



**NEMO|etc.**

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ENGINEER

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**EVALUATION REPORT**

**Boral Roofing**

7575 Irvine Center Drive, Suite 100  
Irvine, CA. 92618  
**(602) 269-2288**

**Evaluation Report M35710.12.10-R15**

**FL14317-R12**

**Date of Issuance: 12/21/2010**

**Revision 15: 03/05/2021**

**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 products described herein have been evaluated for compliance with the **7<sup>th</sup> Edition (2020) Florida Building Code** sections noted herein.

**DESCRIPTION: Boral Roof Underlayments**

**LABELING:** Labeling shall be in accordance with the requirements of the Accredited Quality Assurance Agency noted herein and FBC 1507.1.1.

**CONTINUED COMPLIANCE:** This Evaluation Report is valid until such time as the named product(s) changes, the referenced Quality Assurance or production facility location(s) changes, or Code provisions that relate to the product(s) change. Acceptance of our Evaluation Reports by the named client constitutes agreement to notify NEMO ETC, LLC of any changes to the product(s), the Quality Assurance or the production facility location(s). NEMO ETC, LLC requires a complete review of its Evaluation Report relative to updated Code requirements with each Code Cycle.

**ADVERTISEMENT:** The Florida Product Approval Number (FL#) 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 6.

**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 03/05/2021. 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 COMPONENT EVALUATION:**
**1. SCOPE:**

**Product Category:** Roofing

**Sub-Category:** Underlayment

**Compliance Statement:** **Boral Roof Underlayments**, as marketed by **Boral Roofing**, have demonstrated compliance with the following sections of the **7<sup>th</sup> Edition (2020) Florida Building Code** 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
1504.3.1	Wind resistance	UL 1897	2015
1507.1.1, 1507.2.4, 1507.2.9.2 / R905.1.1, R905.2.8.2	Material standard	ASTM D1970	2015
1507.3.3 / R905.3.3	Material standard	FRSA/TRI, Sixth Edition	2018
TAS 110	Material standard	TAS 103	2020

**3. REFERENCES:**

Entity	Examination	Reference	Date
ERD (TST 6049)	ASTM D1970 / D4798	M36790.07.11	09/30/2011
ERD (TST 6049)	ASTM D226, D1970	B40380.08.12	08/28/2012
ERD (TST 6049)	TAS 103-20 (tensile adhesion)	C41420.09.12-2	09/11/2012
ERD (TST 6049)	ASTM D1970 (adhesion)	B41940.09.12	09/13/2012
ERD (TST 6049)	TAS 103-20 (tensile adhesion)	B47390.07.14-1	07/31/2014
ERD (TST 6049)	TAS 103-20 (tensile adhesion)	B47390.09.14	09/04/2014
OC (PDM1838)	Physical Properties	Equivalency statement	11/02/2017
PRI (TST 5878)	ASTM D1970	NEI-031-02-02:REV	10/27/2010
PRI (TST 5878)	ASTM D1970	NEI-029-02-01:REV	12/03/2010
PRI (TST 5878)	Wind Uplift	BORR-001-02-01	03/17/2015
PRI (TST 5878)	Wind Uplift	BORR-005-02-01	06/24/2015
PRI (TST 5878)	TAS 103-20 (tensile adhesion)	DAPF-002-02-01	03/08/2018
PRI (TST 5878)	ASTM D1970	OCF-356-02-01	03/23/2018
PRI (TST 5878)	FRSA/TRI 09-2018	OCF-356-02-02	03/22/2018
PRI (TST 5878)	TAS 103-20 (tensile adhesion)	OCF-356-02-04	03/22/2018
PRI (TST 5878)	ASTM D1970 (adhesion)	OCF-443-02-01	10/11/2018
PRI (TST 5878)	TAS 103-20 (tile slippage clarification)	OCF-356-02-02.1	02/03/2021
PRI CMT (QUA9110)	Quality Assurance	Declaration from Supplier	03/05/2021

**4. PRODUCT DESCRIPTION:**

	Product	Material Standard	Plant(s)	Description
4.1	Boral® TileSeal 50 <sup>HT</sup>	ASTM D1970	Brentwood, NH	nominal 50-mil thick, polyester-surfaced, self-adhering SBS modified bitumen roof underlayment
4.2	Boral® TileSeal <sup>HT</sup>	ASTM D1970 and FRSA/TRI 09-18	Brentwood, NH	nominal 60-mil thick, polyester-surfaced, self-adhering SBS modified bitumen roof underlayment
4.3	Boral® MetalSeal <sup>HT</sup>	ASTM D1970 and FRSA/TRI 09-18	Brentwood, NH	nominal 60-mil thick, polyester-surfaced, self-adhering SBS modified bitumen roof underlayment
4.4	GatorSeal®	ASTM D1970	Brentwood, NH	nominal 55-mil thick, granule-surfaced, fiberglass reinforced, self-adhering SBS modified bitumen roof underlayment
4.5	Citadel® Plus	ASTM D1970	Brentwood, NH	nominal 48-mil thick, fabric-surfaced, fiberglass reinforced, self-adhering SBS modified bitumen roofing underlayment for use as a base-layer in multi-ply underlayment systems

**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 This Evaluation Report is not for use in FBC High Velocity Hurricane Zone jurisdictions (i.e., Broward and Miami-Dade Counties).
- 5.3 This Evaluation Report pertains to above-deck roof components. Roof decks and structural members shall be in accordance with FBC requirements to the satisfaction of the Authority Having Jurisdiction.
- 5.4 This Evaluation Report does not include evaluation of fire classification. Refer to **FBC 1505** for requirements and limitations regarding roof assembly fire classification. Refer to **FBC 2603** for requirements and limitations concerning the use of foam plastic insulation.
- 5.5 **Boral Roof Underlayments** may be used with any prepared roof cover where the product is specifically referenced within FBC approval documents. If not listed, a request may be made to the Authority Having Jurisdiction for approval based on this evaluation combined with supporting data for the prepared roof covering.
- 5.6 **Allowable Roof Covers:** Table 1 pertains to use of each listed underlayment by-itself beneath the stated roof covers. Refer to the installation instructions for multi-ply underlayment options.

TABLE 1: ROOF COVER OPTIONS							
FBC Section:	1507.2	1507.3		1507.4 & 1507.5		1507.7	1507.8 & 1507.9
Underlayment	Asphalt Shingles	Clay and Concrete Tile		Metal		Slate or Slate-Type Shingles	Wood
		Mechanical Attach	Adhesive-Set	Panels	Shingles		Shingles & Shakes
Boral TileSeal 50 <sup>HT</sup>	Yes	No	No	Yes	Yes	Yes	Yes <i>(joint strips, 1507.1.1.3 / R905.1.1.3)</i>
Boral TileSeal <sup>HT</sup>	Yes	Yes	Yes <i>(See 5.6.1)</i>	Yes	Yes	Yes	Yes <i>(joint strips, 1507.1.1.3 / R905.1.1.3)</i>
Boral MetalSeal <sup>HT</sup>	Yes	Yes	Yes <i>(See 5.6.1)</i>	Yes	Yes	Yes	Yes <i>(joint strips, 1507.1.1.3 / R905.1.1.3)</i>
GatorSeal	Yes	No	No	No	No	Yes	Yes <i>(joint strips, 1507.1.1.3 / R905.1.1.3)</i>

- 5.6.1 Adhesive-set is limited to use of following underlayment / tile-adhesive combinations.

TABLE 1A: ALLOWABLE UNDERLAYMENT / TILE-ADHESIVE COMBINATIONS <sup>1</sup>		
Underlayment	Adhesive	Florida Product Approval
Boral TileSeal <sup>HT</sup> or Boral MetalSeal <sup>HT</sup>	DAP Foam "Touch 'n Seal StormBond Roof Tile Adhesive"	FL14506
Boral TileSeal <sup>HT</sup> or Boral MetalSeal <sup>HT</sup>	DAP Foam "Touch 'n Seal StormBond 2 Two-Component Polyurethane Roof Tile Adhesive"	FL21374
Boral TileSeal <sup>HT</sup> or Boral MetalSeal <sup>HT</sup>	Dupont "Tile Bond™ Roof Tile Adhesive"	FL22525
Boral TileSeal <sup>HT</sup> or Boral MetalSeal <sup>HT</sup>	ICP Adhesives and Sealants "Polyset® AH-160"	FL6332
Boral TileSeal <sup>HT</sup> or Boral MetalSeal <sup>HT</sup>	ICP Adhesives and Sealants "Polyset® RTA-1"	FL6276

<sup>1</sup> Refer to Tile Manufacturer's or Adhesive Manufacturer's Florida Product Approval for Overturning Moment Resistance Performance.

**5.7 Allowable Substrates:**

TABLE 2: SUBSTRATE OPTIONS FOR ADHERED UNDERLAYMENTS			
Underlayment	Application	Primer	Substrates
Citadel Plus, Boral TileSeal 50 <sup>HT</sup> , Boral TileSeal <sup>HT</sup> , Boral MetalSeal <sup>HT</sup> or GatorSeal	self-adhering	(Optional) ASTM D41	plywood
		none	ASTM D226 Type II felt or Citadel Plus
		ASTM D41	metal (flashing metal, valley metal, etc.)
Boral TileSeal <sup>HT</sup> , Boral MetalSeal <sup>HT</sup>	self-adhering	(Optional) ASTM D41	OSB
Boral TileSeal <sup>HT</sup>	self-adhering	(Optional) ASTM D41	Huber “Zip Deck”
		None	G-P Gypsum “DensDeck Prime”

**5.8 Attachment Limitations:**

5.8.1 For use under mechanically attached NON-TILE prepared roof coverings, attachment shall be in accordance with the manufacturer’s installation instructions, but – for mechanically attached underlayments or base sheets - not less than **FBC 1507.1.1** or **R905.1.1**.

5.8.2 For use under tile roof systems, attachment shall be in accordance with the manufacturer’s installation instructions, but not less than Section 5.8.3 herein.

**5.8.3 Wind Resistance for Underlayment Systems in Tile Roof Applications:**

The following wind uplift limitations apply to underlayment systems that are not prescriptive in the **FRSA/TRI Florida High Wind Concrete and Clay Roof Tile Installation Manual**, Sixth Edition. The 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 **FBC 1504.9** has already been applied).

**5.8.3.1 Direct-to-Deck:**

The maximum design pressure for the selected assembly shall meet or exceed that required under **FRSA/TRI Florida High Wind Concrete and Clay Roof Tile Installation Manual**, Sixth Edition, Appendix A, Table 1A or the critical (highest) design pressure determined in accordance with **FBC 1609** or **FBC Residential Chapter 3**.

**#1 Maximum Design Pressure = -120.0 psf:**

Deck: Min. 15/32-inch plywood to meet project requirements to satisfaction of Authority Having Jurisdiction.

Primer: (Optional) ASTM D41 to the plywood deck

Base Ply: Citadel Plus, self-adhered

Cap Ply: Boral TileSeal<sup>HT</sup> or Boral MetalSeal<sup>HT</sup>, self-adhered, and back-nailed within the selvedge-edge side laps using 12 ga. x 1¼” ring shank nails through 32 ga., 1-5/8” diameter tin caps spaced 12-inch o.c.

**#2 Maximum Design Pressure = -142.5 psf:**

Deck: Min. 15/32-inch plywood to meet project requirements to satisfaction of Authority Having Jurisdiction.

Base Ply: None

Cap Ply: Boral TileSeal<sup>HT</sup> or Boral MetalSeal<sup>HT</sup>, self-adhered and back-nailed within the selvedge-edge side laps using 12 ga. x 1¼” ring shank nails through 32 ga., 1-5/8” diameter tin caps spaced 12-inch o.c.

**#3 Maximum Design Pressure = -202.5 psf:**

Deck: Min. 15/32-inch plywood to meet project requirements to satisfaction of Authority Having Jurisdiction.

Primer: Tropical Roofing Products #410 Quick Dry Primer or other ASTM D41 primer to the plywood deck

Base Ply: None

Cap Ply: Boral TileSeal<sup>HT</sup> or Boral MetalSeal<sup>HT</sup>, self-adhered, and back-nailed within the selvedge-edge side laps using 12 ga. x 1¼” ring shank nails through 32 ga., 1-5/8” diameter tin caps spaced 12-inch o.c.

#4 **Maximum Design Pressure = -210.0 psf:**

- Deck: Min. 15/32-inch plywood to meet project requirements to satisfaction of Authority Having Jurisdiction.
- Primer: KARNAK #89 Sta-Tak Primer to the plywood deck
- Base Ply: None
- Cap Ply: Boral TileSeal<sup>HT</sup> or Boral MetalSeal<sup>HT</sup>, self-adhered, and back-nailed within the selvedge-edge side laps using 12 ga. x 1¼” ring shank nails through 32 ga., 1-5/8” diameter tin caps spaced 12-inch o.c.

#5 **Maximum Design Pressure = -120.0 psf:**

- Deck: Min. 2,500 psi structural concrete to meet project requirements to satisfaction of Authority Having Jurisdiction.
- Primer: ASTM D41 to the concrete deck
- Base Ply: (Optional) Citadel Plus, self-adhered
- Cap Ply: Boral TileSeal<sup>HT</sup> or Boral MetalSeal<sup>HT</sup>, self-adhered

#6 All other direct-deck, adhered underlayment systems beneath tile roof systems carry a Maximum Design Pressure of -45 psf.

5.9 **Exposure Limitations:**

TABLE 3: EXPOSURE LIMITATIONS		
Underlayment	Prepared Roof Cover Installation Type	Maximum Exposure (days)
GatorSeal	Mechanically attached	30
Boral TileSeal 50 <sup>HT</sup>	Mechanically attached	180
Boral TileSeal <sup>HT</sup> or Boral MetalSeal <sup>HT</sup>	Adhesive-set tile roof system	180
	Mechanically attached	180
Citadel Plus ( <i>base ply in multi-ply underlayment systems only</i> )	N/A (prior to placement of subsequent underlayment)	180

5.10 **Tile Slippage Limitations:** When loading roof tiles on the underlayment in direct-deck tile roof assemblies, the maximum roof slope shall be as follows. These slope limitations can only be exceeded by using battens during loading of the roof tiles.

TABLE 4: TILE SLIPPAGE LIMITATIONS FOR DIRECT-DECK TILE INSTALLATIONS			
Underlayment*	Tile Profile	Staging Method	Maximum Slope
Boral TileSeal <sup>HT</sup> or Boral MetalSeal <sup>HT</sup>	Flat or Lugged	Max. 10-tile stack	6:12

**6. INSTALLATION:**

- 6.1 **Boral Roof Underlayments** shall be installed in accordance with **Boral Roofing** published installation instructions subject to the Limitations set forth in Section 5 herein and the specifics noted below.
- 6.2 Re-fasten any loose decking panels, and check for protruding nail heads. Sweep the substrate thoroughly to remove any dust and debris prior to application, and prime the substrate (if applicable).

**6.3 Boral TileSeal 50<sup>HT</sup> or GatorSeal:**

6.3.1 Shall be installed in compliance with requirements for an approved self-adhering underlayment (ASTM D1970) in **FBC 1507.1.1.1** or **1507.1.1.3** or **FBC Residential R905.1.1.1** or **R905.1.1.3** for the type of prepared roof covering to be installed, and the manufacturer’s installation instructions.

When installed over a mechanically attached, FBC Approved ASTM D226 Type II felt, the felt shall be fastened in accordance with **FBC 1507.1.1** or **R905.1.1**.

#### 6.3.2 Multi-Ply Underlayment Systems:

One or two plies of **Citadel Plus** followed by **Boral TileSeal 50<sup>HT</sup>** or **GatorSeal** is allowable for use under mechanically attached, non-tile prepared roof systems. Limits of use are those associated with the top-layer material. This is not a requirement, but is allowable if a multi-ply underlayment system is desired.

#### 6.4 **Boral TileSeal<sup>HT</sup> or Boral MetalSeal<sup>HT</sup>:**

##### 6.4.1 Non-Tile Applications:

Shall be installed in compliance with requirements for an approved self-adhering underlayment (ASTM D1970) in **FBC 1507.1.1.1** or **1507.1.1.3** or **FBC Residential R905.1.1.1** or **R905.1.1.3** for the type of prepared roof covering to be installed, and the manufacturer's installation instructions.

When installed over a mechanically attached, FBC Approved ASTM D226 Type II felt, the felt shall be fastened in accordance with **FBC 1507.1.1** or **R905.1.1**.

##### 6.4.2 Tile Applications:

Shall be installed in compliance with requirements for a Self-Adhered Membrane in the **FRSA/TRI Florida High Wind Concrete and Clay Roof Tile Installation Manual**, Sixth Edition, and the manufacturer's installation instructions.

Refer to Section 5.8.2 for attachment limitations.

Refer to Table 4 for tile staging limitations.

##### 6.4.3 Multi-Ply Underlayment Systems:

One or two plies of **Citadel Plus** followed by **Boral TileSeal<sup>HT</sup>** or **Boral MetalSeal<sup>HT</sup>** is allowable for use under mechanically attached, non-tile prepared roof systems. Limits of use are those associated with the top-layer material. This is not a requirement, but is allowable if a multi-ply underlayment system is desired.

Refer to Section 5.8.2 for use of **Citadel Plus** as a base ply membrane in underlayment systems for use under tile-roof systems.

#### 7. **BUILDING PERMIT REQUIREMENTS:**

As required by the Building Official or Authority Having Jurisdiction to properly evaluate the installation of this product.

#### 8. **MANUFACTURING PLANTS:**

Contact the named QA entity for manufacturing facilities covered by **F.A.C. Rule 61G20-3** QA requirements. Refer to Section 4 herein for products and production locations having met codified material standards.

#### 9. **QUALITY ASSURANCE ENTITY:**

PRI Construction Materials Technologies, LLC (QUA9110); (813) 621-5777; [bwilson@pricmt.com](mailto:bwilson@pricmt.com)

- END OF EVALUATION REPORT -