Parasolo Thermoplastic Adhered System

Installer Guide

siplast®

With you every step of the way

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I. System Overview

Parasolo® PVC, PVC KEE, and TPX thermoplastic membranes are designed for single ply applications. Parasolo membranes are heat weldable, have excellent fire resistance pursuant to ANSI/UL 790 (refer to UL Product iQ for specific assemblies). Parasolo thermoplastic membranes are reinforced with a coated polyester scrim. Parasolo thermoplastic membranes are available in both smooth and fleece-back variations. In addition, Parasolo Fleece-Back membranes may be used in hybrid configurations with Siplast SBS modified bitumen ply sheets.

II. Safety Considerations & Warnings

A. As with any construction project, safety is a key element. All applicable safety standards and good roofing practices should be followed. Read and understand Siplast's Design & Application Guidelines and the product safety data sheets before starting application. Follow all precautions and directions.

B. Only properly trained and professionally equipped roofing contractors experienced in the installation of each of the roofing applications listed herein should install these systems. Never allow contact between the heated surface of a hot air welder or other tool and the applicator's hair, skin, or clothing. Always wear protective gear, including but not limited to: hardhats, eye protection, heavy-duty gloves, and snug-fitting clothing.

C. Solvent-containing accessories may be combustible and should always be kept from heat, flame, or any source of ignition. Empty containers must be disposed of in posted toxic substance landfills in accordance with local, state, and federal regulations.

D. Thoroughly train all personnel in first-aid procedures, and obey all OSHA safety standards and fire codes. Use extreme caution when working around equipment, such as gas lines or HVAC units, which have electrical or gas connections.

E. Thermoplastic roof membranes may be slippery when wet. Exercise caution when walking on Parasolo PVC, PVC KEE or TPX membranes during or after a rain shower, or if moisture is present in the form of dew, frost or ice. Pay attention while walking on light-colored surfaces as ice or frost build-up may not be as visible as on a dark surface.

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III. Delivery, Storage, & Protection

A. Deliver products to the site in original containers with the seals unbroken and labeled with the manufacturers name, product brand name, and type.

B. Store materials in a weather-protected environment, clear of the ground and moisture, in accordance with Siplast instructions. Store all adhesives, coatings, and sealants/caulks to protect them from freezing. Frozen material must be discarded and replaced. Properly seal all liquid material containers after use.

C. All materials stored outside must be raised above ground or roof level on pallets and covered with a tarpaulin or other waterproof and "breathable" material. Insulation products should be properly stored and weighted to avoid weather and wind damage.

D. Factory-installed plastic covers are not designed for rooftop storage. Use "breathable" type covers, such as canvas tarpaulins, to protect from weather and moisture. If condensation is present or may accumulate inside of the factory shroud, cut and allow it to vent.

E. Cover and protect materials at the end of each day's work so that conditions will not be conducive to the formation of condensation.

F. Do not remove any protective tarpaulins until immediately before material will be installed. Extreme heat or cold conditions may require special storage. Reference product data sheets for product storage requirements.

G. Follow Siplast directions and requirements for protection of roofing materials prior to and during installation.

H. Do NOT use materials that are wet or damaged to the extent that they will no longer serve their intended purposes. Remove all damaged materials from the job site.

I. When staging materials on the roof during application, ensure that the deck and structure are not temporarily overloaded by the weight of construction materials.

J. At the job site, no more material should be stored than what will be used within two weeks. For periods longer than two weeks, the materials should be properly warehoused in a dry, ventilated area on pallets. No more material should be stored on the rooftop than can be used within five days. When prolonged inclement weather threatens, no more roofing materials should be supplied to the rooftop than can be used within two days.

IV. Equipment & Tools

A. **Heat Welding Equipment:** Successful hot air welding requires the use of specialized, properly maintained and adjusted equipment operated by experienced personnel familiar with hot air welding techniques. Achieving consistent welds is a function of ensuring that the roofing membrane surface is clean and prepared for heat welding, conducting test welds to determine proper equipment settings, and evaluating weld quality after welding has been completed.

B. **Welding equipment consists of three main components:** power supply, hot air welder (either automatic or hand-held), and extension cords. The newest automatic welding equipment provides improved control of speed, temperature, pressure, and membrane. The use of the latest model of automatic welder is highly recommended. Older models may not achieve consistent welds. Follow the equipment manufacturer's recommendations regarding correct equipment operation and adjustment.

1. Current generation automatic hot air welder (recommended).
    a) Minimum Power Supply: 220 volts, 30 amps, 10,000 watt continuous.
2. Current generation hand-held hot air welder (recommended).
    a) Minimum Power Supply: 110 volts, 15 amps, 2500 watt continuous.
3. Commercial Grade 10,000-watt voltage-controlled generator (minimum).
    a) THD (Total Harmonic Distortion) rating should be six or less for quality welds.
    b) 240v & 120v outlets.
    c) GFCI line cords.
    d) Volt meters.
4. Extension Cords
    a) Automatic Welders: #10 wire with a standard plug configuration. Maximum 100' (30.5 m) in length.
    b) Hand-Held Welders: #12 wire with a standard plug configuration. Maximum 100' (30.5 m) in length.
    c) For longer lengths, consult an electrician for line voltage drop. Heavier-gauge extension cords are likely to be required.

C. **Stable power supply:** Adequate wattage and consistent voltage are critical to obtaining consistent hot air welds and to prevent damage to the welder. The use of a contractor-supplied portable generator is recommended. House-supplied power is acceptable for hand welders only. Do not connect to a power source that is:

1. Used for other equipment that cycles on and off.
2. Is subject to momentary disruptions or power surges.
3. Incapable of providing sufficient power.
    a) THD greater than six may lead to fluctuations which may impact welding.

b) Outdated welding equipment and inadequate or fluctuating electrical power are the most common causes of poor seam welds.

D. Silicone Hand Roller (used in conjunction with hand-held welders).

1. Ensure that the roller is in good condition. Rollers with rounded edges should be replaced.

E. Equipment Settings

1. Setting up the hot air robotic welder appropriately is key to having a properly installed roof, and performing test welds is one of the most important steps to ensure a properly welded roof. Making appropriate adjustments before you begin the final welding process ensures that the correct combinations are achieved.
2. Test welds should be performed at the beginning of every work period:
   a) Just before welding in the morning.
   b) Upon returning from lunch in the afternoon.
   c) When there has been a significant change in weather (e.g., air temperature, wind speed, cloud cover, etc.).
3. The correct speed and temperature settings for automatic welders are determined by preparing test welds at various settings. The welds are tested by application of pressure causing the seam to peel apart. A satisfactory weld will fail by exposing the scrim reinforcement. This is known as a “film tearing bond”. A deficient weld fails by separating between the two layers of the membrane.
4. Adjustments to equipment settings: Many factors will affect the settings, such as thicker membranes, lower air temperatures, and overcast skies will generally require a slower speed than would be required with thinner membranes, higher air temperatures, and sunny skies. The slower speed provides additional heat energy to compensate for heat-draining conditions. To determine initial automatic air welder setting, use the formula below:
   a) Speed Formula: Start at (ambient temp/10)+ 2 = FPM (Feet Per Minute)
   b) Example: 70/10 + 2 = 9 FPM

   Note: This formula serves as a starting point. Adjustments may need to be made accordingly. New equipment may run faster and hotter. Remember, settings required for a good weld will change based on equipment type, weather conditions, and membrane thickness.
5. Cautions & Warnings
   a) Do not touch the welding nozzle and heat shield, and avoid keeping unprotected skin in the flow of hot air. The welding nozzle, heat shield, and hot air being expelled from hot air welders is very hot and can result in severe burns.
   b) Any attempt to run a robotic welder at a speed greater than 16 ft. (9.6 m) may result in defective seam welds.
   c) Setting the speed of the welder too fast can pose potential problems for the operator to maintain control of the welder. This is particularly true in re-roofing or over uneven substrates.
   d) Robotic welders running too fast may not allow the operator to monitor the weld width and ensure that critical T-joint areas have been correctly creased.
   e) The operator must keep in mind the relationship between ambient temperature, automatic air welder speed, heat setting, and how much weight is on the machine in order to achieve a film tearing bond/weld.

F. Test Welds

1. Take 2 pieces of freshly unwrapped Parasolo membrane approximately 18" (457 mm) long.

2. Set the automatic welder's speed and heat. For full size welders, such as the BAK - LarOn, Siplast suggests starting at the following settings:
    a) Temperature between 800˚F (427˚C) and 1,148˚F (620˚C). Speed 10-16 feet (3.05 - 4.88 m) per minute. New equipment may run faster and hotter.
3. For an initial setting, use the formula below as a general guideline.

    Speed Formula: Start at
    (ambient temp/10) + 2 = FPM (Feet per Minute).

    1. Example Scenario: Start by setting the speed at 10 FPM and the temperature at 600°F (315˚C) degrees and do a test weld. Increase temperature by 100°F (38˚C) to 700°F (371˚C) keeping the same rate of 10 FPM. Perform another test weld. Continue doing this in 100°F (38˚C) degree increments keeping the speed the same until the machine is maxed out [typically 1,148˚F (620˚C)] to determine the weld range. Set up the machine in the middle of the weld range.

        Note: Remember, settings required for a good weld will change based on equipment type, weather conditions, and membrane thickness.

        1. Weld the 18" (457 mm) pieces together and then allow the membrane to cool for at least 10 minutes. Cut 1" (25 mm) wide strips across the welded material. The welds are tested by application of pressure causing the seam to peel apart.
        2. An acceptable weld will fail by exposing the scrim reinforcement. This is called a "film tearing bond" or "FTB", which will be between 1" (25 mm) and 1.5" (38 mm) wide.
        3. An unacceptable weld will fail by separating between the two layers of the membrane. This is also known as a "cold weld" or "false weld".
        4. During cooler temperatures it is even more critical to perform test welds in the morning, after any extended break such as lunch, or after significant change in weather (e.g., air temperature, wind speed, cloud cover, etc.).
        5. Hand welding during colder temperatures also needs to be adjusted.
            a) Perform test welds on the membrane you will be using that day.
            b) Do not use scrap material to create test welds.
            c) Perform daily quality control including probing and checking seams at the end of the day.

G. Adjustments to the Hot Air Robotic Welder Settings

1. Many factors will affect the settings, including overcast skies and lower air temperatures. This will generally require a slower speed and lower heat settings. The slower speed and lower heat setting provide the additional heat energy to compensate for heat-draining conditions.
2. The correct speed and temperature settings for automatic welders are determined by preparing test welds at various speed and heat settings.
3. Only make one change at a time and avoid changing heat and speed together.
4. If you are welding at 1,148˚F (620˚C) and do not get a good weld, do not automatically adjust the speed because the temperature may be too high. Lowering the temperature or increasing speed may be a necessary adjustment.
5. If the weld is greater than 1.5" (38 mm), the temperature may be too high and this could lead to a failed weld over time.
6. Having too much weight on the automatic hot-air welder combined with too high of a speed setting can potentially cause wrinkles in the weld area.

H. Automatic Hot Air Welding of Field Seams

1. Successful automatic welding is primarily a function of proper machine adjustment and maintaining a consistent power supply.
2. Membrane MUST be cleaned and free from all dirt and debris prior to hot air welding of seams.

3. Verify correct power supply voltage with a voltmeter.
4. Determine proper welder speed and temperature settings by performing the test weld procedure.
5. Mark all locations where automatic welding starts and stops to identify locations of possible weld discontinuities. These areas should be carefully probed and repaired as required.
6. The weld must provide a maximum film-tearing bond of 1.5" (38 mm) and a minimum film-tearing bond of 1" (25 mm).
7. Membrane laps must be heat-welded together. All welds must be continuous, without voids or partial welds. Welds must be free of burns or scorch marks; however, seaming of Parasolo PVC or PVC KEE membrane should exhibit bleed-out when properly welded. Seaming of Parasolo TPX membrane should not exhibit bleed-out.
8. All reinforced membrane field seams should be made using an automatic hot air welder.
9. Tend to all T-joints by carefully pressing each joint down by silicone roller edge or other hard- edged tool immediately after the T-joint has emerged from the automatic welder.

   Note: All Parasolo TPX and 80-mil Parasolo PVC or PVC KEE T-joints require the installation of a heat-welded membrane cover patch.

I. Hand-Held Welding of Seams

1. Successful hand welding is a skill that involves individual technique, normally developed and refined over time. Operators should be proficient with different nozzle configurations. Correct selection of welder temperature and nozzle width can have an effect on the quality of the hand weld.
2. Membrane MUST be cleaned and free from all dirt and debris prior to hand-welding.
3. During basic hand welding, the hot air welder is held in one hand, and a hard silicone roller is typically held in the other hand. When hand welding with a roller, finger pressure is often used to place and tack the upper piece of membrane in position. However, a silicone roller must always be used for final welding. Tack welding and back-tacking is not permitted in the field welding of seams.

V. Substrate Preparation

A. Remove all existing roofing materials to the roof decking, including flashings, metal edgings, drain leads, pipe boots, and pitch pockets, and clean substrate surfaces of all asphalt and adhesive contaminants.

B. Confirm quality and condition of roof decking by visual inspection and by fastener withdrawal testing by an individual trained by the roof fastener manufacturer. Siplast recommends these test results to be kept on file as part of the acceptability of the substrate surface for a Siplast Guarantee. Submission of results to Siplast is not required.

C. Secure all loose decking. Remove and replace all deteriorated decking.

D. Remove abandoned equipment and equipment supports.

E. Confirm that height of equipment supports will allow the installation of full-height flashings.

VI. Membrane Installation

A. Modified Bitumen Base Ply Application for Hybrid Systems

1. Membrane Application: Apply the modified bitumen base ply in accordance with the roofing system manufacturer's instructions and the following requirements. Application of roofing membrane components shall immediately follow application of base sheet and/or insulation as a continuous operation.
2. Aesthetic Considerations: Construction of an aesthetically pleasing overall appearance of the finished roof application is ideal. Make necessary preparations, utilize recommended application techniques, apply the specified materials, and exercise care to help ensure that the finished application is aesthetically pleasing.

3. Kettles And Tankers: Kettles and tankers shall be equipped with accurate, fully readable thermometers. Do not heat asphalt to or above its flash point. Avoid heating at or above the FBT, should conditions make this impractical, heating must be no more than 25ºF below the EVT and no more than 25ºF above EVT.
4. Asphalt Temperatures: If the EVT information is not provided, the following asphalt temperature shall be observed. Maximum heating temperature shall be 500ºF (260ºC). Minimum application temperature shall be 385ºF (195ºC).
5. Asphalt Moppings: Ensure that all moppings do not exceed a maximum of 25 lb/sq. Mopping shall be total in coverage, leaving no breaks or voids.
6. Membrane Adhesive Application: Membrane adhesive can be applied by squeegee. Apply cold adhesive in a smooth, even, continuous layer without breaks or voids. Utilize an application rate of 2 to 2.5 gal/sq (0.6 to 1.0 l/ m^2) over irregular or porous substrates. Utilize an application rate of 1.5 to 2 gal/sq (0.6 to 0.8 kg/m^2) for interply-applications. Refer to the manufacturer's inter-ply flashing detail at the locations that are to receive the specified catalyzed acrylic resin primer/flashing system.
7. Bitumen Consistency: Cutting or alterations of bitumen, primer, and sealants will not be permitted.
8. Roofing Application: Apply all layers of roofing free of wrinkles, creases or fish mouths. Exert sufficient pressure on the roll during application to ensure prevention of air pockets.
9. Apply all layers of roofing perpendicular to the slope of the deck. Contact the Siplast Technical Department regarding application requirements for roof slopes greater than 1:12.
10. Fully bond the base ply to the prepared substrate, utilizing minimum 3-inch side and end laps. Apply each sheet directly behind the asphalt/torch/cold adhesive applicator. Cut a dog ear angle at the end laps on overlapping selvage edges. Using a clean trowel, apply top pressure to top seal T-laps immediately following sheet application. Stagger end laps a minimum of 3 feet.
11. Cold Adhesive Applications: Heat weld all side and end laps of the modified bitumen plies during each day's application. Contact the manufacturer of the heat-welding equipment for specific guidelines on operating the equipment. Apply the adhesive in a full coating, extending completely up to the selvage edge of the adjacent course of roof membrane to be overlapped, taking care to keep the adhesive off of the selvage lap that will be heat welded. Place a straight 2"x6" or larger board adjacent to the modified bitumen sheet overlap to help reduce lifting of the overlapping sheet beyond the selvage area, inhibiting the potential to trap air during heat welding. Lay the board such that the hand held welder nozzle does not extend into the overlap beyond the specified lap width. Hand roll the side laps, head laps, and T-laps of the membrane behind the heat welder.

B. Parasolo PVC, PVC KEE, or TPX Fleece-Back Finish Layer Placement

1. Place the roof membrane so that wrinkles and buckles are not formed. Remove any wrinkles or buckles from the sheet before permanent securement.
2. Full width rolls must be installed in the field of the roof.
3. Overlap roof membrane a minimum of 3" (76 mm) for side and end laps of adhered systems that utilize smooth reinforced membrane. Membranes are provided with lap lines along the side laps; the red line on Parasolo TPX Fleece-Back sheets is for adhered systems. Parasolo PVC and PVC KEE Fleece-Back sheets do not have an adhered line.

4. Install membrane so that the side laps run perpendicular to the roof slope, lapped to shed water toward drainage points. Butt ends of fleece-back membrane.
5. All exposed sheet corners should be cut so they are rounded a minimum of 1" (25 mm).
6. End laps of Parasolo PVC, PVC KEE, and TPX Fleece-Back membranes are made by butting adjacent sheets and heat welding 8 inch wide smooth flashing strip membrane centered over the end laps.
7. Cut edges of reinforced TPX membrane must be sealed with TPO Cut Edge Sealant.

C. Bonding Adhesive Application –Smooth Reinforced Membrane

1. When using Parasolo PVC Bonding or Parasolo TPO SBA Bonding Adhesives, use any one of the following substrates: organic or inorganic coated glass-faced polyisocyanurate insulation (foil -faced product not approved), high density wood fiberboard, gypsum, cured structural concrete with no curing or sealing compound present, untreated CDX plywood, or dry sound masonry with no curing or sealing compounds. For best results use a 3/8" (9.5 mm) solvent-resistant nap roller, brush, or squeegee. When using a roller, avoid taking the roller head out of the bucket, dropping it in one place, and beginning to roll. Instead, remove the roller filled with adhesive and drop the roller on three areas to be adhered, and then connect the adhesive drop areas. This will avoid an excess amount of adhesive in one place, and it will flash off faster and more uniformly. When spraying bonding adhesive, refer to Siplast adhesive product data sheets for viscosity. Contact the spray equipment manufacturer for proper nozzle tip sizes and flow rates.
1. Application of bonding adhesive.
    a) Apply bonding adhesive to both the substrate surface and the underside of the roof membrane.
    b) Parasolo Bonding Adhesives are applied at a rate of 50-70 ft^2 per gallon (1.23 - 1.75 m^2 per liter). Covering both surfaces will yield approximately 60 ft^2 (5.6 m^2) of finished, mated surface per gallon.
2. Application of Parasolo PVC Quick Spray Adhesive
    a) Apply Quick Spray adhesive to both the substrate surface and the underside of the roof membrane.
    b) Parasolo PVC Quick Spray Adhesive is applied at a rate of up to 7.5 squares (69.7 m2) of installed membrane per 40.15 lb (18.2 kg) canister when applied in accordance with Siplast application instructions (coverage rates and flash time may vary in colder temperatures).
3. Application of Parasolo TPO Quick Spray Adhesive
    a) Apply Quick Spray Adhesive to both the substrate surface and the underside of the roof membrane.
    b) Parasolo TPO Quick Spray Adhesive is applied at a rate of up to 10 squares (18.2 m^2) of installed membrane per 40.15 lb (18.2 kg) canister when applied in accordance with Siplast application instructions (coverage rates and flash time may vary in colder temperatures).
4. Application of Parasolo Quick Lay Adhesive
    a) For smooth membrane - Using a standard roller, apply adhesive at 100-120 ft2 per gallon (2.45-2.94 m2 per liter) to the roof substrate ONLY; approximately 600 ft2 (6 sqs) of installed membrane per pail.

b) Install membrane immediately onto wet adhesive: DO NOT ALLOW ADHESIVE TO DRY.

c) Parasolo Quick-Lay Adhesive is approved for use with Parasolo PVC Smooth membranes only, and should not be used with PVC KEE or fleece-back membranes.

5. Apply the adhesive only when the adhesive, substrate, membrane, and outside temperatures are above 40°F (4.4°C) and rising. Application temperatures above 50°F (10°C) are recommended to allow easier adhesive application.
6. Solvent-based adhesive must be allowed to dry until tacky to the touch before mating the membrane.
7. Prevent seam contamination by keeping the adhesive application a few inches back from the seam area.
8. Porous substrates may require a double application of adhesive.
9. Adhere approximately one half of the membrane sheet at a time. One half of the sheet's length must be folded back in turn to allow for adhesive application. Do not crease the membrane.
10. For solvent-based adhesives, mate membrane to the substrate coated with adhesive once the bonding adhesive has flashed off and is tacky to the touch.
11. Broom the membrane to ensure complete bonding between adhesive and membrane.
12. Heat-weld all head-laps with Parasolo smooth reinforced flashing membrane in accordance with heat-welding guidelines.

D. Low Rise Foam (LRF) – Parafast-T Adhesive Applied Fleece-Back Membrane

1. Use appropriate LRF adhesives for substrate surface. Do not apply to wet or damp surfaces. When using LRF adhesives, use any one of the following substrates: approved base sheets, organic or inorganic coated glass-faced polyisocyanurate insulation (foil -faced product not approved), high density wood fiberboard, gypsum, cured structural concrete with no curing or sealing compound present, and dry, sound masonry with no curing or sealing compounds present.
2. Siplast Parafast Adhesive T Canisters may be used for applying fleece-back membrane in a "spatter pattern." Use of a spatter nozzle is required. The spatter pattern should yield a heavily textured, even coating of approximately 1/4" (6.2 mm) to 1/2" (12 mm) nominal thickness height on the peaks of the spattered adhesive. Minimum ambient and surface temperature must be 40°F (4°C) and rising for all low-rise foam adhesives.
3. Unroll fleece-back sheets in place and fold back sheets in the long dimension to allow the adhering of the membrane, one half of the sheet width at a time. Apply adhesive at the prescribed rate to the substrate and ALLOW TO FOAM. Close membrane into wet adhesive and roll into place with a segmented, 150 lb. (68 kg) roller. Repeat for the other half of the sheet. If adhesive contaminates the weld area, immediately clean the area with the appropriate Parasolo Membrane Conditioner or acetone. See Section F paragraph 6 below for more detailed instructions on cleaning up spills.
4. Alternatively, align a full roll of membrane with the factory applied red line on the previously installed sheet. Roll out the roll approximately 20' (6.1 m) checking to see that the edge of the new roll is straight with the red marked line. Pick up the tail end of the previously rolled-out membrane and pull back over top of the roll of Parasolo Membrane. Install the LRF to the substrate per application specifications. Pull the sheet back to its original position, and roll into place. Make sure that the red line is followed when re-installing the sheet.

Note: For further information on low rise adhesives, refer to Siplast's Para-Stik and Parafast Insulation Adhesive Installer's Guide.

E. Supplemental Securement

1. Roof membrane must be mechanically secured at the perimeter, the base of internal walls and curbs, and at all penetrations with Parafast Fasteners and Membrane Plates at 12" (305 mm) o.c. maximum spacing. Membranes may be heat welded to coated metal flanges.

   Note: A minimum of 4 fasteners per penetration is required.

2. Membrane may be extended vertically 3" (76 mm) up walls and curbs and secured to the wall/curb substrate within 2" (50 mm) of the plane of the roof with Parafast Fasteners and Parafast Termination Bar (flat version) at a 12" (305 mm) o.c. maximum spacing. This detail is required to be used for all pressurized buildings.
3. Mechanically attach the membrane with screws and plates to the roof deck at locations of deck angle changes in excess of 1:12.
4. Fasteners must be installed to achieve the proper embedment depth. Install fasteners perpendicular to the substrate (vertical to the deck, or horizontal to the wall/curb) without lean or tilt.
5. Install fasteners so that the plate is drawn down tightly to the membrane surface. Properly installed fasteners will not allow the plate/termination bar to move (under-driving), and will not cause wrinkling of the membrane (over-driving).

F. Seam Cleaning

1. Light Contamination: Membrane that has been exposed for a few days or less to airborne debris, foot traffic, or dew or light precipitation can usually be cleaned with a cloth moistened with the appropriate Parasolo Membrane Conditioner, MEK (methyl ethyl ketone) or acetone. Be sure to wait for the cleaner to dry/flash-off before welding.
2. Dirt-encrusted Contamination: Membrane that is dirt-encrusted will require the use of a low-residue cleaner such as Formula 409® and a mildly abrasive scrubbing pad to remove the dirt. Rinse the area thoroughly with clean water and allow it to dry. This must be followed by cleaning with a cloth moistened with the appropriate Parasolo Membrane Conditioner, MEK (methyl ethyl ketone) or acetone. Be sure to wait for the cleaner to dry/flash-off before welding.
3. Weather or Oxidized Contamination: Membrane that is weathered/oxidized will require the use of a low-residue cleaner such as Formula 409 and a mildly abrasive scrubbing pad to remove the weathered/oxidized top surface layer. This must be followed by cleaning with a cloth moistened with the appropriate Parasolo Membrane Conditioner, MEK (methyl ethyl ketone) or acetone. Be sure to wait for the cleaner to dry/flash-off before welding.
4. Chemical Based Contamination: Membrane that is contaminated with bonding adhesive, asphalt, flashing cement, grease, oil, and most other contaminants usually cannot be cleaned sufficiently to allow an adequate heat weld to the membrane surface. Removal and replacement of the membrane is required in these situations.
5. If Siplast Low-Rise Foam Adhesive is accidentally spilled on the surface of the finished membrane, use the following procedure to clean the roof:
   a) Carefully scrape off the adhesive without rupturing the underlying roof membrane.
   b) After removal of adhesive, cover the affected area with either smooth or fleece-back membrane.

VII. Flashing Installation

Refer to the construction details that depict flashing requirements for typically encountered conditions. Install flashing materials as shown in the construction details.

A. General

1. Flash all perimeter, curb, and penetration conditions with Parasolo TPX Coated Metal sheets, membrane flashing, and flashing accessories as appropriate to the site condition.

2. All Parasolo TPX Coated Metal sheets and membrane flashing corners must be reinforced with pre-formed corners or non-reinforced membrane.
3. All flashing membranes and accessories are to be heat-welded using a hand welder.
4. When using bonding adhesive, be sure to use adhesive specific to membrane type and ambient weather conditions.
5. Minimum flashing height is 8" (203 mm).
6. The maximum distance from the wall that horizontal mechanical attachment should be installed is 6" (152 mm). **When you must go past 6" (152 mm), move the attachment** to the vertical substrate.
7. Alternatively, Parafast fasteners and RhinoBond Plates can be used where applicable for base termination. Place plates and fasteners out from wall a minimum 4.5" (114 mm) to a maximum of 6" (152 mm) with spacing of 12" (305 mm), which allows the field sheet to be used as a wall flashing.
8. Installation of Parasolo Smooth Membrane over asphaltic roof substrates or substrates contaminated with asphalt residue must have an approved sheathing panels under the smooth-back roofing membrane.
9. For Parasolo Smooth Membranes installed as flashing membrane over asphalt based materials or asphalt residue, an approved sheathing panel must be installed.
10. When using Parasolo adhesives, use any one of the following substrates: polyisocyanurate insulation and high density polyisocyanurate (without foil facer), high density fiberboard roof insulation, gypsum roof board, cured structural concrete absent of curing and sealing compounds, untreated CDX plywood, and dry, sound masonry substrates absent of curing or sealing compounds.
11. DensGlass® Sheathing Board is NOT to be used as a substrate for adhered attachment on parapet walls, according to the manufacturer.
    a) DensGlass® is a registered trademark.
12. For adhered Parasolo membranes, use fire-treated plywood/wood for parapet walls only if covered with an approved gypsum sheathing panel.

B. Parasolo Coated Metal Flashing

1. Parasolo PVC and TPO Coated Metal flashing allows much of the metal-work used in typical roofing applications to benefit from the security of heat-welded membrane seaming, with a corresponding reduction in required metalwork maintenance during the life of the roof system.
2. Coated metal must be designed in accordance with Siplast details, the applicable building code and tested for resistance in accordance with the applicable ANSI/SPRI/FM 4435/ES-1, “Wind Design Standard for Edge Systems Used with Low Slope Roof Systems.”
3. Sections of coated metal used for roof edging, base flashing, and coping must be butted together with a 1/4" (6 mm) gap to allow for expansion and contraction. Heat-weld a 6" (152 mm) wide non-reinforced membrane strip to both sides of the joint. A 2" (51 mm) wide aluminum tape can be installed over the joint as a bond-breaker, to prevent welding in this area.
4. Coated metal used for sealant pans and scupper inserts, and corners of roof edging, base flashing, and coping, must be overlapped or provided with separate metal pieces to create a continuous flange condition, and pop-riveted securely. Coated metal flashings must be stripped in using a minimum 6" (152 mm) membranes.
5. Coated metal base flashings must be provided with minimum 4" (102 mm) wide flanges screwed to wood nailers. Coated metal base flashings must be formed with a 1" (25 mm) cant.

6. Coated metal flashings are attached to wood nailers or otherwise mechanically attached to the roof deck, or to the wall or curb substrate, in accordance with construction detail requirements.
7. When installing coated metal on walls or curbs that completely cover the existing flashing, the flashing does not need to be removed provided that it is in good condition and tightly adhered.

C. Parasolo Adhered Reinforced Smooth Surface Membrane Flashing

1. The thickness of the flashing membrane must be the same as the thickness and type of the roofing membrane.
2. Apply the adhesive only when the adhesive, substrate, membrane, and outside temperatures are above 40°F (4.4°C) and rising. Application temperatures above 50°F (10°C) are recommended to allow easier adhesive application.
3. Porous substrates may require double application of adhesive.
4. Application of bonding adhesive
    a) Apply bonding adhesive as per application instructions on the product container.
5. Carefully position the membrane flashing prior to application to avoid wrinkles and buckles.
    a) Please note that solvent-based adhesive must be allowed to dry until tacky to the touch before mating the flashing membrane. Water-based adhesive must be allowed to dry completely to the touch. Typically, the flashing should be installed within one hour of applying the water-based adhesive. However, this may vary depending on ambient temperature conditions.
6. Also available are Parasolo TPX Corner Curb Wraps, consisting of a pre-formed combination corner and flashing pieces that are 12" (305 mm) in height and can be ordered in various lengths. These flashings are fully adhered in place. Apply adhesive to both the underside of the substrate and the flashing membrane to adhere the membrane.
7. Heat-weld all laps in Parasolo smooth reinforced flashing membrane in accordance with heat-welding guidelines.

D. Adhered Reinforced Fleece-Back Membrane Flashing

1. Apply approved low-rise foam adhesive to the substrate per application instructions on the product container.
2. Apply the low-rise foam only when the outside temperature is above 40°F (4.4°C) and rising. Application temperatures above 50°F (10°C) are recommended to allow easier adhesive application.
3. When installing fleece-back membranes to a vertical surface, the material should be rolled in with hand rollers and should have top edge fastening and termination installed immediately to avoid slippage. For best results, flashings may need to be rolled in several times with a hand-held, silicone roller.
4. Non-selvage edge laps in Parasolo Fleece-Back flashing membrane are made by butting adjacent sheets and heat welding an 8" (203 mm) wide reinforced flashing strip of Parasolo Smooth-Surface Membrane over the joint.
5. Overlap selvage edge laps a minimum of 3" (76 mm) and heat weld the laps.

E. Non-Reinforced Membrane Flashing.

1. Non-reinforced membrane can be used as a field-fabricated penetration/reinforcement flashing only where pre-formed corners and pipe boots cannot be properly installed.
2. Penetration flashing constructed of non-reinforced membrane is typically installed in two sections, a vertical piece that extends up the penetration and a horizontal piece that extends onto the roofing membrane. The two pieces are overlapped and heat welded together.

3. The non-reinforced vertical membrane flashing may be adhered to the penetration surface. Refer to Siplast standard specifications and details for additional information regarding application requirements.
4. All round and square type pipe flashings require FlexSeal™ Caulk Grade Sealant or Water-Block Sealant between the penetration and the membrane. Add and tighten a stainless steel band and seal the top of the membrane with FlexSeal Caulk Grade Sealant.
5. T-joint Patches
    a) T-Joint cover patches are to be a minimum 4" (102 mm) in size and made of non-reinforced material. They must be completely hot-air welded over the T-joint at the intersection of the three pieces of reinforced membrane. During installation, care must be taken to "crease-in" the unsupported membrane at the three step-off locations. Prefabricated or field-fabricated non-reinforced membranes that match the membrane being used in the field of the roof are acceptable for T-joints.
    b) T-joint patches are required at T-joints for all TPX membranes and 80-mil PVC and PVC KEE membranes.

F. Roof Edging.

1. Where required, metal roof edging should be designed in accordance with the applicable building code and tested for resistance in accordance to the applicable ANSI/SPRI/FM 4435/ES-1, "Wind Design Standard for Edge Systems Used with Low Slope Roof Systems." When not required, refer to Items 2 and 4.
2. Flash roof edges when using Parasolo Coated Metal flanged edging with minimum 3" (76 mm) wide flange nailed 4" (102 mm) o.c. staggered into wood nailers with a reinforced flashing strip welded to the coated metal and to the field of the roof.
    a) For Parasolo Membranes, an 8" (203 mm) reinforced heat-weldable flashing strip must be used. Cover tape products are not acceptable for use with PVC membranes.
3. Metal roof edging must be provided with a continuous cleat to secure the lower fascia edge. Secure the continuous hook strip to the building a maximum of 4" (102 mm) o.c.
4. Alternatively, flash roof edges with an approved two-piece snap-on fascia system, adhering roof membrane with bonding adhesive and face-nailing the membrane 8" (203 mm) o.c. prior to installing the snap-on fascia.
5. Flash roof edge scuppers with a scupper insert of Parasolo Coated Metal or a Parasolo prefabricated coated metal scupper that is mechanically attached to the roof edge and integrated as part of the metal edging.

G. Parapet and Building Walls.

1. There are 2 options for flashing parapets and building walls: adhered membrane flashings or metal flashings.
2. Secure membrane flashing at the horizontal top edge with a termination bar. Apply FlexSeal Caulk Grade Sealant between the wall surface and membrane flashing underneath all termination bars. Termination bars must be mechanically fastened 8" (203 mm) o.c. Exposed termination bars are only eligible for 20-year max. guarantee coverage. Termination bars that are counter flashed are required for extended-length guarantees.
3. Roof membrane must be mechanically attached along the base of walls that are flashed with membrane flashing. Attach with screws and plates/termination bar. Use a fastener spacing in accordance with the in-lap attachment requirements with a maximum 12" (305 mm) o.c. spacing.
4. Metal counter flashings with adhered membrane wall flashings are required on 20-year guarantees or longer. (They are not required for guarantees of less

than 20 years.) All termination bars, either exposed or covered, must be sealed with FlexSeal Caulk Grade Sealant or Waterblock Sealant.

5. Flash wall scuppers with a scupper insert fabricated of Parasolo Coated Metal that is mechanically attached to the wall and integrated as part of the wall flashing. Refer to the Scupper section for other detail options.
6. Where required, metal cap flashings should be designed in accordance with the applicable building code and tested for resistance in accordance with ANSI/SPRI/FM. 4435/ES-1, "Wind Design Standard for Edge Systems Used with Low Slope Roof systems."
7. Maximum flashing height without intermediate fastening is 54" for flashing adhered with Parasolo Bonding Adhesive.

   Note: Parasolo® PVC Quick Spray Adhesive and Parasolo TPO Quick Spray Adhesive can be applied to walls without any height limitations. Supplemental fastening is not required. The wall flashing must be separate from the roof membrane. The roof membrane cannot extend continuously from the field of the roof up the wall. The roof membrane must be mechanically attached along the base of the wall and the wall flashing must be mechanically attached at the top of the wall.

8. Metal cap flashings must have continuous cleats or be face-fastened 12" (305 mm) o.c. on both the inside and outside of the walls.

H. Round and Square Tube Penetrations

1. Four options are available for penetration flashings: stepped pipe boots, split pipe boots, square tube wraps, and field fabrication with unreinforced membrane and target. The Parapro 123 Flashing System may also be used for flashing penetrations through a Parasolo PVC or PVC KEE System. See Paragraph J for more information.
2. Prior to flashing application, the field membrane must be mechanically attached at the base of each penetration with screws and plates a maximum of 12" (305 mm) o.c., with a minimum of four fasteners per penetration.
3. Install Waterblock Sealant behind the flashing membrane at the top of the flashing, add the draw band and apply FlexSeal Caulk Grade Sealant around the top of the flashing. All flashings using PVC, PVC KEE, or TPX materials require the installation of a stainless steel draw band around the top of the flashing.

I. Fluid-Applied Penetration Flashings (Parasolo PVC and PVC KEE Systems only.)

1. Penetrations through a Parasolo PVC or PVC KEE System may be flashed using a Siplast fluid-applied flashing system for a more durable flashing option. Compatibility of fluid-applied flashing systems varies by thermoplastic membrane type. The Paraflex 531 Flashing System may be used to flash penetrations through a Parasolo PVC KEE System only and the Parapro 123 Flashing System may be used to flash penetrations through a Parasolo PVC or PVC KEE System (see the Paraflex 531 Flashing System Installer's Guide or the Parapro 123 Flashing System Installer's Guide and published details for more information). The use of Siplast fluid-applied flashing systems is not applicable to Parasolo TPX Systems.
   a) Ensure that the Parasolo PVC or PVC KEE field sheet fits tightly around the penetration. Fill voids where the membrane terminates at penetrations with Parasolo Flexseal Caulk Grade Sealant and allow the sealant to cure.
   b) The Parasolo field sheet must be mechanically attached at the base of each penetration with appropriate screws and Parafast Membrane Plates a maximum of 12" (305 mm) o.c., with a minimum of four fasteners per penetration. Galvalume plates are not approved as a substrate for Parapro Flashing Resin.
   c) Remove all foreign materials from the penetration by grinding or sanding. Refer to the substrate preparation chart in the applicable Siplast fluid-applied flashing system installers guide for more information on approved substrates and preparation requirements.

d) Apply a target of Parasolo PVC or PVC KEE Smooth membrane to cover the Galvalume plates. Extend the target from the penetration to a minimum of 3" (76 mm) beyond the outer edge of the Galvalume plates and weld the target to the field membrane.

e) Thoroughly clean the membrane surface with Pro Prep and allow it to dry. Use a scouring pad to create a light profile on the surface of the membrane. Wipe any loose material off with a dry shop rag.

f) Using masking tape, mask off the area to receive the flashing. Ensure a minimum flashing height of 6" (152 mm). Mask the top termination of the flashing and the area at the base of the penetration a minimum of 4" (102 mm) from the penetration onto the field sheet.

g) Cut the Pro Fleece reinforcement for the penetration.

h) Mix the flashing resin in accordance with the applicable fluid-applied flashing system installers guide including catalyst for Parapro applications. Apply a base coat of Parapro Flashing Resin or Paraflex 531 Liquid Flashing Resin to the vertical penetration surfaces, extending onto the field membrane a minimum of 2" (50 mm).

i) Apply the pre-cut Pro Fleece to the vertical penetration surfaces by embedding the fleece in the resin, extending the fleece a minimum of 2" (50 mm) onto the field membrane. Saturate all fleece surfaces to be lapped with the fluid-applied flashing resin. Strips of fleece must overlap by at least 2" (50 mm).

j) Apply a generous base coat of the fluid-applied flashing resin to the horizontal surface to be flashed. Apply the pre-cut Pro Fleece to the horizontal surface by embedding the fleece in the resin. Saturate all fleece surfaces to be lapped with the fluid-applied flashing resin. Strips of fleece must overlap by at least 2" (50 mm). Careful to ensure that a sufficient base coat of resin is applied to allow for full adhesion and saturation of the Pro Fleece, especially over and at the perimeter of the fastener plates to avoid tenting and voids once the Pro Fleece is installed.

k) Top coat the embedded Pro Fleece with an additional layer of fluid-applied flashing resin. Remove the masking tape before the resin sets completely.

J. Irregularly Shaped Penetrations

1. Metal Sealant Pans /Pre-Formed Accessories

a) Flash irregularly shaped penetrations with flanged sealant pans formed of Parasolo Coated Metal secured to the deck through the roof membrane with screws 6" (152 mm) o.c., with a minimum of two per side.

b) Strip in metal flanges with 8" (203 mm) wide membrane flashing strips and vertical pop riveted seams with 4" (102 mm) unreinforced membrane.

c) Fill the sealant pans with non-shrink quick-set grout. Top off sealant pans with a 2" (50 mm) minimum thickness of an approved Parasolo Sealant. If using Flex- Seal Caulk Grade Sealant, after priming, increase the grout to within 1/2" (13 mm) from the top of the pocket, and install the FlexSeal to the very top or overfill the pocket.

d) Installation of preformed sealant pans requires the flange of the sealant pan to be fastened with a minimum of 4 fasteners per penetration. A membrane target is installed around the base of the sealant pan over the flanges of the sealant pan and heat welded to the flanges. Install the fasteners near the outside edge of the flanges to allow for proper heat welding of the target. The outside

edge of the target membrane is heat welded to the field membrane.

e) If a preformed sealant pan is cut to install around the penetration, the cut must be stripped in with a minimum 4" (102 mm) wide non-reinforced membrane. The non-reinforced strip-in membrane must extend a minimum of 2" (50 mm) beyond the outside edge of the sealant pan flange and be fully welded.

K. Curbs

1. Flashings are adhered with adhesive applied to the membrane and substrate.
2. Secure the membrane flashing at the top edge with a termination bar. Apply FlexSeal Caulk Grade Sealant or Waterblock Sealant between the curb surface and membrane flashing. Exposed termination bars must be mechanically fastened 8" (203 mm) o.c. Termination bars that are counter flashed may be fastened 12" (305 mm) o.c. If wood is present at the top of the curb, install ring shank nails 12" (305 mm) o.c. after wrapping the membrane to the inside of the curb. This can be used in lieu of the termination bar if nailed on the top or preferably the inside of the curb.
3. Roof membrane must be mechanically attached along the base of curbs and ducts that are flashed with membrane flashing with screws and plates/ termination bar at 12" (305 mm) o.c.
4. Metal counter flashing must be used for extended guarantee lengths. All termination bars must be sealed with FlexSeal Caulk Grade Sealant or Waterblock Sealant.

L. Expansion Joints

1. Roof membrane must be mechanically attached along the base of raised curb expansion joints with screws and plates a minimum of 12" (305 mm) o.c.
2. Field-fabricated Expansion joint bellows must be twice the width of the expansion joint opening to allow for proper expansion/contraction.

M. Roof Drains

1. Roof drains must be fitted with compression clamping rings and strainer baskets. Both traditional cast iron and aluminum drains, as well as, aluminum or copper retrofit drains.
2. Roof drains must be provided with a minimum 36" x 36" (914 mm x 914 mm) sumped area if possible. Slope of tapered insulation within the sumped area must not exceed 4:12.
3. Extend the roofing membrane over the drain opening. Locate the drain and cut a hole in the roofing membrane directly over the drain opening. Provide a 1/2" (13 mm) membrane flap to extend past the drain flange into the drain opening. Punch holes through the roofing membrane at drain bolt locations.
4. For cast iron and aluminum drains, the roofing membrane must be set in a full bed of Waterblock Sealant (minimum 1 full tube) on the drain flange prior to securing with the compression clamping ring.
5. For fleece-back roof membrane applications, the fleece-back membrane is cut just short of the drain flange. A separate smooth reinforced membrane drain flashing sheet is then heat welded to the roofing membrane and set into the drain above in a full bed of Waterblock Sealant (minimum 1 full tube) and secured as above.
6. Do NOT locate lap seams within the sump area. Where lap seams must be located within the sump area, a separate smooth reinforced membrane drain flashing a minimum of 9" (229 mm) larger than the sump area must be installed. The membrane flashing must be heat welded to the roof membrane. Alternatively, if the seam does not run under the clamping ring, it can be covered with a 6" (152 mm) wide reinforced membrane strip heat welded to the membrane.
7. Tighten the drain compression clamping ring in place.

N. Coated Metal Retrofit Drain Inserts

1. Drain inserts must only be used in the event the original drain is damaged and cannot be repaired without the complete replacement of the drain. Drain inserts will reduce water flow.
2. Consult the design professional to ensure that adequate drainage is maintained.
3. Clean the drain lines a minimum of 24" (610 mm) where the drain insert is to be installed. Failure to clear this section of the drain line can prevent the sealing of the drain and degrade the performance of the drain seal that is required.
4. All drains must be provided with a drain sump of 36" (914 mm) x 36" (914 mm) minimum dimension, if possible. Fasteners must be installed 12" (305 mm) o.c. or a minimum of 4 per penetration.
5. The drain insert is installed on top of the roofing membrane and is secured to the roof deck at 6" (152 mm) o.c. with appropriate fasteners.
6. A separate reinforced membrane drain flashing sheet is then heat welded to the roofing membrane. The drain flashing sheet is then heat welded to the compatible drain flange.
7. Install the drain clamping ring if applicable.
8. All drains must be provided with a strainer basket.
9. Roof drains must be open and functioning.

O. Scuppers

1. Parasolo Coated Metal roof edge scuppers must be provided with a minimum 4" (102 mm) wide flange nailed to wood nailers, with hemmed edges and secured with continuous clips in accordance with the gravel stop assembly.
2. Parasolo Coated Metal wall scuppers must be provided with 4" (102 mm) wide flanges, with additional corner pieces pop-riveted to the flanges to create a continuous flange. All flange corners must be rounded.
3. Scuppers must be set in a bed of FlexSeal Caulk Grade Sealant or Waterblock Sealant.
4. Install wall scuppers over the roof and flashing membrane and secure to the roof deck and wall with appropriate fasteners 6" (152 mm) o.c., with a minimum of 2 fasteners per side.
5. All corners must be reinforced with Parasolo TPX Universal Corners or field fabricated from Parasolo non-reinforced materials.
6. Strip in scupper with flashing membrane target sheet.

P. Heater Stacks

1. The temperature of any heater stack that comes into contact with the Parasolo membrane or flashing should not exceed 140°F (60°C).
2. Field-fabricated two-piece membrane flashings of Parasolo non-reinforced flashing are typically installed at heater stacks. Cone-type prefabricated pipe flashings may work in these applications.
3. Heat stacks must be equipped with either a cone-shaped or vertical tube-type flashing sleeve so that the membrane flashing is not directly in contact with the heater stack.
4. Mechanically attach the roof membrane to the structural deck with Parafast screws and plates around the penetration base prior to flashing installation.
5. All stack flashings must be treated at the top edge with Waterblock Sealant behind the flashing membrane and secured by a stainless-steel clamping band. Seal the detail with FlexSeal Caulk Grade Sealant.
6. Field-fabricated membrane flashings may be adhered to the flashing sleeve with Parasolo adhesives. Make sure to use the correct bonding adhesive with the membrane being installed.

Q. Wood Support Blocking

1. Wood support blocking, typically 4" (102 mm) x 4" (102 mm), is commonly installed under light-duty or temporary roof-mounted equipment, such as electrical conduits, gas lines, and condensation and drain lines.
2. Install wood support blocking over a protective layer of Parasolo walkway pads. Place the wood blocking on an oversized slip sheet, fold two sides vertically, and fasten with roofing nails into the blocking.
3. Do not use prefabricated pipe stands with rubber-like bases.

R. Satellite Dish Support Bases

1. Install non-penetrating satellite dish support bases over a protective layer of Parasolo membrane.

S. Lightning Suppression

1. Secure lightning suppression cables to the roof surface by means of 2" (50 mm) wide Parasolo Flashing Membrane strips heat-welded to the roof membrane.
2. Secure the lightning rod to a reinforced Parasolo membrane patch that is heat welded in place. Securement should not penetrate the roof membrane.

T. Traffic Protection

1. Parasolo TPO Walkway Rolls must be installed at all roof access locations, including ladders, hatchways, stairs, and doors. Install walkway rolls at other designated locations, including roof-mounted equipment work locations and areas of repeated rooftop traffic.
2. Walkway rolls must be spaced 6" (152 mm) to allow for drainage. Edges of walkway rolls or pads must be placed 6" (152 mm) from any seam.
3. Heat-weld walkway rolls to the roof membrane surface continuously around the walkway roll or pad perimeter.

VIII. Appendix. Adhesion Test Guidelines

Purpose

- Testing is required to ensure foam adhesive will bond to a given substrate.
- Siplast requires roofing contractors (or a qualified third party) to conduct an adhesion test prior to registering a Siplast Guarantee.

Guidelines

- Do not use adhesive to install roofing materials on any roof deck or other substrate that shows signs of deterioration or loss of integrity.
- Siplast recommends that contractors keep test results on file, to be submitted to Siplast upon request. Submission of results to Siplast is not required in the ordinary course; however, Siplast may request them on a job-to-job basis. Failure to perform the required testing or to be able to produce the test results may delay or prevent the issuance of a Siplast Guarantee.
- Siplast may, at its sole discretion, require additional testing prior to the job start or prior to issuance of a Siplast Guarantee in accordance with ANSI/SPRI IA-1 2021 Standard Field Test Procedure for Verifying the Suitability of Roof Substrates and Adhesives.

Procedures: Acceptable Adhesion Test Methods are outlined below:

“Shovel Test” Method and Required Materials:

- Para-Stik or Parafast Insulation Adhesive
- Or other Siplast approved adhesive(s)
- Square edge shovel or similar
- Minimum 12" x 12" (305 mm x 305 mm) piece(s) of minimum 1½" (38 mm) Paratherm polyisocyanurate roof insulation or minimum 15/32" (25 mm) plywood

Frequency:

- Minimum of 4 tests for the first 50,000 square feet [500 sqs.] (4,650 square meters) of roof surface area.
- Two additional tests for each additional 50,000 [500 sqs.] square feet (4,650 square meters) of roof surface.
- Tests should not be performed in close proximity to each other.

Directions:

- Install low-rise foam adhesive on the roof deck or the roof substrate in accordance with Siplast or other Siplast approved manufacturer's requirements.
- Place a minimum 12" x 12" (305 mm x 305 mm) piece of polyisocyanurate roof insulation or plywood in the foam adhesive ribbons over the roof deck or roof substrate that is being tested. One or more ribbons are required.
- Allow adhesive to cure for a minimum of 1 hour.
- Pull up on the adhered board by placing a shovel under the corner or end of the board. The direction of the adhesive ribbon(s) should not affect adhesion results. Make sure that the shovel* is placed squarely under the board.

* If the existing substrate is insulation, Siplast requires that a piece of plywood be placed under the bottom of the shovel in order to not crush the underlying insulation. Failure to do so can lead to inaccurate test results.

- Gently push down on shovel until the bond between the board and substrate is broken
- Examine the board and substrate to determine the location of the bond failure.
- Failure should be within the adhesive or board.
- If the foam adhesive has separated from the substrate, this is unacceptable and foam adhesive should not be used to bond the new roof to this substrate.
- When testing adhesion to a deck, if the failure occurs in the deck, the deck is not suitable for using foam adhesive to bond the roof to the deck.

Record mode of failure and place in project file include:

- Photographs
- Date, time & air temperature

Other Acceptable Test Methods include:

- ANSI/SPRI IA-1 2021 Standard Field Test Procedure for Verifying the Suitability of Roof Substrates and Adhesives, modified using a 12" x 12" (305 mm x 305 mm) test size.
- ANSI/SPRI IA-1 2021 Standard Field Test Procedure for Verifying the Suitability of Roof Substrates and Adhesives (no modifications).

Notes

With you every step of the way

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