

Sure-Flex™ PVC

FRS Membrane



Overview

Carlisle's Sure-Flex PVC FRS is an advanced-formula, heat-weldable PVC thermoplastic membrane that is designed for long-term weatherability and performance. The physical properties of the membrane are enhanced by fiberglass reinforcement that is encapsulated by thick PVC-based top and bottom plies for fully adhered applications only. The combination of the fiberglass reinforcement and the PVC plies provide PVC FRS membranes with enhanced dimensional stability for fully adhered roof systems using liquid-applied bonding adhesives. The smooth surface of the PVC FRS membrane allows for a permanent weld that creates a consistent, watertight, monolithic roof assembly.

Features and Benefits

- » Wide choice of thicknesses
- » Enhanced chemical resistance
- » Energy efficiency in warm southern climates
- » Heat weldability
- » Low temperature flexibility
- » Encapsulated fiberglass for added dimensional stability in fully adhered applications
- » Impact and puncture resistance
- » UV, ozone and oxidation resistance
- » Easy installation

Installation

With minimal labor and few components required, PVC FRS is quick and easy to install. PVC systems may be installed utilizing labor-saving devices that make sheet welding fast, clean and consistent.

Fully Adhered Roofing Systems

The fully adhered system starts with a suitable surface to apply the Low-VOC Bonding Adhesive or the HydroBond™ Water-Based Adhesive. After stirring (minimum 5 minutes) the Low-VOC Bonding Adhesive, apply to substrate and membrane using a 9" (23 mm) medium nap roller. Application should be continuous and uniform, avoiding globs or puddles. An open time of 5 – 50 minutes, based on drying conditions, is recommended before assembly. Low-VOC PVC Bonding Adhesive must be allowed to dry until it does not string or stick to a dry finger touch. Any coated area that has been exposed to rain should be allowed to dry and then recoated.

The HydroBond Water-Based Adhesive does not need to be stirred and must not be allowed to dry before installing the membrane. HydroBond water-based, one-sided, wet lay-in adhesive can be applied with a medium nap roller to the approved substrate. Once the adhesive is applied using the medium nap roller, 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.

Contact your Carlisle Manufacturer's Representative for the specific design requirements and installation procedures for this system.

Review Carlisle specifications and details for complete installation information.

Precautions

- » Sunglasses that filter out ultraviolet light are strongly recommended since the white surface is highly reflective to sunlight. White surfaces reflect heat and light. Roofing technicians should dress appropriately and wear sunscreen to protect skin from the sun.
- » Smooth surfaces may become slippery due to frost and ice buildup. Exercise caution during cold conditions to prevent falls.
- » Care must be exercised when working close to a roof edge when 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 membrane. Membranes may be slippery when wet.
- » Store PVC FRS membrane in the 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 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 (CRRC), 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
CRRC - Initial solar reflectance	ASTM C1549	0.87
CRRC - Solar reflectance after 3 years	ASTM C1549 (uncleaned)	0.61
CRRC - Initial thermal emittance	ASTM C1371	0.95
CRRC - 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	Test Method	Property of Unaged Sheet	Property after ASTM D3045 aging 56 days @ 176°F
Tolerance on nominal thickness, %	ASTM D638	±10	
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/m ² total radiant exposure, visual condition at 10X (ASTM D4434 light & spray cycle)	ASTM G155	0.35 W/m ² 63°C B.P.T.* (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

* Black panel temperature