SECTION 07 54 19

POLYVINYL-CHLORIDE (PVC) ROOFING

NOTE: This guide specification is provided as a guideline and must be modified, as required, by the Designer of Record for each project. This specification is prepared in general accordance with CSI format to be included under Division 7 – Thermal and Moisture Protection. Additional information is provided. [delete this paragraph]

Optional information is presented in “blue” font below. Choose appropriate options, delete, as necessary. [delete this paragraph]

# GENERAL

## SUMMARY

### Work shall include, but is not limited to, the following:

#### PVC membrane, [adhered][mechanically fastened][induction welded].

#### PVC membrane flashings, [adhered][mechanically fastened][induction welded].

#### All related materials and labor required to complete specified roofing necessary to receive specified manufacturer’s warranty.

## RELATED SECTIONS

### Division 010000 – General Requirements

### Division 011000 – Summary of Work

### Division 072200 – Roof Insulation

### Division 072713 – Modified Bituminous Sheet Vapor Retarders

### Division 076200 – Sheet Metal Flashing and Trim

## DEFINITIONS

### ASTM D 1079 - Definitions of Term Relating to Roofing and Waterproofing.

### The National Roofing Contractors Association (NRCA) Roofing and Waterproofing Manual, Fifth Edition Glossary.

## REFERENCES

### AMERICAN SOCIETY OF CIVIL ENGINEERS - Reference Document ASCE 7, Minimum Design Loads for Buildings and Other Structures.

### AMERICAN STANDARD OF TESTING METHODS (ASTM):

#### ASTM C 920 - Standard Specification for Elastomeric Joint Sealants

#### ASTM D 751 - Standard Test Methods for Coated Fabrics.

#### ASTM D 4434 - Standard for Polyvinyl Chloride Sheet Roofing.

#### ASTM E 108 - Standard Test Methods for Fire Tests of Roof Coverings.

#### ASTM E 1980 - Standard Practice for Calculating Solar Reflectance Index of Horizontal and Low-Sloped Opaque Surfaces.

### AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)::

#### ANSI/SPRI FX-1, Standard Field Test Procedure for Determining the Withdrawal Resistance of Roofing Fasteners.

#### ANSI/FM 4474- American National Standard for Evaluating the Simulated Wind Resistance of Roof Assemblies Using Static Positive and/or Negative Differential Pressures.

### COOL ROOF RATING COUNCIL (CRRC)

### FACTORY MUTUAL (FM):

#### FM 4450 - Approval Standard - Class I Insulated Steel Roof Decks.

#### FM 4470 - Approval Standard - Class I Roof Covers.

### INTERNATIONAL CODES COUNCIL (ICC):

#### 20XX International Building Code (IBC).

### NATIONAL ROOFING CONTRACTORS’ ASSOCIATION (NRCA).

### SHEET METAL AND AIR CONDITIONING CONTRACTORS’ NATIONAL ASSOCIATION INC. (SMACNA) Architectural Sheet Metal Manual.

### SINGLE PLY ROOFING INDUSTRY (SPRI)

### UNDERWRITERS LABORATORY (UL):

#### UL 790 Standard Test Methods for Fire Tests of Roof Coverings.

## ACTION SUBMITTALS

### Product Data Sheets: Submit manufacturer’s product data sheets, installation instructions and/or general requirements for each component.

### Quality Compliance (QC)/Certificate of Analysis (COA): Submit manufacturers QC or COA signed by company’s Quality Department certifying membrane materials meet the specified properties listed in the specification.

### Material Safety Data Sheets: Submit manufacturer’s Material Safety Data Sheets (MDS) for each component.

### Sample/Specimen Warranty from the manufacturer and contractor.

### Shop Drawings: Provide roof plan and applicable roof system detail drawings.

## INFORMATIONAL SUBMITTALS

### Contractor Certification: Submit written certification from roofing system manufacturer certifying that the applicator is authorized by the manufacturer to install the specified materials and system.

## CLOSEOUT SUBMITTALS

### Warranty: Provide manufacturers and contractor’s warranties upon substantial completion of the roofing system.

## QUALITY ASSURANCE

### MANUFACTURER QUALIFICATIONS:

#### Manufacturer shall have 20 years of experience manufacturing roofing materials.

#### Trained Technical Field Representatives, employed by the manufacturer, independent of sales.

#### Provide reports in a timely manner of all site visit reports.

#### Provide specified warranty upon satisfactory project completion.

### CONTRACTOR QUALIFICATIONS:

#### Contractor shall be authorized by the manufacturer to install specified materials prior to the bidding period through satisfactory project completion.

#### Applicators shall have completed projects of similar scope using same materials as specified herein.

#### Contractor shall provide full time, on-site superintendent or foreman experienced with the specified roof system through satisfactory project completion.

#### Applicators shall be skilled in the application methods for all materials.

#### Contractor shall maintain a daily record, on-site, documenting material installation and related project conditions.

#### Contractor shall maintain a copy of all submittal documents, on-site, available always for reference.

## DELIVERY, STORAGE AND HANDLING

### Refer to each product data sheet or other published literature for specific requirements.

### Deliver materials and store them in their unopened, original packaging, bearing the manufacturer's name, related standards, and any other specification or reference accepted as standard.

### Protect and store materials in a dry, well-vented, and weatherproof location. Only materials to be used the same day shall be removed from this location. During cold weather, store materials in a heated location, removed only as needed for immediate use.

### When materials are to be stored outdoors, store away from standing water, stacked on raised pallets or dunnage, at least 4 in or more above ground level. Carefully cover storage with “breathable” tarpaulins to protect materials from precipitation and to prevent exposure to condensation.

### Properly dispose of all product wrappers, pallets, cardboard tubes, scrap, waste, and debris. All damaged materials shall be removed from job site and replaced with new, suitable materials.

## SITE CONDITIONS

### SAFETY:

#### The contractor shall be responsible for complying with all project-related safety and environmental requirements.

#### Hot-air welding shall include heating the specified membrane ply using electric hot-air welding equipment. The contractor shall determine when and where conditions are appropriate to utilize hot-air welding equipment. When conditions are determined by the contractor to be unsafe to proceed, materials and methods shall be utilized to accommodate requirements and conditions.

#### The contractor shall 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.

### ENVIRONMENTAL CONDITIONS:

#### Monitor substrate temperature and material temperature, as well as all environmental conditions such as ambient temperature, moisture, sun, cloud cover, wind, humidity, and shade. Ensure conditions are satisfactory to begin work and ensure conditions remain satisfactory during the installation of specified materials. Materials and methods shall be adjusted as necessary to accommodate varying project conditions. Materials shall not be installed when conditions are unacceptable to achieve the specified results.

#### Precipitation and dew point: Monitor weather to ensure the project environment is dry before, and will remain dry, during the application of roofing materials. Ensure all roofing materials and substrates remain above the dew point temperature as required to prevent condensation and maintain dry conditions.

#### Hot-air Welding Application: Take all necessary precautions and measures to monitor conditions to ensure all environmental conditions are safe to proceed with the use hot-air welding equipment. Combustibles, flammable liquids, and solvent vapors that represent a hazard shall be eliminated and primers shall be fully dry before proceeding with hot air welding operations.

## PERFORMANCE REQUIREMENTS

### WIND UPLIFT RESISTANCE:

#### Performance testing shall be in accordance with ANSI/FM 4474, FM 4450, FM 4470, UL 580 or UL 1897.

##### Approval Rating:

###### FM 1-[000]

###### Maximum Design Pressure (MDP) –[00.0] psf

##### Roof System Design Pressures: Calculated in accordance with ASCE 7-[00], or applicable standard, for the specified roof system attachment requirements:

###### Field of Roof (Zone 1’): [- 00.0 psf.]

###### Field of Roof (Zone 1): [- 00.0 psf.]

###### Perimeter of Roof (Zone 2): [- 00.0 psf.]

###### Corners of Roof (Zone 3): [- 00.0 psf.]

### FIRE CLASSIFICATION:

* + - 1. Performance testing shall be in accordance with UL 790, ASTM E108, FM 4450 or FM 4470 to meet the [0]:12 roof slope requirement.

##### Meets requirements of UL Class A or FM Class [A][B][C].

#### Performance testing shall be in accordance with UL 1256, FM 4450, or FM 4470 to meet the specified requirements for interior flame spread and fuel contribution.

##### Meets requirements of UL 1256, or FM Class 1.

### ROOF SLOPE:

#### Finished roof slope for PVC surfaces shall be [¼] inch per foot (2 percent) minimum for roof drainage.

### IMPACT RESISTANCE:

#### Performance testing for impact resistance shall be in accordance with FM 4450, FM 4470, or ASTM D4272 to meet the specified impact resistance requirements.

##### Meets requirements for FM-[Moderate Hail (MH)][SH (Severe Hail)][Very Sever Hail (VSH)].

### COOL ROOF RATING COUNCIL (CRRC):

#### SOPREMA® SENTINEL® [P150 HFB][P200 HFB] fleece-backed, bright white PVC membrane shall be listed by the Cool Roof Rating Council (CRRC) with the following minimum published values:

##### Solar Reflectance: Initial: 0.87 3 Year: 0.67

##### Thermal Emittance: Initial: 0.89 3 Year: 0.89

##### Solar Reflectance Index (SRI): Initial: 110 3 Year: 81

#### SOPREMA® SENTINEL® [G150][G200][P150][P200] smooth backed, bright white PVC membrane shall be listed by the Cool Roof Rating Council (CRRC) with the following minimum published values:

##### Solar Reflectance: Initial: 0.85 3 Year: 0.73

##### Thermal Emittance: Initial: 0.89 3 Year: 0.88

##### Solar Reflectance Index (SRI): Initial: 108 3 Year: 90

### LEED SUSTAINABLE SITES (SS) CREDITS:

#### SS 7.2, Heat Island Effect-Roof. Membrane surface shall be bright white:

##### Seventy-five percent of the low-slope (equal to or less than 2:12) roof area shall have an SRI value greater than, or equal to, 78 as published by the Cool Roof Rating Council (CRRC).

##### Seventy-five percent of the steep-slope (greater than 2:12) roof area shall have an SRI value greater than, or equal to, 29 as published by the Cool Roof Rating Council (CRRC).

## WARRANTY

### Manufacturer's No Dollar Limit (NDL) Warranty. The manufacturer shall provide the owner with the manufacturer’s warranty providing labor and materials to for [10][15][20]-years from the date the warranty is issued.

### The contractor shall guarantee the workmanship and shall provide the owner with the contractor’s warranty covering workmanship for a period of 2 years from completion date.

# PRODUCTS

## MANUFACTURER

### PRODUCT QUALITY ASSURANCE PROGRAM: Manufacturer shall be an ISO 9001 registered company.

### ACCEPTABLE MANUFACTURER:

#### SOPREMA, located at: 310 Quadral Dr.; Wadsworth, OH 44281; Tel: 800-356-3521; Tel: 330-334-0066; Website: www.soprema.us.

#### Acceptable Alternate Manufacturers: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

## ROOFING SYSTEM

### ROOFING SYSTEM BASIS OF DESIGN: SOPREMA®

## PVC MEMBRANES

### MECHANICALLY FASTENED MEMBRANE:

#### PVC MEMEBRANE, MECHANICALLY ATTACHED

##### SOPREMA® SENTINEL® P150: Polyester reinforced, thermoplastic polyvinyl chloride (PVC) membrane with a smooth back underside. Overall Thickness ASTM D4434 (ASTM D638): 60 mils minimum

###### Manufacturer shall provide membrane at specified minimum 60 mils

###### ASTM D4434 +/- tolerance for membrane thickness will not be accepted.

###### Thickness over Scrim (ASTM D7635): 30 mils minimum

Manufacturer shall provide membrane with minimum 30 mils compound thickness above reinforcement/scrim

###### Width: [5 ft (1.5 m)][10 ft (3.0 m)]

###### Length: 100 ft (30.5 m)

###### Physical Properties ASTM D4434.

Breaking Strength, lbf/in: 430 (MD) 300 (XMD

Elongation at Break - %: 25 (MD) 25(XMD)

Tear Strength, lbf: 150 (MD) 80 (XMD)

Linear Dimensional Change - %: <0.1%

###### Color: [White][Grey][Tan]

##### SOPREMA® SENTINEL® P200: Polyester reinforced, thermoplastic polyvinyl chloride (PVC) membrane with a smooth back underside.

###### Overall Thickness ASTM D4434 (ASTM D638): 80 mils minimum

Manufacturer shall provide membrane at specified minimum 80 mils

ASTM D4434 +/- tolerance for membrane thickness will not be accepted.

###### Thickness over Scrim (ASTM D7635): 40 mils minimum

Manufacturer shall provide membrane with minimum 40 mils compound thickness above reinforcement/scrim

###### Width: [5 ft (1.5 m)][10 ft (3.0 m)]

###### Length: 65 ft (20 m)

###### Physical Properties ASTM D4434.

Breaking Strength, lbf/in: 460 (MD) 330 (XMD

Elongation at Break %: 25 (MD) 25(XMD)

Tear Strength, lbf: 170 (MD) 80 (XMD)

Linear Dimensional Change - %: <0.1%

###### Color: [White][Grey][Tan]

##### SOPREMA® SENTINEL® P150 HFB: Polyester reinforced, thermoplastic polyvinyl chloride (PVC) membrane with a heavy fleece back underside.

###### Membrane Thickness (above fleece) ASTM D4434: 60 mils minimum

Manufacturer shall provide membrane at specified minimum of 60 mils

ASTM D4434 +/- tolerance for membrane thickness will not be accepted.

###### Thickness over Scrim (ASTM D7635): 30 mils minimum

Manufacturer shall provide membrane with minimum 30 mils compound thickness above reinforcement

###### Width: 10 ft (3.0 m)

###### Length: 80 ft (24.4 m)

###### Physical Properties ASTM D4434.

Breaking Strength, lbf/in: 5500 (MD) 400 (XMD

Elongation at Break %: 30 (MD) 30(XMD)

Tear Strength, lbf: 150 (MD) 100 (XMD)

Linear Dimensional Change - %: <0.1%

###### Color: [White][Grey][Tan].

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Manufacturer shall provide membrane with minimum 40 mils compound thickness above reinforcement

###### Width: 10 ft (3.0 m)

###### Length: 65 ft (20 m)

###### Physical Properties ASTM D4434.

Breaking Strength, lbf/in: 525 (MD) 400 (XMD)

Elongation at Break %: 25 (MD) 25(XMD)

Tear Strength, lbf: 170 (MD) 80 (XMD)

Linear Dimensional Change - %: <0.1%

###### Color: [White][Grey][Tan].

### ADHERED MEMBRANE:

#### PVC MEMBRANE, ADHERED:

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###### Width: [5 ft (1.5 m)][10 ft (3.0 m)]

###### Length: 100 ft (30.5 m)

###### Physical Properties ASTM D4434.

Breaking Strength, lbf/in: 430 (MD) 300 (XMD

Elongation at Break - %: 25 (MD) 25(XMD)

Tear Strength, lbf: 150 (MD) 80 (XMD)

Linear Dimensional Change - %: <0.1%

###### Color: [White][Grey][Tan].

##### SOPREMA® SENTINEL® P200: Polyester reinforced, thermoplastic polyvinyl chloride (PVC) membrane with a smooth back underside.

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Tear Strength, lbf: 170 (MD) 80 (XMD)

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###### Physical Properties ASTM D4434.

Breaking Strength, lbf/in: 525 (MD) 400 (XMD)

Elongation at Break %: 25 (MD) 25(XMD)

Tear Strength, lbf: 170 (MD) 80 (XMD)

Linear Dimensional Change - %: <0.1%

Color: [White][Grey][Tan].

##### SOPREMA® SENTINEL® G150: Fiberglass reinforced, thermoplastic polyvinyl chloride (PVC) membrane with a smooth back underside.

###### Overall Thickness ASTM D4434 (ASTM D638): 60 mils minimum

Manufacturer shall provide membrane at specified minimum 60 mils

ASTM D4434 +/- tolerance for membrane thickness will not be accepted.

###### Thickness over Scrim (ASTM D7635): 30 mils minimum

Manufacturer shall provide membrane with minimum 30 mils compound thickness above reinforcement/scrim

###### Width: 10ft (3.0 m)

###### Length: 100 ft (24.4 m)

###### Physical Properties ASTM D4434.

Breaking Strength, lbf/in: 100 (MD) 90 (XMD

Elongation at Break %: 275 (MD) 275(XMD)

Tear Strength, lbf: 17 (MD) 17 (XMD)

Linear Change - %: <0.04%

###### Color: [White][Grey][Tan].

##### SOPREMA® SENTINEL® G200: Fiberglass reinforced, thermoplastic polyvinyl chloride (PVC) membrane with a smooth back underside.

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#### PVC FLASHING, ADHERED:

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###### Width: 10 ft (2.1 m)

###### Length: 65 ft (20 m)

###### Physical Properties ASTM D4434.

Breaking Strength, lbf/in: 460 (MD) 330 (XMD

Elongation at Break %: 25 (MD) 25(XMD)

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Tear Strength, lbf: 17 (MD) 17 (XMD)

Linear Change - %: <0.04%

###### Color: [White][Grey][Tan].

#### PVC FLASHING, FASTENED, INDUCTION WELDED:

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Tear Strength, lbf: 170 (MD) 80 (XMD)

Linear Dimensional Change - %: <0.1%

###### Color: [White][Grey][Tan].

## ACCESSORIES

### MEMBRANE ADHESIVES:

#### SOPREMA® SENTINEL® S BONDING ADHESIVE: Solvent-based adhesive. Formulated to adhere smooth back PVC membranes.

##### VOC Content: 199.5 g/L or less.

#### SOPREMA® SENTINEL® H2O BONDING ADHESIVE: Waterborne polymeric adhesive. Formulated to adhere smooth and fleece back PVC membranes.

##### VOC Content: 179.0 g/L or less.

#### SOPREMA® DUOTACK® SPF HFO ADHESIVE: Two-component elastomeric polyurethane adhesive. Formulated to adhere fleece back PVC membranes.

##### VOC Content: 98 g/L or less.

#### ICP POLYSET COMMERCIAL ROOF ADHESIVE: Two-component elastomeric polyurethane froth adhesive. Formulated to adhere fleece back PVC membranes.

##### VOC Content: 98 g/L or less.

### FLASHING ADHESIVES:

#### SOPREMA® SENTINEL® S BONDING ADHESIVE: Solvent-based adhesive. Formulated to adhere smooth back PVC flashings.

##### VOC Content: 199.5 g/L or less.

### SEALANTS:

#### SOPREMA® SENTINEL® Universal Sealant: Gun grade, moisture curing, polyether, elastomeric sealant for SENTINEL® PVC membrane terminations.

##### VOC Content: 20 g/L or less

##### Meets or exceeds ASTM C920, Type S, Grade NS, Class 25

##### Color: White

#### BUTYL SEALANT TAPE: Butyl rubber and polyisobutylene water resistant sealant tape for concealed sheet metal joints and water cutoff.

#### BUTYL SEALANT: Butyl rubber and polyisobutylene water resistant sealant for concealed sheet metal joints and water cutoff.

### MEMBRANE FASTENERS AND PLATES

#### SOPREMA® SOPRAFIX® #15 HD Fastener: Membrane fastener.

#### SOPREMA® SOPRAFIX® 2 IN STRESS PLATE: Membrane seam plate.

#### SOPREMA® SOPRAFIX® 2.4 IN STRESS PLATE: Membrane seam plate.

#### SFS isoweld Fastener and Plate: Non-penetrating membrane fastener and plate.

### MEMBRANE ACCESSORIES:

#### 60 MIL PVC DETAILING MEMBRANE: Fiberglass reinforced, thermoplastic polyvinyl chloride (PVC) membrane with a smooth back underside.

##### Overall Thickness ASTM D4434 (ASTM D638): 60 mils minimum

###### Colors: [White][Grey][Tan]

###### Size: 2.5 ft x 100 ft (0.76 m x 30 m)

#### 80 MIL PVC DETAILING MEMBRANE: Fiberglass reinforced, thermoplastic polyvinyl chloride (PVC) membrane with a smooth back underside.

##### Overall Thickness ASTM D4434 (ASTM D638): 80 mils minimum

###### Colors: [White][Grey][Tan]

###### Size: 2.5 ft x 65 ft (0.76 m x 19 m)

#### SOPREMA® SENTINEL® MOLDED OUTSIDE CORNER: Injection Molded Corner

##### Color: [White][Grey][Tan].

#### SOPREMA® SENTINEL® MOLDED INSIDE CORNER: Injection Molded Corner

##### Color: [White][Grey][Tan].

#### SOPREMA® SENTINEL® PVCPREFABRICATED OUTSIDE CORNER: Prefabricated Outside Corner

##### Color: [White][Grey][Tan].

#### SOPREMA® SENTINEL® PVC PREFABRICATED INSIDE CORNER: Prefabricated Inside Corner

##### Color: [White][Grey][Tan].

#### SOPREMA® SENTINEL® T-JOINT PATCHES: 4.5 in Round T-Joint Patch

##### Color: [White][Grey][Tan].

#### SOPREMA® SENTINEL® PVC PIPE FLASHING: Prefabricated PVC pipe flashing.

##### Size: [1 in][2 in][3 in][4 in][5 in][6 in]. Size as required.

##### Color: [White][Grey][Tan].

#### SOPREMA® SENTINEL® PVC SPLIT PIPE BOOT: Prefabricated PVC pipe flashing.

##### Size: 1”-6”

##### Color: [White][Grey][Tan].

#### SOPREMA® SENTINEL® PVC CLOSED PIPE BOOT: Prefabricated PVC pipe flashing.

##### Size: 1”-6”

##### Color: [White][Grey][Tan].

#### SOPREMA® SENTINEL® PVC SPLIT PIPE BOOT: Prefabricated PVC pipe flashing.

##### Size: 6”-12”

##### Color: [White][Grey][Tan].

#### SOPREMA® SENTINEL® PVC CLOSED PIPE BOOT: Prefabricated PVC pipe flashing.

##### Size: 6”-12”

##### Color: [White][Grey][Tan].

#### SOPREMA® SENTINEL® WALKWAY PAD: PVC walkway protection mat.

##### Width: 30 in (0.762 m)

##### Length: 50 ft (15.24 m)

##### Color: Grey

### SHEET METAL FLASHING:

#### Contractor shall furnish all sheet metal flashings, counter flashings, roof edge system, and all other related sheet metal flashings and associated fasteners necessary to flash and counter flash the specified roofing system.

#### Sheet metal flashing materials and fasteners shall be compatible with adjacent materials, to accommodate all project related exposures.

#### Vinyl Coated Metal: 24-gauge galvanized sheet steel with a 20 mil, UV-resistant PVC coated topside.

##### SOPREMA® SENTINEL® VCM: PVC coated metal.

###### Width: 4 ft (1.219 m)

###### Length: 10 ft (3.048 m)

###### Color: [White][Grey][Tan].

#### Pre-Finished (Mill Finished) Sheet Metal Flashing Material: [Aluminum][Galvanized Steel][Stainless Steel].

#### Roof Edge System: Tested per ANSI/SPRI ES-1 to meet or exceed design pressures at roof edge.

### LIQUID-APPLIED REINFORCED FLASHING SYSTEM:

#### SOPREMA® ALSAN® RS 230 FLASH, Catalyzed polymethyl methacrylate (PMMA) resin with polyester reinforcing fleece fabric fully embedded into the resin to form fully reinforced waterproofing membrane flashings.

##### VOC Content: No VOC content.

##### SOPREMA® ALSAN® RS 230 FLASH: Polymethyl methacrylate (PMMA) liquid resin.

##### SOPREMA® ALSAN® RS CATALYST POWDER: Reactive agent added to the PMMA liquid resin to induce curing.

##### SOPREMA® ALSAN® RS FLEECE: Polyester reinforcement fabric.

##### Color: Flash color and finish to match Field.

#### SOPREMA® ALSAN® RS 260 LO FLASH, Catalyzed polymethacrylate (PMA) resin with polyester reinforcing fleece fabric fully embedded into the resin to form fully reinforced waterproofing membrane flashings.

##### VOC Content: No VOC content.

##### SOPREMA® ALSAN® RS 260 LO FLASH: Polymethacrylate (PMA) liquid resin.

##### SOPREMA® ALSAN® RS CATALYST POWDER: Reactive agent added to the PMMA liquid resin to induce curing.

##### SOPREMA® ALSAN® RS FLEECE: Polyester reinforcement fabric.

##### Color: Flash color and finish to match Field.

# EXECUTION

## EXAMINATION

### Examination includes visual observations, qualitative analysis, and quantitative testing measures as necessary to ensure conditions remain satisfactory throughout the project.

### The contractor shall examine all roofing substrates including, but not limited to: insulation materials, roof decks, walls, curbs, rooftop equipment, fixtures, and wood blocking.

### The applicator shall not begin installation until conditions have been properly examined and determined to be clean, dry and, otherwise satisfactory to receive specified roofing materials.

### During the application of specified materials, the applicator shall continue to examine all project conditions to ensure conditions remain satisfactory to complete the specified roofing system.

## PREPARATION

### Before commencing work each day, the contractor shall prepare all roofing substrates to ensure conditions are satisfactory to proceed with the installation of specified roofing materials. Preparation of substrates includes, but is not limited to, substrate repairs, securement of substrates, eliminating all incompatible materials, and cleaning.

### Where conditions are found to be unsatisfactory, work shall not begin until conditions are made satisfactory to begin work. Commencing of work shall indicate contractor’s acceptance of conditions.

## HOT-AIR WELDING

### The Contractor is responsible for project safety. Hot air shall be used to seal membrane side and end laps. Refer to NRCA CERTA, local codes and building owner’s requirements for hot work operations.

### Position the membrane so that it overlaps the adjacent membrane at the required side lap width. Ensure the laps are dry, clean, and free of foreign material.

### Weld the laps together with an automatic welding machine or hand welder maintaining a minimum 1.5 in continuous weld. All seams shall be inspected for a continuous weld.

### At end-laps of bare back membranes, round the corners by cutting a radius on both corners.

### Fleece back membrane end laps shall be butted to one another and a 6 in membrane cover strip welded on top.

### SOPREMA® T-JOINT PATCHES shall be hot-air welded to the membrane at all t-joint intersections. Chamfer the welding seam prior to installing T-Joint patches using an edging tool or by heating the edge and rolling.

### SOPREMA® SENTINEL® PVC CUT EDGE SEALANT shall be installed at all non-factory cut edges.

## ADHERED MEMBRANE APPLICATION (SENTINEL® S BONDING ADHESIVE)

### The ambient temperature shall be above 50°F (10°C).

### SOPREMA® SENTINEL® S BONDING ADHESIVE may be applied using a 3/8 in nap solvent resistant roller.

### Apply adhesive to clean, dry, and prepared compatible substrates as required to ensure full adhesion at the application rate published on the product data sheet.

### Apply adhesive to the underside of the bare back membrane at the application rate published on the product data sheet.

### Allow the adhesive on both surfaces to dry to a tacky feel when touched with a dry finger.

### Mate the membrane to the substrate avoiding any air entrapment or wrinkles and apply pressure with a roller or push broom to ensure complete bonding.

### At the end of the sheet where it terminates at roof edges, walls, and curbs, fasten the perimeter of the membrane with appropriate fasteners and seam plates to the deck or vertical surface at the base of the upstand.

### Hot air weld all side and end laps.

### At PVC terminations at roof edges, walls, and curbs, fasten the perimeter edge of the membrane with appropriate fasteners, seam plates or flat termination bars to the horizontal deck or vertical substrate along the termination.

### Fasten membrane termination 12 in on-centers maximum along membrane terminations. Locate the edge of the fastener plate 1 in or more back from the edge of the membrane.

### Probe all seams/laps once the hot air welds have thoroughly cooled.

### Repair all seam deficiencies the same day they are discovered.

## ADHERED MEMBRANE APPLICATION (SENTINEL® H2O BONDING ADHESIVE)

### The ambient temperature shall be above 50°F (10°C).

### SOPREMA® SENTINEL® H2O BONDING ADHESIVE may be applied using a 3/8 in nap solvent resistant roller.

### Apply adhesive to clean, dry, and prepared compatible substrates only as required to ensure full adhesion.

### Apply a uniform application of membrane adhesive at the application rate published on the product data sheet.

### Mate the membrane to the substrate while the adhesive is wet avoiding any air entrapment or wrinkles. Apply pressure with a roller or push broom to ensure complete bonding.

### Hot air weld all side and end laps.

### At PVC terminations at roof edges, walls, and curbs, fasten the perimeter edge of the membrane with appropriate fasteners, seam plates or flat termination bars to the horizontal deck or vertical substrate along the termination.

### Fasten membrane termination 12 in on-centers maximum along membrane terminations. Locate the edge of the fastener plate 1 in or more back from the edge of the membrane.

### Probe all seams/laps once the hot air welds have thoroughly cooled.

### Repair all seam deficiencies the same day they are discovered.

## ADHERED MEMBRANE APPLICATION (DUOTACK SPF HFO)

### Follow material product data sheets and published general requirements for installation instructions.

### Refer to manufacturers published product data sheets. The ambient and surface temperature shall be between 40°F (4°C) and 100°F (37°C) during installation.

### Adhesive shall be applied to approved substrates in the suggested “spatter pattern” indicated in manufacturer’s published product data sheets.

### Apply adhesive from spray nozzle located 2 to 3 feet above the roof surface using a sweeping motion from side to side to evenly distribute the adhesive at approximately 2,000 square feet (20 squares) per adhesive kit.

### Apply adhesive to prevent contact between bare PVC side-laps and the adhesive.

### Refer to published literature for recommended adhesive “set” time before applying membrane. Monitor changing environmental conditions to ensure satisfactory results as adhesive set time varies with environmental conditions.

### Unroll the PVC membrane into the adhesive so only the fleece contacts adhesive. Prevent contact between bare side laps and adhesive.

### Unroll the PVC to prevent wrinkles and apply pressure using a roller or push broom to ensure complete adhesion between the fleece underside and the adhesive.

### End-laps shall be butted, and a 6 in wide PVC membrane cover-strip shall be welded over the butted end joint.

### SOPREMA® SENTINEL® T-JOINT PATCHES shall be hot-air welded to the membrane at all T-joint intersections. Chamfer the welding seam prior to installing T-Joint patches using an edging tool or by heating the edge and rolling.

### Hot-air weld all side and end-laps with minimum 1-1/2 in welds.

### Fasten PVC terminations located at roof edges, walls, and curbs, using appropriate fasteners, seam plates or flat termination bars. Install fasteners into the horizontal deck or vertical substrate along the termination.

### Fasten membrane termination 12 in on-centers maximum along membrane terminations. Locate the edge of the fastener plate 1 in or more back from the edge of the membrane.

### Probe all seams/laps once the hot air welds have thoroughly cooled.

### Repair all seam deficiencies the same day they are discovered.

## ADHERED MEMBRANE APPLICATION (DUOTACK® SPF HFO)

### Follow material product data sheets and published general requirements for installation instructions.

### Apply adhesive from spray nozzle located 2 to 3 feet above the roof surface using a sweeping motion from side to side to evenly distribute the adhesive at approximately 3,000 square feet (30 squares) per adhesive kit.

### Apply adhesive to prevent contact between bare PVC side-laps and the adhesive.

### Monitor changing environmental conditions to ensure satisfactory results as adhesive set time varies with environmental conditions.

### Unroll the PVC membrane into the adhesive so only the fleece contacts adhesive. Prevent contact between bare side laps and adhesive.

### Unroll the PVC to prevent wrinkles and apply pressure using a roller or push broom to ensure complete adhesion between the fleece underside and the adhesive.

### End-laps shall be butted, and a 6 in wide PVC membrane cover-strip shall be welded over the butted end joint.

### SOPREMA® SENTINEL® T-JOINT PATCHES shall be hot-air welded to the membrane at all T-joint intersections. Chamfer the welding seam prior to installing T-Joint patches using an edging tool or by heating the edge and rolling.

### Hot-air weld all side and end-laps with minimum 1-1/2 in welds.

### Fasten PVC terminations located at roof edges, walls, and curbs, using appropriate fasteners, seam plates or flat termination bars. Install fasteners into the horizontal deck or vertical substrate along the termination.

### Fasten membrane termination 12 in on-centers maximum along membrane terminations. Locate the edge of the fastener plate 1 in or more back from the edge of the membrane.

### Probe all seams/laps once the hot air welds have thoroughly cooled.

### Repair all seam deficiencies the same day they are discovered.

## ADHERED MEMBRANE APPLICATION (ICP POLYSET COMMERCIAL ROOF ADHESIVE)

### Follow material product data sheets and published general requirements for installation instructions.

### Refer to manufacturers published product data sheets. The ambient and surface temperature shall be between 30°F (-1°C) and 100°F (38°C) during installation.

### Adhesive shall be applied to approved substrates in the suggested “spatter pattern” indicated in manufacturer’s published product data sheets.

### Apply adhesive from spray nozzle located 2 to 3 feet above the roof surface using a sweeping motion from side to side to evenly distribute the adhesive at approximately 3,000 square feet (30 squares) per adhesive kit.

### Apply adhesive to prevent contact between bare PVC side-laps and the adhesive.

### Refer to published literature for recommended adhesive “set” time before applying membrane. Monitor changing environmental conditions to ensure satisfactory results as adhesive set time varies with environmental conditions.

### Unroll the PVC membrane into the adhesive so only the fleece contacts adhesive. Prevent contact between bare side laps and adhesive.

### Unroll the PVC to prevent wrinkles and apply pressure using a roller or push broom to ensure complete adhesion between the fleece underside and the adhesive.

### End-laps shall be butted, and a 6 in wide PVC membrane cover-strip shall be welded over the butted end joint.

### SOPREMA® SENTINEL® T-JOINT PATCHES shall be hot-air welded to the membrane at all T-joint intersections. Chamfer the welding seam prior to installing T-Joint patches using an edging tool or by heating the edge and rolling.

### Hot-air weld all side and end-laps with minimum 1-1/2 in welds.

### Fasten PVC terminations located at roof edges, walls, and curbs, using appropriate fasteners, seam plates or flat termination bars. Install fasteners into the horizontal deck or vertical substrate along the termination.

### Fasten membrane termination 12 in on-centers maximum along membrane terminations. Locate the edge of the fastener plate 1 in or more back from the edge of the membrane.

### Probe all seams/laps once the hot air welds have thoroughly cooled.

### Repair all seam deficiencies the same day they are discovered.

## MECHANICALLY FASTENED MEMBRANE APPLICATION

### Refer to agency approvals for fastening and other system requirements.

### Follow product data sheets and published detail requirements for additional installation instructions.

### Ensure environmental conditions are satisfactory, and will remain satisfactory, during the application.

### 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 all roofing and flashing substrates are prepared and acceptable to receive the mechanically fastened membrane.

### Ensure the specified side-lap and end-lap widths are maintained. End-laps should be staggered 3 ft. apart.

### Starting at one end of the sheet, install the mechanical fasteners in the 6 in side-lap 2 in from the edge of the sheet to the center of the fastener. 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.

### At the end of the sheet where it terminates at roof edges, walls, and curbs, fasten the perimeter of the membrane with appropriate fasteners and seam plates to the deck or vertical surface at the base of the upstand.

### Hot air weld all side and end laps.

### When rows of fasteners are installed through the membrane at perimeter and corner enhancements for example, a minimum 8 in wide sealing strip shall cover the fasteners. The sealing strip shall be hot air welded to the membrane with a minimum 1.5 in continuous weld on all sides.

### Temporary night seals are required to seal membrane and flashing terminations watertight. Temporary night seals should be removed upon resuming the installation.

### Probe all seams/laps once the hot air welds have thoroughly cooled.

### Repair all seam deficiencies the same day they are discovered.

## INDUCTION WELDED FASTENING SYSTEM

### Refer to agency approvals for fastening and other system requirements.

### Follow product data sheets and published detail requirements for additional installation instructions.

### Ensure environmental conditions are satisfactory, and will remain satisfactory, during the application.

### Install fasteners and induction welding plates as required for wind uplift requirements.

### Install fasteners and plates that can be induction welded each day.

### Unroll the PVC membrane onto the roof surface and allow it to relax and remove all wrinkles.

### Hot air weld all side and end laps.

### Locate all plates beneath the PVC membrane. Center the induction welder over the plate and activate the induction welding equipment. Do not move the induction welder during the welding cycle.

### Once the weld is complete, place the magnets centered on the plate within 3 seconds of welding, allow sufficient time for the plate to cool before removing the magnet.

### At the end of the sheet where it terminates at roof edges, walls, and curbs, fasten the perimeter of the membrane with appropriate fasteners and seam plates to the deck or vertical surface at the base of the upstand.

### Where necessary, use a hot-air welder to ensure all laps are fully sealed.

### Inspect the installation each day to ensure the membrane is welded to each plate.

### 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 should be removed upon resuming the installation.

### Probe all seams/laps once the hot air welds have thoroughly cooled.

### Repair all seam deficiencies the same day they are discovered.

## PVC FLASHING MEMBRANE APPLICATION (SENTINEL® S BONDING ADHESIVE)

### Follow material product data sheets and published general requirements for installation instructions.

### Ensure field membrane is fastened and secure to the substrate at all membrane terminations before PVC flashing is installed.

### Ensure PVC membrane and substrates are dry, clean, and free of asphalt and all bitumen-based products. Do not allow bare PVC to meet asphalt or bitumen-based products.

### Where required, cover walls and other flashing substrates using specified wood, gypsum or cement roof boards securely fastened in place.

### The ambient temperature shall be above 40°F (4.4°C) during adhesive application. Ensure temperature is well above the dew point temperature to prevent condensation during adhesive application.

### Apply SOPREMA® SENTINEL® S BONDING ADHESIVE using 3/8 in nap solvent resistant rollers to clean, dry and prepared flashing substrates, and onto the underside of the bare PVC membrane. Refer to product data sheet for application rate.

### Prevent adhesive from contacting the membrane at the side and end-laps that are to be hot-air welded.

### Allow the adhesive on both surfaces to dry to the touch. Adhesive may be tacky to-the-touch, but not wet. Adhesive should not transfer to the fingertips when touched.

### Mate the PVC flashing membrane to the flashing substrate. Prevent air entrapment and wrinkles. Apply pressure with hands, roller, or broom to ensure complete adhesion.

### Hot air weld all laps with minimum 1-1/2 in welds.

### Probe all seams/laps once the hot air welds have thoroughly cooled.

### Repair all seam deficiencies the same day they are discovered

### Fasten top leading edge of vertical PVC flashings. Refer to detail drawings.

## LIQUID-APPLIED, [ALSAN RS 230 (PMMA)][ALSAN RS 260 LO (PMA)] MEMBRANE AND FLASHING SYSTEM APPLICATION

### Refer to manufacturer’s details drawings, product data sheets and published general requirements for application rates and specific installation instructions.

### PVC membrane preparation:

#### Ensure the PVC field membrane is fastened and secure to the substrate at all membrane terminations before liquid-applied flashing is installed.

#### Install a welded PVC cover-strip over fasteners where applicable. Ensure cover-strip is welded tight, with no loose ends or open laps.

#### Ensure PVC membrane and substrates are dry, clean, and free of asphalt and all bitumen-based products. Do not allow bare PVC to meet asphalt or bitumen-based products.

#### Lightly abrade the PVC membrane surface where liquid-applied membrane is to be applied.

#### Wipe PVC membrane surface clean using ALSAN® RS CLEANER and allow too fully dry.

### Pre-cut SOPREMA® ALSAN® RS FLEECE polyester reinforcing fleece to conform to roof terminations, transitions and penetrations being flashed. Ensure a minimum 2 in overlap of fleece at side and end-laps. Ensure the completed liquid-applied flashing membrane is fully reinforced.

### Apply the base coat of catalyzed SOPREMA® ALSAN® RS resin onto the substrate using a brush or roller, working the material into the surface for complete coverage and full adhesion.

### Immediately apply the SOPREMA® ALSAN® RS FLEECE reinforcing into the wet base coat of resin. Using a brush or roller, work the SOPREMA® ALSAN® RS FLEECE reinforcing fabric into the wet resin while applying the second coat of catalyzed SOPREMA® ALSAN® RS resin to completely encapsulate the fleece.

### Refer to reinforced, [polymethyl-methacrylate (PMMA)][polymethacrylate (PMA)] specification section and application instructions, details drawings, product data sheets and published general requirements for complete installation instructions.

## SHEET METAL FLASHING APPLICATION

### Refer to sheet metal flashing detail drawings and follow product data sheets and published general requirements for installation instructions.

### Follow the most recent edition of the SMACNA Architectural Sheet Metal Manual for fabrication and installation requirements.

## WALKWAYS

### At areas outlined on the drawings, and around the perimeter of all rooftop equipment and at all door and stair landings, install walkway protection.

### Cut walkway from end of SOPREMA® SENTINEL® WALKWAY PAD.

### Hot air weld the entire perimeter of the SOPREMA® SENTINEL® WALKWAY PAD to the membrane.

## CLEAN-UP

### Clean-up and properly dispose of waste and debris resulting from these operations each day as required to prevent damages and disruptions to operations.

END OF SECTION