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EVALUATION REPORT

Kirsch Building Products, LLC
1464 Madera Road, Suite 387
Simi Valley, CA 93065

**Evaluation Report K31030.11.09-R4
FL8097-R4**

Date of Issuance: 11/09/2009

Revision 4: 05/01/2015

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 and Florida Building Code, Residential Volume. The products described herein have been evaluated for compliance with the 5th Edition (2014) Florida Building Code sections noted herein.

DESCRIPTION: Sharkskin® Roof Underlayments

LABELING: Labeling shall be 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.

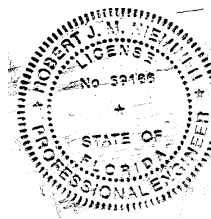
INSPECTION: Upon request, a copy of this entire Evaluation Report shall be provided to the user by the manufacturer or its distributors and shall be available for inspection at the job site at the request of the Building Official.

This Evaluation Report consists of pages 1 through 7.

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 05/01/2015. 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.
5. This is a building code evaluation. Neither Trinity|ERD 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: Sharkskin Roof Underlayments, as produced by Kirsch Building Products, LLC, have demonstrated compliance with the intent of the following sections of the Florida Building Code through testing in accordance with the applicable sections of 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 Uplift	FM 4474	2004
1507.2.3, 1507.2.8, 1507.3.3, 1507.4.5.1, 1507.5.3, 1507.7.3, T1507.8, 1507.8.3, 1507.9.3	Unrolling, Breaking Strength, Pliability, Loss on Heating	ASTM D226	2006
1507.3.3	Installation Practice	FRSA/TRI April 2012 (04-12)	2012
1507.2.3, 1507.2.8, 1507.4.5.1, 1507.5.3, 1507.7.3, 1507.8.3, 1507.9.3	Unrolling, Tear Strength, Pliability, Loss on Heating, Liquid Water Transmission, Breaking Strength, Dimensional Stability	ASTM D4869	2005
1507.2.4, 1507.2.8, 1507.2.9.2, 1507.4.5.1, 1507.4.5.2, 1507.5.3, 1507.5.3.2, 1507.7.3, 1507.7.3.2	Max Load, Elongation at Break, Adhesion, Thermal Stability, Tear Resistance, Nail Sealability	ASTM D1970	2009
1523.6.5.2.1	Physical Properties (2-Ply System)	TAS 103 / TAS 104	1995
TAS 110	Accelerated Weathering	ASTM D4798	2001

3. REFERENCES:

Entity	Examination	Reference	Date
ERD (TST6049)	Physical Properties	K0810.12.05	12/16/2005
ERD (TST6049)	Physical Properties	K6540.07.07	07/19/2007
ERD (TST6049)	Wind Uplift	K6550.08.07	08/20/2007
ERD (TST6049)	Physical Properties	K6540.03.08-1	03/10/2008
ERD (TST6049)	Physical Properties	K6540.03.08-2	03/10/2008
ERD (TST6049)	Physical Properties	K9210.05.08	05/09/2008
ERD (TST6049)	Wind Uplift	P30330.05.10	05/06/2010
ERD (TST6049)	Physical Properties	KRS-SC7390.12.14-1	12/11/2014
ERD (TST6049)	Physical Properties	KRS-SC7390.03.15-R1	03/12/2015
Progressive Eng (TST4205)	Physical Properties	2006-1934	01/02/2007
ITS (QUA1673)	Quality Control	Service Confirmation	05/01/2015

4. PRODUCT DESCRIPTION:

4.1 Mechanically Fastened Underlayments:

- 4.1.1 Sharkskin Comp® is a multi-layer laminated roof underlayment comprised of a high-strength woven polypropylene base with a UV & antioxidant protection bond layer and a slip-resistant top layer.
- 4.1.2 Sharkskin Ultra® is a multi-layer laminated roof underlayment comprised of a high-strength woven polypropylene core with a UV & antioxidant protection bond layer to both sides and a slip-resistant top layer.
- 4.1.3 Sharkskin Ultra Radiant® is a multi-layer laminated roof underlayment comprised of a high-strength woven polypropylene core with a reflective barrier on the underside and a UV & antioxidant protection bond layer on both sides and a slip-resistant top layer.

4.2 Self-Adhering Underlayments:

- 4.2.1 Sharkskin Ultra SA® is a multi-layer laminated roof underlayment comprised of a high-strength woven polypropylene core between two layers of UV & antioxidant protection bond and a self-adhering underside and a slip-resistant top layer.

5. LIMITATIONS:

- 5.1 This is a building code evaluation. Neither Trinity|ERD 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 the HVHZ.
- 5.3 Fire Classification is not part of this Evaluation Report; refer to current Approved Roofing Materials Directory for fire ratings of this product.
- 5.4 Sharkskin 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.
- 5.5 Allowable Roof Covers:

Table 1: Roof Cover Options						
Underlayment	Asphalt Shingles	Nail-On Tile	Foam-On Tile	Metal	Wood Shakes & Shingles	Slate
Sharkskin Comp (<i>single or double layer</i>)	Yes	No	No	Yes	Yes	No
Sharkskin Ultra (<i>single or double layer</i>)	Yes	Yes (base layer in 2-ply system)	Yes (base layer in 2-ply system)	Yes	Yes	Yes
Sharkskin Ultra Radiant	Yes	No	No	Yes (battens only)	No	Yes (battens only)
Sharkskin Ultra SA	Yes	Yes	Yes See 5.5.1	Yes	Yes	Yes

- 5.5.1 "Foam-On Tile" is limited to use of 3M™ 2-Component Foam Roof Tile Adhesive AH-160 (FL6332), Dow TILE BOND™ Roof Tile Adhesive (FL717) or Convenience Products Touch 'n Seal Stormbond Roof Tile Adhesive (FL14506).
- 5.6 Allowable Substrates:
 - 5.6.1 Direct-Bond to Deck: Sharkskin Ultra SA adhered to plywood.
 - 5.6.2 Bond to Mechanically Attached Base Sheet: Sharkskin Ultra SA adhered to Sharkskin Ultra
 - 5.6.3 Wind Resistance for Underlayment Systems in Foam-On Tile Applications: FRSA/TRI April 2012 (04-12) 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 April 2012 (04-12) 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, and reflects the ultimate passing pressure divided by 2 (the 2 to 1 margin of safety per FBC 1504.9 has already been applied). Refer to FRSA/TRI April 2012 (04-12), Appendix A, Table 1A or FBC 1609 for determination of design wind loads.
 - 5.6.3.1 Maximum Design Pressure = -52.5 psf.
 - Deck: Min. 15/32-inch plywood to meet project requirements to satisfaction of AHJ.
 - Underlayment: Sharkskin Ultra SA, self-adhered
 - 5.6.3.2 Maximum Design Pressure = -30 psf*.
 - Deck: Min. 15/32-inch plywood to meet project requirements to satisfaction of AHJ.
 - Base Sheet: Sharkskin Ultra
 - Fasteners: Mechanically attached with 12 ga. annular ring shank nails having not less than 20 rings per inch, heads not less than 3/8 inch diameter and length sufficient to penetrate through the thickness of deck not less than 3/16-inch with min. 32 ga., 1-5/8" diameter tin caps
 - Spacing: 6-inch o.c. at 3-inch wide side laps and 12-inch o.c. at two (2), equally spaced center rows.
 - Underlayment: Sharkskin Ultra SA, self-adhered

5.6.3.3 Maximum Design Pressure = -37.5 psf*.

- Deck: Min. 15/32-inch plywood to meet project requirements to satisfaction of AHJ.
 Base Sheet: Sharkskin Ultra
 Fasteners: Mechanically attached with 12 ga. annular ring shank nails having not less than 20 rings per inch, heads not less than 3/8 inch diameter and length sufficient to penetrate through the thickness of deck not less than 3/16-inch with min. 32 ga., 1-5/8" diameter tin caps
 Spacing: 6-inch o.c. at 3-inch wide side laps and 10-inch o.c. at three (3), equally spaced center rows.
 Underlayment: Sharkskin Ultra SA, self-adhered

5.6.3.4 Maximum Design Pressure = -45 psf*.

- Deck: Min. 15/32-inch plywood to meet project requirements to satisfaction of AHJ.
 Base Sheet: Sharkskin Ultra
 Fasteners: Mechanically attached with 12 ga. annular ring shank nails having not less than 20 rings per inch, heads not less than 3/8 inch diameter and length sufficient to penetrate through the thickness of deck not less than 3/16-inch with min. 32 ga., 1-5/8" diameter tin caps
 Spacing: 6-inch o.c. at 3-inch wide side laps and 8-inch o.c. at three (3), equally spaced center rows.
 Underlayment: Sharkskin Ultra SA, self-adhered

5.6.3.5 For mechanically attached base sheet in a 2-ply system, the maximum design pressure for the selected assembly shall meet or exceed the Zone 1 design pressure determined in accordance with FRSA/TRI April 2012 (04-12), Appendix A, Table 1A or FBC 1609. Zones 2 and 3 shall employ an attachment density designed by a qualified design professional to resist the elevated pressure criteria. Commonly used methods are RAS 117, FM LPDS 1-29 and ANSI/SPRI WD1. Assemblies marked with an asterisk* carry the limitations set forth in Section 2.2.1.5.1(a) of FM LPDS 1-29 for Zone 2/3 enhancements.

5.7 Exposure Limitations:

Sharkskin Comp, Ultra, Ultra Radiant and Ultra SA shall not be left exposed for longer than 180-days after installation.

6. INSTALLATION:

- 6.1 Sharkskin Roof Underlayments shall be installed in accordance with Kirsch Building Products, LLC published installation requirements subject to the Limitations set forth in Section 5 herein and the specifics noted below.
 6.1.1 Sharkskin Roof Underlayments should be installed above ventilated attic spaces in most cases, as they are considered a vapor barrier.
 6.2 Damaged decking must be replaced. The roof deck surface shall be dry and free of dust, dirt, debris, grease, solvents, loose nails or other protrusions. 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.

6.3 Sharkskin Comp:

- 6.3.1 Shall be installed in compliance with the requirements for ASTM D226, Type I or II underlayment in FBC Sections 1507 for the type of prepared roof covering to be installed.
 6.3.2 For slopes 3.5:12 (16.2°) or greater: Sharkskin Comp shall be laid horizontally, parallel to the eave with the printed side up, and have minimum 3-inch horizontal laps and minimum 6-inch vertical laps. Horizontal laps shall run with the flow of water in a shingling manner.
 6.3.3 For slopes 2.5:12 (11.8°) to 3.5:12 (16.2°): Sharkskin Comp shall be applied in a double coverage method (overlapping each installed course by 24" rather than the normal 3").

6.3.4 Attachment:

For wind zones $V_{ult} < 142$ mph ($V_{asd} < 110$ mph): Sharkskin Comp attached to the roof deck with corrosion-resistant or stainless steel nails having minimum 3/8-inch heads or corrosion-resistant or stainless steel staples (at all vertical and horizontal overlaps only), or minimum No. 12 gage corrosion-resistant steel or stainless steel shanks having a minimum 1-inch diameter corrosion-resistant metal round caps, tin tag, or plastic round caps or plastic caps fastened with corrosion resistant staples. Fasteners placed sufficiently to hold underlayment in place, but not less than Kirsch Building Products minimum published requirements. See roll label or www.sharkskin.us for specific requirements.
 For wind zones $V_{ult} \geq 142$ mph ($V_{asd} \geq 110$ mph): Sharkskin Comp attached to the roof deck with approved metal round top caps only. Fasteners placed not less than 4" o.c. at horizontal and vertical laps and 12" o.c. vertically and horizontally in the field of the sheet

6.4 Sharkskin Ultra:

6.4.1 Shall be installed in compliance with the requirements for ASTM D226, Type I or II, ASTM D2626 or ASTM D4869 underlayment in FBC Sections 1507 for the type of prepared roof covering to be installed.

6.4.2 Non-Tile Applications over Wood Decks:

For slopes 3:12 (14°) or greater: Sharkskin Ultra shall be laid horizontally, parallel to the eave with the printed side up, and have minimum 2-inch horizontal laps (*for asphalt shingle roofing*) or minimum 4-inch horizontal laps (*for metal or slate roofing*) and minimum 6-inch vertical laps. Horizontal laps shall run with the flow of water in a shingling manner.

For slopes 2.5:12 (11.8°) to 3:12 (14°): Sharkskin Ultra shall be applied in a double coverage method (overlapping each installed course by 24-inch rather than the normal 2-inch or 4-inch).

Attachment:

For wind zones $V_{ult} < 142$ mph ($V_{asd} < 110$ mph): Sharkskin Ultra attached to the roof deck with corrosion-resistant or stainless steel nails having minimum 3/8-inch heads, corrosion-resistant or stainless steel staples, or minimum No. 12 gage corrosion-resistant steel or stainless steel shanks having a minimum 1-inch diameter corrosion-resistant metal round caps, tin tag, or plastic round caps or plastic caps fastened with corrosion resistant staples. Fasteners placed sufficiently to hold underlayment in place, but not less than Kirsch Building Products minimum published requirements. See roll label or www.sharkskin.us for specific requirements.

For wind zones $V_{ult} \geq 142$ mph ($V_{asd} \geq 110$ mph): Sharkskin Ultra attached to the roof deck with approved metal round top caps only. Fasteners placed not less than 12" o.c. at horizontal and vertical laps and 24" o.c. vertically and horizontally in the field of the sheet.

6.4.3 Metal Roof Applications over Insulated or Non-Insulated Steel Decks:

For slopes 3:12 (14°) or greater: Sharkskin Ultra shall be laid horizontally, parallel to the eave with the printed side up, and have minimum 4-inch horizontal laps and minimum 12-inch vertical laps. Horizontal laps shall run with the flow of water in a shingling manner.

Attachment:

For wind zones $V_{ult} < 142$ mph ($V_{asd} < 110$ mph): Sharkskin Ultra attached to the roof deck with FM Approved #10, #12 or #14 screws and metal stress plates. Screws shall engage the top flute of the steel deck and be of sufficient length for minimum 3/4-inch penetration. Screws & plates placed sufficiently to hold underlayment in place, but not less than Kirsch Building Products minimum published requirements. See roll label or www.sharkskin.us for specific requirements.

For wind zones $V_{ult} \geq 142$ mph ($V_{asd} \geq 110$ mph): Sharkskin Ultra attached to the roof deck with FM Approved #10, #12 or #14 screws and metal stress plates. Screws shall engage the top flute of the steel deck and be of sufficient length for minimum 3/4-inch penetration. Screws & plates placed not less than 24" o.c. at horizontal and vertical laps and 48" o.c. in two, equally spaced, staggered rows in the field of the sheet.

6.5 Sharkskin Ultra Radiant:

6.5.1 Metal and Slate in Horizontal-Battened Applications:

For slopes 3:12 (14°) or greater: Sharkskin Ultra Radiant shall be laid horizontally, parallel to the eave with the printed side down; reflective side up (installer to wear tinted protective sunglasses/eyewear), and have minimum 4-inch horizontal laps and minimum 6-inch vertical laps. Horizontal laps shall run with the flow of water in a shingling manner. Sharkskin Ultra Radiant attached to the roof deck with corrosion-resistant or stainless steel nails having minimum 3/8-inch heads or minimum No. 12 gage corrosion-resistant steel or stainless steel shanks having minimum 1-inch diameter corrosion-resistant metal round tops. Ultra Radiant shall be attached sufficiently to hold in place until the horizontal battens are installed over-top.

6.5.2 Metal and Slate in Counter-Battened Applications:

Sharkskin Ultra Radiant shall laid horizontally, parallel to the eave with the printed-side-up across vertical wood, metal or plastic battens installed over a solid deck (to create an air space beneath the Ultra Radiant) spaced maximum 24" o.c. with minimum 4-inch horizontal laps and minimum 6-inch vertical laps. Horizontal laps shall be sealed with Eternabond Tape, butyl-based tape or other material specifically approved by Kirsch Building Products. Vertical laps shall be minimum 6-inch wide and shall break over a vertical batten to allow water to run away from the center point of the vertical batten. Sharkskin Ultra Radiant shall be attached to the vertical battens with corrosion-resistant or stainless steel nails having minimum 3/8-inch heads or minimum No. 12 gage corrosion-resistant steel or stainless steel shanks having minimum 1-inch diameter corrosion-resistant metal round top caps or plastic round top caps.

Sharkskin Ultra Radiant shall be attached to the vertical battens sufficiently to hold in place until the horizontal battens are installed over-top in accordance with the tile, metal or slate manufacturer's requirements. The positioning of the fasteners holding the Sharkskin Ultra Radiant to the vertical battens prior to placement of horizontal battens shall not interfere with true, flush installation of horizontal battens.

6.6 Sharkskin Ultra SA:

6.6.1 Direct-to-Deck with Mechanically Fastened Roof Cover:

Sharkskin Ultra SA is installed by positioning the material, then pulling away the split-release liner film backing and applying the underlayment to the substrate horizontally, parallel to the eave of the roof with printed-side-up with minimum 2-inch horizontal laps and minimum 6-inch vertical laps. Broom the entire surface of the underlayment, and use a heavy roller on all seams/laps to establish a secure bond.

6.6.2 Direct-to-Deck with Adhesive-Set Tile Applications:

Reference is made to FRSA/TRI April 2012 (04-12) Installation Manual and Table 1 and Section 5.6.2 herein, using the instructions noted above as a guideline.

The top horizontal edge of each run of Sharkskin Ultra SA shall be 'back-nailed' prior to placement of the subsequent run. Back-nailing shall be with minimum No. 12 gage corrosion-resistant steel or stainless steel shanks having minimum 1-inch diameter corrosion-resistant metal round top caps. Nails shall be positioned minimum 1-inch below the top horizontal edge spaced 6" o.c.

6.7 Sharkskin Two-Ply System:

6.7.1 The Sharkskin System consists of a base layer of Sharkskin Ultra mechanically attached to the wood roof deck followed by Sharkskin Ultra SA applied to the Ultra.

6.7.2 Non-Tile Applications:

For slopes 2.5:12 (11.8°) or greater: Sharkskin Ultra shall be laid horizontally, parallel to the eave with the printed side up, and have minimum 2-inch horizontal laps and minimum 6-inch vertical laps. Horizontal laps shall run with the flow of water in a shingling manner.

Attachment:

For wind zones $V_{ult} < 142$ mph ($V_{asd} < 110$ mph): Sharkskin Ultra attached to the roof deck with corrosion-resistant or stainless steel nails having minimum 3/8-inch heads, corrosion-resistant or stainless steel staples, or minimum No. 12 gage corrosion-resistant steel or stainless steel shanks having a minimum 1-inch diameter corrosion-resistant metal round caps, tin tag, or plastic round caps or plastic caps fastened with corrosion resistant staples. Fasteners placed sufficiently to hold underlayment in place, but not less than Kirsch Building Products minimum published requirements. See roll label or www.sharkskin.us for specific requirements.

For wind zones $V_{ult} \geq 142$ mph ($V_{asd} \geq 110$ mph): Sharkskin Ultra attached to the roof deck with approved metal round top caps only. Fasteners placed not less than 12" o.c. at horizontal and vertical laps and 24" o.c. vertically and horizontally in the field of the sheet.

Sharkskin Ultra SA is installed by positioning the material, then pulling away the split-release liner film backing and applying the underlayment to the substrate horizontally, parallel to the eave of the roof with printed-side-up with minimum 2-inch horizontal laps and minimum 6-inch vertical laps. Horizontal laps shall be staggered from those in the Ultra base layer by one half-sheet. Vertical laps shall be staggered from those in the Ultra base layer by not less than 3 feet. Broom in the entire surface of the underlayment and use a heavy roller on all seams/laps to establish a secure bond.

6.7.3 Tile Applications:

Reference is made to FRSA/TRI April 2012 (04-12) Installation Manual and Table 1 herein, using the instructions noted above as a guideline.

For mechanically fastened tile roofing, refer to Kirsch Building Products' published installation instructions, but not less than FRSA/TRI April 2012 (04-12), Table 1.

For adhesive-set tile roofing, refer to Section 5.6.3 herein.

Tile shall be loaded and staged in a manner that prevents tile slippage and/or damage to the underlayment.



7. BUILDING PERMIT REQUIREMENTS:

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

8. MANUFACTURING PLANTS:

Contact the named QA entity for information on plants covered under Rule 61G20-3 QA requirements.

9. QUALITY ASSURANCE ENTITY:

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

- END OF EVALUATION REPORT -