CARLISLE SYNTEC SYSTEMS

FleeceBACK® KEE HP
FRS Membranes

Overview

Carlisle's FleeceBACK KEE HP (High Performance) FRS membrane is tough, durable, and versatile, making it ideal for a wide variety of re-roofing and new construction projects. Manufactured using a hot-melt extrusion process for complete scrim encapsulation, this product is available in total sheet thicknesses of 105, 115, and 135 mils.

FleeceBACK KEE HP FRS membrane offers exceptional weatherability, flexibility, and toughness due to its fiberglass reinforcing scrim, polyester fleece backing, and DuPont® Elvaloy® KEE HP copolymer. The fiberglass reinforcing scrim provides the sheet with added dimensional stability for fully adhered applications; the fleece backing enhances the puncture-resistance of the membrane and provides a built-in separation layer against rough concrete decks or existing asphaltic-based roofing systems. Elvaloy KEE HP, a solid plasticizer that won't migrate out of the sheet over time, helps to ensure the membrane remains pliable and weldable as it ages and reduces the amount of smoke generated during the welding process.

Features and Benefits

- Available in white, gray, and tan and offered in 105-, 115-, and 135-mil thicknesses.
  - 105-mil roll size = 10' x 100'
  - 115-mil roll size = 10' x 80'
  - 135-mil roll size = 10' x 65'
- Provides superior wind uplift performance due to a mechanical bond between fleece and adhesive
- Labor-saving 10'-wide sheets result in 67% fewer seams than a modified bitumen system of comparable size
- Fleece backing enhances toughness, durability, and puncture-resistance
- Fiberglass reinforcing scrim provides exceptional dimensional stability
- KEE HP membrane is highly resistant to chemical types, such as acids, restaurant oils, fats, and greases
- California Title 24 compliant, and contributes toward LEED® credits
- Low-volatility KEE HP plasticizer won't migrate out of the sheet over time
- KEE HP contributes to a wide window of weldability and less smoke during the welding process

Installation

FleeceBACK KEE HP FRS membrane can only be installed as a fully adhered system.

Adhered Roofing System – Low Rise Foam

Insulation is mechanically fastened or adhered with FAST™ or Flexible FAST Adhesive to the roof deck. Spray-apply or extrude adhesive onto the substrate, and allow foam to develop string/body/gel prior to setting FleeceBACK membrane into the adhesive. Roll FleeceBACK membrane with a 30"-wide, 150-pound (68 kg) segmented weighted roller to ensure full embedment. Splices are hot-air welded.

Adhered Roofing System – Water Based

The fully adhered system starts with a suitable surface on which to apply the HydroBond™ Water-Based Adhesive.

HydroBond can be applied to the approved substrate with a medium nap roller. Once the adhesive has been applied, roll the membrane in place. To prevent over-drying, Carlisle recommends applying the adhesive 3'–4' at a time ahead of the roll. Immediately broom the membrane starting from the center 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.

Adhered Roofing System – Multiple-Ply

Insulation is mechanically fastened or adhered with FAST Adhesive or Type III, IV, or modified asphalt to the roof deck. When adhering insulation with asphalt, the insulation boards are limited to 4' x 4'. Cover boards are required over the insulation for hot asphalt installations. If a two-ply system is specified, install the SureMB Modified Base Ply with hot asphalt or Carlisle Cold Applied Adhesive over an approved substrate. Attach the SureMB Modified Base Ply to the substrate with Type III, IV, SBS, or SEBS modified asphalt or Cold Applied Adhesive. Apply FleeceBACK KEE HP cap sheet membrane over the base ply substrate with FAST Adhesive, Carlisle Cold Applied Adhesive, SBS, or SEBS Type III or IV asphalt. Broom the FleeceBACK KEE HP cap sheet membrane with a stiff bristle push broom to ensure full embedment. When using FAST Adhesive for membrane attachment, roll the membrane in with a 150 lb roller. Splices are hot-air welded. End laps are sealed with reinforced PVC. FleeceBACK KEE HP cap sheet membrane may be adhered directly to existing smooth BUR, mineral cap sheet, or SBS modified bitumen after priming the surface with cutback asphalt primer.

Review Carlisle specifications and details for complete installation information.

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Supplemental Approvals, Statements, and Characteristics

- FleeceBACK KEE HP FRS meets or exceeds the requirements of ASTM D4434 Standard Specification for Poly (Vinyl Chloride) Sheet Roofing. FleeceBACK KEE HP FRS is classified as a Type III as defined by ASTM D4434.

Precautions

- Use proper stacking procedures to ensure sufficient stability.
- Exercise caution when walking on wet membrane.
- U.V.-resistant sunglasses are required when working with KEE HP membranes.
- White surfaces reflect heat and may become slippery due to frost and ice accumulation.
- Care must be exercised when working close to a roof edge when the surrounding area is snow-covered.
- FleeceBACK membrane rolls must be tarped and elevated to keep them dry prior to installation. If the fleece gets wet, use a wet vac system to help remove moisture from the fleece.
- KEE HP membrane that has been exposed to the weather must be prepared with Carlisle's PVC Membrane Cleaner prior to hot-air welding.

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

Physical Property	Test Method	White KEE HP	Tan KEE HP	Gray KEE HP
ENERGY STAR - E-903 Initial Solar Reflectance	Solar Spectrum Reflectometer	0.82	0.74	0.57
ENERGY STAR - E-903 Solar Reflectance after 3 years	Solar Spectrum Reflectometer (Uncleaned)	Pending	Pending	Pending
CRRC - Initial Solar Reflectance	ASTM C1549	0.87	0.73	0.58
CRRC - Solar Reflectance after 3 years	ASTM C1549 (uncleaned)	0.71*	0.60*	0.50*
CRRC - Initial Thermal Emittance	ASTM C1371	0.89	0.88	0.88
CRRC - Thermal Emittance after 3 years	ASTM C1371 (uncleaned)	0.87*	0.86*	0.84*
Solar Reflective Index (SRI)	ASTM E1980	110	90	69
Solar Reflective Index (SRI) SRI after 3 years	ASTM E1980	87	71*	56*

*Rapid Ratings

LEED® Information

Pre-consumer Recycled Content	5%
Post-consumer Recycled Content	0%
Manufacturing Location	Hillside, NJ
Solar Reflectance Index (SRI), Initial	White: 103, Tan: 91, Gray: 67

Typical Properties and Characteristics

Physical Property	ASTM D4434 Requirement	105-mil	115-mil	135-mil
Thickness over fleece	No requirement	50-mil	60-mil	80-mil
Thickness over scrim, in. (mm) ASTM D7635/D7635M	0.016 min (0.40)	0.018 (0.46)	0.027 (0.69)	0.038 (0.97)
Weight, lbs/ft² (kg/m²)	No requirement	0.41 (2.00)	0.49 (2.39)	0.58 (2.83)
Breaking strength (MD x CD), lbf/in (kN/m) ASTM D751 grab method	200 min (35)	360 x 350	400 x 390	450 x 425
Elongation break of reinforcement (MD x CD), % ASTM D751 grab method	15 min	PASS	PASS	PASS
Tearing strength (MD x CD), lbf (N) ASTM D751 proc. B, 8 in. x 8 in.	45 min (200)	70 x 75	70 x 75	90 x 80
Low temperature bend, ASTM D2136, no cracks 5x at -40°C	PASS	PASS	PASS	PASS
Linear dimensional change, % ASTM D1204, 6 hours at 176°F	±0.5 max	0.4 typ.	0.4 typ.	0.4 typ.
Water absorption resistance, mass % ASTM D570, 166 hours at 158°F water	±3.0 max	1.25	0.87	0.89
Puncture resistance - Dynamic, J (ft-lbf) ASTM D5635	20 (14.7)	PASS	PASS	PASS
Puncture resistance - Static, lbf (N) ASTM D5602	33 (145)	PASS	PASS	PASS
Xenon-Arc resistance, no cracks/crazing 10x, ASTM G155 0.35 W/m² at 340-nm, 63°C B.P.T. 12,600 kJ/m² total radiant exposure 10,000 hours	PASS	PASS	PASS	PASS
Properties after heat aging 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.

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