CNCGLASS
CNC Ucolin Interlayer Technology Co., Ltd.
SHENZHEN, GD, CHINA
Peter Lin · cnc@cncGlass.com · WhatsApp / Mobile +86 15013829504
WeChat wecan365 · www.cncglass.com

CNCGLASS TECHNICAL NOTE

CNCGLASS EVA Laminated Glass — Pendulum, Heat, Humidity and Radiation

EVA film laminated glass was evaluated for pendulum impact, high-temperature resistance, resistance to sudden temperature changes and temperature differentials, high humidity without condensation, and radiation resistance. The pendulum classification recorded on four 1938 mm × 876 mm × 13.02 mm specimens, all without breakage at a 1200 mm drop, is 1(B)1. High temperature, humidity without condensation, and radiation showed no visible change and no bubbles, delamination, haze or cloudiness. Luminous-transmittance deviations after 2000 h were 4 %, 5 % and 4 %. Under the sudden-temperature-change exposure, specimen 1 did not break; specimens 2 and 3 broke. Those three observations are reported as recorded; this note does not assign a pass or fail to that item.

This document is a CNCGLASS technical note and performance summary. It is not a third-party test certificate or a certificate of conformity, and it does not authorise the use of any third-party laboratory mark.

About this evaluation

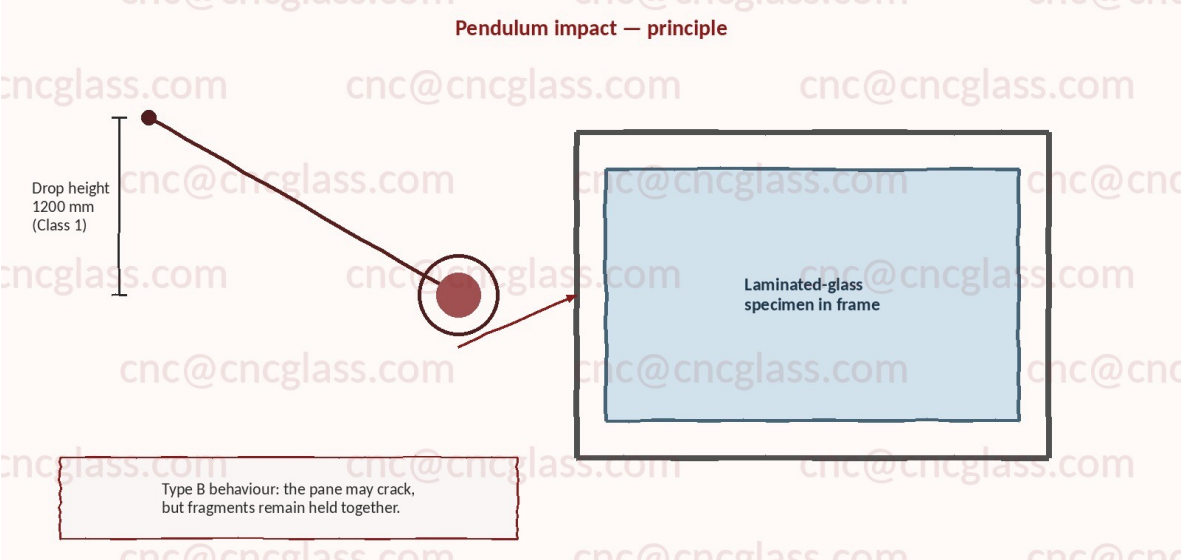
The product is identified only as EVA film laminated glass. Specimen thickness is not the same on every item, so each result is reported against the size and thickness stated for that item. No single glass-plus-interlayer stack is inferred from those thicknesses.

Pendulum impact

Pendulum impact was evaluated to EN 14449:2005 section 4.3.2.7 and EN 12600:2002, COR.1:2010. Four specimens, each 1938 mm × 876 mm × 13.02 mm, were tested from a drop height of 1200 mm. All four were recorded as “no breakage”. The classification is 1(B)1.

In plain terms, Class 1 is the highest drop-height class in EN 12600 and corresponds to a 1200 mm drop. Type B describes the breakage mode of laminated glass: the pane may crack, but the fragments remain held together by the interlayer. A 1(B)1 classification therefore means that the product was tested at the Class 1 height and exhibited Type B behaviour, with the same class applicable from both sides of the pane. In this evaluation the four specimens did not break at that height.

Item	Recorded value
Method	EN 14449:2005 section 4.3.2.7 and EN 12600:2002, COR.1:2010
Specimen size	1938 mm × 876 mm × 13.02 mm
Number of specimens	4
Drop height	1200 mm
Result on each specimen	No breakage
Classification	1(B)1



Principle of the pendulum impact test: a 1200 mm Class 1 drop against a framed laminated-glass specimen.

High-temperature resistance

High-temperature resistance was evaluated to EN 14449:2005 and EN ISO 12543-4:1998 on three specimens measuring 300 mm × 100 mm × 10.38 mm, held at 100 °C for 16 h. The recorded visual result on each specimen was “no visible change”.

Specimen	Size (mm)	Condition	Visual result
1	300 × 100 × 10.38	100 °C, 16 h	No visible change
2	300 × 100 × 10.38	100 °C, 16 h	No visible change
3	300 × 100 × 10.38	100 °C, 16 h	No visible change

Resistance to sudden temperature changes and temperature differentials

This item followed the method cited from EN 14449:2005 section 4.3.2.8 and EN 572-1:2004 section 6. Three specimens measuring 300 mm × 300 mm × 10.28 mm were held at 65 °C for 2 h and then immersed in 25 °C water within 3 s.

Specimen	Size (mm)	Condition	Result as recorded
1	300 × 300 × 10.28	65 °C for 2 h, then 25 °C water within 3 s	No break
2	300 × 300 × 10.28	65 °C for 2 h, then 25 °C water within 3 s	Broken
3	300 × 300 × 10.28	65 °C for 2 h, then 25 °C water within 3 s	Broken

Specimen 1 did not break. Specimens 2 and 3 broke. These three observations are reported exactly as recorded. This note does not treat the item as a pass, does not hide the two broken specimens, and does not invent an overall classification for sudden temperature change.

High humidity without condensation

High humidity without condensation was evaluated with reference to EN 14449:2005 and EN ISO 12543-4:1998 on three specimens measuring 300 mm × 100 mm × 10.38 mm, held at 80 °C and 80 % relative humidity for 24 h. The recorded visual result on each specimen was “no visible change”.

Specimen	Size (mm)	Condition	Visual result
1	300 × 100 × 10.38	80 °C, 80 % RH, 24 h	No visible change
2	300 × 100 × 10.38	80 °C, 80 % RH, 24 h	No visible change
3	300 × 100 × 10.38	80 °C, 80 % RH, 24 h	No visible change

Radiation resistance and luminous transmittance

Radiation exposure followed EN ISO 12543-4:2011 clause 7, method B, for 2000 h of ultraviolet exposure, on specimens measuring 300 mm × 75 mm. After exposure, bubbles, delamination, haze and cloudiness were not found on any of the three specimens.

Luminous transmittance was measured to ISO 9050:2003. Because the initial luminous transmittance was greater than 65 %, the change is reported as a percentage deviation in accordance with clause 7.5 of EN ISO 12543-4:2011.

Specimen	τv before (%)	τv after (%)	Deviation (%)
1	84.7	81.3	4
2	85.2	81.3	5
3	85.2	81.4	4

Commentary for laminated-glass use

Taken together, the pendulum, heat, humidity and radiation items describe an EVA laminated glass that holds together under a Class 1 pendulum blow, remains visually stable through 100 °C heat, 80 °C / 80 % RH humidity and 2000 h of method B radiation, and shows luminous-transmittance deviations of 4 % to 5 % — inside the conventional radiation allowance for a high-transmittance pane. The 1(B)1 pendulum classification is the result most often requested for building safety glazing, and the “no breakage” record at 1200 mm on four full-size specimens is a strong residual-integrity result.

The sudden-temperature-change item must be read separately and honestly. One of the three 300 mm × 300 mm × 10.28 mm specimens survived the 65 °C to 25 °C immersion; the other two broke. That is a thermal-shock observation on the glass plies, not a statement about interlayer adhesion, and it is not presented here as a passed item or as a classified performance. Specifiers who need a declared resistance to sudden temperature change should treat this record as incomplete for that purpose and should not infer a rating from the other, successful items. Specimen thicknesses also differ between items (13.02 mm for pendulum, 10.38 mm for heat and humidity, 10.28 mm for thermal shock), so the results should not be collapsed into a single undeclared makeup.

Contact Us

Brand: CNCGLASS

Company: CNC Ucolin Interlayer Technology Co., Ltd.
Address: SHENZHEN, GD, CHINA
Contact: Peter Lin
Email: cnc@cncGlass.com
WhatsApp / Mobile: +86 15013829504
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Website: www.cncglass.com