

# 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 5' (1.5 m) and 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.

### Features and Benefits

- » 60% greater resistance to punctures (as measured by ASTM D5635 and Federal Method 2031) compared to non-reinforced membranes
- » Internally reinforced sheets provide excellent resistance to punctures, tears, and scuffs that can be caused by maintenance traffic, backed by the industry's longest puncture warranty
- » Factory-Applied Tape™ seam technology and full line of Pressure-Sensitive flashing accessories enhance workmanship quality
- » 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



### Sustainable Attributes

Carlisle SynTec Systems' focus has always been innovation – Innovation to solve problems, improve performance, reduce labor, and above all, improve sustainability. Carlisle is committed to driving sustainable and efficient processes in the design and manufacturing of our products.

- » Carlisle EPDM has over 60 years of proven performance and industry-leading weathering resistance (35,320 kJ/m<sup>2</sup> total radiant exposure without cracking or crazing)
- » 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
- » Utilizes 5% post- and 5% pre-consumer recycled material resulting in:



**Over 62,000**  
used tires out of  
landfills annually



**98% less**  
water used



**61% less**  
electricity used



**97% less**  
CO<sub>2</sub> used

*When compared to manufacturing with virgin material*

### 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 no entrapped air bubbles. Consistent placement of the Factory-Applied Tape also maximizes the splice area resulting in a high-quality seam.

### 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 or hand-applied SecurTAPE™. Sheet flutter/noise may occur on mechanically fastened systems.

**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 or Carlisle's hand-applied SecurTAPE.

**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   | 5%           |
| Post-consumer Recycled Content  | 5%           |
| Manufacturing Location          | Carlisle, PA |
| Solar Reflectance Index         | 9            |
| Corporate Sustainability Report | Yes          |

### Typical Properties and Characteristics

**Sure-Tough EPDM**

| Physical Property   | Test Method               | SPEC (PASS)  | Typical  |
|---|---------------------------|--|--|
| Tolerance on Nominal Thickness, %   | ASTM D751                 | ±10  | ±10  |
| Thickness Over Scrim, min, in. (mm)   | ASTM D4637 Annex          | 0.015 (0.381)  | 0.016 (0.406)<br>0.020 (0.508)<br>0.032 (0.81)         |
| Weight, lbfm/ft² (kg/m²)  |                           |  | 0.27 (1.3)<br>0.39 (1.9)<br>0.48 (2.3)                 |
| Breaking Strength, min, lbf (N)   | ASTM D751 Grab Method     | 90 (400)   | 210 (930)  |
| Elongation, Ultimate, min, %  | ASTM D412 Die C           | 250**  | 480**<br>500**   |
| Tearing Strength, min, lbf (N)  | ASTM D751 B Tongue Tear   | 10 (45)  | 70 (311)<br>70 (311)                                   |
| Brittleness Point, max, °F (°C)*  | ASTM D2137                | -49 (-45)  | -49 (-45)  |
| Resistance to Heat Aging*   | ASTM D573                 |  |  |
| Properties after 4 weeks @ 240°F (116°C)  |                           |  |  |
| Breaking Strength, min, lbf (N)   | ASTM D751                 | 80 (355)   | 250 (1,110)  |
| Elongation, Ultimate, min, %  | ASTM D412 Die C           | 200**  | 250**  |
| Linear Dimensional Change, max, %   | ASTM D1204                | ±1.0   | -1.0   |
| Ozone Resistance*   | ASTM D1149                | No Cracks  | No Cracks  |
| Condition after exposure to 100 pphm Ozone in air for 168 hours @ 104°F (40°C) Specimen wrapped around 3 in. mandrel                    |                           |  |  |
| Resistance to Water Absorption*   | ASTM D471                 |  |  |
| After 7 days immersion @ 158°F (70°C) Change in mass, max, %  |                           | +8, -2**   | 5.5**  |
| Water Vapor Permeance*  | ASTM E 96 (Proc. B or BW) | 0.10   | 0.02   |
| Max, perms  |                           |  |  |
| 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<br>No Cracking<br>7,560 kJ/m²<br>3,000 hrs | No Cracks<br>No Cracking<br>35,320 kJ/m²<br>14,000 hrs |
| At 0.35 W/m² irradiance, 80°C black panel temperature   |                           | 6,000 hrs  | 28,000 hrs   |
| Air Permeance   | ASTM E2178                | (0.02 L/s*m²)  | Pass   |

\*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.

