

Sure-Flex™ PVC

FRS Membrane (All Material Minimum Thickness)



Overview

Carlisle's Sure-Flex PVC FRS is an advanced-formula, heat-weldable PVC membrane used exclusively in fully adhered applications that utilize liquid-applied bonding adhesives. Designed to provide long-term weatherability and performance, thick PVC-based top and bottom plies encapsulate the membrane's internal fiberglass reinforcement, enhancing dimensional stability. The membrane's smooth surface facilitates a permanent weld for a consistent, watertight, monolithic roof assembly. All PVC FRS membranes are manufactured to exceed minimum thickness specifications.

Features and Benefits

- » Manufactured to exceed minimum thickness specifications
- » Available in a variety of thicknesses
- » Excellent chemical resistance
- » Exceptional heat weldability and low-temperature flexibility
- » Resistant to impact, punctures, UV, ozone, and oxidation
- » Simple installation process
- » Reflective PVC FRS can help reduce cooling and air conditioning cost in warm, southern climates

Installation

With minimal labor and few components required, PVC FRS is quick and simple to install.

Fully Adhered Roofing Systems

The fully adhered system starts with a suitable surface upon which the Sure-Flex Low-VOC PVC Bonding Adhesive or HydroBond™ Water-Based PVC Bonding Adhesive will be applied.

HydroBond Water-Based PVC Bonding Adhesive

Refer to HydroBond Product Data Sheet for detailed information.

HydroBond water-based, one-sided, wet lay-in adhesive is first applied with a medium nap roller to the approved substrate. Once the adhesive is applied, roll the membrane in place. Applying the adhesive 3'-4' at a time ahead of the roll is recommended to prevent drying of the adhesive. Immediately broom the membrane, starting from the center of the sheet and working out to the sides of the sheet, using a soft-bristle push broom to work out any air bubbles. Immediately after brooming, roll the adhered membrane in two directions in a crossways pattern using a 100-lb (45 kg) split steel membrane roller.

Sure-Flex Low-VOC PVC Bonding Adhesive

Refer to Sure-Flex Low-VOC PVC Bonding Adhesive Product Data Sheet for detailed information.

Roll the membrane onto the adhesive-coated substrate while avoiding wrinkles. Immediately brush down the bonded portion of the sheet with a soft-bristle push broom or a clean dry roller applicator to achieve maximum contact.

Review Carlisle specifications and details for complete installation information.

Precautions

- » Sunglasses that filter out ultraviolet light are strongly recommended when working on reflective membranes. Roofing technicians should dress appropriately and wear sunscreen.
- » Smooth surfaces may become slippery due to frost and ice buildup. Exercise caution during cold conditions to prevent falls.
- » Care must be exercised while working close to a roof edge when the surrounding area is snow-covered, as the roof edge may not be clearly visible.
- » Use proper stacking procedures to ensure sufficient stability of the materials.
- » Exercise caution when walking on wet membranes; membranes may be slippery when wet.
- » Store PVC FRS membrane in its original, undisturbed plastic wrap in a cool, shaded area and cover with light-colored, breathable, waterproof tarpaulins. PVC FRS membrane that has been exposed to the weather or contaminated with dirt must be prepared with Sure-Flex PVC Membrane Cleaner prior to hot-air welding.

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Supplemental Approvals, Statements and Characteristics

1. Reinforced PVC FRS meets or exceeds the requirements of ASTM D4434 Standard Specification for Poly (Vinyl Chloride) Sheet Roofing. Reinforced PVC FRS is classified as type II as defined by ASTM D4434.
2. Reinforced PVC FRS was tested for dynamic puncture resistance per ASTM D5635 using the most recently modified impact head. 50-mil membrane was watertight after an impact energy of 10.0 J (14.75 ft-lbf), which passes the ASTM D4434 requirement.
3. Reinforced PVC FRS was tested for static puncture resistance per ASTM D5602 and exceeded 33 lbf (145 N), which passes the ASTM D4434 requirement.

Radiative Properties for ENERGY STAR®, Cool Roof Rating Council (CRR), and LEED®

Radiative Property	Test Method	White PVC
ENERGY STAR - E-903 Initial solar reflectance	Solar Spectrum Reflectometer	0.87
ENERGY STAR - E-903 Solar reflectance after 3 years	Solar Spectrum Reflectometer (uncleaned)	0.61
CRR - Initial solar reflectance	ASTM C1549	0.87
CRR - Solar reflectance after 3 years	ASTM C1549 (uncleaned)	0.61
CRR - Initial thermal emittance	ASTM C1371	0.95
CRR - Thermal emittance after 3 years	ASTM C1371 (uncleaned)	0.86
LEED - Thermal emittance	ASTM E408	0.94
Solar Reflectance Index (SRI)	ASTM E1980	111

LEED Information

Pre-consumer Recycled Content	10%
Post-consumer Recycled Content	0%
Manufacturing Location	Hillside, NJ
VOC Content	0
Solar Reflectance Index (SRI)	White: 111

Typical Properties and Characteristics

Physical Property ASTM D4434 Requirement 50-, 60-, and 80-mil

Physical Property	Test Method	Property of Unaged Sheet	Property after ASTM D3045 aging 56 days @ 176°F
Tolerance on nominal thickness, %	ASTM D638	+10-0	
Thickness over fiber, in. (mm) 50-mil & 60-mil 80-mil	ASTM D4434 Optical Method (avg. of 3 areas)	0.016 (0.406) min 0.025 (0.635) min	
Tensile strength, psi (MPa) (machine & cross-machine direction)	ASTM D638	1500 (10.4) min 1900 (13.1) typical	90% min retention of original tensile strength
Elongation at break, % machine direction cross-machine direction	ASTM D638	250 min (270 typ) 220 min (250 typ)	90% min. retention of original elongation
Tear resistance, lbf (N)	ASTM D1004	10 (45) min 12 (53) typ	
Low temperature bend at -40°F (-40°C)	ASTM D2136	Pass	
Linear dimensional change (shrinkage), % after 6 hours at 176°F (80°C)	ASTM D1204	± 0.1 max -0.05 typ	
Ozone resistance, 100 pphm. 168 hours	ASTM D1149	No Cracks	
Resistance to water absorption after 7 days immersion 158°F (70°C) Change in mass, %	ASTM D570	3.0 max 0.5 typ	
Seam strength, % of tensile strength	ASTM D638	75 min 80 typ	
Water vapor permeance, perms	ASTM E96	0.10 max 0.05 typ	
Puncture resistance		See #2 under Supplemental Approvals, Statements and Characteristics	
Resistance to Xenon-Arc weathering Xenon-Arc, 12,600 KJ/m² total radiant exposure, visual condition at 10X (ASTM D4434 light & spray cycle)	ASTM G155 0.35 W/m² 63°C Black panel temperature (10,000 hours)	No cracks (none) No crazing (none)	

Typical properties and characteristics are based on samples tested and are not guaranteed for all samples of this product. This data and information is intended as a guide and does not reflect the specification range for any particular property of this product