Methods for Sampling and Testing Modified Bituminous Sheet Material

3. Terminology

3.1 *Definitions*—For definitions of terms used in this specification, refer to Terminology D1079.

[1] This specification is under the jurisdiction of ASTM Committee D08 on Roofing and Waterproofing and is the direct responsibility of Subcommittee D08.04 on Felts, Fabrics and Bituminous Sheet Materials.

Current edition approved ~~Nov. 1, 2016~~Dec. 1, 2021. Published ~~November 2016~~December 2021. Originally approved in 1997. Last previous edition approved in ~~2015~~2016 as ~~D6162/D6162M – 00a (2015)~~D6162/D6162M – 16.~~ε1~~. DOI: ~~10.1520/D6162_D6162M-16.~~10.1520/D6162_D6162M-21.

[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.

4. Classifications

4.1 Modified bituminous sheet materials reinforced with a combination of polyester fabric and glass fiber reinforcement, Type I, Type II, and Type III are covered by this specification.

4.2 The following grades are used to describe the material surfacing:

4.2.1 Grade *G*—Granule surfaced.

4.2.2 Grade *S*—Smooth surfaced.

5. Material and Manufacture

5.1 In the process of manufacture, the reinforcement is saturated with asphalt or modified asphalt and is impregnated and coated on both sides with an ~~SBS modified~~ SBS-modified bituminous coating. The ~~SBS modified~~ SBS-modified bituminous coating shall be permitted to be compounded with a mineral stabilizer.

5.2 The Grade *G* sheet is surfaced on the weather side with mineral granules, except for any selvage. To prevent sticking in the roll, the reverse side and any selvage shall be permitted to be covered with a mineral or any other surfacing that will not interfere with adhesion or bonding of the lap during application.

5.3 Sheet material intended for application by heat welding (torching) shall meet the minimum bottom coating requirement found in Table 1.

6. Physical Properties

6.1 The sheet shall conform to the minimum physical properties prescribed in Table 2.

6.2 The finished product shall not crack nor be so sticky as to cause tearing or other material damage upon being unrolled at any product temperature between 4 and ~~60°C~~60 °C [40 and ~~140°F~~].140 °F].

7. Dimensions, Mass, and Permissible Variations

7.1 The finished product shall conform to the following dimensions and variations:

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

7.1.2 The area of the roll shall be no less than as agreed between the purchaser and the seller.

7.1.3 The selvage width shall be within 6.4 mm [¼ in.] of the nominal selvage width and shall be not less than 76.2 mm [3 in.] in width without a laying line and 63.5 mm [2.5 in.] in width if the sheet has a laying line. If a laying line is provided, the line must not be less than 76.2 mm [3 in.] from the edge of the sheet.

TABLE 1 Dimensions and Masses of ~~SBS Modified~~ SBS-Modified Bituminous Sheet Materials Using a Combination of Polyester and Glass Fiber Reinforcements

Description	Type I	Type II	Type III
Thickness, min, mm [mils],			
Grade *S*	1.8 [70]	2.0 [80]	2.0 [80]
Grade *G*	2.8 [110]	3.3 [130]	3.5 [135]
Net mass per unit area, min., g/m^2, [lbs/100 ft^2]			
Grade *S*	2197 [45]	2441 [50]	2685 [55]
Grade *G*	2929 [60]	3661 [75]	4150 [85]
Bottom coating thickness, heat welding application products, min, mm [mils]			
Grade *S*	1.0 [40]	1.0 [40]	1.0 [40]
Grade *G*	1.0 [40]	1.0 [40]	1.0 [40]

TABLE 2 Physical Properties of ~~SBS Modified~~ SBS-Modified Bituminous Sheet Materials Using a Combination of Polyester and Glass Fiber Reinforcements[A]

Property	Type I Grade: *G* and *S*	Type II Grade: *G* and *S*	Type III Grade: *G* and *S*
~~Peak load at −18 ± 2°C [0 ± 3.6°F], MD and XMD, before and after heat conditioning,~~ Peak load at −18 ± 2 °C [0 ± 3.6 °F], MD and XMD, before and after heat conditioning, min, kN/m [lbf/in.]	13.1 [75]	21.9 [125]	44 [250]
~~Elongation at −18 ± 2°C [0 ± 3.6°F], MD and XMD, at peak load, before and after~~ Elongation at −18 ± 2 °C [0 ± 3.6 °F], MD and XMD, at peak load, before and after heat conditioning, min, %	1	2	2
~~Peak load at 23 ± 2°C [73.4 ± 3.6°F], MD and XMD, before and after heat conditioning,~~ Peak load at 23 ± 2 °C [73.4 ± 3.6 °F], MD and XMD, before and after heat conditioning, min, kN/m [lbf/in.]	13.1 [75]	14 [80]	44 [250]
~~Elongation at 23 ± 2°C [73.4 ± 3.6°F], MD and XMD, at peak load, before and after~~ Elongation at 23 ± 2 °C [73.4 ± 3.6 °F], MD and XMD, at peak load, before and after heat conditioning, min, %	2	4	3
~~Ultimate elongation 23 ± 2°C [73.4 ± 3.6°F], MD and XMD, min, %~~ Ultimate elongation 23 ± 2 °C [73.4 ± 3.6 °F], MD and XMD, min, %			
as manufactured:	26	75	3
after heat conditioning:	9	30	3
~~Tear strength at 23 ± 2°C [73.4 ± 3.6°F], min, N [lbf]~~ Tear strength at 23 ± 2 °C [73.4 ± 3.6 °F], min, N [lbf]	~~289 [65]~~ 289 [65]	~~400 [90]~~ 400 [90]	~~1245 [280]~~ 1245 [280]
~~Low-temperature flexibility, before and after heat conditioning,~~ Low-temperature flexibility, before and after heat conditioning, max, °C [°F]	−18 [0]	−18 [0]	−18 [0]
Dimensional stability, max, %	0.5	0.5	0.5
~~Compound stability at 107°C [225°F]~~ Compound stability at 107 °C [225 °F]	~~no failures~~ no failures	~~no failures~~ no failures	~~. . .~~ . . .
~~Compound stability at 91°C [195°F]~~ Compound stability at 91 °C [195 °F]	~~. . .~~ . . .	~~. . .~~ . . .	~~no failures~~ no failures
~~Granule embedment, max, g~~ Granule embedment, max loss, g (Grade *G* only)	2	2	2

[A] The properties in this table are "as manufactured" unless otherwise noted.

7.2 The mass and thickness of the finished product shall be as prescribed in Table 1.

8. Workmanship, Finish, and Appearance

8.1 The finished product shall be coated completely in a continuous, unbroken film and shall be free of such defects as holes, tears, cracks, wrinkles or permanent deformations, blisters, ragged or untrue edges, and areas of uncoated reinforcement.

8.2 The surface of the weather side shall be uniform in finish and texture.

8.3 For Grade *G* material, the mineral granules shall be distributed uniformly over the entire surface in an even layer excluding