

# HURRICANE ENGINEERING & TESTING INC.



ISO 17025 Accredited Computer Controlled Product Testing  
Wind Load Design, Analysis & Evaluation



## Rate and Extent of Burn and Smoke Density Test of Composite Material.

Date: June 20, 2013

REPORT NUMBER: **HETI-13-F304**

CLIENT: Glasslam  
1601 Blount Road, Pompano Beach, FL 33069

TEST LOCATION: Hurricane Engineering & Testing Inc.  
6120 NW 97<sup>th</sup> Avenue, Doral, Florida, 33178

NOTIFICATION NUMBER: HETI13016 (MIAMI-DADE COUNTY, FLORIDA)  
LAB. CERTIFICATION No.: 10-1117.07 (MIAMI-DADE COUNTY, FLORIDA)  
IAS. CERTIFICATION No.: TL-296 (ISO 17025-05)  
FBC ORGANIZATION No: TST1691  
FBPE Certificate of Authorization Number: 6905

PRODUCT: Safety Glass Plus II Interlayer

### TEST STANDARDS:

1. **ASTM D 2843-10**: Standard Test Method for Density of Smoke from the Burning or Decomposition of Plastics.
2. **ASTM D 635-10**: Standard Test Method for Rate of Burning and/or Extent and Time of Burning of Plastics in a Horizontal Position.

TEST WITNESSED BY Dr. Syed Waqar Ali (HETI)  
Dr. Nasreen K. Ali. (HETI)  
Mr. Eugenio Rivera (HETI)  
Mr. Rafael E. Droz-Seda, P.E. (HETI)

### Summary of Results

Description	Test Standards	Test Result	Miami-Dade County Criteria
Rate of Burning	ASTM D 635	Less than 1 inch/min	FBC 2010 (C-1: < 1.0 in/min & C-2: < 2.51 in/min.)
Average Time of Burn	ASTM D 635	---	---
Average Extent of Burn	ASTM D 635	---	---
Smoke Density ( $S_d$ )	ASTM D 2843	14.77 %	Acceptable if $S_d < 75%$

*Note: Verification of compliance requirements of any building code is the responsibility of the end user of these results, no compliance of any building code is asserted herein.*

## MATERIAL SPECIFICATION

**Interlayer Color:** Clear

**Interlayer Weight per Unit Area:** 2.60 grams/in<sup>2</sup>

## TEST SPECIMEN QUANTITY & SIZE

- **Rate and Extent of Burn:** (10) ½” wide x 5” long x 0.103” thick interlayer installed between (2) 1/8” panes of glass (for thickness see test results).
- **Smoke Density Test:** (3) 1” x 1” x 0.135” thick squares.

## CONDITIONING

The above listed specimens were conditioned at 23±2°C / 50±5%RH for 48 hours prior to testing.

## TEST EQUIPMENT

ASTM D 2843-10: Smoke Density Apparatus and Computer Interface, HETI-0948.

ASTM D 635-10: Rate Burn apparatus HETI-0986.

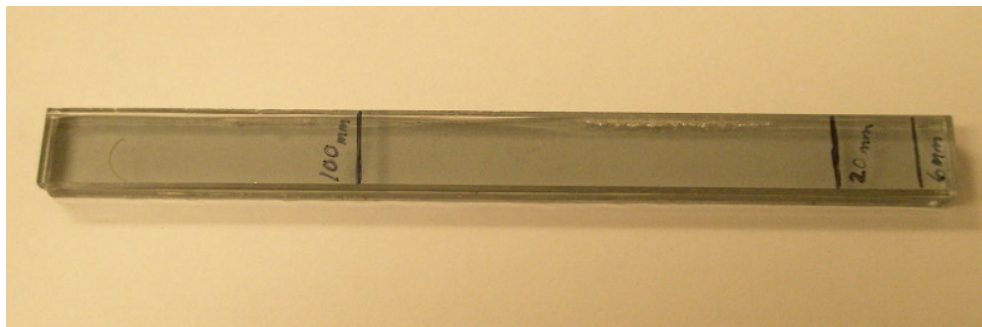
Sample Conditioning: Sample Conditioning Chamber HOTPACK 435314, HETI-0937.

## Test Results

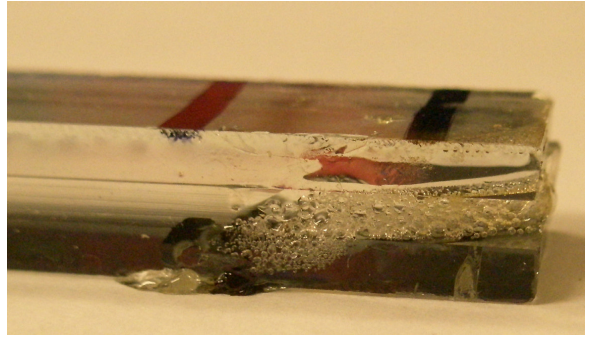
### Rate and Extent of Burn Results and Observations of Test

Specimen No.	Thickness (mm)	Sample burned after flame application (Yes/No)	Flame reach 25 or 100 mm mark (Yes/No)	Re-ignition from burning ember on gauze (Yes/No)	Burned Length (mm)	Elapsed Time (sec)	Linear Burn Rate (mm/sec.)	Linear Burn Rate (in/min.)
1	8.61	Yes	No	No	---	---	---	---
2	8.61	Yes	No	No	---	---	---	---
3	8.61	Yes	No	No	---	---	---	---
4	8.61	Yes	No	No	---	---	---	---
5	8.61	Yes	No	No	---	---	---	---
6	8.61	Yes	No	No	---	---	---	---
7	8.61	Yes	No	No	---	---	---	---
8	8.61	Yes	No	No	---	---	---	---
9	8.61	Yes	No	No	---	---	---	---
10	8.61	Yes	No	No	---	---	---	---
<b>Average</b>					---	---	---	---

**Note:** Thickness reported herein represents (2) panes of glass and an interlayer. Clear glass: 2.95mm; Smoke Glass: 3.05mm; Interlayer: 2.62mm  
Rate of Burn meets requirement of Chapter 26 of FBC 2010 for HVHZ & Non HVHZ.



**Rate and Extent of Burn Sample Prior to Testing**



**Rate and Extent of Burn Samples After Testing**

**Test Results**

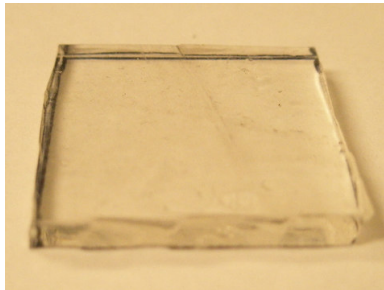
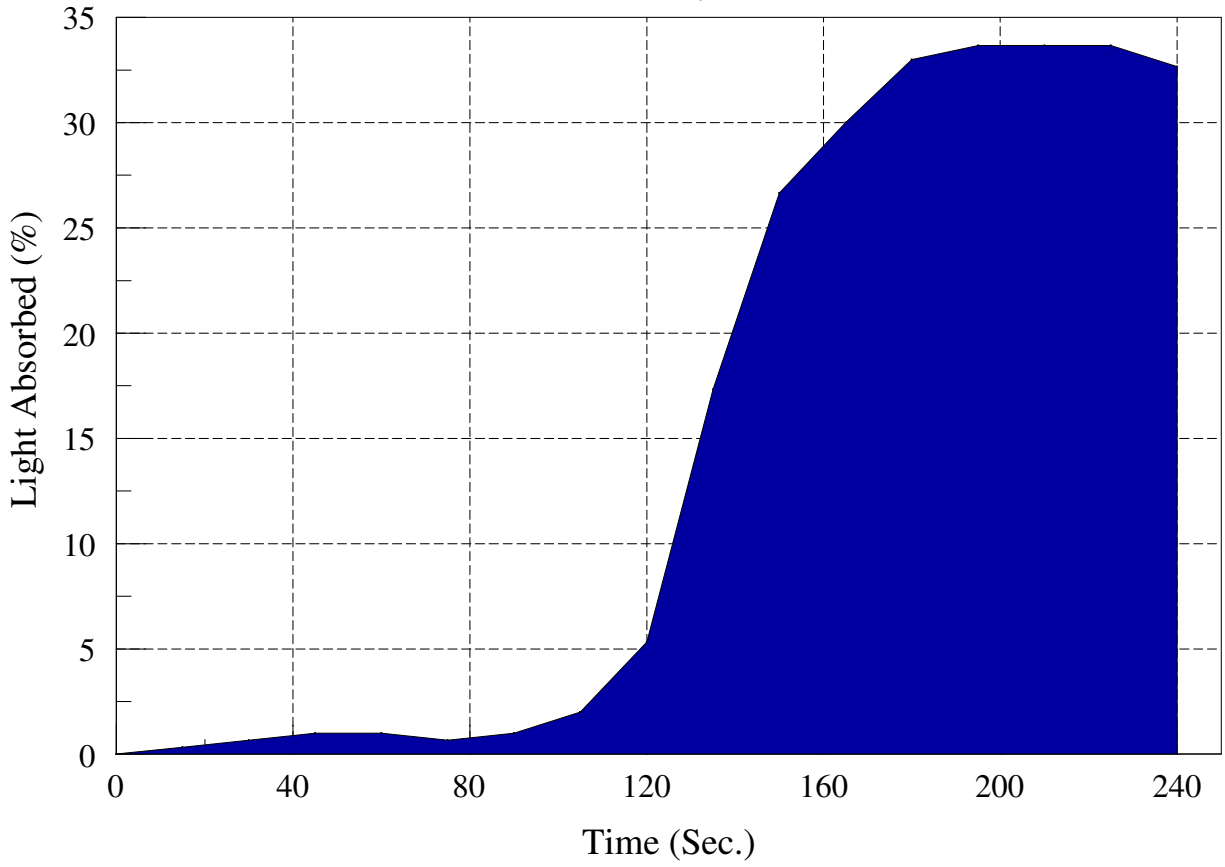
**Observations and Results of Smoke Density Test**

Time (sec)	(% Light Absorbed (Smoke Density) (1.00 - Light Transmitted))			Average Light Absorbed (%)	Area under the curve
	Specimen 1	Specimen 2	Specimen 3		
0	0	0	0	0.000	0.00
15	1	0	0	0.003	0.010
30	1	1	0	0.007	0.031
45	2	1	0	0.010	0.052
60	2	1	0	0.010	0.063
75	1	1	0	0.007	0.052
90	2	1	0	0.010	0.052
105	3	2	1	0.020	0.094
120	4	1	11	0.053	0.229
135	5	3	44	0.173	0.708
150	8	21	51	0.267	1.375
165	10	29	51	0.300	1.771
180	18	31	50	0.330	1.969
195	21	31	49	0.337	2.083
210	22	31	48	0.337	2.104
225	22	31	48	0.337	2.104
240	22	30	46	0.327	2.073
<b>Average</b>	-	-	-	---	14.77
<b>Time to Burst into Flame (s)</b>	8	8	11	---	---
<b>Flame Extinguishment Time (m:s)</b>	1:25	1:34	1:20	---	---
<b>Consumption Time (m:s)</b>	-	-	-	---	---
<b>Exit Sign Obstructed (YES/NO)</b>	No	No	No	---	---

**Average Smoke Density = 14.77%, Standard Deviations Between Samples (  $\sigma$  ) = 7.84%**

# Test Results

Smoke Density Curve



Smoke Density Sample