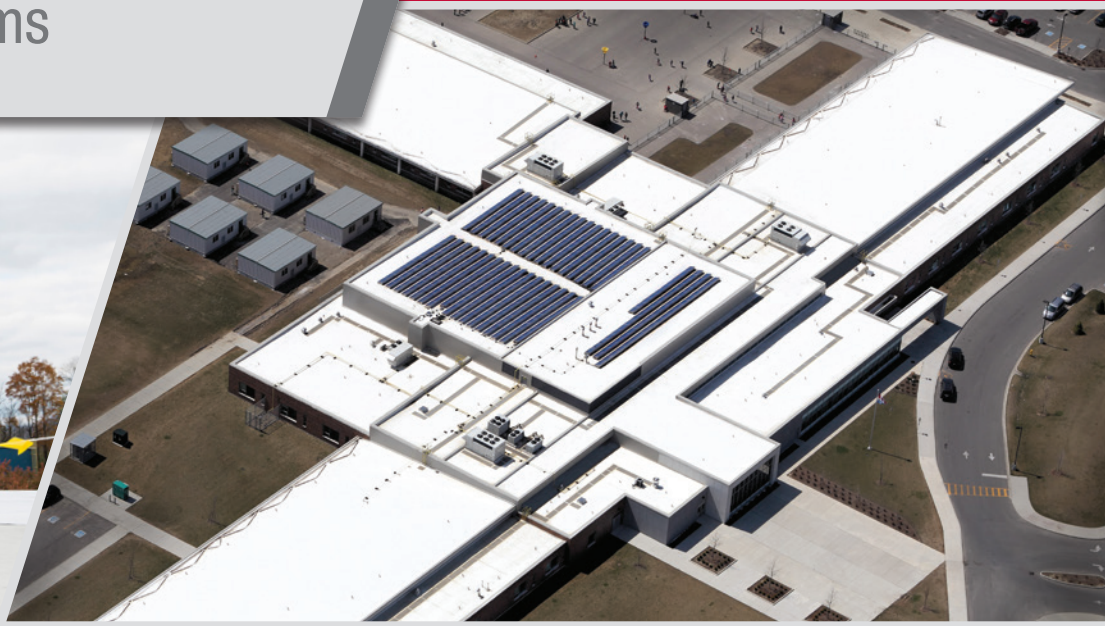
CARLISLE SYNTEC SYSTEMS

Sure-Weld® TPO
Roofing Systems



The Industry's Premier Heat-Weldable Roofing System

Why Choose **Sure-Weld TPO?**

Why Carlisle's TPO?

Thermoplastic polyolefin (TPO) membranes are the fastest-growing segment in the commercial roofing industry and are highly reflective and heat/UV resistant. TPO membranes first became commercialized for roofing in the late 1980's and since 2007 TPO has been the largest market segment of low-slope roofing.

Carlisle SynTec Systems' Sure-Weld TPO membrane is comprised of three layers – a TPO polymer base; a strong, polyester-reinforced fabric center (scrim) and a tough thermoplastic polyolefin compounded top-ply. Because the top-ply is the most vital membrane component for long-term weathering characteristics, Carlisle manufactures all of its TPO membranes with an industry leading thicker top-ply over scrim. Sure-Weld TPO is also packed with the industry leading OctaGuard XT™ weathering package, a combination of ingredients that allow Sure-Weld TPO to stand up to the toughest weather conditions and stand the test of time.

INDUSTRY LEADING WARRANTY COVERAGE

Carlisle's industry-leading warranties offer building owners unparalleled leak coverage, are transferrable, and are available with optional hail, wind, and accidental puncture coverage. Available warranties for Sure-Weld TPO and Sure-Weld FleeceBACK TPO roof systems include:

- A 10-, 15-, or 20-year Golden Seal Total System Warranty with No Dollar Limit
- A 25- or 30-year Golden Seal Total System Warranty when using 80-mil Sure-Weld EXTRA or 135-mil Sure-Weld FleeceBACK membranes
- Wind speed coverage ranging from 55 – 120 mph maximum peak gust wind speeds
- Available 10-year Reflectivity Warranty (based on CRRC reflectivity qualifications) with white membranes
- Available Hail and Puncture Warranty coverage

SUSTAINABILITY

Carlisle Construction Materials is committed to driving measurable results that will contribute to our legacy of sustainability. Carlisle's long history of responsible and sustainable practices extends to the development and production of our highly engineered, energy efficient products and solutions such as Sure-Weld TPO roof systems.

Carlisle's highly reflective Sure-Weld TPO membranes can help reduce the urban heat island effect, reduce energy consumption in warm climates, and contribute to sustainable building certifications such as LEED and Living Building Challenge.

Sustainable attributes include:

- 10% pre-consumer recycled content
- Fully recyclable when used in mechanically attached systems
- 3rd-Party verified Environmental Product Declaration available
- NSF P151 certification for rainwater catchment*
- Certified by the Cool Roof Rating Council and California Title 24 compliant**
- Living Building Challenge "Red List Free" - Declare Label

*White membrane only, produced in Tooele, UT
**White and Tan only

ADVANTAGES OF SURE-WELD TPO

PROVEN LONG-TERM PERFORMANCE

Why It's Important: There are a lot of roofing manufactures to choose from, so it's important to select the manufacturer and membrane that has superior weathering characteristics when tested, and proven real-world experience to back it up.

No one in the industry has more experience, history, and expertise than Carlisle when it comes to manufacturing single ply roofing. Carlisle has over 50 years of experience manufacturing single-ply membranes and over 25 years of real-world TPO performance.

Sure-Weld TPO is engineered to far exceed the accelerated weathering testing in the ASTM D6878 standard for TPO membranes. In fact, Sure-Weld TPO has been tested to withstand more than 4-times the heat aging requirements in the standard and can withstand the equivalent of 40 years of harsh UV and heat exposure in Q-Trac accelerated weathering testing.

Heat Aging Following ASTM D6878 Protocol

Carlisle's Sure-Weld TPO – 60 Weeks (No Failure)

"Competitor C" TPO – 37 Weeks

GREATER WEATHER RESISTANCE

Why It's Important: Over the course of its life, a TPO roof will need to stand up to the worst mother nature can throw at it. Not only does it have to resist high heat and extreme UV exposure, but it should be able to resist damage from wind, impacts and even foot traffic.

- Carlisle's Sure-Weld TPO is tested to resist hail and impact, with assemblies that pass Factory Mutual Very Severe Hail (VSH) testing, FM 4470 Foot Traffic testing, and available hail and puncture warranties.
- Sure-Weld TPO provides superior tearing and breaking strength, allowing it to resist wind uplift and puncture. Coupled with Carlisle's high-performance cover boards, fasteners, and adhesive systems, there are Sure-Weld TPO assemblies available to stand up to the most severe climates.

SEAM STRENGTH AND WELDABILITY

Why It's Important: When installed properly, a bond in a heat-welded seam is stronger than the membrane itself, resulting in a monolithic roof surface that is impervious to water. TPO that's easy to weld also makes it simple if alterations or repairs are ever needed.

- Sure-Weld TPO membranes can be welded at the widest temperature and humidity ranges compared to other TPO membranes on the market, resulting in strong consistent welds in any climate.
- Independent tests show that Carlisle's TPO membrane exhibits far stronger seams than competing products. That means better wind uplift performance with fewer leaks and callbacks.

INDUSTRY LEADING WEATHERING PACKAGE

Why It's Important: In a TPO membrane, the "Weathering Package" is the group of ingredients that help the TPO stand up to high heat and UV exposure over time.

- Carlisle has been at the forefront of TPO development for over 20 years and continues to lead the industry with its high-performance OctaGuard XT weathering package.
- OctaGuard XT is comprised of eight performance-enhancing ingredients, including three heat-stabilizing antioxidants and three UV light stabilizers as well as organic and inorganic UV absorbers. When combined, these eight ingredients provide a weathering package second to none in the TPO industry.

OCTAGUARD XT
WEATHERING PACKAGE

CLEANER AND MORE REFLECTIVE FOR LONGER

Why It's Important: As a white membrane collects dirt, the cost savings and environmental benefits associated with having a reflective roof are severely reduced and the higher associated temperatures can accelerate aging.

- The time-tested Sure-Weld TPO compound produces one of the most reflective TPO sheets on the market.

  Sure-Weld TPO membrane also does not provide a food source for microbial growth that could discolor the membrane.
- Available APEEL Protective Film ensures that the roof starts as clean and reflective as possible when the installation is complete.

WIDER MEMBRANE = FEWER SEAMS

Why It's Important: Seams and splices are often areas where leaks are found as roofs age. It also takes time and labor to weld or splice sheets of membrane together when installing the roof.

- Carlisle's Sure-Weld TPO is available in sheet's up to 16-feet wide. Compared to a traditional modified bitumen system, with 3.3-foot wide rolls, this can result in over 80% fewer seams.
- The use of wider sheets of membrane means less time and labor spent loading, staging, and splicing sheets together, reducing installation time and cost.

TPO PRODUCT OFFERINGS

Sure-Weld TPO

Thickness: 45-, 60-, 80-mil

Width: 4', 6', 8', 10', 12', and 16'

Standard Colors: White, Gray, Tan

Special Colors*: Slate Gray, Medium Bronze, Rock Brown, Terra Cotta, Patina Green

Sure-Weld FleeceBACK TPO

Thickness: 100-, 115-, 135-mil

Width: 6', 12'

Standard Colors: White, Gray, Tan

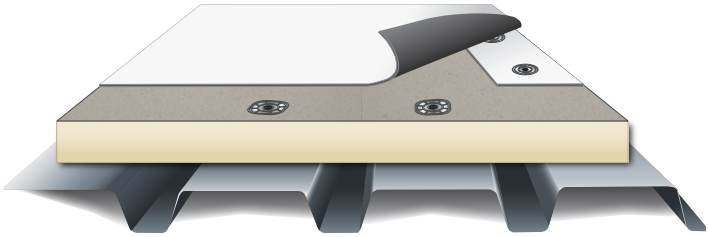
Special Colors*: Slate Gray, Medium Bronze, Rock Brown, Terra Cotta, Patina Green

*Not available in all standard widths and thicknesses.

System **Options**

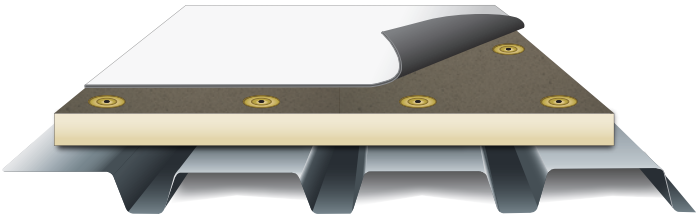
MECHANICALLY ATTACHED SYSTEMS

Mechanically Attached Systems require mechanical attachment of the insulation to the deck and mechanical attachment of the membrane within the seam area. Adjoining membrane sheets are overlapped to cover fasteners and plates in the seams and joined together by hot-air welding.



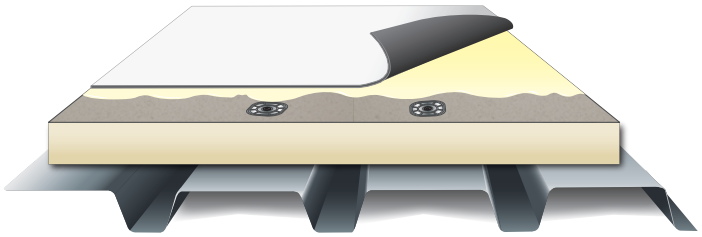
INDUCTION WELDED SYSTEMS

Induction welded systems use fasteners and specially coated plates to secure both the insulation and membrane. Each coated plate is heated with a special induction tool and then cooled using a magnet to secure the membrane to each plate. Adjoining membrane sheets are overlapped and joined together by hot air welding.



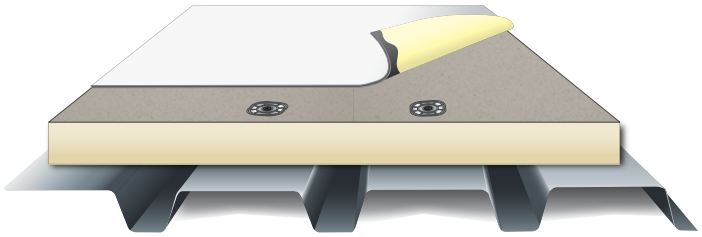
FULLY ADHERED SYSTEMS

Fully Adhered Systems require mechanical or adhesive attachment of the insulation to the roof deck. The TPO membrane and substrate are then coated with bonding adhesive, the membrane is rolled into place and seams are then hot-air welded.



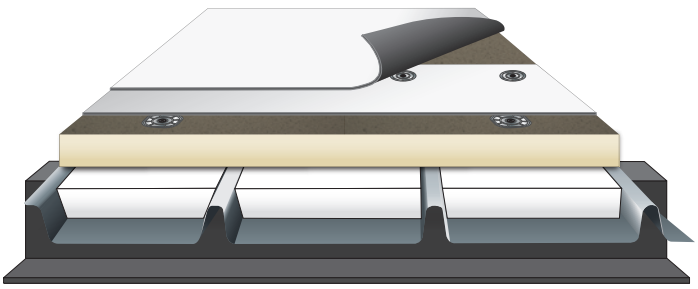
SAT™ (SELF-ADHERING TECHNOLOGY)

Sure-Weld TPO with SAT membrane is a 60-or 80-mil TPO membrane laminated to an elastomeric factory-applied adhesive. The pre-applied adhesive eliminates VOC and odor concerns typically associated with fully adhered systems. SAT TPO also allows for faster installation because it eliminates time spent applying adhesive and waiting for it to flash off.



METAL RETROFIT SYSTEMS

Carlisle's Sure-Weld TPO can be installed over an existing standing seam metal roof to offer proven, long-lasting protection while increasing the energy efficiency of the building. This solution can be more cost effective than replacing the metal roof while proving to be a much longer-term solution compared to coatings.

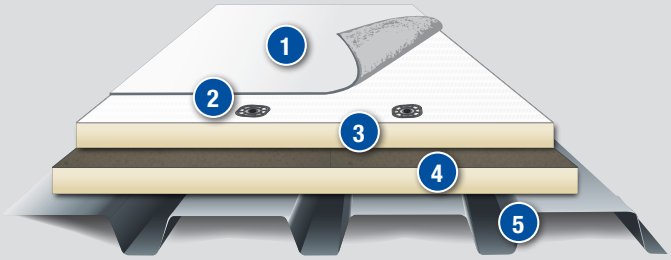


Carlisle's RapidLock Roofing Systems

Carlisle's RapidLock (RL) Roofing System is a revolutionary membrane attachment method that provides a fully adhered system without the use of adhesives. The RL system utilizes VELCRO® Brand Securable Solutions along with FleeceBACK RL TPO to achieve performance on par with traditional fully adhered single-ply systems. Underlayment options include InsulBase RL, SecurShield RL Polyiso, or SecurShield HD RL Polyiso. The RL system is VOC- and odor-free, has no application temperature restrictions, and provides significant labor savings thanks to the simplicity of the system and ease of installation.

SYSTEM FEATURES & BENEFITS

- No application temperature restrictions
- VOC- and odor-free
- Adhesive-less system saves time and labor
- RL fleece is specifically designed to work with RL Insulation facer and features a removable slip sheet for ease of installation
- Excellent Wind uplift performance and ratings (up to FM 1-225), comparable to traditional fully adhered single-ply systems
- Fleece reinforcement adds toughness, durability, and enhanced resistance to hail and punctures



Typical Application

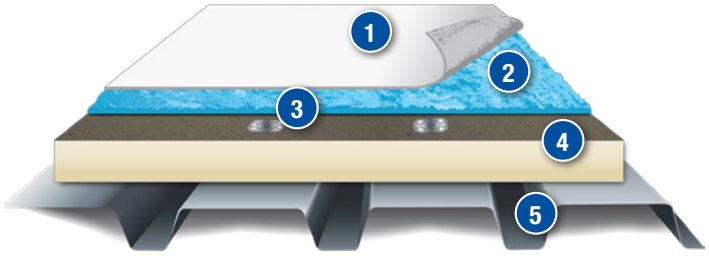
1. FleeceBACK® RL™ TPO Membrane with RapidLock Technology
2. Insulation Fasteners and Plates
3. InsulBase® RL Polyiso, SecurShield® RL Polyiso or SecurShield HD RL Polyiso with RapidLock Technology
4. InsulBase Polyiso or SecurShield Polyiso
5. Steel Deck

FleeceBACK TPO

Carlisle's FleeceBACK TPO contains the OctaGuard XT weathering package, which provides excellent resistance to UV and extreme temperatures. The fleece backing provides additional protection against hail, cuts, and punctures. FleeceBACK TPO is typically adhered using Carlisle's Flexible FAST Adhesive, a low-odor and VOC-free urethane adhesive that provides superior wind uplift performance.

Membrane Options	
Colors	White, Gray, Tan. *Special Colors: Medium Bronze, Rock Brown, Terra Cotta, Slate Gray, Patina Green
Thicknesses	TPO + Fleece: 100, 115, and 135 mils
Standard Widths	6' and 12'
Standard Lengths	50' and 100' (100- and 115-mil) 75' (135-mil)

*Special Colors available in limited thicknesses and sizes. Contact a Versico Representative for more details.



Typical Application

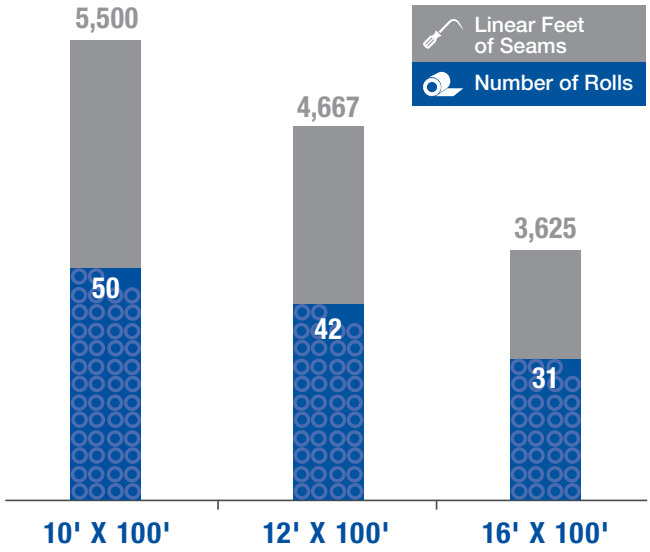
1. FleeceBACK TPO Membrane
2. Flexible FAST™ Adhesive
3. Carlisle Fasteners and Plates
4. 2" InsulBase Polyiso Insulation
5. Steel Deck

Sure-Weld 16-Foot TPO

Carlisle's introduction of the industry's first ever 16-foot-wide TPO sheet brings labor savings and efficiency to get more done in less time. With fewer rolls to load on the roof, less time spent positioning and kicking out rolls, and fewer seams to weld, 16-foot wide TPO is the fastest and most efficient way to install adhered and induction welded TPO roofs.

Rooftop Usage

Example: 50,000 square feet



Sure-Weld Extra TPO

Sure-Weld Extra TPO is Carlisle's thickest, most durable, and longest-lasting TPO membrane. Available in standard and FleeceBACK versions, Sure-Weld Extra TPO provides excellent long-term durability and exceptional resistance to hail and punctures. Sure-Weld Extra TPO also offers superb UV resistance due to the increased levels of Carlisle's OctaGuard XT Weathering Package that thicker membranes contain.

Sure-Weld® Extra TPO
Roofing Systems

DEPENDABILITY

Because of their unmatched performance, Sure-Weld Extra membranes are available with a variety of enhanced warranty packages. The warranty packages available for Sure-Weld Extra membranes include:

- Puncture warranty
- 10-year reflectivity warranty (available for white membranes)
- 30-year No Dollar Limit watertight warranty, which covers:
  - Membrane, insulation, fasteners, and terminations
  - Accidental puncture
  - Wind damage up to 120 mph
  - Hail damage (up to 2")

Each detail of a Sure-Weld Extra TPO roofing system is meticulously engineered by Carlisle to ensure its long-term performance. Every square inch of Sure-Weld Extra TPO is enhanced with the most advanced weathering package on the market: Carlisle's OctaGuard XT.

Because thicker TPO membranes contain higher levels of the OctaGuard XT weathering package, Carlisle's 80-mil Sure-Weld Extra TPO provides longer-lasting protection against the negative effects of UV degradation and heat exposure. The additional protection provided by an upgrade to Sure-Weld Extra TPO often adds as little as 8% to the system's total installed costs, while increasing the lifespan of the roof by as much as 33%.

All of these dependable attributes lead to unmatched warranties for Sure-Weld Extra TPO roof systems.

CARLISLE'S SURE-WELD EXTRA TPO PRODUCTS INCLUDE

- 80-mil Sure-Weld TPO
- 135-mil FleeceBACK TPO
- 155-mil FleeceBACK AFX TPO
- 80 mil SAT TPO

Sure-Weld TPO With APEEL Protective Film

Carlisle's patented APEEL Protective Film guards the surface of TPO membrane from scuffs and dirt accumulation during installation, eliminating the need to clean the roof once the project is complete. Durable and easy to remove, APEEL Protective Film helps save time and labor, improves aesthetics and increases reflectivity. Sure-Weld TPO membrane with APEEL Protective Film is ideal for re-roofing, re-cover and new construction projects.

- Film keeps membrane clean during installation to maximize initial and longterm roof reflectivity and energy savings
- Tough protective film helps prevent scuffs and scratches on TPO membrane during the construction process
- Holes in the film during removal can help identify accidental cuts or punctures made during installation before a leak occurs
- Eliminates the need to clean the roof after installation
- Split film is easily removed by one person
- Gray color helps the surface dry quickly and cuts down on glare

CARLISLE'S APEEL COVER TAPE & APEEL COVER TAPE APPLICATOR

Carlisle's APEEL 6" Cover Tape and APEEL Cover Tape Applicator allow contractors to keep 100 percent of the TPO surface clean during installation, including the seams and areas around details where film may have been removed for welding.

Terra Cotta

SURE-WELD HS TPO SPECIAL COLOR PROGRAM

Turn your roof into a canvas with Carlisle's TPO Special Color Program. The leader in single-ply technology offers more pre-formulated colors than any other manufacturer in the marketplace with reinforced membrane available in 10' x 100' sheets, non-reinforced flashing available in 24" x 50' rolls, TPO Rib Profiles, custom accessories and flashings, and TPO coated metal available in 4' x 10' sheets.

carlisle's tpo color PALETTE

Medium Bronze	Rock Brown	Slate Gray	Terra Cotta	Patina Green

* Color samples printed here are approximations. For actual colors, request a sample of TPO Special Color Membrane.

** Special Color membranes will 'fade' over time mainly due to the ultraviolet portion of sunlight. Since most roof surfaces are exposed to variable sunlight, some areas will be more susceptible to color changes caused by UV fading. Warranties for Special Color membranes do not cover fading of colors.

10 Things to Consider When Investing in a **TPO Roofing System**

1 EXPERIENCE AND INNOVATION

Carlisle has led the industry in TPO research and development for over 20 years. Billions of square feet of Sure-Weld TPO membrane have been installed on rooftops across the globe; more than any other manufacturer.

2 WEATHERING PACKAGE

Every square foot of Sure-Weld TPO is enhanced with the industry leading OctaGuard XT weathering package which results in the most dependable long term performance characteristics of any TPO membrane.

3 SEAM STRENGTH

Independent tests show that Carlisle's TPO membrane exhibits far stronger seams than competing products. That means better wind uplift performance and fewer leaks.

4 WELDABILITY

Sure-Weld TPO membranes can be welded at the widest temperature and humidity ranges resulting in strong welds without having to modify welder settings to compensate for changing climatic conditions.

5 ENERGY EFFICIENCY

Carlisle's White TPO membrane features an initial Cool Roof Rating Council solar reflectance of .79 and emissivity of .90 to keep the building cooler on hot sunny days and meet LEED and cool roofing requirements.

6 APPEARANCE

A combination of our state-of-the-art manufacturing process and over 20 years of manufacturing experience creates a top surface designed to resist dirt, debris, mildew and bacteria build-up. That means you get a cleaner, more solar reflective membrane throughout the life of your roof.

7 DIVERSITY AND VERSATILITY

Carlisle manufactures Sure-Weld TPO membranes with a wide range of thicknesses, widths, lengths and colors, providing the ability to get the perfect TPO membrane for your roofing project.

8 THICKNESS OVER SCRIM

Carlisle's TPO features a typical thickness over scrim well above the ASTM minimum. This thickness leads to greater weathering resistance for added protection against solar heat and UV.

9 WARRANTIES

Carlisle's Total System warranties covering the system for up to 30 years, as well as a large warranty reserve, reflect a commitment and ability to address any warranty issue.

10 PREFABRICATED ACCESSORIES

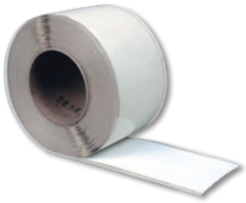
Carlisle offers over a dozen prefabricated, in-stock, accessories and countless custom-order accessories. All carry a CFA (Certified Fabricated Accessory) stamp of approval, so you know they are manufactured to the highest standards.

Certified Fabricated Accessory

ACCESSORIES & ADHESIVES

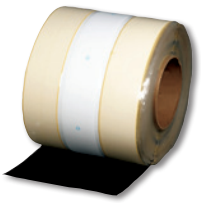
Carlisle offers a wide variety of fully formulated TPO accessories to make it easy for contractors to complete even the most challenging details. Beyond the accessories shown here, Carlisle also offers custom fabricated accessories in all TPO colors to fit any situation. All of these are covered under Carlisle's Total Roof System Warranty and are marked with the Certified Fabricated Accessory stamp so you can be sure they are of the highest quality.

Non-Reinforced Flashing



Pressure-Sensitive Coverstrip

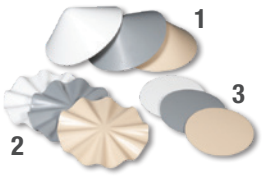
Yellow Pressure-Sensitive Warning Strip



Pressure-Sensitive RUSS

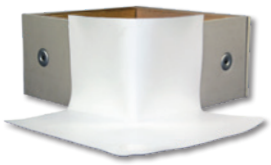
Split Pipe-Seals

Molded Pipe Seals



1-TPO Inside Corners
2-TPO Outside Corners
3-TPO T-Joint Covers

Molded Sealant Pockets



Curb Wrap Corners

Universal Corners

TPO Rib Profile

CAV-PRIME Low-VOC Primer and TPO Primer in pressurized cylinders

CAV-GRIP® III Adhesive/Primer

Low-VOC Primer

TPO Bonding Adhesive

Low-VOC Bonding Adhesive

SURE-WHITE EPDM AND SURE-SEAL EPDM GRAY PRESSURE-SENSITIVE ACCESSORIES ON TPO

Carlisle SynTec Systems allows applicators to use several of its productivity-boosting Sure-White and Sure-Seal Gray EPDM Pressure-Sensitive (PS) accessories on Sure-Weld TPO roofing systems (with up to 20-year Total System Warranties). PS accessories can provide substantial labor savings on projects with hard-to-flash penetrations and are ideal for circumstances in which the use of a generator and hand welder are not practical.

EXPERIENCE THE CARLISLE DIFFERENCE

CARLISLE SYNTEC SYSTEMS

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