

# Sure-Flex™ PVC

## Membrane



### Overview

Carlisle's Sure-Flex PVC 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 a tenacious, weft-inserted polyester fabric that is encapsulated by thick PVC-based top and bottom plies. The smooth surface of the PVC membrane allows for a total-surface fusion and permanent weld, creating a consistent, watertight, monolithic roof assembly. PVC can be used in adhered and mechanically fastened systems. The dark gray-colored bottom ply provides a visual confirmation of a proper weld during the lap welding process.

### Features and Benefits

- » Wide choice of membrane sizes, thicknesses and colors
- » Enhanced chemical resistance
- » Can increase a building's energy efficiency
- » Excellent heat weldability
- » Exceptional low-temperature flexibility
- » Impact Resistance - UL-2218 Class 4 Rating
- » Highly resistant to punctures, UV, ozone and oxidation
- » Easy installation
- » Available in white, gray, light gray, slate gray, and tan

### Installation

With minimal labor and few components required, PVC is quick and easy to install. PVC systems are installed using an Automatic Heat Welder, making sheet welding fast, clean and consistent.

#### Fully Adhered Roofing System

The fully adhered system starts with a suitable surface upon which the CAV-GRIP® PVC, Low-VOC PVC Bonding Adhesive, or HydroBond™ Water-Based PVC Bonding Adhesive is applied.

#### Mechanically Fastened Roofing System

The mechanically fastened system starts with approved insulation being fastened with a minimum of 5 fasteners per 4' x 8' board. The PVC membrane is then mechanically fastened to the deck using HP-X Fasteners™ and Piranha Plates™, or HP-XTRA Fasteners and Piranha XTRA Plates. Adjoining sheets of PVC membrane are overlapped over the fasteners and plates and joined together with a minimum 1½"-wide hot-air weld.

*Review Carlisle specifications and details for complete installation information.*

### Precautions

- » Sunglasses that filter out ultraviolet light are strongly recommended, as the membrane's white surface is highly reflective to sunlight. Roofing technicians should dress appropriately and wear sunscreen.
- » Smooth surfaces may cause slippery conditions 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.

### Optional APEEL™ Protective Film

Shield Carlisle's Sure-Flex PVC membrane from dirt and scuffs during installation with APEEL Protective Film. Factory-applied and easy to remove, APEEL eliminates the need for rooftop cleaning upon project completion.



- » Ideal for re-roofing, re-cover, and new construction projects
- » Simple and easy to remove
- » Film is 100% PVC and recyclable
- » Saves time and money when compared to pressure washing
- » Protecting from dirt maintains maximum membrane reflectivity

#### Installation

Simply order membrane with APEEL, install, and remove the film to reveal a clean, new roof.

- » APEEL Protective film can be left in place for up to 90 days without affecting the integrity of the film
- » After 30 days, membrane sections covered by APEEL should be cleaned with PVC/KEE HP membrane cleaner prior to welding
- » Be sure to clean any excess cleaners, solvents, or adhesives spilled on APEEL protective film

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- » 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 membrane in the original undisturbed plastic wrap in a cool, shaded area and cover with light-colored, breathable, waterproof tarpaulins. PVC membrane that has been exposed to the weather or contaminated with dirt must be prepared with PVC Membrane Cleaner prior to hot-air welding.

## Typical Properties and Characteristics

Physical Property	ASTM D4434 Requirement	50-mil	60-mil	80-mil
<b>Thickness over scrim</b> , in. (mm) ASTM D4434 optical method average of 3 areas	0.016 min (0.40)	0.022 (0.559)	0.027 (0.686)	0.037 (0.940)
<b>Weight</b> , lbs/ft <sup>2</sup> (kg/m <sup>2</sup> )	No requirement	0.33 (1.61)	0.40 (1.95)	0.55 (2.68)
<b>Breaking strength</b> (MD x CD), lbf/in (kN/m) ASTM D751 grab method	275 min (48)	320 x 300 (56 x 53)	330 x 300 (58 x 55)	360 x 330 (63 x 58)
<b>Elongation</b> break of reinforcement (MD x CD), % ASTM D751 grab method	25 min	30 x 30	30 x 30	30 x 30
<b>Tearing strength</b> (MD x CD), lbf (N) ASTM D751 proc. B, 8 in. x 8 in.	90 min (400)	100 x 120 (445 x 534)	100 x 130 (445 x 578)	100 x 132 (445 x 587)
<b>Low temperature bend</b> , ASTM D2136, no cracks 5x at -40°C	PASS	PASS (-40°C)	PASS (-40°C)	PASS (-40°C)
<b>Linear dimensional change</b> , % ASTM D1204, 6 hours at 176°F	±0.5 max	0.4	0.4	0.4
<b>Ozone resistance</b> , no cracks 7x ASTM D1149, 100pphm, 168 hrs	PASS	PASS	PASS	PASS
<b>Water absorption resistance</b> , mass % ASTM D570, 166 hours at 158°F water	±3.0 max	2.0	2.0	2.0
<b>Field seam strength</b> , lbf/in. (kN/m) ASTM D1876 tested in peel	No requirement	25 (4.4) min 60 (10.5) typ.	25 (4.4) min 60 (10.5) typ.	25 (4.4) min 60 (10.5) typ.
<b>Water vapor permeance</b> , Perms, ASTM E96 proc. B	No requirement	0.10 max 0.05 typ	0.10 max 0.05 typ	0.10 max 0.05 typ
<b>Puncture resistance - Federal</b> , lbf (kN) FTM 101C, method 2031	No requirement	280	320	380
<b>Puncture resistance - Dynamic</b> , J (ft-lbf) ASTM D5635	20 (14.7)	PASS	PASS	PASS
<b>Puncture resistance - Static</b> , lbf (N) ASTM D5602	33 (145)	PASS	PASS	PASS
<b>Xenon-Arc resistance</b> , no cracks/ crazing 10x, ASTM G155 0.35 W/m <sup>2</sup> at 340-nm, 63°C B.P.T. 12,600 kJ/m <sup>2</sup> total radiant exposure 10,000 hours	PASS	PASS	PASS	PASS
<b>Properties after heat aging</b> ASTM D3045, 56 days at 176°F Breaking strength, % retained Elongation reinf., % retained	90 min 90 min	90 min 90 min	90 min 90 min	90 min 90 min

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.

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

Physical Property	Test Method	White PVC	Tan PVC	Gray PVC	Light Gray PVC	Slate Gray PVC
ENERGY STAR - E-903 Initial Solar Reflectance	Solar Spectrum Reflectometer	0.86	0.72	0.59	0.74	N/A
ENERGY STAR - E-903 Solar Reflectance after 3 years	Solar Spectrum Reflectometer (Uncleaned)	0.63	Pending	Pending	Pending	N/A
CRRC - Initial Solar Reflectance	ASTM C1549	0.86	0.72	0.59	0.74	N/A
CRRC - Solar Reflectance after 3 years	ASTM C1549 (uncleaned)	0.63	0.60*	0.49*	0.64*	N/A
CRRC - Initial Thermal Emittance	ASTM C1371	0.89	0.87	0.89	0.88	N/A
CRRC - Thermal Emittance after 3 years	ASTM C1371 (uncleaned)	0.87	0.86*	0.86*	0.89*	N/A
Solar Reflective Index (SRI)	ASTM E1980	108	88	70	90	N/A
Solar Reflective Index (SRI) SRI after 3 years	ASTM E1980	75	71*	56*	77*	N/A

\*Rapid Ratings

## LEED® Information

Pre-consumer Recycled Content	10%
Post-consumer Recycled Content	0%
Manufacturing Location	Greenville, IL
Solar Reflectance Index (SRI), Initial	White: 108, Tan: 88, Gray: 70, Light Gray: 90, Slate Gray: N/A

## Supplemental Approvals, Statements and Characteristics

- » Sure-Flex PVC meets or exceeds the requirements of ASTM D4434 Standard Specification for Poly (Vinyl Chloride) Sheet Roofing. Sure-Flex PVC is classified as Type III and/or Type IV as defined by ASTM D4434.
- » Sure-Flex reinforced PVC was tested for dynamic puncture resistance per ASTM D5635-04 using the most recently modified impact head. 50-mil thick membrane was watertight after an impact energy of 22.5 J (16.6 ft-lbf), which passes the ASTM D4434 requirement.
- » Sure-Flex reinforced PVC was tested for static puncture resistance per ASTM D5602-98 and exceeded 33 lbf (145 N), which passes the ASTM D4434 requirement.