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EVALUATION REPORT

Interwrap, Inc.
32923 Mission Way
Mission, BC V2V-6E4
Canada

Evaluation Report I11980.11.08-R2
FL11602-R2
Date of Issuance: 11/03/2008
Revision 2: 02/17/2012

SCOPE:

This Evaluation Report is issued under Rule 9N-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 and Florida Building Code, Residential Volume. The products described herein have been designed to comply with the 2010 Florida Building Code sections noted herein.

DESCRIPTION: Titanium™ Roof Underlayments

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 Robert Nieminen, P.E. if the product changes or the referenced Quality Assurance documentation changes. Trinity|ERD requires a complete review of this Evaluation Report relative to updated Code requirements with each Code Cycle.

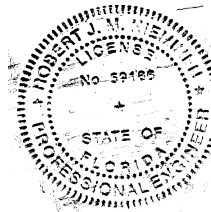
ADVERTISEMENT: The Evaluation Report number preceded by the words "Trinity|ERD Evaluated" may be displayed in advertising literature. If any portion of the Evaluation Report is displayed, then it shall be done in its entirety.

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 02/17/2012. This does not 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. Trinity|ERD 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. Trinity|ERD 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.

ROOFING COMPONENT EVALUATION:

1. SCOPE:

Product Category: Roofing

Sub-Category: Underlayment

Compliance Statement: Titanium™ Roof Underlayments, as produced by Interwrap, Inc., have demonstrated compliance with the intent of the following sections of the Florida Building Code through testing in accordance with applicable sections the following Standards. Compliance is subject to the Installation Requirements and Limitations / Conditions of Use set forth herein.

2. STANDARDS:

<u>Section</u>	<u>Property</u>	<u>Standard</u>	<u>Year</u>
1507.2.3, 1507.3.3, 1507.5.3, 1507.7.3, T1507.8, 1507.8.3, 1507.9.3, 1507.9.5	Unrolling, Breaking Strength, Pliability, Loss on Heating	ASTM D226	2006
1507.2.4, 1507.2.9.2, 1507.5.3	Thickness, Load-Strain, Adhesion, Thermal Stability, Flexibility, Tear, Permeance	ASTM D1970	2001
1507.3.3	Installation Practice	FRSA/TRI 07320	2005
1523.6.5.2.1	Dimensional Stability, Tear, Load- Strain, Water Absorption, Low Temp Flex, Cyclic Elongation, Puncture, Crack Cycling, Peel Adhesion, WVT, Tile Slippage	TAS 103	1995
TAS 110	Accelerated Weathering	TAS 110	2000

3. REFERENCES:

<u>Entity</u>	<u>Examination</u>	<u>Reference</u>	<u>Date</u>
ERD (TST6049)	Physical Properties	I15010.04.09	04/29/2009
ERD (TST6049)	Physical Properties	I15010.05.10	05/14/2010
ERD (TST6049)	Physical Properties	I35520.06.11	06/15/2011
ERD (TST6049)	Wind Uplift	I35520.08.11-1	08/12/2011
ITS (TST1509)	Physical Properties	3146738COQ-003A	03/28/2008
ITS (TST1509)	Physical Properties	3146738COQ-003B	03/28/2008
ITS (TST1509)	Physical Properties	3126617COQ-005	10/31/2007
ITS (QUA1673)	Quality Control	ITS Listings	Current
ITS (QUA1673)	Quality Control	Inspection Report	12/13/2011

4. PRODUCT DESCRIPTION:

4.1 Self-Adhering Underlayments:

4.1.1 **Titanium™ PSU-30** is an unreinforced polymer modified bitumen material adhered to the underside of a polymer-coated, synthetic woven sheet. The underside is backed with a release film. Unit weight 24 lbs/square.

4.2 Mechanically Fastened Underlayments:

4.2.1 **Titanium™ UDL-25 PLUS** is a synthetic sheet-type underlayment comprised of a woven core coated on one side with a polymer coating. Unit weight 2.9 lbs/square.

4.2.2 **Titanium™ UDL-30** is a synthetic sheet-type underlayment comprised of a woven core coated on both sides with a polymer coating. Unit weight 4.0 lbs/square.

4.2.3 **Titanium™ UDL-50** is a synthetic sheet-type underlayment comprised of a woven core coated on both sides with a polymer coating. Unit weight 4.7 lbs/square.

- 4.2.4 **Titanium™ UDL-TT** is a synthetic sheet-type underlayment comprised of a woven core coated on one side with a polymer coating. Unit weight 2.9 lbs/square
- 4.2.5 **Titanium™ UDL-TF** is a synthetic sheet-type underlayment comprised of a woven core coated on both sides with a polymer coating. Unit weight 2.9 lbs/square.
- 4.2.6 **UDL-TTMC300** is a synthetic sheet-type underlayment comprised of a woven core coated on both sides with a polymer coating. Unit weight 3.2 lbs/square.

5. LIMITATIONS:

- 5.1 This Evaluation Report is not for use in the HVHZ.
- 5.2 Fire Classification is not part of this report; refer to current Approved Roofing Materials Directory for fire ratings of this product.
- 5.3 Titanium™ 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 AHJ for approval based on this evaluation combined with supporting data for the prepared roof covering.
- 5.4 Allowable roof covers applied atop Titanium™ Roof Underlayments are follows:

Underlayment	Asphalt Shingles	Nail-On Tile	Foam-On Tile	Metal	Wood Shakes & Shingles	Slate
PSU-30	Yes	Yes	Yes (See 5.4.1)	Yes	Yes	Yes
UDL-25 PLUS	Yes	Yes	No	Yes	Yes	Yes
UDL-30	Yes	Yes	No	Yes	Yes	Yes
UDL-50	Yes	Yes	No	Yes	Yes	Yes
UDL-TT	Yes	Yes	No	Yes	Yes	Yes
UDL-TF	Yes	Yes	No	Yes	Yes	Yes
[†] UDL-TTMC300	Yes	Yes	No	Yes	Yes	Yes

[†]Private Labeled

- 5.4.1 "Foam-On Tile" is limited to use of Polyfoam PolyPro AH160 or Dow Tile Bond applications unless tensile adhesion / long term aging data from an accredited testing laboratory is provided.
- 5.5 Allowable substrates for PSU-30 are noted below:
 - 5.5.1 Direct-Bond to Deck:
 - New untreated plywood;
 - Existing untreated plywood, primed as needed with D41 primer to achieve bond.
 - 5.5.2 Bond to Mechanically Attached Base Underlayment:
 - ASTM D226, Type I or II felt.
 - Titanium UDL-25 PLUS, UDL-30 (primed with D41 primer) or UDL-30 (inverted).
 - 5.5.3 Wind Resistance for Underlayment Systems in Foam-On Tile Applications: FRSA/TRI 07320 does not address wind uplift resistance of all underlayment systems beneath foam-on tile systems, where the underlayment forms part of the load-path. The following wind uplift limitations apply to underlayment systems that are not addressed in FRSA/TRI 07320 and are used in foam-on tile applications. Maximum Design Pressure is the result of testing for wind load resistance based on allowable wind loads. Refer to FBC 1609.1.5 for determination of design wind pressures.

- 5.5.3.1 Maximum Design Pressure = -45 psf.
 Deck: Min. 15/32-inch plywood to meet project requirements to satisfaction of AHJ.
 Primer: (Optional) ASTM D41
 Underlayment: Titanium PSU-30, self-adhered
- 5.5.3.2 Maximum Design Pressure = -45 psf.
 Deck: Min. 15/32-inch plywood to meet project requirements to satisfaction of AHJ.
 Base Layer: Titanium UDL-25 PLUS or UDL-30 (inverted), mechanically attached with FBC HVHZ ring shank nails and 1-5/8" diameter tin caps spaced 6-inch o.c. at 4-inch wide side laps and 8-inch o.c. at three (3), equally spaced center rows.
 Primer: ASTM D41 primer required at all tin-caps.
 Underlayment: Titanium PSU 30, self-adhered
- 5.5.3.3 Maximum Design Pressure = -45 psf.
 Deck: Min. 15/32-inch plywood to meet project requirements to satisfaction of AHJ.
 Base Layer: Titanium UDL-30 (printed side up), mechanically attached with FBC HVHZ ring shank nails and 1-5/8" diameter tin caps spaced 6-inch o.c. at 4-inch wide side laps and 8-inch o.c. at three (3), equally spaced center rows.
 Primer: ASTM D41 primer required over printed side of UDL-30.
 Underlayment: Titanium PSU 30, self-adhered
- 5.6 Exposure Limitations:
- 5.6.1 UDL-25 PLUS, UDL-30, UDL-50, UDL-TT or UDL-TF shall not be left exposed for longer than 30-days.
- 5.6.2 PSU-30 shall not be left exposed for longer than 90-days.
- 5.6.3 UDL-TTMC300 not be left exposed for longer than 180-days.
- 5.7 For tile roof installations governed by the FRSA/TRI 07320/8-05 Installation Manual, Fourth Edition, use is limited to the following.

Table 2: Tile System Options per FRSA/TRI 07320/8-05				
System	Underlay Option	Section	Reference	Roof Underlayment(s)
System One: Mechanically Fastened Tile, Unsealed or Sealed Underlayment System	4	3.02D	Two Ply No. 30	Double-layer, UDL 25, UDL 30, UDL 50, UDL TT, UDL TF or UDL-TTMC300
	5	3.02E	Self-Adhered Underlayment	PSU 30
	6	3.02F	No. 30 / Self-Adhered Underlayment	Base Layer: ASTM 226, Type II felt, UDL 25 PLUS, UDL 30 (primed with D41 primer) or UDL 30 (inverted) Top Layer: PSU 30
System Two: Mechanically Fastened Tile, Sealed Underlayment System	4	3.02D	Self-Adhered Underlayment	PSU 30
	5	3.02E	No. 30 / Self-Adhered Underlayment	Base Layer: ASTM 226, Type II felt, UDL 25 PLUS, UDL 30 (primed with D41 primer) or UDL 30 (inverted) Top Layer: PSU 30
System Four "A": Adhesive-Set Tile, Unsealed or Sealed Underlayment System	4	3.02D	Self-Adhered Underlayment	PSU 30
	5	3.02E	No. 30 / Self-Adhered Underlayment	Base Layer: ASTM 226, Type II felt, UDL 25 PLUS, UDL 30 (primed with D41 primer) or UDL 30 (inverted) Top Layer: PSU 30
System Four "B": Adhesive-Set Tile, Sealed Underlayment System	3	3.02C	Self-Adhered Underlayment	PSU 30
	4	3.02D	No. 30 / Self-Adhered Underlayment	Base Layer: ASTM 226, Type II felt, UDL 25 PLUS, UDL 30 (primed with D41 primer) or UDL 30 (inverted) Top Layer: PSU 30

6. INSTALLATION:

6.1 Titanium Roof Underlayments shall be installed in accordance with Interwrap published installation requirements 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 Titanium™ PSU-30:

6.3.1 PSU-30 shall be installed in compliance with the requirements for ASTM D1970 underlayment in FBC Sections 1507 for the type of prepared roof covering to be installed.

6.3.2 Cut to 10- to 15-foot manageable sections and re-roll with the release film side out.

6.3.3 Membrane Application:

- Peel back release film approximately 1 to 2 feet and align with the lower edge of the roof and set in place, printed side up.
- Apply the balance of the membrane to the substrate by removing the film and firmly pressing the membrane into place.
- Apply subsequent courses parallel to the eave in a shingle-type, water-shedding manner.
- End (vertical) laps shall be minimum 12-inches and side (horizontal) laps shall be minimum 3-inches.
- If the membrane becomes misaligned, cut the roll and re-start.
- Upon completion, inspect the membrane and repair any defects or fish-mouths.

6.3.4 For use in tile applications:

6.3.4.1 Reference is made to FRSA/TRI 07320/8-05 Installation Manual, Fourth Edition, and Section 5.7 herein, using the instructions noted above as a guideline

6.3.4.2 Wait a minimum of 24 hours prior to loading roof tiles.

6.3.4.3 Tiles shall be staged so as to avoid slippage and/or damage to the roof underlayment.

6.4 Titanium™ UDL-25 PLUS, UDL-30, UDL-50, UDL-TT, UDL-TF and (Private Labeled) UDL-TTMC300:

6.4.1 Install in compliance with manufacturer's published installation instructions and the requirements for ASTM D226, Type I and II underlayments in FBC Sections 1507 for the type of prepared roof covering to be installed.

6.4.2 Fasteners:

6.4.2.1 Mechanical attachment of UDL-25 PLUS and UDL-30 is limited to ring shank roofing nails with minimum 1-inch diameter plastic caps.

6.4.2.2 Mechanical attachment of UDL-50, UDL-TT, UDL-TF and (Private Labeled) UDL-TTMC300 is limited to ring shank roofing nails with minimum 3/8-inch diameter heads; ring shank roofing nails with minimum 1-inch diameter plastic caps; screws and plates; or plastic cap staples.

6.4.3 Slopes of 4:12 or greater:

6.4.3.1 End (vertical) laps shall be minimum 6-inches and side (horizontal) laps shall be minimum 4-inches.

- 6.4.3.2 Minimum attachment shall be 12-inches o.c. vertically and 24-inches o.c. horizontally in accordance with the surface markings on the exposed face of the underlayment. When batten systems are to be installed atop the underlayment, the underlayment need only be preliminarily attached pending attachment of the battens.
- 6.4.4 Slopes of 2:12 to less than 4:12:
 - 6.4.4.1 Double layer application; begin by fastening a 25-inch wide strip along the eaves. Place a full-width sheet over the starter, completely overlapping the starter course. Continue as noted in 6.4.3, but maintaining minimum 25-inch side (horizontal) laps, resulting in a double-layer application.
 - 6.4.5 For use in tile applications:
 - 6.4.5.1 Reference is made to FRSA/TRI 07320/8-05 Installation Manual, Fourth Edition, and Section 5.7 herein.
 - 6.4.5.2 Titanium™ UDL underlayments are 48-inches wide; wider than the typical, codified 36-inch wide ASTM D226, Type I and II underlayment. The placement and attachment requirements set forth in Sections 6.4.3 (single layer with PSU-30 overtop) and 6.4.4 (double-layer) are suitable to maintain the intent of FRSA/TRI 07320/8-05 Installation Manual, Fourth Edition, Systems 1 and 2.
 - 6.4.5.3 Tiles shall be staged so as to avoid slippage and/or damage to the roof underlayment.

7. 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.

8. BUILDING PERMIT REQUIREMENTS:

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

9. MANUFACTURING PLANTS:

Contact the named QA agency for information on production locations covered by F.A.C. Rule 9N-3 QA requirements.

10 QUALITY ASSURANCE ENTITY:

Intertek Testing Services NA Inc.-ETL/Warnock Hersey – QUA1673; (604) 520-3321

- END OF EVALUATION REPORT -