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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 24552-2009

**Electric vehicles - Windscreen demisting and defrosting
systems - Performance requirements and test methods**

电动汽车风窗玻璃除霜除雾系统的性能要求及试验方法

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Foreword

This Standard was proposed by National Development and Reform Commission. This Standard shall be administrated by National Automotive Standardization Technical Committee. Drafting organization of this Standard. China Automotive Technology and Research Center. The main drafters of this Standard. He Yuntang, and Zhao Jingwei. Electric vehicles - Windshield demisters and defrosters systems - Performance requirements and test methods

1 Scope

China's national performance requirements and test methods for the windscreen demisting and defrosting systems of electric vehicles. It specifies the requirements and the test procedures for clearing frost and mist from the windscreen of an electric vehicle. Demisting and defrosting are safety requirements on every vehicle - a driver who cannot see out is the hazard - and the general automotive standard has existed for decades. Electric vehicles need their own because the heat has to come from somewhere else. A combustion engine rejects roughly two thirds of its fuel energy as heat, and a conventional car defrosts its windscreen with waste heat it would otherwise throw away; the demister costs nothing but a fan. An electric vehicle has no waste heat worth the name. Clearing a frozen windscreen requires several kilowatts, and that energy comes from the traction battery - the same battery that provides the range, in the same cold weather that has already reduced its capacity. So the demister is one of the largest auxiliary loads on the vehicle and it appears exactly when range is shortest. The consequence is a real temptation to under-specify it, and this standard exists so that the safety requirement is met regardless of the energy cost. It fixes the test conditions - the soak temperature and duration, the frost or mist applied and

how it is produced, the vehicle state and the settings - the areas of the windscreen that must be cleared and the proportion of each, the times within which they must be cleared, and the measurement of the cleared area. Issued on 30 October 2009 and in force since 1 July 2010.

This Standard specifies performance requirements and test methods of electric vehicles' windshield demisters and defrosters systems. This Standard applies to the Class M1 pure electric vehicles which use power batteries as power source and which use demisters and defrosters systems.

2 Normative references

The provisions in following documents become the provisions of this Standard through reference in this Standard. For dated references, the subsequent amendments (excluding corrections) or revisions do not apply to this Standard, however, parties who reach an agreement based on this Standard are encouraged to study if the latest versions of these documents are applicable. For undated references, the latest edition of the referenced document applies.

GB 11555 Passenger cars - Windshield demisters - Performance requirements

GB 11556 Passenger cars - Windshield defrosters - Performance requirements

GB/T 19596-2004 Terminology of electric vehicles

3 Terms and Definitions

The established terms and definitions in GB 11555 and GB 11556 apply to this Standard.

4 Performance Requirements

Every electric vehicle shall be equipped with a set of defroster system and a set of demister system.

5.1 Conditions of defrosting test

5.1.1 Ambient temperature of test is $-18\text{oC}\pm3\text{oC}$.

5.1.5 The air velocity in cryogenic chamber shall be less than

5.1.6 The power battery and auxiliary battery of electric vehicles shall be in fully charged state (see 3.3.3.2.5 of GB/T 19596-2004).

5.1.7 During the whole testing period, defrosting device (controller) shall be adjusted to maximum.

5.2 Deforesting test conditions

5.2.1 Test shall be done in the cryogenic chamber which can accommodate a tested vehicle, and which can keep the temperature at $-30\text{C}\pm 10\text{C}$.

5.2.2 Before testing, use alcohol containing methanol or similar detergents to clean the windshield' inner and outer surface. Sweep oil away thoroughly. Clean it further after drying. Finally clean it with dry cotton cloth.

5.2.3 Measure the temperature of testing room and the cold air velocity timely.

5.2.4 Cold air velocity's horizontal component in testing room shall be less than 2.2m/s.

5.2.5 During the test, apart from inlet and outlet of heat system and ventilating system, all of battery compartment, car door and vent shall be closed. From the beginning of the defrosting test, 1 or 2 car windows may be open. However, the total opening gap shall be less than 25 mm.

5.3 Testing instruments and equipment The testing instruments and equipment of demisting and defrosting shall comply with the requirements of GB 11555 and GB 11556.

5.4 Determining of the Area A, B and A' The area A, B and A' of the test car's windshield are determined by GB 11556.

5.5 Defrosting test procedure

5.5.1 The test car shuts down after entering cryogenic chamber. And it shall park for 10h under the testing temperature.

5.6 Demisting test procedure

5.6.1 The steam generator shall be placed at the place where is near to the back of front seat. And its outlet shall be at the center of the plane that is $580\text{mm}\pm 80\text{mm}$ above the driver seat's R point. If the seat back is adjustable, then it shall be adjusted to predetermined angle. If the back of front seat can not accommodate the steam generator, then it shall be placed at appropriate position at where it may mostly meet the above requirements.

5.6.2 Drive the test car into testing room. Park it at the specified location. Lower the temperature until all the coolant, lubricant and the interior temperature in the car stay at $-30\text{C}\pm 10\text{C}$.

5.6.3 Heat the steam generator which holds at least 1.7L water to boiling point. After it becomes stable, put it into the car and close the door.