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EVALUATION REPORT

Altenloh, Brinck & Co. U.S., Inc.
 02105 Williams County Road 12-C
 Bryan, OH 43506

Evaluation Report A32570.05.12-R1
FL4500-R2
Date of Issuance: 05/15/2012
Revision 1: 10/17/2014

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 product described herein has been designed to comply with the 2010 Florida Building Code sections noted herein.

DESCRIPTION: Trufast Roof Fastening Components

LABELING: 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.

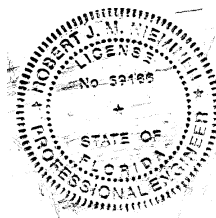
ADVERTISEMENT: The Evaluation Report number preceded by the words "Trinity | ERD Evaluated" may be displayed in advertising literature. If any portion of the Evaluation Report is displayed, then it shall be done in its entirety.

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 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 10/17/2014. 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. Exterior Research & Design, LLC. d/b/a 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. Exterior Research & Design, LLC. d/b/a 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: Roofing Fasteners
Compliance Statement: Trufast Roof Fastening Components, as produced by Altenloh, Brinck & Co. U.S., Inc., have demonstrated compliance with the 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>
1506.6, 1513.1, 1520.4	Corrosion Resistance	TAS 114(E)	1995
1520.4 / TAS 110	Withdrawal & Rupture	TAS 117(A), (B), (C)	1995

3. REFERENCES:

<u>Entity</u>	<u>Examination</u>	<u>Reference</u>	<u>Date</u>
ERD (TST 6049)	Withdrawal & Rupture	4670.10.95-1	10/01/1995
ERD (TST 6049)	Withdrawal & Rupture	4670.07.97-1	07/01/1997
ERD (TST 6049)	Withdrawal & Rupture	4670.03.01-1	09/20/2001
ERD (TST 6049)	Withdrawal	E1060.03.06	03/14/2006
ERD (TST 6049)	Rupture	EO8950.03.08-1	03/28/2008
ERD (TST 6049)	Withdrawal & Rupture	A35880.04.12	04/03/2012
FM (TST 1867)	Corrosion Resistance	0W4A1.AM	01/07/1993
FM (TST 1867)	Corrosion Resistance	3031797	05/19/2008
FM (TST 1867)	Corrosion Resistance	3040205	06/08/2010
FM (QUA 1860)	Quality Assurance	Inspection Report	04/08/2014

4. PRODUCT DESCRIPTION:

4.1 Fasteners:

<u>Part Name</u>	<u>Substrates</u>	<u>Head Style</u>	<u>Drive</u>
Trufast #12 DP	Wood, Steel	Truss	#3 Phillips
Trufast #12 DPH	Wood, Steel	Hex Washer	¼" Hex
Trufast #14 HD	Wood, Steel, Concrete	Truss	#3 Phillips
Trufast #14 Stainless Steel HD	Wood, Steel, Concrete	Truss	#3 Phillips
Trufast #15 EHD	Wood, Steel	Truss	#3 Phillips
Trufast #21 SHD	Wood, Steel	Truss	#3 Phillips
Trufast #12 Purlin Fastener (hex drive)	Steel	Hex Washer	¼" Hex
Trufast #12 Purlin Fastener (square drive)	Steel	Pancake	#3 Square
Trufast Fluted Concrete Nail	Concrete	Pan	N/A
Trufast SIP TP Fastener	Wood	Pancake	T-30 6 Lobe
Trufast SIP LD Fastener	Wood, Steel, Concrete	Pancake	T-30 6 Lobe
Trufast SIP HD Fastener	Steel	Pancake	T-30 6 Lobe
Trufast TL	CWF, Gypsum	Round	#4 Square

4.2 Plates & Bars:

<u>Part Name</u>	<u>Dimensions</u>
Trufast 2" Metal Seam Plate	0.030" x 2" diameter Galvalume [®]
Trufast 2" Barbed Metal Seam Plate	0.030" x 2" diameter Galvalume [®]
Trufast 2.4" Barbed Metal Seam Plate	0.040" x 2.4" diameter Galvalume [®]
Trufast 2.4" Barbed Metal Seam Plate (14 Barb)	0.040" x 2.4" diameter Galvalume [®]
Trufast 2.4" Scoop Seam Plate	0.040" x 2.4" diameter Galvalume [®]
Trufast 2-3/4" Barbed Metal Seam Plate (EHD)	0.040" x 2.75" diameter Galvalume [®]
Trufast 2-3/4" Barbed Metal Seam Plate (SHD)	0.040" x 2.75" diameter Galvalume [®]
Trufast 3" Metal Insulation Plate	0.018" x 3" diameter Galvalume [®]
Trufast 3" Recessed Metal Insulation Plate	0.018" x 3" diameter Galvalume [®]

Part Name

Trufast TL 3 in. Insulation Plate
 Trufast Flat Batten Bar
 Trufast Recessed Batten Bar

Dimensions

0.017" x 3" diameter Galvalume®
 0.047" x 121" long bar or 220 ft long coil; Galvalume®; holes at 6 or 12-inch o.c.
 0.047" x 121" long bar; Galvalume®; holes at 6 or 12-inch o.c., recessed 1/8-inch

4.3 Pre-Assembled Components:

Part Name

Trufast 3" Pre-Assembled Insulation Plate

Substrates

Wood, Steel

Description

Trufast #12 DP with Trufast 3" Metal Insulation Plate or Trufast #12 DPH with Trufast 3" Recessed Metal Insulation Plate

Trufast FM-75 Base Sheet Fastener

Aggregate
 lightweight
 concrete, gypsum

Two piece factory assembled fastener and plate formed from stamped and folded steel. The fastener consists of dual 1.2 in. long rectangular gripping legs and a square cap that is formed from 0.013 in. thick G-90 hot dipped galvanized steel or cold rolled steel that is coated with a black urethane coating. The 2.7 in. diameter plate is formed from 0.013 in. thick Galvalume steel. The fasteners are designed for use in minimum 1 in. thick lightweight vermiculite, perlite or cellular concrete decks but may be used in sound existing poured gypsum decks if they can be driven without damage to the fastener or deck. The fasteners are designed to be installed through a base sheet into roof decks using a Magnetic Driver or Twin Loc Driver.

Trufast FM-90 Base Sheet Fastener

Cellular or
 aggregate
 lightweight
 concrete, gypsum

Two piece factory assembled fastener and plate formed from stamped and folded steel. The fastener consists of dual 1.7 in. long rectangular gripping legs and a square cap that is formed from 0.013 in. thick G-90 hot dipped galvanized steel or cold rolled steel that is coated with a black urethane coating. The 2.7 in. diameter plate is formed from 0.013 in. thick Galvalume steel. The fasteners are designed for use in minimum 2 in. thick lightweight vermiculite, perlite or cellular concrete decks but may be used in sound existing poured gypsum decks if they can be driven without damage to the fastener or deck. The fasteners are designed to be installed through a base sheet into roof decks using a Magnetic Driver or Twin Loc Driver.

Trufast FM-290 Base Sheet Fastener

Cellular or
 aggregate
 lightweight
 concrete, gypsum

Two piece factory assembled fastener and plate formed from stamped and folded. The fastener consists of tandem dual 1.7 in. long rectangular gripping legs and a square cap that is formed from 0.013 in. thick G-90 hot dipped galvanized steel or cold rolled steel that is coated with a black urethane coating. The rectangular plate is formed from 0.013 in. thick Galvalume steel. The fasteners are designed for use in minimum 2 in. thick lightweight vermiculite, perlite or cellular concrete decks but may be used in sound existing poured gypsum decks if they can be driven without damage to fastener or deck. The fasteners are designed to be installed through a base sheet into roof decks using a Magnetic Driver or Twin Loc Driver.

Trufast Insuldeck Loc-Nail Base Sheet Fastener

Cementitious wood
 fiber

Two piece factory assembled fastener and plate formed from stamped and folded steel. The fastener consists of a 1-7/8 in. long dual shank and integral head that are formed from 0.022 in. thick Galvalume coated steel. The round 2.7 in. diameter plate is stamped from 0.013 in. thick Galvalume coated steel. The fasteners are designed to be installed through a base sheet or thin insulation into cementitious wood fiber roof decks using an Insuldeck Driver.

Trufast Twin Loc-Nail Assembled Fastener

Cementitious wood
 fiber, cellular or
 aggregate
 lightweight
 concrete, gypsum

Two piece factory assembled fastener and plate formed from stamped and folded steel. The fastener consists of a 1.4 in., 1.8 in., 2.8 in., 3.8 in. or 4.8 in. long tapered oval Galvalume or G-90 galvanized steel tube factory assembled to a 2.7 in. diameter Galvalume steel plate and a 0.080 in. diameter carbon or stainless steel locking staple. The fasteners are driven with a Twin Loc-Nail Driver by placing a fastener on the face of the driver with the exposed locking staple positioned in the slot in the face of the driver and driving the fastener into the roof deck with a single impact. A second impact drives the locking staple through the tube/plate assembly until it is flush with the top of the plate, forcing the legs of the locking staple out of the bottom of the tube and into the deck.

TABLE 1: TYPICAL PERFORMANCE, STATIC WITHDRAWAL, ULTIMATE LOAD (LBF)								
Fastener	Substrate							
	Min. 19/32" plywood	Min. 22 ga., Grade 50 Steel	Min. 2,500 psi concrete	Min. 1/8" thick steel	Min. 1/4" thick steel	Tectum [®]	Poured Gypsum	Cellular Lightweight Concrete
Trufast #12 DP or DPH	556	463	N/A	N/A	N/A	N/A	N/A	N/A
Trufast #14 HD	546	522	594	N/A	N/A	N/A	N/A	N/A
Trufast #14 Stainless Steel HD	N/A	527	563	N/A	N/A	N/A	N/A	N/A
Trufast #15 EHD	628	706	834	N/A	N/A	N/A	N/A	N/A
Trufast #21 SHD	N/A	870	N/A	N/A	N/A	N/A	N/A	N/A
Trufast #12 Purlin Fastener (hex or square drive)	N/A	N/A	N/A	1,975	3,753	N/A	N/A	N/A
Trufast Fluted Concrete Nail	N/A	N/A	303	N/A	N/A	N/A	N/A	N/A
Trufast SIP TP Fastener	512	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Trufast SIP LD Fastener	540	490	899	N/A	N/A	N/A	N/A	N/A
Trufast SIP HD Fastener	N/A	N/A	N/A	2,043	5,320	N/A	N/A	N/A
Trufast TL	N/A	N/A	N/A	N/A	N/A	505 <i>(1.5" embedment)</i>	400 <i>(7/16" pilot hole, 1.5" embedment)</i>	N/A
Trufast FM-75 Base Sheet Fastener	N/A	N/A	N/A	N/A	N/A	N/A	60	60
Trufast FM-90 Base Sheet Fastener	N/A	N/A	N/A	N/A	N/A	N/A	60	107
Trufast FM-290 Base Sheet Fastener	N/A	N/A	N/A	N/A	N/A	N/A	N/A	164 <i>(200 psi LWC)</i>
Trufast Insuldeck Loc-Nail Base Sheet Fastener	N/A	N/A	N/A	N/A	N/A	64	N/A	N/A
Trufast Twin Loc-Nail Assembled Fastener (1.8-inch)	N/A	N/A	N/A	N/A	N/A	137	263 <i>(260 psi gypsum)</i>	No data

TABLE 2: TYPICAL PERFORMANCE, RUPTURE (PULL-THROUGH), ULTIMATE LOAD (LBF)			
TRUFAST 3" METAL INSULATION PLATE OR TRUFAST TL 3 IN. INSULATION PLATE WITH BASE SHEETS FOR USE IN BUR OR MODIFIED BITUMEN ROOF SYSTEMS			
Manufacturer	Base Sheet	Overlying Application	Rupture (lbf)
Generic	ASTM D226, Type II Felt	Hot-asphalt	224
CertainTeed Corporation	Glasbase	Hot-asphalt	155
	Flexiglas Base	Hot-asphalt	253
	All Weather/Empire Base	Hot-asphalt	215
	Flintlastic 20 Base	Hot-asphalt	303
	Flintlastic Poly SMS Base	Hot-asphalt	372
	Yosemite Venting Base	Hot-asphalt	248
	Flintlastic SA NailBase	Self-adhering	278
Firestone Building Products Company	MB Base M	Hot-asphalt	202
	Venting Base	Hot-asphalt	227
	SBS Base	Hot-asphalt	270
GAF	GAFGLAS #75 Base Sheet	Hot-asphalt	184
	GAFGLAS #80 Ultima Base Sheet	Hot-asphalt	152
	GAFGLAS Stratavent Eliminator (Nailable)	Hot-asphalt	155
	GAFGLAS FlexPly 6	Hot-asphalt	209
	Liberty MA Mechanically Attached Base Sheet	Self-adhering	300
The Garland Company	HPR Glasbase	Hot-asphalt	204
	HPR Premium Glasbase	Hot-asphalt	224
	HPR Tri-Base Plus	Hot-asphalt	463

TABLE 2 (CONTINUED): TYPICAL PERFORMANCE, RUPTURE (PULL-THROUGH), ULTIMATE LOAD (LBF) TRUFAST 3" METAL INSULATION PLATE OR TRUFAST TL 3 IN. INSULATION PLATE WITH BASE SHEETS FOR USE IN BUR OR MODIFIED BITUMEN ROOF SYSTEMS			
Manufacturer	Base Sheet	Overlying Application	Rupture (lbf)
Johns Manville	PermaPly 28	Hot-asphalt	185
	Ventsulation	Hot-asphalt	258
	GlasPly Premier	Hot-asphalt	216
	DynaBase	Hot-asphalt	266
	JM APP Base	Torch-applied	208
Derbigum USA	PRS Glass Base	Hot-asphalt	228
	PRS Modified Base Sheet	Hot-asphalt	230
	PRS Vented Base	Hot-asphalt	202
	Derbibase	Torch-applied	241
	Derbibase Ultra	Torch-applied	232
Siplast	Parabase	Hot-asphalt	251
	Parabase Plus	Hot-asphalt	254
Soprema	Sopra-G	Hot-asphalt	207
	Modified Sopra-G	Hot-asphalt	216
	Soprabase	Hot-asphalt	380
Tamko	Glass-Base	Hot-asphalt	185
	Vapor Chan	Hot-asphalt	242
U.S. Ply, Inc.	USP Base	Hot-asphalt	230
	USP NVB	Hot-asphalt	202
	DuraFlex 30 SBS Base	Hot-asphalt	199
	DuraFlex 60 SBS Base	Hot-asphalt	330
	DuraFlex SBS PolyBase	Hot-asphalt	368

TABLE 3: TYPICAL PERFORMANCE, RUPTURE (PULL-THROUGH), ULTIMATE LOAD (LBF) TRUFAST FM-75, FM-90 OR INSULDECK LOC-NAIL BASE SHEET FASTENER WITH BASE SHEETS FOR USE IN BUR OR MODIFIED BITUMEN ROOF SYSTEMS			
Manufacturer	Base Sheet	Overlying Application	Rupture (lbf)
CertainTeed Corporation	Glasbase	Hot-asphalt	212
	Flintlastic Poly SMS Base	Hot-asphalt	222
Firestone Building Products Company	MB Base	Hot-asphalt	175
GAF	GAFGLAS #75 Base Sheet	Hot-asphalt	206
	GAFGLAS Stratavent Eliminator (Nailable)	Hot-asphalt	178
Johns Manville	Ventsulation	Hot-asphalt	218
Siplast	Parabase	Hot-asphalt	202
	Parabase Plus	Hot-asphalt	200
Soprema	Sopra-G	Hot-asphalt	206
	Sopralene 180 Sanded 2.2	Hot-asphalt	214
Tremco Incorporated	BURMastic Glass Ply	Hot-asphalt	228
	BURMastic Composite Ply	Hot-asphalt	228
Viridian Systems	Multi-Ply Glass	Hot-asphalt	224
	Performance Ply	Hot-asphalt	226

TABLE 4: TYPICAL PERFORMANCE, RUPTURE (PULL-THROUGH), ULTIMATE LOAD (LBF)			
TRUFAST TWIN LOC-NAIL ASSEMBLED FASTENER WITH BASE SHEETS FOR USE IN BUR OR MODIFIED BITUMEN ROOF SYSTEMS			
Manufacturer	Base Sheet	Overlying Application	Rupture (lbf)
CertainTeed Corporation	Glasbase	Hot-asphalt	179
	Flexiglas Base	Hot-asphalt	240
	All Weather / Empire Base	Hot-asphalt	249
Firestone Building Products Company	MB Base	Hot-asphalt	256
GAF	GAFLAS #75 Base Sheet	Hot-asphalt	234
	GAFLAS Stratavent Eliminator (Nailable)	Hot-asphalt	238
Johns Manville	PermaPly 28	Hot-asphalt	275
	Ventsulation	Hot-asphalt	228
	DynaBase	Hot-asphalt	302
Siplast	Parabase	Hot-asphalt	217
	Parabase Plus	Hot-asphalt	279
Soprema	Modified Sopra-G	Hot-asphalt	206
	Sopra-G	Hot-asphalt	245
Tamko	Glass-Base	Hot-asphalt	234
	Vapor Chan	Hot-asphalt	316
Viridian Systems	Multi-Ply Glass	Hot-asphalt	266
	Multi-Ply Glass CL	Hot-asphalt	381

TABLE 5: TYPICAL PERFORMANCE, RUPTURE (PULL-THROUGH), ULTIMATE LOAD (LBF)			
TRUFAST FM-290 BASE SHEET FASTENER WITH BASE SHEETS FOR USE IN BUR OR MODIFIED BITUMEN ROOF SYSTEMS			
Manufacturer	Base Sheet	Overlying Application	Rupture (lbf)
CertainTeed Corporation	Glasbase	Hot-asphalt	256
	Flexiglas Base	Hot-asphalt	267
	Flintlastic Poly SMS Base	Hot-asphalt	372
	Flintlastic SA NailBase	Self-adhering	156
Firestone Building Products Company	APP 160	Torch-applied	364
	SBS Base	Hot-asphalt	326
	SBS Glass Torch Base	Torch-applied	255
	SBS Poly Torch Base	Torch-applied	346
GAF	GAFLAS #75 Base Sheet	Hot-asphalt	263
	GAFLAS #80 Ultima Base Sheet	Hot-asphalt	198
	GAFLAS Stratavent Eliminator (Nailable)	Hot-asphalt	263
	Liberty MA Mechanically Attached Base Sheet	Self-adhering	163
The Garland Company	HPR Glasbase	Hot-asphalt	280
	HPR Tri-Base Plus	Torch-applied	451
Johns Manville	PermaPly 28	Hot-asphalt	273
	Ventsulation	Hot-asphalt	248
	DynaBase	Hot-asphalt	306
Derbigum USA	Derbibase	Torch-applied	260
Polyglass USA, Inc.	Elastobase V	Torch-applied	311
	Elastobase V (poly surface)	Self-adhering	177
Siplast	Parabase	Hot-asphalt	293
Soprema	Modified Sopra-G	Hot-asphalt	254
	Soprabase	Self-adhering	235
Tamko	Glass-Base	Hot-asphalt	267
	Vapor Chan	Hot-asphalt	272
Tarco Roofing	EasyBase	Self-adhering	185
Tremco Incorporated	BURMastic Glass Ply	Hot-asphalt	283
	BURMastic Composite Ply	Hot-asphalt	462
U.S. Ply, Inc.	USP Base	Hot-asphalt	287
	USP NVB	Hot-asphalt	280
	DuraFlex 30 SBS Base	Hot-asphalt	263
Viridian Systems	Multi-Ply Glass	Hot-asphalt	293
	Multi-Ply Glass CL	Hot-asphalt	424
	Performance Ply	Hot-asphalt	382
	Pika Ply HI-TEC 60	Hot-asphalt	461

TABLE 6: TYPICAL PERFORMANCE, RUPTURE (PULL-THROUGH), ULTIMATE LOAD (LBF) TRUFAST 2" BARBED METAL SEAM PLATES WITHIN HEAT-WELDED SIDE LAP			
Manufacturer	Base Membrane	Overlying Application	Rupture (lbf)
CertainTeed Corporation	Flintlastic Poly SMS or Ultra Poly SMS Base	Heat-welded sidelap	330
Johns Manville	DynaLastic 180 S	Heat-welded sidelap	500
Soprema	Soprafix(S)	Heat-welded sidelap	515

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 Trufast Roof Fastening Components are used within roofing systems holding Florida Statewide Product Approval. The products are for use in those roof assemblies that call-out the products listed herein by name. The performance data noted herein may be used by a qualified design professional in conjunction with system performance data for rational analysis and product substitution purposes on a project-by-project, Local Approval basis.
- 5.4 For mechanically attached insulation or membrane over existing roof substrates, fasteners shall be tested in the existing substrate for withdrawal resistance. A qualified design professional shall review the data for comparison to the minimum requirements for the system. Testing and analysis shall be in accordance with TAS 105 or ANSI/SPRI FX-1.
- 5.5 All products in the roof assembly shall have quality assurance audit in accordance with the FBC and F.A.C. Rule 61G20-3.

6. INSTALLATION:

Fasteners, plates and batten bars shall be installed in accordance the manufacturer’s published installation instructions and the roof assembly Florida Statewide or Local Product Approval.

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 LOCATIONS:

Contact the noted QA agency for information on product locations covered for F.A.C. Rule 61G20-3 QA requirements.

9. QUALITY ASSURANCE ENTITY:

FM Approvals – QUA1860; (781) 255-4783

- END OF EVALUATION REPORT -