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TEST REPORT

Report No.: WT2025E09A00189E

Entrusted by: Dongguan Qunan Plastic Industrial Co., Ltd.

Sample Name: 1.52 mm SGP Ionoplast Interlayer

Test Type: Entrustment Test

China Testing & Certification International Group Co., Ltd.

China National Safety Glass & Quartz Glass Test Center

WT2025E09A00189

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China Testing & Certification International Group Co., Ltd.
China National Safety Glass & Quartz Glass Test Center
Test Report

Report No.: WT2025E09A00189E

Sample Name	1.52 mm SGP Ionoplast Interlayer	**Test Type**	Entrustment Test
Entrusted by	Dongguan Qunan Plastic Industrial Co., Ltd.	**Trademark**	——
Manufacturer	Dongguan Qunan Plastic Industrial Co., Ltd.	**Sample Status**	Meet the requirements of testing
Reception Date	March 04, 2025	**Sample Quantity**	33 pieces
Production Date/ Batch No.	——	**Model/Size**	Shown on each data sheet
Test Method	Shown on each data sheet	**Test Date**	March 11, 2025 – April 03, 2025
Criterion	JC/T 2763-2023 *Ionoplast interlayer used for laminated glass* GB 15763.3-2009 *Safety glazing materials in building---Part 3: Laminated glass*		
Test Item	Thermal shrinkage, Light transmittance, Bump test, Haze, Boiling test, UV transmittance, Moisture content, Tensile stress at break & nominal tensile strain at break, Yellowness index, Tear strength, Residual strength after destruction, Shot-bag impact test		
Conclusion	*The test results of thermal shrinkage, light transmittance, bump test, haze, boiling test, UV transmittance, moisture content, tensile stress at break & nominal tensile strain at break, yellowness index, tear strength and residual strength after destruction conform to the requirements of JC/T 2763-2023. The test results of shot-bag impact test conform to the requirements of GB 15763.3-2009. The test results are shown on Page 2-13.* **Date of issue:** 2025-04-23 **(Seal)**		
Remark: Classification of shot bag impact test: II-1.			

Approved by: 王睿 **Checked by:** 丁任鑫 **Compiled by:** 范妍

Laboratory address: No.1 Guanzhuang Dongli, Chaoyang District, Beijing, 100024, P.R. China
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Test Item	Thermal shrinkage	
Test Method	JC/T 2763-2023 *Ionoplast interlayer used for laminated glass*, Section 6.4	
Requirement of Criterion	The requirement of JC/T 2763-2023: Thermal shrinkage at lengthwise direction≤3%.	
Test Result		
Sample No.	Thermal shrinkage /%	Average /%
1	2.0	1.7
2	2.0	
3	1.0	
Item Conclusion	Pass	
Remark	1. Test address: Guanzhuang; 2. Main test equipment: Q-43 DHG-9053A Electrothermal blowing dry box, J-52-1 150 mm Straight steel ruler; 3. Sample size: 150 mm×120 mm×1.52 mm.	

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Test Item	Light transmittance
Test Method	JC/T 2763-2023 *Ionoplast interlayer used for laminated glass*, Section 6.9, GB/T 2680-2021 *Glass in building—Determination of light transmittance, solar direct transmittance, total solar energy transmittance, ultraviolet transmittance and related glazing factors*
Requirement of Criterion	The requirement of JC/T 2763-2023: Light transmittance ⩾ 87%.

Test Result

Sample No.	Light transmittance/%
4	90.4
5	90.5
6	90.4
Item Conclusion	Pass
Remark	1. Test location: Guanzhuang; 2. Main test equipment: S-45 Lambda950 UV/VIS Spectrometer; 3. Sample size: 100mm × 100mm × (6 mm ultra-clear glass+1.52 mm interlayer +6 mm ultra-clear glass).

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Test Item	Bump test
Test Method	JC/T 2763-2023 *Ionoplast interlayer used for laminated glass*, Section 6.5
Requirement of Criterion	The requirement of JC/T 2763-2023: Bump value≥6.
Test Result	
Sample No.	**Bump value**
7	8
8	7
9	7
Item Conclusion	**Pass**
Remark	1. Test address: Guanzhuang; 2. Main test equipment: J-80 QJC-1 Knocking hammer; 3. Sample size: 300 mm×76 mm× [5 mm clear glass (tin side) +1.52 mm interlayer +(tin side) 5 mm clear glass].

<table>
<tr><td>Test Item</td><td>Haze</td></tr>
<tr><td>Test Method</td><td>JC/T 2763-2023 Ionoplast interlayer used for laminated glass, Section 6.10,
GB/T 2410-2008 Determination of the luminous transmittance and haze of transparent plastics</td></tr>
<tr><td>Requirement of Criterion</td><td>The requirement of JC/T 2763-2023:
<table>
<tr><td>Interlayer thickness/mm</td><td>Haze/%</td></tr>
<tr><td>0.76 or 0.89</td><td>≤0.6</td></tr>
<tr><td>1.14 or 1.52</td><td>≤1.2</td></tr>
<tr><td>2.28</td><td>≤1.8</td></tr>
</table></td></tr>
<tr><td colspan="2">Test Result</td></tr>
<tr><td>Sample No.</td><td>Haze/%</td></tr>
<tr><td>29</td><td>0.24</td></tr>
<tr><td>30</td><td>0.25</td></tr>
<tr><td>31</td><td>0.27</td></tr>
<tr><td>Item Conclusion</td><td>Pass</td></tr>
<tr><td>Remark</td><td>1. Test location: Guanzhuang;
2. Main test equipment: Q-07 SGH-2 Haze meter;
3. Sample size: 100 mm × 100 mm × (6 mm ultra-clear glass+1.52mm interlayer +6 mm ultra-clear glass);
4. Procedure A: Hazemeter, Illuminant A.</td></tr>
</table>

Test Item	Boiling test
Test Method	JC/T 2763-2023 *Ionoplast interlayer used for laminated glass*, Section 6.6
Requirement of Criterion	The requirement of JC/T 2763-2023: After the test, the edges of the sample should not miss interlayer, and the portions exceeding original edges 15 mm or cut edges 20 mm should not produce bubbles, delamination, turbidity, or discoloration.

Test Result

Sample No.	Status after boiling test
10	No missing interlayer. No bubbles, delamination, turbidity, or discoloration were found.
11	No missing interlayer. No bubbles, delamination, turbidity, or discoloration were found.
12	No missing interlayer. No bubbles, delamination, turbidity, or discoloration were found.
Item Conclusion	Pass
Remark	1. Test address: Guanzhuang; 2. Main test equipment: Q-09 ZF-68 Boiling chamber; 3. Sample size: 300 mm×300 mm× [5 mm clear glass (tin side) +1.52 mm interlayer +(tin side) 5 mm clear glass].

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Test Item	UV transmittance
Test Method	JC/T 2763-2023 *Ionoplast interlayer used for laminated glass*, Section 6.8, GB/T 2680-2021 *Glass in building—Determination of light transmittance, solar direct transmittance, total solar energy transmittance, ultraviolet transmittance and related glazing factors*
Requirement of Criterion	The requirement of JC/T 2763-2023: UV transmittance≤10
Test Result	
Sample No.	**UV transmittance /%**
4	0.3
5	0.3
6	0.3
Item Conclusion	Pass
Remark	1. Test address: Guanzhuang; 2. Main test equipment: S-45 Lambda950 UV/VIS Spectrometer; 3. Sample size: 100 mm × 100 mm × (6 mm ultra-clear glass+1.52 mm interlayer +6 mm ultra-clear glass).

Test Item	Moisture content	
Test Method	JC/T 2763-2023 *Ionoplast interlayer used for laminated glass*, Section 6.3	
Requirement of Criterion	The requirement of JC/T 2763-2023: Moisture content ⩽ 0.2%.	
Test Result		
Sample No.	**Moisture content/%**	**Average/%**
13	0.0732	0.09
32	0.0958	
33	0.0886	
Item Conclusion	Pass	
Remark	1. Test address: Guanzhuang; 2. Main test equipment: J-103 ML304T/02 Chemical balance, J-74 V20 Karl-fischer moisture meter; 3. Sample size: About 0.5 g.	

Test Item	Tensile stress at break & nominal tensile strain at break	
Test Method	JC/T 2763-2023 *Ionoplast interlayer used for laminated glass*, Section 6.12, GB/T 1040.1-2018 *Plastics-Determination of tensile properties — Part 1: General principles* GB/T 1040.3-2006 *Plastics-Determination of tensile properties — Part 3: Test conditions for films and sheets*	
Requirement of Criterion	The requirement of JC/T 2763-2023: Tensile stress at break≥32MPa, Nominal tensile strain at break≥230%.	
Test Result		
Sample No.	**Average of tensile stress at break /MPa**	**Average of nominal tensile strain at break /%**
14-18	33.2	304.9
Item Conclusion	**Pass**	
Remark	1. Test address: Guanzhuang; 2. Main test equipment: J-112 ETM504C Electromechanical universal testing machine, J-112-2 500 N Mechanical sensor, J-52-1 150 mm Straight steel ruler, J-54-1 25 mm Digital display micrometer; 3. Sample size: Type 5 sample (1.52mm).	

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Test Item	Yellowness index		
Test Method	JC/T 2763-2023 *Ionoplast interlayer used for laminated glass*, Section 6.7, HG/T 3862-2006(2017) *Plastics—Test method of Yellowness index*		
Requirement of Criterion	The requirement of JC/T 2763-2023: Yellowness index≤2		
Test Result			
Sample No.	**Yellowness index**	**Average**	**Standard deviation**
4	0.1	0.0	0.1
5	-0.1		
6	0.1		
Item Conclusion	Pass		
Remark	1. Test address: Guanzhuang; 2. Main test equipment: S-45 Lambda950 UV/VIS Spectrometer; 3. Sample size: 100 mm × 100 mm × (6 mm ultra-clear glass+1.52 mm interlayer +6 mm ultra-clear glass).		

Test Item	Tear strength
Test Method	JC/T 2763-2023 *Ionoplast interlayer used for laminated glass*, Section 6.13, GB/T 529-2008 *Rubber, vulcanized or thermoplastic — Determination of tear strength (Trouser, angle and crescent test pieces*
Requirement of Criterion	The requirement of JC/T 2763-2023: Tear strength ≥ 120 kN/m
Test Result	
Sample No.	**Average of tear strength/（kN/m）**
19~23	138.4(Average of tear strength after removing abnormal data)
Item Conclusion	Pass
Remark	1. Test address: Guanzhuang; 2.Main test equipment: J-112 ETM504C Electromechanical universal testing machine, J-112-2 500 N Mechanical sensor, J-54-1 25 mm Digital caliper (display); 3. Sample size: Unnicked angle sample, thickness 1.52 mm; 4. The tear strength deviation of sample No.21 is greater than 15%, removed.

Test Item	Residual strength after destruction
Test Method	JC/T 2763-2023 *Ionoplast interlayer used for laminated glass*, Section 6.15
Requirement of Criterion	The requirement of JC/T 2763-2023: After the test, the vertical downward displacement of midpoint of the free end of sample should not exceed 30 mm.
Test Result	
Sample No.	**Vertical downward displacement of midpoint of the free end of sample/mm**
24	15
Item Conclusion	Pass
Remark	1. Test address: Guanzhuang; 2.Main test equipment: J-49-3 3 m Steel tape, J-122 Residual strength testing platform after destruction; 3. Sample size: 800 mm×500 mm× [6 mm tempered glass (tin side) +1.52 mm interlayer + (tin side) 6 mm tempered glass].

Test Item	Shot-bag impact test
Test Method	GB 15763.3-2009 *Safety glazing materials in building---Part 3: Laminated glass*, Section 7.12
Requirement of Criterion	Requirement of GB 15763.3-2009: II-1: 3 group test pieces shall be tested at a height of 300mm, 750mm and 1200mm. After impact all the specimens shall not break and/or shall break safely. II-2: 2 group test pieces shall be tested at a height of 300mm and 750mm. After impact all the specimens shall not break or shall break safely. But another group test pieces shall be tested at height of 1200mm, any sample shall be break unsafely. III: 1 group test pieces shall be tested at a height of 300mm. After impact all the specimens shall not break and/or break safely. But another group test pieces shall be tested at height of 750mm, any sample shall be break unsafely. The requirements of the specimens which break safely: a) When breakage occurs with appearance of numerous cracks and fissures, but remains substantially in one piece and no tear or shear or opening develops within the vertical specimens through which a 76 mm diameter sphere can pass using a force of 25 N. b) When breakage occurs, the crack-free particles shall be selected within 3 minutes subsequent to the impact and shall weigh no more than the equivalent weight (300.0g) of 100cm^2 of the original specimen. The largest single particle shall weigh less than the mass (66.0g) equivalent to 44cm^2 of the original specimen.

Test Results

Sample No.	Thickness mm	Impact height /mm: 300		750		1200	
		Status after impact / weight of detached particles(g)/ weight of the largest	76mm ball can pass through or not	Status after impact / weight of detached particles(g)/ weight of the largest	76mm ball can pass through or not	Status after impact / weight of detached particles(g)/ weight of the largest particle(g)	76mm ball can pass through or not
25	13.21	———	———	———	———	Sample was broken with opening./1.7/0.6	Not pass through
26	13.25	———	———	———	———	Sample was broken without opening./0.9/0.4	Not applicable
27	13.27	———	———	———	———	Sample was broken with opening./2.3/0.9	Not pass through
28	13.29	———	———	———	———	Sample was broken without opening./1.2/0.8	Not applicable

Classification	II-1
Item Conclusion	Pass
Remark	1. Test address: Guanzhuang; 2. Main test equipment: J-76 HP-100 Digital pushing gauge; J-69 SPN202F Electronic balance; J-54-1 25mm Micrometer (Digital display); J-02 SBI-II Shot-bag impact machine; 3. Sample size: 1930 mm×864 mm× (6 mm glass+1.52 mm interlayer +6 mm glass).

End of the report

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