Product Data Sheet

MULE-HIDE PVC FLEECE BACK MEMBRANE

PRODUCT DESCRIPTION

Mule-Hide PVC Fleece Back Membranes are manufactured using a state-of-the –art extrusion process that ensures complete scrim encapsulation. The PVC membrane is reinforced with a high-strength fiberglass scrim and is enhanced with a fleece backing, resulting in a very tough, durable and versatile sheet. The fiberglass reinforcement provides additional dimensional stability for the sheet, while the fleece backing enhances the sheets puncture resistance and acts as a built-in separation layer for rough or asphaltic surfaces. Meets or exceeds all requirements of ASTM D4434, Type III.

BASIC USES

Mule-Hide PVC Fleece Back membrane is used in mechanically attached and fully adhered roofing systems in new construction, reroofing and recover (retrofit) applications. PVC standard membrane (non-fleece back) is to be used as flexible membrane flashings for walls, curbs, etc, when installing PVC Fleece Back roofing systems. The system must be installed over acceptable roof insulation or other suitable substrate. See the Mule-Hide PVC Specifications Manual for complete specifications and details.

TYPICAL PHYSICAL PROPERTIES

Physical Property*	ASTM D4434 Requirement	60-mil	80-mil
Breaking Strength (MD x CD), lbf/in (N) ASTM D751 grab method	200 min (890)	450 X 400	500 x 450
Elongation break of reinforcement (MD x CD) % ASTM D751 grab method	15 min	70 x 100	70 x 100
Thickness over scrim, in. (mm) ASTM D4434 optical method, ave of 3	0.016 min (0.40)	0.025 typ (0.635)	0.030 typ (0.762)
Seam Strength, min. ASTM D751 grab method (% of breaking strength)	>75	PASS	PASS
Tearing Strength (MD x CD), lbf (N) ASTM D751 proc. B, 8” x 8”	45 (200)	60	60
Low Temperature Bend, no cracks @5x ASTM D2136	PASS	- Pass -40ºF (-40ºC)	Pass -40ºF (-40ºC)
Linear Dimensional Change % ASTM D1204, 6 hours @ 176° F (80° C)	±0.5 max	0.36 x 0.00 typ	0.36 x 0.00 typ
Water absorption resistance, mass % ASTM D570 166 hrs @ 158° F (70° C)	±3.0 max	2.0 typ	2.0 typ
Water Vapor Permeance, Perms ASTM E96 proc. B	No Requirement	0.10 max 0.05 typ	0.10 max 0.05 typ
Puncture resistance Dynamic, J (ft-lb) ASTM D5635 Static, lbf (N) ASTM D5602	 20 (14.7) 33 (145)	 PASS PASS	 PASS PASS
Properties after heat aging ASTM D3045, 56 days @ 176ºF Breaking strength % retained Elongation rein., % retained	 90 min 90 min	 90 min 90 min	 90 min 90 min
Ozone Resistance, no cracks @ 7x ASTM D1149, 100 pphm, 168 hrs	PASS	PASS	PASS

TYPICAL PHYSICAL PROPERTIES (continued)

Physical Property*	ASTM D4434 Requirement	60-mil	80-mil
Field Seam Strength, lbf/in (kN/m) ASTM D1876 tested in peel	No Requirement	25 (4.4) min 60 (10.5) typ	25 (4.4) min 60 (10.5) typ
Xenon-Arc Resistance, no cracks or crazing @ 10x, ASTM G155, 0.35 W/m^2 at 340 nm, 63ºC B.P.T, 12,600 kJ/m^2) total radiant exposure 10,000 hrs	PASS	PASS	PASS

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.

BENEFITS & SUPPLEMENTAL STATEMENTS

- Fleece backing adds toughness, durability and enhanced puncture resistance
- Wide window of weldability
- Fiberglass reinforcement provides excellent breaking strength
- Use of Low-volatility plasticizer
- Energy efficiency – white color reflects sunlight, Energy Star® & California Title 24 compliant
- Enhanced chemical resistance to acids, bases, restaurant oils, fats, greases and acid rain
- Low temperature flexibility
- Excellent wind uplift resistance due to bond between fleece and adhesive

CODE APPROVALS/COMPLIANCE

A variety of Factory Mutual Ratings and Underwriters Laboratories Classifications are available. Contact Mule-Hide Technical Department for additional information.

INSTALLATION INSTRUCTIONS

1) Approved insulation shall be attached to the roof deck with an approved insulation adhesive or approved fasteners and plates. Install insulation with its largest dimension perpendicular to the direction of the membrane seams where possible.
2) Mechanically Attached Roofing System
   a) Perimeter sheets to be installed in an approved pattern along all exterior roof edges.
   b) Mechanical fasteners and plates are installed in the seams of both the perimeter sheets and field sheets and into the roof deck. Use approved fasteners and maintain proper penetration for specific roof deck.
3) Fully Adhered Roofing System
   a) Perimeter sheets are not required.
   b) The membrane is required to be mechanically attached at the base of all vertical surfaces, roof edges, and angle changes.
   c) The field of the roof is fully adhered to the substrate with HydroBond Water-Based PVC Bonding Adhesive or Aqua Base 120 bonding adhesive.
4) All seams are hot air welded and checked by probing.
5) All details will be done in accordance with Mule-Hide details.
6) On projects where a Mule-Hide Standard or Premium Warranty is requested, an authorized Mule-Hide representative shall inspect all completed work. This is only a brief summary and not the complete specification. The Mule-Hide Specifications, Details, Technical Bulletins, and associated documents should be thoroughly reviewed prior to starting any project. Contact Mule-Hide Products for additional information.

PRECAUTIONS

- Surfaces may be slippery when wet, or due to frost and ice build-up. Exercise caution to prevent falls.
- Mule-Hide PVC membranes 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.

PRECAUTIONS (continued)

- Store Mule-Hide membrane in original wrappings in a cool, shaded area. Cover with light-colored, breathable, waterproof tarpaulins. Mule-Hide membrane that has been exposed to the elements for approximately 7 days or longer must be prepared with Weathered Membrane Cleaner prior to hot air welding.
- Use proper stacking procedures to ensure stability of materials.

PROTECTION & SAFETY

Mule-Hide maintains Safety Data Sheets on all of its non-exempt products. Safety Data Sheets contain health and safety information for your development of appropriate product handling procedures to protect your employees and customers. Mule-Hide's Safety Data Sheets should be read and understood by all of your supervisory personnel and employees before using Mule-Hide products in your facilities.

SUPPLEMENTAL APPROVALS, STATEMENTS AND CHARACTERISTICS

1. Radiative Properties for Energy Star®, Cool Roof Rating Council (CRRC) and LEED™

DESCRIPTION	TEST METHOD	WHITE PVC
ENERGY STAR® initial solar reflectance	Solar Spectrum Reflectometer	0.87
ENERGY STAR® solar reflectance - 3 yrs	Solar Spectrum Reflectometer (uncleaned)	0.61
CRRC initial solar reflectance	ASTM C1549	0.87
CRRC solar reflectance after 3 years	ASTM C1549 (uncleaned)	0.61
CRRC initial thermal emittance	ASTMC1371	0.95
CRRC thermal emittance after 3 years	ASTM C1371 (uncleaned)	0.86
CRRC SRI (Solar Reflectance Index)	ASTM E1980	110
CRRC SRI (Solar Reflectance Index - 3 yrs)	ASTM E1980	72
CRRC Product ID	N/A	0670-0015
LEED™ thermal emittance	ASTM E408	0.94

Mule-Hide White PVC membranes are LEED compliant. Mule Hide White PVC is also an ENERGY STAR® and California Title 24 rated roof product.

An ENERGY STAR qualified low slop 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 not permitted by the ENERGY STAR test protocol. Energy Star is only valid in the United States for Roofing Products.

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.

ADDITIONAL INFORMATION

The information given on this PDS is subject to change without notice. Always check the Mule-Hide website at www.mulehide.com for the latest information, changes and updates or contact Mule-Hide Products Company at 800-786-1492.

DISCLAIMER

The statements provided concerning the material shown are intended as a guide for material usage and are believed to be true and accurate at the time of printing. No statement made by anyone may supersede this information, except when done in writing by Mule-Hide Products Co., Inc. Since the manner of use is beyond our control, Mule-Hide does not authorize anyone to make any warranty of merchantability or fitness for any particular purpose or any other warranty, guarantee or representation, expressed or implied, concerning this material. This product may be eligible for a Mule-Hide warranty, please check the Mule-Hide website at www.mulehide.com or contact Mule-Hide directly at 800-786-1492 for details. Buyer and user accept the product under these conditions and assume the risk of any failure, any injury person or property (including that of the user), loss or liability resulting from the handling, storage or use of the product whether or not it is handled, stored or used in accordance with the directions or specifications. Mule-Hide must be notified in writing of any claims and be given the opportunity to inspect the alleged failure before repairs are made.