



ENGINEER

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CONSULT

**EVALUATION REPORT**

**DUPONT DE NEMOURS, INC.**

200 Larkin Center  
1605 Joseph Drive  
Midland, MI 48674  
**(813) 597-6126**

**Evaluation Report 15755.06.17-R4**

**FL22525-R5**

**Date of Issuance: 06/14/2017**

**Revision 4: 02/15/2021**

**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: TILE BOND™ Roof Tile Adhesive**

**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 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.

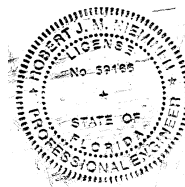
**INSPECTION:** Upon request, a copy of this entire Evaluation Report shall be provided to the user by the manufacturer or its distributors and shall be available for inspection at the job site at the request of the Building Official.

This Evaluation Report consists of pages 1 through 12.

**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 02/15/2021. 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:** Roof Tile Adhesive

**Compliance Statement:** **TILE BOND™ Roof Tile Adhesive**, as produced by **DUPONT DE NEMOURS, INC.**, has demonstrated compliance with the following sections of the **7<sup>th</sup> Edition (2020) Florida Building Code** through testing in accordance with the Standards set forth herein. Compliance is subject to the Installation Requirements and Limitations / Conditions of Use set forth herein.

**2. STANDARDS:**

<u>Sections</u>	<u>Property</u>	<u>Standard</u>	<u>Year</u>
1504.2.1.1	Overturning resistance	SSTD 11	1997
1523.6.5.2.2	Static uplift resistance	TAS 101	1995
1523.6.5.2.17.1	Compressive strength	ASTM D1621	2016
1523.6.5.2.17.2	Density	ASTM D1622	2014
1523.6.5.2.17.3	Tensile strength	ASTM D1623	2017
1523.6.5.2.17.4	Dimensional stability	ASTM D2126	2015
1523.6.5.2.17.5	Open cell content	ASTM D2856	1998
1523.6.5.2.17.6	Water absorption	ASTM D2842	2012
1523.6.5.2.17.7	Moisture vapor permeance	ASTM E96	2015

**3. REFERENCES:**

<u>Entity</u>	<u>Examination</u>	<u>Reference</u>	<u>Date</u>
ERD (TST6049)	Physical properties & TAS 101	D9840.09.09-R1	06/07/2011
ERD (TST6049)	Tensile Adhesion	6535.06.14-1A	06/25/2014
ERD (TST6049)	Tensile Adhesion	6535.06.14-1B	06/25/2014
ERD (TST6049)	Tensile Adhesion	6535.06.14-1C	06/25/2014
ERD (TST6049)	Tensile Adhesion	6535.07.14	07/07/2014
ERD (TST6049)	Static Uplift – SSTD 11	D9840.08.09-1-R1	07/10/2017
Miami-Dade BCCO (CER1592)	FBC HVHZ Certification	20-0701.07	08/13/2020
NEMO (TST6049)	TAS 101 (concrete tile)	4c-DPBS-20-LSOTM-01.A	12/17/2020
NEMO (TST6049)	TAS 101 (clay tile)	4c-DPBS-20-LSOTM-01.B	01/06/2021
UL, LLC. (QUA9625)	Quality Assurance	Service confirmation	01/04/2019
UL, LLC. (QUA9625)	Quality Assurance	Florida BCIS	Current

**4. PRODUCT DESCRIPTION:**

**TILE BOND™ Roof Tile Adhesive** is a single component polyurethane foam roof tile adhesive distributed in factory, pre-mixed canisters.

**5. LIMITATIONS:**

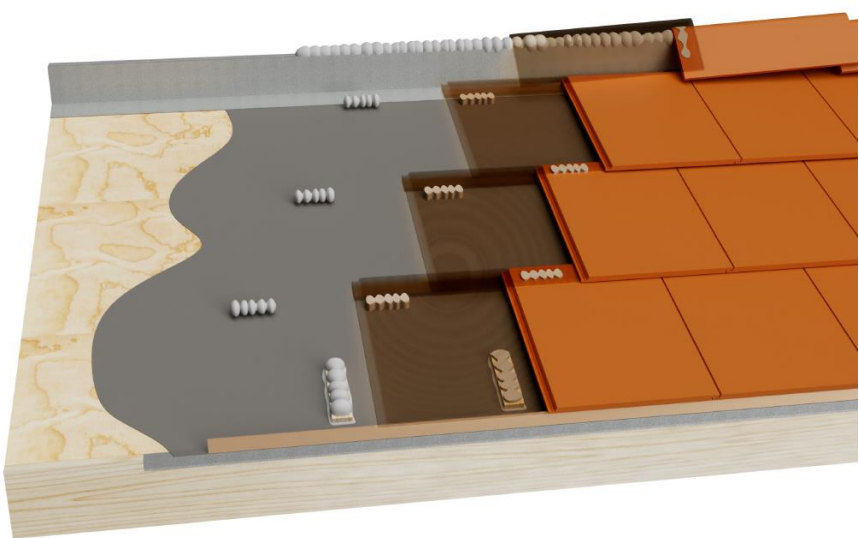
- 5.1 This is a building code evaluation. Neither NEMO ETC, LLC nor Robert Nieminen, P.E. are, in any way, the Designer of Record for any project on which this Evaluation Report, or previous versions thereof, is/was used for permitting or design guidance unless retained specifically for that purpose.
- 5.2 This Evaluation Report 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.
- 5.3 This Evaluation Report does not include evaluation of fire classification. Refer to **FBC 1505, 1516** or **R902** for requirements and limitations regarding roof assembly fire classification. Refer to **FBC 2603** for requirements and limitations concerning the use of foam plastic insulation.
- 5.4 This Evaluation Report does not include evaluation of roof edge termination.

**5.5 FBC NON-HVHZ JURISDICTIONS:**

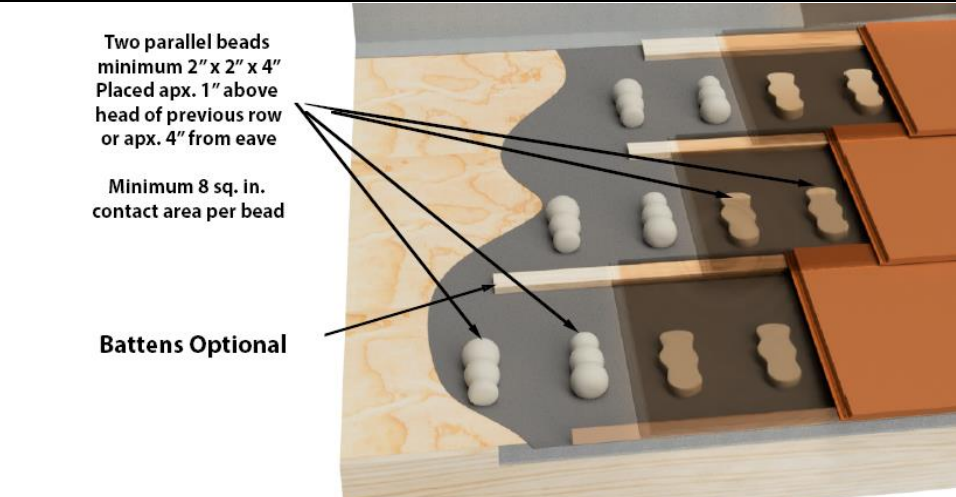
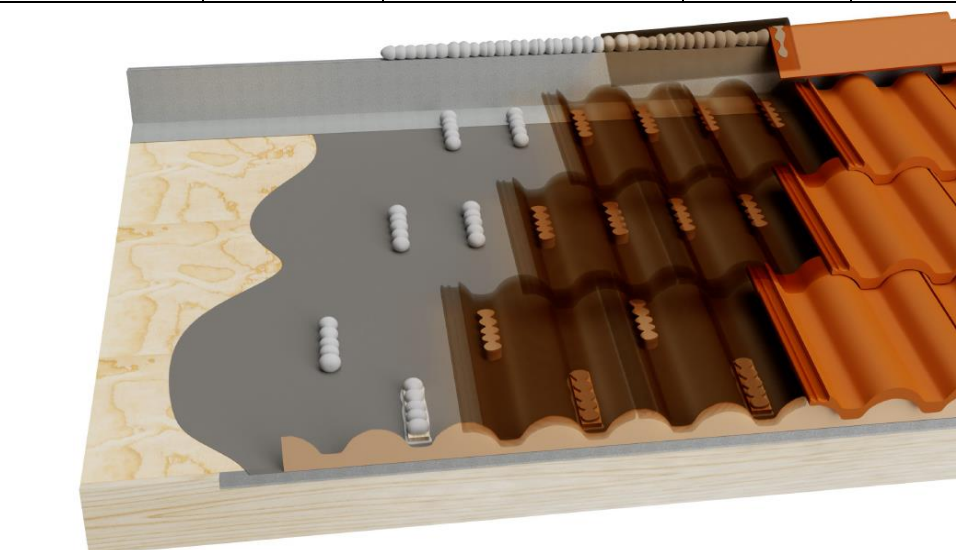
5.5.1 **TILE BOND™ Roof Tile Adhesive** can be used with flat, low and high profile tiles having a current Florida Product Approval or approved on a local-level by the Authority Having Jurisdiction.

5.5.2 Allowable Overturning Moment performance for field tiles, meeting the limitations of **FBC 1609.5.3** and installed using **TILE BOND™ Roof Tile Adhesive**, is set forth in Table 1.

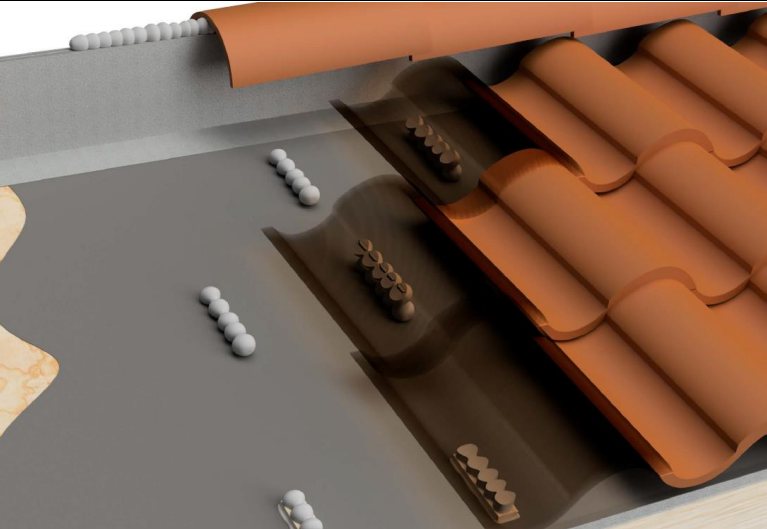
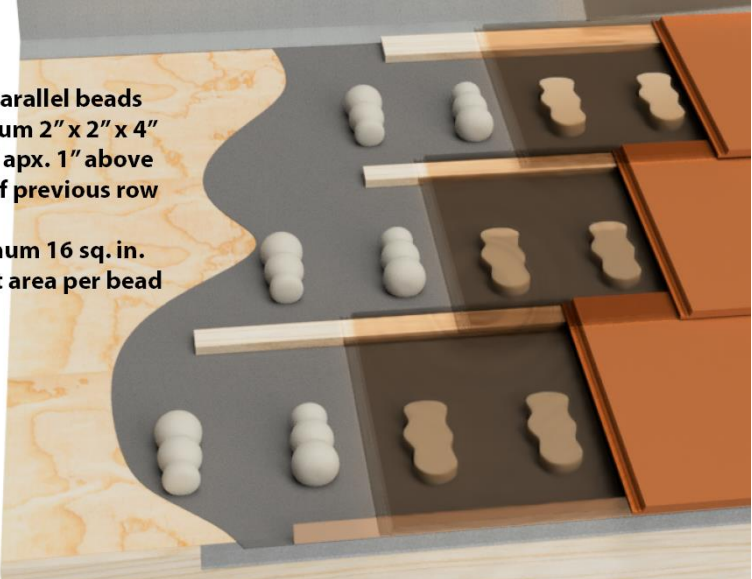
The Allowable Overturning Moment shall meet or exceed the Aerodynamic Uplift Moment (Ma) for the project, as determined in accordance with Table 2HB, 2HC, 2HD, 2GB, 2GC or 2GD of **FRSA/TRI Florida High Wind Concrete and Clay Roof Tile Installation Manual**, Sixth Edition or **FBC 1609.5.3**. Refer to **DUPONT DE NEMOURS, INC.** published installation instructions for Adhesive Paddy Placement details.

TABLE 1: FIELD TILES IN TILE BOND™ ROOF TILE ADHESIVE ALLOWABLE OVERTURNING MOMENT PERFORMANCE DATA FOR NON-HVHZ JURISDICTIONS (MARGIN OF SAFETY ALREADY APPLIED)						
Tile (FBC 1609.5.3)		Adhesive Pad Placement				Allowable Overturning Moment (ft-lbf)
Type	Profile	Type	Size	Location	Contact Area	
Concrete	Flat / Low	Interdependent	1 x 1 x 8-inch	1 to underlayment 1 at tile headlap	Min. 16 in <sup>2</sup> per paddy	63
						

**TABLE 1 (CONTINUED): FIELD TILES IN TILE BOND™ ROOF TILE ADHESIVE**  
**ALLOWABLE OVERTURNING MOMENT PERFORMANCE DATA FOR NON-HVHZ JURISDICTIONS**  
*(MARGIN OF SAFETY ALREADY APPLIED)*

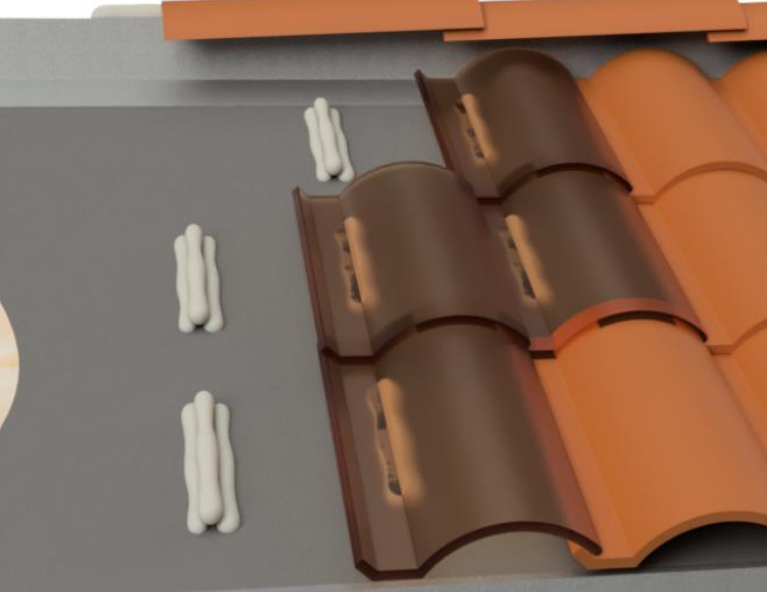
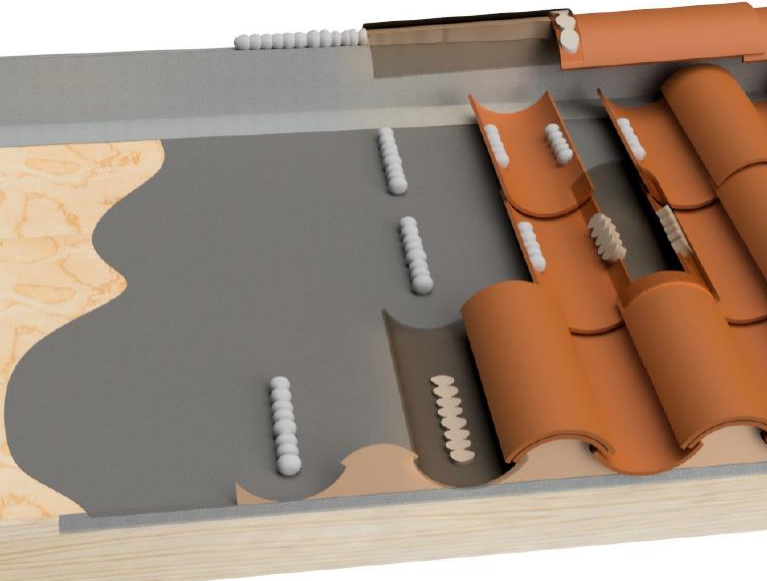
Tile (FBC 1609.5.3)		Adhesive Pad Placement				Allowable Overturning Moment (ft-lbf)
Type	Profile	Type	Size	Location	Contact Area	
Concrete	Flat/Low	Independent	2 x 2 x 4-inch	Two pads to underlayment, parallel to tile length, starting 1-inch back from the head of underlying tile	Min. 8 in <sup>2</sup> per paddy	65
		<p>Two parallel beads minimum 2" x 2" x 4" Placed apx. 1" above head of previous row or apx. 4" from eave</p> <p>Minimum 8 sq. in. contact area per bead</p> <p><b>Battens Optional</b></p> 				
Concrete	Medium	Independent	2 x 2 x 4-inch	Two pads to underlayment, parallel to tile length, starting 1-inch back from the head of underlying tile	Min. 8 in <sup>2</sup> per paddy	67
						

**TABLE 1 (CONTINUED): FIELD TILES IN TILE BOND™ ROOF TILE ADHESIVE  
ALLOWABLE OVERTURNING MOMENT PERFORMANCE DATA FOR NON-HVHZ JURISDICTIONS  
(MARGIN OF SAFETY ALREADY APPLIED)**

Tile (FBC 1609.5.3)		Adhesive Pad Placement				Allowable Overturning Moment (ft-lbf)
Type	Profile	Type	Size	Location	Contact Area	
Concrete	High	Independent (stacked)	1 x 1 x 8-inch	One (1) 1" x 1" x 8" paddy to the center of the tile underside (3" down from the head lap) mating to one (1) 1" x 1" x 8" paddy applied to the deck	Min. 15 in <sup>2</sup> total	58
						
Clay	Flat / Low	Independent	2 x 2 x 4-inch	Two pads to underlayment, parallel to tile length, starting 1-inch back from the head of underlying tile	Min. 16 in <sup>2</sup> per paddy	74
		 <p><b>Two parallel beads minimum 2" x 2" x 4"</b> <b>Placed apx. 1" above head of previous row</b></p> <p><b>Minimum 16 sq. in. contact area per bead</b></p>				



**TABLE 1 (CONTINUED): FIELD TILES IN TILE BOND™ ROOF TILE ADHESIVE**  
**ALLOWABLE OVERTURNING MOMENT PERFORMANCE DATA FOR NON-HVHZ JURISDICTIONS**  
*(MARGIN OF SAFETY ALREADY APPLIED)*

Tile (FBC 1609.5.3)		Adhesive Pad Placement				Allowable Overturning Moment (ft-lbf)
Type	Profile	Type	Size	Location	Contact Area	
Clay	High	Independent (stacked 'pyramid')	Two (2) @ 1 x 1 x 8-inch One (1) @ 1 x 1 x 10-inch	Two (2) pads, 1 x 1 x 10-inch, side by side on the underlayment. A third pad, 1 x 1 x 10-inch on top of the two beads to form a 'pyramid'	Min. 50 in <sup>2</sup>	93
						
Clay	Cap & Pan (Barrel)	Independent	Pan Tile to Substrate: 1 x 1½ x 8-inch Cap Tile Long Edges: 1 x 1 x 8-inch	Pan: Min. 34 in <sup>2</sup> Cap to Pan: Min. 20 in <sup>2</sup> each		133
						

5.5.3 Data in Table 1 relates to installation over a TWO-PLY underlayment system, as detailed in the **FRSA/TRI Florida High Wind Concrete and Clay Roof Tile Installation Manual**, Sixth Edition, using a hot-asphalt-applied, ASTM D6380, Class M cap sheet (commonly called a '30/90 system').


Alternate underlayment systems are those having a current Florida Statewide Product Approval and/or approved on a local-level by the Authority Having Jurisdiction, listed specifically for use with **TILE BOND™ Roof Tile Adhesive**.

5.5.4 Allowable Pressure performance for hip and ridge tiles, installed using **TILE BOND™ Roof Tile Adhesive**, is set forth in Table 2.

The Allowable Pressure shall meet or exceed the hip/ridge design pressure requirements, determined in accordance with Table 1A of **FRSA/TRI Florida High Wind Concrete and Clay Roof Tile Installation Manual**, Sixth Edition or the applicable design pressure determined in accordance with **FBC 1609** or **FBC Residential Chapter 3**. Refer to **DUPONT DE NEMOURS, INC.** published installation instructions for Adhesive Paddy Placement details.

**TABLE 2: HIP & RIDGE TILES IN TILE BOND™ ROOF TILE ADHESIVE**  
**ALLOWABLE UPLIFT RESISTANCE PERFORMANCE DATA FOR NON-HVHZ JURISDICTIONS**  
*(MARGIN OF SAFETY ALREADY APPLIED)*

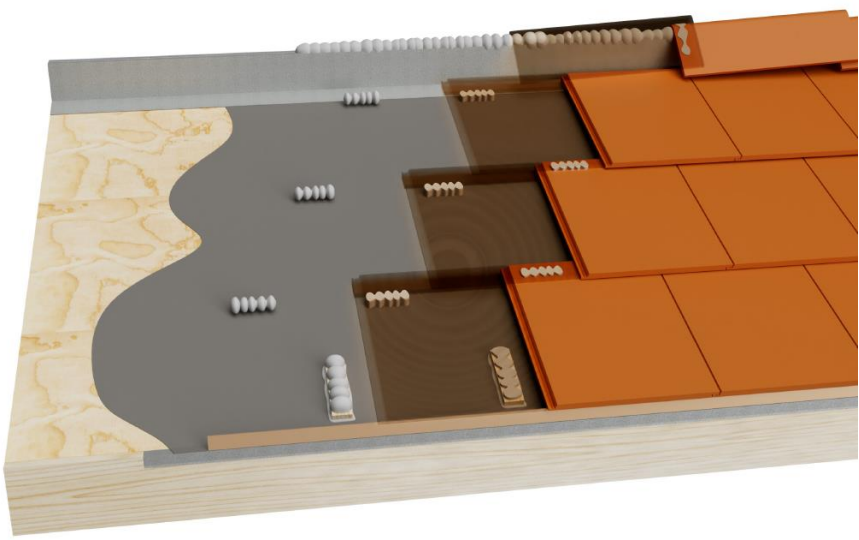
Tile	Substrate	Pad Size / Contact Area	Allowable Pressure (psf)
Clay or Concrete	2x PT ridge board	Tile Underside to Substrate: 1" W x 1" H x 10" L Tile Head Lap: 1" W x 1" H x 4" L / 10 in <sup>2</sup>	174
Clay or Concrete	East Coast Metals "Trim Lock™" (FBC FL5374): <i>Galvalume® or stainless steel</i>	Tile Underside to Substrate: 1" W x 1" H x 10" L Tile Head Lap: 1" W x 1" H x 4" L / 10 in <sup>2</sup>	152
Clay or Concrete	East Coast Metals "Trim Lock™" (FBC FL5374): <i>aluminum</i>	Tile Underside to Substrate: 1" W x 1" H x 10" L Tile Head Lap: 1" W x 1" H x 4" L / 10 in <sup>2</sup>	82
Clay or Concrete	East Coast Metals "Trim Lock™ Plus" (FBC FL5394): <i>aluminum, Galvalume® or stainless steel</i>	Tile Underside to Substrate: 1" W x 1" H x 10" L Tile Head Lap: 1" W x 1" H x 4" L / 10 in <sup>2</sup>	82



**5.6 FBC HVHZ JURISDICTIONS:**

- 5.6.1 Wind driven rain (TAS 100) does not form part of this evaluation. Refer to tile manufacturer’s Florida Product Approval for use in HVHZ jurisdictions or Miami-Dade NOA for this compliance requirement.
- 5.6.2 Reference is made to **FBC 1512.4.2.4** regarding field testing of completed tile roof installations in HVHZ jurisdictions.
- 5.6.3 **TILE BOND™ Roof Tile Adhesive** can be used with flat, low, medium and high profile tiles having a current Florida Product Approval for use in HVHZ jurisdictions or approved on a local-level by the Authority Having Jurisdiction.
- 5.6.4 Attachment Resistance Expressed as a Moment ( $M_f$ ) performance for field tiles, meeting the limitations of **Section 4.1 of TAS 108** and installed using **TILE BOND™ Roof Tile Adhesive**, is set forth in Table 3.

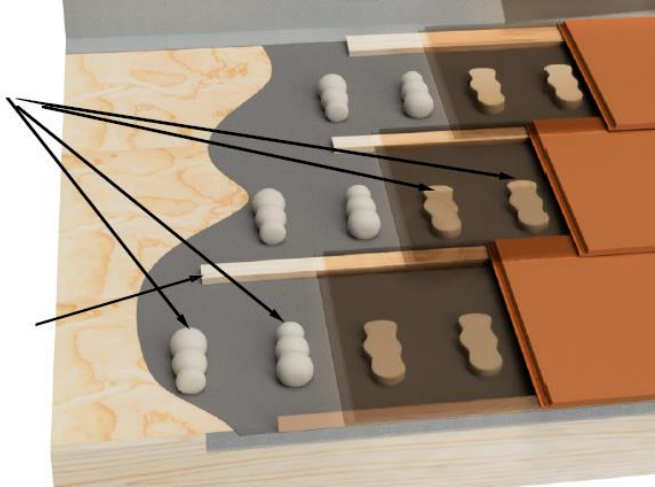
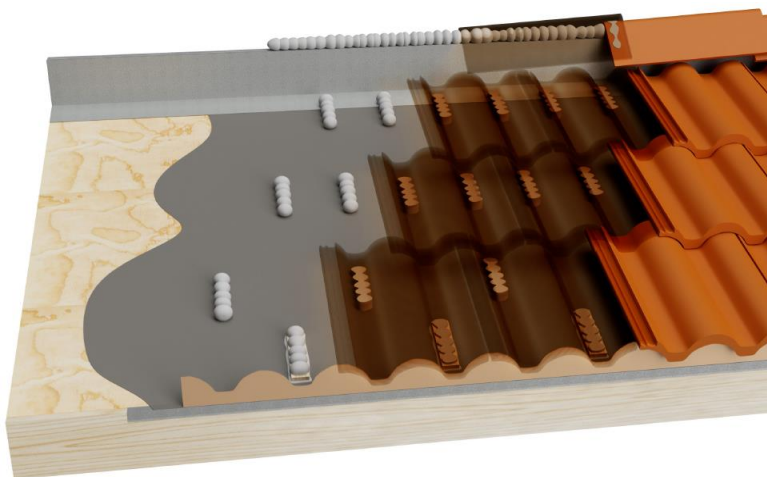
The Allowable Overturning Moment shall meet or exceed the Moment Resistance ( $M_r$ ), determined as a ‘Moment-Based System’ in accordance with **Roofing Application Standard RAS 127-20<sup>1</sup>**. Refer to **DUPONT DE NEMOURS, INC.** published installation instructions for Adhesive Paddy Placement details.

TABLE 3: FIELD TILES IN TILE BOND™ ROOF TILE ADHESIVE ATTACHMENT RESISTANCE EXPRESSED AS A MOMENT ( $M_f$ ) FOR HVHZ JURISDICTIONS (MARGIN OF SAFETY ALREADY APPLIED)						
Tile (Section 4.1 of TAS 108)		Adhesive Pad Placement				Attachment Resistance Expressed as a Moment (ft-lbf)
Type	Profile	Type	Size	Location	Contact Area	
Concrete	Flat / Low	Interdependent	1 x 1 x 8-inch	1 to underlayment 1 at tile headlap	Min. 16 in <sup>2</sup> per paddy	63
						

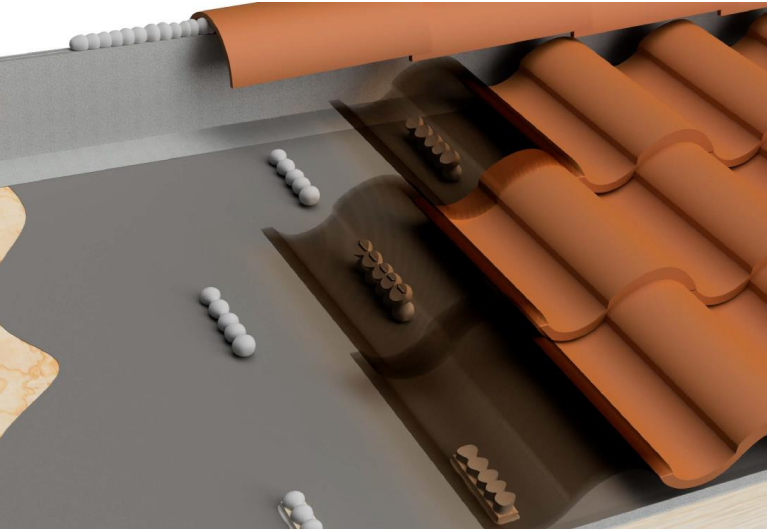
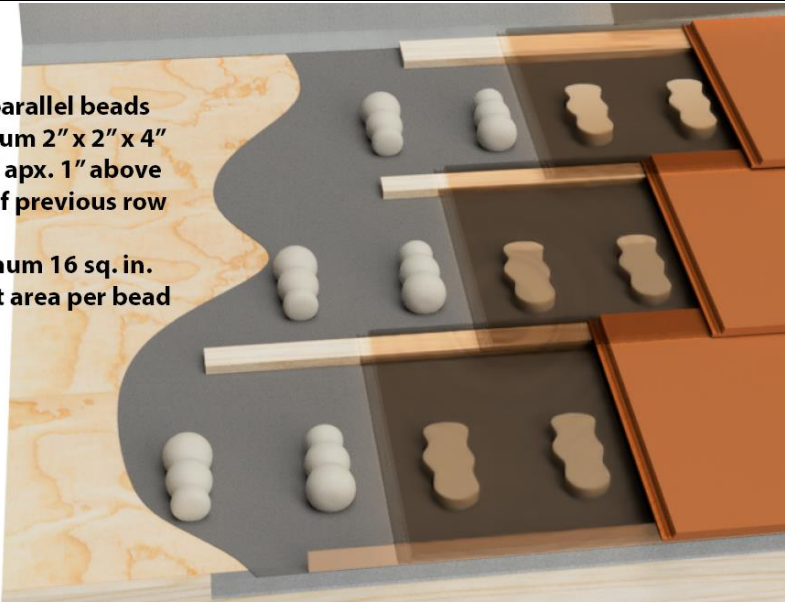
<sup>1</sup> Refer to the tile manufacturer’s Florida Product Approval for use in HVHZ jurisdictions or Miami-Dade NOA for the ‘Aerodynamic Multiplier ( $\lambda$ )’ and ‘Restoring Moment due to Gravity ( $M_g$ )’ variables associated with the specific tile.



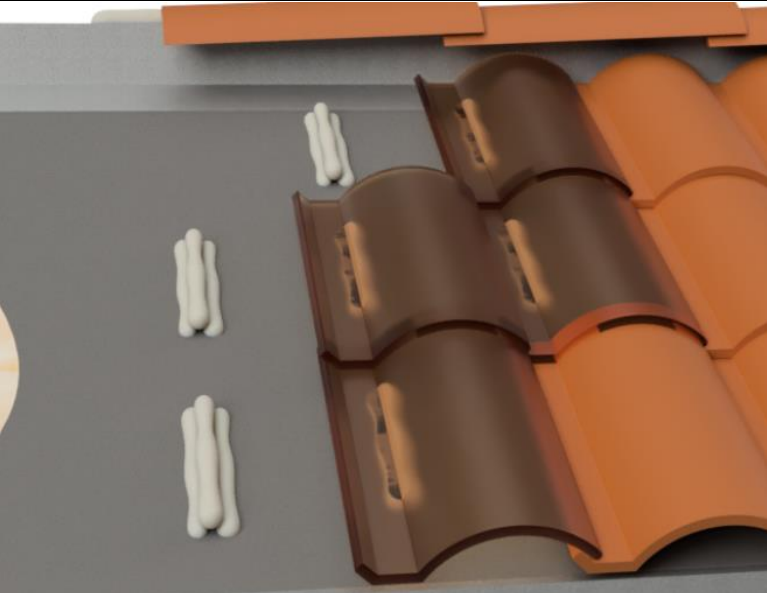
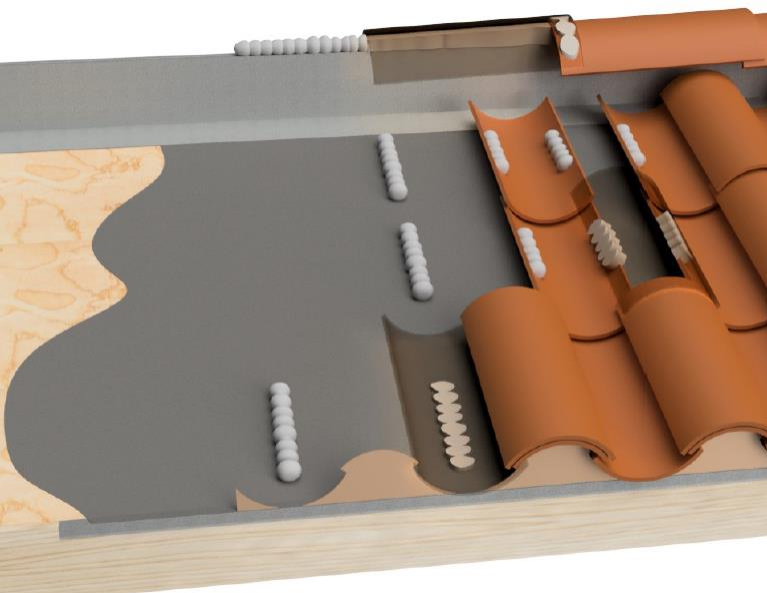
**TABLE 3: FIELD TILES IN TILE BOND™ ROOF TILE ADHESIVE  
ATTACHMENT RESISTANCE EXPRESSED AS A MOMENT (M<sub>r</sub>) FOR HVHZ JURISDICTIONS  
(MARGIN OF SAFETY ALREADY APPLIED)**

Tile (Section 4.1 of TAS 108)		Adhesive Pad Placement				Attachment Resistance Expressed as a Moment (ft-lbf)
Type	Profile	Type	Size	Location	Contact Area	
Concrete	Flat/Low	Independent	2 x 2 x 4-inch	Two pads to underlayment, parallel to tile length, starting 1-inch back from the head of underlying tile	Min. 8 in <sup>2</sup> per paddy	65
		<p>Two parallel beads minimum 2" x 2" x 4" Placed apx. 1" above head of previous row or apx. 4" from eave</p> <p>Minimum 8 sq. in. contact area per bead</p> <p><b>Battens Optional</b></p>				
Concrete	Medium	Independent	2 x 2 x 4-inch	Two pads to underlayment, parallel to tile length, starting 1-inch back from the head of underlying tile	Min. 8 in <sup>2</sup> per paddy	67
						

**TABLE 3 (CONTINUED): FIELD TILES IN TILE BOND™ ROOF TILE ADHESIVE  
ATTACHMENT RESISTANCE EXPRESSED AS A MOMENT (M<sub>r</sub>) FOR HVHZ JURISDICTIONS  
(MARGIN OF SAFETY ALREADY APPLIED)**

Tile (Section 4.1 of TAS 108)		Adhesive Pad Placement				Attachment Resistance Expressed as a Moment (ft-lbf)
Type	Profile	Type	Size	Location	Contact Area	
Concrete	High	Independent (stacked)	1 x 1 x 8-inch	One (1) 1" x 1" x 8" paddy to the center of the tile underside (3" down from the head lap) mating to one (1) 1" x 1" x 8" paddy applied to the deck	Min. 15 in <sup>2</sup> total	58
						
Clay	Flat / Low	Independent	2 x 2 x 4-inch	Two pads to underlayment, parallel to tile length, starting 1-inch back from the head of underlying tile	Min. 16 in <sup>2</sup> per paddy	74
		 <p><b>Two parallel beads minimum 2" x 2" x 4" Placed apx. 1" above head of previous row</b></p> <p><b>Minimum 16 sq. in. contact area per bead</b></p>				

**TABLE 3 (CONTINUED): FIELD TILES IN TILE BOND™ ROOF TILE ADHESIVE  
ATTACHMENT RESISTANCE EXPRESSED AS A MOMENT (M<sub>r</sub>) FOR HVHZ JURISDICTIONS  
(MARGIN OF SAFETY ALREADY APPLIED)**

Tile (Section 4.1 of TAS 108)		Adhesive Pad Placement				Attachment Resistance Expressed as a Moment (ft-lbf)
Type	Profile	Type	Size	Location	Contact Area	
Clay	High	Independent (stacked 'pyramid')	Two (2) @ 1 x 1 x 8-inch One (1) @ 1 x 1 x 10-inch	Two (2) pads, 1 x 1 x 10- inch, side by side on the underlayment. A third pad, 1 x 1 x 10-inch on top of the two beads to form a 'pyramid'	Min. 50 in <sup>2</sup>	93
						
Clay	Cap & Pan (Barrel)	Independent	Pan Tile to Substrate: 1 x 1½ x 8-inch Cap Tile Long Edges: 1 x 1 x 8-inch		Min. 20 in <sup>2</sup> each	133
						

- 5.6.5 Data in Table 3 relates to installation over a '30/90' underlayment system, as detailed in **Roofing Application Standard RAS 120-20**. Alternate underlayment systems include those having a current Florida Product Approval for use in HVHZ jurisdictions or Miami-Dade NOA specifically for use with **TILE BOND™ Roof Tile Adhesive**.
- 5.6.6 Hip and ridge tiles using **TILE BOND™ Roof Tile Adhesive** shall be installed in accordance with **Roofing Application Standard RAS 120-20**.

**6. INSTALLATION:**

**6.1 FBC NON-HVHZ JURISDICTIONS:**

- 6.1.1 **TILE BOND™ Roof Tile Adhesive** and the tile roof assembly shall be installed in accordance with the manufacturers' current published instructions, but not less than the requirements of **FBC 1507.3** and the **FRSA/TRI Florida High Wind Concrete and Clay Roof Tile Installation Manual**, Sixth Edition, subject to the limitations in Section 5.  
Installation of **TILE BOND™ Roof Tile Adhesive** shall be performed by Factory Trained 'Qualified Applicator' approved and licensed by **DUPONT DE NEMOURS, INC.**
- 6.1.2 Underlayment shall hold current Florida Product Approval for use with tile roofing systems. The underlayment Product Approval shall specify allowable use with **TILE BOND™ Roof Tile Adhesive**.  
The underlayment Product Approval shall specify attachment methods for the underlayment system to resist wind uplift design loads in accordance with Table 1A of **FRSA/TRI Florida High Wind Concrete and Clay Roof Tile Installation Manual**, Sixth Edition or the critical (highest) design pressure determined in accordance with **FBC 1609** or **FBC Residential Chapter 3**.
- 6.1.3 Hip and ridge boards or hip/ridge metal shall be installed in accordance with the **FRSA/TRI Florida High Wind Concrete and Clay Roof Tile Installation Manual**, Sixth Edition. Proprietary hip and ridge metal shall be installed in accordance with the manufacturer's Florida Product Approval.

**6.2 FBC HVHZ JURISDICTIONS:**

- 6.2.1 **TILE BOND™ Roof Tile Adhesive** and the tile roof assembly shall be installed in accordance with the manufacturers' current published instructions, but not less than the requirements of **Roofing Application Standard RAS 120-20**, subject to the limitations in Section 5.  
Installation of **TILE BOND™ Roof Tile Adhesive** shall be performed by Factory Trained 'Qualified Applicator' approved and licensed by **DUPONT DE NEMOURS, INC.**
- 6.2.2 Minimum underlayment shall comply with the **Roofing Application Standard RAS 120-20**. Underlayment products shall hold current Florida Statewide Product Approval or Local Approval for use in tile roof assemblies in **FBC HVHZ** jurisdictions.
- 6.2.3 Hip and ridge boards or hip/ridge metal shall be installed in accordance with the **Roofing Application Standard RAS 120-20**. Proprietary hip and ridge metal shall be installed in accordance with the manufacturer's Florida Product Approval.

**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:**

Wilmington, IL

**9. QUALITY ASSURANCE ENTITY:**

UL, LLC– QUA9625; (414) 248-6409; [karen.buchmann@ul.com](mailto:karen.buchmann@ul.com)

**- END OF EVALUATION REPORT -**