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Established 1985

TEST REPORT

ANSI Z97.1-2015 (R2020)
CAN/CGSB-12.1-2022
IMPACT RESISTANCE OF TEMPERED GLASS
"6, 10 &12 mm"

Report No. L24-1636-7070
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Prepared for:
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Respectfully submitted by:

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- This report covers tests carried out on one specimen having specific dimensions. Product performance is affected by variations in its dimensions, assembly details and installation method. The reader is advised to ensure product conformity with all the details of the test sample described in "Sample Description" and annexed drawings of this report.
- This report does not constitute certification of the test product. The reported test results refer only to the specimen tested. No representation is made that other samples of similar design will feature like performance.
- This report was prepared for the consideration of the addressee only. It shall not be used by any other party without the written consent of CAN-BEST.
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1. INTRODUCTION

Canadian Building Envelope Science and Technology (CAN-BEST) was retained by Rez Glass Industries Ltd. to carry out impact resistance testing of transparent, tempered glass in accordance with ANSI Z97.1-2015 (R2020) and CAN/CGSB-12.1-2022 Standards *"Tempered or Laminated Safety Glass"*.

2. SPECIMEN CLASSIFICATION

As per the Referenced standard, the test glass is classified by the test size and impact level as follows:

Size Classification:

- Unlimited size (**U**): 864 mm x 1930 mm, ± 3 mm (34" x 76" ± 1/8"), or
- Limited size (**L**): Less than 864 mm x 1930 mm (34" x 76") with a minimum size of 406 mm x 762 mm (16" x 30")

Impact Classification:

- Class (**A**): Drop Height: 1220 mm - 1232 mm (48"- 48.5")"Class A", shall be deemed to comply with the lower impact drop height level "Class B".
- Class (**B**): Drop Height: 457 mm - 470 mm (18"- 18.5")

3. TEST SPECIMENS

- Number received: Four for each thickness
- Test Size: 864 mm x 1930 mm
- Thicknesses: Nominal: 6, 10 & 12 mm
- Visual inspection: No visually observed surface blemishes or edge chips

Sampling of the test specimens was performed by the client, and delivered to CAN-BEST laboratory on June 10, 2024. Upon receipt, the specimens were conditioned for a minimum of four hours at the laboratory's ambient conditions prior testing. Testing was carried out on May 14-15, 2024.

4. IMPACT TEST

- Impactor: 45.4 kg (100 lb) leather punching bag filled with #7½ lead shots
- Impact location: within 50 mm of specimen's geometrical centre

Following one impact at either Class (A) or Class (B) drop height, the specimen is characterized by whether it breaks Type (2), or remains intact Type (4). All specimens of tempered glass that do not fracture must pass the centre punch fragmentation test to qualify.

5. CENTRE PUNCH FRAGMENTATION TEST

This test is only used to evaluate fully tempered glass specimens that do not break during the impact test. When impacted by a sharp impactor, the total weight of the ten largest fragments shall not exceed the equivalent weight of 6452 mm^2 (10 in^2) of the unbroken test specimen, calculated in grams as 16.18 x glass thickness (mm).

6. TEST RESULTS

Table (1) provides glass classifications for all tested glass thicknesses based on the obtained impact and center punch fragmentation test results.

Table (1): Test Results and Classifications

Nominal Glass Thickness, mm	Actual Thickness, mm *(Average of 4 specimens)*	Impactor Drop Height	Maximum allowable weight (g) of the 10 largest broken pieces *(16.18 x glass thickness)*	Actual weight (g) of the 10 largest broken pieces *(NB = No Breakage, Type 4)* *(B = Breakage, Type 2)*				Classification*
				Test Specimen				
				1	2	3	4	
6	5.68	1220 (48")	91.9	NB	NB	NB	NB	UA, Type 4 *(Unlimited Size Class A)*
				11.22	34.15	31.71	43.14	
10	9.70	1220 (48")	156.9	NB	NB	NB	NB	UA, Type 4 *(Unlimited Size Class A)*
				21.60	19.41	33.57	43.12	
12	12.14	1220 (48")	196.4	NB	NB	NB	NB	UA, Type 4 *(Unlimited Size Class A)*
				35.50	43.75	31.29	29.73	

* *Classification of test size (L or U) and drop height class (A or B) as follows:*

Size Classification:

- Unlimited size (U): 864 mm x 1930 mm (34" x 76"or
- Limited size (L): Less than 864 mm x 1930 mm (34" x 76") with a minimum size of 406 mm x 762 mm (16" x 30")

Impact Classification:

- Class (A): Drop Height: 1220 mm - 1232 mm (48"- 48.5")
- Class (B): Drop Height: 457 mm - 470 mm (18"- 18.5")

Type Classification:

- Type (4): Glass does not break (NB)
- Type (2): Glass break (B)

7. CONCLUSION AND MARKING

Having successfully met the requirements of ANSI Z97.1-2015 (R2020) and CAN/CGSB-12.1-2022 safety glass standards, the nominal thicknesses of 6, 10 & 12 mm of clear **fully tempered** glass **DID PASS** the impact resistance testing. Class "A" is deemed to comply with the lower impact drop height level Class "B".

All cut size, fully tempered glass, shall be permanently marked by the company producing the finished cut to size glass product as follows:

ANSI Z97.1-2015 (R2020) UA
CAN/CGSB-12.1-2022 LA INT

- Glazing company name, distinctive mark or designation
- Laminated
- Plant ID, Place of fabrication
- Date (optional)

Note: Additional details and information, such as thickness and date of manufacture, are permitted.

DISCLAIMERS

This report covers tests carried out on a specific number of glass specimens, having specific properties and under laboratory conditions. Glass performance is affected by aging under service environment, glass loading history and surface and edge finishes. Consequently, the reader is advised to ensure product suitability for the intended application.

Furthermore, no conclusions regarding field performance of the tested glass' stability and its resistance to spontaneous fracturing, may be drawn from the reported results.

Report History

Revision No.	*Change and Reason*	*Date*	*Approved by*
---	Original report issued	June 19, 2024	EA

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