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Standard Guide for Application of Heat Weldable Modified Bituminous Waterproofing Membranes Systems for New Concrete Decks¹

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1. Scope

1.1 This guide presents application recommendations for the heat welding installation of multi-ply Styrene Butadiene Styrene (SBS) and Atactic Polypropylene (APP) modified bituminous systems to new, reinforced, cast in place structural concrete used as part of a horizontal waterproofing system over occupied spaces of buildings where covered by a separate wearing course.

1.2 For the purpose of this guide, the substrate shall be structurally sound, sloped to drain, able to accept the weight of the membrane and other system materials, and meet the local building code requirements. Similarly, all components of the waterproofing system are assumed to comply with any federal, state, and local environmental regulations that may be in effect at the time of installation. Expansion joints, insulation, drainage layers, filter sheets, overburden, and the wearing surfaces are beyond the scope of this guide.

1.3 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 with the standard.

1.4 *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:²

¹ This guide is under the jurisdiction of ASTM Committee D08 on Roofing and Waterproofing and is the direct responsibility of Subcommittee D08.22 on Waterproofing and Dampproofing Systems.

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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.

D41 Specification for Asphalt Primer Used in Roofing, Dampproofing, and Waterproofing

D1079 Terminology Relating to Roofing and Waterproofing

D3019 Specification for Lap Cement Used with Asphalt Roll Roofing, Non-Fibered, Asbestos-Fibered, and Non-Asbestos-Fibered

D4586 Specification for Asphalt Roof Cement, Asbestos-Free

D5295 Guide for Preparation of Concrete Surfaces for Adhered (Bonded) Membrane Waterproofing Systems

D5898 Guide for Details for Adhered Sheet Waterproofing

D5957 Guide for Flood Testing Horizontal Waterproofing Installations

D6162 Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using a Combination of Polyester and Glass Fiber Reinforcements

D6163 Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using Glass Fiber Reinforcements

D6164 Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using Polyester Reinforcements

D6222 Specification for Atactic Polypropylene (APP) Modified Bituminous Sheet Materials Using Polyester Reinforcements

D6223 Specification for Atactic Polypropylene (APP) Modified Bituminous Sheet Materials Using a Combination of Polyester and Glass Fiber Reinforcements

D6451 Guide for Application of Asphalt Based Protection Board

D6506 Specification for Asphalt Based Protection Board for Below-Grade Waterproofing

2.2 American Concrete Institute Standard:³

ACI 301 Specifications for Structural Concrete for Buildings

³ Available from American Concrete Institute (ACI), P.O. Box 9094, Farmington Hills, MI 48333-9094, <http://www.concrete.org>.

2.3 *FMRC Standard*:⁴

FM 4470 Approval Standard, Class Roof Covers, latest edition, where applicable for corrosion resistant components

NRCA / MRCA Certified Roofing Torch Applicator (CERTA) Program

3. Terminology

3.1 For definitions of terms, see Terminology **D1079**.

3.2 *Definitions of Terms Specific to This Standard*:

3.2.1 *construction joint*—a butt joint formed in a structural slab in order to end one pour and start another pour later. The joint is usually a cold joint and may be held together with reinforcing steel in the slab, or the steel may be discontinuous by design.

3.2.2 *heat welding*—the adhering or joining, or both, of the modified bitumen membrane sheet to itself or the substrate, or both, with a torch, hot air, or other means of direct thermal contact.

4. Significance and Use

4.1 This guide provides general procedures, information, guidelines, and precautions for the application of heat welded modified bituminous waterproofing systems used as part of a horizontal waterproofing system.

4.2 This guide is not all-inclusive and is intended only to supplement detailed instructions from designers and system manufacturers.

4.3 The horizontal deck or substrate referred to in this guide is reinforced cast-in-place structural concrete.

5. Storage and Handling of Materials

5.1 Store materials on raised platforms or pallets. Store rolls on end with selvage ends up. Materials shall be stored in a dry, ventilated, and weatherproof location. Avoid damage or embedment of foreign materials.

5.2 Store membrane materials to prevent system supplier's markings from being destroyed.

5.3 Store primer in tightly closed original containers at temperatures recommended by the system supplier. Do not transfer contents of one container to another container. Do not mix different materials. Do not thin primer, except as directed by the system manufacturer.

5.4 Modified bituminous rolls and other materials are to be brought to the job site in good condition, handled so as not to be damaged.

6. Environmental Conditions

6.1 Do not install sheet material during inclement weather, on wet or frost-covered surfaces, during rainfall, blowing dust, or high winds that will inhibit or interfere with sheet material adhesion.

6.2 Follow recommendations of system supplier for system application procedures when ambient temperatures are below 5°C [40°F].

6.3 Surfaces to receive the membrane shall be protected from dirt and debris.

7. Materials

7.1 *Modified Bituminous Sheet*—Prefabricated modified bituminous sheets reinforced with either polyester or glass fiber fabrics or a combination of the two which use styrene butadiene styrene (SBS) or atactic polypropylene (APP) as the primary modifier and meet the requirements of Specifications **D6162**, **D6163**, **D6164**, **D6222**, **D6223**, or **D6506**.

7.2 *Primer*, asphalt primer. See Specification **D41**.

7.3 *Roof Cement*, asphalt roof cement. See Specifications **D4586** and **D3019**.

7.4 *Protection Board*, asphalt based protection board. See Specification **D6506**.

7.5 *Mechanical Affixments*—The mechanical fasteners and stress distribution bars or strips specified for use in the system must meet the corrosion guidelines outlined in FMRC Standard 4470.

7.6 *Joint Filler*, material used to mostly fill construction joints in concrete prior to the application of a sealant.

7.7 *Sealant*, material that is used to fill and seal a crack prior to the application of a waterproofing material.

8. Substrate Preparation

8.1 The structural slab should have a finish of sufficiently rough texture to provide a mechanical bond for the membrane but not so rough to preclude achieving continuity of the membrane across the surface. The minimum finish is an ACI 301 float finish; an ACI 301 trowel finish, without the final troweling, is preferred. Refer to Guide **D5295** for additional surface preparation guidelines.

8.2 Refer to the membrane manufacturer for guidelines related to the moisture content of the concrete or the appropriate methods to mitigate loss of adhesion over new concrete, or both.

8.3 Surfaces to receive modified bituminous sheets are to be frost-free and dry, clean, and free of contaminants such as dirt, debris, loose material, cracks, laitance, voids, and sharp projections which would prevent satisfactory installation. See Guide **D5295**, Sections 5, 6, and 7, for repairs, surface preparation, and evaluation.

8.4 Apply primer at the rate of 0.2 to 0.6 L/m² [0.5 to 1.5 gal/100 ft²] or as recommended by system supplier/manufacturer. Allow to dry. Minimum drying time is one hour or as recommended by manufacturer. Drying time of primer varies with temperature and humidity conditions.

8.5 After the primer is applied and has dried, the area must be covered with the modified bituminous sheets on the same day or the substrate must be reprimed.

⁴ Available from Factory Mutual Research, 11511 Boston-Providence Turnpike, P.O. Box 9102, Norwood, MA 02062-9102.