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LUDEWIG GMBH
TEST REPORT

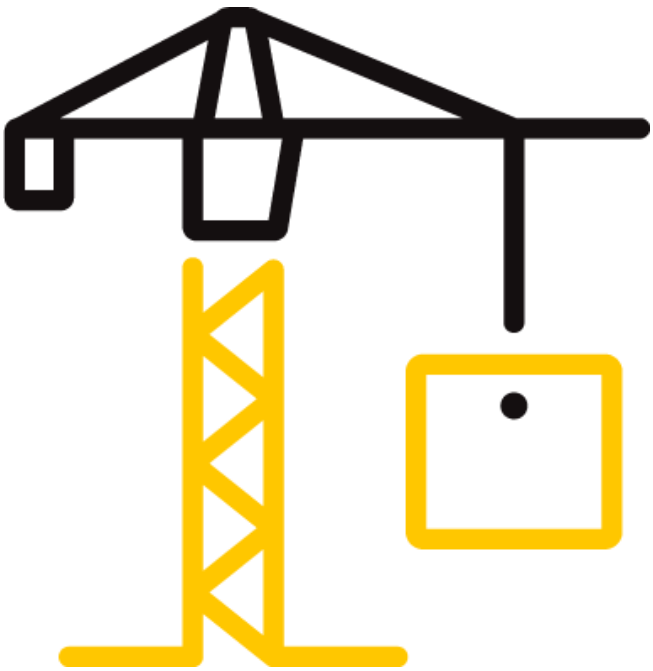
SCOPE OF WORK
TESTING OF SAFETY GLAZING TO CONFIRM COMPLIANCE WITH SGCC 'S REQUIREMENTS OF THE SAMPLES SUPPLIED BY THE CLIENT

REPORT NUMBER
103736663MTL-001
TEST DATE(S)
DECEMBER 20, 2018
ISSUE DATE
JANUARY 8, 2019

RECORD RETENTION END DATE
08 JANNUARYU 2029

PAGES
7

DOCUMENT CONTROL NUMBER
GFT-OP-10c (05/10/17)



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TEST REPORT FOR Ludewig GmbH Report#: 103736663MTL-001
Date:08 January 2019

SECTION 1
REPORT ISSUED TO

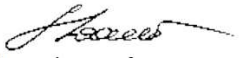
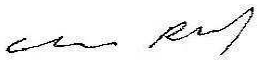
Mr. Carlos Fonseca
Ludewig GmbH
Wiehenstr. 167
32257 Buende, Germany

SECTION 2
SCOPE

Intertek Building & Construction (B&C) was contracted by the client to perform testing in accordance with ANSI Z97.1, 16 CFR 1201 II, Can CGSB 12.1, For her client for Safety Glazing Materials Used in Buildings Safety Performance Specification and Method of Test, on their «Glasse_tested». Results obtained are tested values and were secured by using the designated test method(s). Testing was conducted at Intertek test facility in Lachine, Quebec.

This report does not constitute certification of this product nor an opinion or endorsement by this laboratory.

For INTERTEK B&C:

COMPLETED BY:	Sergiu Toaca	**REVIEWED BY:**	Claude Pelland, P.E.
TITLE:	Technician B&C	**TITLE:**	Manager B&C
SIGNATURE:		**SIGNATURE:**	
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SECTION 3
SUMMARY OF TEST RESULTS

Three sets of samples of four specimens each being 34/ X 13" for the 6 mm and 5 1/8" X 33 ½" for the 2.7mm were supplied for testing. The samples passed.

The three sets of four specimens tested met with the fragment sizes specified in the testing requirements. The 2.7 mm thick samples, though they had their ten largest fragments lighter than 10 Sq inches of the same glass, did not match with any of the specified thicknesses references by the SGCC documents. Also since the size of the samples did not match with the U sizes being 34" x 76", they could not be supported by the standard frame. They had to be broken using the Center punch, which is normally used when a sample does not break under the load of the 100 lbs bag.

SECTION 4
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 Specification and Method of Test.

16 CFR 1201 II. – Safety Standard for Architectural Glazing Materials. Test Method-Year,

CAN CGSB 12.1-2017-National Standard of Canada-Tempered or Laminated Safety Glass.

SECTION 5
MATERIAL SOURCE/INSTALLATION

Test samples were provided by the client. The specimens were delivered by the client' shipping company and were received in apparent good condition on November 29, 2018 and were assigned the MTL1812191516-001/012 Intertek B&C Test Specimen number. Samples tested were consumed during testing.

AS the specimen could not be installed in the test cell due to their dimensions, they were tested using the center punch. Once broken, the ten largest fragments were selected and weighed.

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SECTION 6
EQUIPMENT

Impact Fixture: 180-666
Impact Bag: 180-667
Fragment scale:180-558 Call due: 21/Feb/2019
Thickness Gage:180-107 Call due: 07/Jun/2019
Thermometer: 170-437 Cal due: 08/Jul/2019

Calibration of test equipment was performed by Intertek B&C in accordance with ISO 17025.

SECTION 7
LIST OF OFFICIAL OBSERVERS

NAME	COMPANY
Sergiu Toaca	Intertek.

SECTION 8
TEST PROCEDURE

Samples were conditioned for at least 48 hours at a temperature between 68 to 85 Degrees F. They are normally installed in the test cell maintaining the proper spacer thickness. The impact is normally produced by a 100 lbs bag swung from a height of 48 inches for class A, in a pendulum motion aiming at the center of the specimen.

If sample impacted does not break it is installed on an horizontal surface where it will be broken using a center punch at the position identified by the standards.**(This portion of the procedure is the only one that was utilized).**

Once broken, during the next five minutes, the 10 largest fragments will be identified and weighed after five minutes. In order to pass, the ten fragments obtained shall weigh less than 10 square inches of the same glass.

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SECTION 9
TEST CALCULATIONS

There is no calculation performed. Ten largest fragments obtained will be weighed and compared to teen square inches of the same glass. The fragments shall weigh less than the 10 square inches of same glass.

SECTION 10
TEST SPECIMEN DESCRIPTION

Three sets of four samples identified as 2.7mm, 6mm and 6mm LOBO being 5 1/8" x 33 ½" and 34" x 13" respectively for the 3 mm and 6 mm being Tempered Transparent Glass.

SECTION 11
TEST RESULTS

Impact samples

OVERALL DIMENSION	WIDTH		HEIGHT	
	millimeters	inches	millimeters	inches
Overall size(2.7mm)	130	5 1/8	851	33 1 /2
Overall size (6mm)	330	13	864	34
Overall size (6m LOBO)	330	13	864	34

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The three sets of four samples passed as the ten largest fragments weighed less than 10 square inches of same glass. The products therefore met with the fragment size requirements of the standard.

SECTION 12
CONCLUSION

The three sets of samples submitted specimen met with the fragment size requirements of the standard. As the 2.7mm thick samples could not be identified as one of the thicknesses described in the standard, these samples cannot be classified as passing. The two 6mm series do comply.

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SECTION 13
REVISION LOG

REVISION #	DATE	PAGES	REVISION
0	09/10/18	N/A	Original Report Issue

V 4.6 25-Jul-2018

Intertek Testing Services NA Ltd
1829, 32nd Avenue, Lachine
Quebec, Canada
H8T 3J1

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SAFETY GLAZING IMPACT TESTING

2.7mm in. Thick - Tempered Transparent Glass (TTG)

0.11" Thick

Intertek G1037736663 0.11"

SGCC#	NA
Intertek Project number	G1037736663
Client	Intertek
Sample ID or Description	MTL1812191516
Test Date	20-Dec-2018
Technician(s)	Sergiu Toaca
Specimen Size to nearest 1/16"	5 1/8" x 33 1/2"
Classification (Unlimited of limited)	Unlimited
Preconditioning	72.0 Deg F for: (h) >48
Lab Temperature	70.2 Deg F

Drop height

Classification	Height
ANSI Class A / CPSC, CAN Categopry II	48"
ANSI Class B / CPSC, CAN Categopry I	18"

Testing in acordance with :
ANSI Z97.1-2015
CPSC 16 CFR 1201 II
CAN / CGSB 12.1-2017

Sample Received Date: 29-Nov-2018

Temperature Requirements
ANSI&CPSC=65° F- 85° F (18°C-29°C)
CAN=20°C-30°C (68° F – 86° F)
Combined 68° F – 85°F (20°-29°C)

Specimen No.	Test Standard	Glass Thickness (Inches)	Drop height (inches)	Test Results (grams)	Acceptance criteria*1 (grams)	Center Punch YES	Center Punch NO	Compliant
1	ANSI / CAN		48 in.	40.09	46.57	X		
2	ANSI / CAN			25.77	49.36	X		
3	ANSI / CAN			27.06	46.53	X		
4	ANSI / CAN			33.18	46.41	X		
5	CPSC 16 CFR 1201	NA		NA	NA	N/A	N/A	NA

*1: Acceptance Criteria = 412 x thickness (in.) and no center punch fragment more than 4" long

Additional Comments / Observation: Sample series fails to meet with the abovementioned standards requirements

Asset Numbers:	
Impact Fixture:	
Impact bag:	☑ 180-667
Fragment scale:	☑ 180-558
Thickness Gage:	☑ 180-107
Temp.Gage Thermometer	☑ 170-437
150 lbs Lab Scale	☐ 180-129

INGÉNIEUR • ENGINEER
Claude Pelland
39473
QUÉBEC

In charge of tests:
Sergiu Toaca
Technician

Test Supervisor:
Claude Pelland, Eng.
Project Engineer

V 4.6 25-Jul-2018

Intertek Testing Services NA Ltd
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Quebec, Canada
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SAFETY GLAZING IMPACT TESTING

0.25 in. Thick - Tempered Transparent Glass (TTG)

6mm Thick

Intertek Consumer Goods GmbH-Germany

SGCC#	N / A
Intertek Project number	G103736663
Client	Intertek Consumer Goods GmbH-Germany
Sample ID or Description	6mm
Test Date	20-Dec-2018
Technician(s)	Sergiu Toaca
Specimen Size to nearest 1/16"	**34" X 13"**
Classification (Unlimited of limited)	Unlimited
Preconditioning	72.0 Deg F for: (h) >48
Lab Temperature	70.1 Deg F

Drop height

Classification	Height
ANSI Class A / CPSC, CAN Categopry II	48"
ANSI Class B / CPSC, CAN Categopry I	18"

Testing in acordance with :
ANSI Z97.1-2015
CPSC 16 CFR 1201 II
CAN / CGSB 12.1-2017

Sample Received Date: 29-Nov-2018

Temperature Requirements
ANSI&CPSC=65° F- 85° F (18°C-29°C)
CAN=20°C-30°C (68° F – 86° F)
Combined 68° F – 85°F (20°-29°C)

Specimen No.	Test Standard	Glass Thickness (Inches)	Drop height (inches)	Test Results (grams)	Acceptance criteria*1 (grams)	Center Punch YES	Center Punch NO	Compliant
1	ANSI / CAN	0.231	48 in.	10.76	94.95	X		Pass
2	ANSI / CAN	0.230		9.24	94.87	X		Pass
3	ANSI / CAN	0.231		9.06	95.16	X		Pass
4	ANSI / CAN	0.231		11.65	95.16	X		Pass
5	CPSC 16 CFR 1201	NA		NA	NA	N/A	N/A	NA

*1: Acceptance Criteria = 412 x thickness (in.) and no center punch fragment more than 4" long

Additional Comments / Observation: Sample series meets with the requirements of the abovementioned standards

Asset Numbers:		
Impact Fixture:		
Impact bag:	☑	180-667
Fragment scale:	☑	180-558
Thickness Gage:	☑	180-107
Temp.Gage Thermometer	☑	170-437
150 lbs Lab Scale	☐	180-129

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In charge of tests:
Sergiu Toaca
Technician

Test Supervisor:
Claude Pelland, Eng.
Project Engineer

V 4.6 25-Jul-2018

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SAFETY GLAZING IMPACT TESTING

0.25 in. Thick - Tempered Transparent Glass (TTG) **LOBO**

6mm Thick

Intertek Consumer Goods GmbH-Germany

SGCC#	N / A
Intertek Project number	G10373666
Client	Intertek Consumer Goods GmbH-Germany
Sample ID or Description	6mm
Test Date	20-Dec-2018
Technician(s)	Sergiu Toaca
Specimen Size to nearest 1/16"	**34" X 13"**
Classification (Unlimited of limited)	Unlimited
Preconditioning	72.0 Deg F for: (h) >48
Lab Temperature	70.2 Deg F

Drop height

Classification	Height
ANSI Class A / CPSC, CAN Categopry II	48"
ANSI Class B / CPSC, CAN Categopry I	18"

Testing in acordance with :
ANSI Z97.1-2015
CPSC 16 CFR 1201 II
CAN / CGSB 12.1-2017

Sample Received Date: 29-Nov-2018

Temperature Requirements
ANSI&CPSC=65° F- 85° F (18°C-29°C)
CAN=20°C-30°C (68° F – 86° F)
Combined 68° F – 85°F (20°-29°C)

Specimen No.	Test Standard	Glass Thickness (Inches)	Drop height (inches)	Test Results (grams)	Acceptance criteria*1 (grams)	Center Punch YES	Center Punch NO	Compliant
1	ANSI / CAN	0.230	48 in.	8.91	94.83	X		Pass
2	ANSI / CAN	0.232		10.25	95.44	X		Pass
3	ANSI / CAN	0.231		9.19	95.36	X		Pass
4	ANSI / CAN	0.231		9.22	95.32	X		Pass
5	CPSC 16 CFR 1201	NA		NA	NA	N/A	N/A	NA

*1: Acceptance Criteria = 412 x thickness (in.) and no center punch fragment more than 4" long

Additional Comments / Observation: Sample series meets with the requirements of the abovementioned standards

Asset Numbers:	
Impact Fixture:	
Impact bag:	☑ 180-667
Fragment scale:	☑ 180-558
Thickness Gage:	☑ 180-107
Temp.Gage Thermometer	☑ 170-437
150 lbs Lab Scale	☐ 180-129

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