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CNCGLASS TECHNICAL NOTE

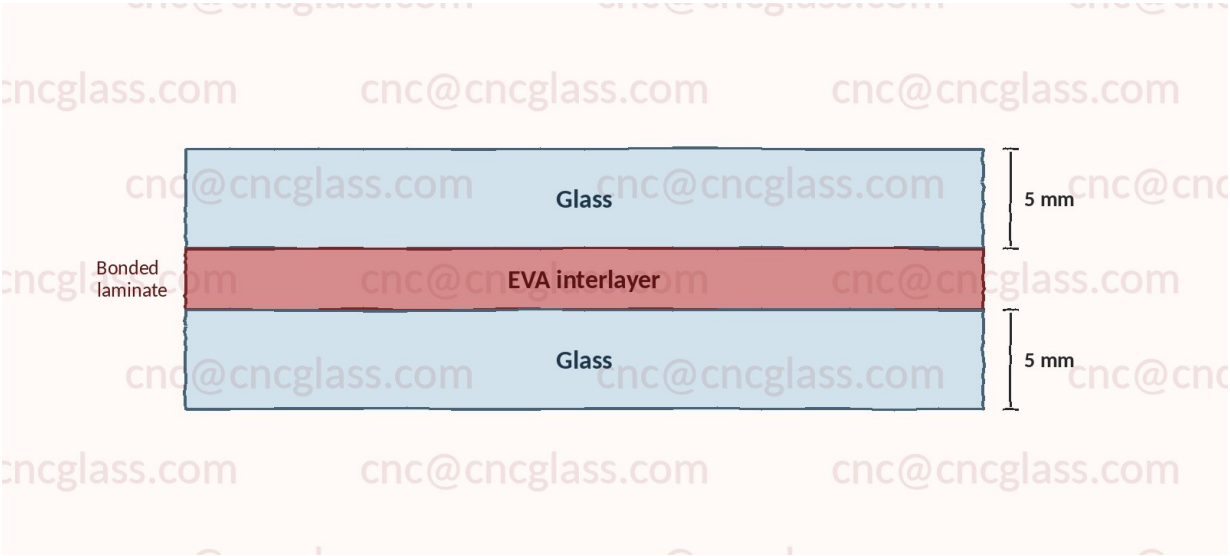
CNCGLASS EVA Laminated Glass — 5 mm + 5 mm, Radiation and Humidity

An EVA laminate made from two 5 mm glass plies was evaluated for radiation resistance and for humidity resistance with condensation, both to UNE-EN ISO 12543-4:1998. After 2000 h of radiation, luminous transmittance moved from 83.0 % to 82.1 %, from 83.8 % to 83.7 %, and from 84.3 % to 84.1 % on the three specimens, with no visual faults in the interlayer area. After two weeks of humidity with condensation, no bubbles or opaqueness were found in the interlayer area; bubbles were present only along the edge, at less than 15 mm from it. Both items were recorded as satisfactory against the cited specification.

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Construction

The construction consists of two 5 mm glass sheets bonded with an EVA interlayer. The interlayer thickness was not stated in the evaluation record and is therefore not quoted here. Radiation specimens measured 300 mm × 300 mm (three specimens). Humidity specimens measured 300 mm × 100 mm (three specimens).



Laminate construction: 5 mm glass / EVA interlayer / 5 mm glass. Interlayer thickness as produced; not stated in the evaluation record.

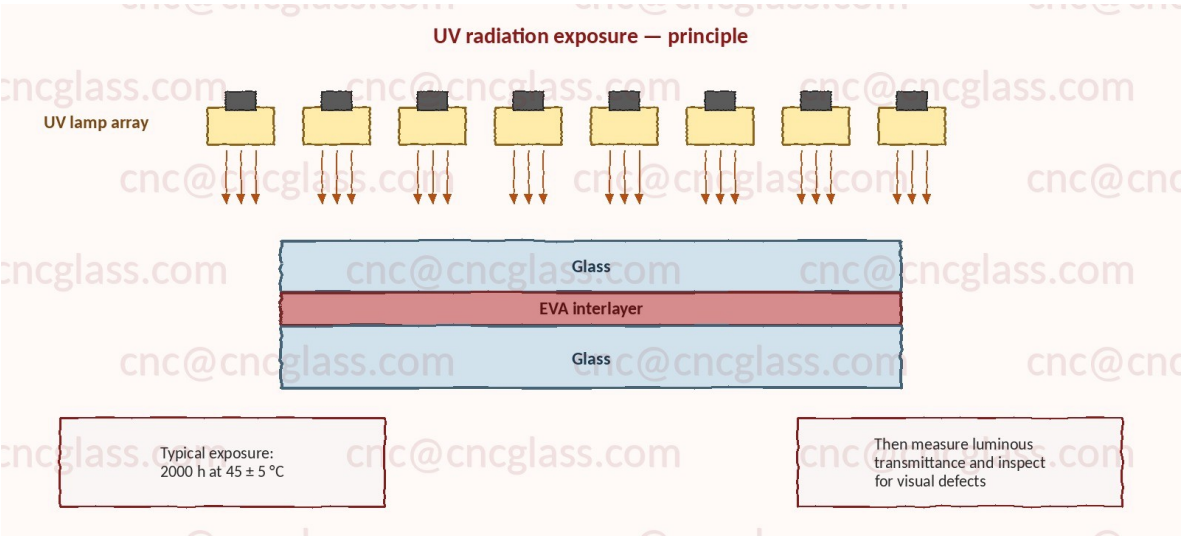
Radiation resistance

Radiation exposure followed UNE-EN ISO 12543-4:1998 for 2000 h, using sixteen lamps arranged in a 1 m × 1 m field, with the specimens at a distance of 1,100 mm and a temperature of 45 ± 5 °C. Luminous transmittance was obtained from the average transmission spectrum between 380 nm and 780 nm in accordance with UNE-EN 410:1998. The specimens were also inspected visually for bubbles, opaqueness and related faults.

The differences tabulated below are the relative differences as recorded. For specimen 1, the change from 83.0 % to 82.1 % corresponds to a relative difference of about 1.1 %, not the absolute difference of 0.9 %. After 2000 h, no faults were observed in the interlayer area of any specimen.

Specimen	τv before (%)	τv after (%)	Relative difference as recorded (%)
1	83.0	82.1	1.1
2	83.8	83.7	0.1
3	84.3	84.1	0.2

The cited specification is UNE-EN ISO 12543-3:1998 section 4.3: if the initial luminous transmittance is greater than 20 %, the change shall not exceed ± 10 %, and there shall be no visual defects (bubbles, delamination or opaqueness). On that basis the recorded result was satisfactory.



Principle of the ultraviolet lamp-array exposure used to assess radiation resistance of the EVA laminate.

Humidity resistance with condensation

Humidity exposure with condensation followed UNE-EN ISO 12543-4:1998. The three specimens were held vertically in a climatic chamber for two weeks at 50 ± 2 °C and 95 % relative humidity, with condensation on the surface allowed. They were then cooled at room temperature and inspected. No bubbles or opaqueness were found in the interlayer area of any of the three specimens. Bubbles were present only along the edge, at less than 15 mm from it. The recorded result was satisfactory.

Commentary for laminated-glass use

A two-ply 5 mm + 5 mm EVA laminate is a common architectural thickness. This evaluation does not record the interlayer gauge, so the results should be read as applying to the EVA-bonded 5 mm + 5 mm construction as produced, not as a licence to assume any particular film thickness. What the numbers do show is a very stable clear pane: initial luminous transmittances of 83.0 % to 84.3 % moved by only 0.1 % to 1.1 % relatively after 2000 h, far inside the ± 10 % allowance that applies when the initial value exceeds 20 %.

The humidity path is the condensed-humidity exposure of UNE-EN ISO 12543-4:1998 — two weeks at 50 °C and 95 % RH, with condensation permitted — which is intended to reveal moisture-driven defects at the edge and in the interlayer area. Bubbles confined to a band less than 15 mm from the edge, with a clear interlayer area, are consistent with a sound bond in the sight area of the pane. CNCGLASS can specify this 5 mm + 5 mm EVA laminated glass on that durability basis; projects that need a declared interlayer thickness should confirm the gauge actually to be produced.

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