

# EASTMAN PERFORMANCE FILMS, LLC PENDULUM IMPACT TEST REPORT

**SCOPE OF WORK**

PENDULUM IMPACT TESTING AND CLASSIFICATION OF LLUMAR SCL SR PS13 FILM ON 4 MM GLASS

**REPORT NUMBER**

I7039.22-119-37

**TEST DATE(S)**

07/24/18

**ISSUE DATE**

08/31/18

**RECORD RETENTION END DATE**

07/24/22

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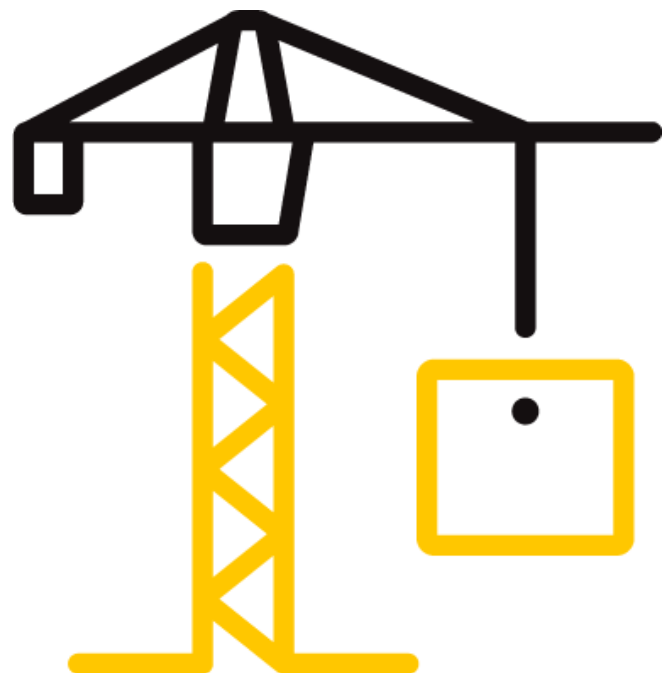
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## TEST REPORT FOR EASTMAN PERFORMANCE FILMS, LLC

Report No.: I7039.22-119-37

Date: 08/31/18

### REPORT ISSUED TO

**EASTMAN PERFORMANCE FILMS, LLC**

4210 The Great Road

Fieldale, Virginia 24089

### SECTION 1

#### SCOPE

Intertek Building & Construction (B&C) was contracted by Eastman Performance Films, LLC - Fieldale, Virginia to perform safety glazing impact testing and classification of flat glass in accordance with EN 12600 on their LLumar SCL SR PS13 Film on 4 mm glass safety glazing. Results obtained are tested values and were secured by using the designated test method. Testing was conducted at the Intertek B&C test facility in York, Pennsylvania. This report does not constitute certification of this product nor an opinion or endorsement by this laboratory.

### SECTION 2

#### SUMMARY OF TEST RESULTS

**PERFORMANCE CLASSIFICATION:  $\alpha$  ( $\beta$ )  $\phi$  1 (B) 1**

For INTERTEK B&C:

**COMPLETED BY:** Todd M. Wilt  
**TITLE:** Lead Technician

**SIGNATURE:**  
**DATE:** 08/31/18

tmw:vtm/aaa

**REVIEWED BY:** Virgal T. Mickley, Jr., P.E.  
**TITLE:** Senior Staff Engineer

**SIGNATURE:**  
**DATE:** 08/31/18

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### SECTION 3

#### TEST METHOD

The specimens were evaluated in accordance with the following:

**BS EN 12600 - 2002**, *Glass in building, Pendulum test - Impact test method and classification for flat glass*, European Standard (April 2003)

### SECTION 4

#### MATERIAL SOURCE

Test samples were provided by the client. The specimens were received on 07/18/18, in good condition and suitable for testing unless noted otherwise.

### SECTION 5

#### SAMPLE RETENTION

All test specimens were destroyed by test or by personnel and have been disposed of as trash. Representative sections of the failing samples will be retained for up to 30 days from the date of report issuance. After 30 days, representative samples will be automatically discarded.

### SECTION 6

#### EQUIPMENT

The test rig was last calibrated in accordance with Annex B of EN 12600 on 03/16/18; per BS EN 12600 section B.4, the calibration shall be in effect for three years.

### SECTION 7

#### LIST OF OFFICIAL OBSERVERS

NAME	COMPANY
Steve DeBusk	Eastman Performance Films LLC
Todd Wilt	Intertek B&C
Corey Straub	Intertek B&C

## TEST REPORT FOR EASTMAN PERFORMANCE FILMS, LLC

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### SECTION 8

#### TEST PROCEDURE

Each test specimen was mounted within the test fixture, the film edges were captured by the specimen mounting clamps and impacted in accordance with DIN EN 12600:2002. The impact sides are identified herein as "glass-side" and "film-side". The test samples are considered asymmetric glazing and were therefore impacted from both sides.

The specimens were impacted from the lowest drop height and continued to next drop height as long as the specimen remained unbroken or, when broke, broke in accordance with the test performance requirements (BS EN 12600, clause 4a). Tested specimens which remained unbroken were tested again at the next sequentially higher drop height. Tested specimens which broke in accordance with the test performance requirements at the designated drop height were not impacted again, the damaged specimen was replaced by an untested specimen and impacted at the next sequentially higher drop height. Impact testing continued until all 3 drop heights were completed 4 times or until a specimen failed to meet the test performance requirements. Specimens were impacted from the following drop heights.

#### Impact Drop Heights

IMPACT CLASSIFICATION	3	2	1
DROP HEIGHT	190 mm	450 mm	1200 mm

#### Performance Classification

Glazing conforming to this standard is classified as follows:

- Its performance under the impact test;
- The drop height at which breakage occurred;
- The drop height at which the product passed in accordance with clause 4a;
- The mode of breakage of the material if it remains unbroken after impact test.

The performance classification of a glass product under this standard is expressed as  $\alpha$  ( $\beta$ )  $\phi$ :

- $\alpha$  - Denotes the highest drop height (impact classification) at which the product either did not break or broke in accordance with the applicable clauses of BS EN 12600.
- $\beta$  - Denotes the mode of breakage.
- $\phi$  - Denotes the highest height (impact classification) at which the product either did not break or when broke, broke in accordance with the test requirements (clause 4 a).

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### SECTION 9

#### TEST SPECIMEN DESCRIPTION

**Test Specimen Set ID:** LLumar SCL SR PS13 Film on 4 mm Glass

**Specimen Manufacturer:** Eastman Performance Films LLC - Fieldale, Virginia

**Glass Type:** Film-Backed/Organic Coated Glass

**Sample Dimensions:** 876 mm wide x 1938 mm high ( $\pm 2$  mm)

**Overall Glazing Thickness:** 4 mm

**Glazing Make-up:** 0.33 mm film applied to 4 mm annealed glass

**Film Manufacturer:** Eastman Performance Films LLC - Fieldale, Virginia

**Film Brand:** LLumar SCL SR PS13

All above thicknesses are nominal.

### SECTION 10

#### TEST RESULTS

**Test Date:** 07/24/18

**Lab Temperature:** 22°C

**Duration of Pre-Conditioning @ 20 - 30°C:** 24 Hours

#### Film-Side Test Results

IMPACT LEVEL	SPEC. NO.	OVERALL THICKNESS (mm)	ACCEPTANCE CRITERIA (grams)	RESULTS & OBSERVATIONS AFTER IMPACT (grams)	
			TOTAL	TOTAL	OBSERVATION
3	1	4.38	101.05	Dust	No openings
	4	4.37	100.80	NA	Glass did not break
	5	4.38	101.05	Dust	No openings
	7	4.37	100.80	NA	Glass did not break
2	2	4.38	101.05	11.0	No openings
	4	4.37	100.80	NA	Glass did not break
	6	4.35	100.30	NA	Glass did not break
	7	4.37	100.80	Dust	No openings
1	3	4.34	100.05	21.6	No openings
	4	4.37	100.80	24.7	No openings
	6	4.35	100.30	23.5	No openings
	8	4.34	100.05	92.4	No openings

**TEST REPORT FOR EASTMAN PERFORMANCE FILMS, LLC**

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**Glass-Side Test Results**

IMPACT LEVEL	SPEC. NO.	OVERALL THICKNESS (mm)	ACCEPTANCE CRITERIA (grams)	RESULTS & OBSERVATIONS AFTER IMPACT (grams)	
			TOTAL	TOTAL	OBSERVATION
3	1	4.35	100.30	Dust	No openings
	4	4.36	100.55	Dust	No openings
	8	4.37	100.80	NA	Glass did not break
	9	4.35	100.30	NA	Glass did not break
2	2	4.38	101.05	7.9	No openings
	5	4.34	100.05	Dust	No openings
	7	4.36	100.55	Dust	No openings
	9	4.34	100.05	10.4	No openings
1	3	4.37	100.80	17.6	No openings
	6	4.38	101.05	19.2	No openings
	8	4.37	100.80	43.7	No openings
	10	4.35	100.30	18.2	No openings

**Acceptance Criteria (Clause 4a):**

**Criterion 1:** No openings develop that permit a 76 mm diameter sphere to pass when a maximum force of 25N (≈5.62 ft-lbs) is applied.

**Criterion 2:** All detached particles shall weigh, in total, no more than a mass equivalent to 10,000 mm<sup>2</sup> of the original test piece ("Total").

**Criterion 3:** No single fragment shall weigh more than 4,400 mm<sup>2</sup> of the original test piece ("Single").

**SECTION 11**

**CONCLUSION**

The specimens meet the impact test requirements of the referenced standard for performance classification **1 (B) 1**.

**SECTION 12**

**REVISION LOG**

REVISION #	DATE	PAGES	REVISION
0	08/31/18	N/A	Original Report Issue