CARLISLE SYNTEC SYSTEMS

Sure-Weld® TPO
SAT™ Reinforced Membrane

Overview

Carlisle's Sure-Weld SAT (Self-Adhering Technology) membrane is a heat-weldable single-ply thermoplastic polyolefin (TPO) sheet designed for fully adhered new roof construction and re-roofing applications. Sure-Weld SAT is nominal 60-mil or 80-mil reinforced TPO membrane laminated to an elastomeric pressure-sensitive adhesive. TPO membrane is based on advanced polymerization technology that combines the durability and weatherability of ethylene-propylene (EP) rubber with the heat weldability of polypropylene. The membrane is specifically formulated for long-term weather resistance without the use of either polymeric or liquid plasticizers.

Every roll of SAT TPO membrane utilizes Carlisle's exclusive Lay-Flat Technology, a perfect combination of membrane, adhesive and manufacturing expertise that results in the easiest TPO installation.

The pressure-sensitive adhesive is a 100%-solid, hot-melt adhesive that eliminates VOC and odor concerns typically associated with fully adhered systems. The adhesive is factory-applied to provide uniform thickness, yielding consistent field performance. An uncoated edge is maintained to allow for heat-welded field seams. The release liner is silicon-coated on both sides to provide consistent, easy release from the adhesive even if either side accidentially touches the adhesive again after removal.

SAT TPO is available in 60-mil and 80-mil white (highly reflective) nominal thickness. Available sizes are 10' x 50' and 10' x 100' rolls. The membrane is environmentally friendly and safe to install with its VOC-free pressure-sensitive adhesive and heat-welded seams.

Carlisle's SAT TPO white membranes can contribute toward LEED® (Leadership in Energy and Environmental Design) credits, and are ENERGY STAR®*-qualified and California Title 24-rated.

Features and Benefits

- ENERGY STAR*-qualified, Title 24-compliant and can contribute toward LEED credits
- FM, UL and CRRC rated; UL-2218 Class 4 Rating
- Improved adhesive formulation for superior bonding to substrates
- No solvents, VOCs or odors
- Double-sided release liner
- Smooth membrane reduces dirt buildup and stays cleaner longer
- Full line of Certified Fabricated Accessories (CFA)
- Exclusive Lay-Flat Technology
- Enhanced with the OctaGuard XT™ weathering package
- APEEL Protective Film application guards the membrane's surface from scuffs and dirt accumulation during installation, improving the roof system's appearance and long-term performance
- APEEL Protective Film can be left in place for up to 90 days without degrading due to its excellent heat- and UV-resistance

OCTAGUARD XT WEATHERING PACKAGE

APEEL PROTECTIVE FILM

Productivity Boosting Features and Benefits:

- Consistent adhesive application
- No waiting for flash-off
- No stirring
- Up to 80% labor savings compared to traditional bonding adhesive

PRODUCTIVITY $ BOOSTER

Optional APEEL™ Protective Film

Carlisle's Sure-Weld SAT membrane is available with an optional APEEL Protective Film, saving time and labor by eliminating the need for roof cleaning upon project completion. Carlisle's innovative APEEL Protective Film can be left in place for up to 90 days without affecting the integrity of the film, guarding the TPO membrane's surface from scuffs and dirt accumulation during installation. Durable and easy to remove, APEEL Protective Film improves aesthetics and long-term reflectivity and is ideal for re-roofing, re-cover, and new construction projects.

Sure-Weld TPO
SAT Reinforced Membrane

Installation

SAT TPO Roofing Systems are fast to install as minimal labor and few components are required.

SAT TPO membrane is approved for application directly to the following substrates: Carlisle's InsulBase® Polyiso, SecurShield® Polyiso, SecurShield HD, SecurShield HD Plus, SecurShield CD, Insulfoam® SP, DensDeck® Prime, SECUROCK®, OSB, plywood, metal, clean concrete block. Contact Carlisle with any questions regarding additional acceptable substrates.

Carlisle's SAT TPO Fully Adhered Roofing System application begins with the insulation/underlayment being attached per the required attachment specification.

1. Carlisle's SAT TPO membrane may only be installed when the outdoor temperature is at least 50°F (10°C).
2. The surface to which the membrane is to be applied must be very clean. Prior to membrane placement, the surface of the insulation or underlayment board must be cleaned of dust and other foreign matter using a fine push broom or a blower.

   Note: Priming of the insulation surface is not required.
3. Remove the release liner on one half of the sheet starting from the split in the liner at the middle of the sheet. The liner should be removed at an angle to reduce splitting or tearing.
4. Roll the membrane onto the substrate while avoiding wrinkles. To achieve the best adhesion, the membrane should be rolled onto the substrate at an angle. When applying Carlisle's SAT TPO membrane it is recommended to maintain a large curve (radius) on the leading edge of the membrane. This will help eliminate creases and bubbles that cannot be removed after the sheet is in place.
5. Roll Carlisle's SAT TPO membrane with a segmented roller to ensure full contact with the substrate. Roller should weigh at least 50 lbs. (22 kg) per linear foot.
6. Fold back the remaining half of the sheet and repeat the above process.

Heat-Welding Procedures

1. Refer to the TPO Adhered Application specification for typical heat-welding procedures.
2. The membrane has an uncoated edge on one side along the length of the sheet for membrane welding. Adjoining membrane sheets are overlapped lengthwise a minimum of 2" to provide for a minimum 1½"-wide heat weld. It is recommended that all splices be shingled to avoid bucking of water.
3. An uncoated edge is not provided at the ends of the rolls. Adjoining membrane sheets must be butted together and overlaid with 6"-wide TPO Reinforced Membrane, hot-air welded along all edges. Seal all membrane edges (where scrim reinforcement is exposed) with TPO Cut-Edge Sealant.**

Wall Flashing

Walls may be flashed using standard TPO membrane in conjunction with TPO Bonding Adhesive or CAV-GRIP Low-VOC Adhesive. SAT TPO membrane can also be used as wall flashing.

Review Carlisle specifications and details for complete installation information.

Precautions

- A static electric charge may develop when removing the poly release liner from the elastomeric pressure-sensitive adhesive on the back of the membrane sheet. To avoid the possibility of ignition, lids must be closed on any flammable products and a fire extinguisher should be readily available.
- Sunglasses that filter out ultraviolet light are strongly recommended as tan and white surfaces are highly reflective. Roofing technicians should dress appropriately and wear sunscreen to protect skin from the sun.
- Surfaces may become slippery 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.
- Use proper stacking procedures to ensure sufficient stability of the rolls.
- Exercise caution when walking on wet membrane. Membranes may be slippery when wet.
- Store SAT TPO membrane in the original undisturbed plastic wrap in a cool, shaded area and cover with light-colored, breathable, waterproof tarpaulins. SAT TPO membrane that has been exposed to the weather must be prepared with Weathered Membrane Cleaner prior to hot-air welding.

Codes and Approvals

1. TPO meets or exceeds the requirements of ASTM D6878 Standard Specification for Thermoplastic Polyolefin Based Sheet Roofing.
2. Reinforced TPO was tested for dynamic puncture resistance per ASTM D5635 using the most recently modified impact head. It was watertight after an impact energy of 22.5 J (16.6 ft-lbf).
3. TPO membranes conform to requirements of the U.S.E.P.A. Toxic Leachate Test (40 CFR part 136) performed by an independent analytical laboratory.

Radiative Properties for ENERGY STAR, Cool Roof Rating Council (CRRC)

Property	Test Method	Sure-Weld SAT TPO
ENERGY STAR – Initial solar reflectance	Solar Spectrum Reflectometer	0.79
ENERGY STAR – Solar reflectance after 3 years	Solar Spectrum Reflectometer (uncleaned)	0.70
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 Information

Pre-consumer Recycled Content	8%
Post-consumer Recycled Content	0%
Manufacturing Location	Tooele, UT
Solar Reflectance Index (SRI)	99

CARLISLE SYNTEC SYSTEMS

Sure-Weld® TPO
SAT™ Reinforced Membrane

Typical Properties and Characteristics

Physical Property	Test Method	60-mil	80-mil
Nominal thickness with adhesive, in. (mm) (adhesive nominal thickness is 0.010)	ASTM D751	0.070 (1.78)	0.090 (2.286)
Thickness over scrim, in. (mm)	ASTM D6878 (avg. of 3 areas)	0.024 typical (0.610)	0.034 typical (0.864)
Breaking strength, lbf (kN)	ASTM D751 Grab Method	250 (1.1) min 360 (1.6) typical	350 (1.6) min 425 (1.9) typical
Elongation at break of fabric, %	ASTM D751	25 typical	25 typical
Tearing strength, lbf (N) 8 x 8 in. Specimen	ASTM D751 B Tongue Tear	55 (245) min 130 (578) typical	55 (245) min 130 (578) typical
Brittleness point, °F (°C)	ASTM D2137	-40 (-40) max -50 (-46) typical	-40 (-40) max -50 (-46) typical
Linear Dimensional Change (shrinkage), % After 6 hours at 158°F (70°C)	ASTM D1204	± 0.5 max -0.2 typical	± 1 max -0.2 typical
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, %	ASTM D471 (top surface only)	3.0 max 2.0 typical	3.0 max 2.0 typical
Resistance to microbial surface growth, rating (1 is very poor, 10 is no growth)	ASTM D3274 2 yr S. Florida	9–10 typical	9–10 typical
Field seam strength, lbf/in. (kN/m) Seam tested in peel	ASTM D1876	25 (4.4) min 60 (10.5) typical	40 (7.0) min 70 (12.3) typical
Water vapor permeance, Perms	ASTM E96	0.10 max 0.05 typical	0.10 max 0.05 typical
Puncture resistance, lbf (kN)	FTM 101C Method 2031	300 (1.3) min 350 (1.6) typical	400 (1.8) min 450 (2.0) typical
Resistance to xenon-arc weathering[2] Xenon-Arc, 17,640 kJ/m² total radiant exposure, visual condition at 10x	ASTM G155 0.70 W/m² 80°C B.P.T.	No cracks No loss of breaking or tearing strength	No cracks No loss of breaking or tearing strength
Properties After Heat Aging	ASTM D573, 32 weeks @ 240°F or 8 weeks @ 275°F No cracking when bent around 3" diameter mandrel	PASS No cracking	PASS No cracking

[1] Aging conditions are 28 days at 240°F (116°C) equivalent to 400 days at 176°F (80°C) for breaking strength, elongations, tearing strength, ozone and puncture resistance
[2] Approximately equivalent to 14,000 hours exposure at 0.35 W/m² irradiance. B.P.T. is black panel temperature.

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.

*ENERGY STAR recommends that using the Roof Savings Calculator (rsc.ornl.gov), which factors in both heating and cooling costs, to determine whether a cool roof will be an energy efficient choice for your geographic climate and building type.

800-479-6832 | P.O. Box 7000 | Carlisle, PA 17013 | Fax: 717-245-7053 | **www.carlislesyntec.com**