



NEMO|etc.

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EVALUATION REPORT

Firestone Building Products Company, LLC.
200 4th Avenue South
Nashville, TN 37201
(800) 428-4442

Evaluation Report F47310.12.13-2-R4
FL16723-R4
Date of Issuance: 12/12/2013
Revision 4: 03/20/2018

SCOPE:

This Evaluation Report is issued under **Rule 61G20-3** and the applicable rules and regulations governing the use of construction materials in the State of Florida. The documentation submitted has been reviewed by Robert Nieminen, P.E. for use of the product under the Florida Building Code. The product described herein has been evaluated for compliance with the **6th Edition (2017) Florida Building Code, High Velocity Hurricane Zone (HVHZ)** sections noted herein.

DESCRIPTION: Firestone UltraPly TPO Single Ply Roof Systems

LABELING: Labeling shall be in accordance with the requirements of the Accredited Quality Assurance Agency noted herein.

CONTINUED COMPLIANCE: This Evaluation Report is valid until such time as the named product(s) changes, the referenced Quality Assurance documentation changes, or provisions of the Code that relate to the product change. Acceptance of this Evaluation Report by the named client constitutes agreement to notify Robert Nieminen, P.E. of any changes to the product(s), the Quality Assurance or the production facility location(s). NEMO|etc. requires a complete review of this Evaluation Report relative to updated Code requirements with each Code Cycle.

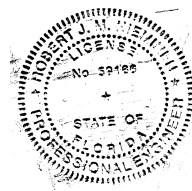
ADVERTISEMENT: The Evaluation Report number preceded by the words "NEMO|etc. Evaluated" may be displayed in advertising literature. If any portion of the Evaluation Report is displayed, then it shall be done in its entirety.

INSPECTION: Upon request, a copy of this entire Evaluation Report 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 Evaluation Report consists of pages 1 through 4, plus a 48-page Appendix.

Prepared by:

Robert J.M. Nieminen, P.E.
Florida Registration No. 59166, Florida DCA ANE1983



The facsimile seal appearing was authorized by Robert Nieminen, P.E. on 03/20/2018. This does not serve as an electronically signed document.

CERTIFICATION OF INDEPENDENCE:

1. NEMO ETC, LLC does not have, nor does it intend to acquire or will it acquire, a financial interest in any company manufacturing or distributing products it evaluates.
2. NEMO ETC, LLC is not owned, operated or controlled by any company manufacturing or distributing products it evaluates.
3. Robert Nieminen, P.E. does not have nor will acquire, a financial interest in any company manufacturing or distributing products for which the evaluation reports are being issued.
4. Robert Nieminen, P.E. does not have, nor will acquire, a financial interest in any other entity involved in the approval process of the product.
5. This is a building code evaluation. Neither NEMO ETC, LLC nor Robert Nieminen, P.E. are, in any way, the Designer of Record for any project on which this Evaluation Report, or previous versions thereof, is/was used for permitting or design guidance unless retained specifically for that purpose.

ROOFING SYSTEMS EVALUATION:
1. SCOPE:

Product Category: Roofing
Sub-Category: Single Ply Roof Systems
Compliance Statement: Firestone UltraPly TPO and UltraPly TPO XR Single Ply Roof Systems, as produced by Firestone Building Products, have demonstrated compliance with the following sections of the 6th Edition (2017) Florida Building Code, HVHZ through testing in accordance with the following Standards. Compliance is subject to the Installation Requirements and Limitations / Conditions of Use set forth herein.

2. STANDARDS:

Section	Property	Standard	Year
TAS 110	Wind, Impact	TAS 114	2011
TAS 110	Physical Properties	TAS 131	1995

3. REFERENCES:

Entity	Exam	Reference	Date	Entity	Exam	Reference	Date
ACRC (TST4671)	TAS 114	ACRC 05-002	01/18/2005	FM (TST1867)	FM 4474	797-07314-267	04/05/2012
ACRC (TST4671)	TAS 114	ACRC 02-002	01/07/2003	FM (TST1867)	FM 4474	3046333	08/10/2012
ACRC (TST4671)	TAS 114	ACRC 06-030	08/21/2006	FM (TST1867)	FM 4474	3041939	08/14/2012
ERD (TST 6049)	FM 4474	F12260.02.09-2	02/04/2009	FM (TST1867)	FM 4474	3042666	08/14/2012
ERD (TST 6049)	FM 4474	F34280.11.10	11/16/2010	FM (TST1867)	FM 4474	797-07680-267	09/14/2012
ERD (TST 6049)	FM 4474	F45610.01.14	01/13/2014	FM (TST1867)	FM 4474	797-07729-267	10/30/2012
ERD (TST 6049)	ASTM D6878	F40090.09.14	09/12/2014	FM (TST1867)	FM 4474	797-07970-267	01/24/2013
ERD (TST 6049)	ASTM D6878	F38200.04.15-R1	03/20/2017	FM (TST1867)	FM 4474	797-07855-267	01/29/2013
FM (TST1867)	FM 4470	3001925	05/24/1999	FM (TST1867)	FM 4474	797-07969-267	01/29/2013
FM (TST1867)	FM 4470	3003830	05/26/1999	FM (TST1867)	FM 4474	3046870	03/22/2013
FM (TST1867)	FM 4470	3004249	11/03/1999	FM (TST1867)	FM 4474	797-08294-267	04/26/2013
FM (TST1867)	FM 4470	3006983	02/08/2000	FM (TST1867)	FM 4474	3049316	05/30/2013
FM (TST1867)	FM 4470	3014031	07/22/2002	FM (TST1867)	FM 4474	797-08513-267	07/15/2013
FM (TST1867)	FM 4470	3014918	12/17/2003	FM (TST1867)	FM 4474	3047398	08/15/2013
FM (TST1867)	FM 4470	3012931	04/30/2004	FM (TST1867)	FM 4474	3047700	08/16/2013
FM (TST1867)	FM 4470	3016670	04/29/2004	FM (TST1867)	FM 4474	797-10191-267	01/09/2015
FM (TST1867)	FM 4470	3017120	04/30/2004	FM (TST1867)	FM 4474	3052525	02/20/2015
FM (TST1867)	FM 4470	3009473	04/30/2004	FM (TST1867)	FM 4474	3050535	05/18/2015
FM (TST1867)	FM 4474	3020394	09/03/2004	FM (TST1867)	FM 4474	3055491	12/05/2016
FM (TST1867)	FM 4474	3022988	01/28/2005	FM (TST1867)	FM 4474	3060621	10/17/2017
FM (TST1867)	FM 4474	3026519	12/14/2006	PRI (TST5878)	FM 4474	FBP-085-02-01	10/04/2012
FM (TST1867)	FM 4474	797-02341-267	12/15/2006	PRI (TST5878)	FM 4474	FBP-086-02-01	10/04/2012
FM (TST1867)	FM 4474	3026520	12/14/2006	PRI (TST5878)	FM 4474	FBP-044-02-01	06/25/2013
FM (TST1867)	FM 4474	3027508	02/07/2007	FM (TST1867)	FM 4474	FBP-119-02-01	07/22/2013
FM (TST1867)	FM 4474	797-02812-267	05/22/2007	PRI (TST5878)	FM 4474	FBP-122-02-01	07/23/2013
FM (TST1867)	FM 4474	3030227	06/18/2007	PRI (TST5878)	FM 4474	FBP-149-02-01	12/18/2013
FM (TST1867)	FM 4474	3028164	11/02/2007	PRI (TST5878)	FM 4474	FBP-150-02-01	12/18/2013
FM (TST1867)	FM 4474	3030650	05/16/2008	PRI (TST5878)	FM 4474	FBP-153-02-01	12/18/2013
FM (TST1867)	FM 4474	3033218	08/12/2008	PRI (TST5878)	FM 4474	FBP-154-02-02	12/18/2013
FM (TST1867)	FM 4474	3035017	04/15/2009	PRI (TST5878)	FM 4474	FBP-160-02-01	12/18/2013
FM (TST1867)	FM 4474	3032272	05/22/2009	PRI (TST5878)	ASTM D6878	FBP-145-02-01	06/26/2014
FM (TST1867)	FM 4474	3033947	05/29/2009	PRI (TST5878)	FM 4474	FBP-158-02-01	04/28/2014
FM (TST1867)	FM 4474	3036642	10/09/2009	PRI (TST5878)	FM 4474	FBP-165-02-01	04/28/2014
FM (TST1867)	FM 4474	3036747	10/09/2009	PRI (TST5878)	FM 4474	FBP-165-02-01A	04/28/2014
FM (TST1867)	FM 4474	3035560	01/11/2010	PRI (TST5878)	FM 4474	FBP-172-02-01	04/28/2014
FM (TST1867)	FM 4474	797-05444-267	04/07/2010	PRI (TST5878)	FM 4474	FBP-175-02-01	04/28/2014
FM (TST1867)	FM 4474	797-05830-267	08/30/2010	PRI (TST5878)	FM 4474	FBP-178-02-01	04/28/2014
FM (TST1867)	FM 4474	797-05604-267	06/02/2010	PRI (TST5878)	FM 4474	FBP-182-02-01	05/01/2014
FM (TST1867)	FM 4474	797-05627-267	06/14/2010	PRI (TST5878)	FM 4474	FBP-181-02-01A	07/15/2014
FM (TST1867)	FM 4474	797-05639-267	06/16/2010	PRI (TST5878)	FM 4474	FBP-184-02-01	07/27/2014
FM (TST1867)	FM 4474	797-05829-267	08/30/2010	PRI (TST5878)	FM 4474	FBP-185-02-01	07/31/2014
FM (TST1867)	FM 4474	797-05830-267	08/30/2010	PRI (TST5878)	FM 4474	FBP-185-02-02	07/31/2014
FM (TST1867)	FM 4474	3040535	10/05/2010	PRI (TST5878)	FM 4474	FBP-186-02-01	07/31/2014
FM (TST1867)	FM 4474	3037109	11/18/2010	PRI (TST5878)	FM 4474	FBP-191-02-01	07/31/2014
FM (TST1867)	FM 4474	3038546	12/17/2010	PRI (TST5878)	FM 4474	FBP-191-02-02	07/31/2014
FM (TST1867)	FM 4474	3041939	01/04/2011	PRI (TST5878)	UL1897	FBP-193-02-02	10/16/2014
FM (TST1867)	FM 4474	3041694	01/14/2011	PRI (TST5878)	UL1897	FBP-206-02-01	10/16/2014
FM (TST1867)	FM 4474	3041939	02/01/2011	PRI (TST5878)	FM 4474	FBP-194-02-02	10/21/2014
FM (TST1867)	FM 4474	3041939	03/02/2011	PRI (TST5878)	UL1897	FBP-196-02-04	10/21/2014
FM (TST1867)	FM 4474	3039133	04/07/2011	PRI (TST5878)	UL 1897	FBP-196-02-02	10/22/2014

Entity	Exam	Reference	Date	Entity	Exam	Reference	Date
FM (TST1867)	FM 4474	3041535	06/08/2011	PRI (TST5878)	UL1897	FBP-213-02-01	11/20/2014
FM (TST1867)	FM 4474	3041949	06/10/2011	PRI (TST5878)	FM 4474	FBP-213-02-03	11/20/2014
FM (TST1867)	FM 4474	3042909	08/03/2011	PRI (TST5878)	FM 4474	FBP-216-02-01	11/20/2014
FM (TST1867)	FM 4474	3038191	08/04/2011	PRI (TST5878)	UL1897	FBP-220-02-01	01/29/2015
FM (TST1867)	FM 4474	3038770	08/04/2011	PRI (TST5878)	FM 4474	FBP-222-02-01	02/02/2015
FM (TST1867)	FM 4474	3041939	08/16/2011	PRI (TST5878)	FM 4474	FBP-220-02-02	02/11/2015
FM (TST1867)	FM 4474	797-06749-267	09/13/2011	UL (TST1740)	UL 1897	10CA20078	11/20/2010
FM (TST1867)	FM 4474	3036639	11/22/2011	UL (TST1740)	UL 1897	10NK13003	06/13/2011
FM (TST1867)	FM 4474	3044812	01/05/2012	UL, LLC (QUA9625)	QC	Service Confirm	Exp. 09/11/2020

4. PRODUCT DESCRIPTION:

The following roof covers are mechanically attached or fully adhered to Approved substrates using fasteners, stress plates and adhesives, as outlined in the Limitations / Conditions of Use herein.

- 4.1 **Firestone UltraPly TPO** is a nominal 45-mil (1.1 mm), 60-mil (1.5 mm) or 80-mil (2.0 mm) thick, polyester scrim reinforced single-ply roof membrane.
- 4.2 **Firestone UltraPly TPO XR** is a nominal 45-mil (1.1 mm) (XR 100), 60-mil (1.5 mm) (XR 115) or 80-mil (2.0 mm) (XR 135) thick, polyester reinforced, single-ply roof membrane produced with an 8-oz polyester backing

5. LIMITATIONS:

- 5.1 This is a building code evaluation. Neither NEMO ETC, LLC nor Robert Nieminen, P.E. are, in any way, the Designer of Record for any project on which this Evaluation Report, or previous versions thereof, is/was used for permitting or design guidance unless retained specifically for that purpose.
- 5.2 Fire classification is not part of this Evaluation Report; refer to a current Approved Roofing Materials Directory for fire ratings of this product.
- 5.3 For steel deck installations, foam plastic insulation shall be separated from the building interior in accordance with **FBC 2603.4** unless the exceptions stated in **FBC 2603.4.1** and **2603.6** apply.
- 5.4 The evaluation herein pertains to above-deck roof components; deck-attachment details pertain to ‘as-tested’ conditions under **Testing Application Standard TAS 114, Appendix J**. Roof decks shall be in accordance with **FBC (HVHZ)** requirements to the satisfaction of the Authority Having Jurisdiction.
- 5.5 Fastener spacing for mechanical attachment of anchor/base sheet or membrane is based on a minimum fastener resistance value in conjunction with the maximum design pressure (MDP) listed for 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 qualified design professional – may be submitted. Said revised fastener spacing shall utilize the withdrawal resistance value taken from **Testing Application Standard TAS 105** and calculations in compliance with **Roofing Application Standard RAS 117** or **Roofing Application Standard RAS 137**.
- 5.5.1 If mechanical attachment to the structural deck through lightweight insulating concrete is proposed, field withdrawal resistance testing shall be performed to confirm equivalent or determine enhanced fastening patterns and density. All testing and fastening design shall be in compliance with **Testing Application Standard TAS 105** and **Roofing Application Standard RAS 117** and/or **Roofing Application Standard RAS 137**. Calculations shall be prepared, signed and sealed by a qualified design professional.
- 5.6 For systems where specific lightweight insulating concrete is referenced, consult the current HVHZ product approval documentation for specific deck construction and limitations. For systems where specific lightweight insulating concrete is not referenced, the minimum design mix shall be for minimum 300 psi cellular material.
- 5.7 For recover installations, the existing roof shall be examined in accordance with **FBC 1521**.
- 5.8 Perimeter and corner areas shall comply with the enhanced uplift pressure requirements of these areas. Fastener densities shall be increased, as calculated in compliance with **Roofing Application Standard RAS 117** and/or **Roofing Application Standard RAS 137** by a qualified design professional. **This extrapolation is not permitted for systems marked with an asterisk*.*
- 5.9 All attachment and sizing of perimeter nailers, metal profile and/or flashing termination designs shall conform to **Roofing Application Standard RAS 111** and applicable wind load requirements.

- 5.10 For assemblies marked with an asterisk*, the maximum design pressure (MDP) limitation listed shall be applicable to all roof pressure zones (i.e., field, perimeters and corners). Neither rational analysis, nor extrapolation is permitted for enhanced attachment at enhanced pressure zones (i.e., perimeters, corners and extended corners).
- 5.11 For bonded insulation or membrane over existing substrates in a recover installation, the existing roof system shall be capable of resisting project design pressures on its own merit to the satisfaction of the Authority Having Jurisdiction, as documented through field uplift testing in accordance with **Testing Application Standard TAS 124**.
- 5.12 All products listed herein shall have quality assurance audit in accordance with the **F.A.C. Rule 61G20-3**.

6. INSTALLATION:

- 6.1 Firestone UltraPly TPO and UltraPly TPO XR shall be installed in accordance with Firestone Building Products published installation instructions, subject to the Limitations / Conditions of Use noted herein.
- 6.2 System attachment requirements for wind load resistance are set forth in Appendix 1. "MDP" = Maximum Design Pressure is the result of testing for wind load resistance based on allowable wind loads, and reflects the ultimate passing pressure divided by 2 (the 2 to 1 margin of safety per **Testing Application Standard TAS 114** has already been applied). Refer to **FBC 1620** and **Roofing Application Standard RAS 128** for determination of design wind loads.
- 6.3 For mechanically fastened membrane systems (Type D) over profiled steel deck, membrane shall be installed running perpendicular to steel deck flutes.
- 6.4 For InvisiWeld installations, care shall be taken to ensure that the InvisiWeld Plates do not line-up with seams in the TPO membrane. This condition precludes proper induction welding of the membrane to the InvisiWeld Plates.

7. QUALITY ASSURANCE ENTITY:

UL, LLC – QUA9625; (414) 248-6409; Karen.buchmann@us.ul.com

- THE 48-PAGES THAT FOLLOW FORM PART OF THIS EVALUATION REPORT -