JAS (Inspection & Testing) Ltd.

A

Glass Impact Test Report

For

Laminated Tempered Glass

To

BS6206: 1981

Manufactured By

Glass Label Ltd.

Prepared By : JAS (Inspection & Testing) Limited

Test Date: 20th May 2019

Report Date : 21st May 2019

Our Ref. : J19-078-R01-190521

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1 INTRODUCTION

This test was conducted at the request of the glass manufacturer **Glass Label Ltd.** to check the safety performance of the Laminated Tempered glass manufactured in their factory in China.

BS 6206:1981 'Specification for Impact Performance Requirements for the Flat Safety Glass and Safety Plastics for use in Buildings' was adopted as the standard for the test.

2 WITNESSES

Test Consultant

Mr. Sam LAU
JAS (Inspection & Testing) Ltd.

3 TEST INFORMATION

3.1 Facility

JAS (Inspection & Testing) Ltd. provided a test structure and a standard impactor to BS 6206 for the impact test.

3.2 Test Date

20th May 2019

3.3 Planning & Preparation

Glass Label Ltd.

3.4 Testing & Report

Mr. Clifford A. Bury
Mr. Sam Lau

3.5 Temperature

25°C.

4 TEST UNIT

4.1 Sizes of the glass units for the test was 865mm +/-3mm wide by 1930mm +/-3mm high

All test specimen dimensions were checked before the test and were all within +/-3mm of the proposed dimension.

4.2 Glass panels of the following thicknesses were prepared with chamfered edges and tested according to BS 6206:1981 for class A, B & C performance (refer to section 6).

- 5mm Tempered + 1.52PVB with fabric + 5mm Tempered

4.3 Laminated glass panel was prepared by

Glass Label Ltd.

5 TEST EQUIPMENT

5.1 A steel frame was fabricated strictly according to the details of BS 6206:1981 and was rigidly mounted against a solid concrete wall and to the ground with expansion anchor bolts.

5.2 A wooden sub frame was fabricated to BS 6206:1981.

5.3 The test glass was securely held between the main frame and the sub-frame by clamps at spacing not more than 450mm apart.

5.4 A leather case of bag type, weighs 45kg +/-0.10kg, was used as an impactor. The impactor was prepared according to BS 6206:1981 and filled with chilled lead shot No.7.

6 TEST SPECIFICATION AND METHOD

6.1 Classification

Safety glass shall be classified as follows (see also table 1).

Class A: Material that complies with the requirements of 6.2 when tested by the method given in 6.4 at drop heights of 305mm, 457mm and 1219mm.

Class B: Material that complies with the requirements of 6.2 when tested by the method given in 6.4 at drop heights of 305mm and 457mm.

Class C: Material that complies with the requirements of 6.2 when tested by the method given in 6.4 at a drop height of 305mm.

Table (1)

Classification of safety glass and safety plastics according to behaviour on impact.

Class	Behaviour on Impact		
	Drop Height 305mm	Drop Height 457mm	Drop Height 1219mm
A	No breakage Or breaks safely	No breakage Or breaks safely	No breakage Or breaks safely
B	No breakage Or breaks safely	No breakage Or breaks safely	No requirement
C	No breakage Or breaks safely	No requirement	No requirement

6.2 Test Requirement

Impact Test

When tested by the method given in 6.4 at any drop height appropriate to the class for which the material is intended (see classification), all four test pieces shall not break or shall break safely as defined in the following for laminated glass:

If numerous cracks or fissures appear in the test piece, but no shear, or opening, develops within the body of the test piece through which a 76mm diameter sphere can be passed freely. Additionally, if particles are detached from the test piece up to 3 min. after impact, they shall in total, weigh no more than the mass equivalent to 10,000mm^2 of the original test piece. The largest single particle shall weigh less than the mass equivalent to 4,400mm^2 of the original test piece.

6.3 Preparation of Test Piece

Remove all masking and protective material from the test pieces and store them for a minimum of 4 hours at a temperature of 20 +/-5° with the test surface exposed to free air at that temperature.

The steel frame should be rigidly mounted to the floor and against the wall. The impactor shall be supported as shown in figures 1 & 2.

6.4 Procedure

A Immediately preceding the test, condition the test piece as described above. Place the test piece in the frame and clamp it so that the chloroprene strips are compressed by no more than 10% to 15% of their original thickness. When the impactor is hanging at rest, suspended from the overhead support, check that it is, at its greatest diameter, not more than 13mm from the surface of the test piece and within 51mm radially from the centre of the test piece.

B Raise the impactor to a drop height of 305mm and steady it.

C Release the impactor so that it swings in a pendulum arc and strikes the piece.

D Inspect the test piece after impact and report whether:

(i) It has remained unbroken.
(ii) It has broken safely in accordance with the requirements of 6.2.
(iii) It has broken and failed to comply with the requirements of 6.2.

E If any test piece fails to comply with the requirements of 6.2, terminate the procedure. If all four test pieces either do not break or break safely and if it is required to test the material to a higher impact level, increase the drop height to 457mm and repeat the test on four more test pieces of the same material or test pieces which have undergone the previous tests and remained unbroken.

F Repeat the same procedure for drop height of 1219mm.

7 TEST RESULTS

Glass Manufacturer : **Glass Label Ltd.**
Test date : **20th May 2019**
Nominal Thickness of Glass being tested:
5mm Tempered + 1.52PVB with fabric + 5mm Tempered

Test Piece Number	Actual Thickness (mm)	Overall Dimension (mm)	Behaviour on Impact at Drop Height 305mm	Compliant to Classification (C)
1	**11.13**	865 x 1930	No Breakage	Compliant
2	**11.12**	865 x 1930	No Breakage	Compliant
3	**11.15**	865 x 1930	No Breakage	Compliant
4	**11.16**	865 x 1930	No Breakage	Compliant

Test Piece Number	Actual Thickness (mm)	Overall Dimension (mm)	Behaviour on Impact at Drop Height 457mm	Compliant to Classification (B)
5	**11.13**	865 x 1930	No Breakage	Compliant
6	**11.12**	865 x 1930	No Breakage	Compliant
7	**11.15**	865 x 1930	No Breakage	Compliant
8	**11.16**	865 x 1930	No Breakage	Compliant

Test Piece Number	Actual Thickness (mm)	Overall Dimension (mm)	Behaviour on Impact at Drop Height 1219mm	Compliant to Classification (A)
9	**11.13**	865 x 1930	No Breakage	Compliant
10	**11.12**	865 x 1930	No Breakage	Compliant
11	**11.15**	865 x 1930	No Breakage	Compliant
12	**11.16**	865 x 1930	No Breakage	Compliant

8. SUMMARY OF RESULTS

8.1 The following glass thicknesses were tested to the specification of BS 6206:1981 and satisfactorily complied with the respective classes of behaviour:

Laminated Tempered Glass Thickness (mm)	BS 6206:1981		
	Class A	Class B	Class C
5mm Tempered + 1.52PVB with fabric + 5mm Tempered	Complied	Complied	Complied

9. COMMENT

All the glass test pieces did not break during the impact test. Thus, all the test pieces of the

- 5mm Tempered + 1.52PVB with fabric + 5mm Tempered

Laminated and tempered by **Glass Label Ltd.** achieved the Class A, B & C designation for safety glass to the specification of BS 6206 1981.

These tests were satisfactory and conclusive.

I certify this to be a true record of the test.

GLASS LABEL LTD
Your Design Partner

Tested by

Mr. Sam Lau

Certified by

Mr. Clifford A. Bury

Appendix

(i) Diagrams of the Impact Test Structure

(ii) Photos

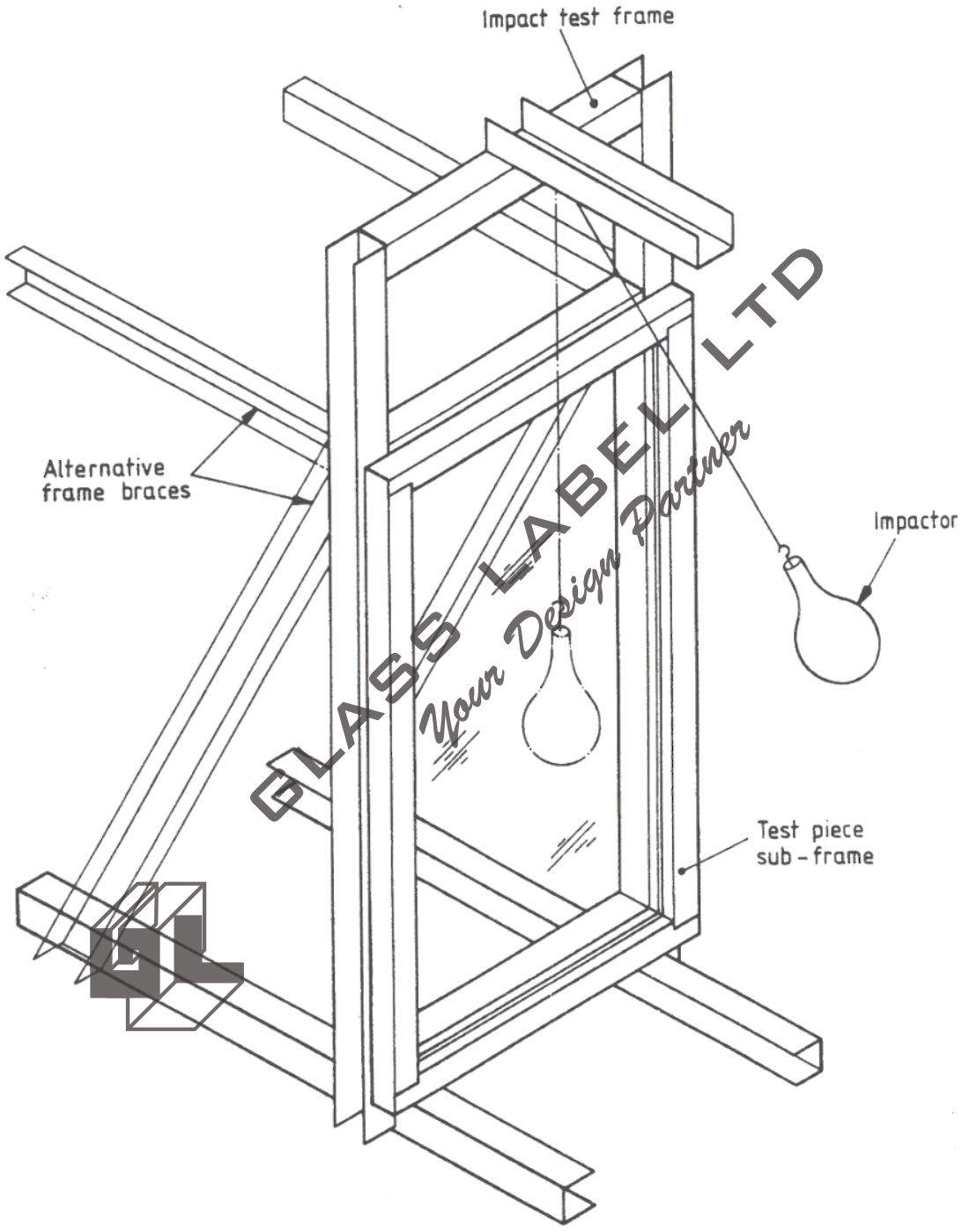

Figure 1. Impact test structure: general arrangement

Figure 1. 玻璃撞擊試驗用之框架示意圖

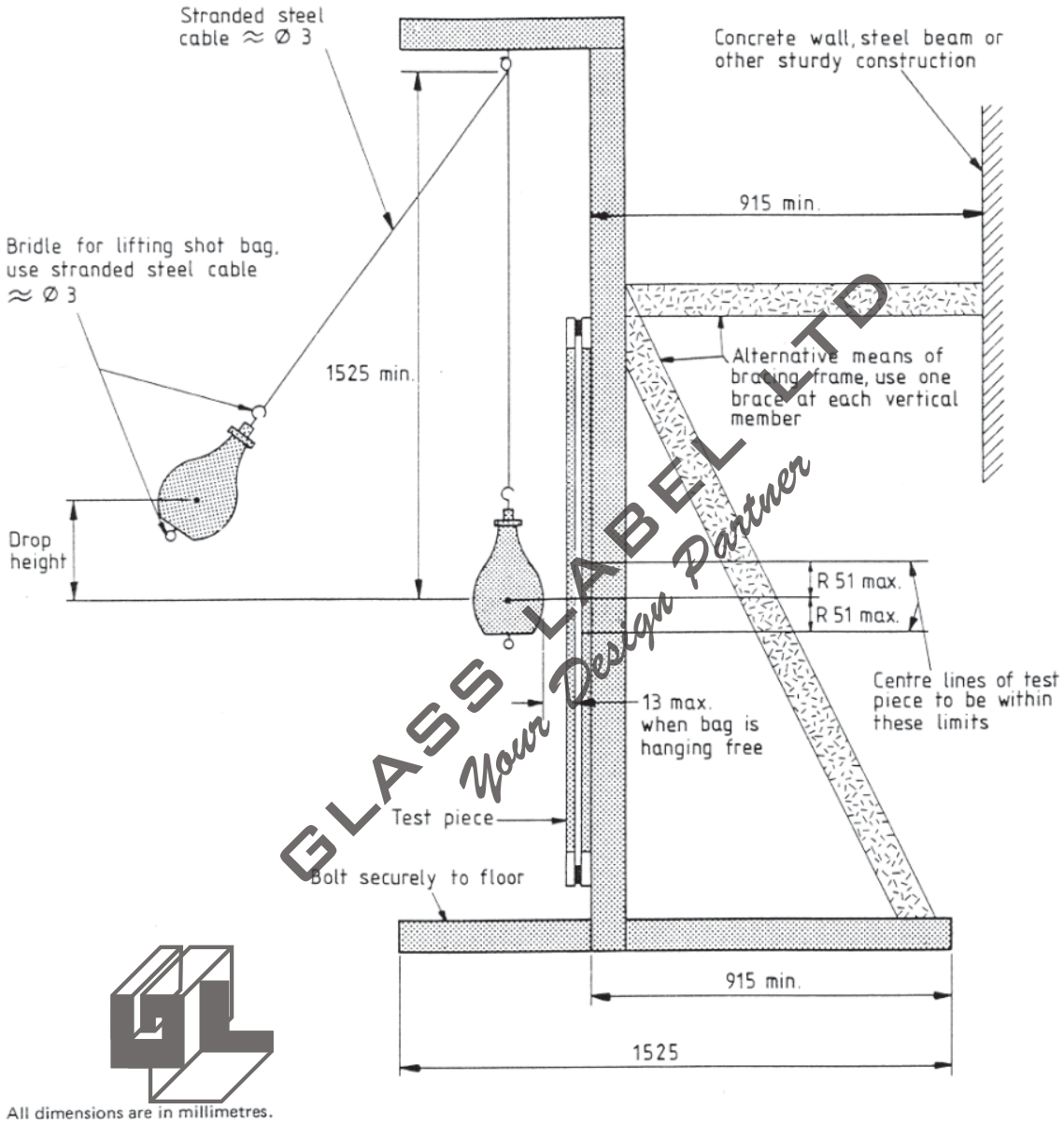

Figure 2. Impact test structure: side elevation

Figure 2. 玻璃撞擊試驗用之框架示意圖 - 側面

	Glass Impact Test Photo Record Manufactured By : Glass Label Ltd.	**Report Ref.:** J19-078-R01-190521

Photo 1

The sizes of the Glass Specimen were checked before test.

Photo 2

The Thickness of the Glass Specimen was checked before test.

Photo 3

Glass specimen was ready for the 305mm Drop height impact (Class C).

Photo 4

Glass specimen was ready for the 457mm Drop height impact (Class B).

Photo 5

Glass specimen was ready for the 1219mm Drop height impact (Class A).

Photo 6

Toughened quality was checked.