

Sure-Tough™ EPDM

Reinforced Membranes



Overview

Carlisle's Sure-Tough polyester-reinforced EPDM roof membranes are available in thicknesses of 45-mil (1.14 mm), 60-mil (1.52 mm), and 75-mil (1.9 mm). Standard sheet size is 10' x 100' (3 m x 30 m). Carlisle offers 6.5'- (1.98 m) wide sheets, ideal for use as perimeter sheets and to achieve certain uplift ratings, in 45- and 60-mil thicknesses.

Sure-Tough membranes are formulated with fire retardants to inhibit the spread of flame and meet or exceed UL Class A requirements for slopes up to 3" (76.2 mm), depending on the assembly. A 10' x 100' Sure-Tough FR membrane is available in 60-mil thickness when higher-slope UL Class A ratings are needed.

Features and Benefits

- » Internally reinforced sheets provide excellent resistance to punctures, tears, and scuffs
- » Carlisle EPDM has over 50 years of proven performance and industry-leading weathering resistance (35,320 kJ/m² total radiant exposure without cracking or crazing)
- » Factory-Applied Tape™ seam technology and full line of Pressure-Sensitive flashing accessories enhance workmanship quality
- » Dark-colored EPDM is the smart choice in colder climates:
 - Reduces heating costs, which are generally 3–5 times greater than air conditioning costs
 - Reduces carbon footprint by lowering heating costs
 - Reduces safety hazards caused by snow and ice accumulation
 - Reduces hazardous conditions caused by frost, dew, and ice
 - Reduces the potential for condensation problems

- » Life Cycle Assessment using EPA's TRACI model analyzed EPDM, TPO, PVC and Modified Bitumen:
 - EPDM had the lowest global warming potential
 - EPDM had the lowest acid rain impact
 - EPDM had the lowest contribution to smog
- » Numerous studies and real-world experience confirm that EPDM's elongation and weathering resistance provide superior hail damage resistance (UL 2218 Class 4 rating)
- » EPDM is the most dimensionally stable, heat-resistant membrane and stays flexible even in extremely cold conditions
- » Extruded manufacturing technology results in seamless sheets that are UL Classified and FM Approved
- » Industry-leading 15, 20, 25, and 30-year warranties are available
- » Carlisle manufactures all the major components of a typical roofing system, including membrane, flashings, tapes, adhesives, sealants, insulations, and insulating cover boards

Carlisle's Factory-Applied Tape Seam Technology

With Carlisle's patented Factory-Applied Tape seam technology, most of the labor to create seams between membrane panels is completed in a quality-controlled, state-of-the-art environment. This process results in a reliable seam with greater peel and shear strengths and no entrapped air bubbles. Consistent placement of the Factory-Applied Tape also maximizes the splice area and results in a high-quality seam. Factory-Applied Tape is available on all Sure-Tough membranes up to 10' (3 m) in width, providing the fastest way to complete a seam in today's roofing market. Factory-Applied Tape has a shelf life of one year.

Reinforced EPDM

Compared to non-reinforced membranes, Carlisle's Sure-Tough Reinforced EPDM offers up to 60% greater resistance to punctures (as measured by ASTM D5635 and Federal Method 2031). Reinforced EPDM features dual-ply construction that makes it resistant to the cuts, tears, and scuffs that can be caused by maintenance traffic, and is backed by the industry's longest puncture warranty.

Installation

Sure-Tough 45-mil (1.14 mm), 60-mil (1.52 mm), and 75-mil (1.9 mm) membranes are utilized in Design MFS (Mechanically Fastened), Design MR (Metal Retrofit), and Design A (Fully Adhered) roofing systems.

Sure-Tough EPDM

Reinforced Membranes

Design MFS (Mechanically Fastened) and Design MR (Metal Retrofit): insulation is mechanically fastened to the roof deck and membrane is secured with seam fastening plates or bars and fasteners. To complete seams between two adjoining membrane panels, apply primer to the splice area in conjunction with Carlisle's Factory-Applied Tape. As an alternative, Carlisle's hand-applied SecurTAPE™ may be used.

Design A (Fully Adhered): insulation is mechanically attached or adhered to the roof deck. The substrate and membrane are coated with the appropriate Carlisle bonding adhesive. The membrane is then rolled into place and broomed down. To complete seams between two adjoining membrane panels, apply primer to the splice area in conjunction with Carlisle's Factory-Applied Tape. As an alternative, Carlisle's hand-applied SecurTAPE may be used.

Follow these steps for splicing in temperatures below 40°F (5°C):

- » Heat the primed area of the bottom membrane with a hot-air gun as the top sheet with Factory-Applied Tape is applied and pressed into place.
- » Prior to rolling the splice area with a 2"-wide steel hand roller, apply heat to the top side of the membrane with a hot-air gun. The heated surface should be hot to the touch. Be careful not to burn or blister the membrane.

Review Carlisle specifications and details for complete installation information.

Precautions

- » Use proper stacking procedures to ensure sufficient stability of the materials.
- » Exercise caution when walking on wet membrane. Membranes are slippery when wet.
- » Membranes with Factory-Applied Tape should not be exposed to prolonged jobsite storage temperatures in excess of 90°F (32°C), otherwise the shelf life of the tape may be affected.
- » When membranes with Factory-Applied Tape are used in warm, sunny weather, shade the tape end of the rolls until ready to use.
- » Factory-Applied Tape has a shelf life of one year.

LEED® Information

Pre-consumer Recycled Content	0%
Post-consumer Recycled Content	0%
Manufacturing Location	Carlisle, PA
Solar Reflectance Index	9

Typical Properties and Characteristics

Sure-Tough Standard and FR EPDM

Physical Property	Test Method	SPEC (PASS)	Typical
Tolerance on Nominal Thickness, %	ASTM D751	±10	±10
Thickness Over Scrim, min, in. (mm) .045 .060 .075	ASTM D4637 Annex	0.015 (0.381)	0.016 (0.406) 0.020 (0.508) 0.032 (0.81)
Weight, lbm/ft² (kg/m²) .045 .060 .075			0.27 (1.3) 0.39 (1.9) 0.48 (2.3)
Breaking Strength, min, lbf (N) .045/0.60 .075	ASTM D751 Grab Method	90 (400)	210 (930)
Elongation, Ultimate, min, % .045/0.60 .075	ASTM D412 Die C	250**	480** 500**
Tearing Strength, min, lbf (N) .045/0.60 .075	ASTM D751 B Tongue Tear	10 (45)	70 (311) 70 (311)
Brittleness Point, max, °F (°C)*	ASTM D2137	-49 (-45)	-49 (-45)
Resistance to Heat Aging* Properties after 4 weeks @ 240°F (116°C) Breaking Strength, min, lbf (N) Elongation, Ultimate, min, % Linear Dimensional Change, max, %	ASTM D573 ASTM D751 ASTM D412 Die C ASTM D1204	80 (355) 200** ±1.0	250 (1,110) 250** -1.0
Ozone Resistance* Condition after exposure to 100 pphm Ozone in air for 168 hours @ 104°F (40°C) Specimen wrapped around 3 in. mandrel	ASTM D1149	No Cracks	No Cracks
Resistance to Water Absorption* After 7 days immersion @ 158°F (70°C) Change in mass, max, %	ASTM D471	+8, -2**	5.5**
Water Vapor Permeance* Max, perms	ASTM E 96 (Proc. B or BW)	0.10	0.02
Fungi Resistance	ASTM G21	N/A	0 (No Growth)
Resistance to Outdoor (Ultraviolet) Weathering* Xenon-Arc, total radiant exposure at 0.70 W/m² irradiance, 80°C black panel temperature	ASTM G155	No Cracks No Cracking 7,560 kJ/m² 3,000 hrs	No Cracks No Cracking 35,320 kJ/m² 14,000 hrs
At 0.35 W/m² irradiance, 80°C black panel temperature		6,000 hrs	28,000 hrs

*Not a quality control test due to the time required for the test or the complexity of the test. However, all tests are run on a statistical basis to ensure overall long-term performance of the sheeting.

**Specimens to be prepared from coating rubber compound, vulcanized in a similar method to the reinforced product.

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.

Note: Sure-Tough reinforced EPDM membrane meets or exceeds the minimum requirements set forth by ASTM D4637 for Type II reinforced EPDM single-ply roofing membranes.