Dade County Testing
as per
Protocol PA 114-95
Appendix J

12' x 24' SIMULATED UPLIFT PRESSURES RESISTANCE TEST OF ROOF SYSTEM ASSEMBLY REPORT

Prepared
for

ES Products
280 Franklin Street
Bristol, RI 02809

by

IRT-ARCON INC
281 NE 32nd Street
Oakland Park, Florida 33334

February 7, 2002
Ref# 02-011
Testing Performed on February 6, 2002

Certificate Of Authorization # 0008172

February 7, 2002

Jamie D. Gascon
Miami-Dade Building Code Compliance Office
Metro-Dade Flagler Building, Suite 1603
140 West Flagler Street
Miami Florida 33130-1563

Re: Laboratory Compliance Letter (00-0823.07)

Dear Mr. Gascon:

The Metro-Dade Protocol PA 114 -95 , Appendix " J " test reported in report IRT-ARCON No. 02-011 for ES Products. has been performed in full accordance to the requirements of Dade County, with no deviations.

If you have any questions, Please do not hesitate to call our office.

Sincerely,

Bob Tedder, RRO, CSI, RCI
IRT-ARCON, Inc.

Cc. IRT-ARCON File

3/20/02
Ali Yemeniciler
Florida P.E. # 54733

Corporate Headquarters
281 NE 32 Street - Fort Lauderdale, FL 33334
954/630-0201 - Fax 954/630-0506 - 888/548-8378

Certificate Of Authorization # 0008172

February 7, 2002

ES Products Inc,.
280 Franklin Street
Bristol, RI 02809

Test Report No:. 02-011
Dade County Reference Number: 02-011

I Scope

1.01 **Es Products Inc.,** requested testing in a 12' x 24' vacuum chamber of the below listed roofing assemblies. This testing was conducted in accordance with **Dade County Protocol PA114, Appendix 'J'.** You will find a copy of the Protocol attached to this report.

1.02 In compliance Miami-Dade County Test Notification procedures, a notification was provided to Miami-Dade County Building Code Compliance office and the following Test Notification Number assigned, IRT# 02-011.

1.03 A copy of this report will be submitted to **ES Products Inc,.** All samples were tested to failure.

1.04 Testing was photographed and videotaped, copies available from IRT-ARCON upon request.

1.05 Roof assemblies and test results are enumerated in Section V of this report.

1.06 Testing was performed on February 6, 2002.

II Testing Apparatus

2.01 12' x 24' Vacuum dome, simulated uplift apparatus, in compliance with Dade County Protocol PA-114, Appendix 'J', Section 3.

III Test Procedure

3.01 Testing procedure is in compliance with Section 5 of Dade County Protocol PA-114, Appendix 'J'.

IV Test Specimen

4.01 Test specimen is in compliance with Section 5 of Dade County Protocol PA-114, Appendix 'J'.

V Test Assembly and Results

5.01

IRT 02-011 (Poured Gypsum, Glasply felt Type 6, Dynaglass 30FR)

Assembly	
Gypsum Deck	CHS Bulb-Tee 112 was buddle welded (1/2" long, 5/8" width) with spacing 32 5/8". Galvanized cross-tees were placed in between the Bulb-Tee with 32" spacing. Staggaro foam board (5/8" thickness) was loose laid above the Bulb-Tee along the direction of Bulb-tee. Wire mesh (12 Gauge 4" center) were run perpendicular to the direction of Bulb-Tee. 2" thickness Gypsum (8.5 gallon of water per 80 lb. gypsum) was poured and allowed to dry to the desired hardness. The detailed description of the material and installation is explained in figure 1 and in the technical guide.
Bonding Agent	Not applied
Glasply Felt Type 6	Mechanically attached with 1.8" Twin Loc-Nail fasteners 3" side lap, 2 rows 12" o.c. in the field and 9" apart between the laps.
Dynaglass 30 FR	Adhered to the Glasply felt Type 6, in full mopping of Type 3 asphalt at the rate of 25 lb. per one roof square.

ES Products Inc.
IRT# 02-011

Test Results IRT 02-011				
Failure Pressure	**Failure Time (sec.)**	**Mode of Failure**	**Passing Pressure (psf)** ***Last Pressure Held for One Minute***	**Safety Margin as per SFBC 2 to 1**
-165 psf	**15 sec**	**Fracture in the Gypsum Substrate**	**-150 psf**	**-75 psf**
Observations: The 12' x 24' (3.6 x 7.3m) simulated wind uplift test sample did meet the 90 psf minimum Dade County requirements for Class I-90 wind storm classification. Failure occurred during the incremental increase from ~~-135~~ 150 psf to ~~-150~~ 165 psf due to crack development in the gypsum deck.				
End Test 02-011				

3/20/02.
Ali N. Yemeniciler P.E.
Florida P.E 54733

Technician: David Espinoza

TWIN LOC-NAIL

SPECIFICATIONS

RECOVERY BOARD OR BASE PLY TO WOOD FIBER / POURED GYPSUM

COMPOSITION

Factory preassembled components consisting of:
Tube: Precision formed from either galvanized (G-90) or Galvalume (AZ-55) coated steel to prevent corrosion. The 1.8" long tube is shaped to easily penetrate decking and existing membranes.
Disk: Precision formed from Galvalume (AZ-55) coated steel to prevent corrosion. Securely clamped to the tube, 2.7" diameter, rib reinforced to resist cupping.
Locking Staple: Precision formed from .080" diameter high tensile steel wire. Coated to prevent corrosion. Factory preinserted into tube.

TECHNICAL DATA

Approvals: Twin Loc-Nail maintains Factory Mutual and Metro-Dade County Approvals.
Fastening Pattern: Consult Factory Mutual or Metro-Dade County requirements for recommended patterns in normal, exposed, and hurricane areas.
Field Testing: On-site withdrawal testing should always be performed to evaluate the ability of the roofing substrate to satisfactorily accept and retain fasteners. Such testing may alter fastener selection and modify applicable fastening patterns.
The Twin Loc-Nail should always be embedded in the structural roof deck to a depth of at least 1".

INSTALLATION

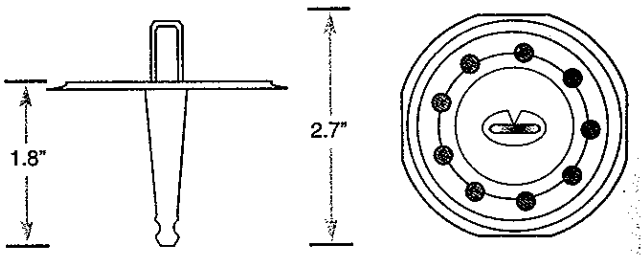
Equipment: Always use ES Products' Twin Loc Driver. The specially designed Driver assures consistent speedy application. ES Nail Pouch holds up to 10 times the quantity of fasteners accommodated by standard nailing aprons.
Method: Using ES Products' Twin Loc Driver, two impacts are required. Place fastener on face of driver positioning exposed staple into slot in driver face. Drive fastener with vertical motion into roofdeck with first impact seating cap flush with roofdeck. With second impact, drive the locking staple thru the tube/disk unit into the deck until the top of the staple is flush with the cap (see illustration).
Operation: When locking staple is driven, its dual wire legs diverge anchoring the fastener in place (see illustration). Uplift resistance may vary depending on the density and integrity of the substrate.

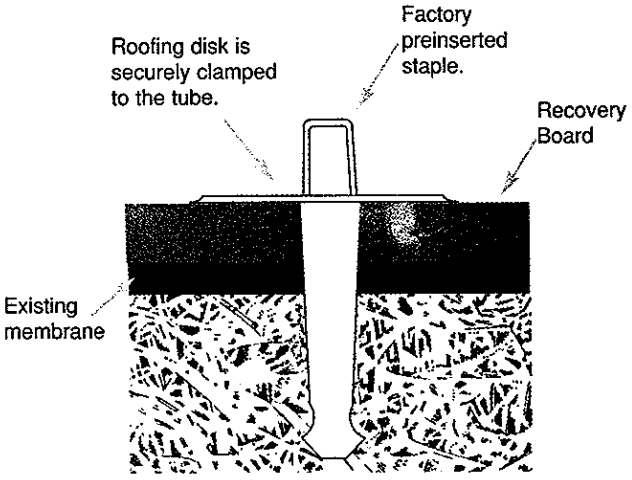
Availability: Twin Loc-Nail is a patented product manufactured only by ES Products, Inc., distributed by leading roofing material and equipment wholesalers.
Packaging: 500 Twin Loc-Nails per carton. Shrink wrapped and palletized. Gross weight: 33 lbs.

PROUDLY MADE IN THE U.S.A.

FM APPROVED

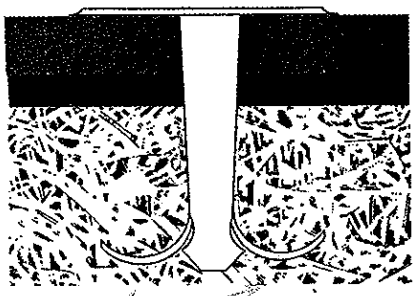
METRO-DADE





First impact sets tube.

Second impact actuates staple.



As locking staple is driven, it's dual wire legs diverge anchoring the fastener in place.

ES PRODUCTS
280 Franklin Street • Bristol, RI 02809 • (401) 253-8600
Fax (401) 253-8896 • www.esproducts.com

Johns Manville

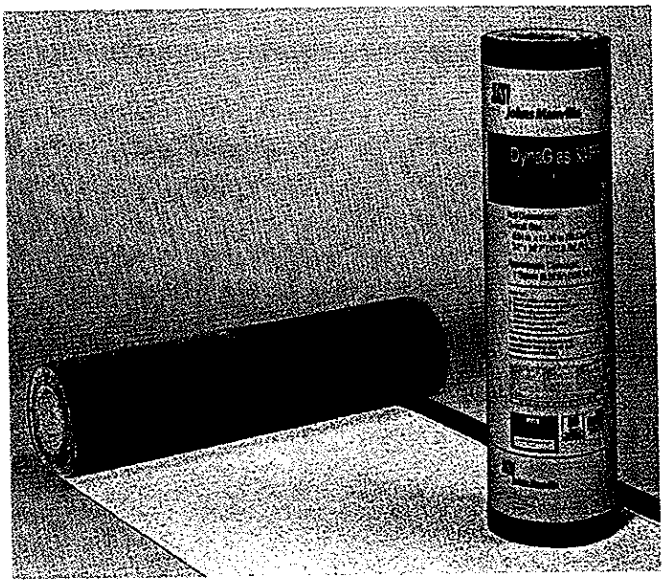
DynaGlas® 30 FR

Description

DynaGlas 30 FR is a fire resistant modified bitumen sheet incorporating the features of a fiber glass mat with a blend of SBS (Styrene-Butadiene-Styrene) rubber, high quality asphalt and fire-retardant additives. The elastomeric asphalt blend has full recovery properties after 100% elongation and lends elasticity and flexibility to the sheet. The inorganic fiber glass reinforcement provides tensile strength, stability and toughness to the product and resists moisture absorption. These properties also afford the product better natural resistance to the other factors which affect roof performance. The covering layer of ceramic-coated roofing granules, black or white, provides durability along with superior resistance to damage from weather and foot traffic. White granules also provide heat reflectance.

Use

DynaGlas 30 FR is designed for use as a quality modified bitumen sheet in UL fire rated, multiple ply roofing systems. (Typically, it is used in conjunction with DynaBase®, a modified bitumen base sheet.) DynaGlas 30 FR, unlike many modified bitumen products, enjoys UL Class A ratings in numerous constructions, both new and reroof, without the use of additional surfacings. It is ideal for low slope applications (inclines up to ½" per foot [41.6 mm/m]), and is recommended for this application with Types III and IV asphalt. For slopes from ½" to 3" per foot (41.6 to 250 mm/m), only Type IV asphalt is recommended. DynaGlas 30 FR may also be installed in JM MBR® Bonding Cement or JM MBR® Cold Application Adhesive. This product is not to be installed using heat-welding application techniques.



Advantages

- The fiber glass mat provides exceptional tensile strength and puncture resistance
- The elongation and recovery properties of the SBS blend allow the product to easily accommodate the continual expansion and contraction strains experienced on all roofs
- The product's flexibility and dimensional stability provide ease of handling, resulting in quick installations
- Fire-retardant formulation

Typical Physical Properties*

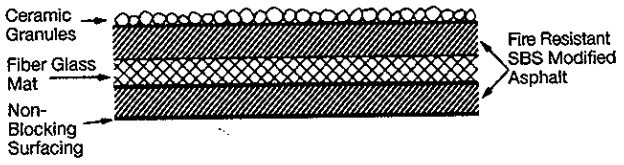
Material meets or exceeds the criteria of ASTM D 6163, Type I, Grade G.

Thickness	0.130 inches (3.3 mm)
Tensile Strength @ 0°F (-18°C)	
Machine Direction	95 lbs. force/in. width (16.6 kN/m)
Cross Machine Direction	85 lbs. force/in. width (14.9 kN/m)
Elongation @ 0°F (-18°C)	
Machine Direction	3.0%
Cross Machine Direction	3.0%
Tensile-Tear	
Machine Direction	100 lbs./in. (17.5 kN/m)
Cross Machine Direction	90 lbs./in. (15.8 kN/m)
Low Temperature Flexibility	-10°F (-23°C)
Dimensional Stability	
Machine Direction	0.20% change
Cross Machine Direction	0.20% change

* Material tested in accordance with ASTM D 5147 Standard Test Method for Sampling and Testing Modified Bituminous Sheet Materials. The physical properties shown represent typical values.

Sizes

Roll size	1 square (9.29 m²)
Roll weight	90 lbs (40.8 kg)
Roll length	32' 10" (10 m)
Roll width	39⅜" (1 m)



Refer to the Material Safety Data Sheet and Product Label prior to using this product. For an identical copy of this data sheet ask for RS-4105.

Johns Manville

GlasPly® Premier

Description

GlasPly Premier is a specially constructed, asphalt-coated, fiber glass ply felt for use in hot applied built-up and modified bitumen roofing systems. It is produced by first impregnating a special high strength Johns Manville (JM) fiber glass mat with a quality asphalt. Next, it is treated with a unique liquid parting agent that eliminates sticking when the felt is unrolled. Before the product is wound into rolls, it is imprinted with laying lines on the top surface so the roofing mechanic can install the felt with the proper exposure and provide the correct number of plies.

Use

GlasPly Premier is intended for use as an integral part of any built-up or modified bitumen roofing system, over nailable and non-nailable roof decks and over approved types of roof insulation. When installed over nailable decks, a fiber glass base sheet, such as JM GlasBase™, is typically used as the first ply and is usually mechanically fastened to the deck. Subsequently, layers of GlasPly Premier are set in hot asphalt to "build-up" the applicable number of plies. Non-nailable decks and approved insulations usually have multiple layers of GlasPly Premier adhered directly to them with hot asphalt.

GlasPly Premier has good flexibility, conformability, and superior strength in both the machine and cross machine directions. "Brooming-in" is not necessary, but use of a squeegee on GlasPly Premier after laying in hot asphalt will help ensure full contact is made with the asphalt.

Advantages

- High tensile strength resists splitting that can be caused by rooftop stresses
- Low moisture absorption, excellent dimensional stability and resistance to rot makes it an ideal replacement for organic felt
- Easy to handle, lays flat, minimizes workmanship related problems
- Excellent porosity providing flexibility and conformability, minimizing fishmouths, wrinkling and ridging

Typical Physical Properties

Material meets the requirements of ASTM D 2178, Type VI.

Breaking Strength (min.) lbf/in. (kN/m)	
Longitudinal (With the Fiber Grain)	60.0 (10.5)
Transverse (Across the Fiber Grain)	60.0 (10.5)
Pliability, ½ in (13 mm) Radius Bend	No Failures
Net Dry Mass of Asphalt-impregnated Glass Felt (min.) lbs./100 ft² (g/m²)	
Average of All Rolls	7.0 (342)
Individual Rolls	6.0 (293)
Moisture at Time of Manufacture (max.)	1.0%
Mass of Desaturated Glass Felt (min.) lbs./100 ft² (g/m²)	1.9 (93)
Bituminous Saturant (Asphalt) (min.) lbs./100 ft² (g/m²)	3.0 (146)
Ash	70-88%
Parting Agent and Stabilizer (max.) lbs./100 ft² (g/m²)	3.0 (146)

GlasPly Premier is classified by Underwriters Laboratories as a Type G-1 Coated Ply Sheet. See the UL Roofing Materials and Systems Directory for acceptable Class A, B or C roof constructions employing GlasPly Premier. Factory Mutual has approved the use of this product in numerous constructions. Refer to the current edition of the FM Approval Guide for details.

Sizes

Roll size	5 squares (46.5 m²)
Roll weight	40 lbs. (18.1 kg)
Roll length	180' (54.9 m)
Roll width	36" (0.92 m)

Refer to the Material Safety Data Sheet and Product Label prior to using this product. For an identical copy of this data sheet ask for RS-2022.