EVALUATION REPORT
3 IN 1 ROOF, Inc.
5041 Kitridge Rd.
Dayton, Ohio 45424

NUTEK ENGINEERING LLC CA 29217
License of Authorization PE#64898
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Evaluation Report – 1081

Date of Issuance: 02/12/2018

SCOPE: This Evaluation Report is issued under Rule 61G20-3 F.A.C. and the applicable rules and regulations governing the use of construction materials in the State of Florida. The documentation submitted has been reviewed by NUTEK ENGINEERING for use of the product under the Florida Building Code and Florida Building Code, Residential Volume. The products described herein have been designed to comply with the 2017 Florida Building Code sections, noted herein.

DESCRIPTION: 3 IN 1 ROOF – Roofing Tiles

LABELING: Each unit shall bear labeling in accordance with the requirements 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 Paul Orr if the product changes or the referenced Quality Assurance documentation changes. Paul Orr, NUTEK ENGINEERING 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 "Paul Orr, NUTEK ENGINEERING 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:

Paul Orr, NUTEK ENGINEERING
CA 29217*. Florida License No. PE#64898*

The facsimile seal appearing was authorized by Paul Orr, NUTEK ENGINEERING *PE#64898* This does serve as an electronically signed document. Signed, sealed hardcopies have been transmitted to the Product Approval Administrator and to the named client

CERTIFICATION OF INDEPENDENCE:

1. P.H.O., NUTEK ENGINEERING 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. P.H.O., NUTEK ENGINEERING is not owned, operated or controlled by any company manufacturing or distributing products it evaluates.
3. P.H.O., NUTEK ENGINEERING 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. P.H.O., NUTEK ENGINEERING does not have, nor will acquire, a financial interest in any other entity involved in the approval process of the product.

ROOFING COMPONENT EVALUATION:

1. SCOPE:

Product Category: Roofing Materials
Sub-Category: Roof Tiles

Compliance Statement: Roof Materials, as produced by 3 IN 1 ROOF, have demonstrated compliance with the following sections of the 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 Test	Standard	Year
1505.2	Fire Tests for Roof Coverings	ASTM E 108	2010
1507.4.1; 15.07.4.3	Wind Driven Rain	TAS 100	2016
1504.1	Adhesive Attachments	TAS 101	1995
1504.1	Polyurethane Foam Roof Tile	TAS 112	1995
1507.4.5.2.1	Compressive Strength	ASTM D 1621	2016
1523.6	Tensile Adhesion	ASTM D 1623	2009
19.040	Exposure of Non-Metallic Materials	ASTM G 155	2005
17.200.10	Material Emittance	ASTM C 1371	2004
17.180.20	Solar Reflectance	ASTM C 1549	2009
17.180.20	Solar Reflectance	ASTM E 1980	2011

3. REFERENCES:

Entity	Examination	Report Number	Date
Intertek Inc.	Fire Tests for Roof Coverings	101831668MID-009 / PASS	02/09/2015
Intertek Inc.	Wind Driven Rain	H9421.01-450-18 R0 / PASS	01/26/2018
Intertek Inc.	Adhesive Attachments	FO848.01-450-18 / PASS	05/17/2005
Intertek Inc.	Polyurethane Foam Roof Tile	I0030.01-450-18 R0 / PASS	01/26/2018
Intertek Inc.	Compressive Strength	102570996COQ-001A / PASS	07/15/2016
Intertek Inc.	Tensile Adhesion	102570996COQ-001A / PASS	07/15/2016
Intertek Inc.	Exposure of Non-Metallic Materials	101908406COQ-001 / PASS	04/01/2010
Intertek Inc.	Material Emittance	101908315MID-001 / PASS	11/24/2014
Intertek Inc.	Solar Reflectance	101908315MID-001 / PASS	11/24/2014
Intertek Inc.	Solar Reflectance	101908315MID-001 / PASS	11/24/2014
FL Solar Energy Center	Energy Gauge/Performance	FSEC-CR-2007-15	10/30/2017
Intertek Inc.	IPM-PIR (05/01/17)	SFT-ETL-OP-19N 5010121 /PASS	11/10/2017

4. AC07 ICC Acceptance Criteria For Special Roof Systems

NUTEK ENGINEERING has thoroughly evaluated the 3 IN 1 ROOF tiles and agrees with ICC and Intertek that this product should be defined as a "Special Roofing System". Since ICC and 3 IN 1 ROOF Inc. has not yet approved the proposed testing criteria for the newly established AC465 code, which does not yet have certain test methods and performance requirements, NUTEK ENGINEERING places the product closely under AC07 section– 3.4 as defined; **Non-Interlocking composite tiles consisting of expanded polystyrene backing and a cementitious facing**, except for the fact that a Polyurethane almost completely makes up the product's embodiment, plus it has a specific and geometric wedge shape design. It is for those differences that NUTEK ENGINEERING agrees with the ICC proposed acceptance criteria listed within AC465 as referenced above **2. STANDARDS**.

NUTEK ENGINEERING has determined that the testing criteria differences between AC07 and AC465 are the follow;

- AC07-3.4.11 PENETRATION TEST:
- ACO7-3.4.16 WET/DRY CYCLING TEST with FASTENERS & HOT WATER TEST

NUTEK ENGINEERING has determined under Rational Analysis that AC07-3.4.11 (PENETRATION TEST) will be easily achieved since within TAS 112 testing criteria, the product performance mean score of 191.6 lbs. without a ridged backing such as concrete will easily meet or exceed the 200 lbs. minimum load with a ridged backing such as concrete even when considering the different method of load application due to the product's dense closed cell foam core and its underside wedge-shape design.

NUTEK ENGINEERING has determined under Rational Analysis that AC07-3.4.16 (WET/DRY CYCLING TEST with FASTNERS & HOT WATER TEST) shall be eliminated because the product does not require fasteners as a permanent or back-up attachment method. Facts; A polystyrene foam (better known as Styrofoam) is an open cell foam and about 1-1.5 lbs. per cubic foot. Open cell foams are soft and easily broken due to tiny air pockets or bubbles trapped or located in between or mixed among the poly cells. The product's embodiment consists of a polyurethane foam and polyurethane foam is closed cell in physical nature ranging from 3 -30 lbs. per cubic foot. Closed cell foams are hard and ridged and have little if any air trapped in between or mixed among the poly cells. The product's polyurethane foam is 3.0 lbs. per cubic foot and so are most poly adhesive foams commonly used in the industry. Given that the product and the adhesives are like poly-based materials, when attached, the point of contact creates a perpetual and weld-like bond, stronger than any mechanical fastener and forever lasting as well. Unlike all other traditional or special roof systems, the product doesn't need permanent or back-up mechanical fasteners on any recommended pitch roof (4:12 – 12:12). As documented in the product's TAS 101 test results, within that test, a TAS 102 test was performed and uplift results for the foam adhered system out-performed the prototype mechanical fastening system by twice the residence.

NUTEK ENGINEERING has determined under Rational Analysis that AC07-3.4.7 (ACCELERATED AGING TEST) shall be eliminated, but only for a "Florida Product Approval" due to the test exposure temperatures that range from 120 degrees Fahrenheit to a -20 degrees Fahrenheit, far below the lowest temperatures anywhere in Florida. NUTEK ENGINEERING sees this test in respect to temperature exposures, very similar to the ASTM C1492 (FREEZE-THAW TEST) located in AC07-3.4.14 which is N/A in Florida, yielding more reason for AC07-3.4.7 elimination. However as a practical substitute, NUTEK ENGINEERING has determined under Rational Analysis that ASTM G155 (ACCELERATED AGING TEST) as conducted on the product is acceptable under Florida code and for the purpose of this Evaluation report.

NUTEK ENGINEERING has noticed that AC07-3.4 nowhere sections an ASTM C1492 (FLEXURAL STRENGHT TEST) that we believe is especially necessary for a special roof system made of polystyrene foam. NUTEK ENGINEERING would not produce a favorable Evaluation of the product even though it is made from polyurethane foam, harder and more

ridged foam, if it wasn't for the product's unique geometric design which allows the underside of the product to be fully supported by the roofing underlayment and structural deck. Such product to deck contact eliminates any voids beneath the product where any portion of the product can bend, flex, collapse, or implode into when weight, force or stress is applied, therefore any type of flexural walking, or traverse testing is irrelevant.

5. PRODUCT DESCRIPTION:

5.1 3 IN 1 ROOF is an Environmental Green roofing tile.

5.2 3 IN 1 ROOF is a Closed cell, 3 pound density, polyurethane foam core in a roofing tile.

5.3 3 IN 1 ROOF is a Cool Roof roofing tile.

5.4 3 IN 1 ROOF is a Class-A fire rating roofing tile.

5.5 3 IN 1 ROOF is a Slope deck roof roofing tile, min slope = 4:12, max slope = 12:12

5.6 3 IN 1 ROOF is an Attic cooling roofing tile.

5.7 3 IN 1 ROOF is a Low Solar-Gain rated roofing tile.

5.8 3 IN 1 ROOF is a BTU consumption reducing roofing tile (up to 38%).

5.9 3 IN 1 ROOF is a PACE Funding approved roofing tile.

5.10 3 IN 1 ROOF is a UV resilient roofing tile.

5.11 3 IN 1 ROOF is a Lifetime Warranted roofing tile.

5.12 3 IN 1 ROOF is a High Wind resistant roofing tile.

5.13 3 IN 1 ROOF is a US Patented roofing tile.

5.14 3 IN 1 ROOF is a Light product load (120 lbs per sq) roofing tile.

5.15 3 IN 1 ROOF is a Light system load (250 lbs per sq) roofing tile.

5.16 3 IN 1 ROOF is an Easy to install roofing tile.

5.17 3 IN 1 ROOF is a "Foam & Go" roofing tile.

5.18 3 IN 1 ROOF is a Highly traversable roofing tile.

5.19 3 IN 1 ROOF is a Curb appealing roofing tile.

5.20 3 IN 1 ROOF is a Made in the USA (Dayton Ohio) roofing tile.

6. LIMITATIONS:

6.1 This Evaluation Report is for use in the HVHZ.

6.2 3 IN 1 ROOF Roof Materials may be used with any subordinate underlayment where the product is specifically referenced within FBC approval documents for tile installations. If not listed, a request may be made to the AHJ for approval based on this evaluation combined with supporting data for the subordinate underlayment.

6.3 Allowable subordinate underlayment applied beneath the Materials are follows:

6.3.1 Underlayment: Granular surface Type No. 60, two ply (1/2 lap) top layer 60 mils, bottom layer 45 mils – 105 mils total

6.3.2 Underlayment: Granular surface self-adhering modified bitumen single ply membrane, minimum 40 mils

6.3.3 Underlayment: Granular surface SBS self-adhering modified bitumen, minimum 40 mils thick at selvage edge.

6.4 Allowable substrates are noted below:

6.4.1 Primary Deck:

Plywood, Plyscore, CDX, Tongue & Grove; Min. 1/2-inch wood

6.4.2 Secondary Deck:

Manufacturer Georgia Pacific (GP)
Mechanically attached Gypsum engineered DensDeck; Min. 1/4-inch
Primed on single side facing up
Stagger DensDeck seams over plywood seams
20 fasteners per 4x8 ft board

6.4.3 Underlayment Fully Adhered to DensDeck:

Approved products and applications for…

a) Hot or cold asphalt adhering membranes; Min. 90 lbs per 3x33 foot roll
b) Self-adhering membranes; Min. 90 lbs per 3x33 foot roll

6.4.4 All underlayment shall be installed in compliance with the requirements for ASTM D1970 in FBC Sections 1507 for the type of prepared roof covering to be installed.

7. INSTALLATION:

7.1 3 IN 1 ROOF, roofing Materials shall be installed in accordance with 3 IN 1 ROOF published installation requirements subject to the Limitations set forth in Section 5 herein.

7.2 Apply DensDeck secondary deck over Primary wood deck.

7.3 Install all metal drip-edge, valley, pipe collars and apply asphalt primer to all exposed metal.

7.4 Apply allowable granular type substrate underlayment.

7.5 Allow substrate to acquire a surface temperature of 70+ degrees Fahrenheit

7.6 Apply 8-10 grams of approved adhesive foam directly into each underside recessed pocket.

7.7 Allow adhesive foam to slightly cure to bond to of each pocket.

7.8 Flip tile and set into place in the specific order noted below.

7.9 Install 1st row / Starter tiles with designated 3 IN 1 ROOF "Z-track" mechanical fasteners.

7.10 Install Field tiles and trim at gable or hip edges.

7.11 Install Rake tiles where needed using one.

7.11 Install Hip & Ridge tiles where needed.

7.12 Apply color matching caulk sealant where trimming has exposed foam core; Ex. @ miter cuts.

8. LABELING:

Each unit shall bear a permanent label with the manufacturer's name, logo, city, state and logo of the Accredited Quality Assurance Agency noted herein.

9. BUILDING PERMIT REQUIREMENTS:

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

10. MANUFACTURING PLANTS:

The manufacturing plants covered under Rule 9N-3 QA requirements, resides in Dayton Ohio, USA.

11. QUALITY ASSURANCE ENTITY:

Intertek, Inc. – Listed Certified Building Product - ETL Listed Mark; Control/Client Number: 310892; Intertek Field Representative - Randy H. Alexander – (614) 949-6788

In Conclusion: NUTEK ENGINEERING has determined 3 IN 1 ROOF tiles are superior in design, material composition, and ease of installation in comparison to any traditional roofing tile or special roofing system seen within our 55+ years of licensed experience.

- END OF EVALUATION REPORT -