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Test method for the resistivity of glass melts

玻璃熔体电阻率试验方法

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Foreword

This document is in accordance with the provisions of GB/T 1.1-2020 "Guidelines for Standardization Work Part

1. Structure and Drafting Rules of Standardization Documents" drafted. Please note that some content of this document may be patented. The issuing agency of this document assumes no responsibility for identifying patents. This document is proposed by China Building Materials Federation. This document is under the jurisdiction of the National Technical Committee for Standardization of Industrial Glass and Special Glass (SAC/TC447). This document is drafted by: Beijing University of Technology, Rainbow Display Co., Ltd., Bengbu Zhongguang Technology Co., Ltd., Suzhou Xinwu Photoelectric Technology Co., Ltd., Bengbu City Product Quality Supervision and Inspection Institute, Hebei Window Glass Co., Ltd., Kelisi Material Technology Co., Ltd. Company, Wuhu Dongxu Photoelectric Technology Co., Ltd., Hebei CSG Glass Co., Ltd., Shandong Lehejia Daily Necessities Co., Ltd., Shenzhen Skyworth Optical Science Technology Co., Ltd., China National Testing and Testing Holding Group Co., Ltd., Beijing Zhongtian Biaohe Standardization Technology Research Institute Co., Ltd., Guizhou Province Building Materials Product Quality Inspection and Testing Institute, Jining City Product Quality Supervision and Inspection Institute, Beijing Xuhui Xinrui Technology Co., Ltd. The main drafters of this document. Tian Yingliang, Li Miao, Zhang Chong, Xu Lihua, Cao Zhiqiang, Yu Yi, Chen Min, Li Qing, Zhang Guangdong, Bai Guangshan, Li Hai'e, Wang Jianjun, Li Yantao, Wu Linyu, Wang Changjun, Hong Lixin, Wang Huiyong, Li Junjie, Shi Zhiqiang, Xu Zhengben, Xu Yongbin, Mao Linshan, Zhao Zhiyong, Xu Yanyun, Guo Xiangru, Li Zhen, Wang Di, Dong Xuanjiang, Lun Xiaoyu. Test method for resistivity of glass melts

1 Scope

China's national test method for the electrical resistivity of glass melts. It specifies the measurement principle, the equipment and auxiliary tools, and the procedure. Molten glass conducts electricity - by ion migration rather than by electrons - and that fact is the basis of how most glass is now melted. An electric melter passes current directly through the glass

between molybdenum electrodes, and the glass heats itself; there is no flame, no combustion products in the melt, and none of the heat loss up a stack. The resistivity is what determines whether that works: it sets the current and voltage the furnace needs, the electrode spacing, and the distribution of heat within the melt, and it falls steeply as temperature rises, which makes the system inherently unstable and requires the control to account for it. Measuring it for a given composition is therefore the first step in designing an electric furnace for that glass.

This document specifies the measurement principle, equipment and auxiliary tools, sample preparation, test procedures, test results for glass melt resistivity measurement Fruit processing and test reports. This document applies to glass resistivity measurements in the melt state.

2 Normative references

The contents of the following documents constitute essential provisions of this document through normative references in the text. Among them, dated citations documents, only the version corresponding to that date applies to this document; for undated references, the latest edition (including all amendments) applies to this document.

GB/T 5432 Glass Density Determination Buoyancy Method

GB/T 6005 Test sieve wire mesh, perforated plate and basic size of electroformed sheet mesh

GB/T 11446.1 Electronic Grade Water

GB/T 12804 Laboratory glass instrument measuring cylinder

GB/T 13560 Sintered NdFeB Permanent Magnet Materials

GB/T 15724 Laboratory Glass Instrument Beakers

GB/T 21389 Verniers, Band Meters and Digital Calipers

GB/T 26497 Electronic balance

GB/T 30429 Industrial Thermocouple

GB/T 39797 Glass melt surface tension test method Sessile drop method

3 Terms and Definitions

The terms and definitions defined in GB/T 39797 and the following apply to this document.

3.1 The glass is heated to a high temperature melt state as the starting point of the test, and the temperature is continuously lowered at a certain rate to the end point of the low temperature test.

4 Measuring principle

Based on Ohm's law, a high-temperature insulating container and high-temperature-resistant electrodes and wires are used to form a measurement circuit (see Figure 1). add glass sample Heat to the melt, apply an AC voltage to the glass melt, measure the current flowing through the glass melt, and obtain the resistance value of the glass melt, see formula (1), combined with the glass melt. The glass melt resistivity can be obtained from the cross-sectional area and length of the glass melt, as shown in formula (2). $R=U/I$ (1) $\rho=(R \times S)/L$ (2) where. R

--- glass melt resistance, in ohms (Ω);