

TECHNICAL BULLETIN

TARGET MARKET ROOFING



BUILDING TRUST



Subject: Water Based Adhesives - Application Method for Roof Membrane

Sarnafil® and Sikaplan® Water Based Adhesives (WBA) are used within Sika Corporation – Roofing (Sika) adhered systems. They are formulated for adhering PVC membranes to clean, dry, water absorbent, horizontal roof surfaces¹ with slopes up to 10° or 2"/12" when using the methods of installation noted below. Precautionary measures must be taken to avoid exposing WBAs to low temperatures. The WBAs may only be used **when temperatures are 40°F (5°C) and rising. WBAs should not be used when temperatures are expected to fall below 40°F (5°C) during the initial curing period of 72 hours.** In cool or humid weather WBA will take longer to cure. WBAs are designed for one sided wet lay in so there is no adhesive flash off time which results in faster membrane application. Our WBA Application for Roof Membranes technical bulletin will explain the two application techniques that can be used for WBA (roller and sprayed) and the applicable coverage rates for each.

¹ For information on using WBA on steep slopes see WBA technical bulletin for steep slopes and for use on vertical flashings see WBA technical bulletin for wall flashing.

ROLLER APPLICATION

WBA can be applied using a 3/8"-1/2" (9.5mm – 12.7mm) medium nap roller for both bareback and felt backed membrane applications. The adhesive is applied to the substrate only. The adhesive is poured onto the substrate in ribbons and are then spread and rolled evenly. Using rollers up to 18" (45.7cm) wide will improve application time. Coverage rate for most substrates is 100 ft²/gal (2.5 m²/L)

When applying WBAs with a roller, it is important to remember that WBA is a product designed for "wet lay in", and care must be taken to insure that the adhesive has not dried before the membrane is laid in place. This is especially important during applications at high temperatures. When using the roller application, the membrane should be aligned by pulling the sheets back lengthwise rather than using the "barn door" method. The barn door method will result in long open times likely resulting in dry laid membrane. To insure a wet lay in, it is recommended that only 3-4 ft (0.9 - 1.2 m) at a time is coated out ahead of the membrane. The membrane is then rolled into the adhesive while it is still wet and immediately broomed into place with a medium bristle push broom to work out any air bubbles. Push the broom down the center of the sheet then broom out from the center on both sides. Immediately after brooming, roll the membrane in both directions with a minimum 100 lb (45 kg), steel, membrane roller. Clean any adhesive residue on the seams while still wet and before welding. If the adhesive dries in the seam it will require a solvent to clean it.

SPRAY APPLICATION

WBAs can also be applied using an airless spray applicator. Spraying WBA maximizes coverage rates for the best material consumption.

Equipment

Typically airless sprayers are characterized by their spray rate, listed as gallons per minute (GPM) and their maximum pressure, listed in pounds per square inch (PSI). To spray WBAs the airless sprayer must be able to generate pressure up to **3000 PSI (211 kg/cm²)** and should be able to deliver a minimum of **1.5 GPM (5.6 L/min)**. Larger units will allow for longer hose runs and increased production.



A typical airless pump sprayer. A gas powered, hydraulic sprayer shown here is capable of dispensing up to 4 gallons per minute.

The hose for pumping WBA should be a minimum of 1/2" (12.7mm) diameter coming out of the machine then reducing down to a 10' (3.1m) long 3/8" (9.5mm) whip leading up to the gun will make it easier to control. Always check with the equipment manufacturer for their recommendations. WBA has a high viscosity and may clog the filters of the airless sprayer. It is recommended that all filters in the spray rig and spray gun be removed. When the filters are removed it is important to keep debris out of the adhesive container to prevent clogging at the spray tip. Always check with the manufacturer before making any modifications to the equipment.

Before use, always read the spray equipment manufacturer's product literature, labels and other information.

Spray gun

The gun should be recommended by the manufacturer for use with the specific airless sprayer.



An extension wand can be added to most guns to make spraying more comfortable and to keep the spray away from the operator. A swivel tip allows for proper angling of the spray pattern.



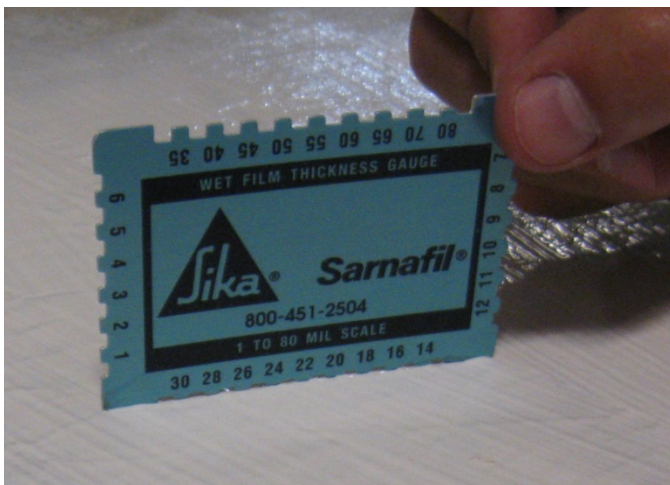
The spray tip will ultimately determine the flow rate of the adhesive. A tip that is too small will result in clogging. A tip size of .027-.035 inches (.68 - .88 mm) should be the minimum orifice opening, however, the tip size can be increased to .045 inches (1.1mm) for greater throughput. The fan pattern size is to be determined by the user. A bigger fan pattern will cover more area faster but will be more difficult to control and will be more prone to overspray. Generally a fan pattern of 10-12 inches (25.4 – 30.5 cm) wide held one foot (30.5cm) off of the substrate works well. Consult the airless sprayer manufacturer for compatible tips and sizes.



Many tips are reversible for self-cleaning. If clogged, engage trigger lock, reverse tip, disengage trigger lock and pull trigger to pump coating through orifice at high pressure to blow out dried/clogged material.

Coverage rate

Once the tip size and fan pattern are determined the typical coverage rate of 133 ft²/gal (3.3m²/L) should be achieved, but will be dictated by the walking speed of the operator as well as the substrate porosity. Structural Concrete and Insulated Concrete will result in a typical coverage rate of 100 ft²/gal (2.5m²/L). Counting the pails used is generally the best method to confirm the coverage rate. However, overspray and bounce back may result in lower coverage than indicated by counting pails. A wet mil thickness gage should be used to confirm adhesive thickness.



To achieve 133 – 100 ft²/gal (3.3 – 2.5 m²/L) coverage the wet mil thickness of the adhesive should be approximately 12-16 mils wet.

Application

Prepare the membrane to be adhered by aligning as many rolls as are to be installed in a day. Unroll the membrane completely and position to achieve the required overlap. Either roll-back or pull-back the membrane lengthwise, 1/2 way (50' [15.2m] of a 100' [30.5m] roll). If the membrane can be rolled back evenly as opposed to pulled back, this is the preferred method. By rolling back the membrane rather than pulling the sheet onto the other half, the adhesive application can be done with fewer workers and can be rolled immediately after adhesive application. Do not use the "barn door" method of opening the sheets when spraying WBA as this will result in long open times and likely dry laid membrane.



By rolling the membrane back evenly there is very little chance of dry laying the sheet as brooming and weighted rolling can follow immediately behind the sheet while the adhesive is wet.

This method requires fewer workers to install and is also less likely to induce air bubbles compared with pulling the sheets back onto the other half.



This is typically a 5 man operation.

- 1- Spray operator
- 1- Hose man/monitor keeping the hose out of the way and alerting the spray operator of roof obstacles and roof perimeter.
- 1- Man rolling membrane into place and following right behind with a weighted roller.
- 1- Man assisting with brooming/rolling and making sure any overspray is quickly removed from the seam area of the preceding sheet.
- 1- Man attending the spray rig and assuring adhesive is mixed and the spray bucket is full.

When the sheets are pulled back rather than rolled back, it takes 2 workers to pull the sheet into the wet adhesive and it delays brooming and weighted rolling until the top sheet is out of the way.



This method requires a minimum of 6 workers.

- 1- Spray operator
- 1- Hose man/monitor keeping the hose out of the way and alerting the spray operator of roof obstacles and roof perimeter.
- 2- Men pulling the sheet into place.
 - 1- Man brooming/rolling with a weighted roller.
 - 1- Man attending spray rig and assuring adhesive is mixed and the spray bucket is full.

Prior to spraying, mix WBA with a mechanical mixer until achieving a smooth consistency with no clumps.

Start the airless sprayer with the pressure settings low and make adjustments upwards until the spray pattern is even without “tails” or “fingers”. Run the spray pump at the lowest pressure setting possible while still achieving a good spray pattern. The lower the pressure the less overspray and bounce back will occur preserving material and minimizing cleanup.

Adhesive should not be applied more than 3-4 ft (0.9 - 1.2 m) in front of the membrane. While moving the gun from side to side it is recommended to trigger the gun on and off when reaching the edge. This will prevent buildup at the edges and prevent contaminating the seams when rolled with the weighted roller. It is not necessary to overlap the preceding pass assuming proper coverage is obtained with a single pass.

The membrane should be rolled/pulled into place as soon as practical. The membrane must be broomed immediately to remove air bubbles. Run the broom down the middle of the sheet and then push from the middle out to each edge. Brooming works much better in removing air pockets but rolling with the 100 lb (45 kg) weighted roller immediately after or concurrent with brooming is also critical to insure proper embedment into the adhesive.

Clean all overspray out of the laps while the adhesive is still wet and before welding. If the adhesive dries in the seam it will require a solvent to clean it.

*Most airless sprayers have the capability of attaching one or more pressure rollers. With a pressure roller, the adhesive is pumped through the spray gun to a slotted, medium nap roller and controlled by the gun trigger. This can be a good option on windy days.

For additional questions please contact the Sika Corporation - Roofing Technical Department.