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GB 48005-2026

Safety technical specification of glazing materials for rolling stock

轨道车辆用玻璃安全技术要求

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1 Scope

GB 48005 is the first Chinese national standard devoted to the glass fitted to rail vehicles, and it arrives as mandatory rather than recommended. It specifies the safety technical requirements for that glazing, the test methods used to verify them, and the determination rules that decide whether a given product conforms. It applies to windscreen glass, bodyside window glass and interior glass in both the cab and the passenger compartments of railway and urban rail transit vehicles. Seven normative annexes carry the individual determination rules and the test procedures, covering properties such as light transmittance, optical distortion, secondary image deviation, electrical performance and resistance to impact, including soft body impact. Because no previous national standard covered this ground, a glazing supplier or rolling stock builder cannot map its existing qualification files onto it: conformity has to be established against this text before the 1 August 2026 effective date.

This document specifies the safety technical requirements, test methods, and judgment rules for glass used in rail vehicles. This document applies to the front windows, side windows, and interior windows of the driver's cab and passenger compartments of railway and urban rail transit vehicles.

4.1 General Rules

4.1.1 The windshield should be made of laminated glass or electrically heated glass, and the side windows should be made of insulated glass, laminated glass, or tempered glass. The interior... Tempered glass or laminated glass should be used.

4.1.2 Safety technical requirements include requirements for visibility safety, electrothermal safety, mechanical safety, and fragmentation safety. Safety requirements for escape and rescue. The windshield, side windows, and interior windows should meet the safety technical requirements listed in Table 1.

4.2 Field of vision safety performance

4.2.1 Light transmittance The light transmittance of the main field of vision area of the front windshield should not be less than 70%.

4.2.2 Optical Distortion The maximum optical distortion of the windshield should not exceed the value specified in Table 2.

4.2.3 Secondary image deviation The deviation of the secondary image on the front windshield from the maximum value should not exceed the value specified in Table 3.

4.3 Electrical heating safety performance

4.3.1 Insulation Resistance The insulation resistance between the insulating parts of the electrically heated glass should not be less than 50MOmega.

4.3.2 Resistance to thermal shock During the test as described in 5.3.2, the electrically heated glass should not exhibit arcing. After the test, the electrically heated glass should not show signs of delamination, bubbles, or other defects. Defects. Resistance or power should meet design requirements, and field of view safety performance should meet requirements 4.2.

4.3.3 Resistance to electric heat During the test as described in 5.3.3, the electrically heated glass should not exhibit arcing. After the test, the electrically heated glass should not show signs of delamination, bubbles, or other defects. Defects. Resistance or power should meet design requirements, and field of view safety performance should meet requirements 4.2.

4.4 Mechanical safety performance

4.4.1 Resistance to missile impact After the test in 5.4.1, the impactor should not penetrate the windshield glass specimen, and the specimen should remain within the frame.

4.4.2 Splash Protection Products with a splash-proof design should undergo this test. After testing according to 5.4.2, the splashes generated by the impact should not remain on the

surface of the tested aluminum foil. Marks were left on the surface.

4.4.3 Resistance to soft impact The side windows and interior glass of rail vehicles (excluding luggage rack glass) shall be subjected to soft impact resistance test at an impact height of 1.2m. Side window glass. When laminated or insulated glass is used, after testing according to 5.4.3, a soft object should not penetrate the side window glass sample; when tempered glass is used... If the glass breaks after the test according to 5.4.3, the total mass of the 10 largest fragments of each sample should not exceed the area equivalent to 65 cm^2. The quality of the glass is such that any glass fragments without penetrating cracks retained within the frame should not exceed 120mm in length. Interior glass. When laminated glass is used, after testing according to 5.4.3, soft materials should not penetrate the laminated glass; when tempered glass is used, test according to 5.4.3. After testing, if the glass shatters, the total mass of the 10 largest fragments from each sample should not exceed the mass equivalent to an area of 65 cm^2. The length of any glass fragment without penetrating cracks within the frame should not exceed 120 mm.

4.4.4 Resistance to steel ball impact

4.4.4.1 Side window glass After the test in 5.4.4, the side window glass should not be penetrated by the steel ball.

4.4.4.2 Interior glass 4.4.4.2.1 For laminated glass, after testing according to 5.4.4, it shall meet the following requirements.

a) The steel ball cannot penetrate the specimen;

b) The mass of the fragments peeled off from the impact side is less than 20g.

Note. This test is not required for tempered laminated glass, curved laminated glass, and laminated glass with more than three original glass sheets. 4.4.4.2.2 For tempered glass, the sample should not be damaged.

4.4.5 Bird strike resistance When the vehicle's maximum operating/design speed is not less than.200 km/h, the windshield should be resistant to bird strikes. Bird strike resistance test. Finally, the front windshield should not crack.

4.5 Fragmentation Security Performance Tempered glass fragments for side windows and interior use should conform to the specifications in Table

4.Three pieces of the product should be tested; all three pieces should conform to the specifications in Table 4. The regulations stipulate that if one product fails to meet the requirements, three additional products may be added for testing, and all additional products must meet the requirements.

4.6 Escape Safety Performance When conducting escape tests, emergency window glass should meet the following requirements.

a) The time required to form a complete emergency exit should not exceed 2 minutes;

b) For emergency exit windows in passenger areas, the dimensions of the emergency exit should be no less than 700mm x 600mm;

c) Emergency windows for the driver's cab and staff should have a minimum size of 400mm and an area of.2000cm^2. exit.

5 Test Methods

5.1 General Rules If the test items do not affect the performance of the sample, the sample can be used to continue testing for other items. When using special products... When a special product is used as a test specimen, it should be produced under the same thickness, material, and process conditions as the product.

5.2 Field of vision safety performance

5.2.1 Light transmittance Using front window glass products or special products as samples, place them at a vertical angle and test them according to the method specified in Appendix B.

5.2.2 Optical Distortion Using the front window glass product as a sample, the test was conducted according to the method specified in Appendix C after placing it at the actual installation angle.

5.2.3 Secondary image deviation Using the front window glass product as a sample, the test was conducted according to the method specified in Appendix D after placing it at the actual installation angle.

5.3 Electrical heating safety performance

5.3.1 Insulation Resistance Using electrically heated glass products as samples, the tests were conducted according to the method specified in E.1 of Appendix E.

5.3.2 Resistance to electrical thermal shock Using electrically heated glass products as samples, the test temperature is -50°C±2°C, and the test is conducted according to the method specified in E.2.

5.3.3 Resistance to electric heat Using electrically heated glass products as samples, the test environment temperature was 20°C±5°C, and the test voltage was

1.2 times the rated voltage, according to E.3 specification. The experiment was conducted using a specific method.

5.4.1 Resistance to missile impact

5.4.1.1 Sample Front window glass products or special products are used as impact test