

# **Firestone**

## **Firestone Building Products**

### **FullForce™ EPDM Application Guide**

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## I. General

This Application Guide outlines instructions for the installation of Firestone's FullForce EPDM membrane with Secure Bond™ Technology. Reference to the EPDM Design and Application Guides, Technical Information Sheets, Detail Drawings, and other Firestone technical specifications as needed to ensure the finished roofing system complies with Firestone requirements and is eligible to receive a Firestone Red Shield™ Warranty.

**NOTE:** If a proposed application falls outside this specification, contact Firestone Technical Services for assistance.

## II. Preparation

- A. Approved substrates must be clean, dry, and free of foreign material such as grease and any debris which could inhibit adhesion. This may require cleaning with a broom or blower. An acceptable Firestone Primer (QuickPrime™ Plus, QuickPrime Plus LVOC, Single-Ply QuickPrime Primer or Single-Ply LVOC Primer) is required for vertical application, seaming, and detail work.
- B. FullForce EPDM membrane may be installed on roofs up to 250' (76.2 m) in height. For building heights exceeding 250' (76.2 m), contact Firestone Technical Services.  
**NOTE:** This does not mean these systems are approved by the Factory Mutual Research Corporation. Contact Firestone or consult the Factory Mutual Approval Guide for approved assemblies.
- C. Insulation must be secured per current Firestone technical specifications to provide a proper substrate for membrane application.
- D. Install FullForce EPDM membrane only when membrane, substrate, and ambient temperatures are minimum 20 °F (-7 °C) and rising.
- E. Unroll and position the membrane over the substrate to achieve the desired alignment and overlaps. Allow the membrane to relax a minimum of 30 minutes [longer in temperatures below 40 °F (4 °C)] before final positioning and adhering. Unroll FullForce EPDM with the release liner facing down so the top side of the membrane is exposed to direct sunlight.
- F. Position adjoining sheets in a manner that all side and end laps provide a minimum 3" (76 mm) overlap.
- G. An acceptable Firestone Primer (QuickPrime™ Plus, QuickPrime Plus LVOC, Single-Ply QuickPrime Primer or Single-Ply LVOC Primer) shall be applied to all lap surface areas to receive FullForce EPDM.
- H. All lap splices require FullForce Sealant along the seam edge.
- I. Position adjoining sheets in a manner that the seams shed water or run parallel to the flow of water.

## III. Membrane Attachment

- A. Membrane Positioning and Seam Primer Application
  1. It is important that the seam overlap areas are clean and that no moisture is present.
  2. Position adjoining sheets allowing for a minimum 3" (76 mm) side and end lap overlap.
  3. Mark the bottom membrane 1" (25 mm) outside the 3" edge of the top membrane with a lumber crayon or similar instrument to note the minimum primer coverage area.
  4. Fold the top membrane back along the seam to allow for primer application without disturbing the original position of the membrane.
  5. Stir the approved Firestone primer thoroughly before using. Do not thin. A minimum of two minutes of vigorous hand mixing is required.

6. Apply the primer along the crayon mark to coat the entire bottom seam area, using the Firestone QuickScrubber™ or QuickScrubber Plus Pad and Handle. Do not use brushes or rollers to apply priming products to Firestone membranes. Use back and forth strokes with heavy pressure along the length of the seam area, until the membrane surface becomes uniform in color, with no streaks, puddles, or blushing.
7. Allow the primer to flash-off/set up appropriately.
8. Fold the membrane back into position at the seam locations, check for proper primer coverage, and complete membrane application as described below. As an option, the mating area may be primed prior to the FullForce sheet's being moved into position for immediate attachment.

#### B. Field Membrane Application

1. Carefully fold back the leading edge of the FullForce EPDM membrane at one end to expose the release liner. **Do not fold the length of the roll in half to remove the release liner.**
2. Starting from the center split of the exposed release liner, remove the liner on both sides of the split at a 45° angle toward the membrane edge. Be sure to pull enough of the release liner to extend out beyond the membrane edge.
3. Expose minimum 6' (1.83 m) of the Secure Bond adhesive at the end of the sheet and back-roll it onto the substrate. (The removed release liner should extend out at an angle beyond both edges of the membrane.) **Do not remove the 4" (102 mm) strip of release liner along the seam edge at this time.** (See III.A.8 above for option to pre-prime the mating area.)
4. Keeping the membrane flat and secured and the seam overlap aligned, continue to remove the release liner at a 45° angle, parallel to the roof surface, along the entire length of the sheet. Pulling the release liner at an alternate angle may allow the sheet to move or may trap air. The two halves of the release liner are to be removed simultaneously by two people. Keep the release liner as close to the roof surface as possible during removal. **Removal of the liner and handling of the exposed Secure Bond adhesive should be completed by two persons minimum.**
5. To initiate adhesion, use a stiff bristled broom and apply downward pressure to broom in the installed membrane across the width of the sheet working from the center toward the edge. Repeat the process for the other half of the sheet.
6. Next, remove the 4" (102 mm) strip of release liner from the edge overlapping the lower sheet. Peel the liner at a 45° angle to the seam edge and parallel to the roof surface.
7. Use a 1½" to 2" (38 mm to 51 mm) wide silicone roller or Firestone QuickRoller™ to roll the entire seam, first at a right angle toward the outer seam edge and then along the length of the seam, making sure there is sufficient contact between the two membrane layers.  
**NOTE:** Firestone QuickSeam™ Joint Covers are required at all T-seam intersections and head lap overlaps.
8. Roll across the width of the installed membrane with a weighted roller (5 lb/LI) to ensure full contact with the substrate.  
**NOTE:** Do not roll membrane in place with a weighted roller if installed over ISOGARD™ HD or RESISTA™ / ISOGARD CG boards.
9. Install Joint Covers as necessary, then apply FullForce Sealant along all seam overlaps according to Firestone specifications.

#### C. Roof Edge Membrane Application

1. Align the FullForce EPDM membrane into position along the roof edge and allow to relax for a minimum of 30 minutes (longer in temperatures below 40 °F (4 °C)). Consult Firestone specifications and details for minimum roof edge overlap.
2. Carefully fold back the leading edge of the membrane minimum 12' (3.7 m) from one end to expose the release liner. **Do not fold the length of the roll in half to remove the release liner.**

3. Starting with the outside edge (roof edge portion) of the release liner, carefully peel the liner from the sheet, pulling it *underneath* the membrane, toward the field of the roof at a 45° angle to expose the Secure Bond adhesive. Take care to not disturb the original positioning of the membrane.
4. Next, pull the remaining section of the liner (inside portion) *underneath* the membrane and toward the field of the roof at a 45° angle. Maintain a minimum 12" (305 mm) separation between the two sections of liner. Pull the 4" (102 mm) strip of release liner with the adjacent section of liner.
5. Expose minimum 12' (3.7 m) of the adhesive backing at the end of the sheet and back-roll it onto the substrate. (All three sections of the removed release liner should extend beyond the field side of the membrane edge at a 45° angle.)
6. Keeping the FullForce EPDM membrane flat, secured and in proper alignment, remove the three sections of the release liner simultaneously at a 45° angle, keeping parallel to the roof surface, along the entire length of the sheet. Pulling the release liner at an alternate angle may allow the sheet to move or may trap air. The roof edge side of the release liner should be pulled just in front of the field edge side, maintaining a minimum 12" (305 mm) separation between the three sections. The three sections of release liner are to be removed simultaneously by three people. Keep the release liner as close to the roof surface as possible during removal. **Removal of the liner and should be completed by two persons minimum.**
7. To initiate adhesion, use a stiff bristled broom and apply downward pressure to broom in the installed membrane across the width of the sheet working from the center toward the edge. Repeat the process for the other half of the sheet.
8. Roll across the width of the installed membrane sheet with a weighted roller (5 lb/LI) to ensure full contact with the substrate.  
**NOTE:** Do not roll membrane in place with a weighted roller if installed over ISOGARD HD or RESISTA / ISOGARD CG boards.
9. Install subsequent membrane panels and complete seams using the process outlined above for application of primer and field membrane.

#### IV. Install Patches at T-Joint Overlaps and Substrate Transitions

- A. Wherever three or more layers of FullForce membrane overlap, install a QuickSeam Joint Cover or minimum 5" (127 mm) section of QuickSeam Flashing, set in an acceptable Firestone primer.
- B. Also install Joint Covers at all steps or changes in plane in the FullForce membrane seam (onto crickets or tapers, at wall and curb transitions, etc).
- C. It is important that areas to receive flashing are clean and that no moisture is present.
- D. Mix the approved Firestone primer thoroughly before and during use. **DO NOT THIN.**
- E. Apply primer to surface of the FullForce membrane using the Firestone QuickScrubber Pad and Handle. **Do not use brushes or rollers to apply primers to Firestone membranes.** Use back and forth strokes with heavy pressure in an area larger than the flashing membrane, until membrane surfaces become uniform in color, with no streaks, puddles, or blushing.
- F. Allow the primer to flash-off/set up appropriately.
- G. Once the primer is ready, remove the release paper from the Joint Cover or Flashing material, being careful not to contaminate the tape portion of the flashing.
- H. Position the flashing over the center of the T-joint area and mate to the primed FullForce membrane.
- I. Roll the flashing with a 1½" to 2" (38 mm to 51 mm) wide silicone roller, from the center outwards, working the flashing into seam step-offs or irregularities.
- J. Apply FullForce Sealant to all flashing edges per specification.

## V. FullForce Sealant Application

- A. All completed FullForce EPDM membrane seam overlaps require FullForce Sealant over the seam edge. Apply an acceptable Firestone primer to the seam edge before installing sealant.
- B. Surfaces to which sealant is applied must be clean, dry, and free from loose or foreign materials, oil, and grease.
- C. Apply FullForce Sealant to all seam and flashing edges by the end of each working day. If inclement weather is threatening, apply Firestone Primer to the edge of the membrane splice before leaving the project.
- D. Prior to application of the primer, if the seam edge has been contaminated with dirt or debris, clean the seam edge a minimum of 1" (25 mm) on each side of the step-off with Firestone Splice Wash, and allow to dry.
- E. Apply a continuous bead of FullForce Sealant approximately  $\frac{3}{8}$ " x  $\frac{1}{4}$ " (9.5 mm x 6.3 mm), centered over the seam or flashing edge. Be sure to keep the applicator tip centered over the lap step-off. Refer to current Firestone FullForce EPDM seam details for additional information. Tooling is not needed with FullForce Sealant.

## VI. Base Tie-In, Wall, and Curb Flashing

Firestone offers numerous options for base tie-in and flashing on EPDM roofing systems. Consult the Firestone EPDM Application Guide and standard details for additional information.

**NOTE:** An acceptable Firestone Primer (QuickPrime Plus, QuickPrime Plus LVOC, Single-Ply QuickPrime Primer or Single-Ply LVOC Primer) is required for vertical application of FullForce EPDM.

- A. Base Tie-In and Vertical Flashing using Firestone QuickSeam Reinforced Perimeter Fastening Strip (RPF)
  - 1. Before installing the roof membrane, unroll and position the QuickSeam RPF strip with the release paper facing up and the tape portion oriented away from the wall or curb.
  - 2. Anchor the side of the QuickSeam RPF without tape to the roof deck or to the wall 12" (305 mm) o.c. using Firestone 2" (51 mm) Metal Seam Plates or Firestone batten strip and approved Firestone fasteners, per current base tie-in details. Refer to current published specifications for product selection and attachment requirements.
  - 3. Position membrane with adequate seam overlap, allowing enough membrane to extend up the vertical surface and mark the horizontal and vertical overlaps.
  - 4. Fold the membrane back onto itself to expose the wall or curb and QuickSeam RPF and apply primer to the vertical substrate, the rear half of the RPF, and to seam overlaps as noted in the primer application section above. Do not prime the tape splice between FullForce EPDM membrane and the QuickSeam RPF.
  - 5. Proceed with installation of FullForce EPDM membrane as described in the field membrane application section of this specification. Remove the release liner from the QuickSeam RPF before mating the membrane to the tape side of the RPF.
  - 6. Tuck the membrane carefully into the angle change then continue to roll the membrane up the wall and broom into place with a stiff push broom. Roll the vertical flashing to ensure permanent adhesion.
  - 7. Roll the membrane over the QuickSeam RPF with a 1½" to 2" (38 mm to 51 mm) wide silicone roller or Firestone QuickRoller, first along the backside of the RPF near the angle change, then over the tape at a right angle toward the outer tape edge, then along the length of the tape.

## VII. FullForce Membrane Repair

- A. Membrane repairs using FullForce EPDM are limited to horizontal repairs only.
- B. The size of a repair using FullForce EPDM should never be smaller than 6" (152 mm) in diameter (length or width) to ensure the repair extends a minimum of 3" (76 mm) in all directions beyond the cut or puncture in the existing membrane.
- C. Multiple cuts or punctures in an existing membrane in close proximity may be repaired with a single piece of FullForce EPDM. In such cases, the FullForce EPDM must extend a minimum of 6" beyond the outermost border of the repair area.
- D. When using FullForce EPDM to repair eligible membranes in ballasted, MAS, or R.M.A. applications, the repair area may not exceed 5' (1.5 m) in any direction. When repairing eligible adhered membranes, there is no maximum limitation on the size of a repair using FullForce EPDM.
- E. FullForce EPDM must be unrolled and allowed to relax at least 30 minutes PRIOR TO cutting and installing the membrane. Unroll FullForce EPDM with the release liner facing down so the top side of the membrane is exposed to direct sunlight.
- F. Prepare the Existing Membrane
  - 1. Clean the Membrane
    - a) When repairing membrane that has been in service, it is necessary to remove accumulated dirt.
    - b) Proper membrane preparation is made by scrubbing the membrane with a scrub brush and warm soapy water, rinsing with clear water, and drying with clean cotton cloths. After this initial cleaning, clean the area again using clean cotton cloths and Firestone SW100 Splice Wash. Additional cleaning using Firestone Splice Wash is often necessary.
    - c) Cleaning must extend a minimum of 6" (152 mm) in all directions beyond the repair area.
  - 2. Prime the Membrane
    - a) Apply an appropriate Firestone primer to the repair area according to the instructions on the Technical Information Sheet. For repairs using FullForce EPDM, Firestone QuickPrime Plus is preferred, but Firestone Single-Ply QuickPrime Primer or QuickPrime Plus LVOC may be substituted. Expect primer flash off/set up times to lengthen based on the type of primer used and ambient conditions.
    - b) Primer must extend a minimum of 3" (76 mm) in all directions past the area to be covered by FullForce EPDM.
- G. Install FullForce EPDM Membrane

**NOTE:** Application of FullForce EPDM and removal of the release liner will vary depending on the size and location of the repair. A repair using FullForce EPDM must be square or rectangular. Never cut FullForce EPDM into an L-shape or at angles greater or less than 90°. The terms 'length' and 'lengthwise' refer to the original direction of the release liner prior to cutting the FullForce EPDM.

- 1. Unroll FullForce EPDM and allow it to relax PRIOR TO cutting and installing the membrane, as per above and standard FullForce application procedures.
- 2. Cut the FullForce EPDM to the needed size. FullForce EPDM must extend at least 3" (76 mm) in all directions beyond the cut or puncture in the existing membrane [with primer extending at least 3" (76 mm) beyond the edge of the FullForce].
  - a) FullForce EPDM must be within its shelf life and must have been stored according to Firestone specifications. The release liner must be in good condition with no peeling, fraying, or tearing. If dust, dirt, or other foreign matter has accumulated along the edge of the FullForce roll, the edge must be cut off prior to installation.

- b) Scissors must be sharp, clean, and free of adhesive or other residues. Cut the FullForce EPDM in a straight line without damaging the Secure Bond™ Adhesive. The cut edge should be straight, clean, and continuous without jagged edges. The release liner must be intact and in full contact with the Secure Bond adhesive.
  - c) For repairs extending more than 5' (1.5 m) in any direction, the existing membrane must be scored (cut) lengthwise along each edge prior to installing FullForce EPDM. FullForce EPDM must extend 6" (152 mm) beyond the scoring in the existing membrane. When applicable, score the existing membrane at least 6" (152 mm) from any seam. Scoring the existing membrane is necessary to avoid trapping air, solvent vapors, or moisture between the existing membrane and FullForce EPDM.
3. FullForce Membrane Application
- a) Position the FullForce EPDM over the repair area. **Do not remove the release liner ahead of time and do not apply downward pressure on the FullForce membrane while the release liner is in contact with the primed surface.**
  - b) Once the FullForce EPDM is in position, fold back the leading edge of the membrane at one end to expose the release liner and pull the liner at a 45° angle moving away from the center until the removed portion of the release liner extends beyond the edge(s) of the FullForce EPDM, then allow the folded back lead edge of the membrane to lie back in its original position. **Do not fold FullForce EPDM in half to expose the release liner.**
  - c) Keeping the FullForce EPDM flat and secured, continue removing the release liner at a 45° angle, parallel to the roof surface, along the entire length of the FullForce sheet taking care not to disturb the original positioning of the FullForce EPDM. Pulling the release liner at an alternate angle may allow the sheet to move or may trap air. Depending on the width of the FullForce EPDM, at least two people may be required to properly remove the release liner, especially if the sheet is wide enough that the release liner remains split. If it is, the two sides of the release liner are to be removed simultaneously. Keep the release liner as close to the roof surface as possible throughout its removal.
    - (i) For full sheet (10' (3 m) wide) repairs, first remove the split release liner, then remove the 4" (102 mm) strip of release liner along the seam edge. FullForce EPDM repairs must "straddle" existing roof seams, extending at least 12" onto the surface beyond an existing seam.
  - d) Follow standard Firestone FullForce EPDM application procedures for brooming and rolling the membrane to initiate adhesion, adjusting as needed based on the size of the repair. For small repairs, it is sufficient to roll the entire membrane repair using a 1½" to 2" (38 mm to 51 mm) wide silicone roller or a Firestone QuickRoller™ just as one would normally roll a FullForce seam.
4. Install Firestone QuickSeam™ Joint Covers at all T-seam intersections created by the installation of FullForce EPDM over seams in the existing membrane.
5. Apply FullForce Sealant along all edges of FullForce EPDM as per standard FullForce EPDM application procedures.

**NOTE:** If the membrane repair will be made along a roof edge or at the base of a parapet wall, adjust FullForce EPDM application and release liner removal accordingly using standard FullForce EPDM application procedures. For membrane repairs within 18" (0.45 m) of a roof drainage device, contact Technical Services for assistance.