



09/10/2015  
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Ms. Maryam Neshasteriz  
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410 Pierce St.  
Houston, TX 77002

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Reference: File: BP20898 Project: 4787037743

Subject: Research Testing in Accordance With UL972, Burglary Resisting Glazing Material, Indoor Use Material, 2-Constructions

Dear Ms. Neshasteriz,

Any information and documentation involving UL Mark services are provided on behalf of UL LLC (UL) or any authorized licensee of UL.

Per your request, project 4787037743 was opened, in order to conduct impact testing of 20 glass samples (2 constructions) in accordance with the applicable requirements of UL972, Burglary Resisting Glazing Material, 6<sup>th</sup> Edition, for Indoor Use Material. Complete results of testing and test data are included as an Appendix.

UL LLC did not select the samples, determine whether the samples were representative of production samples or witness the production of the test samples, nor were we provided with information relative to the formulation or identification of component materials used in the test samples. The test results apply only to the actual samples tested.

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This letter will serve to report that all tests on the subject product have been completed.

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Thank you for the opportunity to provide your company with these services. Please do not hesitate to contact us if you should have any questions or comments.

Sincerely,  
*Cyndi Prosser*

Cyndi Prosser  
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Reviewed by:  
*Steve Sein*

Steve Sein  
Staff Engineer

## TEST APPENDIX

### SAMPLES

20 samples as follows were provided for testing:

Mad15: 1/4 in. (6 mm) thick tempered glass with 15 mil Madico film applied to the protected surface.

LL15: 1/4 in. (6 mm) thick tempered glass with 15 mil Llummar film applied to the protected surface.

All samples were overall 24 by 24 in.

Research testing was conducted in accordance with the applicable requirements of UL972, Burglary Resisting Glazing Material, 6th Edition, for Indoor Use Material.

**Mad 15 MATERIAL**  
MULTIPLE IMPACT TEST: INDOOR USE CONDITIONING

METHOD

The glazing material was subjected to five successive 50 ft-lb impacts produced by dropping a 5 lb., 3-1/4 inch steel ball through a distance of 10 feet. The test was conducted on three samples of the glazing material maintained at room temperature (21-27°C); three samples of the glazing material at a temperature of 13°C and three samples of the glazing material while at a temperature of 35°C. The samples were maintained at the required temperature for at least 4 hours prior to testing.

Sample Construction: 6 mm (1/4 in.) tempered glass with film applied to protected side.

RESULTS

SAMPLE #	Condition Exposure	IN Date/Time	OUT Date/Time	OBSERVATIONS (A;B)
1	21-27°C	2015/09/02 @ 9:00 AM	2015/09/01 @ 11:00 AM	A
2	21-27°C	2015/09/02 @ 9:00 AM	2015/09/01 @ 11:07 AM	A
3	21-27°C	2015/09/02 @ 9:00 AM	2015/09/01 @ 11:20 AM	A
4	13°C	2015/09/03 @ 10:00 AM	2015/09/03 @ 2:05 PM	A
5	13°C	2015/09/03 @ 10:00 AM	2015/09/03 @ 2:15 PM	A
6	13°C	2015/09/03 @ 10:00 AM	2015/09/03 @ 2:25 PM	A
7	35°C	2015/09/02 @ 10:00 AM	2015/09/01 @ 2:03 PM	A
8	35°C	2015/09/02 @ 10:00 AM	2015/09/01 @ 2:10 PM	A
9	35°C	2015/09/02 @ 10:00 AM	2015/09/01 @ 2:17 PM	A

- A. The ball did not penetrate completely through the glazing material. (INDICATE NUMBER OF IMPACT THAT CAUSED INITIAL BREAK).
- B. The ball penetrated completely through the glazing material. (INDICATE NUMBER OF IMPACT THAT CAUSED PENETRATION).

**Mad15 MATERIAL**  
HIGH ENERGY IMPACT TEST:

METHOD

The glazing material was subjected to a 200 ft-lb impact produced by dropping a 5 lb., 3-1/4 inch steel ball through a vertical distance of 40 feet. The test was conducted on one sample of the glazing material maintained at room temperature (21-27°C).

RESULTS

The ball did not penetrate completely through the glazing material.

**LL15 MATERIAL**  
**MULTIPLE IMPACT TEST: INDOOR USE CONDITIONING**

**METHOD**

The glazing material was subjected to five successive 50 ft-lb impacts produced by dropping a 5 lb., 3-1/4 inch steel ball through a distance of 10 feet. The test was conducted on three samples of the glazing material maintained at room temperature (21-27°C); three samples of the glazing material at a temperature of 13°C and three samples of the glazing material while at a temperature of 35°C. The samples were maintained at the required temperature for at least 4 hours prior to testing.

Sample Construction: 6 mm (1/4 in.) tempered glass with film applied to protected side.

**RESULTS**

SAMPLE #	Condition Exposure	IN Date/Time	OUT Date/Time	OBSERVATIONS (A;B)
1.1	21-27°C	2015/09/02 @ 9:00 AM	2015/09/01 @ 10:45 AM	A
2.1	21-27°C	2015/09/02 @ 9:00 AM	2015/09/01 @ 10:50 AM	A
3.1	21-27°C	2015/09/02 @ 9:00 AM	2015/09/01 @ 10:55 AM	A
4.1	13°C	2015/09/03 @ 10:00 AM	2015/09/03 @ 2:30 PM	A
5.1	13°C	2015/09/03 @ 10:00 AM	2015/09/03 @ 2:37 PM	A
6.1	13°C	2015/09/03 @ 10:00 AM	2015/09/03 @ 2:45 PM	A
7.1	35°C	2015/09/02 @ 10:00 AM	2015/09/01 @ 2:23 PM	A
8.1	35°C	2015/09/02 @ 10:00 AM	2015/09/01 @ 2:28 PM	A
9.1	35°C	2015/09/02 @ 10:00 AM	2015/09/01 @ 2:34 PM	A

- A.** The ball did not penetrate completely through the glazing material. (INDICATE NUMBER OF IMPACT THAT CAUSED INITIAL BREAK).
- B.** The ball penetrated completely through the glazing material. (INDICATE NUMBER OF IMPACT THAT CAUSED PENETRATION).

**LL15 MATERIAL**  
HIGH ENERGY IMPACT TEST:

METHOD

The glazing material was subjected to a 200 ft-lb impact produced by dropping a 5 lb., 3-1/4 inch steel ball through a vertical distance of 40 feet. The test was conducted on one sample of the glazing material maintained at room temperature (21-27°C).

RESULTS

The ball penetrated completely through the glazing material.

END OF REPORT