



Mobile Airport Authority

ADDENDUM No. 2 Request for Proposal RFP No. 2023-0010

Date: July 19, 2023

Project Name: Airbus Engineering Lower Roof Repairs

Addendum No. 1 for the above-referenced project has been published. This addendum is available only by electronic delivery on the Mobile Airport Authority website. Please find attached the Documents for the above-referenced **Addendum No. 2**.

This Addendum is hereby made a part of the Contract Documents and Specifications of the above-referenced project. All other requirements of the original Contract Documents and Specifications shall remain effective in their respective order.

ACKNOWLEDGE RECEIPT OF THIS ADDENDUM (Page 16) "Attachment C" BY INSERTING THE ADDENDUM # and DATE OF THE ADDENDUM ON THE SIGNATURE & ACKNOWLEDGEMENT AFFIDAVIT FORM.

ITEM NO. 1: Question & Answer

Question – We are requesting the following system be accepted as an equivalent substitute for the Airbus Engineering Lower Roof Repairs RFP No. 2023-005.

Answer – Versico's 60 Mil TPO Fully Adhered Roofing System will be acceptable as a substitute for the system specified in this RFP. (See the attached)

Sincerely,

MOBILE AIRPORT AUTHORITY

Rita L. Barren
Procurement Officer

cc: Mobile Airport Authority File

Attachment: Versico System Substitution Request

-End of Addendum No. 2-



SUBSTITUTION REQUEST (During the Bidding Phase)

Project: RFP Airbus Engineering Lower Roof Repair
Mobile AL
To: Mobile Airport Authority
Re: Pre-bid approval Thermoplastic Membrane Roofing
Substitution Request Number
From: Zachary Wilson (Versico Representative)
Date: 7-11-2023
A/E Project Number:
Contract For: Mobile Airport Authority

Specification Title: Scope of Work
Description: 60 Mil TPO Fully Adhered Roofing System
Sections: IV Page: all
Article/Paragraph: all

Proposed Substitution: Versico's 60 Mil TPO Fully Adhered Roofing System
Manufacturer: Versico Roofing Systems Address: Carlisle, PA Phone: 334.467.2009
Trade Name: Versiweld Model No.: Versiweld 60 mil

Attached data includes product description, specifications, drawings, photographs, and performance and test data adequate for evaluation of the request; applicable portions of the data are clearly identified.

Attached data also includes a description of changes to the Contract Documents that the proposed substitution will require for its proper installation.

The Undersigned certifies:

- Proposed substitution has been fully investigated and determined to be equal or superior in all respects to specified product.
Same warranty will be furnished for proposed substitution as for specified product.
Same maintenance service and source of replacement parts, as applicable, is available.
Proposed substitution will have no adverse effect on other trades and will not affect or delay progress schedule.
Proposed substitution does not affect dimensions and functional clearances.
Payment will be made for changes to building design, including A/E design, detailing, and construction costs caused by the substitution.

Submitted by: Zac Wilson
Signed by: Zac Wilson
Firm: Exterior Materials LLC
Address:
Telephone: 334.224.2849

A/E REVIEW AND ACTION

- Substitution approved - Make submittals in accordance with Specification Section 01330.
Substitution approved as noted - Make submittals in accordance with Specification Section 01330.
Substitution rejected - Use specified materials.
Substitution Request received too late - Use specified materials.

Signed by: Date:

Supporting Data Attached: Drawings Product Data Samples Tests Reports



TPO Roofing Systems



BUILDING SOLUTIONS



VERSIWELD

TPO ROOFING SYSTEMS

Why Choose 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 membranes in the late 1980's and since 2007 has been the largest market segment of low-slope roofing.

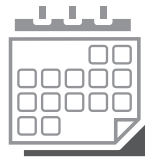
Versico Roofing Systems' VersiWeld TPO membrane is comprised of three layers - a TPO polymer base; a strong, polyester-reinforced fabric center (scrim) and a tough thermoplastic polyolefin compounded top-ply. Because the top-ply is the most vital membrane component for long-term weathering characteristics,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

WHY CHOOSE VERSIWELD® TPO?

Advantages of VersiWeld TPO



Cleaner Surface



Improved Long-term Performance



Long-term Energy Efficiency in Warm, Southern Climates



Excellent Heat and UV Resistance



Greater Weather Resistance



Industry Leading Weathering Package

Versico has been at the forefront of TPO development for nearly 20 years and continues to lead the industry with its high-performance OctaGuard XT weathering package that is incorporated into VersiWeld TPO membrane and accessories. OctaGuard XT weathering package technology 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.



The Tests

TPO membrane samples from four manufacturers, including Versico, were recently subjected to accelerated heat aging in a controlled 240°F environment. Heat aging accelerates the impact that heat plays on TPO and evaluates its performance on the roof. Samples were removed when they showed signs of cracking or were deemed not suitable to perform as a waterproofing membrane. Extreme Xenon Arc Weatherometer testing also reveals that VersiWeld TPO can withstand twice the ASTM D6878 requirement of 10,080 kJ/m² without losing its desired physical properties.

The Results

Independent test results and a chemical analysis show that VersiWeld TPO with OctaGuard XT contains more weather-protecting ingredients than any other TPO membrane tested, which means Versico's TPO provides superior long-term protection against the dangers of heat and UV exposure.

With Versico's VersiWeld TPO, featuring OctaGuard XT weathering package, you get a whiter, cleaner and more energy-efficient, longer-lasting and weather-resistant TPO roofing system. Versico's VersiWeld TPO with OctaGuard XT weathering package technology has set a new standard in the thermoplastic single-ply industry.

Whiter, Longer

As a white membrane collects dirt, the cost savings associated with having a reflective roof are severely reduced and the higher associated temperatures can accelerate aging. The time-tested VersiWeld TPO compound, which includes OctaGuard XT along with Versico's state-of-the-art manufacturing process, produces one of the smoothest TPO sheets on the market. The extremely smooth top ply of Versico's TPO reduces the ability of dirt, mold, bacteria and other contaminants to collect on the membrane, keeping it whiter longer and increasing the efficiency and potential lifespan of your TPO roof.

Reflectivity Warranty

Versico backs their commitment to long-term performance and energy-efficiency with an industry-leading Reflectivity Warranty on all white TPO membranes. A warranty backed by a company with over 50 years of single-ply manufacturing experience.

Benefits of a Versico VersiWeld TPO roof system featuring the OctaGuard XT weathering package include:

- Cleaner surface
- Long-term energy efficiency in warm, southern climates
- Greater weather resistance
- Improved long-term performance
- Heat and UV resistance

Heat Aging Following ASTM D6878 Protocol



Versico VersiWeld – 60 Weeks (No Failure)

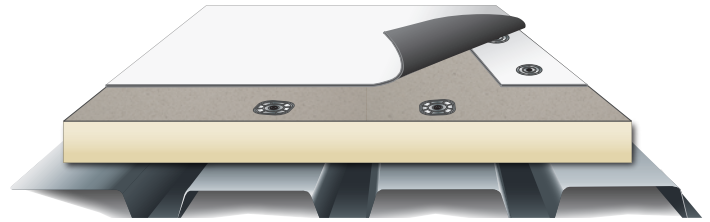


"Competitor C" TPO – 37 Weeks

SYSTEM OPTIONS

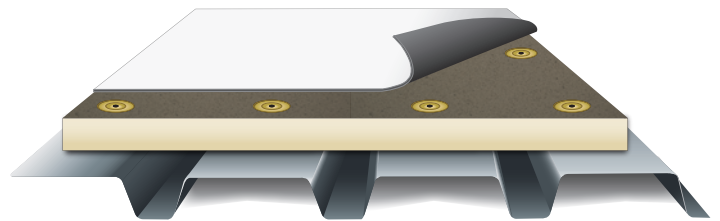
Mechanically Attached Systems

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 and joined together by hot-air welding.



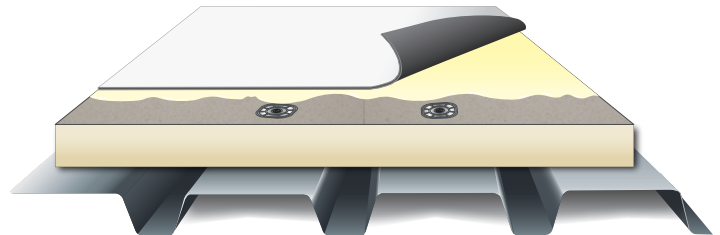
Induction Welded Systems

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.



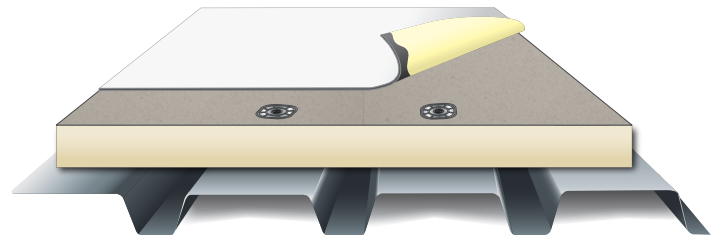
Fully Adhered Systems

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 and the membrane is rolled into place and seams are then hot-air welded.



Quick-Applied Systems

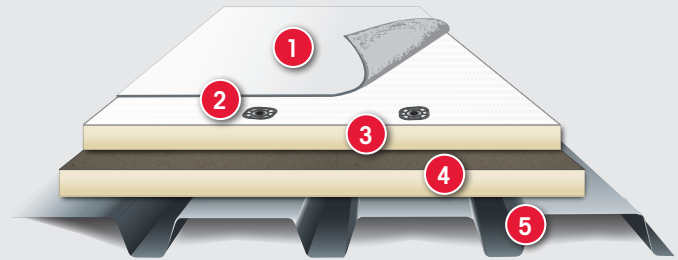
VersiWeld QA (Quick-Applied) TPO membrane is a 60- or 80-mil TPO membrane laminated to an elastomeric quick-applied adhesive. The pre-applied adhesive eliminates VOC and odor concerns typically associated with fully adhered systems.



Versico's RapidLock Roofing Systems

- 1 VersiFleece® RL™ TPO Membrane with RapidLock Technology
- 2 Insulation Fasteners and Plates
- 3 VersiCore MP-H® RL Polyiso, SecurShield® RL Polyiso or SecurShield HD RL Polyiso with RapidLock Technology
- 4 VersiCore MP-H Polyiso or SecurShield Polyiso
- 5 Steel Deck

Versico'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 VersiFleece RL TPO to achieve performance on par with traditional fully adhered single-ply systems. Underlayment options include VersiCore MP-H 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.



RapidLock
TECHNOLOGY

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

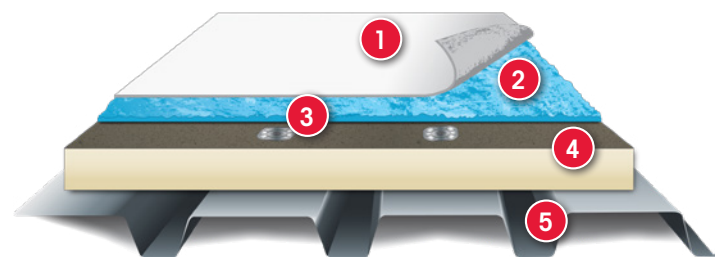
VersiFleece TPO

VersiFleece TPO membranes are manufactured using a hot-melt extrusion process for complete scrim encapsulation, are chlorine- and plasticizer-free, and provide excellent long-term reflectivity. Versico's VersiFleece TPO contains the OctaGuard XT weathering package, which provides excellent resistance to UV and extreme temperatures.

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.



- 1 VersiFleece TPO Membrane
- 2 Flexible DASH Adhesive
- 3 Versico Fasteners and Plates
- 4 2" VersiCore MP-H Polyiso Insulation
- 5 Steel Deck

VERSIWELD TPO WITH APEEL™ PROTECTIVE FILM

Versico'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 customer satisfaction. VersiWeld TPO membrane with APEEL Protective Film is ideal for re-roofing, re-cover and new construction projects.

Features and Benefits:

- Tough protective film helps prevent scuffs and scratches on TPO membrane during the construction process
- Holes in the film can easily check for accidental cuts or punctures made during installation
- Eliminates the need to clean the roof after installation
- Perfect adhesion level keeps the film in place until you remove it
- Film is easily removed by one person due to its manageable 5-foot-wide size
- Gray color helps the surface dry quickly and cuts down on glare



Versico's APEEL 6" Cover Tape & APEEL Cover Tape Applicator

Versico's APEEL 6" Cover Tape and APEEL Cover Tape Applicator allow contractors to keep 100 percent of the TPO surface - including the seams and areas around details - clean during installation.



VERSIWELD PLUS TPO

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

Versico's VersiWeld Plus TPO products include:

- 80-mil VersiWeld TPO
- 135-mil VersiFleece TPO
- 155-mil VersiFleece AC TPO

Dependability

Because of their unmatched performance, VersiWeld Plus membranes are available with a variety of enhanced warranty packages. The warranty packages available for VersiWeld Plus 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 VersiWeld Plus TPO roofing system is meticulously engineered by Versico to ensure its long-term performance. Every square inch of VersiWeld Plus TPO is enhanced with the most advanced weathering package on the market: Versico's OctaGuard XT.

VERSIWELD Plus TPO Roofing Systems

Because thicker TPO membranes contain higher levels of the OctaGuard XT weathering package, Versico's 80-mil VersiWeld Plus TPO provides longer-lasting protection against the negative effects of UV degradation and heat exposure. The additional protection provided by an upgrade to VersiWeld Plus 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 VersiWeld Plus TPO roof systems.



VERSIWELD HS TPO SPECIAL COLOR PROGRAM

Special Color Program

Turn your roof into a canvas with Versico'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.



Medium Bronze



Rock Brown



Slate Gray

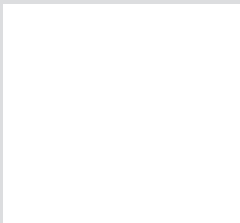


Terra Cotta



Patina Green

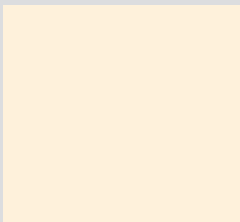
VersiWeld TPO Colors In Stock



White



Gray



Tan



* 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.

WHY CHOOSE A VERSIWELD TPO METAL RETROFIT SYSTEM?

Metal buildings are often chosen because of their cost-effective design and speed of construction. However, when the metal roof begins to leak and deteriorate replacement can be very costly. With decades of experience in single-ply roofing, Versico Roofing Systems has a wide range of metal retrofit options.

Versico's VersiWeld 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.



Convenience, value, and performance are three critical considerations when it comes to the success of any re-roofing project. A VersiWeld TPO Metal Retrofit System offers the following features and benefits:

Convenience



Installs directly over the existing metal roof eliminating costly and disruptive removal and replacement.

Value



Highly reflective TPO membranes offer additional energy savings.

Performance



TPO's proven history of long-term performance provides a lasting solution compared to coatings and spray-applied restoration products.



Multiple membrane and insulation options to meet a variety of performance, budget, and efficiency needs.

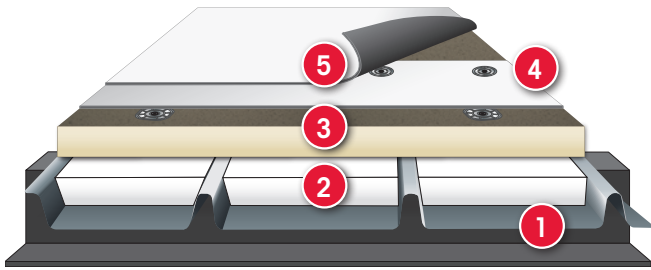


Improves R-value and energy efficiency of the building while reducing noise for occupants.

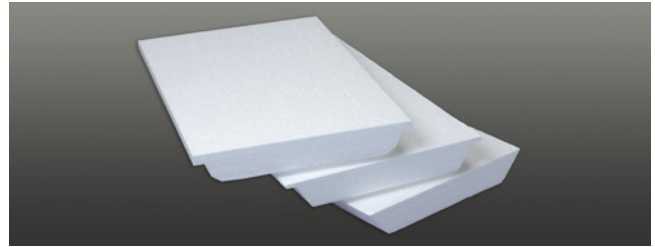


Backed by Versico's industry-leading Total System Warranty for up to 20 years, with optional hail, puncture and reflectivity warranties available upon request.

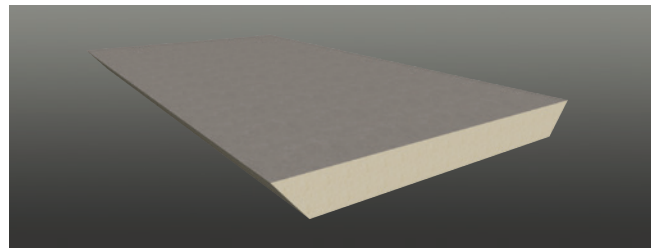
INSTALLING TPO METAL RETROFIT SYSTEMS



- 1 Existing Standing Seam Metal Roof**
- 2 Flute Fill Insulation:** a key component of a metal retrofit system is the addition of custom-fit insulation between the standing seams of the metal roof panels. Versico offers both EPS (expanded polystyrene – shown) and Polyiso flute-fill insulation that can be factory cut to fit between each metal panel. This insulation layer also adds R-value and can be loose-laid or adhered.
- 3 Additional insulation:** once flute-fill has been installed, additional insulation ranging from a ¼-inch cover board to several inches of Polyiso insulation can be installed to create a smooth flat substrate for the membrane. Adding thicker Polyiso insulation and cover boards can add additional R-value to the system. Using a high-compressive strength Polyiso cover board or gypsum cover board can also enhance impact resistance and fire resistance.



EPS Flute Fill



Polyiso Flute Fill

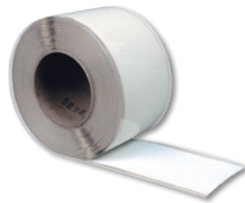
- 4 Attachment:** the VersiWeld TPO membrane can be mechanically attached using fasteners and plates, attached using induction welding plates, or fully adhered using a TPO bonding adhesive. See the back cover for more information on each attachment method.
- 5 VersiWeld TPO Membrane:** the adjoining TPO membrane sheets are hot-air welded together using an approved hot-air welder.



ACCESSORIES & ADHESIVES



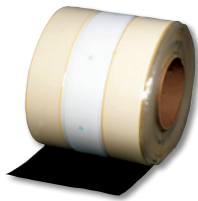
Non-Reinforced Flashing



Pressure-Sensitive Coverstrip



Yellow Pressure-Sensitive Warning Strip



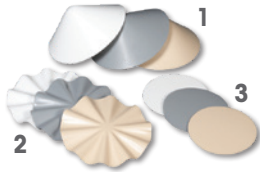
Pressure-Sensitive RUSS



Split Pipe-Seals



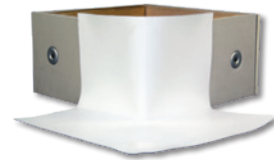
Molded Pipe Seals



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



Molded Sealant Pockets



Curb Wrap Corners



Universal Corners



TPO Rib Profile



TPO Bonding Adhesive



CAV-GRIP® 3V Low-VOC Adhesive/Primer



Low-VOC Primer

10 THINGS TO CONSIDER WHEN INVESTING IN A TPO ROOFING SYSTEM

- 1 Experience and Innovation:** Versico has led the industry in TPO research and development for over 20 years. Billions of square feet of TPO membrane have been installed on rooftops across the globe. That's more than any other manufacturer.
- 2 Weathering Package:** Versico's TPO membrane is enhanced with OctaGuard XT Weathering Package which results in the most dependable, long-term performance characteristics in the industry.
- 3 Seam Strength:** Independent tests show that Versico's TPO membrane exhibits far stronger seams than competing products. That means better wind uplift performance and fewer leaks.
- 4 Weldability:** VersiWeld 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:** Versico's White TPO membrane features an initial ENERGY STAR® solar reflectance of .79 and emissivity of .90.
- 6 Appearance:** a combination of our state-of-the-art manufacturing process and over 20 years of manufacturing experience creates a smoother 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:** Versico manufactures VersiWeld 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:** Versico'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:** Versico's Total System warranties, as well as a large warranty reserve, reflect a commitment and ability to address any warranty issue.
- 10 Prefabricated Accessories:** Versico 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.



A SINGLE SOURCE FOR SINGLE-PLY ROOFING

800.992.7663 • www.versico.com

VERSIWELD® TPO REINFORCED MEMBRANE



Overview

Versico's VersiWeld TPO reinforced membrane is a premium, heat-weldable, single-ply thermoplastic polyolefin (TPO) sheet designed for new roof construction and re-roofing applications. VersiWeld High Slope (HS) membrane is formulated with additional flame retardant for higher-slope fire code approvals. VersiWeld Plus is 80-mils thick for significantly higher strength and weatherability.

VersiWeld TPO membranes use advanced polymerization technology that combines the flexibility of ethylene-propylene (EP) rubber with the heat weldability of polypropylene. All VersiWeld TPO membranes include OctaGuard XT™, an industry-leading, state-of-the-art weathering package. OctaGuard XT technology enables VersiWeld TPO to withstand the extreme weatherability testing intended to simulate exposure to severe climates.

Physical properties of the membrane are enhanced by a strong polyester fabric that is encapsulated between the TPO-based top and bottom plies. The combination of the fabric and TPO plies provides high breaking and tearing strength, as well as excellent puncture resistance. The relatively smooth surface of the membrane produces a total surface fusion weld that results in consistent, watertight, monolithic roof assembly. The membrane is environmentally friendly and safe to install.

VersiWeld TPO Standard and HS membranes are available in highly reflective white, tan and gray, in both 45-mil and 60-mil. 80-mil VersiWeld Plus is also offered in white, gray and tan colors. Special Color VersiWeld HS TPO membranes are also available (see Versico TPO Color Palette brochure). Versico's TPO is offered in 4- and 6-ft perimeter sheets and 8-, 10- and 12-ft field sheets.

VersiWeld special color HS TPO membranes are available in limited sizes.

Versico's tan and white TPO membranes are ENERGY STAR®-qualified and California Title 24 compliant and can contribute toward LEED® (Leadership in Energy and Environmental Design) credits.

Labor Saving Features and Benefits: Optional APEEL™ Protective Film

- Versico's VersiWeld TPO reinforced membrane is available with APEEL Protective Film, saving time and labor by eliminating the need for roof cleaning upon project completion. Versico'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.



Features and Benefits

- Outstanding puncture resistance
- Excellent fire resistant assemblies
- Environmentally friendly and stable formulation
- Excellent resistance to impact and low temperature
- Excellent chemical resistance to acids, bases and restaurant exhaust emissions
- UL 2218 Class 4 hail rating
- Exceptional resistance to heat, solar UV, ozone and oxidation
- Manufactured using a hot-melt extrusion process for complete scrim encapsulation
- 100% recyclable (refer to Versico's Recyclability Statement)
- Enhanced with the OctaGuard XT weathering package

- APEEL Protective Film guards the TPO 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



Installation

1. VersiWeld TPO roofing systems are quick to install, as minimal labor and few components are required. TPO systems are installed using an automatic heat welder, making sheet welding fast, clean, consistent, and easy to learn, while reducing strain on the roofing technician.
2. APEEL Protective Film should be removed from within areas that are to be heat-welded together. In areas

that do not require heat-welding, the APEEL Protective Film can be left in place for up to 90 days. When the installation of the entire TPO roofing system is complete, remove and discard the APEEL Protective Film.

3. **The Versico Mechanically Attached Roof System** installation starts by fastening the insulation with a minimum of 4 fasteners per 4' by 8' board. The membrane is mechanically fastened to the deck using HPVX Fasteners and HPVX Plates or HPV-XL Fasteners and HPV-XL Plates. Adjoining sheets of membrane are overlapped over the fasteners and plates and joined together with a minimum 1½"-wide (4 cm) hot-air weld.
4. **The Versico Fully Ahered Roofing System** installation begins by fastening the insulation at the required density necessary to meet the appropriate warranty or wind load requirement. The substrate and membrane are coated with an appropriate VersiWeld TPO bonding adhesive and the membrane is rolled into place.

REVIEW CURRENT VERSICO SPECIFICATIONS AND DETAILS FOR SPECIFIC INSTALLATION REQUIREMENTS.

TYPICAL PROPERTIES AND CHARACTERISTICS				
Physical Property	ASTM D6878 Requirement	45-mil	60-mil	80-mil
Tolerance on nominal thickness, % ASTM D751 test method	+15, -10	± 10	± 10	± 10
Thickness over scrim, in. (mm) ASTM D7635 optical method, average of 3 areas	0.015 min (0.380)	0.018 typ (0.457)	0.024 typ (0.610)	0.034 typ (0.864)
Breaking strength, lbf (kN) ASTM D751 grab method	220 (976 N) min	225 (1.0) min 320 (1.4) typ	250 (1.1) min 360 (1.6) typ	350 (1.6) min 425 (1.9) typ
Elongation break of reinforcement, % ASTM D751 grab method	15 min	15 min 25 typ	15 min 25 typ	15 min 25 typ
Tearing strength, lbf (N) ASTM D751 proc. B 8 in. x 8 in.	55 (245) min	55 (245) min 130 (578) typ	55 (245) min 130 (578) typ	55 (245) min 130 (578) typ
Brittleness point, °F (°C) ASTM D2137	-40 (-40) max	-40 (-40) max -50 (-46) typ	-40 (-40) max -50 (-46) typ	-40 (-40) max -50 (-46) typ
Linear dimensional change, % ASTM D1204, 6 hours at 158°F	± 1 max	± 1 max -0.2 typ	± 1 max -0.2 typ	± 1 max -0.2 typ
Ozone Resistance, no cracks 7X ASTM D1149, 100 pphm, 168 hrs	PASS	PASS	PASS	PASS
Water absorption resistance, mass % ASTM D471 top surface only 166 hours at 158°F water	± 3.0 max	± 3.0 max 0.9 typ	± 3.0 max 0.9 typ	± 3.0 max 0.9 typ
Factory seam strength, lbf (N) ASTM D751 grab method	66 (290) min	66 (290) min	66 (290) min	66 (290) min
Field seam strength, lbf/in (kN/m) ASTM D1876 tested in peel	No requirement	25 (4.4) min 50 (8.8) typ	25 (4.4) min 60 (10.5) typ	40 (7.0) min 70 (12.3) typ
Water vapor permeance, perms ASTM E96 proc. B	No requirement	0.10 max 0.05 typ	0.10 max 0.05 typ	0.10 max 0.05 typ
Puncture resistance, lbf (kN) FTM 101C, method 2031 (see supplemental section)	No requirement	250 (1.1) min 325 (1.4) typ	300 (1.3) min 350 (1.6) typ	400 (1.8) min 450 (2.0) typ
Properties after heat aging ASTM D573, 32 weeks @ 240°F or 8 weeks @ 275°F No cracking when bent around 3" diameter mandrel Weight change, %	PASS No cracking ± 1.5 max	PASS No cracking 1.0 max	PASS No cracking 1.0 max	PASS No cracking 1.0 max
Typical Weights		0.23 (1.1)	0.29 (1.4)	0.40 (2.0)

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.

Precautions

1. 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.
2. Surfaces may become slippery due to frost and ice buildup. Exercise caution during cold conditions to prevent falls.
3. 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.
4. Use proper stacking procedures to ensure sufficient stability of the rolls.
5. Exercise caution when walking on wet membrane. Membranes may be slippery when wet.
6. Store membrane in the original undisturbed plastic wrap in a cool, shaded area and cover the light-colored, breathable, waterproof tarpaulins. Membrane that has been exposed to the weather must be prepared with Weathered Membrane Cleaner prior to hot-air welding.
7. Take care not to stand or place heavy objects on the edge of folded-over membrane, as this could cause a hard crease in the membrane.
8. Maximum sustained temperature not to exceed 160°F (71°C) for TPO membrane.
9. Do not use razor blades or other sharp tools to cut the APEEL Protective Film while it is still adhered to the TPO membrane as damage to the underlying membrane may occur. Pull the protective film away from the membrane prior to cutting.
10. Remove APEEL Protective Film by pulling toward the center of the roof. Do not remove the film by pulling toward the roof edge.
11. A static electric charge may develop when removing APEEL Protective Film from the surface 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.
12. 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 color membranes do not cover fading of colors.

Extreme Testing for Severe Climates

ASTM Standard D6878 is the material specification for Thermoplastic Polyolefin-Based Sheet Roofing. It covers material property requirements for TPO roof sheeting and includes initial and aged properties after heat and xenon-arc exposure. As stated in the scope of the standard, "the tests and property limits used to characterize the sheet are values intended to ensure minimum quality for the intended purpose." Versico's goal is to produce TPO that delivers maximum performance for the intended purpose of roofing membranes. Maximum performance requires the membrane to far exceed the requirements of ASTM D6878.

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

VERSICO EXTREME TESTING – HEAT AGING

		ASTM Requirement	VersiWeld Requirement
ASTM TEST	240°F	32 weeks*	>128 weeks

* Heat exposure comparable to 3,120 weeks (60 years) at 185°F for 8 hours/day.

- Test specimen is 2" by 6" piece of 45-mil membrane unbacked, placed in a circulating hot-air oven.
- Criterion - no visible cracks after bending aged test specimen around 3"-diameter mandrel.

Q-Trac testing combines accelerated weathering with real world conditions using an array of ten mirrors to reflect and concentrate full spectrum sunlight onto membrane test specimens. The Q-Trac device automatically tracks the sun's path from morning to night. Also, it adjusts to compensate for seasonal changes in the sun's altitude. Eight years in Q-Trac testing is equal to 40 years of real-world exposure. Versico requires its VersiWeld TPO membranes to pass the equivalent of 40 years of exposure in the Q-Trac.

VERSICO EXTREME TESTING – Q-TRAC

ASTM TEST	ASTM D6878 REQUIREMENT	VersiWeld Requirements
N/A	N/A	Equivalent of 40 years of exposure

Environmental Cycling subjects the membrane to repeated cycles of heat aging, hot-water immersion and xenon-arc exposure.

- ASTM requirement - none
- Versico EXTREME test*:
 - 10 days heat aging at 240°F (116°C) followed by
 - 5 days water immersion at 158°F (70°C) followed by
 - 5,040 kJ/m² (2000 hrs at 0.70 W/m² irradiance) xenon-arc exposure

*Test specimen is 2.75" by 5.5" piece of membrane with edges sealed.

*Criterion - after 3 complete cycles, test specimens shall remain flexible and not have any cracking under 10x magnification while wrapped around a 3"-diameter mandrel.

Supplemental Approvals, Statements and Characteristics:

1. VersiWeld TPO meets or exceeds the requirements of ASTM D6878 Standard Specification for Thermoplastic Polyolefin-Based Sheet Roofing.
2. Radiative properties for ENERGY STAR, Cool Roof Rating Council (CRRC) and LEED.
3. VersiWeld TPO membranes conform to requirements of the US E.P.A. Toxic Leachate Test (40 CFR part 136) performed by an independent analytical laboratory.
4. VersiWeld TPO was tested for dynamic puncture resistance per ASTM D5635-04 using the most recently modified impact head. 45-mil was watertight after an impact energy of 12.5 J (9.2 ft-lbf) and 60-mil was watertight after 22.5 J (16.6 ft-lbf). The 80-mil was watertight after an impact energy of 30.0 J (22.1 ft-lbf).
5. NSF-P151 Certification for rainwater catchment system components.
 - Plant 91/White Only

LEED INFORMATION

Pre-consumer Recycled Content	10%
Post-consumer Recycled Content	0%
Manufacturing Location	Senatobia, MS Tooele, UT Carlisle, PA
Solar Reflective Index (SRI)	White: 99 Tan: 86

RADIATIVE PROPERTIES FOR ENERGY STAR* AND LEED*

	Test Method	White TPO	Tan TPO	Gray TPO
ENERGY STAR initial solar reflectance	Solar Spectrum Reflectometer	0.79	0.71	N/A
ENERGY STAR initial solar reflectance after 3 years	Solar Spectrum Reflectometer (uncleaned)	0.70	0.64	N/A
CRRC initial solar reflectance	ASTM C1549	0.79	0.71	0.46
CRRC solar reflectance after 3 years	ASTM C1549 (uncleaned)	0.70	0.64	0.43
CRRC initial thermal emittance	ASTM C1371	0.90	0.86	0.89
CRRC thermal emittance after 3 years	ASTM C1371 (uncleaned)	0.86	0.87	0.88
LEED thermal emittance	ASTM E408	0.90	0.86	0.85
Solar Reflectance Index (SRI) initial	ASTM E1980	99	86	53
Solar Reflectance Index (SRI) 3 years aged		85	77	48

RADIATIVE PROPERTIES (INITIAL) FOR SPECIAL COLORS

	Reflectance	Emittance	SRI
Medium Bronze	0.28	0.86	29
Rock Brown	0.25	0.87	26
Slate Gray	0.38	0.87	42
Terra Cotta	0.25	0.86	25
Patina Green	0.25	0.88	25

Solar Reflectance Index (SRI) is calculated per ASTM E1980. The SRI is a measure of the roof's ability to reject solar heat, as shown by a small temperature rise. It is defined so that a standard black (reflectance 0.05, emittance 0.90) is 0 and a standard white (reflectance 0.80, emittance 0.90) is 100. Materials with the highest SRI values are the coolest choices for roofing. Due to the way SRI is defined, particularly hot materials can even take slightly negative values and particularly cool materials can even exceed 100.

VERSICO TOTAL ROOFING SYSTEM WARRANTY

VSW-1
Rev 01/15

Versico, a division of Carlisle Construction Materials Incorporated (Versico), warrants to the Building Owner (Owner) of the building described below, that subject to the terms, conditions, and limitations stated in this warranty, Versico will repair any leak in the Versico Total Roofing System (Versico Total Roofing System) installed by a Versico Authorized Roofing Contractor for a period of years commencing with the date of Versico's acceptance of the Versico Total Roofing System installation. However, in no event shall Versico's obligations extend beyond years subsequent to the date of substantial completion of the Versico Total Roofing System. See below for exact date of warranty expiration.

The Versico Total Roofing System is defined as the following Versico brand Materials: Membrane, Flashings, Adhesives and Sealants, Insulation, Cover Boards, Fasteners, Fastener Plates, Fastening Bars, Metal Work, Insulation Adhesives, and any other Versico brand products utilized in this installation.

TERMS, CONDITIONS, LIMITATIONS

1. Owner shall provide Versico with written notice via letter, fax or email within thirty (30) days of the discovery of any leak in the Versico Total Roofing System. Owner should send written notice of a leak to Versico's Warranty Services Department at the address set forth at the bottom of this warranty. By so notifying Versico, the Owner authorizes Versico or its designee to investigate the cause of the leak. Should the investigation reveal the cause of the leak to be outside the scope of this Warranty, investigation and repair costs for this service shall be paid by the Owner.

2. If, upon inspection, Versico determines that the leak is caused by defects in the Versico Total Roofing System's materials, or workmanship of the Versico Authorized Roofing Contractor in installing the same, Owner's remedies and Versico's liability shall be limited to Versico's repair of the leak.

3. This Warranty shall not be applicable if, upon Versico's inspection, Versico determines that any of the following has occurred:

(a) The Versico Total Roofing System is damaged by natural disasters, including, but not limited to, lightning, fire, insect infestations, earthquake, tornado, hail, hurricanes, and winds of (3 second) peak gust speeds of mph or higher measured at 10 meters above ground, or

(b) Loss of integrity of the building envelope and, or structure including, but not limited to partial or complete loss of roof decking, wall siding, windows, doors or other envelope components or from roof damage by wind-blown objects, or:

(c) The Versico Total Roofing System is damaged by any intentional or negligent acts, accidents, misuse, abuse, vandalism, civil disobedience, or the like.

(d) Deterioration or failure of building components, including, but not limited to, the roof substrate, walls, mortar, HVAC units, non-Versico brand metal work, etc., occurs and causes a leak, or otherwise damages the Versico Total Roofing System; or

(e) Acids, oils, harmful chemicals and the like come in contact with the Versico Total Roofing System and cause a leak, or otherwise damage the Versico Total Roofing System.

(f) The Versico Total Roofing System encounters leaks or is otherwise damaged by condensation resulting from any condition within the building that may generate moisture.

4. This Warranty shall be null and void if any of the following shall occur:

(a) If, after installation of the Versico Total Roofing System by a Versico Authorized Roofing Contractor, there are any alterations or repairs made on or through the roof or objects such as, but not limited to, structures, fixtures, solar panels, wind turbines, roof gardens or utilities are placed upon or attached to the roof without first obtaining written authorization from Versico; or

(b) Failure by the Owner to use reasonable care in maintaining the roof, said maintenance to include, but not be limited to, those items listed on Versico's Care & Maintenance Information sheet which accompanies this Warranty.

5. Only Versico brand insulation products are covered by this warranty. Versico specifically disclaims liability, under any theory of law, for damages sustained by or caused by non-Versico brand insulation products.

6. During the term of this Warranty, Versico shall have free access to the roof during regular business hours.

7. Versico shall have no obligation under this Warranty while any bills for installation, supplies, services, and warranty charges have not been paid in full to the Versico Authorized Roofing Contractor, Versico, or material suppliers.

8. Versico's failure at any time to enforce any of the terms or conditions stated herein shall not be construed to be a waiver of such provision.

9. Versico shall not be responsible for the cleanliness or discoloration of the Versico Total Roofing System caused by environmental conditions including, but not limited to, dirt, pollutants, or biological agents.

10. Versico shall have no liability under any theory of law for any claims, repairs, restoration, or other damages including, but not limited to, consequential or incidental damages relating, directly or indirectly, to the presence of any irritants, contaminants, vapors, fumes, molds, fungi, bacteria, spores, mycotoxins, or the like in the building or in the air, land, or water serving the building.

11. This warranty shall be transferable upon a change in ownership of the building when the owner has completed certain procedures including a transfer fee and an inspection of the Roofing System by a Versico representative.

VERSICO DOES NOT WARRANT PRODUCTS UTILIZED IN THIS INSTALLATION WHICH IT HAS NOT FURNISHED; AND SPECIFICALLY DISCLAIMS LIABILITY, UNDER ANY THEORY OF LAW, ARISING OUT OF THE INSTALLATION AND PERFORMANCE OF, OR DAMAGES SUSTAINED BY OR CAUSED BY, PRODUCTS NOT FURNISHED BY VERSICO OR THE PRIOR EXISTING ROOFING MATERIAL OVER WHICH THE VERSICO ROOFING SYSTEM HAS BEEN INSTALLED

THE REMEDIES STATED HEREIN ARE THE SOLE AND EXCLUSIVE REMEDIES FOR FAILURE OF THE VERSICO TOTAL ROOFING SYSTEM OR ITS COMPONENTS. THERE ARE NO WARRANTIES EITHER EXPRESSED OR IMPLIED, INCLUDING THE IMPLIED WARRANTIES OF FITNESS FOR A PARTICULAR PURPOSE AND MERCHANTABILITY, WHICH EXTEND BEYOND THE FACE HEREOF. VERSICO SHALL NOT BE LIABLE FOR ANY INCIDENTAL, CONSEQUENTIAL OR OTHER DAMAGES INCLUDING, BUT NOT LIMITED TO, LOSS OF PROFITS OR DAMAGE TO THE BUILDING OR ITS CONTENTS UNDER ANY THEORY OF LAW.

OWNER:
BUILDING :

ROOFER:

DATE INSTALLATION COMPLETED :
DATE OF ACCEPTANCE BY VERSICO :
WARRANTY EXPIRATION DATE :

WARRANTY NUMBER:

VERSICO, a division of Carlisle Construction Materials Incorporated

P.O. Box 1289 Carlisle, PA 17013
(800) 992-7663 (717) 960-4035 FAX

BY _____