



# CARLISLE'S **SURE-SEAL**

## **Part II - Application** **Sure-Seal®/Sure-White®** **Design “A” Adhered Roofing System**

August 2007

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#### **Installation Details**





## Sure-Seal<sup>®</sup>/Sure-White<sup>®</sup> Design “A” Adhered Roofing System

# Part II - Application

August 2007

FOR CARLISLE AUTHORIZED ROOFING APPLICATORS

THE INFORMATION CONTAINED HEREIN IS TO SERVE AS CRITERIA FOR CARLISLE AUTHORIZED ROOFING APPLICATORS REGARDING THE APPLICATION OF THIS SURE-SEAL/SURE-WHITE ADHERED ROOFING SYSTEM. CARLISLE AUTHORIZED ROOFING APPLICATORS ARE ADVISED TO FULLY FAMILIARIZE THEMSELVES WITH “DESIGN CRITERIA,” PART I, PRIOR TO PERFORMING THE ROOFING INSTALLATION.

### A. SUBMITTALS/WARRANTY PREREQUISITES

1. To ensure compliance with Carlisle's minimum warranty requirements, the following projects should be forwarded to Carlisle for review prior to installation, preferably prior to bid.
  - a. Projects where the building height exceeds 250'.
  - b. Air pressurized buildings, canopies, buildings with large openings where the total wall openings exceed 10% of the total wall area on which the openings are located (such as airport hangars, warehouses, and large maintenance facilities).
  - c. Cold storage buildings and freezer facilities
  - d. Projects where the EPDM is expected to come in direct contact with petroleum-based products or other chemicals.
2. Projects where wind speed coverage greater than 55 mph is specified or those with a 20-year Total System Warranty will require additional enhancements beyond those outlined in this section. Prior to installation, refer to “Attachments II and III” in Part I, Design Criteria of this specification.
3. Projects where hot asphalt or an adhesive marketed by others is specified for insulation attachment may qualify for a 15-year warranty. Such projects must be submitted for Carlisle’s review to determine specific requirements or possible limitations.
4. Shop drawings must be submitted to Carlisle by the Carlisle Authorized Roofing Applicator along with a completely executed Notice of Award (Page 1 of Carlisle's Request For Warranty form) for approval. Approved shop drawings are required for inspection of the roof and on projects where on-site technical assistance is requested.

**Shop drawings must include:**

- a. Outline of roof and size
- b. Deck type (for multiple deck types)
- c. Location and type of **all** penetrations
- d. Perimeter and penetration details
- e. Key plan (on multiple roof areas) with roof heights indicated

When field conditions necessitate modifications to the originally approved shop drawings, a copy of the shop drawing outlining all modifications must be submitted to Carlisle for revision and approval prior to inspection and warranty issuance.

- 5. **Along with the project submittals** (shop drawing and Request for Warranty), the roofing contractor must include **pullout test** results when the results are below the requirements identified in Part I, Design Criteria, Attachment I.
- 6. **Notice of Completion** (Page 2 of the Carlisle Request for Warranty form)

After project completion, a Notice of Completion must be submitted to Carlisle to schedule the necessary inspection and acceptance of the project prior to issuance of the Carlisle warranty.

- 7. **As-Built Projects** (roofing systems installed prior to project approval by Carlisle)

The Carlisle Authorized Applicator may supply Carlisle with an As-Built drawing for a project completed prior to Carlisle's approval. The As-Built drawings:

- a. Must conform to Carlisle's most current published specifications and details applicable at the time of bid.
- b. Must be submitted along with a completely executed Notice of Completion.
- c. Must include the items identified in Paragraph A.4 above.

**Note:** As-Built projects are not recommended for those projects referenced in Paragraph A.1 in order to ensure Carlisle warranty requirements have been met.

**B. GENERAL JOB SITE CONSIDERATIONS**

**Material Safety Data Sheets (MSDS) must be on location at all times during transportation, storage and application of materials. The applicator shall follow all safety regulations as recommended by OSHA and other agencies having jurisdiction.**

- 1. Subject to project conditions, it is recommended to begin the application of this roofing system at the highest point of the project area and work to the lowest point to prevent water infiltration. This will include completion of all flashings, terminations and daily seals.
- 2. On phased roofing, temporary closures should be provided to prevent moisture infiltration.
- 3. When possible on multiple level roofs, begin the installation on the highest level to avoid or minimize construction traffic on completed roof sections.
- 4. On projects at high altitudes (6,000' and above), rapid flash off (drying) of Bonding Adhesive and Splicing Cement will occur due to low atmospheric pressure.

**C. JOB SITE MATERIAL STORAGE AND HANDLING**

- 1. Deliver materials to the job site in original, unopened containers.
- 2. When loading materials onto the roof, the Carlisle Authorized Roofing Applicator must comply with the requirements of the specifier/owner to prevent overloading and possible disturbance to the building structure.
- 3. Job site storage temperatures in excess of 90° F (32° C) may affect shelf life of curable materials (i.e., uncured flashing,

adhesives, sealants, primers, SecurTAPE and Pressure-Sensitive Flashing/Accessories).

4. Cold temperatures will not restrict the installation of this roofing system. **When the temperature is expected to fall below 40° F (5° C)**, outside storage boxes should be provided on the roof for temporary storage of liquid adhesives, sealants, primers, SecurTAPE and Pressure-Sensitive Flashing/Accessories. Containers must be rotated to maintain their temperature above 40° F (5° C).

**Note:** Prolonged exposure of Pressure-Sensitive Flashing and SecurTAPE to temperatures below 40° F (5°C) will cause the preapplied adhesive tape to lose tack and in extreme cases, not bond to the substrate. Refer to “Membrane Splicing With SecurTAPE” for application procedures in colder temperatures.

5. Do not store adhesive containers with opened lids due to the loss of solvent, which will occur from flash off.
6. Insulation/underlayment must be stored so it is kept dry and is protected from the elements. Store insulation on a skid and completely cover with a breathable material such as tarp or canvas. If the insulation is lightweight, it should be weighted to prevent possible wind damage.

## D. SUBSTRATE PREPARATION

**Defects in the substrate surface must be reported and documented to the specifier, general contractor and building owner for assessment. The Carlisle Authorized Roofing Applicator shall not proceed with installation unless defects are corrected.**

1. **On retrofit - recover projects**, cut and remove wet insulation, as identified by the specifier, and fill all voids with new insulation so it is relatively flush (+/- 1/4") with the existing surface.
  - a. **For existing PVC membranes**, if the membrane is not removed, it must be cut into maximum 10' by 10' sections. All PVC flashings at the perimeter, roof drains and roof penetrations must be removed.
  - b. When installing this roofing system over an existing **gravel surfaced built-up roof**, **loose gravel must be removed**. Power brooming is recommended by Carlisle to remove the loose gravel, which may trap moisture. Any uneven areas of the substrate must be leveled to prevent insulation from bridging.
  - c. When installing this roofing system over an existing smooth surfaced modified bitumen, EPDM membrane shall be positioned with the length of sheets parallel to modified bitumen field splices. At end laps or other locations where EPDM splices intersect modified bitumen field seams, Pressure-Sensitive “T” Joint Covers or 6" wide Pressure-Sensitive Uncured Elastoform Flashing must be applied over intersections.
2. **For all projects** (new or retrofit), the substrate must be relatively even without noticeable high spots or depressions. Accumulated water, ice or snow must be removed to prevent the absorption of moisture in the new roofing components and roofing system.
3. Prior to the placement of membrane underlayment, clear the substrate of debris and foreign material that may be harmful to the roofing system. Gaps greater than 1/4" must be filled with an appropriate material.

## E. VAPOR RETARDER INSTALLATION

Follow the respective vapor retarder manufacturer's recommended installation procedures and the specifier's instructions for the installation of the product specified.

## F. INSTALLATION OF WOOD NAILERS

1. Install wood nailers in those locations that have been designated by the specifier and as approved by Carlisle.
2. The wood nailer must be installed so the top of the wood nailer is relatively flush (+/- 1/4") with the top surface of the membrane underlayment and the width of the wood nailer exceeds the width of the metal flange (where

applicable at edgings, scuppers, etc.) as shown on the appropriate Carlisle detail.

3. Follow the specifier's guidelines for the securement of the wood nailers.

## G. INSULATION PLACEMENT AND ATTACHMENT

**To verify acceptability of an insulation/underlayment, refer to Part I, "Design Criteria."**

1. Do not install more insulation/underlayment than can be covered by membrane and made watertight in the same day.
2. All insulation boards must be butted together with no gaps greater than 1/4". Gaps greater than 1/4" must be filled with the same material.
3. When multiple layers of insulation are specified, staggering joints between layers is recommended.
4. When mechanical attachment of insulation is specified, **Sure-Seal Insulation** must be secured to the roof deck with **1 insulation fastener and plate per every 2 square feet** of insulation (refer to Details A-27-A or B for fastening pattern) **except as follows:**

For structural concrete, minimum 22 gauge steel or minimum 15/32" thick plywood decks a reduced fastening density can be used:

- a) When a **single or top layer of minimum 1-1/2" thick Sure-Seal Polyisocyanurate** insulation is specified, the Carlisle insulation may be secured at the minimum rate of **1 per 3.2 square feet** (10 fasteners per 4' x 8' board; 5 fasteners per 4' x 4' board). Refer to Details A-27-F.
- b) When a **single or top layer of minimum 2" thick Sure-Seal Polyisocyanurate** insulation is specified, the Carlisle Insulation may be mechanically fastened with **one Carlisle Fastener and Plate every 4 square feet**. Refer to **Detail A-27-C**.
- c) **Dens-Deck Prime (1/4" or 1/2" thick)** may be fastened at the rate of **12 fasteners/plates per 4' x 8' board** (1 per 2.67 square feet). **Dens-Deck Prime (5/8" thick)** may be fastened at the rate of **8 fasteners/plates per 4' x 8' board** (1 per 4 square feet).

**Note:** If a wind speed warranty greater than 55 mph is desired or a 20-year warranty is specified, additional insulation fastening may be required. Refer to Attachments II and/or Attachment III in Part I, Design Criteria for requirements.

- d) **On reroof/no tearoff projects** with a maximum roof height of 40', **any Sure-Seal Insulation** (i.e., HP Recovery Board, Polyisocyanurate less than 1-1/2" thick) may be secured at the minimum rate of **11 Fasteners per 4' x 8' board (5 Fasteners per 4' x 4' board)**. This option is **not applicable for 15-year Golden Seal Warranty projects** or for projects where extended wind speed coverage (greater than 55 mph) is desired. Refer to Detail A-27-E.
5. Hunter Panels Polyisocyanurate Insulation, when specified on 5 or 10-year non-Total System Warranty projects, must be mechanically fastened to the roof deck in accordance with the insulation manufacturer's recommendations.
  6. **Oriented strand board (OSB)** when specified as the membrane underlayment, must be mechanically fastened to the deck in accordance with Carlisle **Detail A-27-D**. If OSB is to be used in conjunction with Carlisle urethane based adhesive, an OSB/Polyisocyanurate composite board is recommended. Refer to "Attachment III" at the end of this specification when FAST Adhesive is specified. For OlyBond Spot Shot or 500 BA or VersiGrip Insulation Adhesive, refer to the applicable Technical Data Bulletin.
  7. When insulation securement is to comply with Factory Mutual (FM) approvals, follow the requirements of the specifier concerning additional securement at the roof perimeter and corners.
  8. When specified, Sure-Seal Fasteners must be used in conjunction with the Sure-Seal 3" diameter Insulation Fastening Plates.
  9. Except for projects where a Total System Warranty is specified, fasteners by others may be used with a corresponding

3" diameter fastening plate promoted by the fastener manufacturer and approved by Factory Mutual as a complete assembly.

10. For applicable Carlisle Fasteners and minimum deck penetration, refer to "Attachment I" at the end of this section.
11. **Sure-Seal FAST Adhesive** (a spray applied, two component, low-rise adhesive) may be used for insulation attachment in lieu of mechanical securement. Refer to Attachment III at the end of this section for applicable requirements.
12. **Carlisle OlyBond 500 BA or Spot Shot**, a two component polyurethane adhesive applied in approximately 1/2" to 3/4" beads spaced a maximum of 12" on center in the field of the roof and 6" on center at the perimeter (based on building height) may be utilized. Refer to the applicable Carlisle Technical Data Bulletin for specific installation instructions.
13. **Carlisle VersiGrip Insulation Adhesive**, a one-component, moisture curing, polyurethane adhesive applied in approximately 1/2" to 3/4" beads spaced a maximum of 12" on center in the field of the roof and 6" on center at the perimeter (based on building height) may be utilized. Refer to the applicable Carlisle Technical Data Bulletin for specific installation instructions.
14. When adhesive marketed by others is specified (on non-Total System warranty projects), contact the respective manufacturer regarding specific installation requirements and available warranty coverage. Carlisle warranties exclude products not supplied or marketed through Carlisle.
15. The specifier may select an alternate insulation attachment that incorporates a solid mopping of the insulation with hot asphalt (ASTM D312, Type III or IV). If the attachment method is to be covered by the Carlisle Warranty, Carlisle must be contacted for specific requirements. Typical precautions include, but are not limited to, the following.
  - a. The existing gravel surfaced built-up roof must be scraped to remove all loose gravel. Large blisters that may prevent continuous embedment of insulation must be repaired. The surface of the substrate must also be dry and clear of foreign material.
  - b. On coal tar pitch, when deemed compatible by the specifier, minimum 1.4" Polyisocyanurate is the required membrane underlayment when using Sure-Seal (black) membrane. If Sure-White (white) membrane is used, minimum 1" thick Polyisocyanurate is required.
  - c. For successful attachment, proper asphalt temperatures must be maintained and the specifier's requirements concerning the installation of a base sheet (where required) and quantity of hot asphalt must be followed.
  - d. The maximum insulation board size shall not exceed 4' X 4'. Trim insulation boards around crickets and saddles to ensure continuous embedment.
  - e. Care must be exercised to prevent contamination of the top surface of the insulation. Asphalt oozing through insulation joints must be wiped from the surface.
  - f. When specified, a grid nailer shall be installed in accordance with Carlisle's A-7 Details.

## H. MEMBRANE PLACEMENT AND BONDING

1. **Ensure** that water does not flow beneath any completed sections of the membrane system by completing all flashings, terminations and daily seals by the end of each workday.
2. **Sweep** all loose debris from the substrate.
3. **Position** EPDM membrane over the acceptable substrate without stretching.
4. **Allow** membrane to relax approximately 1/2 hour prior to bonding.
5. **Fold** membrane sheet back so half of the underside of the sheet is exposed. Sheet fold should be smooth without wrinkles or buckles.

6. **Stir** Bonding Adhesive thoroughly scraping the sides and the bottom of the can (minimum 5 minutes stirring is recommended). Bonding surfaces must be dry and clean.

**CAUTION:** If aesthetics are of concern when Sure-White EPDM membrane is used, protect the white surface next to the edges of the folded membrane sheet so Bonding Adhesive will not discolor the white surface. Do not place Bonding Adhesive containers or their lids directly on the white surface of the Sure-White EPDM membrane.

7. **Apply** 90-8-30A Bonding Adhesive evenly, without globs or puddles with a plastic core medium nap paint roller. A 9" roller will easily fit into the 5-gallon containers.

**Apply** 90-8-30A Bonding Adhesive to both the membrane sheet and the substrate to achieve continuous coating of both surfaces at a coverage rate of approximately 120 square feet per gallon per one surface (membrane or substrate) or approximately 60 square feet per gallon per finished surface (includes coverage on both membrane and substrate).

**A mechanical roller dispenser or a mechanical sprayer** can be used to apply Bonding Adhesive when the continuous coating and coverage rate noted above are maintained. When used, **the adhesive must be rolled after applying** with a plastic core medium nap paint roller to provide continuous coverage.

**CAUTION:** Due to solvent flash off, condensation may form on freshly applied Bonding Adhesive when the ambient temperature is near the dew point. If condensation develops, possible surface contamination may occur and the application of Bonding Adhesive must be discontinued. Allow the surface to dry and apply a thin freshener coat at the coverage rate, which is approximately half of the coverage rate stated above to the previously coated surface when conditions allow for continuing.

8. **Allow** adhesive to dry until it is tacky but will not string or stick to a dry finger touch.
9. **Roll** the coated membrane into the coated substrate while avoiding wrinkles.
10. **Brush** down the bonded half of the membrane sheet, immediately after rolling the membrane sheet into the adhesive, **with a soft bristle push broom** to achieve maximum contact.
11. **Fold** back the unbonded half of the membrane sheet and repeat the bonding procedure.
12. **Install** adjoining membrane sheets in the same manner, overlapping edges appropriately to provide for the minimum splice width. It is recommended that all splices be shingled to avoid bucking of water.

## **I. MEMBRANE SPLICING WITH SecurTAPE (required for 15 or 20-year warranty projects)**

### **1. General**

- a. **Tape splices must be a minimum of 2-1/2" wide** using 3" wide SecurTAPE extending 1/8" minimum to 1/2" maximum beyond the splice edge. Field splices at roof drains must be located outside the drain sump.

**Note:** For projects where a 20-year System Warranty is specified, splice enhancements are required. Refer to Attachment III in Part I, Design Criteria Section of this specification.

- b. **Prior to SecurTAPE application, the splice area must be primed with Sure-Seal HP-250 or LV-600 Primer.** LV-600 Primer is required in areas where volatile organic compound (VOC) regulations are in effect.

#### **c. Cold Weather Restrictions - When Temperatures are Below 40° F (5° C)**

- 1) Splice tape must be stored in a warm, dry area. Hot boxes must be provided for temporary storage to maintain the temperature of SecurTAPE above 40° F (5° C).
- 2) After HP-250 Primer has been applied and allowed to properly dry, **heat the primed area of the bottom membrane sheet** with a hot air gun as the tape is applied and pressed into place.
- 3) When temperatures will fall below 20° F (-7° C), use a steel roller to apply pressure to the tape prior to removing the release film.

- 4) Position the top sheet and remove the release film. Prior to rolling the splice with the 2" steel roller, apply heat to the top side of the splice area with a hot air gun. The heated surface should be very hot to the touch of bare skin (approximately the temperature of hot tap water). Take care not to burn or blister the membrane.
- d. In warmer temperatures, it is recommended to keep SecurTAPE in a shaded area out of direct sunlight.
2. Position membrane sheet to allow for required splice overlap. Mark the bottom sheets with an indelible marker approximately 1/4" to 1/2" from the top sheet edge. The pre-marked line on the membrane edge can also be used as a guide for positioning splice tape.
3. **When using Pre-KLEENED EPDM membrane (maximum 10' wide), Sure-Seal Primer is applied** to the mating surfaces of the membrane **with a 1/2" medium nap roller to achieve a thin, even coat.**
4. **When Sure-Seal Pre-KLEENED membrane is not used**, remove dirt or excess dust from the mating surfaces of overlapping sheets by wiping with Sure-Seal HP Splice Wipes or clean natural fiber rags. Accumulated dirt, footprints, etc. must be removed by scrubbing the membrane with Weathered Membrane Cleaner or HP-250 Primer.

**Note:** Sheets wider than 16-1/2', which are folded prior to packaging, may contain factory induced wrinkles. When adhering the membrane, care must be exercised to prevent wrinkles/fishmouths in the splice area.

**Apply Primer to achieve a thin, even coat** on both membrane surfaces. Splice area must be uniform in color, streak-free and free of globs or puddles.

- a. HP-250 Primer shall be applied with HP Splice Wipes. As an option, Sure-Seal Primer Pads can be used to apply HP-250 Primer.
  - b. To apply LV-600 Primer, dampen a Sure-Seal Primer Pad (attached to 952 Primer Pad Handle) with LV-600 Primer and also apply a bead of LV-600 Primer to the dry membrane area to be cleaned. Dispense LV-600 Primer from an 8 ounce squeeze bottle.
- Note:** Primer Pads clean approximately 100 linear feet for a 3" to 4" wide splice area. Pads can be flipped over and used for another 100 linear feet of splice.
- c. Hycron® Gloves (available from Carlisle) are required for hand protection when primer is used.
  5. The coverage rate for HP-250 Primer is approximately 250 square feet per gallon. This equates to approximately 300 linear feet per gallon for a completed 3" wide splice area (primer applied on 5" wide area on both membrane surfaces).

For LV-600 Primer, the coverage rate is approximately 600 square feet per gallon. This equates to approximately 720 linear feet per gallon for a completed 3" wide splice area (primer applied on 5" wide area on both membrane surfaces).

6. **Allow** Primer to dry until tacky but does not transfer to a dry finger touch.
- Note:** Due to solvent flash-off, condensation may form on freshly applied HP-250 Primer when the ambient temperature is near the dew point. If condensation develops, the application of Primer and SecurTAPE must be discontinued since proper adhesion will not be achieved. Allow the primer surface to dry and apply a thin freshener coat of HP-250 Primer to the previously coated surface and apply SecurTAPE when conditions allow.
7. **Unroll** approximately 3' of SecurTAPE. Align release film with marked line and press tape down to bottom sheet using firm, even, hand pressure. Continue for the length of the splice. Tape roll ends must be overlapped 1". Allow top sheet to rest on release film on backside of tape.

**Note:** Tape placement is critical to obtain a minimum splice width of 2-1/2". A minimum of 1/8" to a maximum of 1/2" of tape must extend beyond the splice edge. A continuous piece of SecurTAPE must be used at all field or factory splice intersections.



8. **Pull** release film from SecurTAPE beneath the top sheet and allow the top sheet to fall freely onto exposed tape.
9. **Press** the top sheet onto the tape using firm, even, hand pressure across the splice towards the splice edge.
10. **Immediately roll** the splice using positive pressure when using a 2" wide steel roller. Roll across the splice edge, not parallel to it. Carlisle's Seam Roller can be used to roll parallel to the splice edge.
11. **Install** Carlisle's Pressure-Sensitive "T" Joint Cover, a 6" wide section (with rounded corners) of Sure-Seal Pressure-Sensitive Flashing or Sure-Seal/Sure-White Elastoform Flashing (maximum 10-year warranty) over **all field splice intersections**. When using non-Pressure-Sensitive Elastoform Flashing, seal edges of flashing with Lap Sealant. Refer to Detail U-2-B and C.

**J. MEMBRANE SPLICING WITH SPLICING CEMENT (Permitted for maximum 10-year warranty projects)**

Adhesive splices must be a **minimum of 3" wide**. Field splices at roof drains must be located outside drain sump.

1. **When using Pre-KLEENED™ EPDM membrane (sheets maximum 10' in width), cleaning the splice area is not required unless the membrane has been contaminated** with field dirt, adhesive or other residue. To remove accumulated dirt, footprints, etc., scrub the membrane sheets with Sure-Seal HP Splice Wipes or clean natural fiber rags saturated with Weathered Membrane Cleaner or HP-250 Primer Cleaner.
2. **When Sure-Seal Pre-KLEENED membrane is not used, cleaning is required prior to applying Splicing Cement.** Remove dirt or excess dust from the mating surfaces of the overlapping sheets by wiping with Sure-Seal HP Splice Wipes or clean natural fiber rags. The splice area of both membrane sheets must be cleaned by scrubbing with Splice Wipes or clean natural fiber rags saturated with Weathered Membrane Cleaner or HP-250 Primer. Extra cleaning is required along a factory seam that intersects a splice area.

**Note: Sheets wider than 16-1/2', which are folded prior to packaging may contain factory induced wrinkles. When adhering the membrane, care must be exercised to prevent wrinkles/fishmouths in the splice area.**

3. When cleaning the membrane surface as stated above, check the membrane surfaces to verify adequate cleaning procedures are maintained.
  - a. **Hold** the top membrane sheet back as the cleaning and scrubbing process continues along the length of the splice so that both mating surfaces may be cleaned at approximately the same time.
  - b. Both sides of the **EPDM membrane** must be thoroughly cleaned.
4. **Stir Splicing Cement thoroughly** scraping the sides and the bottom of the can (minimum 5 minutes stirring is recommended).
  - a. **Sure-Seal EP-95 Splicing Cement** must be used with Sure-Seal (black) EPDM membrane.  
  
Properly stirred Sure-Seal EP-95 Splicing Cement will have a solid black appearance with no heavier black material remaining on the bottom or sides of the can.
  - b. **Sure-White Splicing Cement** must be used with Sure-White (white-on-black) EPDM membrane.  
  
Properly stirred Sure-White Splicing Cement will have a white appearance with no heavier material remaining on the bottom or sides of the can.  
  
**When aesthetics are of concern**, Sure-White Splicing Cement residue will discolor the white surface of the Sure-White (white-on-black) EPDM membrane. When required by the specifier, a slip sheet or other means of protection may be used to avoid surface discoloration along the splice area and beneath Splicing Cement and Bonding Adhesive containers.
  - c. Membrane surfaces must be visibly dry and clean as stated previously.

5. **Apply** Splicing Cement to both mating surfaces with the 4" wide, 1/2" medium nap roller (provided in each carton of Splicing Cement). Apply cement smoothly, continuously and relatively even to achieve a **heavy** coat.
  - a. Do not allow the cement to glob or puddle.
  - b. When a roller cannot be effectively used (at angle changes, corners, etc.), a 1/2" thick paintbrush may be used to apply Splicing Cement; however, the Splicing Cement must be applied to achieve a **smooth surface** without brush marks.

**Note:** When temperatures are expected to fall below 40° F (5° C), the use of a paintbrush must be limited (angle changes and corners) since **brush marks will not bleed out**.

- c. One gallon of Splicing Cement, applied in a **heavy**, relatively even coat, will achieve the approximate coverage rates listed below for an assembled splice (both surfaces coated):

<b>Approximate Splice Width</b>	3 inches	4 inches	5 inches	6 inches	7 inches
<b>Approximate Linear Feet</b>	120 feet	100 feet	85 feet	75 feet	65 feet
The above coverage rates have been calculated to include the application of Splicing Cement 1" beyond the splice width on either side of both mating surfaces of the membrane.					

6. **Allow** the cement to **dry until it is tacky** but will not string or stick to a dry finger touch and will not move when pushed with a dry finger.
  - a. **Do not allow the splicing cement to over-dry before mating the two surfaces** (over-dried Splicing Cement will not be tacky). If splice over-drying occurs, apply a thin freshener coat of Splicing Cement over the dried cement at half the coverage rate listed above. To avoid over-drying, Carlisle recommends using a minimum two-man installation procedure for splices longer than 10'.
  - b. Due to solvent flash off, condensation may form on freshly applied Splicing Cement when the ambient temperature is near the dew point. If condensation develops, the application of Splicing Cement must be discontinued since proper adhesion will not be achieved. Allow the surface to dry and apply a thin freshener coat of Splicing Cement as stated above to the previously coated surface when conditions allow.

7. **For Cured-to-Cured Membrane Splices Only:**

- a. **Just prior to closing the splice**, apply a bead of In-Seam Sealant™ approximately 1/8" to 1/4" in diameter a minimum of 1/2" from the inside edge of the bottom membrane sheet and a minimum of 2" from the lead edge.

**Note:** Do not allow In-Seam Sealant to become overly dry.

Approximately 75 linear feet of coverage per tube can be achieved when a minimum 1/8" diameter bead of In-Seam Sealant is applied.

- b. Maintain a continuous bead of In-Seam Sealant on all membrane splices including at splice intersections. Refer to Detail U-2.
  - c. During splice cleaning procedures, Sure-Seal HP Splice Wipes contaminated with In-Seam Sealant cannot be reused for the application of Splice Cleaner or Primer.
8. **Roll the top membrane sheet** onto the mating surface. Take care not to stretch or wrinkle the membrane sheet to avoid a fishmouth in the field splice.
9. **Assemble** the seam with hand pressure by wiping toward the splice edge.
10. **Immediately roll the splice** with a 2" wide steel roller, using positive pressure, toward the outer edge of the splice. **DO NOT ROLL PARALLEL TO THE SPLICE EDGE**. On a completed splice, the In-Seam Sealant must remain evident and be sensitive to the touch.

## K. LAP SEALANT APPLICATION

### 1. General

- a. The use of Lap Sealant with tape splices is **optional except at tape overlaps and at cut edges of reinforced membrane** (where scrim reinforcement is exposed). Lap Sealant must be utilized at these locations.
- b. Lap Sealant is **required for all adhesive splices** and in conjunction with Elastoform Flashing (maximum 10-year warranty).
- c. Lap Sealant is **optional** on Pressure-Sensitive Flashing and Pressure-Sensitive accessories (pipe seals, corners, pourable sealer pockets, etc.). Sure-Seal Primer is required to prepare the membrane surface.

**Lap Sealant is required at the following locations.**

- 1) Splice tape overlaps.
  - 2) Splices between adjoining sections of Pressure-Sensitive Flashing.
  - 2) Intersections between Pressure-Sensitive Flashing and joints in metal edgings.
- d. When applying Lap Sealant over cured-to-cured adhesive splices (maximum 10-year warranty), wait at least 2 hours after completion of the splice to apply Lap Sealant.

**Note:** Lap Sealant may be applied immediately following completion of uncured-to-uncured adhesive splices or splices completed with SecurTAPE.

2. **When using PRE-KLEENED EPDM Membrane, additional cleaning of the splice edge** prior to applying Lap Sealant is **not required** unless contaminated with dirt or other contaminants.
3. **When Sure-Seal Pre-KLEENED EPDM membrane is not used, clean the dry splice edge**, extending at least 1" onto the top and bottom membranes, using Sure-Seal HP Splice Wipes or a clean cloth dampened with Weathered Membrane Cleaner or Primer.
4. **Apply a 5/16" (minimum 1/4") diameter bead** of Lap Sealant to completely cover the splice edge. When a 5/16" diameter bead of Lap Sealant is applied, approximately 22 linear feet of coverage per tube can be achieved.
5. **Feather** the Lap Sealant with the specially preformed tool or nozzle (included in the Lap Sealant cartons) so the high point or crown of the Lap Sealant is located over edge of splice.

**Clean** the feathering tool occasionally for consistent crowning of Lap Sealant.

**APPLICATION OF LAP SEALANT SHOULD BE COMPLETED BY THE END OF THE DAY.** Delayed Lap Sealant application (not within the same day) will require scrubbing of accumulated dirt and dust along the splice edge, rinsing with clean water and cleaning with Weathered Membrane Cleaner or Primer.

**Note:** If weather is threatening, Lap Sealant may be applied to adhesive splices without waiting; however, splice area must be checked the following day for fishmouths or evidence of solvent entrapment (bubbled Lap Sealant). Refer to "Attachment V," Membrane and Splice Repairs, at the end of this Section for corrective procedures.

## L. ADDITIONAL MEMBRANE SECUREMENT

Securement must be provided at the perimeter of each roof level, roof section, expansion joint, curb flashing, skylight, interior wall, penthouse, etc., at any inside angle change where slope exceeds 2" in one horizontal foot, **and at other penetrations** in accordance with Carlisle's details and securement options as listed below.

Securement may be achieved as follows:

## 1. **RUSS™ (Reinforced Universal Securement Strip)**

- a. Loose lay the 6" wide Pressure-Sensitive RUSS or standard 6" RUSS (maximum 10-year warranty) along parapet walls and fasten with Seam Fastening Plates and the appropriate Carlisle fastener to the roof deck or vertically into the parapet wall. Spacing of the Seam Fastening Plates shall be a maximum of 12" on center.
  - 1) For horizontal attachment, the reinforced strip must be positioned a minimum of 1/8" to a maximum of 6" away from the angle change. Refer to Detail PS-12-C or U-12-C.
  - 2) For vertical attachment, the reinforced strip must be attached to the vertical wall and must extend a minimum of 3" onto the horizontal substrate/insulation. Refer to Detail PS-12-D or U-12-D.
- b. Adjoining sections of the reinforced strip need not be overlapped; however, gaps between adjoining sections must not exceed 1".

**CAUTION:** When RUSS is used for membrane securement along metal edgings, refer to the appropriate detail for applicable installation criteria. For some metal edge details, adjoining sections of the reinforced strip must be overlapped and spliced (refer to Detail A-1-G).

- c. **When using Pressure-Sensitive RUSS, clean the underside of the membrane with Sure-Seal Primer** and allow to properly dry prior to removing the release film from the RUSS.
- d. When using standard 6" RUSS (maximum 10-year warranty), follow cleaning procedures outlined in Paragraph J, "Membrane Splicing With Splicing Cement," to clean the RUSS and the underside of the deck membrane.

To splice the deck membrane to the standard 6" RUSS, follow standard splicing procedures excluding the use of In-Seam Sealant and Lap Sealant. The vertical field splices at the base of a wall or curb must be overlaid with a 6" by 6" section (with rounded corners) of Sure-Seal Pressure-Sensitive Flashing or uncured Elastoform Flashing centered over the field splice.

## 2. **Seam Fastening Plates**

Where the use of RUSS is not feasible (at smaller curbs or skylights), Sure-Seal 2" diameter Seam Fastening Plates may be used.

- a. Seam Fastening Plates may be installed horizontally into the structural deck or vertically into walls or curbs.
  - b. Securement of the EPDM membrane with the approved Carlisle Fasteners and Seam Fastening Plates must be a maximum of 12" on center starting 6" minimum to 9" maximum from inside and outside corners.
  - c. If horizontal wood nailers are provided, secure the Seam Fastening Plates to the wood nailer with Carlisle HP Fasteners. Roofing nails are not acceptable for securement.
  - d. After securing the Seam Fastening Plates, flash in accordance with the appropriate detail.
3. Refer to the "Withdrawal Resistance Criteria" chart in "Attachment I" at the end of this section for the required Sure-Seal Fastener criteria and corresponding deck type.

## **M. FLASHING**

### 1. **General Flashing Considerations**

- a. All existing **loose** flashing must be removed prior to the application of new membrane. New membrane flashing must extend above all existing intact flashing but must not conceal weep holes or cover existing throughwall counterflashing.
- b. Install surface mounted reglets and compression bar terminations directly to the wall surface.
- c. In-Seam Sealant is required on all vertical adhesive splices between adjoining sections of cured membrane flashing.

- d. All vertical field splices (adhesive or tape) at the base of a wall or curb must be overlaid with Pressure-Sensitive “T” Joint Covers, a 6" by 6" section (with rounded corners) of Sure-Seal Pressure-Sensitive Uncured Elastoform Flashing or uncured Elastoform Flashing (maximum 10-year warranty) centered over the field splice.
- e. **Pressure-Sensitive Uncured Elastoform Flashing or Uncured Elastoform Flashing** (maximum 10-year warranty) must be limited to the overlayment of vertical seams (as required at angle changes), or to flash inside/outside corners, vent pipes, scuppers and other unusually shaped penetrations where the use of Pre-molded Pipe Seals, cured EPDM membrane or Pressure-Sensitive Cured Cover Strip or Overlayment Strip is not practical.

**Note:** Even when working in elevated temperatures, in most cases a heat gun will be required to elevate the temperature of uncured Elastoform Flashing or Pressure-Sensitive Uncured Flashing between 105° F and 110° F (40 and 43°C) to permit proper forming of the uncured flashing.

- f. When using **Pressure-Sensitive Cured Cover Strip or Overlayment Strip** to overlay Seam Fastening Plates or metal edging flanges, etc., **Sure-Seal Primer** must be used to clean the membrane and metal flanges.

**Note:** When using Pressure-Sensitive products in colder temperatures, use a heat gun to warm the product. Apply heat to the EPDM flashing side of the product. Do not apply heat directly to the preapplied adhesive. The Pressure-Sensitive Flashing must be applied immediately after Primer flashes off. Refer to “Membrane Splicing with SecurTAPE” for application procedures in colder temperatures.

- g. In areas where metal counterflashing or surface mounted reglets are used as the vertical termination, they must be sealed with a rubber grade caulking to prevent moisture migration behind the new wall flashing.
- h. On Total System Warranty projects, Carlisle's Termination Bar (with Water Cut-Off Mastic) must be installed under all metal counterflashings and surface mounted reglets used for vertical wall terminations.

## 2. Walls, Parapets, Curbs, Skylights, etc.

- a. Use continuous deck membrane with Pressure-Sensitive RUSS (Reinforced Universal Securement Strip) or Seam Fastening Plates along the base of the wall.

- 1) When using Pressure-Sensitive RUSS, refer to Paragraph L, Additional Membrane Securement, for attachment criteria.
- 2) When Seam Fastening Plates are used to secure continuous deck membrane, use minimum 6" wide Pressure-Sensitive Cured Cover Strip or Overlayment Strip to overlay fasteners and plates.

When Cured EPDM Flashing is used (in conjunction with Splicing Cement), In-Seam Sealant is required around each Seam Fastening Plate.

- b. When the use of continuous deck membrane for wall flashing is not feasible, a separate piece of cured EPDM membrane may be used.

- 1) When **SecurTAPE** is used, the **membrane and flashing** (Cured EPDM Flashing) must be cleaned with **Sure-Seal Primer**. Refer to “Membrane Splicing with SecurTAPE” for splicing procedures.
- 2) When Splicing Cement is used to complete the splice (maximum 10-year warranty), follow standard splicing procedures including the use of In-Seam Sealant and Lap Sealant. Cured EPDM Flashing (Pre-KLEENED) need not be cleaned unless contaminated with field dirt, footprints, etc.

- c. Adhere flashing to the wall and terminate in accordance with the applicable U-9 Termination Details.
- d. Use a Pressure-Sensitive “T” Joint Cover, 6" by 6" Pressure-Sensitive Elastoform Flashing or Elastoform Flashing with rounded corners (maximum 10-year warranty) to overlay vertical splices as shown on the applicable U-12 Detail.
- e. Refer to U-15 Details for various corner flashing options.

### 3. Roof Drains (U-6 Details)

- a. Provide a smooth transition from the roof surface to the drain clamping ring. Prepare the substrate around each roof drain to avoid membrane bridging in excess of 2" at the sump area and possible distortion at the drain clamping ring.

**Note:** When reinforced membrane has been specified and the slope at the drain sump is greater than 3" in 12", a separate piece of cured non-reinforced membrane must be extended into the drain sump as shown on the applicable detail.

- b. The mating surfaces between the clamping ring and drain base must be clean and have a smooth finish.
- c. Field splices at roof drains must be located at least 6" outside the drain sump.
- d. Cut membrane so it extends approximately 1/2" beyond the attachment points of the clamping ring. The hole in the membrane must not restrict water flow or be smaller than the drain pipe.
- e. Remove all existing flashing material to prepare for the membrane seal (application of Water Cut-Off Mastic).
- f. All bolts and/or clamps must be in place to provide compression on the Water Cut-Off Mastic.
- g. Use drain strainers, which have been approved by the specifier in accordance with applicable codes.

### 4. Other Penetrations

- a. Flash pipes and round supports with Molded Pipe Seals or Pressure-Sensitive Pipe Seals, when feasible, in accordance with the applicable detail.
- b. Form Field Fabricated Pipe Seals using Pressure-Sensitive Uncured Elastoform Flashing or uncured Elastoform Flashing (maximum 10-year warranty) around pipes, round supports and structural steel tubing with corner radius greater than 1/4" in accordance with U-14 Details.
- c. When flashing seamless metal posts, maximum 4" by 4", with a corner radius less than 1/4", apply a field fabricated pipe flashing with a double vertical wrapping.
- d. Flexible penetrations (braided cables, conduits, wires, etc.) must be enclosed in a stable gooseneck and flashed in accordance with the applicable U-14 Detail.
- e. Hot pipes which exceed 180° F must be insulated with metal collars and rain hoods and flashed in accordance with the applicable U-14 Details.
- f. For pipe clusters or unusually shaped penetrations, a pourable sealer pocket must be utilized. Refer to applicable U-16 Details.

## N. ROOF WALKWAYS

Install walkways in locations designated by the specifier in accordance with "Design Criteria," Part I.

### **Carlisle Pressure-Sensitive Molded Walkway Pads (with Factory-Applied TAPE) or Walkway Rolls**

If a 30' long walkway roll is to be used, the Splice Tape must be applied to the side of the walkway, which faces upward after unrolling to prevent curling. Allow a 1" wide break between maximum 10' lengths of walkway roll. Round all corners of the walkway roll prior to application.

**Discontinue walkways over all field splices to provide a minimum 1" gap over the seam edge.**

#### 1. Attachment With SecurTAPE/Primer

- a. If necessary, **scrub** the membrane with Weathered Membrane Cleaner to remove contaminants. Rinse with clean water and allow to dry.

- b. When using Pressure-Sensitive Walkway Pads, prime the membrane surface with Sure-Seal HP-250 Primer and allow to properly dry. When using walkway rolls, prime the mating surfaces of the membrane and underside of the walkway roll with Sure-Seal HP-250 Primer and allow to dry.
- c. If walkway rolls are used, the SecurTAPE positioning (along the width or length of the pad) will vary depending on direction of roof slope; however, the maximum distance between parallel rows of tape shall not exceed 15" or 24" with 3" or 6" SecurTAPE respectively.
- d. **Remove** release film from SecurTAPE and place walkway pad/roll over the Sure-Seal HP-250 Primer applied to the EPDM membrane.
- e. **Walk** the pad/roll into place to ensure proper adhesion.

**Note:** On Sure-White Roofing Systems, when aesthetics are of importance, care should be exercised when applying Primer to membrane surface to avoid discoloration outside walkway area.

## 2. Concrete Paver Blocks

Install a **slip sheet of cured membrane or two layers of HP Protective Mat** under all smooth pavers for protection of the deck membrane. The protective layer must extend a minimum of 2" on each side of the concrete paver.

- 3. **Sure-Seal Interlocking™ Rubber Pavers** can be loose laid directly over the membrane. Installation instruction sheets are available from Carlisle.
- 4. Pavers are not recommended for walkways when slopes exceed 2" in 12".

## O. DAILY SEAL

- 1. On phased roofing, when the completion of flashings and terminations is not completed by the end of each work day, provisions must be provided to temporarily close the membrane to prevent water infiltration.
- 2. Temporarily seal any loose membrane edge down slope using Sure-Seal Pourable Sealer (two-component) or “closed cell” urethane foam so the membrane edge will not buck water. Caution must be exercised to ensure the membrane is not temporarily sealed near drains in such a way as to promote water migration below the membrane.
- 3. Sure-Seal Pourable Sealer, when utilized, shall be applied as follows:
  - a. On existing built-up roofs, remove the gravel. The surface must be clean and dry.
  - b. The two Pourable Sealer components must be mixed in accordance with the instructions on the container labels.
  - c. Apply the Pourable Sealer along the loose edge of the EPDM membrane. If necessary, use a trowel to spread Pourable Sealer to achieve complete coverage.
  - d. After embedding the membrane in Pourable Sealer, **CHECK FOR CONTINUOUS CONTACT**. Provide continuous pressure over the length of the temporary seal with 15' lengths of 2-1/2" diameter Sure-Seal Lay Flat Tubing filled with dry sand.
 

**Note:** Wood nailers will not provide constant compression due to warping and an uneven substrate.
  - e. When work is resumed, pull the membrane free; trim and remove where the Pourable Sealer was applied.
- 4. When using urethane foam as a daily seal, follow manufacturer’s installation requirements. Trim and remove membrane where urethane foam is applied.

## P. OPTIONAL COLOR COATING

**If optional color coating is specified, Carlisle's final inspection for warranty must be conducted prior to the coating application.** This will permit the completion of any “Repair for Warranty” items without consideration for the removal and

reapplication of the coating. The owner will then verify that the coating was applied after receiving the warranty.

1. If **Sure-Seal X-Tenda Coat Coating** is specified to color the membrane surface, refer to the Carlisle X-Tenda Coat Coating Specification for installation requirements.
2. If **EM-8 Hypalon Color Coating** is to be used, refer to the applicable Technical Data Bulletin for specific installation requirements.

## **Q. CLEAN UP (for Sure-White Roofing Systems)**

If required by the specifier to ensure the aesthetics of the white surface of the Sure-White EPDM membrane, the following procedures should be utilized:

1. Handprints, footprints, general traffic grime, industrial pollutants and dirt may be cleaned from the membrane surface by scrubbing with warm water and a low sudsing soap; rinse the area completely with clean water. Sure-Seal Weathered Membrane Cleaner can also be utilized.
2. Bonding Adhesive and Splicing Cement residue may be cleaned using the following procedures:
  - a. Saturate a clean HP Splice Wipe with clean Weathered Membrane Cleaner.
  - b. Scrub exposed Bonding Adhesive or Splicing Cement with the saturated HP Splice Wipe until all residue is removed from the membrane. For easier removal, it may be necessary to change splice wipes frequently.

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**This specification represents the applicable information available at the time of its publication. Owners, specifiers and Carlisle authorized roofing applicators should consult Carlisle or their Carlisle Manufacturer's Representative for any information that has subsequently been made available.**

**Review the appropriate Carlisle warranty for specific warranty coverage, terms, conditions and limitations.**



# Sure-Seal®/Sure-White® Adhered Roofing Systems

## “Attachment I” Withdrawal Resistance Criteria

August 2007

Deck/Parapet Type and Minimum Pullout Per Fastener	Carlisle Fasteners (Sure-Seal)	Minimum Penetration	Pilot Hole Depth	Pilot Hole Diameter
Steel, 22 gauge or heavier 360 pounds	HP, HP-X, ASAP or InsulFast Fastener	3/4"	N/A	N/A
Steel, less than 22 gauge 300 pounds	HP, HP-X, ASAP or InsulFast Fastener	3/4"	N/A	N/A
Structural Concrete, rated 3,000 psi or greater 800 pounds	CD-10	1"	(1)	7/32"
	HD 14-10	1"	(1)	3/16"
Wood Planks, minimum 15/32" thick Plywood 360 pounds	HP, HP-X, ASAP or InsulFast Fastener	Min. 1" (6)	N/A	N/A
Minimum 7/16" thick oriented strand board (OSB) 250 pounds	HP or HP-X, ASAP or InsulFast Fastener	Min. 1"	N/A	N/A
Cementitious Wood Fiber 225 pounds	HP-NTB (2)	1-1/2"	(3)	(3)
Gypsum 300 pounds	HP-NTB (2) or Lite Deck	1-1/2" (HP-NTB) 2" (Lite Deck)	(1)	1/2" or 7/16" (4)
Masonry (block, brick or concrete)	Term Bar Nail-In (5)	3/4"	1"	1/4"

**Notes:** N/A = Not Applicable

- (1) The pilot hole must be predrilled to a sufficient depth to prevent contact between the fastener point and any accumulated dust in the predrilled hole. This will help prevent bottoming out of the fastener during installation.
- (2) When specified, the HP-NTB Fastener and accompanying 3" diameter fastening plate may be used for attachment of insulation. The 2" diameter fastening plate must be used in conjunction with RUSS (additional membrane securement).
- (3) Most cementitious wood fiber decks do not require pre-drilling; however, Carlisle should be contacted prior to installation for verification of specific types that may require a pilot hole to be predrilled.
- (4) Pilot hole size may be varied to maximize pullout resistance.
- (5) Used for the securement of compression bar terminations or Seam Fastening Plates (used for additional membrane securement into vertical masonry surfaces). **Do not use for insulation securement.**
- (6) For wood planks only, maximum fastener penetration shall not exceed 1-1/2".

# Sure-Seal<sup>®</sup>/Sure-White<sup>®</sup> Adhered Roofing System

## “Attachment II” Direct Application Over Lightweight Insulating Concrete

August 2007

When specified, the Sure-Seal/Sure-White EPDM membrane may be adhered directly to a **new approved cellular or perlite lightweight insulating concrete** with a **minimum compressive strength of 225 psi**.

The Authorized Applicator must provide Carlisle with a copy of a certification letter from the lightweight insulating concrete manufacturer which references the project name and location and contains the manufacturer's brand name, minimum compressive strength, average wet and air dry densities.

The substrate must be free of any debris, fins, loose and foreign materials. Fill any gaps in the substrate greater than 1/4" with an appropriate material.

### Application Cautions

1. Do not proceed with the membrane installation until the lightweight insulating concrete substrate has cured a minimum of 48 hours. If necessary, consult with the lightweight insulating concrete manufacturer concerning additional drying time.
2. After rain or other precipitation, follow the manufacturer's requirements concerning proper visual inspection and additional drying time prior to adhering the membrane.
3. Prior to membrane installation, darker areas, especially along hairline cracks in the concrete, may serve as an indication of moisture entrapment and possible standing water beneath the surface. If this condition is found, consult with the lightweight insulating concrete manufacturer for proper corrective measures.
4. Except when lightweight insulating concrete is poured over slotted steel decks, the roofing applicator must conduct core cuts at the minimum rate of 1 every 2,000 square feet. The core cuts should be located around hairline cracks (if present) where darker areas are visible. After core cuts have been taken, the substrate should be examined for evidence of moisture above the structural deck and, if found, a wet/dry vacuum system, as recommended by the lightweight insulating concrete manufacturer, must be utilized to remove standing water from beneath the surface of the concrete.
  - a. To ensure the efficient operation of the vacuum system, a tight seal must be provided between the nozzle of the vacuum and the lightweight concrete substrate.
  - b. A one-way pressure relief vent, approved by Carlisle, must be installed over each core cut in accordance with Detail A.14.

# Sure-Seal<sup>®</sup>/Sure-White<sup>®</sup> Adhered Roofing Systems

## “Attachment III”

### Insulation Attachment With Sure-Seal FAST<sup>™</sup> Adhesive

August 2007

- A. FAST Adhesive may be used to attach the following roof insulations to an approved roof deck/substrate:
1. Polyisocyanurate (1" minimum thickness), minimum 1/2" thick HP Recovery Board or minimum 1/4" thick Dens-Deck or Dens-Deck Prime. If tapered Polyisocyanurate insulation is used, 1/2" minimum thickness is acceptable.
  2. Expanded Polystyrene (EPS) insulation overlaid with HP Recovery Board or Dens-Deck/Dens-Deck Prime. A composite board can be used to eliminate the need for an additional layer of FAST Adhesive.
  3. Extruded Polystyrene insulation overlaid with HP Recovery Board or Dens-Deck/Dens-Deck Prime.
  4. When oriented strand board (OSB) is proposed as the membrane underlayment, a polyisocyanurate/OSB composite board may be used since attachment of individual OSB panels is not recommended due to board stiffness and potential bowing on uneven surfaces.

Insulation board sizes up to 4' x 8' may be used providing full attachment is achieved. Trimming or slitting of boards may be required on uneven surfaces. If necessary, use maximum 4' x 4' boards so full embedment of boards may be achieved.

#### B. Cautions and Warnings

1. **Do not apply FAST Adhesive** when surface and/or ambient temperatures are below 25° F and rising when using heated spray equipment.  
  
When using FAST Adhesive in **non-heated spray equipment**, surface and/or ambient temperatures must be **60° F or warmer**.
2. The temperature of FAST Adhesive must be at a **minimum of 70° F at the time of use**. Use drum band heaters when necessary.

#### C. Roof Deck/Substrate Criteria

FAST Adhesive can be used to attach insulation to new or tearoff construction over structural concrete, fibrous cement (i.e., Tectum), gypsum, cellular or perlite lightweight insulating concrete (min. 200 psi compressive strength), wood and steel decks.

FAST Adhesive may also be used to attach insulation to an existing asphalt or coal tar pitch, modified bitumen or mineral surfaced cap sheets as follows:

1. On tearoff projects, the existing roof deck must be investigated and all wet and deteriorated material must be replaced. All loose base sheet material or asphalt must be removed prior to FAST Adhesive application.
2. The deck surface must be cleaned using compressed air, vacuum equipment or hand/power brooms to remove dust, loose dirt or debris. If excessive dust or dirt is present, a primer may be required prior to application of the adhesive. Contact Carlisle for specific primer requirements.
3. For new galvanized steel decks, power washing is required to remove finishing oils, if present.
4. For projects with existing Type III or IV asphalt, coal tar pitch, modified bitumen or mineral surface cap sheets, the existing roof must be inspected to determine if moisture is present within the existing assembly. Wet insulation and membrane shall be removed and replaced with compatible materials.

- a. Blisters, buckles, wrinkles and fishmouths shall be cut out or mechanically fastened.
- b. Remove loose gravel, dust and residue from a gravel surfaced BUR by using of a Hydro-Vac (wet vacuum equipment). Power vacuum equipment or a power sweeper followed by air blowing or another suitable means are also acceptable. Care shall be exercised in areas where evidence of ponding is obvious (remove residue from low areas prior to proceeding).

**CAUTION:** On coal tar pitch, when using white Sure-Weld membrane, minimum 1 inch thick polyisocyanurate is the required membrane underlayment. If gray or tan Sure-Weld membrane is used, minimum 1.4" thick polyisocyanurate is required.

**D. Adhesive Coverage Rates**

The coverage rate for FAST Adhesive will vary depending on the substrate as follows:

Roof Deck/Substrate	Square Feet per 50 Gallon "Drum Set"	Square Feet per 15 Gallon "Drum Set"
Gypsum, Cellular Lightweight Insulating Concrete, Structural Concrete or Wood	8500-9000	2500-2700
Fibrous Cement	5500-6500	1650-2000
Steel	8500-9000	2500-2700
Smooth BUR, Modified Bitumen or Mineral Cap Sheet	8500-9000	2500-2700
Gravel BUR	5000-6000	1500-1800
Insulation (for multiple layers)	8500-9000	2500-2700
Carlisle 725 Air and Vapor Barrier	8500-9000	2500-2700

**E. Adhesive Catalyst Criteria**

1. Sure-Seal FAST Adhesive Catalyst is required for use in the Part B side of FAST Adhesive when temperatures are below 50° F to accelerate adhesive set up time and allow insulation to be walked into place in a minimal amount of time (5 to 10 minutes).

FAST Adhesive Catalyst is recommended for temperatures between 50°-70°F. If adhesive is not catalyzed, preliminary fastening of insulation at corners or weighting of individual boards may be required in temperatures below 70° F since adhesive set up time will be slower.

2. Carlisle FAST Adhesive Catalyst is available in 1-gallon (8 pints) containers. The catalyst should be added in small quantities until experience is gained for proper judgment.
3. Mixing can be achieved with a minimum 1/2 horsepower collapsible drum mixer or equivalent such as Binks Model #31296. It is imperative that thorough mixing (15 minutes for FAST 100 and 10 minutes for FAST 100-LV) is achieved in order to maintain a consistent blend of materials for proper reaction of adhesive.

The Part B side of FAST Adhesive must be at least 70° F prior to adding catalyst. The catalyst must be agitated prior to adding to the Part B side to promote proper dispersion.

The amount of catalyst to be added to the Part B side of FAST Adhesive will vary based on the temperature of the surface to be sprayed as follows. This information is also included on the Catalyst container label.

Surface Temperature	Amount of Catalyst Added to Part B Side of FAST 100 Adhesive		Amount of Catalyst Added to Part B Side of FAST 100-LV Adhesive	
	50 Gallon Drum (oz.)	15 Gallon Drum (pints)	50 Gallon Drum (oz.)	15 Gallon Drum (pints)
25° F	12	2-1/2	43	8
32° F	10	2	34	6-3/4
40° F	8	1-3/4	24	5
50° F	6	1-1/4	18	3-14
60° F	4	1	8	1-1/2
70° F	2	1/2	4	1/2

1 pint = 16 oz. and 8 pints = 1 gallon

Note:  
 (1) FAST 100-LV Adhesive cannot be used for surface/ambient temperatures below 60° F unless applied with heated spray equipment.

**F. Installation Criteria**

1. Check to ensure the substrate is dry. FAST Adhesive cannot be applied to a wet or damp surface.
2. Spray-apply FAST Adhesive over the dry substrate area at the coverage rate indicated previously to allow for full coverage.
3. Allow the adhesive to rise up approximately 1/8" and develop strings prior to setting insulation boards into adhesive.

**Note:** String-time is measured by touching the adhesive with a splice wipe and looking for development of “strings” of adhesive as you pull the splice wipe out of the adhesive. With FAST Adhesive, string time is generally around 1-1/2 – 2 minutes after application at room temperature.

4. **Walk the boards into the adhesive and roll using the 30" wide, 100 – 150 pound weighted steel roller** to ensure full embedment. Optimal set up time should be approximately 5 to 10 minutes. As an option, a nylon bristle push broom may be used.

**CAUTION:** Walking on the boards immediately after placement in adhesive can cause slippage/movement until the adhesive has started to set up.

On roofs with a slope greater than 1/2" in 12", begin adhering insulation at the low point and work upward to avoid slippage.

**One person should be designated to walk/roll in all boards and trim/slit or apply weight as needed to ensure adequate securement.**

5. Position all edges of the boards on the top flutes of steel decks for adequate support.
5. If multiple layers of insulation are specified or required, spray-apply FAST Adhesive over the base layer once fully secured and follow procedures noted above for attachment of each insulation layer.

# Sure-Seal<sup>®</sup>/Sure-White<sup>®</sup> Adhered Roofing System

## “Attachment IV” Aqua Base 120 Bonding Adhesive

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### A. General Cautions and Warnings

1. Review the applicable Material Safety Data Sheet for complete safety information prior to use.
2. This adhesive is designed to be applied when the ambient temperature is 40° F (4°C) and rising. Do not apply if ambient temperature will drop below 32° F (0° C) before adhesive dries. Do not allow to freeze. Do not store below 40° F.
3. Opened containers of Aqua Base 120 Bonding Adhesive should be used within 48 hours. The adhesive will form a thick surface skin that will not re-dissolve. Adhesive can be used once the skinned layer is removed.
4. Aqua Base 120 Bonding Adhesive is approved for use on Polyisocyanurate, HP Recovery Board, Dens-Deck Prime, oriented strand board, plywood, cellular lightweight, and structural concrete. Aqua Base 120 Bonding Adhesive is not acceptable over existing roof systems or decks with residual adhesive or asphalt.
5. Immediately broom the bonded portion of the sheet with a soft bristle push broom to achieve maximum contact. **Brooming is critical.**

### B. Application

1. Stir the Aqua Base 120 Bonding Adhesive until settled material or phased liquid is redistributed and the adhesive is uniform in color.
2. Apply adhesive to the membrane and the substrate (at the recommended rate) in a uniform manner avoiding globs, puddles, and uncoated areas.
3. Application methods:
  - a) Roller Application – Use a medium nap roller.
  - b) Mechanical Roller Application – Follow the manufacturer’s safety and use procedures.
  - c) Mechanical Spray Application – Follow the manufacturer’s safety and use procedures.
    - 1) Tip sizes between .019" to .023" in a Graco 510 gun.
    - 2) A minimum fluid pressure of 2,500 psi is required for a fair pattern.
    - 3) Back rolling is recommended.
    - 4) Flush with water at the end of the day.
4. The adhesive must be allowed to dry until the adhesive does not transfer to a dry finger touch or pull away from the membrane. The dried adhesive should remain tacky before assembly.
5. Mate the membrane with the adhesive coated substrate, while avoiding wrinkles.
6. Immediately broom the bonded portion of the sheet with a soft bristle push broom to achieve maximum contact. The adhesive contains no solvents to react with the membrane; therefore, brooming the sheet is critical.

7. Extended drying times can be expected in cool, overcast, humid, shaded or late day applications. The adhesive must be dry to avoid permanent blisters from trapped moisture. Coated areas exposed to moisture shall be allowed to dry and then recoated. All adhesive residue in the splice area must be removed.

# Sure-Seal<sup>®</sup>/Sure-White<sup>®</sup> Adhered Roofing System

## “Attachment V” Membrane and Splice Repairs

August 2007

### A. GENERAL

1. Prior to initiating repairs, the membrane must be cleaned to remove field dirt and other contaminants. Using a scrub brush, scrub the splice areas with warm water and a low-sudsing soap (Spic and Span, Tide, Lestoil). Rinse with clean water and allow to dry prior to applying Weathered Membrane Cleaner or Primer as required.
2. Saturate a clean HP Splice Wipe or natural fiber rag (cotton) with Weathered Membrane Cleaner and scrub the area in a circular motion. Continue cleaning until the surface is a consistent matte black color without streaking.

**Note:** Extreme conditions of accumulated dirt may require detergent and water cleaning as referenced above.

### B. REPAIRS OF CUTS AND TEARS (Surface Splice)

Repairs to cuts and tears in the membrane must be accomplished by splicing a membrane section over the affected area.

1. Select a repair membrane, which is the same material as that to be repaired.
2. When using Pressure-Sensitive Cured Cover Strip or SecurTAPE for repairs, after thoroughly cleaning the membrane to remove field dirt, etc., apply HP-250 Primer to the splice areas. Apply Pressure-Sensitive Cured Cover Strip or Cured Membrane/SecurTAPE and roll the splice areas. Apply “T” Joint Covers at splice intersections. Lap Sealant is applied at flashing and tape overlaps in accordance with standard procedures.
3. When using Splicing Cement (maximum 10-year warranty), for areas where a section of the cured membrane has been cut and removed, In-Seam Sealant must be placed 1/2" from all edges of the open area. For small holes, punctures, or tears in the cured membrane, if In-Seam Sealant can completely cover the damage with a normal bead, the sealant can be placed directly over the puncture. Follow standard cleaning and splicing procedures as outlined in the “Application” section.
4. When the repair membrane is uncured Elastoform Flashing, the use of In-Seam Sealant is not required.
5. Extend the repair membrane section at least 3" in every direction from the cut or tear. Round the corners of the repair membrane prior to splicing.

### C. SPLICE REPAIRS

1. **Repair of Improperly Installed Tape Splices**
  - a. Improperly installed tape splices include, but are not limited to, fishmouths at field splices, lack of or improper use of Primer, condensation formation on primer or incorrect tape placement, etc.
  - b. Clean the splice area with Sure-Seal HP-250 Primer on both sides extending past the width of the new flashing overlay to be installed.
  - c. Overlay the defective splice area with a minimum 6" wide Sure-Seal Pressure-Sensitive Cured Cover Strip or Overlayment Strip centered over the edge of the splice.



- d. **If fishmouths are present in the field splice**, the fishmouth must be cut by removing the top layer of membrane prior to overlaying the splice. The flashing overlay **must** be supported by the bottom layer of cured membrane.

## 2. **Repair of Improperly Installed Adhesive Splices**

- a. Improperly installed splices include, but are not limited to, missing In-Seam Sealant, fishmouths at field splices, overly dry or wet Splicing Cement or incorrect coverage rate.
- b. Pull any loose edges of the splice apart, reapply splicing cement and mate the two surfaces together. Do not reapply In-Seam Sealant.
- c. Clean the splice area with HP-250 Primer on both sides extending past the width of the flashing to be applied.
- d. Overlay the defective splice area with a minimum 6" wide Sure-Seal Pressure-Sensitive Cured Cover Strip or Overlayment Strip (centered over the edge of the splice).
- e. **If fishmouths are present in the field splice**, the fishmouth must be cut by removing the top layer of membrane prior to overlaying the splice. The flashing overlay **must** be supported by the bottom layer of cured membrane.

# **SURE-SEAL/SURE-WHITE ADHERED ROOFING SYSTEM**

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# ***Metrics***

## ***Length***

1/8 inch = 3 mm  
1/4 inch = 6 mm  
15/32 inch = 12 mm or 1.2 cm  
1/2 inch = 13 mm or 1.3 cm  
5/8 inch = 16 mm or 1.6 cm  
3/4 inch = 19 mm or 1.9 cm  
1 inch = 2.5 cm  
1-1/4 inches = 3.8 cm  
1-1/2 inches = 4 cm  
2 inches = 5 cm  
2-1/2 inches = 6.5 cm  
3 inches = 8 cm  
4 inches = 10.5 cm  
5 inches = 12.7 cm  
5-1/2 inches = 14 cm  
6 inches = 16.5 cm  
7 inches = 18 cm  
9 inches = 23 cm  
12 inches = 31 cm  
14 inches = 35 cm  
18 inches = 46 cm  
24 inches = 61 cm  
3 feet = .9 m  
3 feet, 6 inches = 1.1 m  
4 feet = 1.2 m  
4 feet, 6 inches = 1.4 m  
5 feet = 1.5 m  
8 feet = 2.4 m  
10 feet = 3 m  
40 feet = 12 m  
50 feet = 15.2 m  
65 feet = 20 m  
75 feet = 22.9 m  
85 feet = 26 m  
100 feet = 30 m  
120 feet = 37 m  
250 feet = 76.2 m  
6000 feet = 1829 m

10 feet per minute = 3 m per minute  
15 feet per minute = 4.6 m per minute

.028 inch = .7 mm  
.035 inch = .9 mm  
.045 inch = 1.1 mm  
.060 inch = 1.5 mm

## ***Length (continued)***

2 inches in 12 inches = 16 cm/m  
3 inches in 1 horizontal foot = 25 cm/m  
5 inches in 12 inches = 41 cm/m  
18 inches in 12 inches = 150 cm/m  
22 linear feet = 6.6 m  
75 linear feet = 23 m  
300 linear feet = 91.5 m

1 per 2 square feet = 1 per 1.86 m<sup>2</sup>  
1 per 4 square feet = 1 per 3.72 m<sup>2</sup>  
1 per 5.3 square feet = 1 per 4.93 m<sup>2</sup>  
1 per 6.4 square feet = 1 per 5.95 m<sup>2</sup>  
60 square feet = 5.6 m<sup>2</sup>  
100 square feet = 9.3 m<sup>2</sup>  
120 square feet = 11.2 m<sup>2</sup>  
150 square feet = 14 m<sup>2</sup>  
250 square feet = 23 m<sup>2</sup>  
720 square feet = 67 m<sup>2</sup>  
2000 square feet = 186 m<sup>2</sup>

## ***Weight***

80 pounds = 36 kg  
300 pounds = 136 kg  
360 pounds = 163 kg  
500 pounds = 227 kg  
800 pounds = 363 kg

## ***Miles Per Hour***

55 mph = 88 km per hour  
72 mph = 115 km per hour  
79 mph = 127 km per hour  
80-89 mph = 128 – 143 km per hour  
90-99 mph = 144 – 159 km per hour  
100 mph = 161 km per hour

## ***Fahrenheit/Celsius***

20° Fahrenheit = -7° Celsius  
40° Fahrenheit = 4.5° Celsius  
90° Fahrenheit = 32° Celsius  
120° Fahrenheit = 49° Celsius

## ***Volume***

8 ounces = .24 l  
1 gallon = 3.78 l  
5 gallon = 19 l

225 psi = 15.8 kg/cm<sup>2</sup>  
3000 psi = 211 kg/cm<sup>2</sup>