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Smart glazing used on road vehicles - Part 1: Organic electrochromic glazing

汽车用智能变色玻璃 第1部分：有机电致变色玻璃

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1 Scope

This document specifies the requirements, test methods, inspection rules, packaging, transportation and storage of organic electrochromic glazing used on road vehicles.

This document applies to the design, production and delivery of smart electrochromic glazing products used on road vehicles that use organic materials as the electrochromic medium.

2 Normative References

GB/T 5137.2-2020

GB/T 5137.4

GB/T 11942

GB/T 30142

JJF 1615

3 Terms and Definitions

The terms and definitions defined in JC/T 2631-2021, and the following are applicable to this document.

3.1 Smart glazing used on road vehicles

A glazing product used on road vehicles that, under the influence or excitation of an external energy field, can alter its optical properties, such as transmission, reflection or absorption in specific wavelength bands.

NOTE. the absolute value of the visible light transmittance difference corresponding to the change from bright to dark or from dark to bright is 80% of the openings of bleached and colored (3.7).

4.1 Appearance Quality of Electrochromic Area

The appearance quality of the electrochromic area of the electrochromic glazing in both the colored and bleached states shall meet the requirements of Table 1.The corresponding

state or appearance characteristics required for different locations after assembly shall be agreed upon by the supply-side and the demand-side.

4.2.1 Visible light transmittance and its deviation

When the nominal value is explicitly stated, the absolute value of the difference between the visible light transmittance in the bleached state and the explicitly stated nominal value shall not exceed 5%, and the absolute value of the difference between the visible light transmittance in the colored state and the explicitly stated nominal value shall not exceed 2%, and the visible light transmittance in the colored state shall be less than 5%;

When the nominal value is not explicitly stated, the absolute value of the difference between the visible light transmittance of any specimen in the bleached state and the average value shall not exceed 4%, the absolute value of the difference between the visible light transmittance in the colored state and the average value shall not exceed 1%, and the visible light transmittance in the colored state shall be less than 5%;

For products with special applications, the visible light transmittance in the colored state can be agreed upon by the supply-side and the demand-side.

4.2.2 Uniformity of visible light transmittance

The absolute value of the maximum difference in visible light transmittance at different test points shall not exceed 2% in both the colored and bleached states.

4.2.3 Contrast ratio

The contrast ratio shall not be less than 5.If there are special requirements, it shall be agreed upon by the supply-side and the demand-side.

4.2.4 Deviation of openings of bleached and colored

The absolute value of the difference between the openings of bleached and colored and the explicitly stated nominal value shall not exceed 2%; if no explicitly stated nominal value is provided, it shall be agreed upon by the supply-side and the demand-side.

4.2.5 Ultraviolet transmittance

The ultraviolet transmittance of both the colored and bleached states shall not exceed 1.0%.

4.3 Color Uniformity of Electrochromic Area

It is expressed as color difference deltaE *???? in the CIELAB uniform color space. The single-piece reflective color difference, batch reflective color difference, single-piece transmission color difference, and batch transmission color difference in both the colored

and bleached states shall

4.9 Irradiation Durability

After the test, the specimen shall be able to maintain normal discoloration ability. The appearance quality of the electrochromic area shall meet the requirements of 4.1, and there shall be no significant color change, bubbling or delamination defects outside the printing masking area. Compared with before the test, the decrease in visible light transmittance of the specimen in the bleached state shall not exceed 5%; the increase in visible light transmittance of the specimen in the colored state shall not exceed 5%.

4.10 Electromagnetic Shielding Effectiveness

For electromagnetic waves with frequencies of 758 MHz ~ 788 MHz, 2,300 MHz ~ 2,400 MHz, 2,515 MHz ~ 2,675 MHz, 3,400 MHz ~ 3,600 MHz, and 4,800 MHz ~ 4,900 MHz, the shielding effectiveness shall not exceed 50 dB.

If necessary, the supply-side and the demand-side shall agree on whether to conduct shielding effectiveness tests at other frequencies.

5.1.1 Requirements for test pieces

If the inspection item does not affect the performance of the specimen, then the specimen can be used to continue testing for other items. When using specially made test pieces, the test pieces shall be of the same structure, material, and manufactured under the same process conditions as the product.

background conditions, vertically place the specimen and visually observe at a distance of 600 mm from the specimen, and record any visible appearance defects. The dimensions of point- like defects and the width of line defects are measured using a reading microscope with a division value of 0.01 mm. The length of line defects and the spacing between point-like defects are measured using a steel ruler with a division value of 1 mm or a measuring instrument with an equivalent accuracy.

5.3.1.1 Specimen

Use the product or test pieces as the specimens. The size of the test pieces shall be 600 mm ? 600 mm, and 3 pieces shall be used.

5.3.1.2 Test device

The test device shall conform to the provisions of 5.3 in GB/T 5137.2-2020.

5.3.1.3 Test procedures

Connect the specimen to the electrochromic control system, and in accordance with its