



Designation: D7051 – 05 (Reapproved 2020)

Standard Test Method for Cyclic Thermal Shock of SBS-Modified Bituminous Roofing Sheets with Factory-Applied Metal Surface¹

This standard is issued under the fixed designation D7051; 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 test method covers the measurement of movement due to cyclic thermal exposure of SBS (styrene-butadiene-styrene)-modified bituminous sheets with a factory-applied metal foil surface.

1.2 The values stated in SI units are to be regarded as standard. The values in parentheses are for information only.

1.3 *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, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.4 *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

C552 Specification for Cellular Glass Thermal Insulation
D41/D41M Specification for Asphalt Primer Used in Roofing, Dampproofing, and Waterproofing
D312/D312M Specification for Asphalt Used in Roofing
D5147/D5147M Test Methods for Sampling and Testing Modified Bituminous Sheet Material

3. Summary of Test Method

3.1 This test consists of exposing two specimens of 2000 ± 5 by 90 ± 5 mm (78.7 ± 0.2 by 3.5 ± 0.2 in.) to cycles of temperature produced by infrared radiation. The variation in

¹ This test method 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.

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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.

the specimen length dimension is measured in relation to the number of cycles and temperature variation. This test applies to metal foil surfaced SBS-modified bitumen roofing sheets.

4. Significance and Use

4.1 This test method is used to determine the dimensional changes and physical stability of the product upon exposure to specified cyclic thermal conditions. It is also useful in determining the integrity of the bond between the metal foil and the SBS-modified bituminous compound.

5. Apparatus

5.1 The apparatus and test assembly as shown in Figs. 1-4 consist of the following components.

5.2 A hollow metal, rigid support or base on which the test sample is mounted, hereafter referred to as the shock table. The base shall be 2110 ± 25 mm long by 280 ± 25 mm wide by 125 ± 13 mm tall (83 ± 1.0 in. long by 11 ± 1.0 in. wide by 5 ± 0.5 in. tall). The shock table shall have water inlet and outlet attachments mounted such that the support is always full of circulating water. This is done to avoid expansion or contraction of the shock table during the test.

NOTE 1—The support can be easily constructed by welding two pieces of wide channel iron together with the addition of end plates.

5.3 Mounting brackets for the measuring devices shall be attached to the shock table such that the measuring device is level with and facing the metal reference tabs attached to the foil surface of the specimens (see 6.4).

5.4 Linear transducers, or dial indicators, accurate to $10 \mu\text{m}$ (0.4 mil) shall be used to measure the change in distance between the adhered metal reference tab and the mounted indicator.

5.5 Six or more 250 W infrared heating lamps are mounted above the support equally spaced across the 2000 mm (79 in.) test length.

NOTE 2—The number of lamps is not critical as long as the temperature is accurate and consistent.

5.6 Sheet metal panels, or other suitable protection, shall be mounted on the sides and ends of the hollow support to reduce drafts and temperature fluctuations during the test. The panels should be easily removed to allow for daily observations of the test assembly.