



PRODUCTS FOR OUR ENVIRONMENT

## TECHNICAL DATA SHEET

### ERS-TPO FBHA Membrane

For Professional Use Only



#### PRODUCT DESCRIPTION:

ERS-TPO FBHA Membrane-045 and FBP-060 Membranes are polyester reinforced, .045" or .060 thick, polyolefin based, thermoplastic, heat-weldable membranes with a special 10 oz / yd<sup>2</sup>, stain resistant, polyester fleece backing designed for attachment with hot asphalt.

#### RECOMMENDED USES:

ERS-TPO FBHA Membrane is used in fully adhered roofing systems in new construction, reroofing and recover (retrofit) applications, where the roof membrane is adhered with hot asphalt. The system must be installed over an acceptable roof insulation or other suitable substrate. These may also be used as flexible membrane flashings for walls, curbs, etc, when installing ERS-TPO FBHA Membrane roofing systems. See the Ecology Roof Systems Manual for complete specifications and details.

#### ADVANTAGES:

- Wide window of weldability
- Thick 10 oz / yd<sup>2</sup> stain resistance fleece specifically designed for use with hot asphalt
- 75% fewer seams than modified - bitumen systems
- Outstanding puncture resistance which is enhanced further by the fleece backing
- Chlorine-free with no halogenated flame retardants
- Excellent low temperature impact resistance
- Excellent chemical resistance to acids, bases, restaurant oils and greases
- Plasticizer-free, does not contain liquid or polymeric plasticizer
- Exceptional resistance to solar UV, ozone and oxidation
- Hot melt extrusion processed for complete scrim encapsulation
- Warp knitted fabric (not woven) for smooth surface and greater thickness-over-scrim
- Low vapor permeance and water absorption
- Polyester reinforcing fabric and fleece backing which are resistant to degradation by bacteria, mildew and fungi
- Polyester fleece backing for fully adhered systems provided exceptional wind uplift resistance
- ERS-TPO FBHA Membrane is 100% recyclable

#### APPROVALS:

A variety of Factory Mutual Ratings and Underwriters Laboratories Classifications are available. Contact Ecology Roof Systems for additional information.



1) The fabric reinforced membrane component of ERS-TPO FBHA Membrane meets and exceeds the requirements of **ASTM D 68781** Standard Specification for Thermoplastic Polyolefin Based Sheet Roofing

2) **Radiative Properties** for ENERGY STAR®, Cool Roof Rating Council (CRR) and LEED™

DESCRIPTION	TEST METHOD	WHITE TPO
ENERGY STAR® initial solar reflectance	Solar Spectrum Reflectometer	0.87
ENERGY STAR® solar reflectance after 3 years	Solar Spectrum Reflectometer (after cleaning)	0.83
CRRC initial solar reflectance	ASTM C1549	0.79
CRRC solar reflectance after 3 years	ASTM C1549 (uncleaned)	0.70
CRRC initial thermal emittance	ASTMC1371	0.90
CRRC thermal emittance after 3 years	ASTM C1371 (uncleaned)	0.86
LEED™ thermal emittance	ASTM E408	0.95
SRI (Solar Reflectance Index)	ASTM E1980	110

3) ERS-TPO FBHA Membrane is LEED compliant and is a ENERGY STAR® and California Title 24 rated roof product.

An ENERGY STAR qualified low slope roof product must have an initial solar reflectance of at least 0.65 and a 3-year aged solar reflectance of at least 0.50. Cleaning the aged roof surface is permitted by the ENERGY STAR test protocol.

The Cool Roof Rating Council (CRRC) does not specify minimums for reflectance or emittance but they do require specific protocols for testing and reporting. Cleaning of the aged roof surface is not permitted for determination of radiative properties after 3 years.

A LEED “point” may be earned if a roof material is ENERGY STAR qualified and has a thermal emittance of at least 0.90 as determined by ASTM E408.

Solar Reflectance Index (SRI) is calculated per ASTM E 1980. 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.

California Title 24 requires an initial minimum reflectance of 0.70 and emittance of 0.75 as determined by CRRC.

4) ERS-TPO FBHA Membrane conforms to requirements of the U.S.E.P.A. Toxic Leachate Test (40 CFR part 136) performed by an independent analytical laboratory.

5) ERS-TPO FBHA Membrane 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 ftlbf)

**INSTALLATION:**

- 1) A proper substrate shall be provided to receive the ERS-TPO FBHA Membrane Roofing System.
- 2) ERS-TPO FBHA Membrane shall be fully adhered to the properly installed and prepared substrate using the techniques stated in Ecology Roof Systems specifications
- 3) The membrane side laps shall be overlapped before being hot air welded. All seams are to be hot air welded and probed.
- 4) The membrane is required to be mechanically attached only at the base of all vertical surfaces, roof edges, and angle changes.
- 5) The field of the roof is fully adhered to the substrate with hot asphalt applied at EVT.
- 6) All details will be done in accordance with Ecology Roof Systems details.
- 7) On projects where a warranty is requested, an authorized Ecology Roof Systems representative shall inspect all completed work. This is only a brief summary and not the complete specification. The ERS-TPO FBHA Membrane

Specifications, Details, Technical Bulletins, associated documents should be thoroughly reviewed prior to starting any project.

**PRECAUTIONS:**

- Surfaces may be slippery when wet, or due to frost and ice build-up. Exercise caution to prevent falls.
- ERS-TPO FBHA Membrane are highly reflective to sunlight. Workers should dress appropriately, wear sunscreen, and wear sunglasses that filter out UV light.
- Exercise care when working near roof edge. Roof edges may not be visible when surrounding area is covered with snow.
- Store ERS-TPO FBHA Membrane in original wrappings in a cool, shaded area. Cover with light-colored, breathable, waterproof tarpaulins. TPO membrane that has been exposed to the elements for approximately 7 days or longer must be prepared with ERS-TPO Weathered Membrane Cleaner prior to hot air welding.

**PROTECTION AND SAFETY**

Ecology Roof Systems maintains Material Safety Data Sheets on all of its products. Material Safety Data Sheets contain health and safety information for your development of appropriate product handling procedures to protect your employees and customers. Ecology Roof Systems' Material Safety Data Sheets should be read and understood by all of your supervisory personnel and employees before using Ecology Roof Systems products in your facilities.

**PHYSICAL PROPERTIES:**

Colors: White top/Black bottom (Standard) (Special Order Top Colors) Tan and Gray.

Material: .045-inch (FBP-45) and .060-inch (FBP-60) (nominal) thick polyester reinforced thermoplastic FBP-45 = 100 mils total thickness, FBP-60 = 115 mils total thickness

Sizes: 6' X 100', 12' X 50' and 12' X 100'

Physical Properties	Test Method	Property of Unaged Sheet	Property After Aging <sup>1</sup> 28 days at 240°F
Thickness of reinforced sheet over fleece, in. (mm) (tolerance is ± 10%)	ASTM D-751	0.045 (1.14) – FBP-045 0.060 (1.52) – FBP-060	
Breaking Strength, lbf (kN)	ASTM D-751 (Grab Method)	225 (1.0) min 400 (1.8) typical	225 (1.0) min 400 (1.8) typical
Elongation at break of internal fabric, %	ASTM D-751	25 typical	25 typical
Tearing Strength, lbf (N) 8 by 8 in. specimen	ASTM D-751 (B Tongue Tear)	55 (245) min. 130 (578) typical	55 (245) min. 130 (578) typical
Brittleness point, F° (C°)	ASTM D-2137	-40 (-40) max. -50 (-46) typical	
Linear Dimensional Change (shrinkage), % after 6 hours@158° F (70° C)	ASTM D-1204	+/- 0.5 max - 0.2 typical	
Ozone resistance, 100 pphm, 168 hours	ASTM D-1149	No cracks	No cracks
Resistance to water absorption After 7 days immersion 158°F (70°C) Change in mass, %	ASTM D-471 (fleece removed, edges sealed)	4.0 max. 2.0 typical	
Resistance to microbial surface growth, rating (1 is very poor, 10 is no growth)	ASTM D-3274 2-yr S. Florida	9-10 typical	
Field seam strength, lbf/in. (kN/m) Seam tested in peel	ASTM D-1876	40 (7.0) min. 60 (10.5) typical	
Water vapor permeance, Perms	ASTM E-96	0.10 max. 0.05 typical	
Puncture resistance, lbf (N)	FTM 101C Method 2031	400 (1.8) min 525 (2.3) typ - FBP-045 575 (2.6) typ - FBP-060	
Resistance to xenon-arc weathering <sup>2</sup> Xenon-Arc, 17,640 kj/m <sup>2</sup> total radiant exposure, visual condition at 10X	ASTM G-155 0.70 W/m <sup>2</sup> 80°C B.P.T.	No cracks No loss of breaking or tearing strength	

<sup>1</sup> Aging conditions are 28 days at 240°F (116° C) equivalent to 400 days at 176°F (80°C) for breaking strength, elongation, tearing strength, ozone and puncture resistance  
<sup>2</sup> Approximately equivalent to 14,000 hour exposure at 0.35 W/m<sup>2</sup> irradiance B.P.T. is black panel temper

**Ecology Roof Systems®**

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To the best of our knowledge, all technical data contained herein is true and accurate as of the date of issuance and subject to change without prior notice. User must contact Ecology Roof Systems to verify correctness before specifying or ordering. We guarantee our products to conform to the quality control standards established by Ecology Roof Systems. We assume no responsibility for coverage, performance or injuries resulting from use. Liability, if any is limited to replacement of the product. NO OTHER WARRANTY OR GUARANTEE OF ANY KIND IS MADE BY ECOLOGY ROOF SYSTEMS, EXPRESSED OR IMPLIED, STATUTORY, BY OPERATION OF LAW, OR OTHERWISE, INCLUDING MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.