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Testing method of energy efficiency for hot aging test ovens

热老化试验箱能效测试方法

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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). The drafting organizations of this Standard. Machinery Industry Instrumentation Technology and Economy Institute, Guangdong Institute of Product Quality Supervision and Inspection, Yangzhou Optoelectronics Products Testing Center, Chongqing Sida Test Equipment Co., Ltd., Guangzhou Wusuo Environmental Equipment Co., Ltd., Hangzhou Xuetemp Technology Co., Ltd., Shanghai Institute of Measurement and Testing Technology, Chengdu Yihua Tianyu Test Equipment Co., Ltd., Shanghai Aisipeike Environmental Equipment Co., Ltd., Shenzhen Institute of Standards and Technology, Wuxi Sunan Test Equipment Co., Ltd., Hunan Institute of Measurement and Testing, Zhejiang Institute of Metrology, Guangzhou Institute of Energy Testing, Shenzhen National Technology Instrument Co., Ltd., Zhuhai Gree Electric Co., Ltd., China University of Metrology. Main drafters of this Standard. Zhang Guiling, Gao Xiaodong, Wei Yuefeng, Wang Chengcheng, Tang Lihua, Li Siyuan, Chen Jinhan, Chen Yunsheng, Xie Chenhao, Xu Yueming, Tang Suiping, Feng Hua, Ling Yancui, Huang Qiang, Wang Ke, Wu Shuangshuang, Wan Yong, Zhou Lianqin, Zhu Ping, Pang Yan, Chen Shuai, Duan Huawei, Meng Jiawen, Zhou Siqing, Huang Yu, Hu Fen, Chen Qiyong, Hu Xiaofeng, Jiang Jianhui, Xie Xiaofang. Testing method of energy efficiency for hot aging test oven

1 Scope

China's national method for measuring the energy efficiency of hot air ageing test ovens. It applies to air hot ageing test ovens, gravity convection electric ovens and forced ventilation

electric ovens that use electricity as the heating energy and air as the conducting medium, and it specifies the terms and definitions, the technical requirements, the test conditions and the test methods. Hot air ageing is how the service life of a polymer is estimated without waiting for it: the material is held at an elevated temperature for a defined period, which accelerates the oxidation that would take years at ambient, and the properties are measured before and after. Rubber, cable insulation and plastics are all qualified this way, and the oven that does it runs at temperature continuously for days or weeks per test. This standard is the companion to the temperature test chamber method, and it separates gravity convection from forced ventilation because the two move heat by different means and cannot be compared on the same basis.

This Standard specifies the terms and definitions, technical requirements, testing conditions, testing methods for hot aging test oven (hereinafter referred to as the test oven). This Standard applies to energy efficiency test of air hot aging test oven, gravity convection electric oven and forced ventilation electric oven that use electric energy as heating energy, air as conduction medium.

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 30435-2013, Electric gravity convection and forced ventilation ovens

JB/T 7444-1994, Air heat-up ageing tests box

3 Terms and definitions

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

3.1 hot aging test oven closed box or space with specified high temperature and fresh air ventilation

3.2 gravity convection electric oven a closed box obtaining the specified stable high temperature by electric heating and with natural convection of air

3.3 forced ventilation electric oven a closed box obtaining the specified stable high temperature by electric The ambient conditions for the test oven 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 oven) refers to the temperature measured at the measuring point, 1m from vertical central line of the test oven wall, 1m from the

ground (the ambient temperature is not affected by the outlet temperature of the test oven).

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 oven shall meet the following.

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

b) frequency. 50Hz ± 0.5Hz.

5.3 Testing equipment

5.3.1 Energy measuring instrument Measuring range. voltage, current measurement range shall meet the testing requirements. Maximum allowable energy measurement error. no more than ± 0.5%. Usage. measurement of active energy consumption of the test oven.

5.3.2 Power meter Measurement range. voltage, current measurement range shall meet the testing requirements. Maximum allowable power measurement error. no more than ± 0.5%. Usage. measurement of active power consumption of the test oven.