



# Standard Guide for Application of Fully Adhered Vulcanized Rubber Sheets Used in Waterproofing<sup>1</sup>

This standard is issued under the fixed designation D 5843; 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.

<sup>ε1</sup> NOTE—Editorially switched from English dominant to SI dominant.

## 1. Scope

1.1 This guide provides information to assist the specifier in developing a specification for the application and protection of fully adhered EPDM (elastomeric terpolymer synthesized from ethylene, propylene and diene monomer), butyl, and neoprene vulcanized rubber sheets to be installed on concrete substrates.

1.2 The structure and the deck should be evaluated, and found to be mechanically sound, able to accept the weight of the sheet and overburden, and meet the local building code requirements.

1.3 The deck should be sloped to drain with a drainage media or layer above the membrane. The drainage media or layer is not addressed in this guide.

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:

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

D 5295 Guide for Preparation of Concrete Surfaces for Adhered (Bonded) Membrane Waterproofing Systems<sup>2</sup>

D 5898 Guide for Standard Details for Adhered Sheet Waterproofing<sup>2</sup>

D 5957 Guide for Flood Testing Horizontal Waterproofing Installation<sup>2</sup>

## 3. Terminology

3.1 For definitions of terms used in this guide, refer to Terminology D 1079.

## 4. Delivery of Materials

4.1 Deliver materials in producer or system supplier's

unopened containers and packages.

4.2 All materials or material packaging must be clearly marked in a weather resistant manner with type, stock or lot number, and other pertinent information, for example, thickness, size, weight, producer or system supplier's name, ASTM specification, and so forth.

## 5. Storage and Handling

5.1 Store sheet materials in a horizontal position, elevated off the ground and under protective coverings to prevent contamination of the sheet material surfaces.

5.2 Store sheet materials in a manner to prevent producer or system supplier's markings from being destroyed.

5.3 Store adhesives and sealants in tightly closed original containers in a temperature controlled environment between 16 and 27°C (60 and 80°F) for three days before using.

5.4 Store splicing cleaners, primers, and adhesives in original closed containers in a manner that will not pose a fire hazard.

## 6. Safety Precautions

6.1 Material Safety Data Sheets (MSDS) shall be available for the products that require them.

6.2 Adhesives, cleaning agents, and other solvent bearing materials may be flammable.

6.3 The following safety precautions include, but are not limited to the following: no smoking when using flammable materials; do not use flammable material near an open flame or equipment that may produce sparks; and avoid breathing solvent vapors and vent solvent fumes when in unventilated and confined areas. Refer to the MSDS for further safety precautions.

## 7. Environmental Conditions

7.1 Conditions for installation can proceed when agreed upon by the owner, producer or system supplier, and installer.

7.2 Do not attempt to install or bond sheet material to substrate or prepare seam splices in weather conditions such as dew, fog, rain, snow, frost, high winds, or temperatures below 4°C (40°F).

7.3 Do not expose membrane and accessories to a constant temperature in excess of 82°C (180°F).

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

## 8. Substrate Preparation

8.1 The following items should be addressed in Division 3 of the project specification.

8.1.1 Remove from the substrate any laitance, loose aggregate, sharp projections, grease, oil, excessive dirt, debris, curing compounds, and visible moisture that would prevent satisfactory installation. Refer to Guide D 5295 for substrate preparation.

8.1.2 Prepare all controlled and uncontrolled (cracks) joints as recommended by the owner, producer, system supplier, or installer.

8.1.3 The producer or system supplier of sheeting shall specify types of substrates that would be acceptable for use with the sheet bonding adhesive, splicing adhesive, and lap sealant. Information regarding acceptability of substrate materials with other components utilized in the system is available from suppliers of individual components.

8.1.4 Concrete curing agents, other than water, are subject to acceptance by the producer or system supplier.

## 9. Installation of Sheets

9.1 Deliver the sheets to the substrate in good condition. Handle the materials with care so as not to damage the sheets.

9.1.1 Use care and diligence during installation to avoid damaging the substrate and sheet.

9.1.2 Start the sheet installation at the low point of the deck or wall and work to the termination point.

9.1.3 Field seams shall be perpendicular or parallel with the direction of water flow. Avoid field seams that oppose the direction of water flow.

9.1.4 Follow appropriate details in Guide D 5898.

9.2 Unroll or unfold the sheet and visually inspect for physical damage prior to setting into location and performing the attachment to the substrate and the field seaming between sheets. Allow sheets to relax for a minimum of ½ h. (Specifier should consult manufacturer for recommendation). (Use or removal of questionable sheets shall be as agreed upon by producer or system supplier, installer, and owner's representative). Do not permanently install protection board until all areas of question and other defects are resolved.

9.3 Align the sheet in its proper location maintaining a recommended splice overlap to the adjacent sheet. (Specifier should consult manufacturer for splice width recommendation). Fold back the area to be adhered, making a rounded edge. Use temporary ballast of sand bags or bias ply tires as necessary to hold the horizontal membrane in position. Remove foreign matter like sand, dirt, twigs, and so forth, which may have lodged under the sheet. Where dirt has contaminated the surface, clean the sheet in accordance with the manufacturer's recommendations.

9.4 *Horizontal Installation Procedure for Adhesively Bonding Sheet to Substrate:*

9.4.1 Fold back one-half of the sheet, apply bonding adhesive continuously to the exposed substrate and the back of the exposed folded sheet at the producer or system supplier's recommended rate. Do not apply bonding adhesive to the perimeter splice areas (recommended width of 15 cm (6 in.)) of the sheet.

9.4.2 Allow the bonding adhesive to dry (sufficient solvent has evaporated) to the point where it is still tacky, but will not stick to the finger when touched lightly.

9.4.3 Carefully roll the sheet into the applied adhesive while maintaining a rounded leading edge, in a manner that minimizes voids and wrinkles. Keep the sheet even and continue rolling until the sheet is adhered.

9.4.4 Apply positive pressure to adhered areas to obtain contact between membrane and substrate. Use a stiff broom or large roller with rounded edges to embed the membrane into the applied adhesive.

9.4.5 Fold back the unbonded portion of the sheet to expose the unattached portion of the sheet.

9.4.6 Repeat steps 9.4.1 through 9.4.4, be sure that no adhesive is applied on the perimeter splice areas of the sheet.

9.5 *Vertical Installation Procedure for Adhesively Bonding Sheet to Approved Substrate:*

9.5.1 Fanfold the membrane onto itself at the foundation's footing and fully adhere the membrane vertically by section or hang the membrane with the splice running either vertically (bottom to top) or horizontally. If horizontally, work from the bottom up for shingled splices.

9.5.2 Fold back one-half of the sheet, apply bonding adhesive continuously to the substrate and the back of the folded sheet and repeat procedure or completely to the back of the sheet at the recommended rate. Do not apply bonding adhesive in the splice area.

9.5.3 Allow the bonding adhesive to dry (sufficient solvent has evaporated) to the point where it is still tacky, but will not stick to the finger when touched lightly.

9.5.4 Carefully roll the sheet into the applied adhesive while maintaining a rounded leading edge or hang the membrane against the coated substrate in a manner that minimizes voids and wrinkles. Keep the sheet even and continue rolling until the sheet is adhered.

9.5.5 Apply positive pressure to adhered areas to attempt to obtain total contact between the membrane and substrate. Use a stiff brush or large roller with rounded edges to embed the membrane into the applied adhesive.

9.6 Make field seams with producer or system supplied splicing systems. Prior to applying splicing adhesives to the waterproofing sheets at the job site, clean the splice area thoroughly with splice cleaner dispensed from underwriters laboratory (UL) pump cans using clean natural fiber cloth.

9.6.1 Apply the splice cleaner, primer, and splicing adhesive and allow for open time as recommended by producer or system supplier.

9.6.2 Apply the in-the-seam sealant a minimum of 1.2 cm (½ in.) from the unexposed edge (if required by producer or system supplier for additional protection at splice intersections).

9.6.3 Join the mating surfaces carefully for a uniform contact.

9.6.4 Use a steel hand roller with rounded edges to apply positive pressure to the splice. Run the hand roller across the seam, from the inside of the top sheet to the edge of the field splice to work out air bubbles.

9.6.5 Inspect the outside edge for fishmouths. Where fishmouths exist, cut the sheet to allow it to lay flat. Apply a patch of sheet material to the cut that extends a minimum of 15 cm (6 in.) in all directions beyond the defect in accordance with splicing procedures noted in 9.6.1 through 9.6.4.

9.6.6 After cleaning the seam edge with splice cleaner, apply and feather lap-seam sealant by the end of each day's work. Inspect lap-seam sealant for continuous contact with both sheets.

9.6.7 Complete all field seams and secure and make watertight all terminations by the end of each work day.

**9.7 Flashings, Terminations, Tie-Ins, and Expansion Joints:**

9.7.1 Flashings and termination should extend a minimum of 20 cm (8 in.) above the grade.

9.7.2 Flash penetrations inside and outside corners using separate uncured flashing materials.

9.7.3 Secure the membrane edge to the substrate by using a termination bar or reglet when stopping the membrane and use counterflashing when extending the membrane above the grade.

9.7.4 Consult the producer or system supplier for recommended tie-ins.

9.8 Take precautions necessary to provide protection of the waterproofing system before the end of the day.

9.8.1 The loose edge of the sheet shall have a watertight seal

to the substrate to prevent water from penetrating any completed section of the waterproofing system.

9.8.2 Do not abuse completed sections by subsequent material handling operations and traffic.

9.8.3 Temporary protection of the membrane shall be provided at the end of each day's work with a minimum 3 mm (1/8 in.) protection board.

9.8.4 Apply by loose laying or spot bonding a minimum 3 mm (1/8 in.) protection board over the membrane after quality assurance (QA) items are addressed.

## 10. Quality Assurance

10.1 The producer or system supplier with the applicator shall inspect splices, flashed details, and terminations during the application to verify that the sheet system is installed in accordance with the producer or system supplier's specifications.

10.2 Flood test horizontal waterproofing in accordance with Guide D 5957. Repair any leaks with a surface splice that extends a minimum of 15 cm (6 in.) past the damaged area in accordance with procedures outlined in 9.6.

## 11. Keywords

11.1 application; substrate; vulcanized rubber sheeting; waterproofing

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