



HELIX[®] LOW-RISE ADHESIVE

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PRODUCT DESCRIPTION

Mule-Hide Helix[®] Low-Rise Adhesive is a two-component, low-rise, construction grade, polyurethane foam adhesive designed to adhere approved roof insulations, thermal barriers, cover boards and fleece backed single-ply membranes to acceptable substrates. This VOC, CFC, HCFC and solvent free adhesive is quickly and easily applied. The Helix Low-Rise Adhesive is applied in continuous ribbons or beads spaced 4", 6" or 12" on center depending on the project and code requirements. FM approved assemblies over various deck types are available.

BASIC USES

Helix Low-Rise Adhesive can be used to adhere single or multiple layers of approved roof insulation boards, cover and thermal barrier boards and fleece backed membranes to acceptable substrates.

PACKAGING

The Helix Low-Rise Adhesive is available packaged in the following containers:

1. Helix Low-Rise Adhesive Cartridge is a twin-pack consisting of one tube of Part A and one tube of Part B bound together. The cartridge is designed to fit the durable, cordless Trufast Dispensing Gun. Cartridges are sold in cartons. Each carton contains 4 cartridges (2 tubes per cartridge) and 6 Cartridge Static Mix Tips.
2. Helix Low-Rise Adhesive Tanks consists of two tanks, one labeled Part A (Component A) and one labeled Part B (Component B). Each tank is supplied in a separate box. The Helix Gun Assembly (a 25' dual hose with attached spray gun), petroleum packet, wrench, 10 Tank Static Mix Tips and additional instruction sheet) is included in the Part A box. The Part B box only contains the Part B Tank. Helix Gun Assemblies and additional Tank Static Mix Tips may be purchased separately. The instructions printed on the boxes and packaged in the Part A Tank box must be read prior to using the Helix Low-Rise Adhesive.
3. Helix 15 or 50 Gallon Drum Set consists of two 15 or 50 gallon drums. One drum is labeled Part A (Component A) and one is labeled Part B (Component B). 15 and 50 gallon drums require the use of specialized dispensing equipment (spray foam rigs/carts) in order to apply the material at a 1:1 ratio at the application tip. Choices of equipment vary, but if the appropriate drum sets can be accommodated by the equipment, it should be able to dispense the Helix Adhesive. If there are any questions regarding compatibility between the Helix Adhesive and the spray equipment, the equipment manufacturer should be consulted.

ACCEPTABLE INSULATIONS, COVER BOARDS/THERMAL BARRIERS

Helix Low-Rise Adhesive is compatible with the following:

1. High Density Wood Fiberboard – maximum sheet size is 4' x 4'
2. Polyisocyanurate – maximum sheet size is 4' x 4'.
3. Extruded Polystyrene (XPS) – Mule-Hide recommend the use of STYROFOAM[™] Brand DECKMATE[™] Plus FA flat or tapered insulation (available in 2' x 8' sheets). Other XPS brands may require a primer or scoring of the surface (contact Mule-Hide Tech Dept. before proceeding). 4' x 8' sheets must be cut into 2 pieces (4' x 4').
4. Expanded Polystyrene (EPS) – maximum sheet size is 4' x 4'. Fleece backed membranes (not black EPDM) may be installed directly over a minimum 1.5 lb density EPS. UL and FM codes will require an overlay of polyisocyanurate insulation or an acceptable cover board (DensDeck Prime[®] or Securock[®]).
5. DensDeck - Mule-Hide recommends the use of DensDeck Prime.
6. Securock - Mule-Hide recommends the use of Securock[®] Brand Gypsum-Fiber Roof Board.
7. Oriented Strand Board (OSB) – When used as a cover board for fully adhered systems place rough side up.

Helix[®] Low-Rise Adhesive

Note: Perlite and Fiberglass Insulation are not acceptable. Existing Phenolic insulation must be removed.

ACCEPTABLE SUBSTRATES/SURFACES

Helix Low-Rise Adhesive is compatible with the following:

1. Concrete (poured in place or precast) – New poured decks must have a minimum 28 day cure time. Contractor must confirm decks are thoroughly dry. Mule-Hide recommends adhesion tests for existing concrete. Any asphalt residue found on the existing concrete must be primed with CAV-GRIP™ Low-VOC Adhesive/Primer.
2. Lightweight Concrete - Cellular or air-entrained lightweight substrates are acceptable. Lightweight concrete containing expanded aggregate such as perlite or vermiculite is not acceptable. New lightweight concrete must be confirmed by the contractor to be thoroughly dry. Existing substrates will require adhesion tests.
3. Gypsum (poured in place or precast) – New gypsum must be confirmed by the contractor to be thoroughly dry. Old gypsum decks having any asphalt residue must be primed with CAV-GRIP™ Low-VOC Adhesive/Primer. Adhesion tests are recommended.
4. Cementitious Wood Fiber – Adhesion tests are recommended for aged decks.
5. Wood (plywood, OSB or plank) – minimum deck thickness must be 19/32 inches.
6. Painted, galvanized, or acoustical steel decks – steel decks may require pressure washing to remove processing oil residue. Acoustical steel decks should have the flutes filled with fiberglass or other suitable fill insulation (to be approved by the building owner/designer) and tacked in place with either duct tape or other adhesive prior to applying the Helix Low-Rise Adhesive.
7. Weathered, Smooth BUR (minimum type III or IV surfaced) – surfaces must be clean, dry and in sound condition. Adhesion tests are recommended.
8. Gravel surfaced BUR – Insulation only may be attached to a properly prepared graveled BUR (contact Mule-Hide Tech Dept.). Adhesion tests are required.
9. Mineral Cap Sheet/Granulated Mod Bit Cap Sheet – Mule-Hide recommends cleaning (pressure washing) of the cap sheet prior to application of the Helix Low-Rise Adhesive. Surfaces must be clean, dry and in sound condition.
10. Weathered, Smooth Mod Bit Cap Sheet – Mule-Hide recommends cleaning (pressure washing) of the cap sheet prior to application of the Helix Low-Rise Adhesive. Surfaces must be clean, dry and in sound condition. Adhesion tests are required. New sanded cap sheet is not an acceptable substrate.
11. Fresh type III or IV asphalt and asphalt that has not been previously exposed (non-oxidized, glossy surfaced) must be primed with CAV-GRIP™ Low-VOC Adhesive/Primer.
12. Mule-Hide F5 Air and Vapor Barrier
13. Carlisle VapAir Seal™ 725TR Vapor Barrier
14. Existing roof coatings require adhesion tests to determine proper adhesion to the coatings. Proper adhesion of the existing coatings to their substrate must be verified. Use of the Helix Low-Rise Adhesive for adhesion to acrylic or aluminum coatings is not acceptable.
15. Contact Mule-Hide Technical Department when considering installations over existing single-ply roof systems.

Note: All surfaces listed above must be clean, dry and free of any loose materials/debris and in sound condition. In general it is recommended to perform adhesion tests when attempting to install new assemblies over an existing roof surface. Certain surfaces as listed above shall require adhesion tests to determine the bond strength to the existing roof surface. Mule-Hide assumes no responsibility for damages to the new roof system caused by the existing roof assembly. Contact Mule-Hide Technical Service Dept. regarding any substrates not listed above.

Helix[®] Low-Rise Adhesive

Helix Coverage Rates

Container Size	Approx. Net Wt./Set	Substrate	Approximate Mule-Hide Helix Coverage Rates (sq. ft./set)		
			4" o.c.	6" o.c.	12" o.c.
1500 ml Cartridge (box of 4)	3.7 lbs.	Insulation to a smooth flat surface	165	250	500
Tanks	89 lbs.	Insulation to a smooth flat surface	1000	1500	3000
15 gal. Drum Set	275 lbs.	Insulation to a smooth flat surface	3000	4500	7500
50 gal. Drum Set	991 lbs.	Insulation to a smooth flat surface	10000	15000	25000

The coverage rates published are estimates and not guaranteed. Application rates are based on 3/4" wide ribbons applied to a smooth, flat substrate. The adhesive will expand to 2"-3" wide x 1" above substrate. Coverage rates will decrease when used on irregular, rough or porous substrates.

INSTALLATION TEMPERATURE

1. Apply adhesive when substrate and ambient temperature is above 32°F. When using adhesive in temperatures below 60°F, the adhesive must be kept warm. Adhesive temperature is very important. Containers and adhesive must be above 70°F when applied. Initial rise and set time will vary with weather conditions.

INSTALLATION INSTRUCTIONS

Surface Preparation (General)

1. Prior to applying the Helix Low-Rise Adhesive, the surfaces to which the adhesive is being applied must be inspected to ensure that it is smooth, flat, clean, sound, dry and free of any oil, sharp edges, loose and foreign materials or irregular surfaces. Fibrous cement decks should be checked for their ability to retain the adhesive (some types may allow adhesive to pass through).
2. Existing substrates having residual asphalt must be cleaned and scraped smooth as best as possible. Any remaining asphalt that was not previously exposed (non-oxidized, glossy, shiny) must be primed with CAV-GRIP™ Low-VOC Adhesive/Primer. All perimeters, penetrations, deck seam and joints must be sealed to prevent air infiltration through the deck.
3. When applying the Helix Low-Rise Adhesive over existing materials/surfaces, all wet materials must be removed and remaining moisture dried before the application. Do not use on substrates showing signs of deterioration or loss of structural integrity.
4. Once the surfaces have been inspected and prepared, the Helix Low-Rise Adhesive is applied at a 1:1 ratio through a disposable static mixing tip at various coverage rates and may be used to anchor roof insulation and cover boards to acceptable substrates, adhere multiple layers of roof insulation, and secure fleece backed roof covers to compatible substrates.
5. Apply adhesive when substrate and ambient temperature is above 32°F. When using adhesive in temperatures below 60°F, the adhesive must be kept warm (above 70°F). Initial rise and set time will vary with weather conditions.

Helix[®] Low-Rise Adhesive

Application Instructions for Insulation/Cover Board Attachment

During setup, application and disposal of adhesive, wear nitrile gloves, protective glasses and clothing that protects against dermal exposure. Use only in a well ventilated area. Consult Safety Data Sheets (SDS) before using this product.

1. When using cartridges remove retaining cap and plug from cartridge and attach static mixing tip provided. Keep cartridges standing upright until cartridge is in the dispensing gun and application of adhesive has started. Always remove the static mixing tip immediately after any stoppage. Do not allow static mixing tip to remain on partially used cartridges. Do not attempt to use mixing tips from other manufacturers. The static mixing tips provided are specific for the Helix formulation.
2. Before using tanks, first invert (or shake) the tanks several times to ensure proper mixing of the contents. Connect the hoses to each tank (red braided hose to the Part A tank and the black braided hose to the Part B tank) ensuring a tight fit to prevent leakage. A wrench is provided in each Helix Gun Assembly to tighten hose fittings. Tanks must be in an upright position when connecting hoses and during use. Be sure to fully open both tank valves. **The adhesive must be dispensed in a 1:1 ratio.** Each Part A tank includes additional instruction information which must be followed. A Helix Gun Assembly is provided with each Part A Tank and not intended to be used on a repeated basis. Once the hoses are connected to the tanks it is recommended that they should not be removed until the tanks are empty.
3. Adhesive temperature is very important. Tanks must be above 70°F.
4. When first using a set of tanks, point the gun without a static mixing tip into one of the tank boxes and slowly purge the lines of air by slowly pressing the trigger $\frac{1}{4}$ to $\frac{1}{2}$ open. Verify both streams of adhesive are free flowing. Once air is purged from the lines, attached the static mixing tip and confirm adhesive is coming out of the static mixing tip, application of the adhesive can begin. **Always make sure the tank valves are fully open.**
5. 15 gal and 50 gal Drum Sets require specialized dispensing equipment (spray foam rigs/carts) in order to pump the material to the application tip in a 1:1 ratio. Choices of this equipment vary, but as long as the container size selected can be accommodated by the equipment it should be able to be used to dispense Helix Adhesive. If there are any questions with compatibility, check with the equipment manufacturer.
6. When using bulk drums, warming the adhesive is often required. The adhesive being dispensed to the foam spray rig/cart should be at least 70°F. The use of electric drum warmers and recirculation (if available on the equipment) can assist in keeping the adhesive at an acceptable usable temperature. The drums should also be protected from moisture using desiccant air dryers and/or nitrogen blankets to protect the bulk material.
7. Apply adhesive to the substrate in continuous, approximate $\frac{3}{4}$ " wide beads spaced 4", 6" or 12" o.c. (see figure 1). The adhesive will spread to several inches wide while rising $\frac{1}{2}$ " – 1". Porous or rough surfaces may require more adhesive. Always make sure both tanks are setting upright when applying the adhesive. If stopping the adhesive application for longer than 30 seconds, immediately change to a new static mixing tip. Always check the gun face to be sure the ports are not blocked before installing a new tank static mixing tip.
8. Place the board into the adhesive after it has spread and begins to rise. Do not allow the adhesive to reach a "tack-free" condition prior to placing boards. Carefully step/walk the board into place to ensure positive contact with the beads of adhesive. It may be necessary to step in the boards more than once to ensure positive contact with the substrate when the adhesive cures. During windy conditions it may be necessary to use temporary weight (such as full pails of bonding adhesive, pails filled with stone ballast or pails of fasteners) for 5 – 10 minutes (See Helix attachment details for recommended weight placement) until the adhesive cures. Do not use warped boards.
9. Attempting to place the board and step/walk into place before the adhesive has risen may result in difficulty keeping the board in place and result in a poor bond due to adhesive being forced out from under the board. This may result in an insufficient amount of adhesive for proper bonding. If the adhesive is allowed to dry to a tack-free condition, proper bonding will not occur. If this happens, stop application, remove affected adhesive and re-apply new adhesive.
10. The Helix Low-Rise Adhesive initial rise time and insulation placement will vary depending on environmental conditions (temperature and humidity). Adhesive will react quicker in hot, moist environments and slower in cool, dry environments. Boards should be placed into the adhesive before the adhesive reaches a "tack-free" condition. Do not allow the adhesive to over-cure and become tack free. If slippage or movement occurs during the step/walk-in of the insulation board, placement of additional board should be delayed until the movement or slippage reaches a minimum. This allows

Helix[®] Low-Rise Adhesive

placement and wet-out of the board while maintaining an optimum level of adhesive between the insulation and substrate.

11. Periodically throughout the insulation attachment process, go back to check the adhesion of boards installed to ensure a tight bond was created and maximum contact was achieved.
12. Standard spacing of the beads of the Helix Low-Rise Adhesive is as follows (for warranties up to and including 20-yr. system warranties):

Recommended Helix Bead/Ribbon Spacing

Building Height	Perimeter Width	Bead Spacing		
		Field	Perimeter	Corner
0-25'	4 Feet	12" O.C.	6" O.C.	6" O.C.
26'-49'	8 Feet	12" O.C.	6" O.C.	6" O.C.
50'-74'	12 Feet	12" O.C.	6" O.C.	6" O.C.
75'-100'	16 Feet	12" O.C.	6" O.C.	6" O.C.
101' or greater	Contact Mule-Hide Technical for Spacing			

13. All project requesting warranties longer than 20 years, projects requesting extended wind speed coverage or Factory Mutual Insured Projects must contact Mule-Hide for appropriate attachment patterns prior to bidding the project.

Application Instructions Fleece Backed Membrane Installation

During setup, application and disposal of adhesive, wear nitrile gloves, protective glasses and clothing that protects against dermal exposure. Use only in a well ventilated area. Consult Safety Data Sheets (SDS) before using this product. Application temperature of the adhesive is very important. Containers and adhesive must be a minimum of 70°F when applied.

1. Option # 1:
 - a. Unroll the fleece backed membrane and position in place. Starting at one end of the roll, fold the membrane back half way on top of itself (a 10' x 100' sheet will be folded to a 10' x 50' sheet).
 - b. Starting at the fold, apply the Helix Low-Rise Adhesive to the substrate at **4" on center** rows (depending on the specification and warranty requirements). Rows may run either perpendicular or parallel to the length of the membrane but should be uniform in direction throughout the field of the roof.
 - c. Allow adhesive to rise for about 1 minute at temperatures between 60° - 80°F. Adhesive should rise about ½" and still be tacky. Higher temperatures will shorten the rise time and lower temperatures will extend this time. Do not wait until the adhesive becomes tack-free as a bond will not take place.
 - d. Once the adhesive has risen about ½ inch (and still tacky), start slowly sliding the membrane into place. Do not lay the membrane into the adhesive too soon. There should be a steady application of adhesive to the point on the roof where the roll will end followed with the membrane slowly being slid into place.
 - e. Once the first half of the membrane is installed, immediately broom the membrane into the adhesive and then roll that portion of the membrane with a roller (not to exceed 150 lbs.). Do not delay in rolling the membrane.
 - f. Repeat the procedure with the remaining half of the membrane. If the adhesive contaminates the seam area of the membrane, immediately remove the adhesive with a rag and membrane cleaner. Continue this process for all field membrane installation. Allow the membrane to set 10 -15 minutes prior to welding seams. When using TPO membranes, due to the stiffness of the membrane, the end

Helix[®] Low-Rise Adhesive

of the membrane may want to curl from being rolled on the core. The end of the membrane may require weight to be applied until the adhesive has cured.

2. Option # 2:
 - a. Unroll the fleece backed membrane and position in place. Starting at one end of the membrane, using the roll core, carefully roll the membrane back up half way making sure you do not reposition the membrane. Leaving half the membrane laid out will help prevent this.
 - b. Starting at the base of the rolled membrane start the application of the Helix Low-Rise Adhesive to the substrate at 4" on center rows (depending on the specification and warranty requirements). Rows may run either perpendicular or parallel to the length of the membrane but should be uniform in direction throughout the field of the roof.
 - c. Allow adhesive to rise for about 1 minute at temperatures between 60° - 80°F. Adhesive should rise about ½" and still be tacky. Higher temperatures will shorten the rise time and lower temperatures will extend this time. Do not wait until the adhesive becomes tack-free as a bond will not take place.
 - d. Once the adhesive has risen about ½ inch (and still tacky), start slowly rolling the membrane into place. Do not roll the membrane into the adhesive too soon. There should be a steady application of adhesive to the point on the roof where the membrane will end followed with the membrane slowly being rolled into place.
 - e. Once the first half of the membrane is installed, immediately broom the membrane into the adhesive and then roll that portion of the sheet with a roller (not to exceed 150 lbs.). Do not delay in rolling the membrane.
 - f. Repeat the procedure with the remaining half of the membrane. If the adhesive contaminates the seam area of the membrane, immediately remove the adhesive with a rag and membrane cleaner. Continue this process for all field membrane installation. Allow the membrane to set 10 -15 minutes prior to welding seams. When using TPO membranes, due to the stiffness of the membrane, the end of the membrane may want to curl from being rolled on the core. The end of the membrane may require weight to be applied until the adhesive has cured.

STORAGE & HANDLING

Helix Low-Rise Adhesive has a shelf life of approximately 12 months from the date of manufacture when stored in upright position, in original, unopened containers at 60°-90°F. Storage temperatures above the recommended range will shorten shelf life. Store in a covered, secure location. Keep from freezing. Product stored below 60°F must be given sufficient time (minimum 24 hrs.) for the adhesive to warm above 70°F prior to use. Do not store in direct sunlight or temperatures higher than 90°F.

CAUTIONS, RECOMMENDATIONS, PROTECTION & SAFETY

Helix Low-Rise Adhesive is a two-component, low rise, polyurethane adhesive used to adhere roof insulation and membrane in commercial applications.

1. Prior to use all contractors and applicators must:
 - a. Comply with all applicable and appropriate storage, handling, processing and safety guidelines.
 - b. Read and understand the Safety Data Sheets (SDS) and use an appropriate respiratory (NIOSH/MSHA approved respirator of organic vapors with prefilters and solvent resistant cartridges if concentrations of MDI exceed the TLV or are unknown), skin and eye Personal Protective Equipment (PPE) when handling and processing polyurethane chemical systems.
2. Use only in a well ventilated area. Avoid breathing vapors. If inhaled, remove the affected individual into fresh air and keep the person calm. Assist in breathing if necessary. Immediate medical attention required.
3. Avoid contact with eyes. Safety glasses or goggles are required. If splashed in eyes, rinse cautiously with water for several minutes.
4. Avoid contact with skin. Wear nitrile or other approved gloves, long sleeves and pants. Wash thoroughly after handling with plenty of soap and water.

Helix[®] Low-Rise Adhesive

5. The adhesive produced must be considered as combustible and may constitute a fire hazard. High-intensity heat sources such as welding or cutting torches must not be used in contact with or in close proximity to this adhesive. Shield from heat and spark.
6. Do not smoke during installation.
7. Keep out of the reach of children.
8. Do not leave product exposed to direct sunlight.

Mule-Hide maintains Safety Data Sheets on all of its non-exempt products. Safety Data Sheets contain health and safety information for your development of appropriate product handling procedures to protect your employees and customers. Mule-Hide's Safety Data Sheets should be read and understood by all of your supervisory personnel and employees before using Mule-Hide products.

CLEAN UP

Tools and uncured adhesive can be cleaned with solvents such as mineral spirits, xylene, etc. Follow all safety precautions listed on solvent containers.

ADDITIONAL INFORMATION

The information given on this PDS is subject to change without notice. Always check the Mule-Hide website at www.mulehide.com for the latest information, changes and updates or contact Mule-Hide Products Company at 800-786-1492.

DISCLAIMER

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