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Testing method of energy efficiency for temperature test chambers

高低温试验箱能效测试方法

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Standardization Administration Committee.

Table of Contents

Foreword

This Standard was drafted in accordance with the rules given in GB/T 1.1-2009.

This Standard was proposed by China Machinery Industry Federation.

This Standard shall be under the jurisdiction of National Technical Committee on Laboratory Instrument and Equipment of Standardization Administration of China (SAC/TC 526).

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Testing method of energy efficiency for temperature test chambers

1 Scope

This Standard specifies the terms and definitions, technical requirements, testing conditions, testing methods of temperature test chambers (hereinafter referred to as test chambers).

This Standard applies to the energy efficiency test of test chambers of which the working space is not greater than 5 m^3, temperature rate of change is not higher than 5°C/min.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

GB/T 10592-2008, *Specification for low/high temperature test chambers*

GB/T 19923-2005, *The reuse of urban recycling water - Water quality standard for industrial uses*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1 temperature test chambers

closed body or space equipped with heating and cooling devise at the same time, some of which can meet the specified test conditions

3.2 constant temperature energy efficiency

the energy consumed for maintaining constant temperature per working space for 1h during the thermostat of the test chambers

NOTE: The unit is J/m^3.

5 Testing conditions

5.1 Ambient conditions

The ambient testing conditions of test chambers shall meet the following:

a) ambient temperature: 23°C ± 2°C, the temperature gradient of ambient temperature measuring point at the vertical direction shall not exceed 2°C/m;

NOTE: ambient temperature (space temperature around the test chamber) refers to the temperature measured at the measuring point, 1m from vertical central line of the test chamber wall, 1m from the ground (the ambient temperature is not affected by the outlet temperature of the test chamber).

b) relative humidity: ≤85%;

c) air pressure: 80kPa ~ 106kPa;

d) without forced convection air.

5.2 Power supply conditions

The power supply testing conditions for the test chamber shall meet the following:

a) AC voltage: 220V ± 6.6V or 380V ± 11.4V;

b) frequency: 50Hz ± 0.5Hz.

5.3 Water supply conditions

Tap water or circulating water meeting the following conditions may be used:

a) water temperature: 23°C ± 1°C;

b) water pressure: 0.20MPa ± 0.05MPa;

c) water quality: meet the requirements of GB/T 19923-2005.

5.4 Testing equipment

5.4.1 Energy measuring instrument

Measuring range: voltage, current measurement range shall meet the testing requirements.

Maximum allowable energy measurement error: no more than ± 0.5%.

In addition to 6.7, the test chambers shall be empty loaded during the test and meet the following requirements:

a) cooling of refrigeration system: the test chambers using air cooling shall ensure that the inlet air temperature of condenser meet the conditions listed in 5.1; the test chambers using water cooling shall ensure that the cooling water temperature meet the conditions of 5.3 and the cooling water flow meet the requirements of the test chambers for cooling;

b) the accessories that are scheduled to connect with the test chambers to ensure normal working of the test chamber shall be installed and connected according to the installation requirements in the instructions for use;

c) defrosting device continuously powered shall be kept on; automatic defrost function shall be maintained in automatic state; manual control of the defrost function, lighting, etc. shall be kept off;

d) the test chambers equipped with test holes shall use the attaching plug to make test holes sealed;

e) the door of the test chamber shall be completely closed;

f) pre-set the test chamber under the specified test conditions at least 2h so as to make the temperature inside the oven consistent with the ambient temperature;

g) the constant temperature test shall make the test chamber reach preset temperature and maintain stable; the temperature change test shall make the test chamber increase or decrease the temperature at the maximum temperate rate of change;

h) the test chamber equipped with ventilation door shall make the door closed.

6.2 Measurement of working space

Use ruler and other tools to divide the space that the distance to the test chamber wall is 1/10 of each side length into a number of simple geometric shapes that are easy to measure for the measurement. The result shall be the working space of the test chamber, represented in V.

6.3 Measurement of geometric center temperature

Place the probe of the temperature inspection device in the geometric center of the test chamber. Test the temperature value once every 1min.

NOTE: See 6.3.1 of GB/T 10592-2008 for the geometric center.