

FleeceBACK® AFX TPO

Membranes for Multiple-Ply Roofing Systems



Overview

Carlisle's FleeceBACK AFX TPO membranes are tough, durable, and versatile, making them ideal for re-roofing or new construction projects. This high-performance membrane is manufactured using a hot-melt extrusion process for complete scrim encapsulation, and incorporates a 10-ounce (75-mil) AFX fleece backing for added durability and puncture-resistance. Featuring a highly reflective white surface, FleeceBACK AFX TPO contains no chlorine or plasticizers and provides excellent chemical resistance to acids, bases, restaurant oils, and greases. This membrane is offered in total sheet thicknesses of 120, 135, and 155 mils.

Designed for use in adhered roofing and waterproofing systems, AFX TPO is ideal for re-covering aged smooth BUR, mineral cap sheets, or SBS modified bitumen roofs. AFX TPO can be used in conjunction with Carlisle's Modified Base Sheets for a multiple-ply, redundant system. AFX TPO is also approved for use in mechanically fastened systems.

FleeceBACK AFX TPO contains Carlisle's OctaGuard XT™ weathering package, which protects against UV degradation and helps the membrane maintain its highly reflective finish.

Features and Benefits

- » Available in 120-, 135-, and 155-mil thicknesses
- » UL Class A rated
- » Compatible with Hot-Mopped and Cold-Applied Adhesive
- » Up to 75% fewer seams than modified bitumen systems
- » Wide window of weldability
- » Excellent option for multiple-ply systems
- » Outstanding puncture-resistance
 - Greater puncture-resistance than modified bitumen
- » Excellent hail damage resistance
 - Passes FM's severe hail test
 - UL-2218 Class 4 rating
 - Passes National Bureau of Standards – 23 Ice Ball test up to 3"-diameter hail with the membrane cooled to 32°F
- » 10-ounce AFX fleece backing resists asphalt staining

Installation

Adhered Roofing System - Insulation is mechanically fastened or adhered to the roof deck using Carlisle's Cold-Applied Adhesive, FAST-Adhesive, ASTM D312 Type III, IV, or Modified Asphalt. When using asphalt or Cold-Applied Adhesive for insulation attachment, the insulation boards are limited to 4' x 4'. For hot asphalt installations, cover board must be installed atop the insulation. If a two-ply system is specified, install Carlisle Modified Base Sheet with hot asphalt or Cold-Applied Adhesive over an approved substrate. Apply Type III or IV Asphalt, Modified Asphalt or Cold-Applied Adhesive to the substrate or Modified Base Sheet; then set the AFX cap sheet into the asphalt or adhesive. Broom the AFX membrane with a stiff-bristle push broom to ensure full embedment. Splices are hot-air welded. End laps are sealed with reinforced TPO. AFX membrane may be adhered directly to existing smooth BUR, mineral cap sheets, or SBS Modified Bitumen after the surface has been primed with ASTM D41-compliant, Cut-Back Asphalt primer.

Review Carlisle specifications and details for complete installation information.

Precautions

- » Use proper stacking procedures to ensure sufficient stability.
- » Exercise caution when walking on wet membrane.
- » UV-resistant sunglasses are required when working with reflective 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, particularly when the surrounding area is snow-covered.
- » FleeceBACK rolls must be tarped and elevated to keep the material dry prior to installation. If the fleece gets wet, use a wet vac system to help remove moisture from the fleece.
- » Once installed, exposed AFX membrane edges must be sealed with Cut-Edge Sealant, or other night seal options, on a daily basis to prevent water from wicking into the fleece.
- » Membrane that has been exposed to weather must be prepared with Weathered Membrane Cleaner prior to hot-air welding.

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Typical Properties and Characteristics

Physical Property	Test Method	SPEC (PASS)	Sure-Weld
Tolerance on Nominal Thickness, %	ASTM D751	±10	±10
Thickness Over Fleece, min 120-mil (3.05 mm) 135-mil (3.43 mm) 155-mil (3.94 mm)	ASTM D4637 Annex	.030 (.762) .045 (1.14) .080 (2.03)	.045 (1.14) .060 (1.52) .080 (2.03)
Weight, lbm/ft² (kg/m²) 120-mil 135-mil 155-mil	— — —	— — —	0.31 0.40 0.50
Breaking Strength, min, lbf (kN) 120-mil 135-mil 155-mil	ASTM D751 Grab Method	90 (0.4)	300 (1.3) 400 (1.8) 425 (1.9)
Elongation at break of internal fabric, %	ASTM D751	—	25
Tearing Strength, min, lbf (kN) 120- & 135-mil, 155-mil	ASTM D751 B Tongue Tear	10 (45)	55 (245)
Puncture Resistance, Joules 120-mil 135-mil 155-mil	ASTM D5635	— — —	17.5 22.5 30.0
Puncture Resistance, lbf 120-mil 135-mil 155-mil	FTM 101C Method 2031	350 400 425	525 575 600
Brittleness Point, max, °F (°C)	ASTM D2137	-40 (-40)	-50 (-46)
Linear Dimensional Change, %	ASTM D1204	± 1 max	-0.2 typical
Field Seam Strength, lbf/in (kN/m) ASTM D1876 tested in peel 120-mil 135-mil 155-mil	ASTM D1876	25 (4.4) 25 (4.4) 40 (7.0)	40 (7.4) 60 (10.5) 70 (12.3)
Water Vapor Permeance, Perms ASTM E96 proc. B	ASTM E96 Proc B	—	0.10 max 0.05 typical
Resistance to Microbial Surface Growth, Rating (1 is very poor, 10 is no growth)	ASTM D3274	—	9–10 typical
Properties after heat aging ASTM D573, 670 hrs. at 240°F Breaking strength, % retained Elongation reinf. % retained Tearing Strength, % retained Weight Change, %	ASTM D573	— — — —	90 min. 90 min. 60 min. ±1.0 max
Ozone Resistance 100 pphm, 168 hours	ASTM D1149	No cracks	No cracks
Resistance to Water Absorption * After 7 days immersion @ 158°F (70°C). Change in mass, max, %	ASTM D471	+4	+2
Resistance to Outdoor (Ultraviolet) Weathering * Xenon-Arc, 17,640 kJ/m ² (Black) and 7,560 kJ/m ² (White) total radiant exposure at 0.70 W/m ² irradiance, 80°C black panel temp. 120-mil 135-mil 155-mil	ASTM G155	No cracks No loss of breaking or tearing strength	No cracks No loss of breaking or tearing strength 17,640 kg/m ² 20,160 kg/m ² 27,720 kg/m ²
Air Permeance	ASTM E2178	(0.02 L/s*m ²)	Pass

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.

LEED® Information

Pre-consumer Recycled Content	10%
Post-consumer Recycled Content	0%
Manufacturing Locations	Senatobia, MS or Tooele, UT
Solar Reflectance Index	White: 99

Radiative Properties for Cool Roof Rating Council (CRRC) and LEED

Property	Test Method	White
CRRC – Initial solar reflectance	ASTM D1549	0.79
CRRC – Solar reflectance after 3 years	ASTM D1549 (uncleaned)	0.70
CRRC – Initial thermal emittance	ASTM C1371	0.90
CRRC – Thermal emittance after 3 years	ASTM C1371 (uncleaned)	0.86
LEED – Thermal emittance	ASTM E408	0.90
Solar Reflectance Index (SRI)	ASTM E1980	99

Carlisle Extreme Testing – Heat Aging

	ASTM Requirement	Sure-Weld Requirement
ASTM Test 240°F	670 hrs or 4 weeks	5,376 hrs or 32 weeks*

*Comparable to 1,024 weeks (20 years) at 185°F for 6 hrs/day

Heat Aging accelerates the oxidation rate that roughly doubles for each 10°C (18°F) increase in roof membrane temperature. Oxidation (reaction with oxygen) is one of the primary chemical degradation mechanisms of roofing materials.

Carlisle Extreme Testing – Environmental Cycling

–10 days heat aging at 240°F (116°C) followed by 5 days water immersion at 158°F (70°C) or with another specimen set

–5 eight-hour cycles in Kesternich sulfur dioxide chamber (sulfurous acid fog) followed by 5040 kJ/m² (2000 hrs. at 0.70 W/m² irradiance) xenon-arc exposure

Environmental Cycling subjects the membrane to repeated cycles of heat aging, hot-water immersion or acid fog followed by xenon-arc exposure. The acid fog accelerates acid etching that may occur from acid rain if the roof membrane is not resistant to acidic conditions.