

# KEE-Stone® Hybrid System

## 2-Ply Cold Application Guidelines



### DESCRIPTION

Garland's 2-ply KEE-Stone hybrid cold system incorporates a Garland approved modified bitumen base sheet, designed to exceed the industry's highest standards by containing the latest SBS (Styrene-Butadiene-Styrene), fire retardant compounds, and fiberglass and polyester scrim reinforcements with Garland's KEE-Stone FB 60 membrane as a cap sheet, featuring high-performance Dupont™ Elvaloy® HP Ketone Ethylene Ester (KEE) technology that exceeds all requirements outlined in ASTM D 6754.

### MATERIALS

The materials used in the system may include Green-Lock® Membrane Adhesive, Green-Lock Flashing Adhesive, KEE-Lock Foam to adhere the membranes, an approved modified bitumen base sheet, the KEE-Stone FB 60 membrane for the cap sheet, and KEE-Stone 6" Utility Roll for all end laps and vertical flashing seams. Approved base sheets are listed below.

### SYSTEM/PRODUCT OPTIONS

**Nailable Base Sheet (Optional):** ASTM D4601 Type II base sheet

**Interply:** StressBase® 80/120, FlexBase® 80, FlexBase Plus 80, FlexBase E 80, HPR® Torchbase, Viking CIF-2HM, Ultra-Shield Torch Base

**Membrane:** KEE-Stone FB 60, KEE-Stone FB 60 Flashing, KEE-Stone Utility Roll (6")

### APPLICATION EQUIPMENT

Every professional roofer is familiar with the tools needed to complete a cold process roof installation, but here are some specific tools you'll need to install Garland's 2-ply cold KEE-Stone hybrid system:

- Suitable trowel for applying adhesive to flashing details if necessary
- Roofer's knife with hooked blade
- Long-handled (standing) squeegee that has a 12"-16" (304 - 406 mm) flat blade for applying cold adhesive
- Long-handled squeegee with 1/8" (3 mm) notch for colder weather
- Seam rollers
- Leister Uniroof AT/ST hot air welder for field seams
- Hand-held hot air welder for seam details and flashings
- Seam probing tool to check for small voids
- Heavy weighted roller to press membrane into adhesive
- Weights for edges or corners that potentially curl up when the sheets have not had enough time to relax

### BASE SHEET APPLICATION OVER NAILABLE SUBSTRATE (OPTIONAL)

1. Beginning at the low point of the roof, fasten one ply of VersiPly 40 or StressBase 80 to the nailable substrate.
2. Start with an appropriate roll width (1/3 or 1/2 roll width) to accommodate off-setting of side laps of subsequent layers of base sheet. Install so that no side laps are against the flow of water.
3. Fasten nailable base sheet with a minimum fastening pattern of every 9" (230 mm) o.c. on side laps and every 18" (457 mm) o.c. in two staggered rows in the field of the sheet.

**Note:** Check specification for exact fastening pattern as it may change based on wind uplift requirements.

4. Overlap nailable base sheet side laps 4" (100 mm) and end laps 8" (200 mm). Offset end laps of side by side sheets a minimum of 3' (0.90 m).
5. Additional plies of base sheet are to be installed as specified in the section below.

**Note:** Do not leave fastened base exposed; cover in the same day with the base sheet and cap sheet that is specified.

6. Start base sheet application at the low point of the roof with appropriate roll width to offset side laps 18" (457mm) from side laps of the nailable base sheet. Install flush to roof edge if over base sheet, otherwise turn the base sheet over the fascia minimum 2" (50 mm) and nail 9" (230 mm) o.c. For perimeter flashing details, you must extend the base sheet up to a minimum of 8" (203 mm). Design layout so that no side laps are against the flow of water.

**Note:** On smaller roofs, cut rolls into manageable lengths.

### BASE SHEET APPLICATION OVER APPROVED ROOF BOARD

**Approved Roof Boards: 1/2" (8 mm) min.**

- G-P Gypsum
- DensDeck Prime®
- DensDeck DuraGuard®
- SecuRock®
- High density asphalt coated wood fiberboard

1. Sweep or blow away any dust, dirt or sand particles that could interfere with adhesion.
2. Tape all insulation joints prior to applying Green-Lock Membrane Adhesive to keep material from seeping in between the boards. (duct tape can be used for taping insulation joints)
3. Relax base sheet prior to application (until sheet lies flat) and work with no more than 18' (5.5 m) lengths. This will allow the sheet to sit down into the adhesive.
4. Snap chalk lines for area of application to prevent material from skinning over in areas that material will not be applied immediately.
5. Pour a liberal amount of Green-Lock Membrane Adhesive onto the cover board at a rate 1.5 to 2.0 gallons per square (.61 to .82 l/m<sup>2</sup>).  
**Note:** Work outwards to eliminate voids. Coverage based on a smooth surface; uneven surfaces or more porous roof boards will increase the coverage rate.
6. Start base sheet application at the low point of the roof with appropriate roll width. Install flush to roof edge if over base sheet, otherwise turn the base sheet over the fascia minimum 2" (50 mm) and nail 9" (230 mm) o.c. For perimeter flashing details, you must extend the base sheet up to a minimum of 8" (203 mm). Design layout so that no side laps are against the flow of water.

**Note:** On smaller roofs, cut rolls into manageable lengths.

### KEE-STONE FB 60 SHEET APPLICATION

1. Before installing KEE-Stone FB 60, you must sweep or blow away any dust, dirt or debris off the base sheet, as this will interfere with adhesion.
2. Relax the KEE-Stone FB 60 cap sheet prior to application. This will allow the sheet to sit down into the adhesive.
3. Apply KEE-Lock Foam to the approved base sheet in a ribbon pattern. Space 1/4" - 1/2" (0.64 cm - 1.27 cm) wide beads, 12" o.c. (61 cm).
4. Position the KEE-Stone FB 60 where it is ready to be installed and then roll the membrane into the KEE-Lock Foam.

**Note:** Ensure that foam adhesive is not applied to any side laps or areas where the membrane is to be welded.

5. Broom in the KEE-Stone FB 60 membrane immediately after install to ensure even continuous contact between the fleece backing and the foam adhesive followed by a weighted roller to ensure contact with the adhesive and push out any air pockets.
6. To install KEE-Stone FB 60, start at the low point of the roof with an appropriate roll width to offset side laps from the underlying base sheet a minimum of 18" (457 mm). Work with manageable lengths for proper handling. Position the KEE-Stone FB 60 cap sheet with salvage edge at low side of roof. Install in shingle fashion, with no laps against the flow of water.

**Note:** Once the membrane has had a chance to bond, utilize a seam probe to check all laps and joints for full adhesion. Check for small voids at laps. If the membrane can be lifted at any area, it is not properly adhered. Any areas not properly bonded require welding or, if necessary, the application of a utility patch to seal an un-bonded areas that exist.

7. Once the KEE-Stone FB 60 is adhered, heat-weld side lap seams to seal the membranes together.
8. All end laps shall be butted up to one another. Once end laps are adjoined, heat weld KEE-Stone 6" Utility Roll over joint to seal.
9. Refer to Leister equipment manual for proper heat welding instructions.

## FLASHING APPLICATION

At all vertical and other flashing details, install one of the approved base sheets followed by the KEE-Stone FB 60 Flashing membrane extending over the already installed field plies.

### Base Flashing Installation

1. Position the base flashing ply where it is ready to be installed.
2. Use preferred method to align sheet with install path.
3. Apply Green-Lock Flashing Adhesive to the substrate and a min. 6" (152.4 mm) onto the field at a rate of 2-3 gallons per 100 sq. ft. (0.82-1.2 l / m<sup>2</sup>).
4. Install a 3' (0.9 m) wide approved base flashing ply extending min. 6" (152.4 mm) onto the field of the roof.
5. Overlap base flashing ply side laps 4" (100 mm).
6. Utilize a clean trowel to apply pressure to all T-laps to seal immediately following base ply application.

### KEE-Stone FB 60 Flashing Installation

1. Before installing the KEE-Stone FB 60 Flashing, all dust, dirt or debris must be removed from the base sheet.
2. Position KEE-Stone FB 60 Flashing membrane where the membrane is ready to be installed.
3. Use preferred method to align sheet with install path.
4. Apply KEE-Lock Foam to the fleece side of the membrane in a ribbon pattern. Space ¼" – ½" (0.64 cm – 1.27 cm) wide beads, 6" o.c. (30.5 cm).
5. Install 10' (3.3 m) wide KEE-Stone FB 60 cap flashing ply extending min. 9" (228.6 mm) onto the field of the roof.

**Note:** Ensure that foam adhesive is not applied to any side laps or areas where the membrane is to be welded.

6. Broom in the KEE-Stone FB 60 Flashing membrane immediately after install to ensure even continuous contact between the fleece backing and the foam adhesive.
7. All vertical seams are to be butted together and then fully heat weld 6" KEE-Stone Utility Roll covering the seam.
8. Complete all inside and outside corner flashing details by fully heat welding KEE-Stone Utility Roll centered on the seam.

**Note:** Once the membrane has had a chance to bond, utilize a seam probe to check all laps and joints for full adhesion. Check for small voids at laps. If the membrane can be lifted at any area, it is not properly adhered. Any areas not properly bonded require welding or, if necessary, the application of a utility patch to seal any unbonded areas that exist.

9. All vertical flashings shall be terminated a min. 8" (203 mm) above the top layer of insulation with approved termination bar and counter-flashing system.
10. For any applications involving PVC or KEE-coated sheet metal, refer to its specific installation details.

## LIMITATIONS

1. Do not install in inappropriate weather. Green-Lock Membrane Adhesive is a moisture-cured product and rain or high humidity can accelerate the curing process.
2. Store the adhesives properly to protect them before use. Keep dry and above 70°F (21°C) for 24 hours prior to application.
3. Leave the lids on the product until you are ready to use. Open containers will skin and start to cure.
4. Flip over all sealed buckets of Green-Lock Membrane Adhesive onto their lids to allow the product to mix before beginning the job. This will give you a more consistent product.
5. When applying KEE-Lock Foam, allow product to rise but do not let it skim over.
6. Do not apply Green-Lock Membrane Adhesive or Flashing Adhesive that has been improperly stored or exposed to moisture. IF THE MATERIAL ISN'T BONDING, STOP THE APPLICATION!
7. Refer to the KEE-Stone cold process specification for complete requirements.
8. Substrates must be free of dust, dirt, oil, debris and moisture.
9. Work with manageable lengths of base and cap sheets for the particular job. Where appropriate, cut rolls into ⅓ or ½ roll lengths and allow material to relax prior to installation.
10. End laps do not have a selvedge edge. Therefore, make sure all end laps are sealed by heat welding KEE-Stone 6" Utility Roll over joints.

## WEATHER CONDITIONS

Do not attempt application if ice, snow, moisture or dew is present. Bonding substrates must be clean, dry and free of dust or other inhibitors of proper adhesion. Ambient temperature must be 50°F (10°C) or rising through the day. Cooler temperatures will negatively impact the properties of the system. Contact your Garland Sales Representative for proper cold weather applications.

## STORAGE

Store pails and roll goods in their original packaging, indoors on pallets protected from the elements. Green-Lock Membrane and Flashing Adhesives need to be kept at 70°F (21°C) for at least 24 hours prior to application. If stored on the roof, all product needs to be under a tarp at all times. Rolls and containers that are improperly stored or have been warehoused for prolonged periods of time could potentially be damaged or go beyond their shelf life.

For more information, visit us at: [www.garlandco.com](http://www.garlandco.com)

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