

PVC/SBS HYBRID MEMBRANE ROOFING TECHNICAL MANUAL



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INTRODUCTION

The *PVC-SBS Hybrid Membrane Roofing Technical Manual* is intended to offer guidance to <u>SOPREMA®</u> authorized contractors and design professionals. The manual provides specific instructions and details for <u>SOPREMA®</u> roofing. Refer to applicable building codes, standards, and roofing industry publications for additional requirements and best-practice guidelines. Refer to current <u>SOPREMA®</u> product data sheets and safety data sheets for specific product data and product-related requirements. For additional information refer to <u>www.soprema.us</u> or contact <u>SOPREMA®</u> at 800.356.3521.

DISCLAIMER

This manual is intended for use by <u>SOPREMA®</u> authorized roofing contractors and design professionals in order to provide instructions and details for the application of <u>SOPREMA®</u> roofing when a <u>SOPREMA®</u> warranty will be requested upon project completion. The contents of this manual are believed to be consistent with good roofing practices, but are not specific to any particular project's needs and are not a substitute for professional design services. <u>SOPREMA®</u> bears no liability nor responsibility for the design of any particular project.

The roofing material applicator is responsible for ensuring compliance with contract documents, project specifications, roofing industry standards and jurisdictional codes necessary to meet the requirements for specific project applications.

1 GENERAL

<u>SOPREMA®</u> SENTINEL® PVC roofing membranes with polyester fleece backing may be adhered to an SBS modified bitumen base ply to create PVC-SBS "hybrid" membrane assemblies.

The SBS base ply may be installed by heat-welding, self-adhesive, mechanically fastened (SOPRAFIX[®]), adhered using <u>SOPREMA[®] COLPLY[™] EF ADHESIVE</u> or applied using hot asphalt. Refer to the *SBS Modified Bitumen Membrane Roofing Technical Manual* for more information related to SBS modified bitumen roofing membranes.

The SENTINEL[®] fleece-backed PVC surface ply is fully-adhered to the SBS base ply using <u>DUOTACK[®] SPF HFO</u> or ICP Polyset[®] Commercial Roof Adhesive adhesive applied in a "spatter pattern." Refer to the *PVC Membrane Roofing Technical Manual* for more information related to PVC roofing membranes.

PVC membrane flashings for PVC-SBS "hybrid" membrane assemblies consist of SENTINEL[®] bare-PVC adhered to clean, prepared flashing substrates using <u>SENTINEL[®] S BONDING ADHESIVE</u>, or fastened to flashing substrates as described herein.

2 SBS MODIFIED BITUMEN BASE PLY

2.1 SBS PRIMERS

2.1.1 SBS PRIMERS FOR HEAT WELDED AND HOT ASPHALT APPLIED SBS BASE PLIES

General:

- SENTINEL[®] fleece-backed PVC is the surface ply for PVC-SBS hybrid membranes. SBS primers are intended for use with the SBS base ply only. Prevent direct contact between PVC and SBS primers.
- <u>SOPREMA®</u> primers are produced specifically for use with <u>SOPREMA®</u> SBS roofing materials and systems.
- <u>ELASTOCOL™ 500</u> is a solvent-based primer used to improve adhesion between approved substrates and heat welded and hot asphalt applied SBS membranes.
- <u>ELASTOCOL[™] 350</u> is a low VOC, polymer emulsion primer used to improve the adhesion between approved substrates and heat welded and hot asphalt applied SBS membranes.
- Primers should be stored in a dry, protected storage area between 40°F and 105°F and away from direct sunlight. Store primers away from excessive heat and open flames. Prevent rupturing the containers, or breaking the sealed lids prior to use when handling.
- The contractor and/or applicator is responsible for managing and controlling all exposures related to chemical hazards, toxic substances and odors. This includes personal protective equipment (PPE), administrative and work practice controls, and engineering controls. The contractor is responsible for the elimination or substitution of products as necessary to manage and control exposures related to chemical hazards, toxic substances and odors.



- Refer to product Safety Data Sheets (SDS) for health, safety, and environment related hazards, and take all necessary measures and precautions to comply with exposure requirements.
- Refer to the PDS and SDS for additional information.

Preparation:

• Ensure substrates are clean, dry, uniform and properly prepared to receive primer and subsequent roofing materials.

Application:

- Ensure environmental conditions are acceptable before beginning application. Refer to application instructions for each SBS membrane type indicated herein for additional guidance.
- Apply <u>ELASTOCOL[™] 500</u> or <u>ELASTOCOL[™] 350</u> primer using brush, roller, or sprayer at approximately 1 gallon per 100 square feet. Coverage rates vary based on substrate roughness and porosity.

- Lightly prime surfaces for light, uniform coverage. Do not over-apply heavy or thick coats of primer.
- Apply <u>ELASTOCOL[™] 500</u> or <u>ELASTOCOL[™] 350</u> primer to clean, dry masonry, concrete, metal, wood and other compatible substrates before applying hot asphalt and heat welded membrane and flashing plies.
- Primer is not recommended for SBS membranes adhered using <u>COLPLY™ EF ADHESIVE</u> or <u>COLPLY™ EF</u> <u>FLASHING CEMENT</u>.

Inspection:

- Examine substrates to ensure they are uniform and properly prepared to apply the SBS modified bitumen membrane. Rough, irregular substrates should be corrected or otherwise addressed before applying <u>SOPREMA®</u> roofing.
- Examine the primed areas before installing the SBS membranes.
- Ensure primer is fully dry before applying SBS membranes. Primer should not transfer to the fingertips when touched. Apply membrane within 24 hours of primer application if primer becomes contaminated re-prime as necessary.
- Adjust primer application methods as necessary to achieve the desired results for optimum adhesion.
- Examine membrane adhesion as necessary as indicated herein.

2.1.2 SBS PRIMERS FOR SELF-ADHESIVE SBS BASE PLIES

General:

- SENTINEL[®] fleece-backed PVC is the surface ply for PVC-SBS hybrid membranes. SBS self-adhesive primers are intended for use with the SBS self-adhesive base ply only. Prevent direct contact between PVC and SBS primers.
- Self-adhesive primers are required for <u>SOPREMA®</u> SBS selfadhesive membranes.
- <u>ELASTOCOL[™] STICK</u> is a solvent-based primer option for approved substrates and self-adhesive SBS membranes.
- <u>ELASTOCOL[™] STICK ZERO</u> is a low VOC, solvent-based primer option for approved substrates and self-adhesive SBS membranes.
- <u>ELASTOCOL™ STICK H2O</u> is a water-based primer option for approved substrates and self-adhesive SBS membranes.
- Self-adhesive primers should be stored in a dry, protected storage area away from direct sunlight.
 Store primers away from excessive heat and open flames.
- The contractor and/or applicator is responsible for managing and controlling all exposures related to chemical hazards, toxic substances and odors. This includes personal protective equipment (PPE), administrative and work practice controls, and engineering controls. The contractor is responsible for the elimination or substitution of products as necessary to manage and control exposures related to chemical hazards, toxic substances and odors.



- Refer to product Safety Data Sheets (SDS) for health, safety, and environment related hazards, and take all necessary measures and precautions to comply with exposure requirements.
- Refer to the PDS and SDS for additional information.

Preparation:

• Ensure substrates are clean, dry, uniform and properly prepared to receive primer and subsequent roofing materials.

Application:

- Ensure environmental conditions are acceptable before beginning application. Refer to <u>Section 2.4</u> for self-adhesive membrane plies.
- Apply <u>ELASTOCOL[™] STICK</u> and <u>ELASTOCOL[™] STICK ZERO</u> primer using brush or roller at 0.66 to 1 gallons per 100 square feet or <u>ELASTOCOL[™] STICK H2O</u> primer using brush, roller, or sprayer at 0.5 gallons per 100 square feet. Lightly prime for uniform coverage. Do not apply heavy or thick coats of primer.
- Apply <u>ELASTOCOL[™] STICK</u> and <u>ELASTOCOL[™] STICK ZERO</u> primer to clean, dry masonry, metal, wood and other compatible substrates before applying self-adhesive SBS membrane and flashing plies.

Inspection:

- Examine substrates to ensure they are uniform and properly prepared to apply the SBS modified bitumen membrane. Rough, irregular substrates should be corrected or otherwise addressed before applying <u>SOPREMA®</u> self-adhesive primers and membrane plies.
- Ensure self-adhesive primer is tacky to-the-touch, but not wet. Primer should not transfer to the fingertips when touched. If primer becomes fully dry, dirty and loses all tack, re-prime the substrate as necessary to achieve membrane adhesion.
- Adjust primer application methods as necessary to achieve the desired results for optimum adhesion.
- Examine membrane adhesion as necessary as indicated herein.

Table 2.1.2a Primers for Self-Adhesive SBS Base Plies					
Substrate	Primer Required				
Prepared structural concrete,					
Conditioned, un-treated wood,	<u>ELASTOCOL™ STICK</u> ,				
Approved gypsum roof boards,	ELASTOCOL™ STICK ZERO,				
Approved cement roof boards,	ELASTOCOL™ STICK H2O				
Sand-surfaced SBS membrane					
	ELASTOCOL™ STICK,				
<u>SOPRADUARD</u>	ELASTOCOL [™] STICK ZERO				

2.2 SBS BASE SHEETS/ANCHOR SHEETS

General:

- <u>SOPREMA®</u> base sheets/anchor sheets are "carrier" sheets used to secure roofing materials to roofing substrates.
- Acceptable substrates include lightweight insulating concrete, wood, cementitious wood fiber, gypsum and other nailable roofing substrates.
- SBS Base Ply:
 - <u>SOPREMA®</u> base sheets/anchor sheets may be mechanically fastened to the substrate to support the SBS base ply. For PVC-SBS hybrid membranes, the SBS base ply may be adhered to the base sheet/anchor sheet by heatwelding, self-adhesive or adhered using hot asphalt.
- Insulation:
 - Mechanically fastened base sheets/anchor sheets may be used to secure approved insulation products. Insulation products may be adhered to the base sheet/anchor sheet using <u>DUOTACK® 365</u>, ICP Polyset® Commercial Roof Adhesive, <u>DUOTACK® SPF HFO</u> or hot asphalt.
- Refer to <u>Table 2.2a</u> for <u>SOPREMA®</u> base sheet/anchor sheet options.
- Refer to <u>Table 2.2b</u> for base sheet/anchor sheet fastener options.
- The contractor and/or applicator is responsible for managing and controlling all exposures related to chemical hazards, toxic substances and odors. This includes personal protective equipment (PPE), administrative and work practice controls, and engineering controls. The contractor is responsible for the elimination or substitution of products as necessary to manage and control exposures related to chemical hazards, toxic substances and odors.
- Refer to product Safety Data Sheets (SDS) for health, safety, and environment related hazards, and take all necessary measures and precautions to comply with exposure requirements.
- Refer to the PDS and SDS for additional product-related information.

Preparation:

- Ensure substrates are clean, dry, uniform and properly prepared to receive roofing materials.
- Ensure environmental conditions are satisfactory, and will remain satisfactory, during the application.
- Where applicable, ensure base sheet/anchor sheet fastener withdrawal (pull-out) tests have been conducted in accordance with project requirements, specifications and jurisdictional requirements.
- Refer to Figures 2.2a through 2.2k for SOPREMA[®] base sheet/anchor sheet fastening patterns. Fastening patterns and enhancements shown are for SOPREMA[®] warranty purposes only.

Application:

- Unroll the base sheet/anchor sheet onto the roof surface and allow time for the sheet to relax prior to fastening.
- Starting at the low point of the roof, lay out the sheet to ensure all plies are installed perpendicular to the roof slope, shingled to prevent back-water laps.
- Cut sheets to working lengths and widths as required to conform to rooftop conditions.
- Align side-laps to produce the consistent overlap required for attachment to meet wind uplift approvals.



- As uniform tension is applied, start fastening at the center of the sheet and work towards the end-laps. Remove wrinkles and buckles as fastening progresses.
- Install specified fasteners along the center of side-laps. Align intermediate rows of fasteners staggered between side-laps. Fasten all end-laps.
- Refer to <u>Table 2.2b</u> for base sheet/anchor sheet fastener types. Fasten sheet as required for specified wind uplift resistance.
- Refer to Figures 2.2a through 2.2k for base sheet/anchor sheet fastening patterns. Fastening patterns and enhancements shown are for SOPREMA® warranty purposes only.

Inspection:

- Examine base sheet/anchor sheet and fasteners during installation. Replace all damaged and improperly installed fasteners.
- Repair base sheet/anchor sheet wrinkles, buckles, and all other installation deficiencies.
- Inspect the installed materials to ensure all deficiencies are corrected before installing subsequent roofing materials over the base sheet/anchor sheet.

Table 2.2a Base Sheets/Anchor Sheets					
Name	Reinforcement	Top Surfacing	Overlying SBS Base Ply Options		
		Sanded	All fully adhered, heat welded SBS base plies. Refer to <u>Table 2.3.1a</u> .		
MODIFIED SOPRA G	Glass fiber		All fully adhered, self-adhesive SBS base plies. Refer to <u>Table 2.4.1a</u> .		
			All hot asphalt-applied SBS base plies. Refer to <u>Table 2.7a</u> .		
<u>SOPRABASE™ S</u>	Non-woven polyester	Sanded	All fully adhered, self-adhesive SBS base plies. Refer to <u>Table 2.4.1a</u> .		
			All hot asphalt-applied SBS base plies. Refer to <u>Table 2.7a</u> .		
SOPRABASE™ TG	Non-woven polyester	Plastic burn-off film	All fully adhered, heat welded SBS base plies. Refer to <u>Table 2.3.1a</u> .		
		Sanded	All fully adhered, heat welded SBS base plies. Refer to <u>Table 2.3.1a</u> .		
<u>SOPRA™ 4897</u>	Glass fiber		All fully adhered, self-adhesive SBS base plies. Refer to <u>Table 2.4.1a</u> .		
			All hot asphalt-applied SBS base plies. Refer to <u>Table 2.7a</u> .		

Table 2.2b Base Sheet/Anchor Sheet Fasteners							
Name	Graphic	Base Sheet/Anchor Sheet	Substrate				
<u>FM-90 BASE SHEET</u> FASTENER		MODIFIED SOPRA G,	Cellular lightweight insulating concrete,				
or <u>FM-75 BASE SHEET</u> <u>FASTENER</u>		<u>SOPRABASE™ TG</u> ,	Aggregate lightweight insulating concrete,				
		<u>SOPRA™ 4897</u>	Poured gypsum				
		MODIFIED SOPRA G,	Cementitious wood fiber,				
	No Sel	<u>SOPRABASE™ S</u> ,	Aggregate lightweight insulating concrete,				
	200	<u>SOPRABASE™ TG</u> ,	Cellular lightweight insulating concrete,				
		<u>SOPRA™ 4897</u>	Gypsum				
		MODIFIED SOPRA G,	Aggregate lightweight				
VERSA-FAST® FASTENERS		<u>SOPRABASE™ S</u> ,	insulating concrete,				
and <u>VERSA-FAST® METAL</u> DLATES	- mannes	<u>SOPRABASE™ TG</u> ,	insulating concrete,				
<u>rtaits</u>		<u>SOPRA™ 4897</u>	Gypsum				
		MODIFIED SOPRA G,					
Simplex [®] MAXX Cap		<u>SOPRABASE™ S</u> ,	Wood				
		<u>SOPRABASE™ TG</u> ,					
		<u>SOPRA™ 4897</u>					
		MODIFIED SOPRA G,					
Metal can nail	Z	<u>SOPRABASE™ S</u> ,	Wood				
		<u>SOPRABASE™ TG</u> ,					
	*	<u>SOPRA™ 4897</u>					



Roll Width (Y)	Lap Width (Z)	Zone	Pattern	Row Spacing (X)	Fasteners Per Square
		1	6,6,6	11.33in	212
36in (0.9m)	2in	2	7,7,7,7,7,7	5.67in	363
		3	5,5,5,5,5,5,5	4.86in	593
		1	6,6,6	11in	218
36in (0.9m)	3in	2	7,7,7,7,7,7	5.5in	374
		3	5,5,5,5,5,5,5	4.71in	611
		1	6,6,6	10.67in	225
36in (0.9m)	4in	2	7,7,7,7,7,7	5.33in	386
		3	5,5,5,5,5,5,5	4.57in	630
	~	1	6,6,6	12in	200
39in (1m)	3in	2	7,7,7,7,7,7	6in	343
		3	5,5,5,5,5,5,5	5.14in	560
		1	6,6,6	11.67in	206
39in (1m)	4in	2	7,7,7,7,7	5.83in	353
		3	5,5,5,5,5,5,5	5in	576

Figure 2.2a Mechanically Fastened Base Sheet/Anchor Sheet 6, 6, 6 Fastening Pattern



ONE (1) ROW AT SIDE LAPS SPACED 6" O.C. THREE (3) EQUALLY SPACED INTERMEDIATE ROWS SPACED 6" O.C. AND STAGGERED

ZONE 2

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ZONE 3

- NOMINAL 160% INCREASE .
- ONE (1) ROW AT SIDE LAPS SPACED 4" O.C. SIX (6) EQUALLY SPACED INTERMEDIATE ROWS
- SPACED 4" O.C. AND STAGGERED PRIME PLATES
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Roll Width (Y)	Lap Width (Z)	Zone	Pattern	Row Spacing (X)	Fasteners Per Square
		1	6,6,6,6	8.5in	282
36in (0.9m)	2in	2	6,6,6,6,6,6,6	4.86in	494
		3	4,4,4,4,4,4,4	4.86in	741
		1	6,6,6,6	8.25in	291
36in (0.9m)	3in	2	6,6,6,6,6,6,6	4.71in	509
		3	4,4,4,4,4,4,4	4.71in	763
		1	6,6,6,6	8in	300
36in (0.9m)	4in	2	6,6,6,6,6,6,6	4.57in	525
		3	4,4,4,4,4,4,4	4.57in	788
21. XX	~	1	6,6,6,6	9in	267
39in (1m)	3in	2	6,6,6,6,6,6,6	5.14in	467
		3	4,4,4,4,4,4,4	5.14in	700
		1	6,6,6,6	8.75in	274
39in (1m)	4in	2	6,6,6,6,6,6,6	5in	480
		3	4,4,4,4,4,4,4	5in	720

Figure 2.2b Mechanically Fastened Base Sheet/Anchor Sheet 6, 6, 6, 6 Fastening Pattern



- **ZONE 3** NOMINAL 160% INCREASE

ZONE 1

NOMINAL 70% INCREASE

PRIME PLATES

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Roll Width (Y)	Lap Width (Z)	Zone	Pattern	Row Spacing (X)	Fasteners Per Square
		1	7,7,7	11.33in	182
36in (0.9m)	2in	2	5.5,5.5,5.5,5.5	8.5in	308
		3	6,6,6,6,6,6,6	4.86in	494
		1	7,7,7	11in	187
36in (0.9m)	3in	2	5.5,5.5,5.5,5.5	8.25in	317
		3	6,6,6,6,6,6,6	4.71in	509
	4in	1	7,7,7	10.67in	193
36in (0.9m)		2	5.5,5.5,5.5,5.5	8in	327
		3	6,6,6,6,6,6,6	4.57in	525
		1	7,7,7	12in	171
39in (1m)	3in	2	5.5,5.5,5.5,5.5	9in	291
		3	6,6,6,6,6,6,6	5.14in	467
39in (1m)		1	7,7,7	11.67in	176
	4in	2	5.5,5.5,5.5,5.5	8.75in	299
		3	6,6,6,6,6,6,6	5in	480

Figure 2.2c Mechanically Fastened Base Sheet/Anchor Sheet 7, 7, 7 Fastening Pattern



Roll Width (Y) Lap Width (Z) Zone Pattern Row Spacing (X) Fasteners Per Square 7,10,10 8.5,8.5,8.5,8.5,8.5 11.33in 6.8in 145 249 36in (0.9m) 2in 5.5.5.5.5.5.5.5.5 6.8in 11in 385 7,10,10 150 8.5,8.5,8.5,8.5,8.5 36in (0.9m) 3in 6.6in 257 5.5,5.5,5.5,5.5,5.5 6.6in 397 7,10,10 10.67in 154 36in (0.9m) 4in 8.5,8.5,8.5,8.5,8.5 6.4in 265 5.5,5.5,5.5,5.5,5.5 6.4in 409 7,10,10 8.5,8.5,8.5,8.5,8.5,8.5 12in 137 39in (1m) 3in 7.2in 235 5.5,5.5,5.5,5.5,5.5 7.2in 364 7,10,10 11.67in 141 39in (1m) 4in 8.5.8.5.8.5.8.5.8.5 7in 242 374 5.5.5.5.5.5.5.5.5.5 7in

Figure 2.2d Mechanically Fastened Base Sheet/Anchor Sheet 7, 10, 10 Fastening Pattern

ZONE 1

ZONE 2

ZONE 3

NOMINAL 70% INCREASE

NOMINAL 160% INCREASE

SPACED 5.5" O.C. AND STAGGERED

PRIME PLATES

PRIME PLATES

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SPACED 8.5" O.C. AND STAGGERED

ONE (1) ROW AT SIDE LAPS SPACED 7" O.C. TWO (2) EQUALLY SPACED INTERMEDIATE ROWS SPACED 10" O.C. AND STAGGERED

LBack to Top



ONE (1) ROW AT SIDE LAPS SPACED 7" O.C. TWO (2) EQUALLY SPACED INTERMEDIATE ROWS SPACED 14" O.C. AND STAGGERED

ZONE 2

- NOMINAL 70% INCREASE •
- •
- NOMINAL 70% INCREASE ONE (1) ROW AT SIDE LAPS SPACED 8" O.C. THREE (3) EQUALLY SPACED INTERMEDIATE ROWS SPACED 8" O.C. AND STAGGERED PRIME PLATES
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ZONE 3

- .
- NOMINAL 160% INCREASE ONE (1) ROW AT SIDE LAPS SPACED 8" O.C. FIVE (5) EQUALLY SPACED INTERMEDIATE ROWS SPACED 8" O.C. AND STAGGERED PRIME PLATES
- •
- .

Roll Width (Y)	Lap Width (Z)	Zone	Pattern	Row Spacing (X)	Fasteners Per Square
		1	7,14,14	11.33in	121
36in (0.9m)	2in	2	8,8,8,8	8.5in	212
		3	8,8,8,8,8,8	5.67in	318
	1.72	1	7,14,14	11in	125
36in (0.9m)	3in	2	8,8,8,8	8.25	219
		3	8,8,8,8,8,8	5.5in	328
	4in	1	7,14,14	10.67in	129
36in (0.9m)		2	8,8,8,8	8in	225
		3	8,8,8,8,8,8	5.33in	338
		1	7,14,14	12in	115
39in (1m)	3in	2	8,8,8,8	9in	200
		3	8,8,8,8,8,8	6in	300
		1	7,14,14	11.67in	118
39in (1m)	4in	2	8,8,8,8	8.75in	206
		3	8,8,8,8,8,8	5.83in	309

Figure 2.2e Mechanically Fastened Base Sheet/Anchor Sheet 7, 14, 14 Fastening Pattern



ZONE	3

NOMINAL 70% INCREASE

PRIME PLATES

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ZONE 1 ONE (1) ROW AT SIDE LAPS SPACED 7.5" O.C. TWO (2) EQUALLY SPACED INTERMEDIATE ROWS SPACED 7.5" O.C. AND STAGGERED

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- NOMINAL 160% INCREASE ONE (1) ROWAT SIDE LAPS SPACED 5.5" O.C. FIVE (5) EQUALLY SPACED INTERMEDIATE ROWS SPACED 5.5" O.C. AND STAGGERED
- PRIME PLATES

Roll Width (Y)	Lap Width (Z)	Zone	Pattern	Row Spacing (X)	Fasteners Per Square
		1	7.5,7.5,7.5	11.33in	169
36in (0.9m)	2in	2	8.5,8.5,8.5,8.5,8.5,8.5	5.67in	299
		3	5.5,5.5,5.5,5.5,5.5,5.5	5.67in	462
		1	7.5,7.5,7.5	11in	175
36in (0.9m)	3in	2	8.5,8.5,8.5,8.5,8.5,8.5	5.5in	308
		3	5.5,5.5,5.5,5.5,5.5,5.5	5.5in	476
		1	7.5,7.5,7.5	10.67in	180
36in (0.9m)	4in	2	8.5,8.5,8.5,8.5,8.5,8.5	5.33in	318
		3	5.5,5.5,5.5,5.5,5.5,5.5	5.33in	491
	·	1	7.5,7.5,7.5	12in	160
39in (1m)	3in	2	8.5,8.5,8.5,8.5,8.5,8.5	6in	282
		3	5.5,5.5,5.5,5.5,5.5,5.5	6in	436
		1	7.5,7.5,7.5	11.67in	165
39in (1m)	4in	2	8.5,8.5,8.5,8.5,8.5,8.5	5.83in	290
		3	5.5.5.5.5.5.5.5.5.5.5.5	5.83in	449

Figure 2.2f Mechanically Fastened Base Sheet/Anchor Sheet 7.5, 7.5, 7.5 Fastening Pattern



Roll Width (Y)	Lap Width (Z)	Zone	Pattern	Row Spacing (X)	Fasteners Per Square
		1	7.5,10,10	11.33in	142
36in (0.9m)	2in	2	8.5,8.5,8.5,8.5,8.5	6.8in	249
		3	5.5,5.5,5.5,5.5,5.5	6.8in	385
		1	7.5,10,10	11in	146
36in (0.9m)	3in	2	8.5,8.5,8.5,8.5,8.5	6.6in	257
		3	5.5,5.5,5.5,5.5,5.5	6.6in	397
	4in	1	7.5,10,10	10.67in	150
36in (0.9m)		2	8.5,8.5,8.5,8.5,8.5	6.4in	265
		3	5.5,5.5,5.5,5.5,5.5	6.4in	409
	3in	1	7.5,10,10	12in	134
39in (1m)		2	8.5,8.5,8.5,8.5,8.5	7.2in	235
		3	5.5,5.5,5.5,5.5,5.5	7.2in	364
39in (1m)		1	7.5,10,10	11.67in	138
	4in	2	8.5,8.5,8.5,8.5,8.5	7in	242
		3	5.5,5.5,5.5,5.5,5.5	7in	374

Figure 2.2g Mechanically Fastened Base Sheet/Anchor Sheet 7.5, 10, 10 Fastening Pattern

ONE (1) ROW AT SIDE LAPS SPACED 7.5" O.C. TWO (2) EQUALLY SPACED INTERMEDIATE ROWS SPACED 10" O.C. AND STAGGERED

ZONE 2

- •
- NOMINAL 70% INCREASE ONE (1) ROW AT SIDE LAPS SPACED 8.5" O.C. FOUR (4) EQUALLY SPACED INTERMEDIATE ROWS SPACED 8.5" O.C. AND STAGGERED PRIME PLATES .
- •

ZONE 3

- NOMINAL 160% INCREASE •
- NOMINAL TOUG INCREASE ONE (1) ROW AT SIDE LAPS SPACED 5.5" O.C. FOUR (4) EQUALLY SPACED INTERMEDIATE ROWS SPACED 5.5" O.C. AND STAGGERED PRIME PLATES
- .



ONE (1) ROWAT SIDE LAPS SPACED 8" O.C. TWO (2) EQUALLY SPACED INTERMEDIATE ROWS SPACED 8" O.C. AND STAGGERED

ZONE 3

ZONE 2

SPACED 7.5" O.C. AND STAGGERED PRIME PLATES

- .
- NOMINAL 160% INCREASE ONE (1) ROW AT SIDE LAPS SPACED 6" O.C. FIVE (5) EQUALLY SPACED INTERMEDIATE ROWS SPACED 6" O.C. AND STAGGERED PRIME PLATES
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Roll Width (Y)	Lap Width (Z)	Zone	Pattern	Row Spacing (X)	Fasteners Per Square
		1	8,8,8	11.33in	159
36in (0.9m)	2in	2	7.5,7.5,7.5,7.5,7.5	6.8in	282
		3	6,6,6,6,6	5.67in	424
		1	8,8,8	11in	164
36in (0.9m)	3in	2	7.5,7.5,7.5,7.5,7.5	6.6in	291
		3	6,6,6,6,6	5.5in	436
	4in	1	8,8,8	10.67in	169
36in (0.9m)		2	7.5,7.5,7.5,7.5,7.5	6.4in	300
		3	6,6,6,6,6	5.33in	450
	3in	1	8,8,8	12in	150
39in (1m)		2	7.5,7.5,7.5,7.5,7.5	7.2in	267
		3	6,6,6,6,6	6in	400
39in (1m)		1	8,8,8	11.67in	154
	4in	2	7.5,7.5,7.5,7.5,7.5	7in	274
		3	6,6,6,6,6,6	5.83in	411

Figure 2.2h Mechanically Fastened Base Sheet/Anchor Sheet 8, 8, 8 Fastening Pattern



Roll Width (Y)	Lap Width (Z)	Zone	Pattern	Row Spacing (X)	Fasteners Per Square
		1	9,9,9	11.33in	141
36in (0.9m)	2in	2	7,7,7,7	8.5in	242
		3	8,8,8,8,8,8,8	4.86in	371
		1	9,9,9	11in	145
36in (0.9m)	3in	2	7,7,7,7	8.25in	249
		3	8,8,8,8,8,8,8	4.71in	382
		1	9,9,9	10.67in	150
36in (0.9m)	4in	2	7,7,7,7	8in	258
		3	8,8,8,8,8,8,8	4.57in	394
		1	9,9,9	12in	133
39in (1m)	3in	2	7,7,7,7	9in	229
		3	8,8,8,8,8,8,8	5.14in	350
		1	9,9,9	11.67in	137
39in (1m)	4in	2	7,7,7,7	8.75in	235
		3	8,8,8,8,8,8,8	5in	360

Figure 2.2i Mechanically Fastened Base Sheet/Anchor Sheet 9, 9, 9 Fastening Pattern

ZONE 2

ZONE 3

ONE (1) ROWAT SIDE LAPS SPACED 9" O.C. TWO (2) EQUALLY SPACED INTERMEDIATE ROWS SPACED 9" O.C. AND STAGGERED

NOMINAL 70% INCREASE

NOMINAL 160% INCREASE

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ONE (1) ROWAT SIDE LAPS SPACED 9" O.C. TWO (2) EQUALLY SPACED INTERMEDIATE ROWS SPACED 12" O.C. AND STAGGERED

ZONE 3

ZONE 2

- •
- NOMINAL 160% INCREASE ONE (1) ROW AT SIDE LAPS SPACED 6.5" O.C. FOUR (4) EQUALLY SPACED INTERMEDIATE ROWS SPACED 6.5" O.C. AND STAGGERED
- . PRIME PLATES

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Roll Width (Y)	Lap Width (Z)	Zone	Pattern	Row Spacing (X)	Fasteners Per Square
		1	9,12,12	11.33in	118
36in (0.9m)	2in	2	8,8,8,8	8.5in	212
		3	6.5,6.5,6.5,6.5,6.5	6.8in	326
		1	9,12,12	11in	121
36in (0.9m)	3in	2	8,8,8,8	8.25in	218
		3	6.5,6.5,6.5,6.5,6.5	6.6in	336
	4in	1	9,12,12	10.67in	125
36in (0.9m)		2	8,8,8,8	8in	225
		3	6.5,6.5,6.5,6.5,6.5	6.4in	346
	3in	1	9,12,12	12in	111
39in (1m)		2	8,8,8,8	9in	200
		3	6.5,6.5,6.5,6.5,6.5	7.2in	308
		1	9,12,12	11.67in	114
39in (1m)	4in	2	8,8,8,8	8.75in	206
		3	6.5,6.5,6.5,6.5,6.5	7in	316

Figure 2.2j Mechanically Fastened Base Sheet/Anchor Sheet 9, 12, 12 Fastening Pattern



ONE (1) ROWAT SIDE LAPS SPACED 9" O.C. TWO (2) EQUALLY SPACED INTERMEDIATE ROWS SPACED 18" O.C. AND STAGGERED ٠ .

ZONE 3

ZONE 2

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NOMINAL 70% INCREASE

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- NOMINAL 160% INCREASE ONE (1) ROW AT SIDE LAPS SPACED 8.5" O.C. FOUR (4) EQUALLY SPACED INTERMEDIATE ROWS SPACED 8.5" O.C. AND STAGGERED .
- . PRIME PLATES

Roll Width (Y)	Lap Width (Z)	Zone	Pattern	Row Spacing (X)	Fasteners Per Square
		1	9,18,18	11,33in	94
36in (0.9m)	2in	2	7.5,7.5,7.5	11.33in	169
		3	8.5,8.5,8.5,8.5,8.5	6.8in	249
		1	9,18,18	11in	97
36in (0.9m)	3in	2	7.5,7.5,7.5	11in	175
		3	8.5,8.5,8.5,8.5,8.5,8.5	6.6in	257
36in (0.9m)	4in	1	9,18,18	10.67in	100
		2	7.5,7.5,7.5	10.67in	180
		3	8.5,8.5,8.5,8.5,8.5	6.4in	265
	3in	1	9,18,18	12in	89
39in (1m)		2	7.5,7.5,7.5	12in	160
		3	8.5,8.5,8.5,8.5,8.5	7.2in	235
39in (1m)		1	9,18,18	11.67in	91
	4in	2	7.5,7.5,7.5	11.67in	165
		3	8.5,8.5,8.5,8.5,8.5	7in	242

Figure 2.2k Mechanically Fastened Base Sheet/Anchor Sheet 9, 18, 18 Fastening Pattern

2.3 HEAT WELDED SBS BASE PLIES

2.3.1 FULLY ADHERED, HEAT WELDED SBS BASE PLIES

General:

- SENTINEL[®] fleece-backed PVC is the surface ply for PVC-SBS hybrid membranes. The SBS base ply includes heat-welded SBS base ply options. Refer to <u>Table 2.3.1a</u>.
- <u>SOPREMA®</u> heat welded SBS modified bitumen base plies may be installed over approved insulation substrates, mechanically fastened base sheets, and installed over other SBS modified bitumen plies that are heat welded, self-adhesive applied, hot asphalt applied or cold adhesive-applied.
- The underside of heat welded SBS membrane plies have a plastic burn-off film to optimize heat welding operations. The top surface is sanded to receive SENTINEL[®] PVC membrane adhered with <u>DUOTACK[®] SPF HFO</u> or ICP Polyset[®] Commercial Roof Adhesive. Refer to <u>Table 2.3.1a</u>.
- The contractor and/or applicator is responsible for managing and controlling all exposures related to chemical hazards, toxic substances and odors. This includes personal protective equipment (PPE), administrative and work practice controls, and engineering controls. The contractor is responsible for the elimination or substitution of products as necessary to manage and control exposures related to chemical hazards, toxic substances and odors.
- Refer to product Safety Data Sheets (SDS) for health, safety, and environment related hazards, and take all necessary measures and precautions to comply with exposure requirements.





- Ensure environmental conditions are acceptable to proceed. Monitor
 precipitation, temperature, humidity, wind, cloud cover and sun that may have an effect on materials and
 roofing application.
- Conditions should remain dry, and the ambient temperature should be well above the dew point at all times during roofing application.
- Ensure all roofing substrates are prepared and acceptable to receive the heat-welded membrane plies.
- Ensure substrates are primed where required using <u>ELASTOCOL™ 350</u> or <u>ELASTOCOL™ 500</u> primer. Ensure primer is fully dry before beginning heat-welding operations. Refer to <u>Section 2.1.1</u>.
- Adhesion/peel tests are encouraged for concrete, masonry and other substrates where surface conditions are inconsistent or otherwise vary. Conduct 180 degree peel tests as follows:
 - Choose three (3) or more representative substrate areas to examine.
 - Clean and prepare the substrate as specified, allow to dry.
 - Cut minimum 2 in (5.08 cm) wide by 12 in (30.48 cm) long strips of the specified membrane.
 - Apply the specified primer to the clean, prepared substrate.
 - Heat weld an 8 to 9 in (20.32 to 22.86 cm) long section of the 12 in (30.48 cm) strip, and allow a 3 to 4 in (7.62 to 10.16 cm) long portion to remain un-adhered in order to grip and pull.
 - Allow sufficient time for the samples to cool.
 - Grip the un-adhered portion of the sample and pull 180 degrees and parallel with the surface.
 Use a small scale to measure results in pounds of resistance where quantitative results are desired.
 - Results should demonstrate strong resistance to peel. A strong bond will result in significant residual materials remaining adhered to the substrate, or part of the substrate itself may be removed along with the sample.

- Samples that peel away easily from the substrate may indicate further preparation is needed, or alternate materials and/or application methods may be necessary.
- Where quantitative measurements of peel resistance are desired, the peel resistance should exceed 2 lbf per lieneal inch of sample width (e.g. a 2 in wide sample should exceed 4 lbf and the sample should not peel away "clean" from the substrate.
- Take photos or videos of the samples and the substrate to record conditions.
- Refer to NRCA CERTA, local codes and building owner's requirements for hot work operations.
- Where the applicator deems conditions are unsafe to use open flames, <u>SOPREMA®</u> alternate membrane application methods should be used to install SBS modified bitumen membranes. Acceptable alternate installation methods include self-adhesive membranes, mechanically fastened plies, cold adhesive-applied and hot asphalt-applied plies.
- Remove all roll packaging tape prior to installation.

Application:

- Single or multi-nozzle, hand-held propane roof torches should be used to install heat welded SBS field membranes.
- Multi-nozzle carts "dragon wagons" may also be utilized to install membrane plies. Seven (7) nozzle carts are recommended for uniform heat application rather than five (5) nozzle carts.
- <u>SOPREMA® Mini MACADEN® 1000</u> is recommended to optimize the efficiency of heat welded SBS base plies for large roofing and waterproofing projects. Contact <u>SOPREMA®</u> for more information.
- Refer to the following instructional videos for heat welded SBS modified bitumen membranes:
 - Heat Applied Base Field Installation Procedure (Instructional Video)
 - Link: <u>https://www.youtube.com/watch?v=CsBo7outpc8&index=11&list=PLCkWI-tgKqeWtmaTluoO30L0gLSn7pD-q</u>
- Unroll membrane sheets onto the roof surface and allow time to relax prior to heat welding.
- Starting at the low point of the roof, lay out the membrane to ensure the plies are installed perpendicular to the roof slope, shingled to prevent back-water laps.
- Cut membrane to working lengths and widths to conform to rooftop conditions and lay out to always work to a selvage edge.
- Ensure specified side-laps and end-laps are maintained. End-laps should be staggered 3 ft apart.
- As the membrane ply is unrolled, apply heat to the underside of the ply until plastic burn-off film melts away sufficiently for full adhesion to the substrate, and full adhesion between plies.
- For hand-held roof torches, continuously move the torch side-to-side across the underside of the roll to melt the bitumen while continuously unrolling sheet.
- For multi-nozzle carts, apply uniform heat to the underside of the roll to melt the bitumen while continuously unrolling the sheet.
- While unrolling and heating the sheet, ensure approximately ¼ to 1/2 in of hot bitumen flows ahead of the roll, and there is no more than 1/8 to 1/4 in bleed out at all laps. Ensure all side-laps are fully adhered and sealed watertight.
- Adjust application methods to accommodate varying environmental conditions as necessary to achieve the desired results.
- For gypsum coverboards and other substrates subject to potential damage, apply heat high on the roll to prevent overheating or damaging the substrate.
- At 6 in end-laps where T-Joints exist, cut a 45 degree dog-ear away from the selvage edge.

Inspection:

- Each day, physically inspect all side and end-laps, and ensure the membrane is sealed watertight.
- Where necessary, use a torch or hot-air welder and a clean trowel to ensure all laps are fully sealed.
- Inspect the installation each day to ensure the plies are fully adhered.
- Each day, repair all voids, wrinkles, open laps, blisters and all other deficiencies before proceeding.

- Temporary night seals are required to seal membrane and flashing terminations watertight. Temporary night seals must be removed upon resuming the installation.
- Ensure incompatible bitumen materials are not left exposed on the surface of the base ply before installation of the PVC membrane.

Table 2.3.1a Fully Adhered, Heat-Welded Base Plies					
Name Reinforcement Top Surfacing					
ELASTOPHENE [®] SP 2.2,	Glass fiber	Sanded			
ELASTOPHENE® SP 3.0		Sanueu			
SOPRALENE [®] 180 SP 3.0,	Non-woven polyester	Sanded			
SOPRALENE® 180 SP 3.5					

Table 2.3.1b Substrate Preparation, Fully Adhered, Heat-Welded SBS Base Plies				
Substrate ***	Preparation			
Concrete	Prime with <u>ELASTOCOL[™] 500</u> * or <u>ELASTOCOL[™] 350</u> *			
Approved gypsum roof boards**	Optional prime with <u>ELASTOCOL[™] 500</u> * or <u>ELASTOCOL[™] 350</u> *			
Approved cement roof boards	Prime with ELASTOCOL [™] 500 [*] or ELASTOCOL [™] 350 [*]			
SOPRABOARD™	None			
All base sheets/anchor sheets. Refer to <u>Section 2.2</u> .	None			
Plastic burn-off film surfaced SBS membrane	None			
Sand-surfaced SBS membrane laps	None			

*Refer to <u>Section 2.1.1</u> for priming.

**Primer is optional. Primer is recommended for optimum performance. Contact <u>SOPREMA®</u>.

***Refer to NRCA CERTA recommendations for heat welding methods and recommended protection of substrates.

2.4 SELF-ADHESIVE SBS BASE PLIES

2.4.1 FULLY ADHERED, SELF-ADHESIVE SBS BASE PLIES

General:

- <u>SOPREMA®</u> self-adhesive membranes are composed of elastomeric SBS modified bitumen in combination with a high tack self-adhesive layer.
- The underside of the self-adhesive base plies is surfaced with protective polyolefin release film that is removed during application. The top surface is sanded to receive SENTINEL[®] PVC membrane adhered with <u>DUOTACK[®] SPF</u> <u>HFO</u> or ICP Polyset[®] Commercial Roof Adhesive.
- Approved substrates are primed using a <u>SOPREMA®</u> self-adhesive primer. Refer to <u>Table 2.1.2a</u> for primer options.
- The contractor and/or applicator is responsible for managing and controlling all exposures related to chemical hazards, toxic substances and odors. This includes personal protective equipment (PPE), administrative and work practice controls, and engineering controls. The contractor is responsible for the elimination or substitution of products as necessary to manage and control exposures related to chemical hazards, toxic substances and odors.
- Refer to product Safety Data Sheets (SDS) for health, safety, and environment related hazards, and take all necessary measures and precautions to comply with exposure requirements.
- Refer to the PDS and SDS for additional product information.

Preparation:

- Ensure environmental conditions are acceptable to proceed. Monitor precipitation, temperature, humidity, wind, cloud cover and sun that may have an effect on materials and roofing application.
- Conditions should remain dry, and the ambient temperature should be well above the dew point at all times during roofing application.
- Ensure all substrates are clean, dry and prepared to receive the specified self-adhesive primer and membrane plies.
- The following are recommended during cold weather:
 - The ambient temperature should be at least 40°F (4.4°C), and rising to ensure conditions remain acceptable to apply self-adhesive primers and membrane plies.
 - The self-adhesive primer and membrane temperature should be 70°F (21°C) or more at the point of membrane application.
 - To ensure the primer is applied at 70°F (21°C) during cold weather, drums and 5 gallon pails should be stored in heated areas. Drums and 5 gallon pails exposed to cold temperature on the roof should be provided with heaters when necessary to ensure the minimum application temperature is maintained.
 - Store rolls in a heated area to maintain the rolls at 70°F (21°C) during cold weather.
- Ensure all substrates are primed using self-adhesive membrane primer. Refer to <u>Section 2.1.2</u>.
- Adhesion/peel tests are encouraged for concrete, masonry and other substrates where surface conditions may vary. Conduct 180 degree peel tests as follows:
 - Choose three (3) or more representative substrate areas to examine.
 - Clean and prepare the substrate as specified, allow to dry.
 - Cut minimum 2 in (5.08 cm) wide by 12 in (30.48 cm) long strips of the specified membrane.
 - Apply the specified primer to the clean, prepared substrate.



- Apply an 8 to 9 in (20.32 to 22.86 cm) long section of the 12 in (30.48 cm) strip, and allow a 3 to 4 in (7.62 to 10.16 cm) long portion to remain un-adhered in order to grip and pull.
- Grip the un-adhered portion of the sample and pull 180 degrees and parallel with the surface.
 Use a small scale to measure results in pounds of resistance where quantitative results are desired.
- Results should demonstrate strong resistance to peel. A strong bond will result in significant residual materials remaining adhered to the substrate, or part of the substrate itself may be removed along with the sample.
- Samples that peel away easily from the substrate may indicate further preparation is needed, or alternate materials and/or application methods may be necessary.
- Where quantitative measurements of peel resistance are desired, the peel resistance should exceed 2 lbf per lieneal inch of sample width (e.g. a 2 in wide sample should exceed 4 lbf and the sample should not peel away "clean" from the substrate.
- Take photos or videos of the samples and the substrate to record conditions.
- Remove all roll packaging tape prior to installation.

Application:

- Unroll self-adhesive membrane ply onto the roof surface and allow time to relax prior to installing the membrane.
- Starting at the low point of the roof, lay out the membrane to ensure the plies are installed perpendicular to the roof slope, shingled to prevent back-water laps.
- Ensure all roofing and flashing substrates are prepared and acceptable to receive the self-adhesive primer and membrane.
- Ensure self-adhesive primer is tacky to-the-touch, but not wet. Primer should not transfer to the fingertips when touched. Do not proceed if primer is wet or becomes fully dry or dirty. If primer becomes fully dry, dirty and loses all tack, re-prime the substrate as necessary to achieve membrane adhesion. Refer to Table 2.1.2a.
- Cut rolls to working lengths and widths to conform to rooftop conditions, and lay sheets onto the roof surface, always working to a selvage edge.
- Ensure membrane side-laps and 6 in end-laps are maintained. Heat weld all end-laps or adhere using COLPLY[™] or COLPLY[™] EF.
- Peel the release film from the underside of the membrane. Press and adhere the leading edge of the membrane to the substrate.
- As the release film is removed, use a weighted roller to firmly set the sheet in place. Ensure full contact is made between the self-adhesive ply and the substrate for full adhesion. Use a hand-roller to roll-in vertical flashings and confined areas.

Inspection:

- Each day, physically inspect all side and end-laps, and ensure the membrane is sealed watertight.
- Where necessary, use a torch or hot-air welder and a clean trowel to ensure all laps are fully sealed.
- Inspect the installation each day to ensure the plies are fully adhered.
- Each day, repair all voids, wrinkles, open laps, blisters and all other deficiencies before proceeding.
- Temporary night seals are required to seal membrane and flashing terminations watertight. Temporary night seals must be removed upon resuming the installation.
- Ensure incompatible bitumen materials are not left exposed on the surface of the base ply before installation of the PVC membrane.

Table 2.4.1a Fully Adhered, Self-Adhesive SBS Base Plies					
Name Reinforcement Top Surfacing					
ELASTOPHENE® STICK	Glass fiber	Sanded			
SOPRALENE [®] STICK	Non-woven polyester	Sanded			

2.5 MECHANICALLY FASTENED SBS BASE PLIES

General:

• <u>SOPREMA®</u> mechanically fastened SOPRAFIX® systems are tough, durable, wind resistant, multi-ply roofing membrane assemblies.

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- The SOPRAFIX[®] BASE ply is mechanically fastened within side-laps and sealed watertight. The top surface is sanded to receive SENTINEL[®] PVC membrane adhered with <u>DUOTACK[®] SPF HFO</u> or ICP Polyset[®] Commercial Roof Adhesive. Refer to <u>Table 2.5a</u>.
- For SOPRAFIX[®] BASE fastening requirements refer to <u>Table 2.5b</u> and <u>Figures 2.5a</u> <u>through 2.5n</u>.
- The contractor and/or applicator is responsible for managing and controlling all exposures related to chemical hazards, toxic substances and odors. This includes personal protective equipment (PPE), administrative and work practice controls, and engineering controls. The contractor is responsible for the elimination or substitution of products as necessary to manage and control exposures related to chemical hazards, toxic substances and odors.
- Refer to product Safety Data Sheets (SDS) for health, safety, and environment related hazards, and take all necessary measures and precautions to comply with exposure requirements.
- Refer to the PDS and SDS for additional product information.

Preparation:

- Ensure all roofing substrates are examined and are acceptable to receive the mechanically fastened membrane.
- For heat-welded side and end-laps, refer to NRCA CERTA, local codes and building owner's requirements for hot work operations. Ensure all roofing substrates are prepared and acceptable to receive the heat-welded membrane.
- Remove all roll packaging tape prior to installation.

Application:

- Unroll the SOPRAFIX[®] BASE ply onto the roof surface and allow time to relax before fastening as necessary to prevent wrinkling once fastened.
- Starting at the low point of the roof, lay out the membrane to ensure the plies are installed perpendicular to the roof slope, shingled to prevent back-water laps.
- Remove all wrinkles from the sheet.
- Ensure the specified side-lap and end-lap widths are maintained. End-laps should be staggered 3 ft. apart.
- Unroll the first roll onto the roof substrate, re-roll the adjacent roll.
- Starting at one end of the sheet, install the mechanical fasteners along the center of the side-lap. Ensure spacing between fasteners in the laps meets specified wind uplift resistance requirements.
- Do not over-drive fasteners. Install fasteners as necessary to firmly set the fastener and seam plate tight against the sheet. Prevent wrinkles from forming in the sheet as the fasteners are installed.
- When the side-lap is fastened, un-roll the adjacent roll over the fasteners. Maintain the required side-lap width. Ensure the full side-lap width, and all 6 in end-laps, are sealed water-tight.
 - Heat-welded side-laps: Use an approved roof torch to apply heat within the side-lap while unrolling the membrane. Apply heat until the bitumen melts to ensure full adhesion. Ensure a

continuous weld is produced across the full side-lap width. Using a weighted steel roller, carefully press in laps to ensure approximately 1/8 to ¼ in bleed-out is achieved at laps.

- Hot-air welded side-laps: Insert the hot-air welder shoe within the lap, and adjust the hot-air welder as required to produce a continuous weld across the full side-lap width. Ensure approximately 1/8 to ¼ in bleed-out is achieved at laps.
- Self-adhesive side-laps: Remove the release film within the side-lap while immediately following with a weighted steel roller to ensure a watertight seal is achieved.
- At 6 in end-laps, cut a 45 degree dog-ear away from the selvage edge. Refer to <u>Table 2.5c</u> for end-lap preparation.
- Contact <u>SOPREMA®</u> for other membrane and flashing options.
- Refer to the following for more information:
 - SOPRAFIX[®] Installation (Video)
 - Link: <u>https://www.youtube.com/watch?v=da4_levAAI0&t=7s</u>

Inspection:

- Each day, physically inspect side-laps and end-laps to ensure the membrane is sealed watertight. Where necessary, use a torch or hot-air welder and a clean trowel to ensure all laps are fully sealed.
- Repair all un-adhered voids, wrinkles, open laps and all other deficiencies before installing the inter-ply and/or cap sheet over completed fastened base ply sheet.
- Temporary night seals are required to seal membrane and flashing terminations watertight. Temporary night seals must be removed upon resuming the installation.
- Ensure incompatible bitumen materials are not left exposed on the surface of the base ply before installation of the PVC membrane.

Table 2.5a Mechanically Fastened Modified Bitumen Base Plies					
SOPRAFIX® BASE Ply Bottom Surfacing Top Surfacing Side Lap Surfacing Side Lap Width* Length					
SOPRAFIX® BASE 622	Sanded	Sanded	Burn off film	4 and 5 in	32.8 ft (10 m)

*For 2in seam plates, a minimum 4in side lap is required. For 2.4in and 3in seam plates, a minimum 5in side lap is required. Also refer to agency approvals for other required minimum side laps.

Table .	Table 2.5b Mechanically Fastened SBS Base Ply Fasteners					
Name	Graphic	SBS Base Ply	Substrate/Deck Type			
SOPRAFIX® #14 MP FASTENER and SOPRAFIX® 2 IN STRESS PLATE, SOPRAFIX® #14 MP FASTENER and SOPRAFIX® 2.4 IN STRESS PLATE		SOPRAFIX® BASE 622	Steel, Wood, Concrete			
SOPRAFIX® #15 HD FASTENER and SOPRAFIX® 2 IN STRESS PLATE, SOPRAFIX® #15 HD FASTENER and SOPRAFIX® 2.4 IN STRESS PLATE		SOPRAFIX® BASE 622	Steel, Wood			
SOPRAFIX® #14 MP FASTENER and SOPRAFIX® MBB, SOPRAFIX® #14 MP FASTENER and SOPRAFIX® MBB-R		SOPRAFIX® BASE 622	Steel, Wood, Concrete			

Name	Graphic	SBS Base Ply	Substrate/Deck Type
SOPRAFIX® #15 HD FASTENER and SOPRAFIX® MBB, SOPRAFIX® #15 HD FASTENER and SOPRAFIX® MBB-R		SOPRAFIX® BASE 622	Steel, Wood
VERSA-FAST® FASTENERS and VERSA-FAST® METAL PLATES		SOPRAFIX® BASE 622	Cellular lightweight insulating concrete, Aggregate lightweight insulating concrete, Poured gypsum, Gypsum plank, Wood
TRI-FIXX™ FASTENING SYSTEM		SOPRAFIX® BASE 622	Cellular lightweight insulating concrete, Poured gypsum

Name	Graphic	SBS Base Ply	Substrate/Deck Type
<u>TWIN LOC-NAIL</u>		SOPRAFIX® BASE 622	Cementitious wood fiber, Cellular lightweight insulating concrete, Aggregate lightweight insulating concrete, Poured gypsum
TWIN LOC-NAIL with SOPRAFIX® MBB-TL		SOPRAFIX® BASE 622	Cementitious wood fiber, Cellular lightweight insulating concrete, Aggregate lightweight insulating concrete, Poured gypsum
CONCRETE SPIKE and SOPRAFIX 2 IN STRESS PLATE or SOPRAFIX 2.4 IN STRESS PLATE		<u>SOPRAFIX® BASE 622</u>	Concrete

*For 2in seam plates, a minimum 4in side lap is required. For 2.4in and 3in seam plates, a minimum 5in side lap is required. Also refer to agency approvals for other required minimum side laps.

Table 2.5c Mechanically Fastened Modified Bitumen Base Plies End-Lap Preparation		
Cap Sheet Name	End Lap Application Method	Preparation
SOPRAFIX [®] BASE 622	Heat welded	None


Roll Width (Y)	Lap Width (Z)	Zone	Pattern	Row Spacing (X)	Fasteners Per Square
		1	24	35in	18
39in (1m)	4in	2	24,24	17.5in	35
		3	24,24,24	11.67in	52
		1	24	34in	18
39in (1m)	5in	2	24,24	17in	36
		3	24,24,24	11.33in	53
		1	24	33in	19
39in (1m)	6in	2	24,24	16.5in	37
		3	24,24,24	11in	55

Figure 2.5a Mechanically Fastened Base Ply, 24in O.C. In Lap Fastening Pattern



Figure 2.5b Mechanically Fastened Base Ply, 18in O.C. In Lap Fastening Pattern



39in (1m)	4in	1	12	35IN	35
		2	12,12	17.5in	69
		3	12,12,12	11.67in	103
39in (1m)	5in	1	12	34in	36
		2	12,12	17in	71
		3	12,12,12	11.33in	106
		1	12	33in	37
39in (1m)	6in	2	12,12	16.5in	73
		3	12,12,12	11in	110

Figure 2.5c Mechanically Fastened Base Ply, 12in O.C. In Lap Fastening Pattern



Figure 2.5d Mechanically Fastened Base Ply, 10in O.C. In Lap Fastening Pattern



		1	9	35in	46
39in (1m)	4in	2	9,9	17.5in	92
		3	9,9,9	11.67in	138
39in (1m)		1	9	34in	48
	5in	2	9,9	17in	95
		3	9,9,9	11.33in	142
		1	9	33in	49
39in (1m)	6in	2	9,9	16.5in	97
		3	9,9,9	11in	146

Figure 2.5e Mechanically Fastened Base Ply, 9in O.C. In Lap Fastening Pattern



Figure 2.5f Mechanically Fastened Base Ply, 8in O.C. In Lap Fastening Pattern



		1	7	35in	59
39in (1m)	4in	2	7,7	17.5in	118
		3	7,7,7	11.67in	177
39in (1m) 5in		1	7	34in	61
	5in	2	7,7	17in	122
		3	7,7,7	11.33in	182
		1	7	33in	63
39in (1m)	6in	2	7,7	16.5in	125
		3	7,7,7	11in	188



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	39in (1m)	6in	2	6,6	16.5in	146
			3	6,6,6	11in	219
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Figure 2.5h Mechanically Fastened Base Ply, 6in O.C. In Lap Fastening Pattern



Figure 2.5i Mechanically Fastened Base Ply, 12in O.C. In Lap and 1 Row In Between Laps at 12in O.C. Fastening Pattern



Figure 2.5j Mechanically Fastened Base Ply, 9in O.C. In Lap and 1 Row In Between Laps at 9in O.C. Fastening Pattern



Figure 2.5k Mechanically Fastened Base Ply, 8in O.C. In Lap and 1 Row In Between Laps at 8in O.C. Fastening Pattern



Figure 2.51 Mechanically Fastened Base Ply, 6in O.C. In Lap and 1 Row In Between Laps at 6in O.C. Fastening Pattern



Figure 2.5m Mechanically Fastened Base Ply, 12in O.C. In Lap and 2 Rows In Between Laps at 12in O.C. Fastening Pattern



Figure 2.5n Mechanically Fastened Base Ply, 6in O.C. In Lap and 2 Rows In Between Laps at 6in O.C. Fastening Pattern

2.6 COLD ADHESIVE-APPLIED SBS BASE PLIES

2.6.1 FULLY ADHERED, COLD ADHESIVE-APPLIED SBS BASE PLIES

General:

- <u>SOPREMA® COLPLY™ EF ADHESIVE</u> is a non-toxic, low-odor, solvent free, polymeric membrane adhesive approved for use in SBS-PVC hybrid membranes. Avoid direct contact between <u>COLPLY™ EF ADHESIVE</u> and PVC membrane surfaces.
- The adhesive-applied SBS modified bitumen base plies may be installed over approved insulation substrates, mechanically fastened base sheets, and installed over other SBS modified bitumen plies with sanded top surfacing that are heat welded, self-adhesive applied, hot asphalt applied or cold adhesive-applied. Cold adhesive-applied SBS modified bitumen base plies may also be installed over hot asphalt-applied built-up membranes.
- The underside of cold adhesive-applied SBS plies have a sanded surface for installation in cold adhesive. The top surface is sanded to receive SENTINEL® PVC membrane adhered with <u>DUOTACK® SPF HFO</u> or ICP Polyset® Commercial Roof Adhesive. Refer to <u>Table 2.6.1a</u>.
- The contractor and/or applicator is responsible for managing and controlling all exposures related to chemical hazards, toxic substances and odors. This includes personal protective equipment (PPE), administrative and work practice controls, and engineering controls. The contractor is responsible for the elimination or substitution of products as necessary to manage and control exposures related to chemical hazards, toxic substances and odors.
- Refer to product Safety Data Sheets (SDS) for health, safety, and environment related hazards, and take all necessary measures and precautions to comply with exposure requirements.
- Refer to the PDS and SDS for additional product information.

Preparation:

- Ensure environmental conditions are acceptable to proceed. Monitor precipitation, temperature, humidity, wind, cloud cover and sun that may have an effect on materials and roofing application.
- Conditions should remain dry, and the ambient temperature should be well above the dew point at all times during roofing application.
- The following are recommended during cold weather:
 - Ensure roofing substrates are dry, and there is no frost or ice on roofing substates.
 - The adhesive and membrane temperature should be 70°F (21°C) or more at the point of membrane application.
 - To ensure the adhesive is applied at 70°F (21°C) during cold weather, drums and 5 gallon pails should be stored in heated areas. Drums and 5 gallon pails exposed to cold temperature on the roof should be provided with heaters when necessary to ensure the minimum application temperature is maintained.
 - Store rolls in a heated area to maintain the rolls at 70°F (21°C) during cold weather.
 - Primer is not recommended for <u>COLPLY™ EF ADHESIVE</u>. Refer to <u>Section 2.1.1</u>.
- Ensure all substrates are clean, dry and prepared to receive the specified adhesive and membrane plies.

- Adhesion/peel tests are encouraged for concrete, masonry and other substrates where surface conditions are inconsistent or otherwise vary. Conduct 180 degree peel tests as follows:
 - Choose three (3) or more representative substrate areas to examine.
 - Clean and prepare the substrate as specified, allow to dry.
 - Cut minimum 2 in (5.08 cm) wide by 12 in (30.48 cm) long strips of the specified membrane.
 - Apply the specified primer, where required, to the clean, prepared substrate.
 - Adhere an 8 to 9 in (20.32 to 22.86 cm) long section of the 12 in (30.48 cm) strip, and allow a 3 to 4 in (7.62 to 10.16 cm) long portion to remain un-adhered in order to grip and pull.
 - Allow sufficient time for the samples to cure.
 - Grip the un-adhered portion of the sample and pull 180 degrees and parallel with the surface.
 Use a small scale to measure results in pounds of resistance where quantitative results are desired.
 - Results should demonstrate strong resistance to peel. A strong bond will result in significant residual materials remaining adhered to the substrate, or part of the substrate itself may be removed along with the sample.
 - Samples that peel away easily from the substrate may indicate further preparation is needed, or alternate materials and/or application methods may be necessary.
 - Where quantitative measurements of peel resistance are desired, the peel resistance should exceed 2 lbf per lieneal inch of sample width (e.g. a 2 in wide sample should exceed 4 lbf and the sample should not peel away "clean" from the substrate.
 - Take photos or videos of the samples and the substrate to record conditions.
- Remove all roll packaging tape prior to installation.

- Before beginning the installation, unroll membrane onto the roof surface and allow the membrane to relax prior to installing the membrane.
- Re-roll the membrane in order for the plies to be unrolled into the adhesive while ensuring the specified side and end-laps are maintained.
- Adhesive application:
 - <u>COLPLY™ EF ADHESIVE</u> may be applied using a 3/16 3/8 in notched squeegee or brush.
 <u>COLPLY™ EF ADHESIVE</u> is not spray-applied.
 - Apply adhesive to clean, dry and prepared compatible substrates as required to ensure full adhesion.
 - Apply adhesive at 1-1/2 to 2-1/2 gallons per square.
 - Apply adhesive at 3 to 4 gallons per square or more over absorptive substrates and granule surfaces. Adjust the application rate based upon conditions to ensure full coverage.
- Starting at the low point of the roof, lay out the membrane to ensure the plies are installed perpendicular to the roof slope, shingled to prevent back-water laps.
- Cut rolls to working lengths and widths to conform to roof conditions, and lay out to always work to a selvage edge.
- Install the specified membrane adhesive ahead of the membrane application. Do not allow the adhesive to skin-over before the membrane is applied into the adhesive. The membrane will not adhere where adhesive has skinned over.
- Use a follow tool, weighted roller or broom the leading edge of the membrane to the substrate, working forward and outward as necessary to remove wrinkles. Avoid walking over the membrane and prevent adhesive displacement or damage during application.
- Where laps are adhered using membrane adhesive, apply sufficient adhesive coverage to ensure 1/8 to 1/4 in of adhesive bleed-out at all laps.
- At 6 in end-laps, cut a 45 degree dog-ear away from the selvage edge for all T-joints. Heat weld all endlaps or adhere using COLPLY™ EF.

• For low-slope areas where the roof slope falls below 1/4 in per foot, and where otherwise specified, leave all membrane side and end-laps "dry" in order to hot-air weld or torch all laps watertight.

- Each day, physically inspect all side and end-laps, and ensure the membrane is sealed watertight.
- Where necessary, use a torch or hot-air welder and a clean trowel to ensure all laps are fully sealed.
- Inspect the installation each day to ensure the plies are fully adhered.
- Each day, repair all voids, wrinkles, open laps, blisters and all other deficiencies before proceeding.
- Temporary night seals are required to seal flashing end terminations watertight. Temporary night seals must be removed upon resuming the installation.
- Ensure incompatible bitumen materials are not left exposed on the surface of the base ply before installation of the PVC membrane.

Table 2.6.1a Fully Adhered, Cold Adhesive-Applied Base Plies			
Name	Reinforcement	Top Surfacing	
ELASTOPHENE® SANDED 2.2,			
ELASTOPHENE [®] SANDED 3.0,	Glass fiber	Sanded	
ELASTOPHENE [®] HR SANDED 2.2,			
ELASTOPHENE [®] HR SANDED 3.0			
SOPRALENE [®] 180 SANDED,	Non-woven nolvester	Sanded	
SOPRALENE [®] 250 SANDED			

Table 2.6.1b Substrate Preparation, Fully Adhered, Cold Adhesive-Applied SBS Base Plies				
SBS Membrane Ply	Adhesive	Substrate	Primer	
	<u>COLPLY™ EF</u> ADHESIVE	Concrete		
		Metal		
		Masonry		
All cold adhesive-		Approved gypsum roof boards	Neza	
applied SBS base plies. Refer to <u>Table 2.6.1a</u> .		Approved cement roof boards	None	
		Wood		
		<u>SOPRABOARD™</u>		
		All SBS base plies with sanded top surfacing.		

Table 3.2.1c Fully Adhered, Cold Adhesive-Applied Field Plies End-Lap Preparation				
Cap Sheet Name	End Lap Application Method	Preparation		
ELASTOPHENE® SANDED 2.2,				
ELASTOPHENE® SANDED 3.0,	Heat welded			
ELASTOPHENE [®] HR SANDED 2.2,		None		
ELASTOPHENE® HR SANDED 3.0,		None		
SOPRALENE [®] 180 SANDED,	Adhered with COLPLY™ EF			
SOPRALENE [®] 250 SANDED,				

2.6.2 PARTIALLY ADHERED/RIBBON-APPLIED, COLD ADHESIVE-APPLIED BASE PLIES

General:

- Partially-adhered base plies may be installed using ribbon-applied <u>SOPREMA[®] COLPLY[™] EF ADHESIVE</u> over approved cellular lightweight insulating concrete, gypsum, concrete and other approved substrates.
- <u>COLPLY™ EF ADHESIVE</u> is ribbon-applied to partially attach SBS modified bitumen base plies. The un-adhered portions between adhesive ribbons allow for vapor pressure to dissipate to the atmosphere where the venting channels are open to flashing terminations.
- The underside of the SBS base ply has a sanded surface for installation in ribbons of COLPLY™ EF ADHESIVE. The top surface is sanded to receive SENTINEL® PVC membrane adhered with <u>DUOTACK® SPF HFO</u> or ICP Polyset® Commercial Roof Adhesive. Refer to <u>Table 2.6.2a</u>.
- The contractor and/or applicator is responsible for managing and controlling all exposures related to chemical hazards, toxic substances and odors. This includes personal protective equipment (PPE), administrative and work practice controls, and engineering controls. The contractor is responsible for the elimination or substitution of products as necessary to manage and control exposures related to chemical hazards, toxic substances and odors.
- Refer to product Safety Data Sheets (SDS) for health, safety, and environment related hazards, and take all necessary measures and precautions to comply with exposure requirements.
- Refer to the PDS and SDS for additional product information.



Preparation:

- Ensure environmental conditions are acceptable to proceed. Monitor precipitation, temperature, humidity, wind, cloud cover and sun that may have an effect on materials and roofing application.
- Conditions should remain dry, and the ambient temperature should be well above the dew point at all times during roofing application.
- The following are recommended during cold weather:
 - The adhesive and membrane temperature should be 70°F (21°C) or more at the point of membrane application.
 - To ensure the adhesive is applied at 70°F (21°C) during cold weather, drums, 5 gallon pails and cartridges should be stored in heated areas. Drums and 5 gallon pails exposed to cold temperature on the roof should be provided with heaters when necessary to ensure the minimum application temperature is maintained.
- Primer is not recommended for <u>COLPLY™ EF ADHESIVE</u>.
- Ensure all substrates are clean and prepared to receive the specified adhesive and membrane ply.
- Surfaces must be dry to the touch and free of water and frost.
- Adhesion/peel tests are encouraged for lightweight concrete, concrete, masonry and other substrates where surface conditions may vary. Conduct 180 degree peel tests as follows:
 - Choose three (3) or more representative substrate areas to examine.
 - Clean and prepare the substrate as specified, allow to dry.
 - Cut minimum 2 in (5.08 cm) wide by 12 in (30.48 cm) long strips of the specified membrane.
 - Adhere an 8 to 9 in (20.32 to 22.86 cm) long section of the 12 in (30.48 cm) strip <u>COLPLY™ EF</u> <u>ADHESIVE</u>, and allow a 3 to 4 in (7.62 to 10.16 cm) long portion to remain un-adhered in order to grip and pull.

- Allow sufficient time for the samples to cure.
- Grip the un-adhered portion of the sample and pull 180 degrees and parallel with the surface.
 Use a small scale to measure results in pounds of resistance where quantitative results are desired.
- Results should demonstrate strong resistance to peel. A strong bond will result in significant residual materials remaining adhered to the substrate, or part of the substrate itself may be removed along with the sample.
- Samples that peel away easily from the substrate may indicate further preparation is needed, or alternate materials and/or application methods may be necessary.
- Where quantitative measurements of peel resistance are desired, the peel resistance should exceed 2 lbf per lieneal inch of sample width (e.g. a 2 in wide sample should exceed 4 lbf and the sample should not peel away "clean" from the substrate.
- Take photos or videos of the samples and the substrate to record conditions.
- Remove all roll packaging tape prior to installation.

- Refer to the following instructional videos for partially adhere, cold adhesive-applied base plies:
 - COLPLY EF Ribbon-Adhered Base Ply Instructional Video
 - Link: <u>https://www.youtube.com/watch?v=Ss4pqVgyyg8</u>
- Before beginning the installation, unroll membrane onto the roof surface and allow the membrane to relax prior to installing the membrane.
- Re-roll the membrane in order for the plies to be unrolled into the adhesive while ensuring the specified side and end-laps are maintained
- Adhesive application:
 - Apply <u>COLPLY™ EF ADHESIVE</u> in ribbons or beads using a spreader cart, or dispense <u>COLPLY™ EF</u> <u>ADHESIVE</u> from cartridges and guns.
 - Ribbons of adhesive should be ½ to ¾ in wide at the point of application and should spread 2-1/2 to 3 in when rolled-in using a weighted roller.
 - Application rate for the minimum ½ in ribbons is approximately 1 gallon per 100 linear feet based on smooth substrate conditions. Adjust the application rate based upon conditions.
 - Side-laps and end-laps are sealed watertight using beads of <u>COLPLY™ EF ADHESIVE</u> dispensed from cartridges and guns, or laps may be heat-welded and sealed watertight.
 - To allow for cross-venting, provide a 6 in "skip" in adhesive to allow for a 2in "break" in the ribbons spaced 33 to 45 ft apart or less as necessary to accommodate rooftop and roof perimeter conditions.
 - For lightweight insulating concrete substrates, and where specified, install one-way spun aluminum roof vents evenly spaced to cover 1,000 sq ft per vent.
- Starting at the low point of the roof, lay out the membrane to ensure the plies are installed perpendicular to the roof slope, shingled to prevent back-water laps.
- Cut rolls to working lengths and widths to conform to roof conditions and lay out to always work to a selvage edge.
- Install the specified membrane adhesive ahead of the membrane application. Do not allow the adhesive to skin-over before the membrane is applied into the adhesive. The membrane will not adhere where adhesive has skinned over.
- Use a weighted roller to ensure the membrane is fully adhered to the ribbons of adhesive. Roll the membrane working forward and outward as necessary to remove wrinkles.
- Where laps are adhered using membrane adhesive, apply sufficient adhesive coverage to ensure 1/8 to 1/4 in of adhesive bleed-out at all laps.
- At 6 in end-laps, cut a 45 degree dog-ear away from the selvage edge for all T-joints. Heat weld all side and end-laps or adhere using COLPLY[™] EF.

- For low-slope areas where the roof slope falls below 1/4 in per foot, and where otherwise specified, leave all membrane side and end-laps "dry" in order to hot-air weld or torch all laps watertight.
- Where specified, the perimeter details should be partially adhered, or otherwise designed to allow for venting vapor pressure.
- Refer to flashing application guidelines indicated herein. Contact <u>SOPREMA®</u> for additional flashing options.

- Each day, physically inspect all side and end-laps, and ensure the membrane is sealed watertight.
- Where necessary, use a torch or hot-air welder and a clean trowel to ensure all laps are fully sealed.
- Inspect the installation each day to ensure the plies are fully adhered.
- Each day, repair all voids, wrinkles, open laps, blisters and all other deficiencies before proceeding
- Temporary night seals are required to seal flashing end terminations watertight. Temporary night seals must be removed upon resuming the installation to ensure venting channels are maintained as specified.
- Each day, ensure all vented flashing details are flashed watertight to prevent moisture infiltration into the venting channels between ribbons of adhesive.
- Ensure incompatible bitumen materials are not left exposed on the surface of the base ply before installation of the PVC membrane.

Table 2.6.2a Partially-Adhered, Cold Adhesive-Applied Field Base Plies				
Name	Reinforcement	Top Surfacing		
SOPRALENE [®] 180 SANDED 2.2,				
SOPRALENE® 180 SANDED,	Non-woven polyester	Sanded		
SOPRALENE® 250 SANDED				

Table 2.6.2b Partially Adhered, Cold Adhesive-Applied Field Base Plies End-Lap Preparation				
Cap Sheet Name	End Lap Application Method	Preparation		
SOPRALENE® 180 SANDED 2.2,	Heat welded	Nana		
SOPRALENE® 250 SANDED	Adhered with COLPLY™ EF	NOTE		



*DOES NOT INCLUDE SIDE LAPS AND END LAPS. LAPS MAY BE SEALED USING COLPLY EF OR HEAT WELDED WATER TIGHT.

Figure 2.6.2a Ribbon Adhered SBS Base Ply, 6in O.C. Fastening Pattern

2.7 HOT ASPHALT-APPLIED SBS MODIFIED BITUMEN BASE PLIES

General:

- <u>SOPREMA®</u> hot asphalt-applied SBS modified bitumen base plies may be installed over <u>SOPRABOARD™</u> or other approved roof cover boards and other approved roofing substrates.
- The underside of hot asphalt-applied SBS plies are sand surfaced. The top surface is sanded to receive SENTINEL® PVC membrane adhered with <u>DUOTACK® SPF HFO</u> or ICP Polyset® Commercial Roof Adhesive. Refer to <u>Table 2.7a</u>.
- Contact <u>SOPREMA®</u> for review of ASTM D312 Type IV mopping asphalt used for <u>SOPREMA®</u> SBS modified bitumen membrane plies.
- The contractor and/or applicator is responsible for managing and controlling all exposures related to chemical hazards, toxic substances and odors. This includes personal protective equipment (PPE), administrative and work practice controls, and engineering controls. The contractor is responsible for the elimination or substitution of products as necessary to manage and control exposures related to chemical hazards, toxic substances and odors.
- Refer to product Safety Data Sheets (SDS) for health, safety, and environment related hazards, and take all necessary measures and precautions to comply with exposure requirements.
- Refer to the PDS and SDS for additional product information.

Preparation:

- Ensure environmental conditions are acceptable to proceed. Monitor precipitation, temperature, humidity, wind, cloud cover and sun that may have an effect on materials and roofing application.
- Conditions should remain dry, and the ambient temperature should be well above the dew point at all times during roofing application.
- The following are recommended during cold weather:
 - The ambient temperature should be at least 40°F (4.4°C), and rising to ensure conditions remain acceptable to apply hot asphalt and membrane plies.
 - Take all necessary measures, and monitor all conditions, to ensure the specified asphalt temperature is no less than the equiviscous temperature (EVT) at the point of contact with the membrane ply as it is unrolled into the hot asphalt.
 - Store rolls in a heated area to maintain the rolls at 70°F (21°C) during cold weather.
- Ensure all substrates are smooth, free of dust and debris, dry and acceptable for installation of asphaltapplied sheets. Ensure substrates are even at all substrate transitions to prevent membrane voids. Ensure substrates are primed where required using <u>ELASTOCOL™ 350</u> or <u>ELASTOCOL™ 500</u> primer. Refer to <u>Section 2.1.1</u>.
- Ensure environmental conditions are satisfactory, and will remain satisfactory, during the application.
- Refer to mopping asphalt supplier's published values for softening point, flash point (FP), finished blowing temperature (FBT) and equiviscous temperature (EVT).
- Refer to the softening point for maximum roof slope applications. The maximum recommended roof slope for asphalt-applied built-up roofing is 3/4:12.
- Remove all roll packaging tape prior to installation.





- Before beginning the installation, unroll membrane onto the roof surface and allow the membrane to relax prior to installing the membrane.
- Re-roll the membrane in order for the plies to be unrolled into the adhesive while ensuring the specified side and end-laps are maintained.
- Starting at the low point of the roof, lay out the membrane to ensure the plies are installed perpendicular to the roof slope, shingled to prevent back-water laps.
- Cut rolls to working lengths and widths as required to conform to rooftop conditions. Cut membrane plies as necessary to always work to a selvage edge.
- Ensure all roofing and flashing substrates are prepared and primed as necessary, and all substrates are acceptable to receive the specified asphalt and membrane.
- Re-roll the membrane in order for the plies to be unrolled into the hot asphalt while ensuring the specified side and end-laps are maintained.
- Apply Type IV asphalt within 400 to 475°F (204 to 246°C) at the point of contact with the ply as the ply is unrolled into the hot asphalt. The mopping asphalt should be within +/- 25°F (14°C) of the published EVT and as required to obtain a nominal 23 to 25 pounds per square interply coverage rate. Refer to the EVT provided by the asphalt supplier.
- The asphalt application temperature should be monitored and recorded during application to ensure application temperature remains as published herein.
- Apply sufficient asphalt coverage to ensure 1/8 to 1/4 inch bleed-out is present beyond all laps. Prevent excessive asphalt bleed-out on the SBS ply surface.
- At 6 in end-laps, cut a 45 degree dog-ear away from the 3 in selvage edge at all T-joints. Refer to <u>Table</u> 2.7b for end-lap preparation.
- Broom the membrane to the substrate, working forward to the end of the roll as necessary to remove wrinkles and voids to ensure full adhesion. Avoid walking over the membrane during application.
- Offset cap sheet side and end-laps away from the base ply laps so that cap sheet laps are not located within 12 inches of base ply laps.

- Each day, physically inspect all side and end-laps, and ensure the membrane is sealed watertight.
- Where necessary, use a torch, hot-air welder or SBS mastic to ensure all laps are fully sealed.
- Inspect the installation each day to ensure the plies are fully adhered.
- Each day, repair all voids, wrinkles, open laps, blisters and all other deficiencies before proceeding.
- Temporary night seals are required to seal flashing end terminations watertight. Temporary night seals must be removed upon resuming the installation.
- Ensure incompatible bitumen materials are not left exposed on the surface of the base ply before installation of the PVC membrane.

Table 2.7a Hot Asphalt Applied Base Plies			
Name	Reinforcement	Top Surfacing	
ELASTOPHENE® SANDED 2.2,			
	Glass fiber	Sanded	
ELASTOPHENE® SANDED 3.0			
ELASTOPHENE [®] HR SANDED 2.2,			
	Glass grid	Sanded	
ELASTOPHENE" HR SANDED 3.0			
SOPRALENE [®] 180 SANDED,			
	Non-woven polyester	Sanded	
SUPRALENE [®] 250 SANDED			

Table 2.7b Hot Asphalt Applied Base Ply End-Lap Preparation				
Base Ply Name	End Lap Application Method	Preparation		
ELASTOPHENE [®] SANDED 2.2,				
ELASTOPHENE® SANDED 3.0,	Heat welded	None		
ELASTOPHENE® HR SANDED 2.2,				
ELASTOPHENE® HR SANDED 3.0,				
SOPRALENE® 180 SANDED,	Adhered with hot asphalt or COLPLY™ EF	None		
SOPRALENE [®] 250 SANDED				

3 SENTINEL[®] PVC MEMBRANE

3.1 GENERAL

3.1.1 PVC CHEMICAL RESISTANCE

- SENTINEL® PVC membranes have been evaluated for exposure and compatibility to the following materials:
 - Acrylic paint
 - o Bleach
 - Copper sulfate
 - Detergent solutions
 - o Ferric chloride
 - Fertilizer solutions
 - Fiberglass matting
 - Fruit juices
 - Furnace residues
 - $\circ \quad \text{Hydrogen peroxide} \\$
 - Latex paint
 - o Linseed oil
 - Lard (animal fats)
 - Masonry cleaner
 - o Muriatic acid
 - Oleic acid
 - Phosphoric acid
 - o Polypropylene
 - Sodium hydroxide
 - Zinc chloride
- The following roofing materials are incompatible with SENTINEL® PVC:
 - Asphalt-based roofing and flashing products.
 - Coal tar pitch.
 - Un-faced extruded and expanded polystyrene.
- Eliminate or separate incompatible materials from direct contact with bare PVC membranes and flashings.
- The SENTINEL[®] fleece-backed underside is compatible with SOPREMA[®] SBS modified bitumen sanded and granule-surfaced membranes and application methods when separated as indicated herein. The PVC materials must be applied to ensure the fleece separates and prevents direct contact between the PVC membrane and all bitumen products.
- Maintain the polyester fleece separation layer between SENTINEL® PVC and the SOPREMA® SBS modified bitumen roofing products.
- Prevent direct contact between SENTINEL[®] PVC and bitumen-based adhesives, cements, mastics, primers and all other asphalt products.
- SOPREMA[®] SBS roofing materials should not be overlapped onto SENTINEL[®] PVC. Self-adhesive SBS will become soft and liquify if overlapped onto SENTINEL[®] membrane and flashing products.
- Inadvertent exposure to foreign materials, debris and other contaminants should be addressed by proper removal and cleaning. Refer to <u>Section 3.1.2</u>.
- Contact <u>SOPREMA®</u> for additional information.

3.1.2 PVC CLEANING PROCEDURES

Household Cleaner:

- Follow all safety and environmental regulations and requirements regarding the use of household cleaners.
- SENTINEL® PVC roofing may be cleaned using common household cleaners such as Simple Green®, Formula 409[®], Spic and Span[®] or other mild household cleaners.
- Pre-rinse the area using low-pressure water, less than 1,200 psi, with wide-angle fan spray nozzle.
- Follow the household cleaner instructions; dilute the cleaner using clean water as required. Do not pour undiluted cleaner directly onto roof surface.
- Clean the area using a cloth, sponge, soft bristle brushes or push brooms.
- Where necessary, use a general purpose scrubbing pad and cleaner to remove stubborn contaminants. Do not use sharp metal tools or wire brushes.
- Rinse the area using low-pressure water directed downward to prevent water from entering equipment, walls, windows or roof flashings.
- Repeat cleaning as necessary.
- The contractor and/or applicator is responsible for managing and controlling all exposures related to chemical hazards, toxic substances and odors. This includes personal protective equipment (PPE), administrative and work practice controls, and engineering controls. The contractor is responsible for the elimination or substitution of products as necessary to manage and control exposures related to chemical hazards, toxic substances and odors.
- Refer to product Safety Data Sheets (SDS) for health, safety, and environment related hazards, and take all necessary measures and precautions to comply with exposure requirements.
- Contact <u>SOPREMA®</u> for additional information.

Solvent Cleaner:

- Follow all safety and environmental regulations and requirements regarding the use of cleaners.
- PVC membranes may be cleaned using solvents such as methyl ethyl ketone (MEK).
- Do not pour solvent directly onto roof surface.
- Clean the area using and damp cloth soaked in solvent.
- Where necessary, use a general purpose scrubbing pad and solvent to remove contaminants. Do not use sharp tools or wire brushes.
- Allow the solvent to evaporate, or wipe the surface using a dry cloth where necessary.
- Repeat cleaning as necessary.
- Contact <u>SOPREMA®</u> for additional information.

3.1.3 PVC HOT-AIR AUTOMATIC WELDING PROCEDURES

General:

- Automatic hot air welding equipment is required to achieve consistent watertight membrane seam welds.
- Refer to hot air welding equipment manufacturer's published operating instructions and follow all applicable requirements and recommendations.

Preparation:

- Ensure a safe and consistent power supply is available and maintained for the welding equipment throughout the installation.
- Conduct test welds before the roofing installation to ensure equipment settings consistently achieve satisfactory welded seams. Repeat test welds when the welder has been turned off and restarted, and as environmental conditions change significantly. Changes in environmental conditions such as temperature and humidity can have an effect on the quality of welds.
 - Use clean, dry PVC cut into strips as necessary to create sample side-laps to weld and test.
- Set the welding equipment temperature and speed settings, adjust as necessary, to achieve satisfactory welded seams.
- Weld a 1-1/2 in continuous weld and allow the sample to cool.
- Cut the welded sample in 1 to 2 in wide test strips.
- Peel the test strips apart at the weld.
- A satisfactory weld is achieved when the PVC breaks, or consistently and uniformly delaminates from the reinforcing fabric.
- Before welding roofing seams, ensure the area within the seams is dry, clean and free of debris.
- Clean the PVC surfaces as necessary. Refer to <u>Section 3.1.2</u>.
- The contractor and/or applicator is responsible for managing and controlling all exposures related to chemical hazards, toxic substances and odors. This includes personal protective equipment (PPE), administrative and work practice controls, and engineering controls. The contractor is responsible for the elimination or substitution of products as necessary to manage and control exposures related to chemical hazards, toxic substances and odors.
- Refer to product Safety Data Sheets (SDS) for health, safety, and environment related hazards, and take all necessary measures and precautions to comply with exposure requirements.

Application:

- Position and align the automatic welder at the lap. Ensure the press wheel is positioned over the edge of the lap being welded.
- Set the temperature and speed settings as determined from sample test welds.
- Insert the welding shoe 2 in within the lap to ensure a minimum 1-1/2 in continuous weld is always produced.

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- When the weld is complete and the welding shoe is disengaged, examine the welding shoe for residue.
- Ensure the welding nozzle remains clean. Remove residue accumulations from the nozzle using a wire brush.

- Carefully probe all seams and t-joints using a rounded-tip probe such as a cotter pin puller. Prevent damage to the membrane during inspection.
- Repair all open seams and damage found during inspection.
- When seam weld quality is suspect, inspect laps using destructive examination methods.
 - Cut 2 in wide weld samples across the seam 6 in on either side of the weld (2 in x 12 in wide strip).
 - Cut a minimum of three (3) sample welds in each suspect area.
 - Peel the test strips apart at the welds.
 - A satisfactory weld is achieved when the PVC breaks, or consistently and uniformly delaminates from the reinforcing fabric.
- Ensure the membrane is repaired and sealed watertight each day.

3.1.4 PVC HOT-AIR HAND WELDING PROCEDURES

General:

- Hand-held hot-air welding equipment should be used where automatic welding equipment is not possible.
- Hand held welding equipment should be used to weld PVC to vinyl coated metal, small detail work, repairs and other work not accessible to automatic welding equipment.
- Refer to hot-air welding equipment manufacturer's published operating instructions and follow all applicable requirements and recommendations.
- The contractor and/or applicator is responsible for managing and controlling all exposures related to chemical hazards, toxic substances and odors. This includes personal protective equipment (PPE), administrative and work practice controls, and engineering controls. The contractor is responsible for the elimination or substitution of products as necessary to manage and control exposures related to chemical hazards, toxic substances and odors.
- Refer to product Safety Data Sheets (SDS) for health, safety, and environment related hazards, and take all necessary measures and precautions to comply with exposure requirements.

Preparation:

- Ensure an adequate and consistent power supply for welding equipment is provided and maintained at all times.
- Conduct test welds during the roofing installation to ensure equipment settings consistently achieve satisfactory welded seams.
 - \circ ~ Use clean, dry PVC cut into strips as necessary to create sample side-laps to weld and test.
 - \circ ~ Set the welder temperature, adjust as necessary, to achieve satisfactory welded seams.
 - Weld a 1-1/2 in continuous weld and allow the sample to cool.
 - Cut the welded sample in 1 to 2 in wide test strips.
 - Peel the test strips apart at the welds.
 - A satisfactory weld is achieved when the PVC breaks, or consistently and uniformly delaminates from the reinforcing fabric.
- Before welding roofing seams, ensure the area within the seams is dry, clean and free of debris.
- Clean the PVC surfaces as necessary. Refer to <u>Section 3.1.2</u>.

Application:

- Insert the welding nozzle 2 in or more within the membrane lap and heat both surfaces sufficiently to fuse the lap.
- While still hot, use a silicone roller and apply sufficient pressure to ensure the two membranes are pressed and fused together.
- Consistently weld along the lap to ensure a minimum 1-1/2 in continuous weld is produced.
- Ensure the welding nozzle remains clean. Remove residue accumulations from the nozzle using a wire brush.

- Carefully probe all seams and t-joints using a rounded-tip probe such as a cotter pin puller. Prevent damage to the membrane during inspection.
- Repair all open seams and damage found during inspection.
- When seam weld quality is suspect, inspect laps using destructive examination methods.
 - Cut 2 in wide weld samples across the seam 6 in on either side of the weld (2 in x 12 in wide strip).

- Cut a minimum of three (3) sample welds in each suspect area.
- Peel the test strips apart at the welds.
- A satisfactory weld is achieved when the PVC breaks, or consistently and uniformly delaminates from the reinforcing fabric.
- Ensure the membrane is repaired and sealed watertight each day.

3.2 ADHERED SENTINEL® PVC MEMBRANES

3.2.1 ADHERED SENTINEL® PVC FIELD MEMBRANES

General:

- SENTINEL[®] PVC field membranes may be adhered for new and roof recover applications.
- Adhered SENTINEL[®] PVC field membranes are polyester reinforced, 60 or 80 mils thick, and are fleecebacked. Refer to <u>Table 3.2.1a</u>.
- PVC field membranes may be adhered to SBS modified bitumen with a sanded surface using <u>DUOTACK® SPF HFO</u> or ICP Polyset® Commercial Roof Adhesive.
- The contractor and/or applicator is responsible for managing and controlling all exposures related to chemical hazards, toxic substances and odors. This includes personal protective equipment (PPE), administrative and work practice controls, and engineering controls. The contractor is responsible for the elimination or substitution of products as necessary to manage and control exposures related to chemical hazards, toxic substances and odors.
- Refer to product Safety Data Sheets (SDS) for health, safety, and environment related hazards, and take all necessary measures and precautions to comply with exposure requirements.
- Refer to safety data sheets and product data sheets for additional information.

Preparation:

- Ensure environmental conditions are acceptable to proceed. Monitor precipitation, temperature, humidity, dew point temperature, wind, cloud cover and sun that may have an effect on materials and application.
- The ambient temperature should be above 40°F (4°C) and rising during application. During extended periods of cold weather, PVC materials should be stored in a warm, heated storage area for optimum performance.
- Conditions should remain dry, and the ambient temperature should be well above the dew point at all times during roofing application.
- Before beginning application, unroll the PVC membrane and allow it to relax.
- Adhesion/peel tests are encouraged where SBS base ply surface conditions may vary. Conduct 180 degree peel tests as follows:
 - Choose three (3) or more representative substrate areas to examine.
 - Clean and prepare the substrate as specified, allow to dry.
 - Cut 2 in (5.08 cm) wide or more by 12 in (30.48 cm) long strips of the specified membrane.
 - Adhere an 8 to 9 in (20.32 to 22.86 cm) long section of the 12 in (30.48 cm) strip and allow a 3 to 4 in (7.62 to 10.16 cm) long portion to remain unadhered in order to grip and pull.
 - \circ $\;$ Allow sufficient time for the samples to cure.
 - Grip the un-adhered portion of the sample and pull 180 degrees and parallel with the surface.
 Use a small scale to measure results in pounds of resistance where quantitative results are desired.



- Results should demonstrate strong resistance to peel. A strong bond will result in significant <u>DUOTACK® SPF HFO</u> or ICP Polyset[®] Commercial Roof Adhesive remaining adhered to the SBS base ply.
- Samples that peel away easily from the substrate may indicate further preparation is needed, or alternate materials and/or application methods may be necessary.
- Where quantitative measurements of peel resistance are desired, the peel resistance should exceed 2 lbf per lieneal inch of sample width (e.g. a 2 in wide sample should exceed 4 lbf and the sample should not peel away "clean" from the substrate.
- Take photos or videos of the samples and the substrate to record conditions.
- SBS base ply exposure and phased applications:
 - Ensure conditions are satisfactory to install subsequent SENTINEL[®] PVC membrane when the base ply is installed and left exposed to UV, dust, debris, traffic and other extreme conditions for an extended period of time. Due to the wide range of environmental conditions and project related exposures the effects from these exposures will vary.
 - Adhesion/peel tests are encouraged to examine adhesion when conditions vary.
 - Refer to product data sheets and contact <u>SOPREMA®</u> technical services for review of project conditions.

Application:

- DUOTACK[®] SPF HFO:
 - For use with fleece-backed PVC only.
 - Refer to published instructions.
 - Spray-apply the foam adhesive to clean, dry and prepared compatible substrates.
 - Ensure the adhesive spray pattern provides for complete membrane adhesion.
 - Prevent adhesive over-spray from contaminating the PVC lap seams to be welded.
 - Ensure the adhesive is tacky to the touch but does not dry or skin over.
 - Mate the membrane to the substrate while applying pressure using a push broom to ensure complete adhesion and prevent wrinkles and air bubbles.
- ICP Polyset[®] Commercial Roof Adhesive:
 - For use with fleece-backed PVC only.
 - Refer to the adhesive manufacturer's published instructions.
 - Spray-apply the foam adhesive to clean, dry and prepared compatible substrates.
 - Ensure the adhesive spray pattern provides for complete membrane adhesion in accordance with adhesive manufacturer's requirements.
 - Prevent adhesive over-spray from contaminating the PVC lap seams to be welded.
 - Examine the adhesive in accordance with adhesive manufacturer's requirements, ensure the adhesive is tacky to the touch but does not dry or skin over.
 - Mate the membrane to the substrate while applying pressure using a push broom to ensure complete adhesion and prevent wrinkles and air bubbles.
- At the end of the field sheet where it terminates at roof edges, walls and penetrations, fasten the membrane with appropriate fasteners and seam plates.
- Secure the membrane to the deck or vertical surface at the base of the upstand. Refer to Figures 3.2.2a through 3.2.2b.
- Clean all laps as necessary before welding. Refer to <u>Section 3.1.2</u>.



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• Hot-air weld all laps watertight. Refer to <u>Section 3.1.4</u>.

- Carefully probe all seams and t-joints using a rounded-tip probe such as a cotter pin puller. Prevent damage to the membrane during inspection.
- Repair all open seams and damage found during inspection.
- When seam weld quality is suspect, inspect laps using destructive examination methods.
 - Cut 2 in wide weld samples across the seam 6 in on either side of the weld (2 in x 12 in wide strip).
 - Cut a minimum of three (3) sample welds in each suspect area.
 - Peel the test strips apart at the welds.
 - A satisfactory weld is achieved when the PVC breaks, or consistently and uniformly delaminates from the reinforcing fabric.
- Inspect the membrane each day to ensure the membrane is adhered to the substrate.
- Each day, repair all un-adhered voids, wrinkles, open and damaged laps, and all other deficiencies before proceeding.
- Temporary night seals are required to seal membrane terminations watertight. Remove all temporary night seals before resuming the installation.
- Ensure the membrane is sealed watertight each day.

Table 3.2.1a Adhered PVC Field Membranes								
Membrane	Thickness	Reinforcement	Backing	Widths	Length			
SENTINEL [®] P150 HFB	60 mils	Polyester	Fleece	120 in	80 ft			
SENTINEL [®] P200 HFB	80 mils	Polyester	Fleece	120 in	65 ft			
SENTINEL® COPPERART P150 HFB	60 mils	Polyester	Fleece	63 in	65.5 ft			
SENTINEL [®] SILVERART P150 HFB	60 mils	Polyester	Fleece	63 in	65.5 ft			

3.2.2 ADHERED SENTINEL® PVC FLASHINGS

General:

- SENTINEL® PVC flashing membranes may be adhered for new and roof recover applications.
- Adhered SENTINEL[®] PVC flashing membranes are glass or polyester reinforced, 60 or 80 mils thick, and are bare on the underside. Refer to Table 3.2.2a.
- PVC flashing membranes are adhered to approved substrates using <u>SENTINEL® S BONDING ADHESIVE</u>. Refer to <u>Table 3.2.2b</u>.
- The contractor and/or applicator is responsible for managing and controlling all exposures related to chemical hazards, toxic substances and odors. This includes personal protective equipment (PPE), administrative and work practice controls, and engineering controls. The contractor is responsible for the elimination or substitution of products as necessary to manage and control exposures related to chemical hazards, toxic substances and odors.
- Refer to product Safety Data Sheets (SDS) for health, safety, and environment related hazards, and take all necessary measures and precautions to comply with exposure requirements.
- Refer to safety data sheets and product data sheets for additional information.

Preparation:

- Ensure flashing substrates are clean, dry, smooth and free of asphalt, coatings and other incompatible materials and debris.
- Ensure environmental conditions are acceptable to proceed. Monitor precipitation, temperature, humidity, dew point temperature, wind, cloud cover and sun that may have an effect on materials and application.
- The ambient temperature should be above 40°F (4°C) and rising during application. During extended periods of cold weather, PVC materials should be stored in a warm, heated storage area for optimum performance.
- Conditions should remain dry, and the ambient temperature should be well above the dew point at all times during roofing application.
- Before beginning application, unroll the PVC flashing membrane and allow it to relax.
- Roof recover flashing:
 - Ensure existing flashing substrates have been thoroughly evaluated and are determined to be structurally sound, dry and meet all applicable requirements for roof recover.
 - Remove or otherwise prepare existing flashings or coatings to ensure the surface is smooth and will provide a satisfactory substrate for new SENTINEL® PVC flashing.
 - Remove all existing incompatible materials or separate incompatible materials from direct contact with bare PVC. Refer to <u>Section 3.1.1</u> or contact <u>SOPREMA®</u> for additional information.
 - Where existing bitumen products and coating cannot be completely removed, install new gypsum or cement roof boards, or other acceptable wall sheathing, to provide a new substrate for PVC flashing.

- Flashing application using SENTINEL® S BONDING ADHESIVE:
 - For use with bare PVC only.
 - Use a minimum 3/8 in nap, solvent resistant roller or brush to apply adhesive. Dip the roller into the adhesive to fully coat the roller.
 - Evenly apply adhesive to clean, dry and prepared substrate while applying adhesive to the back of the bare PVC membrane.
 - Prevent adhesive from contaminating the PVC lap seams to be welded.

- Apply uniform adhesive coverage as indicated on product data sheet. Adjust the application rate based on environmental conditions, substrate roughness and porosity.
- Allow the adhesive on both surfaces to become tacky but not wet. The adhesive should not transfer to the finger or string when touched.
- Prevent dust and debris from contaminating adhesive.
- During humid weather, and during periods when the temperature is near the dew point temperature, examine surfaces closely for condensation.
- Do not install if condensation forms on the adhesive surface. During humid conditions condensation may form on the adhesive surface due to evaporative cooling that occurs when the solvent evaporates.
- Mate the membrane to the substrate for adhesive-to-adhesive contact.
- Apply pressure using a hand-held roller to ensure complete adhesion and prevent wrinkles and air bubbles.
- Install butyl water cutoff, fasten and seal the top leading edge to vertical surfaces. Refer to Figures 3.2.2a through 3.2.2b.
- Clean laps as necessary before welding. Refer to <u>Section 3.1.2</u>.
- Hot-air weld all flashing laps. Refer to <u>Section 3.1.4</u>.

- Carefully probe all seams and t-joints using a rounded-tip probe such as a cotter pin puller. Prevent damage to the membrane during inspection.
- Repair all open seams and damage found during inspection.
- When seam weld quality is suspect, inspect laps using destructive examination methods.
 - Cut 2 in wide weld samples across the seam 6 in on either side of the weld (2 in x 12 in wide strip).
 - Cut a minimum of three (3) sample welds in each suspect area.
 - Peel the test strips apart at the welds.
 - A satisfactory weld is achieved when the PVC breaks, or consistently and uniformly delaminates from the reinforcing fabric.
- Inspect the flashings each day to ensure the flashings are adhered to the substrate.
- Each day, repair all un-adhered voids, wrinkles, open and damaged laps, and all other deficiencies before proceeding.
- Temporary night seals are required to seal terminations watertight. Remove all temporary night seals before resuming the installation.
- Ensure the flashings are sealed watertight each day.

Table 3.2.2a Adhered PVC Flashing Membranes								
Membrane	Thickness	Reinforcement	Backing	Widths	Length			
SENTINEL® P150	60 mils	Polyester	Bare	120 in, 60 in	100 ft			
SENTINEL [®] P200	80 mils	Polyester	Bare	120 in, 60 in	65 ft			
SENTINEL® G150	60 mils	Fiberglass	Bare	120 in, 30 in	100 ft			
SENTINEL [®] G200	80 mils	Fiberglass	Bare	120 in, 30 in	65 ft			
SENTINEL [®] COPPERART P150	60 mils	Polyester	Bare	63 in, 21 in	65.5 ft			
SENTINEL [®] SILVERART P150	60 mils	Polyester	Bare	63 in, 21 in	65.5 ft			
Table 3.2.2b Substrates for Adhered PVC Flashing Membranes								
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Substrate	Adhesive	PVC Flashing Membrane						
Concrete								
Approved gypsum roof boards	SENTINEL [®] S BONDING ADHESIVE	All PVC flashing membranes. Refer to <u>Table 3.2.2a</u> .						
Approved cement roof boards								
Wood								
Masonry								
Metal								



Figure 3.2.2a PVC/SBS Hybrid Membrane, Adhered Flashing, Wall/Curb With Horizontal Perimeter Fastening



Figure 3.2.2b PVC/SBS Hybrid Membrane, Adhered Flashing, Wall/Curb With Vertical Perimeter Fastening



Figure 3.2.2c PVC/SBS Hybrid Membrane, Gravel Stop Edge With Vinyl Coated Fascia



Figure 3.2.2d PVC/SBS Hybrid Membrane, Gravel Stop Edge With Sheet Metal Fascia



Figure 3.2.2e PVC/SBS Hybrid Membrane, Drip Edge



Figure 3.2.2f PVC/SBS Hybrid Membrane, Roof Drain



Figure 3.2.2g PVC/SBS Hybrid Membrane, Pipe Penetration With Prefabricated Pipe Boot



Figure 3.2.2h PVC/SBS Hybrid Membrane, Pipe Penetration With Field Fabricated Pipe Boot



Figure 3.2.2i PVC/SBS Hybrid Membrane, Low Profile Expansion Joint



Figure 3.2.2 PVC/SBS Hybrid Membrane, Adhered Flashing, Through Wall Scupper



Figure 3.2.2k Adhered PVC Flashing Membrane at Field Fabricated Inside Corner



Figure 3.2.21 Adhered PVC Flashing at Membrane Prefabricated Inside Corner



Figure 3.2.2m Adhered PVC Flashing Membrane at Molded Outside Corner



Figure 3.2.2n Adhered PVC Flashing Membrane at Prefabricated Outside Corner

3.3 INDUCTION WELDED SENTINEL® PVC FLASHING MEMBRANES

General:

- SENTINEL[®] PVC flashing membranes may be induction welded to fastener stress plates for new roof and recover applications.
- Induction welded SENTINEL[®] PVC flashing membranes are polyester reinforced, 60 or 80 mils thick, and are bare on the underside. Refer to <u>Table 3.3a</u>.
- The induction welding tool, fasteners and 3 in induction welding stress plates must be approved together for use with the specified SENTINEL[®] PVC membrane. Refer to Table 3.3b.
- The fasteners and stress plates are secured to the flashing substrate, then the SENTINEL® PVC flashing membrane is applied over the 3 in stress plates and induction welded to the plates.
- Refer to the fastener manufacturer's installation instructions and induction welding tool operating instructions.
- The contractor and/or applicator is responsible for managing and controlling all exposures related to chemical hazards, toxic substances and odors. This includes personal protective equipment (PPE), administrative and work practice controls, and engineering controls. The contractor is responsible for the elimination or substitution of products as necessary to manage and control exposures related to chemical hazards, toxic substances and odors.
- Refer to product Safety Data Sheets (SDS) for health, safety, and environment related hazards, and take all necessary measures and precautions to comply with exposure requirements.
- Refer to safety data sheets and product data sheets for additional information.

Preparation:

- Ensure the PVC flashing substrate surface has been properly prepared and is clean, dry and free of incompatible materials and debris. Separate PVC flashing from residual asphalt, coal tar pitch, coatings and other existing flashing materials.
- Examine curbs, wall substrates, nailers and all other flashing substrate conditions.
- Ensure the flashing substrate conditions are acceptable to install the appropriate fasteners.
- Unroll the PVC membrane flashing and allow it to relax.
- Roof recover flashings:
 - Ensure existing flashing substrates have been thoroughly evaluated and are determined to be structurally sound, dry and meet all applicable requirements for induction welded flashings.
 - Remove or otherwise prepare existing flashings or coatings to ensure the surface is smooth and will provide a satisfactory substrate for new induction welded SENTINEL® PVC flashing.
 - Remove all existing incompatible materials or separate incompatible materials from direct contact with bare PVC. Refer to <u>Section 3.1.1</u> or contact <u>SOPREMA®</u> for additional information.
 - Where existing bitumen products and coating cannot be completely removed, install new gypsum or cement roof boards, or other acceptable wall sheathing, to provide a new substrate for induction welded PVC flashing.
- Test induction welding equipment by welding a sample of PVC to stress plates to ensure settings are satisfactory. Allow the plate to cool, then attempt to pull the PVC from the plate. A satisfactory weld is achieved when the PVC consistently and uniformly delaminates from the reinforcing fabric, leaving residual PVC bonded to the plate.

Application:

- Install fasteners and induction welding plates to the vertical substrate a maximum of 12 in on-centers in both directions. Refer to <u>Table 3.3b</u> and <u>Figures 3.3a through 3.3c</u>.
- During the same day, induction weld the PVC to all plates that have been installed to prevent condensation from forming on plates overnight.

- Cut the PVC membrane to the desired length to conform to flashing conditions.
- Loose lay the PVC membrane over the flashing substrate and fasten at the leading top edge, or as required to secure the flashing in place.
- Ensure the side laps are a minimum of 3 in to accommodate minimum 1-1/2 in welded lap seams.
- Avoid locating membrane side and end laps over the stress plates. Where multiple layers of membrane occur, refer to the induction welding tool operating instructions to adjust settings.
- Clean side and end laps as necessary before welding seams. Refer to Section 3.1.2.
- Remove all membrane wrinkles.
- Hot-air weld all side laps. Refer to <u>Section 3.1.4</u>.
- Ensure the induction welding plates and bottom surface of the PVC membrane are dry and free of condensation before beginning induction welding.
- Locate each stress plate beneath the PVC membrane. Center the induction welder over each plate and activate the induction welding tool. Do not move the induction welder during the induction welding cycle.
- Once the weld is complete, immediately place a specialized magnet directly over each plate. Allow the magnets to remain in place until the plates have cooled.
- Where induction welds are suspect, examine the membrane attachment using a suction plate or plunger.
- Install butyl water cutoff, fasten and seal the top leading edge to vertical surfaces. Refer to Figures 3.3a through 3.3b.

Inspection:

- Carefully probe all seams and t-joints using a rounded-tip probe such as a cotter pin puller. Prevent damage to the membrane during inspection.
- Repair all open seams and damage found during inspection.
- When seam weld quality is suspect, inspect laps using destructive examination methods.
 - Cut 2 in wide weld samples across the seam 6 in on either side of the weld (2 in x 12 in wide strip).
 - Cut a minimum of three (3) sample welds in each suspect area.
 - Peel the test strips apart at the welds.
 - A satisfactory weld is achieved when the PVC consistently and uniformly delaminates from the reinforcing fabric.
- Inspect the membrane each day to ensure the membrane is properly fastened to the substrate.
- Each day, repair all voids, wrinkles, open and damaged laps, and all other deficiencies before proceeding.
- Temporary night seals are required to seal membrane terminations watertight. Remove all temporary night seals before resuming the installation.
- Ensure the membrane is sealed watertight each day.

Table 3.3a Induction Welded PVC Flashing Membranes					
Membrane	Thickness	Reinforcement	Backing	Widths	Length
SENTINEL® P150	60 mils	Polyester	Bare	120 in, 60 in	100 ft
SENTINEL® P200	80 mils	Polyester	Bare	120 in, 60 in	65 ft

Table 3.3b Induction Welded PVC Flashing Membrane Fasteners			
Name	Graphic	PVC Membrane	Substrate/Deck Type
SOPRAFIX [®] #12 DP FASTENER with SFS [®] isoweld Plate		<u>SENTINEL® P150</u> ,	Steel,
SOPRAFIX® #12 DP FASTENER with SENTINEL® Induction Weld Plate or Trufast PVC IW Plate		<u>SENTINEL® P200</u>	Wood
SOPRAFIX [®] #14 MP FASTENER with SFS [®] isoweld Plate		SENTINEL® P150,	Steel,
SOPRAFIX [®] #14 MP FASTENER with SENTINEL [®] Induction Weld Plate or Trufast PVC IW Plate		<u>SENTINEL® P200</u>	Wood, Concrete
SOPRAFIX [®] #15 HD FASTENER with SFS [®] isoweld Plate		<u>Sentinel® p150</u> ,	Steel,
SOPRAFIX® #15 HD FASTENER with SENTINEL® Induction Weld Plate or Trufast PVC IW Plate		<u>SENTINEL® P200</u>	Wood

Name	Graphic	PVC Membrane	Substrate/Deck Type
Approved anchor with SENTINEL® isoweld Plate		<u>SENTINEL® P150,</u>	Concrete,
Approved anchor with SENTINEL® Induction Weld Plate or Trufast PVC IW Plate		<u>SENTINEL® P200</u>	Masonry



Figure 3.3a PVC/SBS Hybrid Membrane, Induction Welded Flashing, Wall/Curb With Horizontal Perimeter Fastening



Figure 3.3b PVC/SBS Hybrid Membrane, Induction Welded Flashing, Wall/Curb With Vertical Perimeter Fastening



Figure 3.3c PVC/SBS Hybrid Membrane, Induction Welded Flashing, Through Wall Scupper



Figure 3.3d Induction Welded PVC Flashing Membrane at Field Fabricated Inside Corner



Figure 3.3e Induction Welded PVC Flashing Membrane at Prefabricated Inside Corner



Figure 3.3f Induction Welded PVC Flashing Membrane at Molded Outside Corner



Figure 3.3g Induction Welded PVC Flashing Membrane at Prefabricated Outside Corner

3.4 MISCELLANEOUS

3.4.1 PVC HOT-AIR WELDED SIDE AND END LAPS

General:

- All SENTINEL® PVC membranes require a minimum 1-1/2 in continuous hot-air welded seam at all side and end laps.
- Refer to <u>Section 3.1.3</u> and <u>Section 3.1.4</u> for hot-air welding procedures.
- The contractor and/or applicator is responsible for managing and controlling all exposures related to chemical hazards, toxic substances and odors. This includes personal protective equipment (PPE), administrative and work practice controls, and engineering controls. The contractor is responsible for the elimination or substitution of products as necessary to manage and control exposures related to chemical hazards, toxic substances and odors.
- Refer to product Safety Data Sheets (SDS) for health, safety, and environment related hazards, and take all necessary measures and precautions to comply with exposure requirements.

Preparation:

- Ensure all substrates and bottom surfaces of bare membranes are dry and free of debris.
- Clean laps as necessary. Refer to <u>Section 3.1.2</u>.

Application:

- Hot-air welders shall be used to seal all membrane lap seams.
- Position the membrane so that it overlaps the adjacent membrane at the required side lap width.
- Weld the laps using an automatic welding machine or hand welder to maintain a 1-1/2 in uniform, continuous weld. Refer to Section 3.1.3 and Section 3.1.4.
- At end-laps of bare PVC, dog-ear and round all corners. Extend the end-lap a minimum of 3 in beyond the adjacent roll. Refer to Figure 3.4.1a.
- <u>SENTINEL® T-JOINT PATCHES</u> shall be hot-air welded to the membrane at all t-joint intersections. Chamfer the welding seam prior to installing <u>SENTINEL® T-JOINT PATCHES</u> using an edging tool or by heating the edge and rolling.
- SENTINEL[®] CUT EDGE SEALANT shall be installed at all non-factory cut edges for <u>SENTINEL[®] COPPERART</u> <u>P150</u> and <u>SENTINEL[®] SILVERART P150</u> membranes only.

Inspection:

- Carefully probe all seams and t-joints using a rounded-tip probe such as a cotter pin puller. Prevent damage to the membrane during inspection.
- Repair all open seams and damage found during inspection.
- When seam weld quality is suspect, inspect laps using destructive examination methods.
 - Cut 2 in wide weld samples across the seam 6 in on either side of the weld (2 in x 12 in wide strip).
 - Cut a minimum of three (3) sample welds in each suspect area.
 - Peel the test strips apart at the welds.
 - A satisfactory weld is achieved when the PVC breaks, or consistently and uniformly delaminates from the reinforcing fabric.
- Inspect the membrane each day to ensure the membrane is properly fastened to the substrate.
- Each day, repair all voids, wrinkles, open and damaged laps, and all other deficiencies before proceeding.

- Temporary night seals are required to seal membrane terminations watertight. Remove all temporary night seals before resuming the installation.
- Ensure the membrane is sealed watertight each day.

Table 3.4.1a PVC Membrane End-Laps			
Membrane	End Lap	Application	
SENTINEL [®] P150 HFB	Butt end laps	Minimum 6 in <u>SENTINEL® P150</u> or <u>SENTINEL® P200</u> cover strip centered over end laps with a minimum 1.5 in continuous weld on each side.	
SENTINEL [®] P200 HFB	Butt end laps	Minimum 6 in <u>SENTINEL® P200</u> cover strip centered over end laps with a minimum 1.5 in continuous weld on each side.	
SENTINEL [®] COPPERART P150	3 in minimum overlap	Minimum 1.5 in continuous weld. Apply SENTINEL® CUT EDGE SEALANT at non factory cut edges.	
SENTINEL [®] SILVERART P150	3 in minimum overlap	Minimum 1.5 in continuous weld. Apply SENTINEL® CUT EDGE SEALANT at non factory cut edges.	
SENTINEL [®] COPPERART P150 HFB	Butt end laps	Minimum 6 in <u>SENTINEL® COPPERART P150</u> cover strip centered over end laps with a minimum 1.5 in continuous weld on each side.	
SENTINEL [®] SILVERART P150 HFB	Butt end laps	Minimum 6 in <u>SENTINEL® SILVERART P150</u> cover strip centered over end laps with a minimum 1.5 in continuous weld on each side.	



Figure 3.4.1a Fleece-backed PVC Field Membrane Side And End Laps

3.4.2 PVC VINYL RIBS

General:

- <u>SENTINEL® PVC PROFILE BARS</u> are extruded, pliable PVC bars designed to provide the PVC membrane with the appearance of a standing seam metal roof. The PVC profile bars are installed for aesthetics, thus spacing and location should be carefully coordinated with the owner.
- The contractor and/or applicator is responsible for managing and controlling all exposures related to chemical hazards, toxic substances and odors. This includes personal protective equipment (PPE), administrative and work practice controls, and engineering controls. The contractor is responsible for the elimination or substitution of products as necessary to manage and control exposures related to chemical hazards, toxic substances and odors.
- Refer to product Safety Data Sheets (SDS) for health, safety, and environment related hazards, and take all necessary measures and precautions to comply with exposure requirements.

Preparation:

• Ensure vinyl ribs and membrane surfaces are clean, dry and free of debris. Refer to <u>Section 3.1.2</u>.

Application:

- Use care when installing the profile bars to ensure they are true and straight, with uniform spacing between the profile bars.
- Typically, PVC membranes receiving vinyl profile bars will be installed with side-laps parallel to the slope. Therefore, profile bars should be installed so that a profile bars are located at the edge of each side-lap.
- Space profile bars evenly between side-laps to desired spacing.
- Spot weld the center of the profile bar to hold the profile bar in place.
- Use a hand welder to weld the profile bars to the membrane providing a continuous weld on each side of the profile bar. Refer to Figure 3.4.2a.

Inspection:

• Ensure ribs are continuously welded along each side of the rib.



Figure 3.4.2a PVC Vinyl Ribs

3.4.3 PVC WALKWAYS & SACRAFICIAL PROTECTION PADS

General:

- <u>SENTINEL® WALKWAY PAD</u> protects roof membranes from damage caused by foot traffic or other rooftop activities. This product is compatible with new or existing PVC roof membranes.
- <u>SENTINEL® WALKWAY PAD</u> is also used as a sacrificial layer for additional protection when rooftop equipment, fixtures, lightning protection, etc. are installed directly on the roof surface.
- Other bare PVC membranes may also be used in lieu of <u>SENTINEL® WALKWAY</u> PAD. Refer to Figures 3.4.3a through 3.4.3b.
- The contractor and/or applicator is responsible for managing and controlling all exposures related to chemical hazards, toxic substances and odors. This includes personal protective equipment (PPE), administrative and work practice controls, and engineering controls. The contractor is responsible for the elimination or substitution of products as necessary to manage and control exposures related to chemical hazards, toxic substances and odors.
- Refer to product Safety Data Sheets (SDS) for health, safety, and environment related hazards, and take all necessary measures and precautions to comply with exposure requirements.



Preparation:

• Ensure walkways, sacrificial protection pads and membrane surfaces are clean, dry and free of debris. Refer to <u>Section 3.1.2</u>.

Application:

- Roll out walkways and sacrificial protection pads and cut desired length and allow to relax in the desired position. Walkway pads should be cut in maximum 10' lengths.
- Walkways and sacrificial protection pads should be placed a minimum of 2 in from membrane side laps, end laps, and flashing membranes. Refer to Figures 3.4.3a through 3.4.3b.
- <u>SENTINEL® S BONDING ADHESIVE</u> may be used in the field of walkways and protection pads to adhere to the PVC membrane if desired.
- Use a hot-air welder to weld the walkway and protection pad to the membrane providing a minimum 1.5 in wide continuous weld around the entire perimeter.
- When rooftop equipment and fixtures are to be installed directly onto the roof surface, ensure the sacrificial membrane is installed to protect the underlying PVC membrane.
- For equipment protection pads such as for lightning protection, refer to Figure 3.4.3b.

Inspection:

• Ensure walkways and sacrificial protection pads have a continuous weld around the perimeter.



Figure 3.4.3a Walkways



Figure 3.4.3b Sacraficial Protection Pads

3.4.4 PVC ACCESSORIES

General:

- Refer to <u>Table 3.4.4a</u> for SENTINEL[®] PVC membrane and flashing accessories products and basic application.
- Refer to the Product Data Sheets and Safety Data Sheets for additional product information.

Table 3.4.4a PVC Accessories			
Product	Application		
SENTINEI ® VCM*	Polyvinyl-coated sheet metal used to produce shop fabricated edge metals		
	and other details for welding PVC membranes.		
SENTINEL [®] COPPERART VCM	Copper-colored polyvinyl-coated sheet metal used to produce shop		
	fabricated edge metals and other details for welding PVC membranes.		
SENTINEL [®] SILVERART VCM	Silver-colored polyvinyl-coated sheet metal used to produce shop		
	fabricated edge metals and other details for welding PVC membranes.		
SENTINEL [®] SKIRTED DRIP EDGE	Polyvinyl-coated sheet metal edge with a factory applied PVC membrane		
	skirt used to terminate PVC membranes at roof edges.		
SENTINEL® MOLDED OUTSIDE	Injection-molded, unreinforced PVC flashings used to flash outside corners.		
CORNERS*	Injection-molded, unreinforced PVC flashings used to flash inside corners.		
SENTINEL® MOLDED LINIVERSAL	Injection-molded unreinforced PVC flashings used to flash inside and		
CORNERS*	outside corners.		
SENTINEL [®] PVC PREFABRICATED			
OUTSIDE CORNERS*	Fiberglass reinforced PVC flashings used to flash outside corners.		
SENTINEL [®] PVC PREFABRICATED	Eiberglass reinforced DVC flashings used to flash inside corpors		
INSIDE CORNERS*	Fiberglass reinforced PVC flashings used to flash inside corners.		
SENTINEL [®] PVC COPPERART	Copper-colored fiberglass reinforced PVC flashings used to flash outside		
PREFABRICATED OUTSIDE	corners.		
CORNERS			
SENTINEL® PVC COPPERART	Copper-colored fiberglass reinforced PVC flashings used to flash inside		
PREFABRICATED INSIDE CORNERS	corners.		
SENTINEL® PVC SILVERARI	Silver-colored fiberglass reinforced PVC flashings used to flash outside		
CORNERS	corners.		
SENTINEL® DVC SILVERART	Silver-colored fiberglass reinforced PVC flashings used to flash inside		
PREFABRICATED INSIDE CORNERS	corners.		
SENTINEL® T-JOINT PATCHES*	Round, polyester reinforced PVC patches used to seal t-joint intersections.		
	Extruded PVC ribs welded to PVC membranes to simulate the appearance		
SENTINEL [®] PVC PROFILE BARS*	of a standing seam metal roof.		
SENTINEL [®] PVC COPPERART	Copper-colored extruded PVC ribs welded to PVC membranes to simulate		
PROFILE BAR	the appearance of a standing seam metal roof.		

Product	Application
SENTINEL® PVC SILVERART PROFILE	Silver-colored extruded PVC ribs welded to PVC membranes to simulate
BAR	the appearance of a standing seam metal roof.
	Fiberglass reinforced prefabricated PVC pipe flashings used to flash round
SENTINEL FIFE FLASHING	penetrations.
	Prefabricated PVC closed and split pipe flashing for penetrations 1 in to 6
SENTINEL® BOOT FLASHING	in. and 6 in to 12 in.
SENTINEL® WALKWAY PAD	Slip resistant PVC protective pad used to create a walk path and protect
	field membranes from traffic.
SENTINEL [®] UNIVERSAL SEALANT*	Moisture curing, polyether, elastomeric sealant for PVC membrane
	terminations.
SENTINEL [®] CUT EDGE SEALANT	Sealant used to seal non-factory cut edges of <u>SENTINEL® COPPERART P150</u>
	and <u>SENTINEL[®] SILVERART P150</u> .
RUTVI SEALANT	100 percent solids, water cutoff, gun-grade butyl used to seal flashing
BUTTE SEALANT	details between PVC membrane and approved substrates.
	100 percent solids, water cutoff tape to seal flashing details between PVC
BUTTLTAPE	membrane and approved substrates.
	Bond breaker tape, nominal 2 in wide, adhesive-backed aluminum foil:
FOIL TAPE BOND BREAKER	Applied to vinyl coated metal edge detail joints prior to stripping-in
	joints with PVC flashing membrane.
	Applied to pipes and other flashing substrates to cover incompatible
	materials such as asphalt.

*Refer to product data sheets or contact <u>SOPREMA®</u> for color options.

4 POLYMETHYL METHACRYLATE (PMMA)/POLYMETHACRYLATE (PMA) LIQUID-APPLIED FLASHING FOR PVC ROOFING

General:

- <u>SOPREMA®</u> offers <u>ALSAN® RS 230 FLASH</u> or <u>ALSAN® RS 260 LO FLASH</u> liquid-applied, reinforced flashing systems as acceptable alternates to PVC flashing membranes.
- ALSAN[®] RS liquid-applied flashing systems may be used with adhered PVC membranes to form waterproof flashings for roof transitions, terminations and penetrations. Refer to Figures 4a through 4d.
- The contractor and/or applicator is responsible for managing and controlling all exposures related to chemical hazards, toxic substances and odors. This includes personal protective equipment (PPE), administrative and work practice controls, and engineering controls. The contractor is responsible for the elimination or substitution of products as necessary to manage and control exposures related to chemical hazards, toxic substances and odors.
- Refer to product Safety Data Sheets (SDS) for health, safety, and environment related hazards, and take all necessary measures and precautions to comply with exposure requirements.



• Refer to ALSAN® RS detail drawings, product data sheets, safety data sheets and published guidelines for additional information.

Preparation:

- Ensure all substrates are sound, dry clean and free of dust, debris, and adhesives.
- PVC membrane preparation:
 - Ensure the PVC field membrane is fastened to the substrate at all membrane terminations before installing liquid-applied flashing.
 - Install SENTINEL® T-JOINT PATCHES over exposed fasteners and stress plates.
 - Lightly abrade the PVC membrane surface using a scouring pad only where liquid-applied flashing is to be applied.
 - Wipe the PVC membrane surface clean using ALSAN® RS CLEANER, and allow to fully dry.
- Metal substrate preparation:
 - Prepare approved metal surfaces to near-white finish by abrasion and wipe clean with ALSAN[®] RS CLEANER before applying ALSAN[®] RS liquid-applied flashing systems.
- Concrete and masonry substrate preparation:
 - Substrates should be smooth and free of spalls, voids, blow holes and loose materials.
 - Use mechanical scarifying, grinding or shot blasting methods where necessary to provide a smooth, open surface free of laitance. The surface profile should be prepared to ICRI Concrete Surface Profile CSP 3, CSP 4 or SCP 5; CSP 3 being the preferred profile.
 - Refer to ASTM D4259 and D5295 for surface preparation guidance.
- Other approved substrates: Contact <u>SOPREMA®</u> and refer to ALSAN® RS installation instructions for other approved substrates and priming requirements.
- Conduct adhesion/peel tests by applying ALSAN[®] RS primer and liquid-applied membrane where necessary to ensure satisfactory adhesion is achieved.

Application:

- SENTINEL® PVC membranes do not require ALSAN® RS primers.
 - Refer to <u>Table 4a</u> for substrates that require priming.
 - o ALSAN[®] RS 222 PRIMER
 - Refer to product data sheets and safety data sheets, as well as ALSAN[®] RS installation instructions.
 - Using a slow-speed mechanical agitator, thoroughly stir the entire container.
 - Mix primer resin and catalyst approximately 2 minutes using a clean spiral agitator on slow speed or stir stick until evenly mixed. Do not aerate. Mix only the amount of primer that can be used within the application time.
 - Apply the appropriate specified primer to dry, compatible substrates as required to enhance adhesion of new specified flashing materials. Refer to <u>Table 4a</u>.
 - Apply primer using brush or roller at the rate published on the product data sheet. Do not allow heavy accumulations of primer.
 - Allow primer to fully cure before membrane application.
 - ALSAN[®] RS METAL PRIMER
 - Refer to product data sheets and safety data sheets, as well as ALSAN[®] RS installation instructions.
 - Using a slow-speed mechanical agitator, thoroughly stir the entire container.
 - Apply primer using brush or roller at the rate published on the product data sheet.
 - ALSAN[®] RS membranes and flashings should be installed to the primed surface within 24 hours of primer application.
- Pre-cut <u>ALSAN® RS FLEECE</u> polyester reinforcement to conform to roof terminations, transitions and penetrations. Cut reinforcement to ensure a minimum 2 in overlap of fleece at side-laps and end-laps. Ensure the liquid-applied flashing membrane is fully reinforced.
- Apply the base coat of catalyzed <u>ALSAN® RS 230 FLASH</u> or <u>ALSAN® RS 260 LO FLASH</u> resin onto the substrate using a brush or roller, working the liquid resin into the surface for complete coverage and full adhesion.
- Immediately apply the <u>ALSAN® RS FLEECE</u> reinforcing into the wet base coat of resin. Using a brush or roller, work the <u>ALSAN® RS FLEECE</u> reinforcement into the wet resin while applying the second coat of catalyzed ALSAN® RS FLASH resin to fully encapsulate the fleece.
- Extend the <u>ALSAN® RS 230 FLASH</u> or <u>ALSAN® RS 260 LO FLASH</u> resin a maximum of 1/4 in beyond the reinforcement.

Inspection:

- As project conditions vary, monitor changing conditions, Adjust primer and membrane application methods as necessary to achieve the desired results.
- Refer to ALSAN[®] RS installation instructions for additional guidance.

Table 4a ALSAN® RS Flashing Substrate Primer		
Substrate	Primer	
Prepared structural concrete	Prime with ALSAN® RS 222 PRIMER	
Prepared masonry	Prime with ALSAN® RS 222 PRIMER	
Conditioned, un-treated wood	Prime with ALSAN® RS 222 PRIMER	
Approved gypsum roof boards	Prime with ALSAN® RS 222 PRIMER	
Approved cement roof boards	Prime with ALSAN® RS 276 PRIMER	
Prepared metal	Optional ALSAN [®] RS METAL PRIMER	
SENTINEL [®] P150 HFB,		
SENTINEL [®] P200 HFB	Do not prime. Refer to <i>Preparation.</i>	
SENTINEL [®] COPPERART P150,		
SENTINEL [®] COPPERART P150 HFB,		
SENTINEL [®] SILVERART P150,	ALSAN [®] KS IS NOT COMPATIBLE.	
SENTINEL [®] SILVERART P150 HFB		

*Do not apply ALSAN[®] RS directly to exposed adhesives or <u>SENTINEL[®] UNIVERSAL SEALANT</u>.



- FIELD SBS BASE PLY

Figure 4a ALSAN® RS Flashing on PVC Membrane At Wall/Curb With Horizontal Perimeter Fastening



Figure 4b ALSAN® RS Flashing on PVC Membrane At Wall/Curb With Vertical Perimeter Fastening







Figure 4d ALSAN® RS Flashing on PVC Membrane At Penetration