



## Laboratory Report EO8950.03.08-1

**Rupture Testing**  
*of*  
**ES Products FM-290 Fastener**  
*in accordance with*  
**TAS 117(B)**

**Prepared for:**  
**ES Products, Inc.**  
**146 Levy Road**  
**Atlantic Beach, FL 32233**

**Date of Issuance:**  
**March 28, 2008**

EXTERIOR RESEARCH & DESIGN, LLC.

MAIN: 80 Yesler Way • Suite 200 • Seattle, WA 98104 • P: (206) 467-0054 • F: (206) 467-5840

EAST: 353 Christian Street • Unit 13 • Oxford, CT 06708 • P: (203) 262-9245 • F: (203) 262-9243

LAB: 10 Mauney Court • Columbia, SC 29201 • P: (803) 988-8133 • F: (908) 988-8111





**CLIENT INFORMATION:** ES Products, Inc.  
146 Levy Road  
Atlantic Beach, FL 32233  
c/o: Fred Hall

**ERD REFERENCE:** Project #2007.EO8950SC(a)

**SAMPLES:** ES Products FM-290 Fastener  
Various Certainteed, Firestone, GAF, Garland, JM, Polyglass, PRS, Siplast, Soprema, Tamko, Tarco, Tremco, US Ply and WP Hickman base sheets and roof covers.

**SAMPLE DELIVERY:** The named client shipped samples of said fasteners to TRINITY | ERD's Seattle laboratory for testing. Trinity|ERD procured roll goods from the respective manufacturer's or local distribution warehouses.

**TEST DATE(S):** December 2007 – March 2008

**ERD TECHNICIANS:** Charles Phillips

**PROPERTIES:** Pull Through Resistance                      TAS 117(B)

**STANDARDS:** TAS 117(B) *Test Procedure for Dynamic Pull-Through Performance of Roofing Membranes over Fastener Heads or Fasteners with Metal Bearing Plates*, Florida Building Code, 1995.

**EQUIPMENT:** Pull Through Resistance                      Comten Universal Tester

**I. PULL-THROUGH RESISTANCE:**

**I.1 Sample Preparation:**

**I.1.1** A total of four specimens were prepared for each of the supplied base sheets. Each fastener/plate was installed through the center of the roof cover with the fastener point extending through the backside of the membrane.

**I.1.2** The finished base sheet specimen is then covered with a roof cover designed for use with the base sheet.

**I.2 Procedure:**

**I.2.1** Each sample is installed into the testing device by clamping the membrane firmly to the base of the load frame with the fastener point facing up. The clamp of the testing device is secured to the fastener and an initial load is applied to remove any slack from the loading device. The fastener and plate is then pulled through the roof cover at a rate of 2 in/min. and the highest load is recorded.

**I.3 Results:**

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Table 1: Pull-Through Resistance FM-290 Fastener									
Base Sheet / Roof Cover			Peak Load (lbf)						C of V
Mfgr	Base	Cap Application	1	2	3	4	Avg	SD	
Certainteed	Glasbase	Hot asphalt	275.6	264.0	244.8	238.1	255.6	17.3	7%
	Flex-I-Glas Base	Hot asphalt	295.3	233.3	240.3	300.1	267.3	35.3	13%
	PolySMS Base	Hot asphalt	400.0	376.0	361.0	351.0	372.0	21.3	6%
	Flintlastic SA Nailbase	Self-adhered	153.7	151.1	148.3	169.8	155.7	9.6	6%
Firestone	SBS Base Sheet	Hot asphalt	289.6	292.5	321.0	399.2	325.6	51.1	16%
	APP 160	Torch	343.0	357.0	380.0	375.0	363.8	17.0	5%
	SBS Glass Torch Base	Torch	224.2	326.6	225.2	245.7	255.4	48.5	19%
	SBS Poly Torch Base	Torch	398.0	329.1	351.0	306.3	346.1	39.1	11%
GAF	GAFLAS #75	Hot asphalt	272.6	255.6	274.6	248.2	262.8	12.9	5%
	GAFLAS Stratavent Eliminator	Hot asphalt	272.8	239.3	267.5	271.1	262.7	15.7	6%
	GAFLAS #80 Ultima	Torch	212.5	195.7	221.1	161.1	197.6	26.5	13%
	Liberty MA Base	Self-adhered	158.8	185.5	156.8	151.1	163.1	15.3	9%
Garland	HPR Glas Base	Hot asphalt	263.1	273.7	278.5	305.5	280.2	18.1	6%
	HPR Tri Base Plus	Torch	488.0	452.0	398.0	467.0	451.3	38.4	9%
Johns Manville	Permaply #28	Hot asphalt	282.5	268.5	271.1	270.2	273.1	6.4	2%
	Ventsulation	Hot asphalt	253.7	254.2	251.8	231.1	247.7	11.1	4%
	DynaBase	Hot asphalt	299.6	298.0	317.2	311.1	306.5	9.2	3%
Polyglass	Elastobase V	Torch	299.8	325.2	304.0	317.0	311.5	11.7	4%
	PolyProtector UDL	Self-adhered	153.7	214.6	207.8	202.6	194.7	27.8	14%
	Elastobase V (poly surface)	Self-adhered	191.1	140.8	192.8	181.2	176.5	24.3	14%
PRS	Derbi Base	Torch	306.1	208.7	259.7	265.7	260.1	40.0	15%
Siplast	Parabase	Hot asphalt	290.1	303.7	282.8	297.3	293.5	9.0	3%
Soprema	Modified Sopra G	Hot asphalt	266.8	263.0	259.0	225.5	253.6	19.0	7%
	Soprabase	Self-adhered	218.1	226.5	254.1	239.5	234.6	15.7	7%
Tamko	Glass-Base	Hot asphalt	280.3	275.8	233.5	277.0	266.7	22.2	8%
	Vapor Chan	Hot asphalt	289.7	266.3	254.7	277.6	272.1	15.0	6%
Tarco	Easy Base	Self-adhered	179.7	211.5	213.2	136.2	185.2	36.1	19%
Tremco	BURMastic Glass Ply	Hot asphalt	245.3	269.7	296.8	320.0	283.0	32.4	11%
	BURMastic Composite Ply	Hot asphalt	435.0	452.0	575.0	388.0	462.5	79.7	17%
US Ply	USP Base	Hot asphalt	313.3	250.2	309.6	275.3	287.1	30.0	10%
	Duraflex 30 SBS Base	Hot asphalt	265.1	250.6	278.5	259.1	263.3	11.7	4%
	USP NVB	Hot asphalt	283.3	299.0	280.8	257.5	280.2	17.1	6%
WP Hickman	Multi-Ply Glass	Hot asphalt	281.0	327.5	307.6	254.2	292.6	31.9	11%
	Multi-Ply Glass CL	Hot asphalt	465.0	345.1	442.0	446.0	424.5	53.9	13%
	Performance Ply	Hot asphalt	403.0	376.0	372.0	377.0	382.0	14.2	4%
	Pika Ply HI-TEC 60	Hot asphalt	495.0	406.0	481.0	461.0	460.8	39.1	8%

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**2. CONCLUSIONS:**

- 2.1 Trinity|ERD has tested the FM-290 Fastener as produced by ES Products, Inc. in accordance with TAS 117, Appendix B. Results are listed in Table I herein.
- 2.2 While only four (4) specimens were tested for each base sheet, rather than the 14 specified in TAS 117(B), results were consistent from one base sheet to the next, as evidenced by Coefficient of Variation < 20%. Miami-Dade BCCO has historically accepted this deviation, as additional specimens would be redundant.

Please contact our offices with any questions.

Sincerely,  
TRINITY | ERD

A handwritten signature in black ink, appearing to read "C. Phillips".

Charles Phillips  
Laboratory Systems Manager

A handwritten signature in black ink, appearing to read "Robert Nieminen".

Robert Nieminen, P.E.  
Vice President  
Florida Reg. No. 59166

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Figure 1: Pull-Through Resistance

