

Test Report No. 7191249626 - MEC21/01A-TWS
dated 20 Jan 2021



PSB Singapore

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SUBJECT:

Impact performance, boil test and dimensional tolerance measurements on tempered laminated glass submitted by Glass Label Ltd on 12 Jan 2021.

TESTED FOR:

Glass Label Ltd
6F, Hing Yip Centre,
31 Hing Yip St, Kwun Tong,
Kln, Hong Kong

Attn: Ms. Shirmen Ma

TEST METHOD:

SS 341: 2001 (2012) Specification for safety glazing materials for use in buildings (human impact considerations)

TEST LOCATION:

60 Tuas South Street 1. Singapore 639925

DESCRIPTION OF SAMPLE:

Brand : Glass Label

- 4 pieces of 11.52 mm thick tempered laminated glass (5mm thick Anti-scratch tempered clear glass + 1.52mm thick digital print pattern w/ craftsmanship (laminated) + 5mm thick tempered clear glass) of nominal size 1900mmH x 860mmW were received for impact test.
- 1 piece of 11.52 mm thick tempered laminated glass (5mm thick Anti-scratch tempered clear glass + 1.52mm thick digital print pattern w/ craftsmanship (laminated) + 5mm thick tempered clear glass) of nominal size 1900mmH x 860mmW was received for dimensional measurements, thickness and squareness, overall bow and warpage test.
- 3 pieces of 11.52 mm thick tempered laminated glass (5mm thick Anti-scratch tempered clear glass + 1.52mm thick digital print pattern w/ craftsmanship (laminated) + 5mm thick tempered clear glass) of nominal size 300mmH x 300mmW were received for boil test.

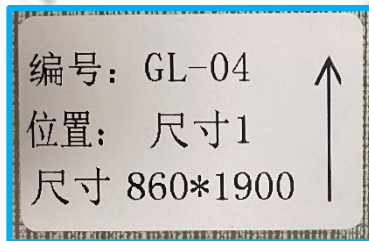


Photo 1: Glass Label



LA-2007-0380-A LA-2007-0386-C
LA-2007-0381-F LA-2010-0464-D
LA-2007-0382-B LA-2018-0702-B
LA-2007-0383-G LA-2018-0703-G
LA-2007-0384-G LA-2020-0747-L
LA-2007-0385-E

The results reported herein have been performed in accordance with the terms of accreditation under the Singapore Accreditation Council. Inspections/Calibrations/Tests marked "Not SAC-SINGLAS Accredited" in this Report are not included in the SAC-SINGLAS Accreditation Schedule for our inspection body/laboratory.

Laboratory:
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Singapore 609937
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RESULTS:

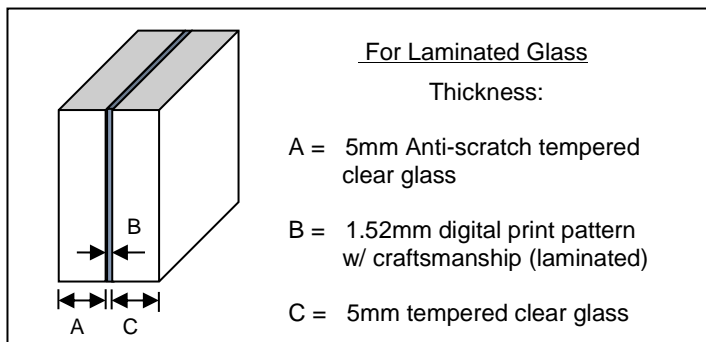
1. Impact Test

Date of Test: 19 Jan 2021

Weight of Glass = 40.90 kg

Declared Nominal Thickness = 11.52 mm

Impactor Weight = 46.0 ± 0.1 kg



Sample	Dimension									
	1900 ± 3mm			Average	Result	860 ± 3mm			Average	Result
S1	1900	1900	1900	1900	Pass	860	860	860	860	Pass
S2	1900	1900	1900	1900	Pass	860	860	860	860	Pass
S3	1900	1900	1900	1900	Pass	860	860	860	860	Pass
S4	1900	1900	1900	1900	Pass	860	860	860	860	Pass

Impact Test			
Drop Heights	Observation		Requirements in accordance to SS 341 : 2001 (2012) Clause A.5 (g)
	Impact on 5mm Tempered Clear Glass		
300 mm	4 pcs of glass did break safely Complied with item (2)		Shall comply with any of the following requirements after impact: 1) It has remained unbroken; or 2) It has broken and numerous cracks or fissures appear but no shear or opening develops within the body of the glazing material through which a 76 mm diameter sphere can be passed freely; additionally, if fragments are detached from the test piece up to 3 min after impact, they shall, in total, weigh no more than the mass equivalent to 10 000 mm ² of the original test piece and the largest single fragment shall weigh less than the mass equivalent to 4400 mm ² of the original test piece; or 3) It has broken and disintegration occurs but the 10 largest crack-free fragments selected 3 min after impact, together weigh no more than the mass equivalent to 6500 mm ² of the original test piece; or 4) It has broken and the breakage results in several separate pieces, which may or may not be retained in the frame. Those pieces that are exposed after the impact shall be in accordance with one or both of the following: a) The perimeter shall not be sharp. b) Where any pointed protrusion occurs in any perimeter, the length of the chord between the two points which are established when an arc of radius 25 mm, whose centre is at the apex of the protrusion, crosses the perimeter on each side of the apex shall not be less than 25 mm.
450 mm			
600 mm			
750 mm	-		
900 mm	-		
1200 mm	-		
1500 mm	-		

Remark: The results of the impact performance test for the submitted tempered laminated glass meet the Class 'A' requirements of SS 341: 2001(2012) up to maximum drop height of 300 mm.

RESULTS (CONT'D):

2. Dimension Measurement

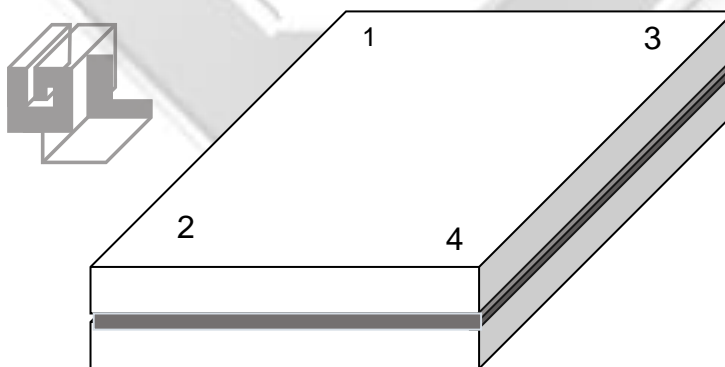
Date of test: 19 Jan 2021

Declared Nominal Thickness = 11.52 mm

Test	Measurement			Average	Sample Size	Result	SS 341 : 2001 (2012) Requirement for Glass
Dimensional Measurements	Width (mm)	860	860	860	860	Pass	(Table 2) <1200 ± 2 mm ≥1200 ± 3 mm
	Height (mm)	1900	1900	1900	1900	Pass	

Test	Measurement		Average	Result	SS 341 : 2001 (2012) Requirement for Glass
Thickness (mm)	1	9.8	9.7	Pass	(Clause 4.5) Table 1.1 Minimum 9.3 mm Maximum 10.4 mm
	2	9.7			
	3	9.7			
	4	9.7			

Note: Glass thickness limits specified for laminated glass exclude interlayer thickness.



Thickness (mm)

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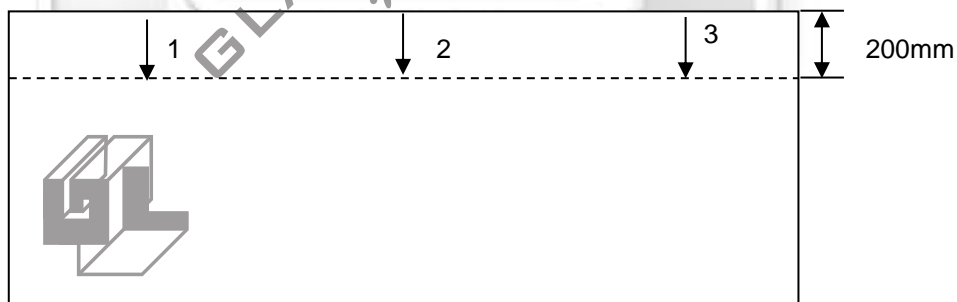
RESULTS (CONT'D):

Date of test: 19 Jan 2021

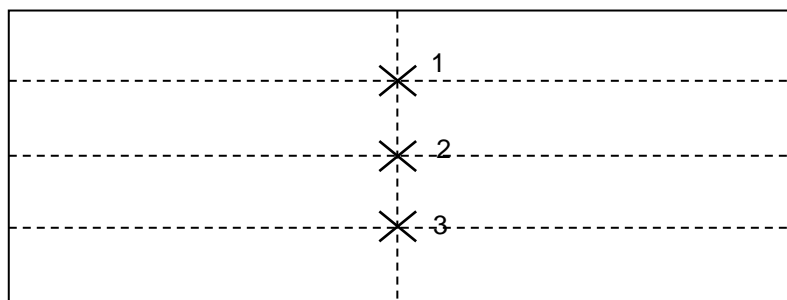
Test	Measurement		Average	Result	SS 341 : 2001 (2012) Requirement for Glass
Flatness – Localized warp over any 200 mm span (mm)	1	0.1	0.1	Pass	(Clause 4.10) ± 1.0 mm
	2	0.1			
	3	0.1			
Flatness – Overall bow and warpage (mm)	1	0.7	0.5	Pass	(Clause 4.10) ± 6.3 mm
	2	0.5			
	3	0.3			

Test	Measurement of opposite diagonals		Difference between diagonals of glass	Observation	SS 341 : 2001 (2012) Requirement for Glass (Clause 4.8)
Squareness (mm)	1	2085	0	Pass	Difference between the two diagonals does not exceed 10 mm
	2	2085			

Result: Pass



Flatness - Localized warp over any 200 mm span (mm)



Flatness – Overall bow and warpage (mm)

RESULTS (CONT'D):

3. Boil Test

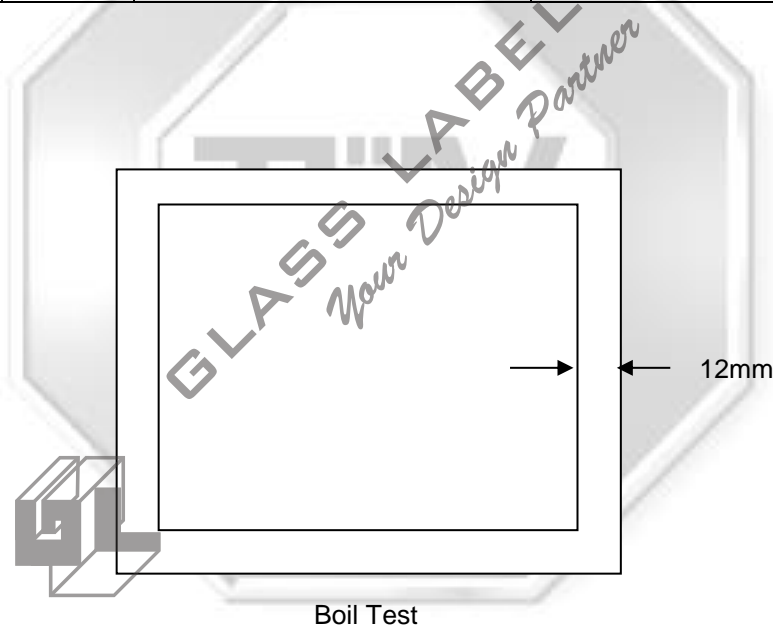
Date of Test: 19 Jan 2021

Time of glass immersion in water at 65.0 °C for 3 mins: 1:11 pm – 1:14 pm

Time of glass immersion in water at 100.0 °C for 120 mins: 1:14 pm – 3:14 pm

Test	Sample	Observation	SS 341 : 2001 (2012) Requirement for Glass (Clause 5.5)
Boil Test	S1	Pass	Glass may crack but no bubble or other defect shall develop more than 12 mm from the edge of the test specimen or from any cracks that have developed.
	S2	Pass	
	S3	Pass	

Result: Pass




Tyeah Wei Sheng
Testing Officer



Ong Khay Beng
Product Manager
Building Group
Real Estate and Infrastructure – Mechanical

PHOTO:



Photo 2: After Impact Test



PHOTO:

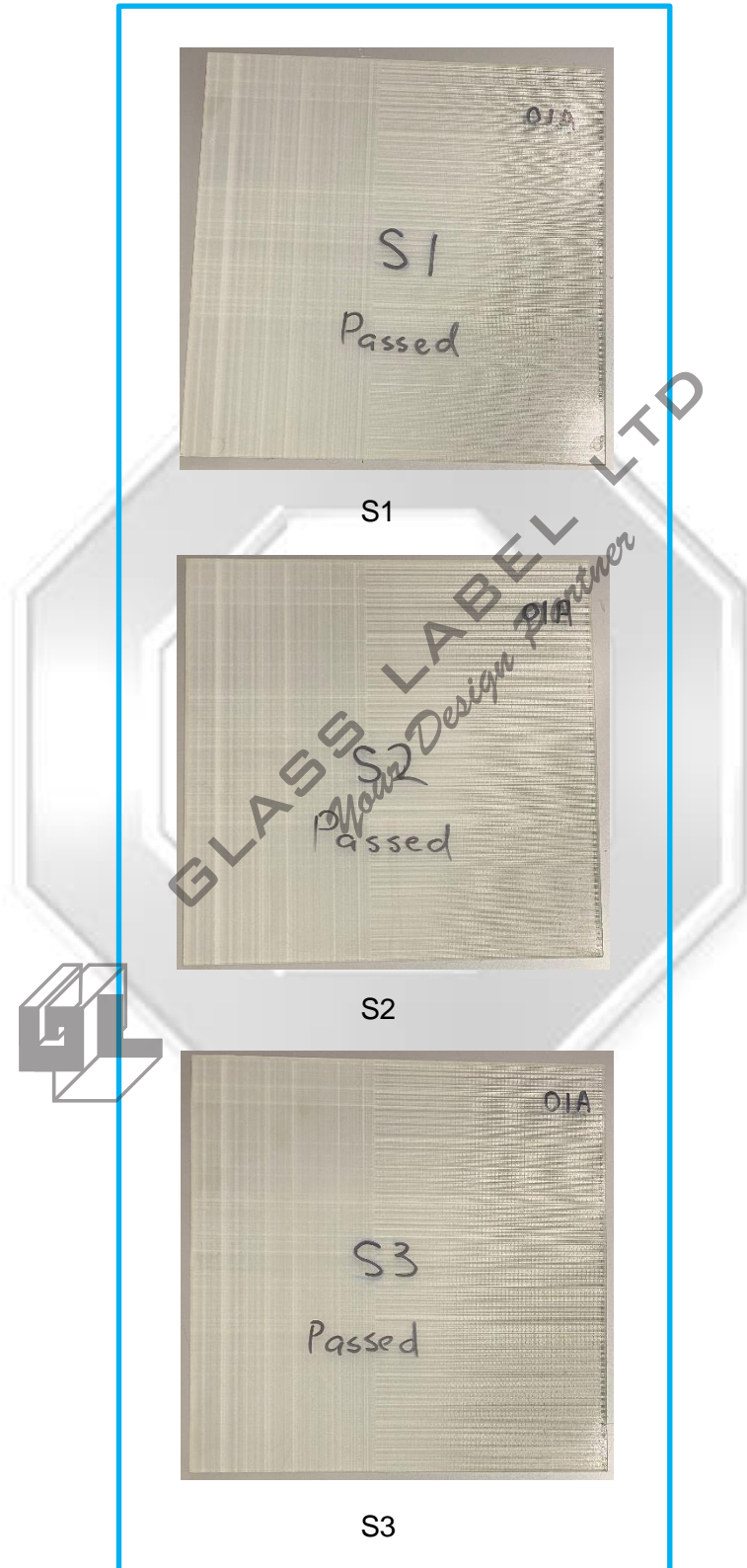


Photo 3: After Boil Test



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Effective 26 January 2021

