



DEPARTMENT OF REGULATORY AND ECONOMIC RESOURCES (RER)  
 BOARD AND CODE ADMINISTRATION DIVISION

MIAMI-DADE COUNTY  
 PRODUCT CONTROL SECTION

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[www.miamidade.gov/pera](http://www.miamidade.gov/pera)

**NOTICE OF ACCEPTANCE (NOA)**

**Mule-Hide Products Co., Inc.**  
**1195 Prince Hall Drive**  
**Beloit, WI 53511**

**SCOPE:**

This NOA is being issued under the applicable rules and regulations governing the use of construction materials. The documentation submitted has been reviewed and accepted by Miami-Dade County RER - Product Control Section to be used in Miami Dade County and other areas where allowed by the Authority Having Jurisdiction (AHJ).

This NOA shall not be valid after the expiration date stated below. The Miami-Dade County Product Control Section (In Miami Dade County) and/or the AHJ (in areas other than Miami Dade County) reserve the right to have this product or material tested for quality assurance purposes. If this product or material fails to perform in the accepted manner, the manufacturer will incur the expense of such testing and the AHJ may immediately revoke, modify, or suspend the use of such product or material within their jurisdiction. RER reserves the right to revoke this acceptance, if it is determined by Miami-Dade County Product Control Section that this product or material fails to meet the requirements of the applicable building code.

This product is approved as described herein, and has been designed to comply with the Florida Building Code including the High Velocity Hurricane Zone of the Florida Building Code.

**DESCRIPTION: Mule-Hide Single Ply TPO Roof Systems over Lightweight Concrete Decks**

**LABELING:** Each unit shall bear a permanent label with the manufacturer's name or logo, city, state and following statement: "Miami-Dade County Product Control Approved", unless otherwise noted herein.

**RENEWAL** of this NOA shall be considered after a renewal application has been filed and there has been no change in the applicable building code negatively affecting the performance of this product.

**TERMINATION** of this NOA will occur after the expiration date or if there has been a revision or change in the materials, use, and/or manufacture of the product or process. Misuse of this NOA as an endorsement of any product, for sales, advertising or any other purposes shall automatically terminate this NOA. Failure to comply with any section of this NOA shall be cause for termination and removal of NOA.

**ADVERTISEMENT:** The NOA number preceded by the words Miami-Dade County, Florida, and followed by the expiration date may be displayed in advertising literature. If any portion of the NOA is displayed, then it shall be done in its entirety.

**INSPECTION:** A copy of this entire NOA shall be provided to the user by the manufacturer or its distributors and shall be available for inspection at the job site at the request of the Building Official.

This NOA renews NOA# 15-1215.01 and consists of pages 1 through 22.  
 The submitted documentation was reviewed by Alex Tigera.



NOA No: 18-0109.14  
 Expiration Date: 08/31/23  
 Approval Date: 08/23/18  
 Page 1 of 22

## ROOFING SYSTEM APPROVAL

<b>Category:</b>	Roofing
<b>Sub-Category:</b>	Single Ply
<b>Material:</b>	TPO
<b>Deck Type:</b>	Lightweight Concrete Decks
<b>Maximum Design Pressure</b>	-492.5 psf
<b>Fire Classification:</b>	See General Limitation #1

### TRADE NAMES OF PRODUCTS MANUFACTURED OR LABELED BY APPLICANT:

TABLE 1

<u>Product Name</u>	<u>Dimensions</u>	<u>Test Specifications</u>	<u>Product Description</u>
Mule-Hide TPO-c Fleece Back	various	TAS 131	Reinforced white or colored TPO membrane with fleece backing. Total sheet thicknesses available are 100, 115 and 135 mils.
TPO-c Fleece Back Plus	various	TAS 131	Reinforced white or colored TPO membrane with fleece backing. Total sheet thicknesses available are 120, 135 and 155-mils.
Mule-Hide TPO-c	various	TAS 131	Reinforced white or colored TPO membrane. Available sheet thicknesses are 45 and 60-mils.
Mule-Hide TPO-c EXTRA	various	TAS 131	Reinforced white or colored TPO membrane. Available sheet thickness is 80-mils.
Mule-Hide TPO-c (FR)	various	TAS 131	Reinforced white or colored FR TPO membrane. Available sheet thicknesses are 45, 60 and 80-mils.
SA-TPO	Various	TAS 131	Self-Adhered Reinforced TPO Membrane. Available sheet thickness is 60-mil.
Mule-Hide TPO-c Bonding Adhesive	5-gal. pail	TAS 110	Solvent-based bonding adhesive.

### APPROVED INSULATIONS:

TABLE 2

<u>Product Name</u>	<u>Product Description</u>	<u>Manufacturer (With Current NOA)</u>
Mule-Hide Poly ISO 1	Rigid-roof insulation panel comprised of closed cell Polyisocyanurate foam core with fiber reinforced facers.	Mule-Hide Products Co, Inc.
H-Shield CG	Rigid-roof insulation panel comprised of closed cell Polyisocyanurate foam core with coated glass facers	Hunter Panels, LLC
H-Shield HD Composite CG	Rigid-roof composite insulation panel comprised of closed cell Polyisocyanurate foam core and high-density cover board.	Hunter Panels, LLC



**APPROVED FASTENERS/ADHESIVES:**

**TABLE 3**

<u>Fastener Number</u>	<u>Product Name</u>	<u>Product Description</u>	<u>Dimensions</u>	<u>Manufacturer (With Current NOA)</u>
1.	Mule-Hide EHD Fastener	Truss head, self-drilling, drill point, high thread fastener for use into steel and wood decks	#15 wire diameter with a #3 Philips drive	Mule-Hide Products Co., Inc.
2.	Mule-Hide 2.4" Seam Plate	Steel stress plate used with HPX Fastener for attachment of membrane	2-3/8 inch diameter	Mule-Hide Products Co., Inc.
3.	Mule-Hide 3" Insulation Plate	Galvalume plated steel stress plate with reinforcing ribs	3-inch diameter	Mule-Hide Products Co., Inc.
4.	CR Base Sheet Fastener (1.7")	Galvalume fastener for base sheet attachment for use into gypsum and lightweight insulating concrete decks	1.125" head 1.75" long	OMG, Inc.
5.	FAST 100 LV Adhesive	Two-part, low rise polyurethane adhesive	15& 50-gal. drum	Carlisle SynTec, a division of Carlisle Construction Materials Inc.
6.	FAST Dual Cartridge Adhesive	Two-part, low rise polyurethane adhesive	Dual Cartridge	Carlisle SynTec, a division of Carlisle Construction Materials Inc.
7.	FAST Bag in a Box Adhesive	Two-part, low rise polyurethane adhesive	Bag-In-A-Box	Carlisle SynTec, a division of Carlisle Construction Materials Inc.
8.	Flexible FAST Adhesive	Two-part, low rise polyurethane adhesive	15& 50-gal. drum	Carlisle SynTec, a division of Carlisle Construction Materials Inc.
9.	Flexible FAST Dual Cartridge Adhesive	Two-part, low rise polyurethane adhesive	Dual Cartridge	Carlisle SynTec, a division of Carlisle Construction Materials Inc.
10.	Flexible FAST Bag in A Box Adhesive	Two-part, low rise polyurethane adhesive	Bag-In-A-Box	Carlisle SynTec, a division of Carlisle Construction Materials Inc.
11.	Aqua Base 120 Bonding Adhesive	Water-based bonding adhesive	5-gal. pail	Carlisle SynTec, a division of Carlisle Construction Materials Inc.
12.	Cold Applied Adhesive	Asphalt-modified Polyether adhesive	5-gal. pail	Carlisle SynTec, a division of Carlisle Construction Materials Inc.



**EVIDENCE SUBMITTED:**

<u>Test Agency</u>	<u>Test Identifier</u>	<u>Description</u>	<u>Date</u>
Atlantic & Caribbean Roof Consulting, LLC.	11-034	TAS 114 Appendix D	06/28/11
	11-035	TAS 114 Appendix D	06/28/11
	11-037	TAS 114 Appendix D	06/29/11
	15-002	TAS 114 Appendix D	03/30/15
	15-008	TAS 114 Appendix D	04/02/15
	15-009	TAS 114 Appendix D	04/06/15
	15-041	TAS 114 Appendix D	12/30/15
	15-043	TAS 114 Appendix D	01/04/16
Architectural Testing Inc.	ATI-37490.01	Membrane Brittleness Testing	7/7/00
Factory Mutual Research Corp.	3Z9A1.AM	Wind Uplift and Fire Classification	10/15/97
	1B7A5.AM	Wind Uplift and Fire Classification	02/23/98
	3011220	Class 4470	08/16/01
	3012879	Class 4470	04/04/03
	3022174	Wind Uplift and Fire Classification	09/25/06
Celotex Corporation Testing Services	520257	Membrane Physical Property Testing	4/19/00
SGS U.S. Testing Company Inc.	131248-R2	Membrane Ozone Resistance Testing	1/6/00
Trinity ERD	C46470.07.14-1A	TAS 131	07/16/14
	C46470.07.14-1B	TAS 131	07/16/14
	C46470.07.14-4-R1	TAS 131	07/21/14
	C46470.07.14-2A	TAS 131	07/30/14

**DECK STRESS ANALYSIS CALCULATIONS/REPORTS**

<u>Engineer/Agency</u>	<u>Identifier</u>	<u>Assemblies:</u>	<u>Date</u>
Randall Fowler P.E.	Letter	E(1), E(2)	04/30/15



## APPROVED ASSEMBLIES

<b>Membrane Type:</b>	Single Ply, Thermoplastic, TPO
<b>Deck Type 4I:</b>	Lightweight Concrete
<b>Deck Description:</b>	Elastizell Range II Lightweight Insulating Concrete, minimum 300 psi. over structural concrete
<b>System Type A(1):</b>	One or more layers of insulation adhered with FAST 100 LV Adhesive, FAST Dual Cartridge Adhesive, FAST Bag in a Box Adhesive or Flexible FAST Adhesive, Flexible FAST Dual Cartridge Adhesive, Flexible FAST Bag in A Box Adhesive. Membrane fully adhered.

**All General and System Limitations apply. Roof accessories not listed in Table 1 of this NOA are not approved and shall not be installed unless said accessories demonstrate compliance with prescriptive Florida Building Code requirements and are field fabricated utilizing the approved membranes listed in Table 1.**

<u>Insulation Layer</u>	<u>Insulation Fasteners (Table 3)</u>	<u>Fastener Density/ft<sup>2</sup></u>
Mule-Hide Poly ISO 1, H-Shield CG, H-Shield HD Composite CG Minimum 1” thick	N/A	N/A

**Note: All insulation shall be adhered to the deck with FAST 100 LV Adhesive, FAST Dual Cartridge Adhesive, FAST Bag in a Box Adhesive or Flexible FAST Adhesive, Flexible FAST Dual Cartridge Adhesive, Flexible FAST Bag in A Box Adhesive at a rate of 1 gal./sq., full coverage. Please refer to Roofing Application Standard RAS 117 for insulation attachment. Insulation listed as base layer only shall be used only as base layers with a second layer of approved top layer insulation installed as the final membrane substrate. Composite insulation panels used as a top layer shall be placed with the Polyisocyanurate side facing down.**

**Membrane:** Mule-Hide TPO-c, Mule-Hide TPO-c EXTRA or Mule-Hide TPO-c (FR) membrane fully adhered to the insulation using Mule-Hide TPO-c Bonding Adhesive. The adhesive is applied in a contact application and is applied to both the underside of the roofing membrane and the top side of the approved substrate at a rate of 60 ft<sup>2</sup>/gallon, finished surface area. Overlap membrane splices a minimum of 2 inches to provide for a minimum 1-1/2 inch heat weld.

Or

Mule-Hide TPO-c Fleece Back membrane fully adhered to the insulation using FAST 100 LV Adhesive, FAST Dual Cartridge Adhesive, FAST Bag in a Box Adhesive or Flexible FAST Adhesive, Flexible FAST Dual Cartridge Adhesive, Flexible FAST Bag in A Box Adhesive applied at a rate of 1 gal/sq. full coverage. Overlap membrane splices a minimum of 2 inches to provide for a minimum 1-1/2 inch heat weld.

Or

Mule-Hide TPO-c Fleece Back membrane fully adhered to the insulation using Aqua Base 120 Bonding Adhesive. The adhesive is applied to the substrate only at a rate of 120 ft<sup>2</sup>/gallon. Overlap membrane splices a minimum of 2 inches to provide for a minimum 1-1/2 inch heat weld.

Or

TPO-c Fleece Back Plus membrane adhered to the insulation Cold Applied Adhesive. The adhesive is applied to the substrate only at a rate of 67 ft<sup>2</sup>/gallon. Overlap membrane splices a minimum of 2 inches to provide for a minimum 1-1/2 inch heat weld.

**Maximum Design Pressure:** -340 psf (See General Limitation #9)



**Membrane Type:** Single Ply, Thermoplastic, TPO  
**Deck Type 4I:** Lightweight Concrete  
**Deck Description:** Elastizell Range II Lightweight Insulating Concrete, minimum 300 psi. over structural concrete  
**System Type A(2):** One or more layers of insulation adhered with FAST 100 LV Adhesive, FAST Dual Cartridge Adhesive, FAST Bag in a Box Adhesive or Flexible FAST Adhesive, Flexible FAST Dual Cartridge Adhesive, Flexible FAST Bag in A Box Adhesive. Membrane fully adhered.

**All General and System Limitations apply. Roof accessories not listed in Table 1 of this NOA are not approved and shall not be installed unless said accessories demonstrate compliance with prescriptive Florida Building Code requirements and are field fabricated utilizing the approved membranes listed in Table 1.**

<u>Insulation Layer</u>	<u>Insulation Fasteners (Table 3)</u>	<u>Fastener Density/ft<sup>2</sup></u>
Mule-Hide Poly ISO 1, H-Shield CG, H-Shield HD Composite CG Minimum 1” thick	N/A	N/A

**Note:** All insulation shall be adhered to the deck with FAST 100 LV Adhesive, FAST Dual Cartridge Adhesive, FAST Bag in a Box Adhesive or Flexible FAST Adhesive, Flexible FAST Dual Cartridge Adhesive, Flexible FAST Bag in A Box Adhesive at a rate of 1 gal./sq., full coverage. Please refer to Roofing Application Standard RAS 117 for insulation attachment. Insulation listed as base layer only shall be used only as base layers with a second layer of approved top layer insulation installed as the final membrane substrate. Composite insulation panels used as a top layer shall be placed with the Polyisocyanurate side facing down.

**Membrane:** Mule-Hide TPO-c, Mule-Hide TPO-c EXTRA or Mule-Hide TPO-c (FR) membrane fully adhered to the insulation using Aqua Base 120 Bonding Adhesive. The adhesive is applied in a contact application and is applied to both the underside of the roofing membrane and the top side of the approved substrate at a rate of 120 ft<sup>2</sup>/gallon, finished surface area. Overlap membrane splices a minimum of 2 inches to provide for a minimum 1-1/2 inch heat weld.

**Maximum Design Pressure:** -90 psf (See General Limitation #9)



**Membrane Type:** Single Ply, Thermoplastic, TPO  
**Deck Type 4:** Lightweight Concrete  
**Deck Description:** Elastizell Cellular Lightweight Concrete, minimum 324 psi over steel.  
**System Type E(1):** Membrane mechanically fastened through lightweight concrete to steel deck.

**All General and System Limitations apply. Roof accessories not listed in Table 1 of this NOA are not approved and shall not be installed unless said accessories demonstrate compliance with prescriptive Florida Building Code requirements and are field fabricated utilizing the approved membranes listed in Table 1.**

**Deck:** Minimum 22 ga. vented corrugated 1-1/2 inch, WR Type B, G90 galvanized, 55 ksi steel deck attached to steel supports spaced at a maximum of 6-ft o.c. with 5/8-inch diameter puddle welds at the bottom of each flute. Metal deck side laps are fastened with #12 SD screws spaced 12-inch on center.

**This Tested Assembly has been analyzed for allowable deck stress. See Evidence Submitted Table.**

**Lightweight Concrete:** The deck is filled with a slurry coat of Elastizell Cellular Lightweight Concrete, minimum 300 psi, to a depth of 1/8 inch above the top deck rib. **(Optional)** EPS Holey Board with 3” diameter holes is placed into the slurry, followed by a minimum 2” thick pour of Elastizell Cellular Lightweight concrete, minimum 324 psi.

**Membrane:** 10-foot wide Mule-Hide TPO-c or Mule-Hide TPO-c EXTRA membrane mechanically fastened 6-inches on center using Mule-Hide EHD Fasteners and Mule-Hide 2.4” Seam Plates. Membrane shall be fastened through the lightweight concrete and into the steel deck. Overlap membrane splices a minimum of 5-1/2 inches to provide for a minimum 1-1/2 inch heat weld. End laps shall be overlapped a minimum of 2 inches to provide for a minimum 1-1/2 inch heat weld.

**Maximum Design Pressure:** -67.5 psf.; (See General Limitation #7)



**Membrane Type:** Single Ply, Thermoplastic, TPO  
**Deck Type 4:** Lightweight Concrete  
**Deck Description:** Minimum 323 psi Generic Cellular Lightweight Concrete over steel. Lightweight concrete shall record a Minimum Characteristic Resistance Force (MCRF) of 147.971 lbf when tested with CR Base Sheet Fasteners (1.7").  
**System Type E(2):** Membrane mechanically fastened through lightweight concrete to steel deck.

**All General and System Limitations apply. Roof accessories not listed in Table 1 of this NOA are not approved and shall not be installed unless said accessories demonstrate compliance with prescriptive Florida Building Code requirements and are field fabricated utilizing the approved membranes listed in Table 1.**

**Deck:** Minimum 22 ga. vented corrugated 1-1/2 inch, WR Type B, G90 galvanized, 55 ksi steel deck attached to steel supports spaced at a maximum of 6-ft o.c. with 5/8-inch diameter puddle welds at the bottom of each flute. Metal deck side laps are fastened with #12 SD screws spaced 12-inch on center.

**This Tested Assembly has been analyzed for allowable deck stress. See Evidence Submitted Table.**

**Lightweight Concrete:** The deck is filled with a slurry coat of Generic Cellular Lightweight Concrete, minimum 300 psi, to a depth of 1/8 inch above the top deck rib. **(Optional)** EPS Holey Board with 3" diameter holes is placed into the slurry, followed by a minimum 2" thick pour of Generic Cellular Lightweight concrete, minimum 323 psi.

**Membrane:** 10-foot wide Mule-Hide TPO-c or Mule-Hide TPO-c EXTRA membrane mechanically fastened 6-inches on center using Mule-Hide EHD Fasteners and Mule-Hide 2.4" Seam Plates. Membrane shall be fastened through the lightweight concrete and into the steel deck. Overlap membrane splices a minimum of 5-1/2 inches to provide for a minimum 1-1/2 inch heat weld. End laps shall be overlapped a minimum of 2 inches to provide for a minimum 1-1/2 inch heat weld.

**Maximum Design Pressure:** -67.5 psf.; (See General Limitation #7)





**Membrane Type:** Single Ply, Thermoplastic, TPO  
**Deck Type 4:** Lightweight Concrete, Non-insulated, over Steel Deck  
**Deck Description:** Celcore Cellular Lightweight Concrete, minimum 300 psi., over steel or structural concrete.  
**System Type F(1):** Membrane adhered to lightweight concrete deck

**All General and System Limitations apply. Roof accessories not listed in Table 1 of this NOA are not approved and shall not be installed unless said accessories demonstrate compliance with prescriptive Florida Building Code requirements and are field fabricated utilizing the approved membranes listed in Table 1.**

**Deck:** Minimum 2500 psi structural concrete or minimum 18-22 ga. 33 ksi steel deck

**Membrane:** Mule-Hide TPO-c Fleece Back membrane fully adhered to the lightweight concrete using FAST 100 LV Adhesive, FAST Dual Cartridge Adhesive, FAST Bag in a Box Adhesive or Flexible FAST Adhesive, Flexible FAST Dual Cartridge Adhesive, Flexible FAST Bag in A Box Adhesive applied at a rate of 1 gal/sq. full coverage. Overlap membrane splices a minimum of 2 inches to provide for a minimum 1-1/2 inch heat weld.

**Maximum Design Pressure:** -90 psf. (See General Limitation #9)



**Membrane Type:** Single Ply, Thermoplastic, TPO  
**Deck Type 4:** Lightweight Concrete  
**Deck Description:** Celcore Lightweight Insulating Concrete, minimum 300 psi. over structural concrete.  
**System Type F(2):** Membrane adhered to lightweight concrete.

**All General and System Limitations apply. Roof accessories not listed in Table 1 of this NOA are not approved and shall not be installed unless said accessories demonstrate compliance with prescriptive Florida Building Code requirements and are field fabricated utilizing the approved membranes listed in Table 1.**

**Membrane:** Mule-Hide TPO-c, Mule-Hide TPO-c EXTRA or Mule-Hide TPO-c (FR) membrane fully adhered to the lightweight concrete using Mule-Hide TPO-c Bonding Adhesive. The adhesive is applied in a contact application and is applied to both the underside of the roofing membrane and the top side of the approved substrate at a rate of 60 ft<sup>2</sup>/gallon, finished surface area. Overlap membrane splices a minimum of 2 inches to provide for a minimum 1-1/2 inch heat weld.  
Or  
Mule-Hide TPO-c, Mule-Hide TPO-c EXTRA or Mule-Hide TPO-c (FR) membrane fully adhered to the lightweight concrete using Aqua Base 120 Bonding Adhesive. The adhesive is applied in a contact application and is applied to both the underside of the roofing membrane and the top side of the approved substrate at a rate of 120 ft<sup>2</sup>/gallon, finished surface area. Overlap membrane splices a minimum of 2 inches to provide for a minimum 1-1/2 inch heat weld.  
Or  
Mule-Hide TPO-c Fleece Back membrane fully adhered to the lightweight concrete using FAST 100 LV Adhesive, FAST Dual Cartridge Adhesive, FAST Bag in a Box Adhesive or Flexible FAST Adhesive, Flexible FAST Dual Cartridge Adhesive, Flexible FAST Bag in A Box Adhesive applied at a rate of 1 gal/sq., full coverage. Overlap membrane splices a minimum of 2 inches to provide for a minimum 1-1/2 inch heat weld.

**Maximum Design Pressure:** -232.5 psf.; Mule-Hide TPO-c Fleece Back adhered with FAST 100 LV Adhesive, FAST Dual Cartridge Adhesive, FAST Bag in a Box Adhesive or Flexible FAST Adhesive, Flexible FAST Dual Cartridge Adhesive, Flexible FAST Bag in A Box Adhesive.  
  
-135 psf; Mule-Hide TPO-c, Mule-Hide TPO-c EXTRA or Mule-Hide TPO-c (FR) adhered with Mule-Hide TPO-c Bonding Adhesive  
  
-82.5 psf; Mule-Hide TPO-c, Mule-Hide TPO-c EXTRA or Mule-Hide TPO-c (FR) adhered with Aqua Base 120 Bonding Adhesive

(See General Limitation #9 for all options)



**Membrane Type:** Single Ply, Thermoplastic, TPO  
**Deck Type 4:** Lightweight Concrete  
**Deck Description:** Elastizell Range II Lightweight Insulating Concrete, minimum 300 psi over structural concrete.  
**System Type F(3):** Membrane adhered to lightweight concrete.

**All General and System Limitations apply. Roof accessories not listed in Table 1 of this NOA are not approved and shall not be installed unless said accessories demonstrate compliance with prescriptive Florida Building Code requirements and are field fabricated utilizing the approved membranes listed in Table 1.**

**Membrane:** Mule-Hide TPO-c, Mule-Hide TPO-c EXTRA or Mule-Hide TPO-c (FR) membrane fully adhered to the lightweight concrete using Mule-Hide TPO-c Bonding Adhesive. The adhesive is applied in a contact application and is applied to both the underside of the roofing membrane and the top side of the approved substrate at a rate of 60 ft<sup>2</sup>/gallon, finished surface area. Overlap membrane splices a minimum of 2 inches to provide for a minimum 1-1/2 inch heat weld.  
Or  
Mule-Hide TPO-c, Mule-Hide TPO-c EXTRA or Mule-Hide TPO-c (FR) membrane fully adhered to the lightweight concrete using Aqua Base 120 Bonding Adhesive. The adhesive is applied in a contact application and is applied to both the underside of the roofing membrane and the top side of the approved substrate at a rate of 120 ft<sup>2</sup>/gallon, finished surface area. Overlap membrane splices a minimum of 2 inches to provide for a minimum 1-1/2 inch heat weld.  
Or  
Mule-Hide TPO-c Fleece Back membrane fully adhered to the lightweight concrete using FAST 100 LV Adhesive, FAST Dual Cartridge Adhesive, FAST Bag in a Box Adhesive or Flexible FAST Adhesive, Flexible FAST Dual Cartridge Adhesive, Flexible FAST Bag in A Box Adhesive applied at a rate of 1 gal/sq., full coverage. Overlap membrane splices a minimum of 2 inches to provide for a minimum 1-1/2 inch heat weld.

**Maximum Design Pressure:** -90 psf.; Mule-Hide TPO-c Fleece Back adhered with FAST 100 LV Adhesive, FAST Dual Cartridge Adhesive, FAST Bag in a Box Adhesive or Flexible FAST Adhesive, Flexible FAST Dual Cartridge Adhesive, Flexible FAST Bag in A Box Adhesive.  
  
-67.5 psf.; Mule-Hide TPO-c, Mule-Hide TPO-c EXTRA or Mule-Hide TPO-c (FR) adhered with Mule-Hide TPO-c Bonding Adhesive  
  
-90 psf.; Mule-Hide TPO-c, Mule-Hide TPO-c EXTRA or Mule-Hide TPO-c (FR) adhered with Aqua Base 120 Bonding Adhesive  
  
(See General Limitation #9 for all options)



**Membrane Type:** Single Ply, Thermoplastic, TPO

**Deck Type 4:** Lightweight Concrete

**Deck Description:** Elastizell Cellular Lightweight Concrete, minimum 324 psi over steel or structural concrete.

**System Type F(4):** Membrane adhered to lightweight concrete.

**All General and System Limitations apply. Roof accessories not listed in Table 1 of this NOA are not approved and shall not be installed unless said accessories demonstrate compliance with prescriptive Florida Building Code requirements and are field fabricated utilizing the approved membranes listed in Table 1.**

**Deck:** Minimum 2500 psi structural concrete or minimum 22 ga. vented corrugated 1-1/2 inch, WR Type B, G90 galvanized 55 ksi steel deck.

**Lightweight Concrete:** The deck is filled with a slurry coat of Elastizell Cellular Lightweight Concrete, minimum 300 psi, to a depth of 1/8 inch above the top deck rib. **(Optional)** EPS Holey Board with 3" diameter holes is placed into the slurry, followed by a minimum 2" thick pour of Elastizell Cellular Lightweight concrete, minimum 324 psi.

**Membrane:** Mule-Hide TPO-c, Mule-Hide TPO-c EXTRA or Mule-Hide TPO-c (FR) membrane fully adhered to the lightweight concrete using Mule-Hide TPO-c Bonding Adhesive. The adhesive is applied in a contact application and is applied to both the underside of the roofing membrane and the top side of the approved substrate at a rate of 60 ft<sup>2</sup>/gallon, finished surface area. Overlap membrane splices a minimum of 2 inches to provide for a minimum 1-1/2 inch heat weld.

**Maximum Design Pressure:** -492.5 psf.; (See General Limitation #9)



**Membrane Type:** Single Ply, Thermoplastic, TPO

**Deck Type 4:** Lightweight Concrete

**Deck Description:** Elastizell Cellular Lightweight Concrete, minimum 324 psi over steel or structural concrete.

**System Type F(5):** Membrane adhered to lightweight concrete.

**All General and System Limitations apply. Roof accessories not listed in Table 1 of this NOA are not approved and shall not be installed unless said accessories demonstrate compliance with prescriptive Florida Building Code requirements and are field fabricated utilizing the approved membranes listed in Table 1.**

**Deck:** Minimum 2500 psi structural concrete or minimum 22 ga. vented corrugated 1-1/2 inch, WR Type B, G90 galvanized 55ksi steel deck.

**Lightweight Concrete:** The deck is filled with a slurry coat of Elastizell Cellular Lightweight Concrete, minimum 300 psi, to a depth of 1/8 inch above the top deck rib. **(Optional)** EPS Holey Board with 3" diameter holes is placed into the slurry, followed by a minimum 2" thick pour of Elastizell Cellular Lightweight concrete, minimum 324 psi.

**Membrane:** Mule-Hide TPO-c Fleece Back membrane adhered to the lightweight concrete using Flexible FAST 100 LV Adhesive, FAST Dual Cartridge Adhesive, FAST Bag in a Box Adhesive or Flexible FAST Adhesive, Flexible FAST Dual Cartridge Adhesive, Flexible FAST Bag in A Box Adhesive applied in 1/2 to 3/4 inch wet beads spaced 6 inch on center. Overlap membrane splices a minimum of 2 inches to provide for a minimum 1-1/2 inch heat weld.

**Maximum Design Pressure:** -250 psf.; (See General Limitation #9)



**Membrane Type:** Single Ply, Thermoplastic, TPO  
**Deck Type 4:** Lightweight Concrete  
**Deck Description:** Concrecel Cellular Lightweight Concrete, minimum 360 psi over structural concrete.  
**System Type F(6):** Membrane adhered to lightweight concrete.

**All General and System Limitations apply. Roof accessories not listed in Table 1 of this NOA are not approved and shall not be installed unless said accessories demonstrate compliance with prescriptive Florida Building Code requirements and are field fabricated utilizing the approved membranes listed in Table 1.**

**Deck:** Minimum 2500 psi structural concrete.

**Lightweight Concrete:** The deck is filled with a slurry coat of Concrecel Cellular Lightweight Concrete, minimum 300 psi, to a depth of 1/8 inch. **(Optional)** EPS Holey Board with 3” diameter holes is placed into the slurry, followed by a minimum 2” thick pour of Concrecel Cellular Lightweight concrete, minimum 360 psi.

**Membrane:** Mule-Hide TPO-c, Mule-Hide TPO-c EXTRA or Mule-Hide TPO-c (FR) membrane fully adhered to the lightweight concrete using Mule-Hide TPO-c Bonding Adhesive. The adhesive is applied in a contact application and is applied to both the underside of the roofing membrane and the top side of the approved substrate at a rate of 60 ft<sup>2</sup>/gallon, finished surface area. Overlap membrane splices a minimum of 2 inches to provide for a minimum 1-1/2 inch heat weld.

**Maximum Design Pressure:** -452.5 psf.; (See General Limitation #9)



**Membrane Type:** Single Ply, Thermoplastic, TPO  
**Deck Type 4:** Lightweight Concrete  
**Deck Description:** Concrecel Cellular Lightweight Concrete, minimum 360 psi over structural concrete.  
**System Type F(7):** Membrane adhered to lightweight concrete.

**All General and System Limitations apply. Roof accessories not listed in Table 1 of this NOA are not approved and shall not be installed unless said accessories demonstrate compliance with prescriptive Florida Building Code requirements and are field fabricated utilizing the approved membranes listed in Table 1.**

**Deck:** Minimum 2500 psi structural concrete.

**Lightweight Concrete:** The deck is filled with a slurry coat of Concrecel Cellular Lightweight Concrete, minimum 300 psi, to a depth of 1/8 inch. **(Optional)** EPS Holey Board with 3” diameter holes is placed into the slurry, followed by a minimum 2” thick pour of Concrecel Cellular Lightweight concrete, minimum 360 psi.

**Membrane:** Mule-Hide TPO-c Fleece Back membrane adhered to the lightweight concrete using FAST 100 LV Adhesive, FAST Dual Cartridge Adhesive, FAST Bag in a Box Adhesive or Flexible FAST Adhesive, Flexible FAST Dual Cartridge Adhesive, Flexible FAST Bag in A Box Adhesive applied in 1/2 to 3/4 inch wet beads spaced 12 inch on center. Overlap membrane splices a minimum of 2 inches to provide for a minimum 1-1/2 inch heat weld.

**Maximum Design Pressure:** -217.5 psf.; (See General Limitation #9)



**Membrane Type:** Single Ply, Thermoplastic, TPO

**Deck Type 4:** Lightweight Concrete

**Deck Description:** Minimum 323 psi Generic Cellular Lightweight Concrete over steel or structural concrete. Lightweight concrete shall record a Minimum Characteristic Resistance Force (MCRF) of 147.971 lbf when tested with CR Base Sheet Fasteners (1.7”).

**System Type F(8):** Membrane adhered to lightweight concrete.

**All General and System Limitations apply. Roof accessories not listed in Table 1 of this NOA are not approved and shall not be installed unless said accessories demonstrate compliance with prescriptive Florida Building Code requirements and are field fabricated utilizing the approved membranes listed in Table 1.**

**Deck:** Minimum 2500 psi structural concrete or minimum 22 ga. vented corrugated 1-1/2 inch, WR Type B, G90 galvanized 55 ksi. steel deck.

**Lightweight Concrete:** The deck is filled with a slurry coat of Cellular Lightweight Concrete, minimum 300 psi, to a depth of 1/8 inch above the top deck rib. **(Optional)** EPS Holey Board with 3” diameter holes is placed into the slurry, followed by a minimum 2” thick pour of Cellular Lightweight concrete, minimum 323 psi.

**Membrane:** Mule-Hide TPO-c, Mule-Hide TPO-c EXTRA or Mule-Hide TPO-c (FR) membrane fully adhered to the lightweight concrete using Mule-Hide TPO-c Bonding Adhesive. The adhesive is applied in a contact application and is applied to both the underside of the roofing membrane and the top side of the approved substrate at a rate of 60 ft<sup>2</sup>/gallon, finished surface area. Overlap membrane splices a minimum of 2 inches to provide for a minimum 1-1/2 inch heat weld.

**Maximum Design Pressure:** -492.5 psf.; (See General Limitation #9)





**Membrane Type:** Single Ply, Thermoplastic, TPO

**Deck Type 4:** Lightweight Concrete

**Deck Description:** Minimum 323 psi Generic Cellular Lightweight Concrete over steel or structural concrete. Lightweight concrete shall record a Minimum Characteristic Resistance Force (MCRF) of 147.971 lbf when tested with CR Base Sheet Fasteners (1.7”).

**System Type F(9):** Membrane adhered to lightweight concrete.

**All General and System Limitations apply. Roof accessories not listed in Table 1 of this NOA are not approved and shall not be installed unless said accessories demonstrate compliance with prescriptive Florida Building Code requirements and are field fabricated utilizing the approved membranes listed in Table 1.**

**Deck:** Minimum 2500 psi structural concrete or minimum 22 ga. vented corrugated 1-1/2 inch, WR Type B, G90 galvanized 55 ksi. steel deck.

**Lightweight Concrete:** The deck is filled with a slurry coat of Generic Cellular Lightweight Concrete, minimum 300 psi, to a depth of 1/8 inch above the top deck rib. **(Optional)** EPS Holey Board with 3” diameter holes is placed into the slurry, followed by a minimum 2” thick pour of Generic Cellular Lightweight concrete, minimum 323 psi.

**Membrane:** Mule-Hide TPO-c Fleece Back membrane adhered to the lightweight concrete using Flexible FAST 100 LV Adhesive, FAST Dual Cartridge Adhesive, FAST Bag in a Box Adhesive or Flexible FAST Adhesive, Flexible FAST Dual Cartridge Adhesive, Flexible FAST Bag in A Box Adhesive applied in 1/2 to 3/4 inch wet beads spaced 6 inch on center. Overlap membrane splices a minimum of 2 inches to provide for a minimum 1-1/2 inch heat weld.

**Maximum Design Pressure:** -250 psf.; (See General Limitation #9)



**Membrane Type:** Single Ply, Thermoplastic, TPO  
**Deck Type 4:** Lightweight Concrete  
**Deck Description:** Minimum 353 psi Generic Cellular Lightweight Concrete over structural concrete. Lightweight concrete shall record a Minimum Characteristic Resistance Force (MCRF) of 100.92 lbf when tested with CR Base Sheet Fasteners (1.7").  
**System Type F(10):** Membrane adhered to lightweight concrete.

**All General and System Limitations apply. Roof accessories not listed in Table 1 of this NOA are not approved and shall not be installed unless said accessories demonstrate compliance with prescriptive Florida Building Code requirements and are field fabricated utilizing the approved membranes listed in Table 1.**

**Deck:** Minimum 2500 psi structural concrete.

**Lightweight Concrete:** The deck is filled with a slurry coat of Generic Cellular Lightweight Concrete, minimum 300 psi, to a depth of 1/8 inch. **(Optional)** EPS Holey Board with 3" diameter holes is placed into the slurry, followed by a minimum 2" thick pour of Generic Cellular Lightweight concrete, minimum 353 psi.

**Membrane:** Mule-Hide TPO-c, Mule-Hide TPO-c EXTRA or Mule-Hide TPO-c (FR) membrane fully adhered to the lightweight concrete using Mule-Hide TPO-c Bonding Adhesive. The adhesive is applied in a contact application and is applied to both the underside of the roofing membrane and the top side of the approved substrate at a rate of 60 ft<sup>2</sup>/gallon, finished surface area. Overlap membrane splices a minimum of 2 inches to provide for a minimum 1-1/2 inch heat weld.

**Maximum Design Pressure:** -452.5 psf.; (See General Limitation #9)



**Membrane Type:** Single Ply, Thermoplastic, TPO  
**Deck Type 4:** Lightweight Concrete  
**Deck Description:** Minimum 353 psi Generic Cellular Lightweight Concrete over structural concrete. Lightweight concrete shall record a Minimum Characteristic Resistance Force (MCRF) of 100.92 lbf when tested with CR Base Sheet Fasteners (1.7").  
**System Type F(11):** Membrane adhered to lightweight concrete.

**All General and System Limitations apply. Roof accessories not listed in Table 1 of this NOA are not approved and shall not be installed unless said accessories demonstrate compliance with prescriptive Florida Building Code requirements and are field fabricated utilizing the approved membranes listed in Table 1.**

**Deck:** Minimum 2500 psi structural concrete.

**Lightweight Concrete:** The deck is filled with a slurry coat of Generic Cellular Lightweight Concrete, minimum 300 psi, to a depth of 1/8 inch. **(Optional)** EPS Holey Board with 3" diameter holes is placed into the slurry, followed by a minimum 2" thick pour of Generic Cellular Lightweight concrete, minimum 353 psi.

**Membrane:** Mule-Hide TPO-c Fleece Back membrane adhered to the lightweight concrete using FAST 100 LV Adhesive, FAST Dual Cartridge Adhesive, FAST Bag in a Box Adhesive or Flexible FAST Adhesive, Flexible FAST Dual Cartridge Adhesive, Flexible FAST Bag in A Box Adhesive applied in 1/2 to 3/4 inch wet beads spaced 12 inch on center. Overlap membrane splices a minimum of 2 inches to provide for a minimum 1-1/2 inch heat weld.

**Maximum Design Pressure:** -217.5 psf.; (See General Limitation #9)



**Membrane Type:** Single Ply, Thermoplastic, TPO  
**Deck Type 4:** Lightweight Concrete  
**Deck Description:** Elastizell Cellular Lightweight Concrete, minimum 324 psi over structural concrete.  
**System Type F(12):** Membrane adhered to lightweight concrete.

**All General and System Limitations apply. Roof accessories not listed in Table 1 of this NOA are not approved and shall not be installed unless said accessories demonstrate compliance with prescriptive Florida Building Code requirements and are field fabricated utilizing the approved membranes listed in Table 1.**

**Deck:** Minimum 3000 psi structural concrete.

**Lightweight Concrete:** The deck is filled with a slurry coat of Elastizell Cellular Lightweight Concrete, minimum 250 psi, to a depth of 1/8 inch. **(Optional)** EPS Holey Board with 3” diameter holes is placed into the slurry, followed by a minimum 2” thick pour of Elastizell Cellular Lightweight concrete, minimum 324 psi.

**Membrane:** SA-TPO (Self-Adhered Technology) membrane fully adhered to the lightweight concrete. Overlap membrane splices a minimum of 2 inches to provide for a minimum 1-1/2 inch heat weld.

**Maximum Design Pressure:** -282.5 psf.; (See General Limitation #9)



## **LIGHTWEIGHT INSULATING CONCRETE SYSTEM LIMITATIONS:**

1. If mechanical attachment to the structural deck through the lightweight insulating concrete is proposed, a field withdrawal resistance testing shall be performed to determine equivalent or enhanced fastener patterns and density. All testing and fastening design shall be in compliance with Testing Application Standard TAS 105 and Roofing Application Standard RAS 137, calculations shall be signed and sealed by a Florida registered Professional Engineer, Registered Architect, or Registered Roof Consultant.
2. For steel deck application where specific deck construction is not referenced: The deck shall be a minimum 22 gage attached with 5/8" puddle welds with weld washers at every flute with maximum deck spans of 5 ft. o.c.
3. For Systems where specific lightweight insulating concrete is referenced consult current lightweight insulating concrete NOA for specific deck construction and limitations. For systems where specific lightweight insulating concrete is not referenced, the minimum design mix shall be a minimum of 300 psi.



## GENERAL LIMITATIONS:

1. Fire classification is not part of this acceptance, refer to a current Approved Roofing Materials Directory for fire ratings of this product.
2. Insulation may be installed in multiple layers. The first layer shall be attached in compliance with Product Control Approval guidelines. All other layers shall be adhered in a full mopping of approved asphalt applied within the EVT range and at a rate of 20-40 lbs./sq., or mechanically attached using the fastening pattern of the top layer
3. All standard panel sizes are acceptable for mechanical attachment. When applied in approved asphalt, panel size shall be 4' x 4' maximum.
4. An overlay and/or recovery board insulation panel is required on all applications over closed cell foam insulations when the base sheet is fully mopped. If no recovery board is used the base sheet shall be applied using spot mopping with approved asphalt, 12" diameter circles, 24" o.c.; or strip mopped 8" ribbons in three rows, one at each sidelap and one down the center of the sheet allowing a continuous area of ventilation. Encircling of the strips is not acceptable. A 6" break shall be placed every 12' in each ribbon to allow cross ventilation. Asphalt application of either system shall be at a minimum rate of 12 lbs./sq. **Note: Spot attached systems shall be limited to a maximum design pressure of -45 psf.**
5. Fastener spacing for insulation attachment is based on a Minimum Characteristic Force (F') value of 275 lbf., as tested in compliance with Testing Application Standard TAS 105. If the fastener value, as field-tested, are below 275 lbf. insulation attachment shall not be acceptable.
6. Fastener spacing for mechanical attachment of anchor/base sheet or membrane attachment is based on a minimum fastener resistance value in conjunction with the maximum design value listed within a specific system. Should the fastener resistance be less than that required, as determined by the Building Official, a revised fastener spacing, prepared, signed and sealed by a Florida Registered Engineer, Architect, or Registered Roof Consultant may be submitted. Said revised fastener spacing shall utilize the withdrawal resistance value taken from Testing Application Standards TAS 105 and calculations in compliance with Roofing Application Standard RAS 117.
7. Perimeter and corner areas shall comply with the enhanced uplift pressure requirements of these areas. Fastener densities shall be increased for both insulation and base sheet as calculated in compliance with Roofing Application Standard RAS 117 and/or RAS 137. Calculations prepared, signed and sealed by a Florida registered Professional Engineer, Registered Architect, or Registered Roof Consultant **(When this limitation is specifically referred within this NOA, General Limitation #9 will not be applicable.)**
8. All attachment and sizing of perimeter nailers, metal profile, and/or flashing termination designs shall conform with Roofing Application Standard RAS 111 and applicable wind load requirements.
9. The maximum designed pressure limitation listed shall be applicable to all roof pressure zones (i.e. field, perimeters, and corners). Neither rational analysis, nor extrapolation shall be permitted for enhanced fastening at enhanced pressure zones (i.e. perimeters, extended corners and corners). **(When this limitation is specifically referred within this NOA, General Limitation #7 will not be applicable.)**
11. All products listed herein shall have a quality assurance audit in accordance with the Florida Building Code and Rule 61G20-3 of the Florida Administrative Code.

**END OF THIS ACCEPTANCE**

