IEC 62276

Edition 4.0 2025-03

# INTERNATIONAL STANDARD

# NORME INTERNATIONALE

## Single crystal wafers for surface acoustic wave (SAW) device applications – Specifications and measuring methods

## Tranches monocristallines pour applications utilisant des dispositifs à ondes acoustiques de surface (OAS) – Spécifications et méthodes de mesure



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# SINGLE CRYSTAL WAFERS FOR SURFACE ACOUSTIC WAVE (SAW) DEVICE APPLICATIONS – SPECIFICATIONS AND MEASURING METHODS

## FOREWORD

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IEC 62276 has been prepared by IEC technical committee 49: Piezoelectric, dielectric and electrostatic devices and associated materials for frequency control, selection and detection. It is an International Standard.

This fourth edition cancels and replaces the third edition published in 2016. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

a) The terms and definitions, the technical requirements, sampling frequency, test methods and measurement of transmittance, lightness, colour difference for LN and LT have been added in order to meet the needs of industry development;
b) The term “inclusion” (mentioned in 4.13 and 6.10) and its definition have been added because there was no definition for it in Clause 3;

c) The specification of LTV and PLTV, and the corresponding description of sampling frequency for LN and LT have been added, because they are the key performance parameters for the wafers;

d) The tolerance of Curie temperature specification for LN and LT have been added in order to meet the development requirements of the industry;

e) Measurement of thickness, TV5, TTV, LTV and PLTV have been completed, including measurement principle and method of thickness, TV5, TTV, LTV and PLTV.

The text of this International Standard is based on the following documents:

| Draft | Report on voting |
|---|---|
| 49/1454/CDV | 49/1460/RVC |

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/publications.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn, or
- revised.

# SINGLE CRYSTAL WAFERS FOR SURFACE ACOUSTIC WAVE (SAW) DEVICE APPLICATIONS – SPECIFICATIONS AND MEASURING METHODS

## 1 Scope

This document applies to the manufacture of synthetic quartz, lithium niobate (LN), lithium tantalate (LT), lithium tetraborate (LBO), and lanthanum gallium silicate (LGS) single crystal wafers intended for use as substrates in the manufacture of surface acoustic wave (SAW) filters and resonators.

## 2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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.

IEC 60758:2016, *Synthetic quartz crystal – Specifications and guidelines for use*

## 3 Terms and definitions

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

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

- IEC Electropedia: available at https://www.electropedia.org/
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### 3.1 Flatness

**3.1.1**
**fixed quality area**
**FQA**
central area of a wafer surface, defined by a nominal edge exclusion, X, over which the specified values of a parameter apply

Note 1 to entry: The boundary of the FQA is at all points (e.g. along wafer flats) the distance X away from the perimeter of the wafer of nominal dimensions as shown in Figure 1.

**3.1.2**
**reference plane**
plane used as a reference for flatness measurements

Note 1 to entry: The reference plane can be one of the following types:

a) for measurements in which the wafer is clamped, the reference plane is the flat chuck surface that is identical with the back surface of the wafer;

b) for measurements in which the wafer is not clamped, the reference plane is defined by the surface height at three points on the front surface of the wafer within the FQA;

c) for measurements in which the wafer is not clamped, the reference plane is defined by the least-squares fit to the front surface of the wafer using the surface height at all measured points within the FQA.