

TECHNICAL BULLETIN

TARGET MARKET ROOFING



BUILDING TRUST

**Subject: Vapor Retarder Offerings****17-02**

Sika Corporation – Roofing offers several vapor retarder products to provide specifiers and contractors more options to meet specific project requirements. The vapor retarders are versatile and have other uses as noted below. The ply sheets listed below can be used as vapor retarders.

- **Vapor Retarder PE 10** - a 10 mil (0.25 mm) thick low density polyethylene sheet vapor retarder/air barrier.
- **Vapor Retarder SA 31** - a 31 mil (0.8 mm) thick self-adhesive SBS modified bitumen vapor retarder/air barrier. It can also be used as temporary roof protection in areas subject to limited light construction traffic.
- **Vapor Retarder SA 106** - a 106 mil (2.7 mm) thick self-adhesive SBS modified bitumen vapor retarder. It can also be used as temporary roof protection and is more robust than Vapor Retarder SA 31.
- **Vapor Retarder TA 138** - a 138 mil (3.5 mm) thick torch applied SBS modified bitumen vapor retarder. It can also be used as temporary roof protection.
- **Ply Sheet HA 87** - a 87 mil (2.2 mm) thick hot applied SBS modified bitumen ply sheet that can also be used as a vapor retarder.
- **Ply Sheet TA 87** - a 87 mil (2.2 mm) thick torch applied SBS modified bitumen ply sheet that can also be used as a vapor retarder.
- **Ply Sheet HA 118** - a 118 mil (3.0 mm) thick hot applied SBS modified bitumen ply sheet that can also be used as a vapor retarder.

The Product Reference Chart below provides a quick summary of the vapor retarder products and application.

| Product Reference Chart | | | | | |
|-------------------------------|--|--|--|-------------------------------------|--|
| | Vapor Retarder PE 10 | Vapor Retarder SA 31 | Vapor Retarder SA 106 | Ply Sheet HA 118 Ply Sheet HA 87 | Vapor Retarder TA 138 Ply Sheet TA 87 |
| Primer | None | - Vapor Retarder Primer SB - Vapor Retarder Primer VC - Vapor Retarder Primer WB | - Vapor Retarder Primer SB - Vapor Retarder Primer VC - Vapor Retarder Primer WB | Vapor Retarder Primer TA | Vapor Retarder Primer TA |
| Application | Loose laid | Self-Adhered | Self-Adhered | Type III or Type IV Hot Asphalt | Torch Applied |
| Substrates¹ | - Concrete - Steel - Gypsum Decks - Approved Gypsum Boards - Approved Insulation Boards - Plywood | - Concrete - Steel - Gypsum Decks - Approved Gypsum Boards - Plywood | - Concrete - Steel - Gypsum Decks - Approved Gypsum Boards - Plywood | Concrete | Concrete |
| Seams | Sika Multi-Purpose Tape | Self-Adhered | Self-Adhered Side Laps Heat Welded End Laps | Type III or Type IV Hot Asphalt | Torch Applied |

¹ Concrete substrates require priming (primer not required when using Vapor Retarder PE 10) and must be clean, sound, dry, and free of loose materials or contaminants such as water, frost, ice, oil or grease. Steel substrates do not need priming but must be clean, sound, dry and free loose materials or contaminants such as water, frost, ice, oil or grease.

PRODUCT DESCRIPTIONS – Please refer to the Product Data Sheets for complete information.

Vapor Retarders

- **Vapor Retarder PE 10** - a 10 mil (0.25 mm) thick low density polyethylene sheet vapor retarder/air barrier for use in Sika roofing systems. It is supplied in a folded panel rolled onto a 5 ft (1.5 m) core. When unrolled and unfolded the sheet dimension is 20 ft (6.9 m) wide by 100 ft (30.5 m) long. Coverage is 2000 sf (185.8 m²) per roll not including overlaps. Seams are taped with Sika's double sided SikaLastomer®-65 tape. Vapor Retarder PE 10 is intended for direct application to concrete, steel, gypsum decks, approved gypsum boards, approved insulation boards, and plywood.
- **Vapor Retarder SA 31** - a 31 mil (0.8 mm) thick self-adhesive SBS modified bitumen vapor retarder/air barrier with a tri-laminated woven polyethylene facer. A release liner covers the self-adhesive back side of the membrane and is removed during installation. Vapor Retarder SA 31 is supplied in 44.8 in (1.14 m) wide by 133.8 ft (40.8 m) rolls. Coverage is 500 sf (46.5 m²) per roll not including overlaps. Vapor Retarder SA 31 is intended for direct application to concrete, steel, gypsum decks, approved gypsum boards and plywood. Prepare concrete surfaces to achieve a Concrete Surface Profile CSP 2 to CSP 5 in accordance with the International Concrete Repair Institute (ICRI) Technical Guideline No. 310.2R-2013 (see Figure 1). Concrete substrates must be dry before installing Vapor Retarder SA 31. Primer is required for all surfaces except steel. The Vapor Retarder SA 31 polyethylene facer can accept approved urethane adhesives for insulation or membrane attachment. Vapor Retarder SA 31 may be exposed for up to 2 months. It can be used as temporary roof protection in areas subject to limited light construction traffic.
- **Vapor Retarder SA 106** - a 106 mil (2.7 mm) thick self-adhesive SBS modified bitumen vapor retarder that can also serve as temporary roof protection. The SBS modified bitumen with a non-woven polyester mat reinforcement with self-adhesive bitumen on the underside and a sanded topside surface. Vapor Retarder SA 106 has a polyolefin release liner and self-adhered seams. Vapor Retarder SA 106 is supplied in 39.4 in (1 m) wide by 49.2 ft (15 m) rolls. Coverage is 161 sf (15 m²) per roll not including overlaps. Vapor Retarder SA 106 is intended for direct application to concrete, steel, gypsum decks, approved gypsum boards and plywood. Prepare concrete surfaces to achieve a Concrete Surface Profile CSP 2 to CSP 5 in accordance with the International Concrete Repair Institute (ICRI) Technical Guideline No. 310.2R-2013 (See Figure 1). Concrete substrates must be dry before installing Vapor Retarder SA 106. Primer is required for all surfaces except steel. The Vapor Retarder SA 106 top surface can accept approved urethane adhesives for insulation or membrane attachment. Vapor Retarder SA 106 may be exposed for up to 6 months. It is more robust than Vapor Retarder SA 31.
- **Vapor Retarder TA 138** - a 138 mil (3.5 mm) thick torch applied SBS modified bitumen vapor retarder that can also serve as temporary roof protection. Vapor Retarder TA 138 is composed of SBS polymer modified bitumen with a non-woven polyester mat reinforcement with a plastic, burn-off film underside and a fine mineral aggregate (sand) topside. Vapor Retarder TA 138 is supplied in 39.4 in (1 m) wide by 32.8 ft (10 m) rolls. Coverage is 107 sf (10 m²) per roll not including overlaps. Vapor Retarder TA 138 is intended for direct torch application to properly prepared, clean, dry and primed concrete decks only. Prepare concrete surfaces to achieve a Concrete Surface Profile CSP 2 to CSP 5 in accordance with the International Concrete Repair Institute (ICRI) Technical Guideline No. 310.2R-2013 (See Figure 1). Concrete substrates must be dry before installing Vapor Retarder TA 138. Vapor Retarder TA 138 requires the use of Vapor Retarder Primer TA to enhance the adhesion to concrete. The Vapor Retarder TA 138 top surface can accept approved urethane adhesives for insulation or membrane attachment. The torch application allows for installation without low temperature restrictions and provides a durable, temporary roof for up to 6 months.
- **Ply Sheet TA 87** - a 87 mil (2.2 mm) thick torch applied SBS modified bitumen ply sheet that can also be used as a vapor retarder. Ply Sheet TA 87 is composed of SBS polymer modified bitumen with fiberglass mat reinforcement with a plastic, burn-off film underside and a fine mineral aggregate (sand) topside. Ply Sheet TA 87 is supplied in 39.4 in (1 m) wide by 49.2 ft (15 m) rolls. Coverage is 161 sf (15 m²) per roll not including

overlaps. Ply Sheet TA 87 is intended for direct torch application to properly prepared, clean, dry and primed concrete decks only. Prepare concrete surfaces to achieve a Concrete Surface Profile CSP 2 to CSP 5 in accordance with the International Concrete Repair Institute (ICRI) Technical Guideline No. 310.2R-2013 (See Figure 1). Concrete substrates must be dry before installing Ply Sheet TA 87. Ply Sheet TA 87 requires the use of Vapor Retarder Primer TA to enhance the adhesion to concrete. The top surface of Ply Sheet TA 87 can accept approved urethane adhesives for insulation or membrane attachment. The torch application allows for installation without low temperature restrictions. Ply Sheet TA 87 may be exposed for up to 6 months.

- **Ply Sheet HA 87** - a 87 mil (2.2 mm) thick hot applied SBS modified bitumen ply sheet that can also be used as a vapor retarder. Ply Sheet HA 87 is composed of SBS polymer modified bitumen with fiberglass mat reinforcement and a fine mineral aggregate (sand) topside and underside. Ply Sheet HA 87 is supplied in 39.4 in (1 m) wide by 49.2 ft (15 m) rolls. Coverage is 161 sf (15 m²) per roll not including overlaps. Ply Sheet HA 87 is intended for hot applied applications to properly prepared, clean, dry concrete decks using Type III or Type IV asphalt. Prepare concrete surfaces to achieve a Concrete Surface Profile CSP 2 to CSP 5 in accordance with the International Concrete Repair Institute (ICRI) Technical Guideline No. 310.2R-2013 (See Figure 1). Prime concrete substrates with Vapor Retarder Primer TA or Vapor Retarder Primer BE prior to the application of asphalt and allow to dry. The top surface of Ply Sheet HA 87 can accept approved urethane adhesives for insulation or membrane attachment. Ply Sheet HA 87 may be exposed for up to 6 months.
- **Ply Sheet HA 118** - a 118 mil (3.0 mm) thick torch applied SBS modified bitumen ply sheet that can also be used as a vapor retarder. Ply Sheet HA 118 is composed of SBS polymer modified bitumen with a non-woven polyester mat reinforcement and fine mineral aggregate topside and underside. Ply Sheet HA 118 is supplied in 39.4" (1 m) x 32.8 ft (10 m) rolls. Coverage is 97 ft² (9 m²) per roll not including overlaps. Ply Sheet HA 118 is intended for hot applied applications to properly prepared, clean, dry concrete decks using Type III or Type IV asphalt. Prepare concrete surfaces to achieve a Concrete Surface Profile CSP 2 to CSP 5 in accordance with the International Concrete Repair Institute (ICRI) Technical Guideline No. 310.2R-2013 (See Figure 1). Concrete substrates must be dry before installing Ply Sheet HA 118. Prime concrete substrates with Vapor Retarder Primer TA or Vapor Retarder Primer BE prior to the application of asphalt and allow to dry. The top surface of Ply Sheet HA 118 can accept approved urethane adhesives for insulation or membrane attachment. Ply Sheet HA 118 may be exposed for up to 6 months.

Vapor Retarder Primers and Mastic

- **Vapor Retarder Primer SB** - a solvent-based primer used to prime wood, concrete, lightweight concrete, gypsum decks, and approved gypsum boards prior to the application of Vapor Retarder SA 31 or Vapor Retarder SA 106. Application temperature must be 14°F (-10°C) and above. The coverage rate will range from 83 - 138 sf/gal (0.3 - 0.5 L/m²) on porous surfaces to 166 - 416 sf/gal (0.1 - 0.25 L/m²) on non-porous surfaces. The VOC content² is 500 g/l. It is red in color.
- **Vapor Retarder Primer VC** – a solvent-based primer used to prime wood, concrete, lightweight concrete, gypsum decks, and approved gypsum boards prior to the application of Vapor Retarder SA 31 or Vapor Retarder SA 106. Application temperature must be 14°F (-10°C) and above. The coverage rate will range from 104 - 208 sf/gal (0.2 - 0.4 L/m²) on porous surfaces to 166 - 416 sf/gal (0.1 - 0.25 L/m²) on non-porous surfaces. The VOC content is 0 g/l with exemptions³. It is green in color.
- **Vapor Retarder Primer WB** – a polymer emulsion-based primer used to prime wood, concrete, lightweight concrete, gypsum decks, and approved gypsum boards prior to the application of Vapor Retarder SA 31 or Vapor Retarder SA 106. Recommended when the use of solvent-based primer is not advised and/or not permitted. Application temperature must be 41°F (5°C) and rising. The coverage rate will range from 140 - 416 sf/gal (0.1 - 0.3 L/m²) depending on the porosity of the surface. The VOC content is 0 g/l. It is blue in color.

- **Vapor Retarder Primer TA** - a blend of elastomeric and bitumen solvents for use on concrete decks prior to the application of Vapor Retarder TA 138, Ply Sheet TA 87 and Ply Sheet HA 87. The primer improves the adhesion of Sika's torch-applied vapor retarders and ply sheets to the properly prepared, dry concrete surface. Application temperature must be 14°F (-10°C) and rising. The coverage rate is 166 - 277 sf/gal (0.15 - 0.25 L/m²) depending on the porosity of the surface. The VOC content² is 340 g/l. It is black in color.
- **Vapor Retarder Primer BE** - a bituminous emulsion (water based) primer used to prime concrete and approved gypsum boards prior to the application of Vapor Retarder TA 138, Ply Sheet TA 87, Ply Sheet HA 87, and Ply Sheet HA 118. The primer improves the attachment of Sika's torch-applied vapor retarders to the properly prepared and dry concrete surface. The coverage rate is 125 – 200 ft²/gal (0.2 – 0.3 L/m²) depending on the porosity of the surface

² The solvent content of this product may prohibit its use in certain jurisdictions. See SDS for material composition. Always check with the local governing body before using.

³ The U.S. EPA considers the solvents in Vapor Retarder Primer VC as “exempt”, and therefore the product's VOC content can be considered “0 g/l” and used in all jurisdictions operating under the EPA guidelines. At this time, the SCAQMD does not recognize the TBAC solvent as “exempt”, and therefore the primer's VOC content is “240 g/l” when used in jurisdictions operating under their guidelines (e.g. specific counties in CA). Vapor Retarder Primer VC is eligible for credits in LEED or Green Globes projects. For more information please refer to the Vapor Retarder Primer VC product data sheet.

- **Mastic** - a cold applied, fiber reinforced high strength SBS modified bitumen mastic that is specially formulated to detail around penetrations and flashings where Sika vapor retarders are used. It is specially formulated to seal around penetrations and flashings where Sika vapor retarders and hybrid system ply sheets are used. Mastic is easy to apply and offers excellent water and weather resistance. It is asbestos free and has a low solvent content providing good adhesion in 24 - 48 hours. Mastic meets the requirements of ASTM D3019 standards. Application temperature range is 41 - 104°F (5 - 40°C). It is applied at the rate of 10 square feet per gallon (4.1 L/m²) at 1/8 in (3.2 mm) thickness. Do not apply Mastic where it may come in direct contact with Sarnafil® or Sikaplan® membranes. The VOC content² is 225 g/l.

VAPOR RETARDER APPLICATION GUIDE

- **Vapor Retarder PE 10**
 - Vapor Retarder PE 10 is loose laid over suitable substrates.
 - Overlap all edges a minimum of 4 in (10.2 cm) and seal with SikaLastomer-65 tape.
 - Extend Vapor Retarder PE 10 to the perimeter and deck penetrations and seal with SikaLastomer-65 tape to provide continuity of the air/vapor envelope. Vapor Retarder PE 10 must also be sealed with SikaLastomer-65 tape on the vertical surface at roof penetrations.
- **Vapor Retarder SA 31**
 - Vapor Retarder SA 31 requires one of the primers designated for use with the self-adhered vapor retarders. Shake or stir primer before applying. Primers can be rolled, brushed or sprayed. Primer is not required on steel. Let the primer dry completely.
 - After the primer has dried completely, begin the installation at the low point of the roof. Chalk a line on the deck to align the first sheet. Unroll Vapor Retarder SA 31 onto the substrate for alignment. Overlap each sheet by 3 in (7.6 cm) on the side lap and 6 in (15.2 cm) on the end laps. Stagger end laps by at least 12 in (30.5 cm).
 - Once aligned, peel back a portion of the release liner and press the membrane onto the substrate. When securely adhered, remove the remaining release liner from the roll.
 - On steel decks install a 6 in x 42 in (15.2 cm x 1.1 m) metal plate under the end lap to support the membrane between the metal flutes. Stagger the end laps by at least 12 in (30.5 cm).
 - Use a minimum 75 lb (34 kg) steel roller to press the Vapor Retarder SA 31 membrane down onto the substrate including the laps. Use the roller to push out any air bubbles out to the edge of the membrane. Do not cut the membrane to remove a bubble.

- Apply Sika's Mastic to seal around penetrations, T-joints, 90° angle transitions, fishmouths or other openings. Use a trowel to mound Sika's Mastic around the penetrations to seal the opening. Do not apply Sika's Mastic where it may come in direct contact with the Sarnafil® or Sikaplan® membrane.
- **Vapor Retarder SA 106**
 - Vapor Retarder SA 106 requires one of the primers designated for use with the self-adhered vapor retarders. Shake or stir primer before applying. Primers can be rolled, brushed or sprayed. Primer is not required on steel. Let the primer dry completely.
 - After the primer has dried completely, begin the installation at the low point of the roof. Chalk a line on the deck to align the first sheet. Unroll, position, and align Vapor Retarder SA 106 with the release liner covered selvage edge on the up-slope side.
 - After the sheet is placed in its final position, loosely reroll half of the sheet toward the center of the roll. Using a straight blade utility knife, carefully score the release liner across the width of the roll.
 - Roll Vapor Retarder SA 106 into its final position as the release liner is being removed. Re-roll the remaining Vapor Retarder SA 106 and repeat the process.
 - On steel decks install a 6 in x 42 in (15.2 cm x 1.1 m) metal plate under the end lap to support the membrane between the metal flutes. Stagger the end laps by at least 12 in (30.5 cm).
 - Roll Vapor Retarder SA 106 with a 75 lb (34 kg) steel roller to ensure full contact with the substrate.
 - Align successive sheets with 3 in (7.6 cm) wide side laps and 6 in (15.2 cm) wide end laps. The seam area has a pre-applied primer/adhesive on one side for mating with the bottom of the next sheet. Remove the release liner from the seam area and mate the top sheet to the bottom. Roll the seam area to ensure full contact. Hot air weld the end laps. Hot air welded laps must show a minimum ½ in (1.3 cm) bleed out. Stagger adjacent end laps a minimum of 12 in (30.5 cm).
 - Apply Sika's Mastic to seal around penetrations. Use a trowel to mound Sika's Mastic around the penetrations to seal the opening. Do not apply Sika's Mastic where it may come into direct contact with the Sarnafil or Sikaplan membrane.
- **Ply Sheet HA 87 & Ply Sheet HA 118**
 - Prime concrete substrate with Vapor Retarder Primer TA or Vapor Retarder Primer BE. Apply Vapor Retarder Primer TA or Vapor Retarder Primer BE with a roller, brush or spray and let dry completely.
 - Unroll Ply Sheet HA 87 or Ply Sheet HA 118 onto the roof surface and allow it to relax.
 - Place Ply Sheet HA 87 or Ply Sheet HA 118 in desired position and back roll the product.
 - Adhere Ply Sheet HA 87 or Ply Sheet HA 118 to the primed substrate with Type III or Type IV asphalt according to the asphalt manufacturer's instructions and industry standards.
 - Apply a full mopping of Type III or Type IV asphalt in accordance with manufacturer's instructions at a minimum rate of 25 lbs per 100 square feet (1.2 kg/m²).
 - Install Ply Sheet HA 87 or Ply Sheet HA 118 so that there are no significant and avoidable air spaces between the ply sheet and the substrate.
 - Overlap side laps 3 in (76 mm) and end laps 6 in (152 mm).
- **Vapor Retarder TA 138 & Ply Sheet TA 87**

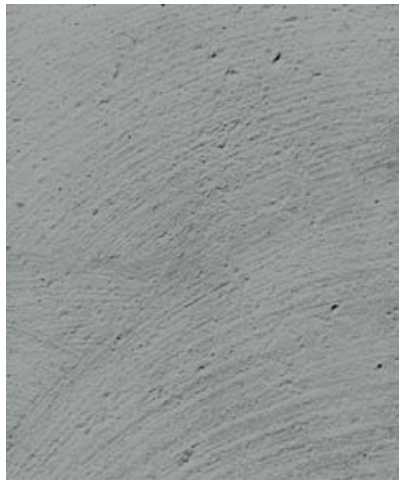
Torch applied products should only be installed by trained personnel. It is imperative that the NRCA safety guidelines, as outlined in their Certified Roofing Torch Applicator Program (CERTA) and good industry practices be followed.

- Prime concrete substrate with Vapor Retarder Primer TA or Vapor Retarder Primer BE. Apply Vapor Retarder Primer TA or Vapor Retarder Primer BE with a roller, brush or spray and let dry completely.
- After the primer has dried completely, install Vapor Retarder TA 138 or Ply Sheet TA 87 in a shingle fashion starting at the low point so the laps shed water.
- Chalk a line on the deck to align the first sheet. Unroll Vapor Retarder TA 138 or Ply Sheet TA 87 and allow the sheet to relax. Align the side lap with the chalk line. Back roll the sheet halfway.
- Begin torching the bottom side of Vapor Retarder TA 138 or Ply Sheet TA 87. As the bitumen begins to soften pull the roll forward with a metal pole. When heated properly there should be a bleed out of approximately ½ in (1.3 cm). Back roll the other half of the roll and repeat the process.
- Kick out the next roll and align the side lap. Side laps must be a minimum of 3 in (7.6 cm). End laps should be a minimum of 6 in (15.2 cm). Stagger the end laps a minimum of 12 in (30.5 cm). Cut the lower outside corner of the end lap at a 45° angle to minimize material build-up where it will be covered by the next roll.
- When heating the membrane move the torch in an 'L' pattern to ensure heating of the lap area on the bottom sheet. Proper heating will create a minimum ½ in (13 mm) bleed out.
- Walk in the seam area or use a weighted roller to ensure proper adhesion and bleed out.
- Ensure that all laps are firmly and smoothly adhered without wrinkles, voids or fishmouths.
- Check the seams with the edge of a trowel. Any loose areas should be lifted with the trowel, re-heated and pushed back down to achieve the necessary bleed out.
- Apply Sika's Mastic to seal around penetrations. Use a trowel to mound Sika's Mastic around the penetrations to seal the opening. Do not apply Sika's Mastic where it may come in direct contact with the Sarnafil® or Sikaplan® membrane.
- **Do NOT torch apply Vapor Retarder TA 138 or Ply Sheet TA 87 to combustible substrates or substrates with a combustible backing.** Use Vapor Retarder SA 106 in such locations.

Figure 1: Concrete Surface Profiles (CSP)⁴



CSP 1



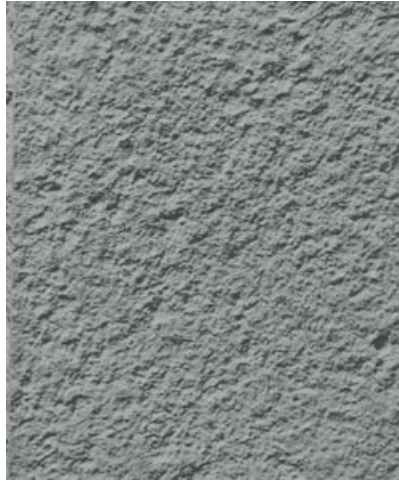
CSP 2



CSP 3



CSP 4



CSP 5



CSP 6



CSP 7



CSP 8



CSP 9

⁴ IRCI Technical Guideline No. 310.2R-2013, Selecting and Specifying Concrete Surface Preparation for Sealers, Coatings, Polymer Overlays, and Concrete Repair.