TEST REPORT

REPORT NUMBER: 160318001SHF-BP-1
ORIGINAL ISSUE DATE: March 21, 2016

EVALUATION CENTER

Intertek Testing Services Ltd., Shanghai
Plant 7, No. 6958 Daye Road, Fengxian District, Shanghai, China

RENDERED TO

SHANGHAI YEELION IND. CO., LTD.
ROOM 2403, UNIT NO.17, LANE NO. 588, ZEPU ROAD, JIADING DISTRICT, SHANGHAI, CHINA.

PRODUCT EVALUATED
Tempered Glass
Model: Thickness of 8 mm

EVALUATION PROPERTY
Dimensions and Quality, Flatness, Impact Resistance, Impact Test

Report of Testing Tempered Glass (Model: Thickness of 8 mm) for compliance with the applicable requirements of the following criteria: Section 5.1, 5.2 and 5.5 in *CAN/CGSB-12.1-M90 Tempered or Laminated Safety Glass,* Section 5.1 in ANSI Z97.1-2009 American National Standard for Safety Glazing Materials Used in Buildings - Safety Performance Specifications and Methods of Test.

1 Table of Contents

2 Introduction

Intertek has conducted testing for Shanghai Yeelion Ind. Co., Ltd. on Tempered Glass (Model: Thickness of 8 mm) to evaluate Impact Resistance, Impact Test, Flatness, Dimensions and Quality. Testing was conducted in accordance with Section 5.1, 5.2 and 5.5 in CAN/CGSB-12.1-M90 and Section 5.1 in ANSI Z97.1-2009. This evaluation began on February 19, 2016 and was completed on March 2, 2016.

3 Test Samples

3.1. SAMPLE SELECTION

Samples were randomly selected on January 26, 2016 by Intertek Representative Weber Wang, at the Dongguan Success Glass & Mirror Co., Ltd. located at Suifengnian Industrial District, Shatian Town, Dongguan City, Guangdong Province, China. Samples were received at the Evaluation Center on February 1, 2016.

The subject test specimens were traceable samples selected from the manufacturer's facility. Intertek selected the specimens and had verified the manufacturing techniques and quality assurance procedures.

3.2. SAMPLE DESCRIPTION

Table 1 Specimen Description

Sample ID	Sample Size (mm) Length × Width × Thickness	Type	Quantity (pieces)
S160219001SHF-001~ S160219001SHF-006	1930 × 863 × 8	Tempered Glass	6

Manufacturer: Dongguan Success Glass & Mirror Co. Ltd.
Manufacturer´s address: Suifengnian Industrial District, Shatian Town, Dongguan City, Guangdong Province, China.

4 Testing and Evaluation Methods

The specimens of Tempered Glass (Model: Thickness of 8 mm) were tested according to Sections 5.1, 5.2 and 5.5 in CAN/CGSB-12.1-M90 and Section 5.1 in ANSI Z97.1-2009.

4.1. Dimensions and Quality

The test was conducted in accordance with CAN/CGSB-12.1-M90 Section 5.1. The tolerances of length and width were required to be less than ±2.5 mm and the tolerance of thickness was required to be less than ±0.8 mm when nominal thickness of tempered glass was 8 mm.
Quality test was conducted in accordance with detecting the specimen’s defects.

4.2. Flatness

The test was conducted in accordance with CAN/CGSB-12.1-M90 Section 5.2. The Localized warp and overall bow and warpage tolerances needed to be conducted. Sample glass was placed in a free-standing vertical position, resting on blocks at the quarter points and was placed a straight edge across the concave surface and the maximum deviation was measured with a taper or feeler gauge, or a dial indicator. Localized warp for rectangular glass should not exceed 1.5 mm over any 300 mm span, overall bow and warpage tolerances should not exceed the deviations from a flat surface shown in Table 1 in CAN/CGSB-12.1-M90.

4.3. Impact Test

The test was conducted in accordance with CAN/CGSB-12.1-M90 Section 5.5. The required specimen was mounted and centered on the test frame. The impactor assembly, which was suspended and stabilized in the launch position, was released and fell to hit the center of the specimen. The drop height was 1220 mm (Category II). Then the glazing material was judged whether it passed or failed according to the standard which meant the specimens did not break or when breakage occurred, the total mass of the ten largest particles, obtained within 5 min after impact, should not exceed the mass of 6500 mm^2 of the original specimen.

The test was conducted in accordance with ANSI Z97.1-2009 Section 5.1 and 5.2. The required specimen whose size was 1930 mm (length) by 863 mm (width) was mounted and centered on the test frame. The impactor assembly, which was suspended and stabilized in the launch position, was released and fell to hit the center of the specimen. The drop height was 1225 mm (Class A). If the specimens did not break after impact testing, the center punch fragmentation test would be performed on each not broken tempered glass specimen. Then the glazing material was judged whether it passed or failed according to the standard.

5 Testing and Evaluation Results

5.1. RESULTS AND OBSERVATIONS

The sample test results were summarized in Table 2 below.

Table 2 Test Results

Test Item	Test Results		Verdict
Impact Test [1]	The drop height was 1225 mm Drop height class: Class A (For ANSI Z97.1-2009) Category II (For CAN/CGSB-12.1-M90)		Pass
	Specimen 1	After impact test, the specimen was not broken. Then the specimen was conducted to Center Punch Fragmentation Test, mass of ten largest crack-free particles was 9.0 g, no one particle was longer than 4 inches (102 mm).	
	Specimen 2	After impact test, the specimen was not broken. Then the specimen was conducted to Center Punch Fragmentation Test, mass of ten largest crack-free particles was 8.8 g, no one particle was longer than 4 inches (102 mm).	
	Specimen 3	After impact test, the specimen was broken. Mass of ten largest crack-free particles was 17.8 g.	
	Specimen 4	After impact test, the specimen was broken. Mass of ten largest crack-free particles was 8.0 g.	
Quality	The specimens have no defects.		Pass
Dimensions [2]	Thickness tolerance	-0.1 mm	Pass
	Tolerances of width	1 mm	
	Tolerances of length	2 mm	
Flatness [3]	Localized Warp	0.02 mm/300 mm	Pass
	Overall Bow and Warpage Tolerances	0.29 mm	

Note:

1. Requirements of impact test and center punch fragmentation test:
   The total weight of the ten largest crack-free particles shall be no more than 129.4 g (equivalent weight of 10 square inches of the original test specimen) and no one particle shall be longer than 4 inches (102 mm).
2. Requirements of the tolerances of length and width were required to be less than $\pm$2.5 mm and the tolerance of thickness was required to be less than $\pm$0.8 mm when nominal thickness of tempered glass was 8 mm.
3. Requirements of localized warp for rectangular glass should not exceed 1.5 mm over any 300 mm span, overall bow and warpage tolerances should not exceed the deviations from a flat surface shown in Table 1 in CAN/CGSB-12.1-M90.

6 Conclusion

The Tempered Glass (Model: Thickness of 8 mm) evaluated in this report have been tested in accordance with Section 5.1, 5.2 and 5.5 in CAN/CGSB-12.1-M90 and Section 5.1 and 5.2 in ANSI Z97.1-2009. The samples met the requirements of Impact Test per ANSI Z97.1-2009 based on Class A drop height and Impact Resistance per CAN/CGSB-12.1-M90 based on Category II, Dimensions and Quality, Flatness Test per CAN/CGSB-12.1-M90.

The conclusions of this test report may be used as part of the requirements for Intertek product certification. Authority to Mark must be issued for a product to become certified.

INTERTEK

Reported by: Alvin. Zhu

Alvin Zhu
Engineer, Intertek Building Products

Reviewed by: Fred Bao

Fred Bao
Senior Technical Supervisor, Intertek Building Products

7 Appendix A: Sample Photo

Fig.1 Photo of Representative Samples

8 Revision Page

Revision No.	Date	Changes	Author	Reviewer
0	March 21, 2016	First Issue	Alvin Zhu	Fred Bao

END OF DOCUMENT