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Synthetic Quartz Crystal - Specifications and guidelines for use

## EESTI STANDARDI EESSÕNA

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English Version

## Synthetic quartz crystal - Specifications and guidelines for use (IEC 60758:2016)

Cristal de quartz synthétique - Spécifications et lignes  
directrices d'utilisation  
(IEC 60758:2016)

Synthetischer Quarzkristall - Festlegungen und Leitfaden  
für die Anwendung  
(IEC 60758:2016)

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European Committee for Electrotechnical Standardization  
Comité Européen de Normalisation Electrotechnique  
Europäisches Komitee für Elektrotechnische Normung

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## European foreword

The text of document 49/1185/FDIS, future edition 5 of IEC 60758, prepared by IEC/TC 49 "Piezoelectric, dielectric and electrostatic devices and associated materials for frequency control, selection and detection" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 60758:2016.

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## INTRODUCTION

The reason for adding synthetic quartz crystal for optical application to this International Standard is as follows.

Quartz crystal produced for optical applications is produced by many of the same suppliers manufacturing quartz for electronic applications. The equipment and methods to produce optical quartz are similar to those used in the production of electronic quartz. Also, with a few exceptions the characterization methods of electronic and optical material are similar. Therefore, IEC 60758 serves as the proper basis for including addenda related to quartz crystal for optical applications.

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# SYNTHETIC QUARTZ CRYSTAL – SPECIFICATIONS AND GUIDELINES FOR USE

## 1 Scope

This International Standard applies to synthetic quartz single crystals intended for manufacturing piezoelectric elements for frequency control, selection and optical applications.

## 2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60068-1:2013, *Environmental testing – Part 1: General and guidance*

IEC 60122-1:2002, *Quartz crystal units of assessed quality – Part 1: Generic specification*

IEC 60410, *Sampling plans and procedures for inspection by attributes*

IEC 61994 (all parts), *Piezoelectric and dielectric devices for frequency control and selection – Glossary*

## 3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 61994 and the following apply.

### 3.1

#### **hydrothermal crystal growth**

crystal growth in the presence of water, elevated temperatures and pressures by a crystal growth process believed to proceed geologically within the earth's crust

Note 1 to entry: The industrial synthetic quartz growth processes utilize alkaline water solutions confined within autoclaves at supercritical temperatures (330 °C to 400 °C) and pressures (700 to 2 000 atmospheres).

Note 2 to entry: The autoclave is divided into two chambers: the dissolving chamber, containing raw quartz chips at the higher temperature; the growing chamber, containing cut seeds at the lower temperature (see 7.1.2).

### 3.2

#### **synthetic quartz crystal**

single crystal of  $\alpha$  quartz grown by the hydrothermal method

Note 1 to entry: Cultured quartz has the same meaning as synthetic quartz crystal.

### 3.3

#### **as-grown synthetic quartz crystal**

state of synthetic quartz crystal prior to grinding or cutting

### 3.4

#### **as-grown Y-bar**

crystals which are grown by using long stick seed in the Y-direction