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Polyvinyl Butyral Interlayer for Laminated Glass

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Polyvinyl Butyral Interlayer for Laminated Glass

1 Application Scope

This Standard specifies the classification and specifications, requirements, test methods, inspection rules and marking, packaging, transportation and storage of polyvinyl butyral interlayer for laminated glass (hereinafter referred to as PVB interlayer).

This Standard applies to interlay for laminated glass for automotive, construction and other industries, which is made with the extrusion tape casting method with polyvinyl butyral resin as the main material.

2 Normative References

The following referenced documents are indispensable for the application of this document. For dated references, only the edition dated applies to this document. For undated references, the latest edition of the referenced document (including any amendments) applies to this Standard.

GB/T 1040.3-2006, *Plastics – Determination of Tensile Properties – Part 3: Test Conditions for Films and Sheets*

GB/T 2410-2008, *Determination of the Luminous Transmittance and Haze of Transparent Plastics*

GB/T 2828.1-2012, *Sampling Procedures for Inspection by Attributes – Part 1: Sampling Schemes Indexed by Acceptance Quality Limit (AQL) for Lot-by-lot Inspection*

GB/T 2918-1998, *Plastics – Standard Atmospheres for Conditioning and Testing*

GB/T 5137.3-2002, *Test Methods of Safety Glazing Materials Used on Road Vehicle – Part 3: Test Methods for Resistance to Radiation, High Temperature, Humidity Fire and Simulated Weathering*

GB/T 6672-2001, *Plastics Film and Sheeting – Determination of Thickness by Mechanical Scanning*

GB/T 6673-2001, *Determination of Length and Width of Plastics Film and Sheeting*

GB 11614-2009, *Flat Glass*

GB/T 12027-2004, *Plastics – Film and Sheeting – Determination of Dimensional Change on Heating*

5.4.3.4 Test result

Measure the front and back faces of PVB film; use the arithmetic mean value of each group of samples as test result. The deviation between measured value and mean value of each sample shall not be greater than 15%. Those greater than 15% shall be discarded; the residual samples shall not be less than 50% of the original sample number, or else, the test shall be conducted once again.

5.4.4 Dimensional change

As specified in GB/T 12027-2004. Lay sample flat on a tray covered with talcum powder; place into a constant temperature oven at $(65 \pm 1) ^\circ\text{C}$; take out after $15 \text{ min} \pm 30 \text{ s}$.

5.4.5 Tensile strength and tensile strain at break

As specified in GB/T 1040.3-2006. Use samples of type 5 and take samples longitudinally. The test speed is $(100 \pm 10) \text{ mm/min}$; the gauge length is $(25 \pm 0.25) \text{ mm}$.

5.4.6 Knocking value

5.4.6.1 Preparation of samples

5.4.6.1.1 Take 2 pieces of sheet glass of $300 \text{ mm} \times 300 \text{ mm} \times 3 \text{ mm}$ which meet GB/T 11614-2009; use water to wash them; dry them for use.

5.4.6.1.2 Take 1 piece of PVB film of $305 \text{ mm} \times 305 \text{ mm}$; put it between 2 pieces of sheet glass; press them fit on a press at temperature $(128 \pm 1) ^\circ\text{C}$ and pressure $(1.20 \pm 0.05) \text{ MPa}$; take out when the temperature decreases to $45 ^\circ\text{C}$ while maintaining the pressure after maintaining the temperature and pressure for $5 \text{ min} \pm 20 \text{ s}$; cut into 2 pieces of sample of $300 \text{ mm} \times 50 \text{ mm}$ for use.

5.4.6.2 Treatment of samples

Store prepared samples in a cryogenic box at $(-18 \pm 1) ^\circ\text{C}$ for 2 h before taking out.

5.4.6.3 Test

Place the samples taken out from the cryogenic box immediately on a support forming a 30° angle with horizontal desk surface; use a steel ball peen hammer of 0.45 kg which meets QB/T 1290.2-2010 to knock samples, until the glass on the surface of samples are completely broken. The test shall be completed within 3 min.

5.4.6.4 Test result

Determine the knocking value of PVB film in accordance with Table 4. The test result is expressed as the arithmetic mean value of the knocking values of two samples.

where

Z – radiation resistance;

Y – light transmittance after irradiation; and

X – light transmittance before irradiation.

6 Inspection Rules

6.1 Batching

The products are acceptable by batch. PVB films of the same type and the same specification which are made of the same material through the same series process. Each batch shall not be more than 50 t; if the output of one week's continuous production is less than 50 t, then the output of one week is deemed as one batch.

6.2 Inspection

6.2.1 Ex-factory inspection

The items for ex-factory inspection include appearance, dimensions, mass fraction of volatile matter, yellow indexes, roughness, dimensional change, tensile strength, tensile strain at break, knocking value, light transmittance and haze.

6.2.2 Type inspection

Type inspection includes all items required by this Standard. Type inspection shall be carried out in one of the following cases:

- a) during the trial-manufacture finalization and evaluation of a new product or an old product which will be manufactured in another factory;
- b) when there is any major change in equipment, raw material or technology after mass production, which may influence product properties;
- c) once at least each year during normal production;
- d) when the production is resumed after production halt for 6 months or more;
- e) when there is any significant difference between ex-factory inspection results and last type inspection results; and
- f) when a product quality supervision department or competent department asks for type inspection.

6.3 Sampling scheme

7.1.1 Product marking

The package of each roll of PVB film shall be marked with distinctive product marking, which shall include the following content:

- a) product name;
- b) batch number;
- c) product category and specifications; and
- d) product net weight, length or area.

7.1.2 Certificate of compliance

Each batch of products shall be accompanied with a certificate of compliance. The marking of compliance certificate shall include the following content:

- a) product name;
- b) product category and specifications;
- c) batch number;
- d) a reference to this Standard;
- e) locations of point defects;
- f) locations and quantity of headers;
- g) manufacturer name and address; and
- h) inspection date and inspector's signature.

7.1.3 Marking of packing case

Packing case shall be marked with the words or symbols, such as protection from moisture, shock or sunlight exposure.

7.2 Packaging

Different layers of PVB film in rolls are preferably isolated with PE film; aluminium foil-plastics film bags are used for vacuum packaging; then they are enclosed in packing cases. The compound bags shall be sealed without damage; the packing cases shall be solid.

7.3 Transportation

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