

ONYX SOLAR GROUP LLC TEST REPORT

SCOPE OF WORK

BOIL AND IMPACT TESTING ON LAMINATED SAFETY GLAZING MATERIAL

REPORT NUMBER

I5325.01-119-37 R0

TEST DATE(S)

06/09/18

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06/13/18

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TEST REPORT FOR ONYX SOLAR GROUP LLC

Report No.: I5325.01-119-37 R0

Date: 06/13/18

REPORT ISSUED TO

ONYX SOLAR GROUP LLC

Calle Rio Cea 1, H6

Avila, 05004 Spain

SECTION 1

SCOPE

Intertek Building & Construction (B&C) was contracted by Onyx Solar Group LLC - Avila, Spain to perform safety glazing impact testing in accordance with ANSI Z97.1, CAN/CGSB 12.1, and CPSC 16 CFR 1201 on their laminated transparent glass. Results obtained are tested values and were secured by using the designated test methods. Testing was conducted at Intertek test facility in York, Pennsylvania where testing was completed. This report does not constitute certification of this product nor an opinion or endorsement by this laboratory.

SECTION 2

SUMMARY OF TEST RESULTS

SPECIMEN NUMBER	1	2	3	4
BOIL TEST RESULTS	Pass	Pass	Pass	NA
IMPACT TEST RESULTS	Pass	Pass	Pass	Pass

For INTERTEK B&C:

COMPLETED BY: Todd M. Wilt
TITLE: Lead Technician
SIGNATURE:
DATE: 06/13/18

tmw:vtm/kf

REVIEWED BY: Virgal T. Mickley, Jr., P.E.
TITLE: Senior Staff Engineer
SIGNATURE:
DATE: 06/13/18

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TEST METHOD(S)

The specimens were evaluated in accordance with the following:

ANSI Z97.1-2015, *For safety glazing materials used in buildings - safety performance specifications and methods of test*, American National Standard

CAN/CGSB 12.1-2017, *Safety Glazing*, National Standard of Canada

CPSC 16 CFR 1201, *Safety Standard for Architectural Glazing Materials*, Consumer Product Safety Commission (Version: 2012; Source: 42 FR 1441, Jan. 16, 1977)

SECTION 4

MATERIAL SOURCE

Test samples were obtained from the manufacturer. The specimens were received on 05/30/18, 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

LIST OF OFFICIAL OBSERVERS

NAME	COMPANY
Todd M. Wilt	Intertek B&C

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TEST PROCEDURE

Overview

Designated impact specimens were impacted once from the select drop height unless noted otherwise. For asymmetric materials, two specimens were impacted from each side. Three boil specimens were preconditioned and placed in boiling water for two hours, a visual inspection of the boil specimens was conducted following the exposure.

Drop Height Classification

All specimens were impacted once from a drop height of 48 inches.

DROP HEIGHT CLASSIFICATION			DROP HEIGHT
ANSI	CGSB	CPSC	
Class A	Class A	Category II	48 in.

SECTION 8

TEST SPECIMEN DESCRIPTION

Manufacturer: Onyx Solar Group LLC - Avila, Spain

Glazing Product Designation: Prototype

Overall Glazing Thickness: 5/8" (nominal)

Glazing Type: Laminated Transparent Glass (LTG)

Sample Dimensions: Impact: 34" wide x 76" high (±1/8")

Boil: 12" x 12" (±1/8")

Size Classification: Unlimited

Interlayer Manufacturer/Type: Kuraray/Sentry Glass Plus

Interlayer Manufacturer/Type Obtained from client.

Laminated Glazing Composition Details

SAMPLE TYPE	THICKNESS MEASUREMENTS (inches) ^A					
	Overall	Glass 1	Interlayer ^B	Glass 2	Interlayer ^B	Glass 3
Boil	0.659	0.233	0.035	0.122	0.035	0.234
Impact	0.653	0.227	0.038	0.123	0.039	0.226
Type	--	Heat-Strengthened	Interlayer	Heat-Strengthened	Interlayer	Heat-Strengthened

^A Measurement values obtained from the first test specimen of the boil and impact test.

^B Calculated thickness based on summation of glass thicknesses subtracted from overall thickness with the remainder being split between the two interlayers.

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TEST RESULTS

Lab Temperature: 71°F

Duration of Pre-Conditioning @ 68 - 85°F: 24 Hours

Boil Test Results

SPECIMEN NUMBER	OVERALL THICKNESS (inches)	TEST RESULTS & OBSERVATIONS OBSERVATIONS	PASS/FAIL
1	0.659	No bubbles or defects	Pass
2	0.655	No bubbles or defects	Pass
3	0.658	No bubbles or defects	Pass

Acceptance Criteria: No bubbles or defects more than 1/2" from edge or crack.

Impact Test Results

SPECIMEN NUMBER	THICKNESS (inches)	TEST RESULTS & OBSERVATIONS OBSERVATIONS	PASS/FAIL
1 ^A	0.653	Did not break	Pass
2 ^B	0.652	Did not break	Pass
3 ^A	0.652	Did not break	Pass
4 ^B	0.652	Did not break	Pass

^A Impacted, Light side

^B Impacted, Dark side

Acceptance Criteria: After impact, openings are evaluated as described below and detached particles are collected. Individual detached particles less than the mass equivalent of 1 sq. in. of the original test specimen are excluded from evaluation.

(a) No shear or opening through which a 3" sphere can freely pass with 4 lbs. force.

(b) Detached particles collected after impact shall not weigh more than 15.5 sq. in. of the original test specimen.

(c) No single particle shall weigh more than 6.82 sq. in. of the original test specimen.

SECTION 10

CONCLUSION

The specimens meet the boil and impact test requirements of the referenced standards for the size classification listed.



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REVISION LOG

REVISION #	DATE	PAGES	REVISION
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