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

**GB/T 12442-2019**

Replacing GB/T 12442-1990

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**Test method for the hydroxyl groups content of silica glass**

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### Foreword

This standard was drafted in accordance with the rules given in GB/T 1.1-2009. This standard replaces GB/T 12442-1990 "Test method for hydroxyl content in quartz glass". Compared with GB/T 12442-1990, except The main technical changes outside the editorial changes are as follows:

- Revised the requirements for test equipment (see 5.1, 5.1 of the.1990 edition);
- Removed the requirement of "electronic AC voltage regulator with  $\pm 0.5\%$  stability accuracy" (see 5.2 of.1990 edition);
- Revised the requirements for fixed diaphragms (see 5.3, 5.4 of.1990 edition);
- Added Method B (see 8.2);
- Revised the contents of Appendix A (see Appendix A, Appendix A of the.1990 edition);
- Increased precision requirements (see 8.4). This standard was proposed by the China Building Materials Federation. This standard is under the jurisdiction of the National Industrial Glass and Special Glass Standardization Technical Committee (SAC/TC447). This standard was drafted. China Building Materials Inspection and Certification Group Co., Ltd., China Building Materials Science Research Institute Co., Ltd., China Tian Technology Precision Materials Co., Ltd., Hubei Feilihua Quartz Glass Co., Ltd., China Building Materials Quzhou Jingran Quartz Co., Ltd. The main drafters of this standard. Yang Xuedong, Xiao Yuhua, Wu Hao, Ouyang Yuhua, Wu Jie, Qian Yigang, Chen Yali, Liu Junlong, Shao Zhufeng, Zhang Haoyun, Yang Xiaohui, Wang Jingxia, Liu Huanmin, Nie Lanjian, Huaning, Yan Magnesium, Li Huaiyang. The previous versions of the standards replaced by this standard are.

---GB/T 12442-1990. Method for testing hydroxyl content in quartz glass

## 1 Scope

GB/T 12442-2019 is the Chinese national standard on test method for the hydroxyl groups content of silica glass, in the field of glass and ceramics industries. The /T suffix marks it as a recommended standard: it is not compulsory by itself, but it becomes binding as soon as a contract, a tender or a customer specification calls it up - which in practice is how most foreign buyers meet it. It was issued on 30 August 2019 by the State Administration for Market Regulation; Standardization Administration of China, and has been in force since 1 July 2020. Classification: ICS 81.040, CCS Q35. This page is published from the official record of the standard held by the Chinese standards administration: the identification, the dates, the classification and the issuing body are taken from there. The clause text, the tables and the numeric limits are in the document itself, which is delivered complete in English translation.

This standard specifies the terms and definitions of the hydroxyl content test in quartz glass, the test principle, test equipment, sample requirements, test procedures, Results calculation method and representation, inspection report. This standard applies to the inspection of hydroxyl content in quartz glass.

## 2 Normative references

The following documents are indispensable for the application of this document. For dated references, only dated versions apply to this article. Pieces. For undated references, the latest edition (including all amendments) applies to this document. JC/T 2205 quartz glass terminology

## 3 Terms and definitions

The following terms and definitions defined by JC/T 2205 apply to this document.

3.1 Baseline baseline The line connecting the base points of the two shoulders of the absorption peak on the spectral curve.

## 4 Test principle

The hydroxyl content in quartz glass is linear with its light absorption intensity at a wavelength of 2.73  $\mu\text{m}$ , according to Beer-Lambert law (Beer- Lambert Law (a) is quantitatively determined and the formula is given by equation (1).  $A=-\log_{10}(T)=kDc$  (1) In the formula. A

--- absorbance; T

--- transmittance; k

--- constant, related to the nature of the absorbing material and the wavelength  $\lambda$  of the incident light;  $d$

--- sample thickness in millimeters (mm);  $C$

--- The hydroxyl content of the sample in micrograms per gram ( $\mu\text{g/g}$ ).

## 5 Test equipment

5.1 The measurable wavelength range shall be  $2.50\mu\text{m}$ ~ $3.10\mu\text{m}$ , and the spectrophotometer or infrared light with a transmittance measurement accuracy of not less than 1% Spectrometer.

5.2 Vernier calipers and other measuring tools with a graduation value not greater than 0.02 mm.

5.3 Fixed diaphragm. When necessary, select the appropriate fixed diaphragm according to the shape of the sample.