

Garland's 2-ply KEE-Stone hybrid hot 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 membrane as a cap sheet, featuring high-performance ELVALOY™ HP Ketone Ethylene Ester (KEE) technology that exceeds all requirements outlined in ASTM D 6754.

MATERIALS

The materials used in the KEE-Stone hybrid system may include HPR® All-Temp, Garlastic® KM Plus or approved ASTM D 312 hot asphalt to adhere the membrane; an approved modified bitumen base sheet, the KEE-Stone membrane as 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, StressBase 80 Plus, FlexBase Plus 80, FlexBase E 80, HPR® Torchbase, Ultra-Shield Torch Base

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

APPLICATION EQUIPMENT

Here are some specific tools you'll need to install Garland's 2-ply hot KEE-Stone hybrid system:

- Suitable trowel for applying adhesive to flashing details if necessary
- Roofer's knife with hooked blade
- Long-handled (standing) roller with 1/8"-1/4" (3-6 mm) nap for applying primer 1/8" (3 mm) nap for smooth surfaces; 1/4" (6 mm) nap for more porous surfaces
- Fiberglass mop head
- Fire extinguisher
- Leister Uniroof AT/ST hot air welder for field seams
- Hand-held hot air welder for seam details and flashings
- Silicone seam rollers
- Seam probing tool to check for small voids
- Heavy weighted steel roller (minimum 75 lb.) roller

BASE SHEET APPLICATION OVER NAILABLE SUBSTRATE (OPTIONAL)

1. Beginning at the low point of the roof, fasten one ply of approved ASTM D 4601 base sheet 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 base sheet with a minimum fastening pattern complying with project wind uplift requirements. **Note: Check specification for exact fastening pattern as it may vary based on wind uplift requirements.**
4. Overlap 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" (457 mm) 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. (Refer to Tech Bulletin TB5-23 for Priming and Cover Board Full Encapsulation Precautions)

- Perlite
 - G-P Gypsum
 - DensDeck Prime®
 - DensDeck DuraGuard®
 - DensDeck Storm-X™
 - Securock®
 - High density asphalt coated wood fiberboard
1. Sweep or blow away any dust, dirt or sand particles that could interfere with adhesion.
 2. 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.
 3. Apply a liberal amount of approved hot asphalt onto the roof at a rate of 25 lbs. per square (11.34 kg/m²) from the base coat to the top cover board. **Note: Work outwards to eliminate voids. Coverage based on a smooth surface; uneven surfaces or more porous roof boards will increase the amount of material needed.**
 4. Start base sheet application at the low point of the roof with appropriate roll width to offset side laps 18" (457 mm) from side laps of the nailed base sheet if installed. 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. Design layout so that no side laps are against the flow of water. **Note: On smaller roofs, cut rolls into manageable lengths.**

KEE-STONE SHEET APPLICATION

1. Before installing KEE-Stone, 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 cap sheet prior to application. This will allow the sheet to sit down into the adhesive.
3. Apply a liberal amount of approved hot asphalt onto the existing base sheet at a rate of 25 lbs. per square (11.34 kg/m²) for the cap sheet. **Note: Ensure that asphalt is not applied to any side laps or areas where the membrane is to be welded. Work outwards to eliminate voids. Coverage based on a smooth surface; uneven surfaces or more porous roof boards will increase the coverage rate.**
4. To install the cap sheet, 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 cap sheet with salvage edge at the 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 any unbonded areas.**
5. Broom in the KEE-Stone membrane immediately after install to ensure even, continuous contact between the fleece backing and the asphalt.

After brooming, immediately use a minimum 75 lb. weighted roller to roll the membrane to ensure proper contact and adhesion with the adhesive and push out any air pockets.

6. Once the KEE-Stone membrane is adhered, use hot air welding equipment and a 2" silicone roller to heat-weld side lap seams to seal the membranes together.
7. 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.
8. Refer to Leister equipment manual for proper heat welding instructions.
9. Foot traffic must be restricted on applied membrane. Stained or contaminated membrane will not be accepted.
10. All hot air welded seams should be no less than 1.5" indicating a proper welded seam.
11. To ensure proper equipment settings throughout the project, a preliminary test weld is required prior to installation and at the re-start of welding throughout the day.

FLASHING APPLICATION

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

Base Flashing Installation

1. Prime the horizontal surface with GarlaPrime and allow to dry.
2. Position the base flashing ply where it is ready to be installed.
3. Use preferred method to align sheet with install path.
4. Apply asphalt to the substrate and a min. 6" (152.4 mm) onto the field at the manufacturer's specified EVT (+/- 25°F) at a nominal rate of 25 lbs. per 100 sq. ft. or apply Green-Lock Plus 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. (0.8 2-1.2 l/ m2).
5. Install a 3' (0.9 m) wide approved base flashing ply extending min. 6" (152.4 mm) onto the field of the roof.
6. Overlap base flashing ply side laps 4" (100 mm).
7. Utilize a clean trowel to apply pressure to all T-laps to seal immediately following base ply application.

KEE-Stone Flashing Installation

1. Before installing KEE-Stone Flashing, all dust, dirt or debris must be removed from the base sheet.
2. Position KEE-Stone Flashing membrane where the membrane is ready to be installed.
3. Use preferred method to align sheet with install path.
4. Apply KEE-Lock WB Flashing adhesive in a smooth, even coat to the exposed side of the installed base flashing ply and to the backside of the KEE-Stone NF Flashing at a total combined rate of 1.0-1.5 gallons per sq. ft.
5. Install 10' (3.3 m) wide KEE-Stone cap flashing ply extending min. 9" (228.6 mm) onto the field of the roof. Note: Ensure the adhesive is not applied to any side laps or areas where the membrane is to be welded.

6. Broom in or roll with a weighted roller the KEE-Stone Flashing membrane immediately after install to ensure even continuous contact between the flashing membrane and the 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 on the center of the seam or by using KEE-Stone pre-fabricated accessories. **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 or when there is a 30% or greater chance of rain or snow. If temperatures are lower than 50°F (10°C), refer to the cold weather guidelines applied by the NRCA and The Garland Company.
2. Store all roofing materials in a protected area prior to application.
3. Do not apply roofing materials that have been improperly stored or exposed to moisture. IF THE MATERIAL ISN'T BONDING, STOP THE APPLICATION!
4. Refer to the 2-ply KEE-Stone hot-applied roof system specification for complete requirements.
5. Substrates must be free of dust, dirt, oil, debris and moisture.
6. Primer, if used, must be applied at the specified rate and must be all owed to thoroughly dry.
7. Work with manageable lengths of base and cap sheets for the particular job. Where appropriate, cut rolls into 1/3 or 1/2 roll lengths and allow material to relax prior to installation.
8. KEE-Stone 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.
9. Do not fully encapsulate Securock or Densdeck in hot asphalt. These cover boards can still be used in hot applications but must be mechanically fastened or adhered with insulation adhesive.

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. 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. 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