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EVALUATION REPORT

Tarco Roofing
One Information Way, Suite 225
Little Rock, AR 72202

Evaluation Report 10880.07.08-R2
FL10450-R2
Date of Issuance: 07/11/2008
Revision 2: 12/07/2011

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: Tarco 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 8.

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 12/07/2011. 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: Roof Underlayments, as produced by Tarco, 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:

<u>Section</u>	<u>Property</u>	<u>Standard</u>	<u>Year</u>
1507.2.3, 1507.3.3, 1507.5.3, 1507.7.3, 1507.8.3, 1507.9.3	Physical Properties	ASTM D226	2006
1507.2.4, 1507.2.9.2, 1507.3.3, 1507.5.3	Physical Properties	ASTM D1970	2001
1507.2.3, 1507.5.3, 1507.7.3, 1507.8.3, 1507.9.3	Physical Properties	ASTM D4869	2005
1507.3.3	Physical Properties	ASTM D6380	2003
1504.3.1	Wind Uplift	FM 4474	2004
1507.3.3	Installation Practice	FRSA/TRI 07320	2005
1523.6.5.2.1	Physical Properties	TAS 103	1995

3. REFERENCES:

<u>Entity</u>	<u>Examination</u>	<u>Reference</u>	<u>Date</u>
ERD (TST6049)	FM 4474	T6460.06.07-R1	10/09/2007
ERD (TST6049)	ASTM D1970	T30160.08.09	08/14/2009
ERD (TST6049)	TAS 103	T33190.08.10	08/06/2010
ERD (TST6049)	ASTM D1970	T32530.08.10	08/17/2010
ERD (TST6049)	FM 4474	T37610.07.11	06/29/2011
PRI (TST5878)	ASTM D1970	BRY-018-02-01	08/11/2003
PRI (TST5878)	ASTM D1970	BRY-017-02-01	08/11/2003
PRI (TST5878)	ASTM D226	TOT-014-02-02	05/18/2004
PRI (TST5878)	ASTM D4869	TOT-013-02-01	05/20/2004
PRI (TST5878)	ASTM D226	TOT-015-02-02	05/24/2004
PRI (TST5878)	ASTM D6380	TOT-029-02-01	07/05/2005
PRI (TST5878)	ASTM D4869	TOT-09-02-01	09/14/2004
PRI (TST5878)	ASTM D226	TOT-041-02-01	05/24/2006
Miami-Dade (CER1592)	FBC HVHZ Certification	08-0229.04	10/02/2008
UL (QUA1743)	Quality Assurance	Service Confirmation	Exp. 12/08/2014

4. PRODUCT DESCRIPTION:

4.1 Self-Adhering Underlayments:

4.1.1 **LeakBarrier® Fast90® Self-adhering Tile Underlayment** is an asphalt-saturated organic felt coated on both sides with asphalt and surfaced on the top side with mineral granules and on the underside with a self-adhering compound and release film.

4.1.2 **LeakBarrier® MS300 Ice and Water Armor** is a self-adhering, glass mat reinforced, mineral surfaced, SBS modified roof underlayment.

4.1.3 **LeakBarrier® PS200^{HT} Ice and Water Armor** is a self-adhering, glass mat reinforced, fabric surfaced, SBS modified roof underlayment.

4.1.4 **LeakBarrier® PS200^{MU} Ice and Water Armor** is a self-adhering, glass mat reinforced, smooth poly film surfaced, SBS modified roof underlayment.

4.1.5 **LeakBarrier® NR500^{HT}** is a self-adhering, plastic film surfaced, modified underlayment.

4.1.6 **LeakBarrier® SS400 Ice and Water Armor** is a self-adhering, fiberglass reinforced, smooth surfaced modified underlayment.

4.2 **Mechanically Fastened Underlayments:**

4.2.1 **Tarco 15** is an ASTM D226 Type I, 15 lb asphalt-saturated organic felt

4.2.2 **Tarco 30** is an ASTM D226 Type II, 30 lb asphalt-saturated organic felt

4.2.3 **Tarco NO 15** is an ASTM D4869 Type I asphalt-saturated organic felt

4.2.4 **Tarco NO 30** is an ASTM D4869 Type II asphalt-saturated organic felt

4.2.5 **LeakBarrier® EasyLay®** is an asphalt-coated polyester fabric roof underlayment.

5. LIMITATIONS:

5.1 This Evaluation Report is not for use in the HVHZ.

5.2 Fire Classification is not part of this Laboratory Report; refer to current Approved Roofing Materials Directory for fire ratings of this product.

5.3 Tarco 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 Tarco underlayments are follows:

Underlayment	Asphalt Shingles	Nail-On Tile	Foam-On Tile	Metal	Wood Shakes & Shingles	Slate
LeakBarrier Fast90	Yes	Yes	Yes See 5.4.2	No	Yes	Yes
LeakBarrier MS300	Yes	No	No	No	Yes	Yes
LeakBarrier PS200 ^{HT}	Yes	Yes	Yes See 5.4.2	Yes	Yes	Yes
LeakBarrier PS200 ^{MU}	Yes	No	No	Yes	Yes	Yes
LeakBarrier NR500 ^{HT}	Yes	No	No	Yes (No copper or zinc)	Yes	Yes
LeakBarrier SS400	Yes	No	No	No	Yes	Yes
LeakBarrier EasyLay	Yes	Yes	No	Yes	Yes	Yes
Tarco 15	Yes	No	No	Yes	Yes	No
Tarco 30	Yes	Yes	No	Yes	Yes	Yes
Tarco NO 15	Yes	No	No	Yes	Yes	Yes
Tarco NO 30	Yes	No	No	Yes	Yes	Yes

5.4.1 Tarco 15, Tarco 30, Tarco NO 15, Tarco NO 30 and EasyLay may be used as a mechanically attached base layer followed by a LeakBarrier self-adhering top layer with allowable roof covers noted above for the respective LeakBarrier® self-adhering underlayments.

5.4.2 "Foam-On Tile" is limited to use of Polyfoam Polyset applications unless tensile adhesion / long term aging data from an accredited testing laboratory is provided.

5.5 Allowable substrates are noted below:

5.5.1 LeakBarrier Self-Adhering Direct-Bond to Deck:

- New untreated plywood;
- ASTM D41 primed new untreated plywood;
- Existing plywood;
- ASTM D41 primed existing plywood;
- Structural concrete
- ASTM D41 primed structural concrete.

Note: Tarco does not require priming of new or existing plywood sheathing. New or existing plywood sheathing should be cleaned of all dirt and debris prior to application of LeakBarrier membranes.

5.5.2 LeakBarrier Self-Adhering Bond to Mechanically Attached Base Underlayment:

- ASTM D226, Type I or II felt;
- ASTM D4869 felt;
- LeakBarrier EasyLay

For installations under mechanically attached prepared roof coverings, base layer shall be attached per minimum codified requirements. For installations under foam-on tile systems, base layer shall be attached per minimum requirements of FRSA/TRI 07320/8-05 or RAS 120.

5.5.3 LeakBarrier Self-Adhering Bond to Other Substrate Types:

- ASTM D41 primed metal (flashing metal, valley metal, etc.)

5.5.4 FRSA/TRI 07320 does not address wind uplift resistance of direct-deck, adhered underlayment systems beneath foam-on tile systems, where the bonded underlayment forms part of the load-path. The following wind uplift limitations apply to direct-deck, adhered LeakBarrier underlayment systems.

5.5.4.1 Maximum Design Pressure = -217.5 psf.

Deck: Structural concrete to meet project requirements to satisfaction of AHJ.
 Primer: (Optional) ASTM D41
 Underlayment: LeakBarrier PS200^{HT}, self-adhered.

5.5.4.2 Maximum Design Pressure = -75.0 psf.

Deck: Min. 19/32-inch plywood to meet project requirements to satisfaction of AHJ, but not less than max. 24-inch spans with 8d ring shank nails spaced 6-inch o.c.
 Primer: (Optional) ASTM D41
 Underlayment: LeakBarrier PS200^{HT}, self-adhered.

5.6 Exposure Limitations:

- 5.6.1 LeakBarrier EasyLay and FAST 90 shall not be left exposed for longer than 180-days after installation.
- 5.6.2 LeakBarrier PS200^{HT} shall not be left exposed for longer than 120-days after installation.
- 5.6.3 LeakBarrier MS300, NR500^{HT}, PS200^{MU} or SS400 shall not be left exposed for longer than 30-days after installation.
- 5.6.4 Tarco 15, Tarco NO 15, Tarco 30 and Tarco NO 30 shall be covered as soon as possible after installation; exposure for more than 24 hours after installation could adversely affect performance.

5.7 For tile roof installations governed by the FRSA/TRI 07320/8-05 Installation Manual, Fourth Edition, use is limited to the following. Reference is made to the FRSA/TRI Technical Brief titled "Florida High Wind Roof Tile Self-Adhered Underlayment Requirements as of 02/14/2011" for limitations for self-adhering underlayments used beneath tile roof systems.

Table 2: Tile System Options per FRSA/TRI 07320/8-05				
System	Underlay Option	Section	Reference	Product(s)
System One: Mechanically Fastened Tile, Unsealed or Sealed Underlayment System	2	3.02B	No. 30	Tarco 30
	3	3.02C	No. 30	Tarco 30
	4	3.02D	No. 30	Tarco 30 or EasyLay
	5	3.02E	Self-Adhered Underlayment	Fast 90 or PS200 ^{HT}
	6	3.02F	No. 30 / Self-Adhered Underlayment	Base Layer: Tarco 30 or EasyLay Top Layer: Fast 90 or PS200 ^{HT}
System Two: Mechanically Fastened Tile, Sealed Underlayment System	2	3.02B	No. 30	Tarco 30
	3	3.02C	No. 30	Tarco 30
	4	3.02D	Self-Adhered Underlayment	Fast 90 or PS200 ^{HT}
	5	3.02E	No. 30 / Self-Adhered Underlayment	Base Layer: Tarco 30 or EasyLay Top Layer: Fast 90 or PS200 ^{HT}
System Three: Mortar Set	1	3.02A	No. 30	Tarco 30
	2	3.02B	No. 30	Tarco 30
System Four "A": Adhesive-Set Tile, Unsealed or Sealed Underlayment System	2	3.02B	No. 30	Tarco 30
	3	3.02C	No. 30	Tarco 30
	4	3.02D	Self-Adhered Underlayment	Fast 90 or PS200 ^{HT}
	5	3.02E	No. 30 / Self-Adhered Underlayment	Base Layer: Tarco 30 or EasyLay Top Layer: Fast 90 or PS200 ^{HT}
System Four "B": Adhesive-Set Tile, Sealed Underlayment System	1	3.02A	No. 30	Tarco 30
	2	3.02B	No. 30	Tarco 30
	3	3.02C	Self-Adhered Underlayment	Fast 90 or PS200 ^{HT}
	4	3.02D	No. 30 / Self-Adhered Underlayment	Base Layer: Tarco 30 or EasyLay Top Layer: Fast 90 or PS200 ^{HT}

6. INSTALLATION:

- 6.1 Tarco Roof Underlayments shall be installed in accordance with Tarco 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 primed the substrate (if applicable).
- 6.3 LeakBarrier® Fast90® Self-Adhering Tile Underlayment:**
- 6.3.1 EasyLay shall be installed in compliance with the requirements for 90# felt underlayment (except the product is self-adhered) in FBC Sections 1507 for the type of prepared roof covering to be installed.
- 6.3.2 For use in non-tile applications:
- 6.3.2.1 Cut the Fast90 roll into 12' to 16' sections for workability and allow to relax prior to application.
- 6.3.2.2 Chalk a plumb line 36" from all outside perimeters; then chalk plumb lines 32" apart, upslope to the ridge line.

- 6.3.2.3 Membrane Application:
- Place a full width piece of Fast90 on the prepared substrate, parallel to the eave edge of the roof, with the selvedge edge positioned upslope and in-line with the 1st chalk line.
 - Fold back half the sheet and remove the exposed release film, taking care not to displace the membrane
 - Working from the centerline out, roll the membrane onto the substrate, taking care to avoid wrinkles and ridges, and repeat for the other half of the sheet.
 - Remove selvage release film, if present, and install capped or tin tagged nails 6" o.c. in the center of the selvedge edge.
 - Install the subsequent sheets in the same manner, with upslope selvedge edges in-line with chalk lines, with 4" side laps and 8" end laps.
 - Seal all 8" end laps 1/16" thick application of asphalt plastic cement and stagger all end laps minimum 36".
 - Roll the entire surface with a weighted roller, paying particular attention to side laps, end laps and eave / rake areas to ensure a complete bond.
- 6.3.4 For use in tile applications, reference is made to FRSA/TRI 07320/8-05 Installation Manual, Fourth Edition, and Table 2 herein, using the instructions noted above as a guideline.
- 6.3.4.1 Wait a minimum of 24 hours prior to loading roof tiles.
- 6.3.4.2 All tiles shall be staged four tiles perpendicular to slope, six tiles on top, parallel to slope; not to exceed 10 tiles total to a maximum roof pitch of 5:12 for flat tiles and 6:12 for lugged tiles. If tiles are to be left in a staged condition for more than 30 days, tiles shall be staged two tiles perpendicular to slope, four tiles on top, parallel to slope; not to exceed 6 tiles total to a maximum roof pitch of 5:12 for flat tiles and 6:12 for lugged tiles.
- 6.3.4.3 At roof pitch in excess of those noted above, the tiles shall be staged behind a nominal 1 x 2 horizontal batten.
- 6.4 LeakBarrier® MS300, PS200^{HT}, PS200^{MU}, NR500^{HT} or SS400 Ice and Water Armor:**
- 6.4.1 MS 300, PS200^{HT}, PS200^{MU}, NR500^{HT} or SS400 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.
- 6.4.2 For use in non-tile applications:
- 6.4.2.1 Cut MS 300, PS200^{HT}, PS200^{MU}, NR500^{HT} or SS400 to manageable sections and allow to relax prior to application.

- 6.4.2.3 Membrane Application:
- Place a full width piece on the prepared substrate, aligned parallel to the eave edge and extend approximately 3/8" over the eave and rake with the selvedge edge positioned upslope.
 - Fold back the upslope half of the sheet and remove the exposed release film, taking care not to displace the membrane
 - Working from the centerline out, roll the membrane onto the substrate, taking care to avoid wrinkles and ridges
 - Apply a 1/16" thick layer of asphalt plastic cement over the eave and rake metal, extending 2" to 3" onto the deck surface.
 - Fold back the downslope half of the sheet, remove the release film and roll the membrane onto the substrate from the centerline out.
 - Seal all 6" end laps with a 1/16" thick application of asphalt plastic cement and stagger all end laps minimum 36".
 - Remove selvage release film, if present, and install second and subsequent courses in a similar manner.
 - Install capped or tin-tagged nails 6" o.c. along the centerline of the laps.
 - At all T-joints, where an end-lap and the next overlapping course intersect, apply a bead of roofing laps cement before the overlapping course is laid.
 - Roll the entire surface with a weighted roller, paying particular attention to side laps, end laps and eave / rake areas to ensure a complete bond.
- 6.4.4 For use in tile applications (PS200^{HT} only), reference is made to FRSA/TRI 07320/8-05 Installation Manual, Fourth Edition, and Table 2 herein, using the instructions noted above as a guideline.
- 6.4.4.1 Wait a minimum of 24 hours prior to loading roof tiles.
- 6.4.4.2 All tiles shall be staged four tiles perpendicular to slope, six tiles on top, parallel to slope; not to exceed 10 tiles total to a maximum roof pitch of 5:12 for flat tiles and 6:12 for lugged tiles. If tiles are to be left in a staged condition for more than 30 days, tiles shall be staged two tiles perpendicular to slope, four tiles on top, parallel to slope; not to exceed 6 tiles total to a maximum roof pitch of 5:12 for flat tiles and 6:12 for lugged tiles.
- 6.4.4.3 At roof pitch in excess of those noted above, the tiles shall be staged behind a nominal 1 x 2 horizontal batten.
- 6.5 Tarco 15 and 30:**
- 6.5.1 Tarco 15 and 30 shall be installed in compliance with the requirements for ASTM D226, Type I and II underlayments, respectively, in FBC Sections 1507 for the type of prepared roof covering to be installed.
- 6.5.2 For use in non-tile applications, reference is made to the current edition of the NRCA Steep-slope Roofing Manual.
- 6.5.3 For use in tile applications (Tarco 30 only), reference is made to FRSA/TRI 07320/8-05 Installation Manual, Fourth Edition, and Table 2 herein.
- 6.6 Tarco NO 15 and NO 30:**
- 6.6.1 Tarco NO 15 and NO 30 shall be installed in compliance with the requirements for ASTM D4869 underlayment in FBC Sections 1507 for the type of prepared roof covering to be installed.
- 6.6.2 For use in non-tile applications, reference is made to the current edition of the NRCA Steep-slope Roofing Manual.
- 6.6.3 Not for use in tile applications.

6.7 LeakBarrier EasyLay:

- 6.7.1 EasyLay 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.
- 6.7.2 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.
- 6.7.3 For use in non-tile applications:
- 6.7.3.1 Place a full width section of EasyLay, parallel to the eave edge of the roof and unroll 2 to 3 feet with the lay lines facing up, and position to the edge of the eave and rake. Install a few fasteners at the top, near the rake, and roll out the sheet to a manageable length. Pull, straighten and align the sheet so that any wrinkles are eliminated and the sheet is even with the eave edge. Fasten with 3/8" headed roofing nails or 1" capped (plastic or metal) nails, driven by hand or pneumatically, spaced 6" o.c. at all laps in the center of the seam area, and two staggered rows fastened 12" o.c. in the field of the sheet. Install nails such that the head of the nail is flush with the surface, without cutting into the surface. Fasten from the top to avoid walking or kneeling on unsecured sheet. Continue to the end of the substrate and fasten down. Align the next roll over the preceding sheet so as to form a minimum 4", water-shedding lap, and install per instructions above. Apply subsequent sheets in the same manner, with minimum 4" water-shedding laps and minimum 8" end-laps, which are staggered minimum 36" from the preceding course.
- For double layer applications, follow the instructions noted above, but using a minimum 19", water-shedding side lap.
- 6.7.3.2 Allow for minimum 6" up the vertical transitions and minimum 6" over hips and ridges.
- 6.7.3.3 At valleys, first install a vertical length of EasyLay down the center of the valley, then start at the low point and work to the high point, rolling the membrane from the center outward in each direction, ensuring no wrinkles or tears. Covered with valley-metal or other valley lining material in accordance with NRCA recommendations.
- 6.7.3.4 Apply a thin coat of asphalt plastic cement to waterproof areas where any cuts or tears have occurred. Seams or joints that require adhesive or sealant can be treated with high quality plastic cement (asbestos free).
- 6.7.4 For use in tile applications, reference is made to FRSA/TRI 07320/8-05 Installation Manual, Fourth Edition, and Table 2 herein, using the instructions noted above as a guideline.

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 noted QA agency for information on product locations covered for F.A.C. Rule 9N-3 QA requirements

10 QUALITY ASSURANCE ENTITY:

Underwriters Laboratories – QUA1743; (847) 664-3281

- END OF EVALUATION REPORT -