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

**GB/T 10589-2008**

Replacing GB/T 10589-1989

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**Specifications for low temperature test chambers**

低温试验箱技术条件

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## Foreword

This standard is one of the Specifications for environmental test equipment" series of

standards. This series of standards consists of the following standards. - GB/T 10586-2006 Specifications for damp heat chambers - GB/T 10587-2006 Specification for salt mist test chambers - GB/T 10588-2006 Specification for mould growth test chambers - GB/T 10589-2008 Specifications for low temperature test chambers - GB/T 10590-2006 Specifications for high and low temperature/low air pressure testing chambers - GB/T 10591-2006 Specifications for high temperature/low air pressure testing chambers - GB/T 10592-2008 Specification for low/high temperature test chambers - GB/T 11158-2008 Specifications for high temperature test chambers - GB/T 11159-2008 Specifications for low air pressure test chamber This standard replaces GB/T 10589-1989 "Specifications for low temperature test chambers". The main changes between this standard and GB/T 10589-1989 are as follows: - ADD the chapter "Terms and definitions"; the content adopts the relevant parts of IEC 60068-3-5; - According to the concept of temperature fluctuation of IEC 60068-3-5, CHANGE the temperature fluctuation index into 1 °C (see Table 1); - According to the temperature data recording requirements of IEC 60068-3-5, CHANGE to record data once per minute (see 6.3); - According to the test method of temperature rise and fall rate in IEC 60068-3-5, MODIFY the test method of temperature rise and fall rate (see 6.5); - EXPAND the range of atmospheric pressure in the environmental conditions of use (see 4.1); - MODIFY the wind speed requirements (see Table 1); - MODIFY the safety protection requirements; ADD the requirements for electrical insulation strength (see 5.3); - ADD the grade of temperature rise and fall rate (see Table 1); - CHANGE the test conditions to the no-load conditions (see 6.2); - ADD the information on the evaluation method of Temperature variation measurement uncertainty and its application (see Appendix B). Appendix A and Appendix B of this standard are informative annexes. This standard was proposed by China Machinery Industry Federation. This standard shall be under the jurisdiction of the Mechanical Industry Laboratory Instrument and Equipment Standardization Technical Committee. Responsible drafting organizations of this standard. Wuxi Sunan Test Equipment Co., Ltd., Chongqing Star Test Equipment Co., Ltd., Shanghai Espec Environmental Equipment Co., Ltd., Chengdu Tianyu Test Equipment Co., Ltd., Hunan Institute of Metrology and Inspection, Ministry of Information Industry Electronics The Fifth Research Institute, the Institute of Comprehensive Technology and Economics of Machinery Industry Instrumentation. The main drafters of this standard. Ni Yiming, Chen Yunsheng, Xia Yifen, Jin Xubin, Feng Xiaosheng, Li Qingxian, Zou Suyang, Ma Lin, Jin Lihui, Xiong Zhiming. This standard replaces the standard previously issued as follows: - GB/T 10589-1989. Specifications for low temperature test chambers

## 1 Scope

China's national specification for low temperature test chambers - the cabinets in which products are held at low temperature to establish whether they survive it, start in it and work in it. The test is required of almost anything sold into a cold climate or carried by air, and the failures it finds are characteristic: elastomers that harden and stop sealing, greases and

lubricants that stiffen, batteries that lose most of their capacity, condensation and then ice on the wrong surfaces, displays that go slow, and materials that turn brittle and break at a load they carried easily at room temperature. This standard specifies the terms and definitions, the conditions of use, the technical requirements, the test methods, the inspection rules and the marking, packaging, storage and transport of low temperature test chambers. The requirements are those that determine whether the specimen actually experiences what the test method asks for: the lowest temperature the chamber will reach and hold; the uniformity of temperature through the working space and its fluctuation over time, which are the two figures that decide whether a specimen in the corner has been tested to the same conditions as one in the middle; the rate at which the chamber can be cooled and recovered after the door is opened; and the temperature overshoot, since a chamber that dips below the set point on the way down has exposed the specimen to a condition nobody asked for. Around them sit the refrigeration system, the air circulation, the frost and condensation management on the door and the windows, the through-holes for instrumentation, the control and recording, and the safety devices. Issued on 30 June 2008 and in force since 1 January 2009, it replaces GB/T 10589-1989.

This standard specifies the terms and definitions, conditions of use, technical requirements, test methods, inspection rules, markings, packaging, storage related to low temperature test chambers (referred to as test chambers"). This standard applies to test chambers that conduct low-temperature tests for electrical, electronic and other products, parts, materials.

## 2 Normative references

The provisions in following documents become the provisions of this Standard through reference in this Standard. For the 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/T 191-2008 Packaging - Pictorial marking for handling of goods ( ISO 780.1997, MOD)

GB 14048.1-2006 Low-voltage switchgear and controlgear - Part

## 3 Terms and definitions

The following terms and definitions apply to this standard.

**3.1 Test chamber** An enclosed chamber and space the part of which can meet the specified test conditions.

**3.2 Temperature setpoint** The desired temperature set by the test chamber control device.

**3.3 Achieved temperature** After stabilization, the temperature at any point in the working

space of the test chamber.

3.4 Temperature stabilization The temperature of all points in the working space reaches the temperature setpoint and is maintained within the specified tolerance range.

3.5 Temperature fluctuation After stabilization, the difference between the highest and lowest temperature at any point in the working space within a specified arbitrary time interval.

## **4.2 Power supply conditions**

4.3 Water supply conditions Tap water or circulating water that meets the following conditions can be used;

4.4 Load conditions The load of the test chamber shall meet the following conditions at the same time.

## **5 Technical requirements**

5.1 Product performance The performance items and indexes of the test chamber are as shown in Table 1.

### **5.2 Product structure and appearance requirements**

5.2.1 The inner wall of the test chamber shall be made of materials that are heat-resistant, resistant to oxidation, corrosion-resistant, have certain mechanical strength. There shall be no pollution sources that affect the test.

5.2.8 It shall be provided with leading holes.

5.2.9 The appearance coating layer shall be flat and smooth, with uniform color; there shall be exposed bottom, blistering, layering or scratches.

### **5.3 Safety and environmental protection requirements**

5.3.1 Between the power supply terminal and the metal shell of the chamber - Insulation resistance value shall meet the following requirements. cold state resistance  $\geq 2 \text{ M}$ , hot state resistance  $\geq 1 \text{ M}$ ; - It shall be able to withstand a voltage withstand test of

50 Hz, 1500 V AC voltage and a voltage application duration of 5 s.

#### **6.1.1 Anemometer An anemometer which has an induction capacity of not less than**

0.05 m/s.