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

GB 3352-1982

Replacing GB/T 3352-2012

**Synthetic quartz crystal - Specifications and guidelines for use
(English Translation)**

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Foreword

This document complies with the provisions of GB/T 1.1-2020 "Standardization Work Guidelines Part 1: Structure and Drafting Rules of Standardization Documents".

Drafting.

This document replaces GB/T 3352-2012 "Specifications and Guidelines for the Use of Artificial Quartz Crystals". Compared with GB/T 3352-2012, except for...

Aside from structural adjustments and editorial changes, the main technical changes are as follows.

---Added five terms and their definitions for characterizing the properties of synthetic quartz crystals for optical applications (see 3.27, 3.28, 3.29, 3.30, and 3.31);

---Some terms and their definitions have been deleted (see sections 3.2.3, 3.6, 3.8.1, 3.11, and 3.13 in the 2012 edition);

---The technical requirements and testing methods for artificial quartz crystals used in optics have been increased, namely, the classification of inclusion density, fringes, and alpha values.

The transmittance index was clearly defined and refined (see 4.1.3.2, 4.1.4, 4.1.6, 4.1.8.2, 4.1.9, 4.2.8, 4.2.9), for optical...

The procedures for sample preparation and measurement of transmittance have been standardized (see 4.2.11);

---Added usage guidelines for electro-cleaned quartz crystals and high-purity low-aluminum quartz crystals (see 7.6.4);

---The infrared quality level corresponding to the infrared absorption coefficient α_{3410} value has been deleted (see 4.1.3 in the 2012 edition);

---Examples of α_{3410} absorption wavenumber and α_{3410} correction data related to infrared absorption coefficient α value compensation have been removed (see Appendix.2012 edition).

Record E);

This document is modified to adopt IEC 60758:2016 "Specifications and guidelines for the use of artificial quartz crystals".

Compared with IEC 60758:2016, this document has undergone the following structural adjustments.

---Appendices A and D correspond to Appendix D and Appendix A of IEC 60758:2016.

The technical differences between this document and IEC 60758:2016, and the reasons therefor, are as follows.

---IEC 60410 (see 6.1.2.2 and 6.2.2.2) has been replaced with the normatively referenced GB/T 2828.1 to accommodate my country's technical requirements.

Add components to increase operability;

---IEC 60122-1:2002 (see 4.1.7 and 4.2.7) has been replaced by the normatively referenced GB/T 12273.1-2017.

The degree of consistency between them needs to be modified to adapt to my country's technical conditions and increase operability;

---IEC 61994 (alparts) (see Chapter 3) has been replaced with the normatively referenced SJ/T 11743 (all parts) to adapt to my country's national standards.

The technical conditions are improved to increase operability;

---Some terms and their definitions have been deleted (see 3.5, 3.9, 3.22, and 3.24 of IEC 60758:2016);

---The phrase "artificial quartz crystals grown in the same autoclave during the same period" has been changed to "artificial quartz crystals grown in the same autoclave during the same period using the same process and the same..." Artificial quartz crystals grown from raw materials and submitted under the same technical conditions (see 3.5) should conform to the actual situation in my country;

---The crystal plane symbol "z" has been changed to "r", and "r" to "R" [see 3.13 and Figures 1, 2b, 3, 9, and 10] to conform to domestic standards.

Number system;

---The requirement that "angle deviation should be less than 30'" for seed crystals has been changed to "angle deviation should be less than 20'" (see 4.2.1) to accurately reflect the current domestic processing standards.

Technical level;

---The detection light source has been changed (see 4.2.8) to match domestic detection procedures;

---The sample thickness range has been increased (see 4.2.11) to suit practical applications;

--- Changed "Big X face" to "X face", "Small X face" to "-X face", and added "(Big X)" and "(Small X)" (see...) 4.3.1), to conform to the customary terminology used in domestic labeling;

---The requirement that the flatness of the datum surface should not exceed "0.2mm" has been changed to "0.1mm" (see 5.1.2) to conform to the actual requirements in my country;

---The description of delivery quantity has been changed from "large" to "small" (see 5.3.4) to align with the modification in 3.5;

---The description of the inspection lot has been changed (see 6.2.2.1) to align with the amendment in 3.5;

---The factor of "seed quality" that affects crystal growth has been added (see 7.1.2) to make the description more comprehensive.

The following editorial changes have been made to this document.

---Change the pressure value and unit "Atm" to the International System of Units (SI) value and unit "MPa";

---Change the angle "35.25°" to "35°15'";

---Delete descriptive text that is easily misunderstood, has the lowest Q value at the corresponding level, and is incorrect at the B level.

Please note that some content in this document may involve patents. The issuing organization of this document assumes no responsibility for identifying patents.

This document was proposed by the Ministry of Industry and Information Technology of the People's Republic of China.

This document is under the jurisdiction of the National Technical Committee on Standardization of Piezoelectric Devices for Frequency Control and Selection (SAC/TC182).

Introduction

The reason for including artificial quartz crystals for optical applications in this document is as follows.

Optical quartz crystals are manufactured by many of the same suppliers as piezoelectric quartz crystals. Equipment used for producing optical quartz crystals.

The methods and techniques are similar to those used for piezoelectric quartz crystals. Furthermore, with very minor differences, the properties of piezoelectric and optical synthetic quartz crystal materials are largely the same.

Indeed. Therefore, it is appropriate to add relevant content about optical quartz crystals to this document.

Specifications and Usage Guidelines for Artificial Quartz Crystals

1 Scope

This document specifies the terms and definitions, and technical specifications for artificial quartz crystals used in frequency control and selection of piezoelectric elements and for optical applications.

Technical requirements, measurement methods, inspection rules, and user guidelines.

This document applies to artificial quartz crystals (hereinafter referred to as "piezoelectric crystals") used in the manufacture of frequency control and selection piezoelectric elements and optical artificial quartz crystals.

Quartz crystal (hereinafter referred to as "optical crystal").

2 Normative references

The contents of the following documents, through normative references within the text, constitute essential provisions of this document. Dated citations are not included.