



Standard Guide for Application of Fully Adhered, Cold-Applied, Prefabricated Reinforced Modified Bituminous Membrane Waterproofing Systems¹

This standard is issued under the fixed designation D 6769; 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 guide lists application and installation requirements for fully adhered, cold-applied, prefabricated modified bituminous membrane waterproofing systems for below-grade or below-wearing-surface (such as plaza decks) vertical or horizontal applications.

1.2 For the purposes of this application guide, the substrate is assumed to be structurally sound, sloped to drain (if new construction), and meeting the local building code requirements. Similarly, the system components are assumed to comply with all federal, state, and local requirements in effect at the time of installation.

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

1.4 *This guide may involve hazardous materials, operations, and equipment. 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 requirements prior to use.*

2. Referenced Documents

2.1 ASTM Standards:

D 1079 Terminology Relating to Roofing, Waterproofing, and Bituminous Materials²

D 5295 Guide for Preparation of Concrete Surfaces for Adhered (Bonded) Membrane Waterproofing Systems²

D 5898 Guide for Standard Details for Adhered Sheet Waterproofing²

D 5957 Guide for Flood Testing Horizontal Waterproofing Installations²

3. Terminology

3.1 Definitions:

3.1.1 *lift, n*—the height or length of sheet that may be

comfortably handled by the person applying the sheet to a vertical surface. This is normally the height of this person, or 1.5 to 2.1 m (5 to 7 ft).

3.1.2 *skin over, n*—a condition in which the surface of the material is no longer tacky, but will move under slight finger pressure.

3.1.3 *tack, n*—a condition in which if the surface is touched, there will be a string of material attached to the finger.

3.2 For definitions of other terms relating to waterproofing, see Terminology D 1079.

4. Significance and Use

4.1 This guide outlines general procedures for the storage and application of various prefabricated sheets made using modified bituminous materials and intended for use as below-grade and below-wearing-surface waterproofing.

4.2 The substrate used for applications described in this guide shall be concrete or masonry.

4.3 This application consists of a prefabricated reinforced modified bituminous sheet applied to a suitable substrate using a bituminous-based, cold-applied adhesive or mastic. Application rates given are typical for such installations.

4.4 This guide is intended to supplement instructions from designers and manufacturers.

5. Delivery of Materials

5.1 Deliver materials in supplier's original containers and packaging.

6. Storage and Handling

6.1 Store adhesive or mastic in tightly closed original containers under the conditions recommended by the manufacturer.

6.2 Store the modified bituminous sheet in the manufacturer's original packaging in the manner specified by the manufacturer. Storage on wood pallets and stacking usually no more than five rolls high is recommended. Protect against exposure to direct sunlight, precipitation, dust, and other such contaminants. If inside storage is not available, tarp only with canvas tarpaulins; do not use polyethylene or other nonbreathing films

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

Current edition approved Feb. 10, 2002. Published April 2002.

² *Annual Book of ASTM Standards*, Vol 04.04.

to cover the packages.

7. Safety Precautions

7.1 Store flammable materials in a manner that will not pose a fire hazard. Solvent-bearing adhesives may be flammable. Do not use flammable materials near an open flame or equipment that may produce sparks.

8. Environmental Conditions at Time of Application

8.1 Environmental conditions under which installation may proceed shall be as recommended by the manufacturer of the adhesive and the sheet. Acceptable weather conditions would be dry enough to allow the mastic to adhere to the substrate, without excessive wind conditions and with surface temperatures of the substrate at 4°C (40°F) or above and rising. Contact the manufacturer for recommendations whenever weather conditions raise questions.

9. Materials

9.1 The waterproofing sheet shall be made using a fabric of open weave glass and polyester, or both, which in turn is encapsulated in a chloroprene- and butyl-rubber-modified asphalt that also contains fillers, slow-curing agents, and ultraviolet inhibitors.

9.2 The adhesive or mastic shall be made using an asphalt cutback with a Rule-66-type solvent into which has been blended chloroprene- and butyl-type rubbers for plasticity along with inorganic fillers and ultraviolet inhibitors.

10. Substrate Preparations

10.1 Contaminants such as dirt, debris, loose materials moisture, or surface irregularities that would interfere with the satisfactory installation and performance of the system shall be removed. See Guide D 5295 for further details about surface preparation.

11. Installation

11.1 Apply the adhesive at a rate of 0.5 to 0.6 L/m² (1.25 to 1.5 gal/100 ft²) as a thin coat and allow to dry to a tacky condition before covering with membrane so as to minimize blistering of the applied membrane. Apply only as much adhesive as can be covered with membrane before the adhesive loses its tack. Rub in the membrane by brooming, handrolling, or similar method.

11.2 Installation of reinforcement material is required at all transitions, such as internal and external corners and at static concrete construction joints and cracks. Reinforcement is also required where reinforcing bars, pipes, and conduits penetrate the membrane. The minimum reinforcement is one ply; the preferred is two plies.

11.2.1 Installations of reinforcement membrane applications are made before the normal sheet applications.

11.2.2 Where additional plies are used for reinforcement, they shall extend at least 150 mm (6 in.) beyond the corner or penetration in each direction; each succeeding ply shall extend at least 75 mm (3 in.) beyond the previous ply and shall be adhered to the previous reinforcement layer with additional adhesive.

11.2.3 The details used shall be as presented in Guide

D 5898, unless otherwise specified by the manufacturer or designer.

11.2.4 All laps are to be inspected and sealed with adhesive at the rate of 0.2 to 0.3 L/m² (0.5 to 0.75 gal/100 ft²).

11.3 For horizontal surfaces, the membrane sheet is applied over the completed details on a surface previously coated with adhesive applied at the rate of 0.5 to 0.6 L/m² (1.25 to 1.5 gal/100 ft²). Although one ply does cover, the use of a second ply is suggested for better protection; this would be applied over a similar application of adhesive.

11.3.1 Apply all sheets from the low point to the high point so that the laps shed water.

11.3.2 Lap all edge seams a minimum of 100 mm (4 in.) ± 25 mm (1 in.). Stagger all end laps a minimum of 300 mm (12 in.). Continue the sheets 75 to 100 mm (3 to 4 in.) up any vertical edges already flashed with the system. Place sheets with special attention so that total contact with the substrate is maintained, that is, no bridging is allowed.

11.3.3 If this is a single-ply application, uniformly top coat the applied membrane with the adhesive at the rate of 0.6 to 0.7 L/m² (1.5 to 1.75 gal/100 ft²) as a finish coat.

11.3.4 If this is a multiple-ply application, coat the top of the first ply with adhesive at the rate of 0.3 to 0.4 L/m² (0.75 to 1.0 gal/100 ft²). Allow to dry to tack. Smoothly embed the second ply. Offset the side laps of the second ply from the first-ply sheet joints; offset the end laps a minimum of 100 to 150 mm (4 to 6 in.). If additional plies are to be installed, follow the same application of adhesive and displacement of laps as in the second ply application. A finish coat shall be applied as described in 11.3.3.

11.3.5 Flood testing shall be done before application of the final top coat of adhesive. The procedure to be used is described in Guide D 5957. The surface of the bituminous material shall have skinned over before water application.

11.3.6 If protection board or sheet is to be used, it shall be adhered to the membrane using the adhesive finish coat. If in solid panels, the panels shall be applied in a common brick pattern.

11.4 For applications to vertical surfaces, the prefabricated membrane shall be applied in vertical strips, like wallpaper, unless otherwise allowed by the manufacturer or designer.

11.4.1 For single-ply applications:

11.4.1.1 Uniformly coat the substrate to be waterproofed with adhesive applied at the rate of 0.6 to 0.7 L/m² (1.5 to 1.75 gal/100 ft²) and allow to dry to tack.

11.4.1.2 Use 1.5- to 2.1-m (5- to 7-ft) precut lengths of the membrane coated across the top edge of the sheet with a 100- to 125-mm (4- to 5-in.) band of the adhesive. Allow this band of adhesive to tack before smoothly embedding in the adhesive already applied to the vertical surface.

11.4.1.3 Side laps over the preceding sheet shall be maintained at 100 mm (4 in.) ± 25 mm (1 in.). The bottom end of the precut sheet shall extend at least 100 mm (4 in.) onto the top surface of the footer for the first lift and 50 mm (2 in.) beyond the horizontal end of the flashing. The bottom edge of subsequent lifts shall extend 100 to 150 mm (4 to 6 in.) over the upper edge of the lower lift.

11.4.1.4 At the top edge of the topmost lift, apply a sealing

strip using a 150- to 200-mm (6- to 8-in.) wide strip of membrane, cut from the lengthwise of the sheet. Apply a thin coat of adhesive at 0.4 to 0.5 L/m² (1.0 to 1.25 gal/100 ft²) of adhesive to the top 100 to 125 mm (4 to 5 in.) of the already applied sheet and bring it up on the uncoated area a similar distance. Apply the prepared sealing strip, rubbing it in well.

11.4.2 For multiple-ply applications, check the adhesion setup of each ply by applying hand pressure to the sheet; if the sheet moves, delay the next ply application until the first has set.

11.4.2.1 Apply a uniform coat of adhesive to the first ply at the rate of 0.4 to 0.5 L/m² (1.0 to 1.25 gal/100 ft²).

11.4.2.2 Embed the second ply in the same manner as the first ply, staggering the laps so that no lap shall be over a preceding lap. Side laps shall be 100 mm (4 in.) ± 25 mm (1 in.). Lap over the footer shall extend 75 mm (3 in.) beyond the end of the first ply. Overlap of the bottom end of the second lift over the top of the first lift shall be 150 to 200 mm (6 to 8 in.).

11.4.2.3 If a third ply of membrane is to be applied, repeat the steps for the second ply, but being sure no lap is on top of a previous lap.

11.5 Inspection and approval of the waterproofing membrane installations shall occur before application of any protective or insulating boards.

11.6 To apply insulation, protection board, or sheet over the final ply of waterproofing membrane, a coat of adhesive shall be applied at the rate of 0.6 to 0.8 L/m² (1.5 to 2 gal/100 ft²) after the membrane applications have become solid. Allow this coat to become tacky, then apply the insulation, protection board, or sheet and embed it in the tacky adhesive. If no such products are to be used, then the coat of adhesive shall be applied at 0.6 to 0.8 L/m² (1.5 to 2.0 gal/100 ft²) and allowed to dry before any backfilling occurs.

11.7 Backfill vertical waterproofing installations within 24 h of protective board installation and after final inspection and approval of the installation.

12. Keywords

12.1 adhesive; cold applied; modified bituminous; prefabricated; reinforced; waterproofing

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