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PEOPLE'S REPUBLIC OF CHINA**

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**Safety glazing materials in building Fire-resistant glass
(English Translation)**

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1 Scope

This standard specifies the product classification, technical requirements, test methods, inspection rules, signs, product's user instruction, packaging, transportation, storage and other requirements for fire-resistant glass in building (hereinafter referred to as fire-resistant glass).

This standard applies to fire-resistant glass for industrial and civil buildings.

2 Normative references

The provisions contained in the following standards constitute provisions of this standard through reference in this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision and parties using this standard shall explore the possibility of using the latest version of the standard listed below.

GB/T 1216-1985 Micrometers (neq ISO 3611.1978)

GB/T 2680-1994 Determination of light transmittance, solar direct transmittance, total solar energy transmittance and ultraviolet transmittance for glass in building and related glazing factors (neq ISO 9050.1990)

GB 4871-1995 Sheet glass

GB/T 5137.3-1996 Road vehicles - Safety glazing materials - Test methods for resistance to radiation, high temperature, humidity, fire and simulated weathering (eqv ISO 3917.1992)

GB/T 9963-1998 Tempered glass (eqv JISR 3206.1989)

GB 11614-1999 Float glass (neq JISR 3202.1996.EN 572-2.1994)

GB/T 12513-1990 Fire-resistance tests - Glazed elements (eqv ISO 3009.1976)

3 Definition

This standard uses the following definition

3.1 Integrity of fire-resistant

Under standard fire resistance test conditions, the ability of a building partition component to prevent flame penetration or the appearance of flames on the backside of the fire for a certain period of time, when one side is exposed to fire.

3.2 Insulation of fire-resistant

Under standard fire resistance test conditions, the ability of building partition components to prevent the temperature of the back-fire surface from exceeding the specified value within a certain period of time, when a certain side is exposed to fire.

3.3 Irradiance

Under standard fire resistance test conditions, the thermal radiation illumination value at a certain distance and within a certain period of time from the back-fire surface of the glass.

4.1.1 Composite fire-resistant glass (FFB). A special glass composed of two or more

layers of glass or a layer of glass and organic materials, AND meets the corresponding fire-resistant grade requirements.

4.1.2 Single piece fire-resistant glass (DFB). Special glass composed of a single layer

of glass and meeting the requirements of the corresponding fire resistance grade.

4.2 Fire-resistant glass is divided into three categories. A, B, C according to fire resistance.

Category A fire-resistant glass. Fire-resistant glass that meets both fire-resistant integrity and fire-resistant and thermal insulation requirements.

Category B fire-resistant glass. Fire-resistant glass that meets both fire-resistant integrity and irradiance requirements.

Category C fire-resistant glass. Fire-resistant glass that meets fire-resistant integrity requirements.

The above three categories of fire-resistant glass can be divided into level I, level II, level III,

level IV according to the fire resistance grade.

4.3 Marking examples

A piece of composite fire-resistant glass, which has a nominal thickness of 15 mm, fire resistance category A, fire resistance level I, is marked as follows.

5.10.1 Impact resistance of composite fire-resistant glass

Carry out the test according to 6.9. After the test, the glass shall meet any of the following a) and b).

- a) The glass is not damaged.
- b) If the glass is damaged, the steel ball shall not penetrate the specimen.

5.10.2 Impact resistance of single piece fire-resistant glass

Carry out the test according to 6.9. The glass shall not be broken after the test.

5.10.3 Fragment status of single piece fire-resistant glass

When tested in accordance with 6.10, the number of fragments in each sample within a 50 mm x 50 mm area shall exceed 40; the fragment crossing the area boundary is counted as half piece. A small number of long strip fragments are allowed, but their length shall not exceed 75 mm, meanwhile the ends are not blade-shaped. The angle formed by the long strip fragment extending to the edge of the glass and the edge of the glass shall not be greater than 45°.

6.1 Measurement of size and thickness

Dimensions are measured using a steel ruler or steel tape measure, which has a minimum graduation of 1 mm. The thickness is measured at the midpoint of the four sides of the glass, using a micrometer that complies with GB 1216 or an instrument of equivalent precision. The measurement results are expressed as the average of the four points; the value is accurate to 0.1 mm.

6.2 Appearance quality

Under good natural light and diffuse lighting conditions, conduct a visual inspection at a distance of 600 mm from the front of the glass.

6.3 Fire resistance

Mount the entire piece of fire-resistant glass in a fixed frame, to perform a fire resistance test according to GB 12513. The height of the fire-resistant glass shall not be less than

1100 mm; the width shall not be less than 600 mm. The specimen shall be installed vertically.

The fixed frame and installation method used in the test shall be the same as the structure used in the actual project; the structure and installation method of the fixed frame shall be recorded in drawings or other equivalent methods.

6.4 Curvature

The glass shall be placed vertically; the ruler shall be placed horizontally close to the surface of the specimen for measurement. In the case of a bow, it is expressed as the percentage of the height of the arc to the length of the chord. In the case of a wave, it is expressed as the percentage of the ratio -- of the height from the trough to the crest TO the height from the crest to the crest (or from trough to trough).

6.5 Transmittance

Inspection shall be carried out according to the method specified in Article 3.1 of GB/T 2680-1994.

6.6 Heat resistance of composite fire-resistant glass

6.6.1

Use 3 specimens which have dimensions of 300 mm x 300 mm. Before the test, the specimen shall be placed vertically at room temperature for more than 6 hours, to check the appearance quality and record the defects in detail.

6.6.2 Place the specimen vertically into the constant temperature box. Maintain a

constant temperature of $50\text{ }^{\circ}\text{C} \pm 2\text{ }^{\circ}\text{C}$ for 6 hours. Then take it out.

6.6.3 Place the removed specimen vertically for more than 6 hours at room temperature, to check its appearance quality and light transmittance.

6.6.4 After the test, if the appearance quality of 3 specimens meets the requirements, it is considered qualified; if the appearance quality of only 1 specimen meets the requirements, it is deemed unqualified. When 2 specimens meet the requirements, 3 more new specimens are tested. When all 3 specimens meet the requirements, they are qualified.

6.7 Cold resistance of composite fire-resistant glass

6.7.1

Use 3 specimens which have dimensions of 300 mm x 300 mm. Before the test, the specimen shall be placed at room temperature for more than 6 hours, to check the appearance quality and record the defects in detail.