

JAS (Inspection & Testing) Ltd.

A

Test Report

For

The Flat Glass

To ASTM C1036-11

Further Process by

广东中融玻璃科技有限公司

Prepared By: JAS (Inspection & Testing) Ltd.

Date: 22nd October 2024

Our Ref.: J24-184-R01-241022



CONTENTS

1.	INTRODUCTION	1
2.	METHOD OF THE TESTS ON GLASS SPECIMEN	2
2.1	Measurement of Glass Thickness	2
2.2	Measurement of Squareness of Glass	2
2.3	Distortion of Glass	2
2.4	Visual Check for Defects of the Glass.....	2
3.	TEST RESULTS	3
3.1	6mm Clear Float Glass	3
3.2	8mm Clear Float Glass	4
3.3	10mm Clear Float Glass	5
3.4	12mm Clear Float Glass	6
3.5	15mm Clear Float Glass	7
3.6	19mm Clear Float Glass	8
4.	TEST RESULTS (SUMMARY).....	9
5.	COMMENT	10
9.	Appendix	
i.	Photos	



1. INTRODUCTION

Test Consultant	JAS (Inspection & Testing) Ltd.
Tester	Jin Cheng
Glass Manufacturer	广东中融玻璃科技有限公司
Address	肇庆高新区迎宾大道 6 号之二
Date of Specimen manufactured	18 th October 2024
Test Date	21 st October 2024
Selected Procedure	ASTM C 1036-11
Identification of the specimen	Clear Tempered Glass 6, 8, 10, 12, 15 & 19mm
Room Temperature	30°C
Humidity	80%
Condition period	4 hours



C1036 – 11^{e1}

TABLE 2 Dimensional Tolerances for Rectangular Shapes of Type 1—Transparent Flat Glass

Nominal Designation		Thickness Range				Length and Width Tolerance ^A				Squareness (D1–D2)			
SI Designation ^B mm	Traditional Designation	mm		in.		Cut Size		Stock Sheet		Cut Size		Stock Sheet	
		min	max	min	max	± mm	(± in.)	± mm	(± in.)	mm	(in.)	mm	(in.)
1.0	micro-slide	0.79	1.24	0.031	0.049	1.6	(¹ / ₁₆)	6.4	(¹ / ₄)	2.0	(⁵ / ₁₆)	3.0	(¹ / ₈)
1.5	photo	1.27	1.78	0.05	0.07	1.6	(¹ / ₁₆)	6.4	(¹ / ₄)	2.0	(⁵ / ₁₆)	3.0	(¹ / ₈)
2	picture	1.80	2.13	0.071	0.084	1.6	(¹ / ₁₆)	6.4	(¹ / ₄)	2.0	(⁵ / ₁₆)	3.0	(¹ / ₈)
2.5	single	2.16	2.57	0.085	0.101	1.6	(¹ / ₁₆)	6.4	(¹ / ₄)	2.0	(⁵ / ₁₆)	3.0	(¹ / ₈)
2.7	lami	2.59	2.90	0.102	0.114	1.6	(¹ / ₁₆)	6.4	(¹ / ₄)	2.0	(⁵ / ₁₆)	3.0	(¹ / ₈)
3 ^C	double, ¹ / ₈ in.	2.92	3.40	0.115	0.134	1.6	(¹ / ₁₆)	6.4	(¹ / ₄)	2.0	(⁵ / ₁₆)	3.0	(¹ / ₈)
4	⁵ / ₃₂ in.	3.78	4.19	0.149	0.165	1.6	(¹ / ₁₆)	6.4	(¹ / ₄)	2.0	(⁵ / ₁₆)	3.0	(¹ / ₈)
5	³ / ₁₆ in.	4.57	5.05	0.18	0.199	1.6	(¹ / ₁₆)	6.4	(¹ / ₄)	2.0	(⁵ / ₁₆)	3.0	(¹ / ₈)
6	¹ / ₄ in.	5.56	6.20	0.219	0.244	1.6	(¹ / ₁₆)	6.4	(¹ / ₄)	2.0	(⁵ / ₁₆)	3.0	(¹ / ₈)
8	⁵ / ₁₆ in.	7.42	8.43	0.292	0.332	2.0	(⁵ / ₁₆)	6.4	(¹ / ₄)	2.8	(⁷ / ₁₆)	6.0	(¹ / ₄)
10	³ / ₈ in.	9.02	10.31	0.355	0.406	2.4	(¹ / ₈)	6.4	(¹ / ₄)	3.4	(¹ / ₈)	6.0	(¹ / ₄)
12	¹ / ₂ in.	11.91	13.49	0.469	0.531	3.2	(¹ / ₈)	6.4	(¹ / ₄)	4.5	(¹ / ₈)	10.0	(³ / ₈)
16	⁵ / ₈ in.	15.09	16.66	0.595	0.656	4.0	(⁵ / ₁₆)	6.4	(¹ / ₄)	5.7	(¹ / ₈)	12.0	(¹ / ₂)
19	³ / ₄ in.	18.26	19.84	0.719	0.781	4.8	(⁹ / ₁₆)	6.4	(¹ / ₄)	6.8	(¹ / ₄)	14.0	(⁹ / ₁₆)
22	⁷ / ₈ in.	21.44	23.01	0.844	0.906	5.6	(⁷ / ₁₆)	6.4	(¹ / ₄)	7.9	(¹ / ₈)	16.0	(⁵ / ₈)
25	1 in.	24.61	26.19	0.969	1.031	6.4	(¹ / ₄)	6.4	(¹ / ₄)	9.0	(¹ / ₈)	18.0	(³ / ₄)

^A Length and width of cut size and stock sheets of flat glass include flares and bevels.

^B These designations apply only to ASTM international and may not reflect other international standards.

^C Within the 3.0 designation there are some applications that may require different thickness ranges such as DST. (Typical minimum thickness for DST is 0.120 in.)



2. METHOD OF THE TESTS ON GLASS SPECIMEN

The following tests were conducted of the glass specimen listed in section 4.

2.1 Measurement of Glass Thickness

All the thicknesses of glasses were scaled with a caliper whose accuracy is 0.01mm.

2.2 Measurement of Squareness of Glass

All the squareness of glass were checked by a tape measure.

2.3 Distortion of Glass

A zebra board was used for the distortion of the glass.

2.4 Visual Check for Defects of the Glass

Place the pane of glass to be examined vertically in front of the light box. Arrange the distance of observation from the glass, keeping the direction of observation normal to the glass surface.



3. TEST RESULTS

3.1 6mm Clear Float Glass

6mm (T) x 2000mm (L) x 1000mm (w)			
Specimen Number		Records	Comment
Thick- ness	Measured Thickness (mm)	5.96	Comply Dimensional Tolerances for Rectangular shapes of type 1 Transparent Flat Glass
	Allowable Thickness Range (mm)	5.56-6.20	
Size	Measured Length (mm)	2000	
	Measured Width (mm)	1000	
	Allowable (mm)	±1.6	
Squareness	Measured D1 (mm)	2236	
	Measured D2 (mm)	2235	
	Calculated D1-D2	1.0	
	Allowable (mm)	±2.0	
Shell Chip	Observed Shell Chip	None	Comply Q1 - Shell Chip size and distribution qualities of type 1 Transparent Flat Glass
	Chip depth = % of glass thickness	N.A.	
	Chip width = % of glass thickness	N.A.	
	Chip length = times of the Chip width	N.A.	
Distor- tion	Interference Angle	80 °	Comply Q1 - Distortion qualities of type 1 Transparent Flat Glass
	Allowable Vision, Q1≥60° ,Q2≥50°	Q1	
Point and Linear Blemish	Point Blemish (<0.5mm)	None	Comply Q1 – Point and Linear Blemish qualities of type 1 Transparent Flat Glass
	Point Blemish (≥0.5mm)	None	
	Linear Blemish (≤75mm)	None	
	Linear Blemish (>75mm)	None	
Result: Satisfactory Q1 Quality			

**3.2 8mm Clear Float Glass**

8mm (T) x 2000mm (L) x 1000mm (w)			
Specimen Number		Records	Comment
Thick- ness	Measured Thickness (mm)	7.92	Comply Dimensional Tolerances for Rectangular shapes of type 1 Transparent Flat Glass
	Allowable Thickness Range (mm)	7.42-8.43	
Size	Measured Length (mm)	1999	
	Measured Width (mm)	1000	
	Allowable (mm)	±2.0	
Squareness	Measured D1 (mm)	2236	
	Measured D2 (mm)	2236	
	Calculated D1-D2	0.0	
	Allowable (mm)	±2.8	
Shell Chip	Observed Shell Chip	None	Comply Q1 - Shell Chip size and distribution qualities of type 1 Transparent Flat Glass
	Chip depth = % of glass thickness	N.A.	
	Chip width = % of glass thickness	N.A.	
	Chip length = times of the Chip width	N.A.	
Distor- tion	Interference Angle	80 °	Comply Q1 - Distortion qualities of type 1 Transparent Flat Glass
	Allowable Vision, Q1≥60° ,Q2≥50°	Q1	
Point and Linear Blemish	Point Blemish (<0.5mm)	None	Comply Q1 – Point and Linear Blemish qualities of type 1 Transparent Flat Glass
	Point Blemish (≥0.5mm)	None	
	Linear Blemish (≤75mm)	None	
	Linear Blemish (>75mm)	None	
Result: Satisfactory Q1 Quality			



3.3 10mm Clear Float Glass

10mm (T) x 2000mm (L) x 1000mm (w)			
Specimen Number		Records	Comment
Thick- ness	Measured Thickness (mm)	9.75	Comply Dimensional Tolerances for Rectangular shapes of type 1 Transparent Flat Glass
	Allowable Thickness Range (mm)	9.02-10.31	
Size	Measured Length (mm)	2000	
	Measured Width (mm)	999	
	Allowable (mm)	±2.4	
Squareness	Measured D1 (mm)	2235	
	Measured D2 (mm)	2235	
	Calculated D1-D2	0	
	Allowable (mm)	±3.4	
Shell Chip	Observed Shell Chip	None	Comply Q1 - Shell Chip size and distribution qualities of type 1 Transparent Flat Glass
	Chip depth = % of glass thickness	N.A.	
	Chip width = % of glass thickness	N.A.	
	Chip length = times of the Chip width	N.A.	
Distor- tion	Interference Angle	75 °	Comply Q1 - Distortion qualities of type 1 Transparent Flat Glass
	Allowable Vision, Q1≥60° ,Q2≥50°	Q1	
Point and Linear Blemish	Point Blemish (<0.5mm)	None	Comply Q1 – Point and Linear Blemish qualities of type 1 Transparent Flat Glass
	Point Blemish (≥0.5mm)	None	
	Linear Blemish (≤75mm)	None	
	Linear Blemish (>75mm)	None	
Result: Satisfactory Q1 Quality			



3.4 12mm Clear Float Glass

12mm (T) x 2000mm (L) x 1000mm (w)			
Specimen Number		Records	Comment
Thick- ness	Measured Thickness (mm)	11.82	Comply Dimensional Tolerances for Rectangular shapes of type 1 Transparent Flat Glass
	Allowable Thickness Range (mm)	11.91-13.49	
Size	Measured Length (mm)	1999	
	Measured Width (mm)	1000	
	Allowable (mm)	±3.2	
Squareness	Measured D1 (mm)	2236	
	Measured D2 (mm)	2235	
	Calculated D1-D2	1	
	Allowable (mm)	±4.5	
Shell Chip	Observed Shell Chip	None	Comply Q1 - Shell Chip size and distribution qualities of type 1 Transparent Flat Glass
	Chip depth = % of glass thickness	N.A.	
	Chip width = % of glass thickness	N.A.	
	Chip length = times of the Chip width	N.A.	
Distor- tion	Interference Angle	75 °	Comply Q1 - Distortion qualities of type 1 Transparent Flat Glass
	Allowable Vision, Q1≥60° ,Q2≥50°	Q1	
Point and Linear Blemish	Point Blemish (<0.5mm)	None	Comply Q1 – Point and Linear Blemish qualities of type 1 Transparent Flat Glass
	Point Blemish (≥0.5mm)	None	
	Linear Blemish (≤75mm)	None	
	Linear Blemish (>75mm)	None	
Result: Satisfactory Q1 Quality			



3.5 15mm Clear Float Glass

Note 1 15mm (T) x 2000mm (L) x 1000mm (w)			
Specimen Number		Records	Comment
Thick- ness	Measured Thickness (mm)	14.77	Comply Dimensional Tolerances for Rectangular shapes of type 1 Transparent Flat Glass
	Allowable Thickness Range (mm)	14.09-15.66	
Size	Measured Length (mm)	2000	
	Measured Width (mm)	1001	
	Allowable (mm)	±4.0	
Squareness	Measured D1 (mm)	2237	
	Measured D2 (mm)	2235	
	Calculated D1-D2	2	
	Allowable (mm)	±5.7	
Shell Chip	Observed Shell Chip	None	Comply Q1 - Shell Chip size and distribution qualities of type 1 Transparent Flat Glass
	Chip depth = % of glass thickness	N.A.	
	Chip width = % of glass thickness	N.A.	
	Chip length = times of the Chip width	N.A.	
Distor- tion	Interference Angle	70 °	Comply Q1 - Distortion qualities of type 1 Transparent Flat Glass
	Allowable Vision, Q1≥60° ,Q2≥50°	Q1	
Point and Linear Blemish	Point Blemish (<0.5mm)	None	Comply Q1 – Point and Linear Blemish qualities of type 1 Transparent Flat Glass
	Point Blemish (≥0.5mm)	None	
	Linear Blemish (≤75mm)	None	
	Linear Blemish (>75mm)	None	
Result: Satisfactory Q1 Quality			

Note 1: The allowable requirements of 16mm were used for this 15mm glass, As there is no designation of 15mm specified in ASTM C1036 table 4.



3.6 19mm Clear Float Glass

19mm (T) x 2000mm (L) x 1000mm (w)			
Specimen Number		Records	Comment
Thick- ness	Measured Thickness (mm)	18.68	Comply Dimensional Tolerances for Rectangular shapes of type 1 Transparent Flat Glass
	Allowable Thickness Range (mm)	18.26-19.84	
Size	Measured Length (mm)	1999	
	Measured Width (mm)	1000	
	Allowable (mm)	±4.8	
Squareness	Measured D1 (mm)	2236	
	Measured D2 (mm)	2236	
	Calculated D1-D2	0	
	Allowable (mm)	±6.8	
Shell Chip	Observed Shell Chip	None	Comply Q1 - Shell Chip size and distribution qualities of type 1 Transparent Flat Glass
	Chip depth = % of glass thickness	N.A.	
	Chip width = % of glass thickness	N.A.	
	Chip length = times of the Chip width	N.A.	
Distor- tion	Interference Angle	70 °	Comply Q1 - Distortion qualities of type 1 Transparent Flat Glass
	Allowable Vision, Q1≥60° ,Q2≥50°	Q1	
Point and Linear Blemish	Point Blemish (<0.5mm)	None	Comply Q1 – Point and Linear Blemish qualities of type 1 Transparent Flat Glass
	Point Blemish (≥0.5mm)	None	
	Linear Blemish (≤75mm)	None	
	Linear Blemish (>75mm)	None	
Result: Satisfactory Q1 Quality			



4. TEST RESULTS (SUMMARY)

SPECIMEN	TEST	RESULTS	COMMENT
Clear Glass 6mm, 8mm, 10mm, 12mm, 15mm & 19mm	Thickness	All within allowable tolerance	Satisfactory
	Sizes	All within allowable tolerance	
	Squareness	All within allowable tolerance	
	Shell Chip	None	Q1
	Distortion	$\geq 60^\circ$	Q1
	Point Blemish	None	Q1
	Linear Blemish	None	Q1



5. COMMENT

The following listed glass that further processed by 广东中融玻璃科技有限公司 were satisfy the requirements set out in ASTM C1036:11 Dimension and Q1 qualities in Shell Chip, Distortion, Point Blemish and Linear Blemish.

Clear Glass: 6mm, 8mm, 10mm, 12mm, 15mm & 19mm

All the tests were satisfactorily conducted and conclusive.

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

Report by

Mr. Mark Lau
Test Engineer

Certified by



Mr. Sam Lau
Managing Director

Appendix

(i) Photo



**Glass Test
Photo Record**
广东中融玻璃科技有限公司

Report Ref.:
J24-184-R01-241022



Photo 1

The sizes of the glass specimen was checked.



Photo 2

The thickness of the specimen was checked.



Photo 3

The squareness of the specimen was checked.



Photo 4

The specimen was wipe-cleaned before inspection.



Photo 5

The specimen was checked for the blemish and shell chip in front of a light box

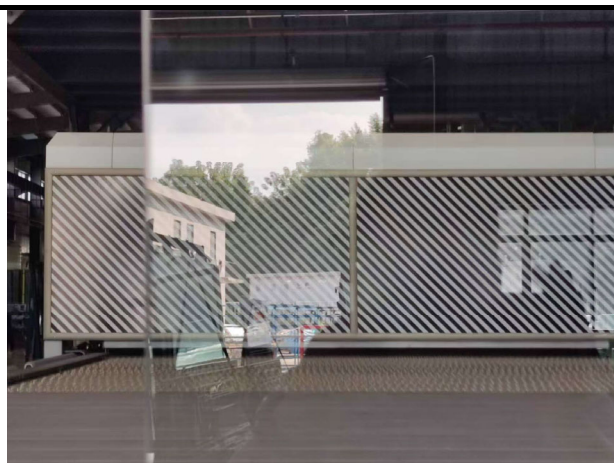


Photo 6

Distortion of the float glass was checked by an zebra broad.