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Piezoelektriska egenskaper hos keramiska material och komponenter – Del 1: Termer och definitioner

*Piezoelectric properties of ceramic materials and components –
Part 1: Terms and definitions*

Som svensk standard gäller europastandarden EN 50324-1:2002. Den svenska standarden innehåller den officiella engelska språkversionen av EN 50324-1:2002.

**Piezoelectric properties of ceramic materials and components
Part 1: Terms and definitions**

Propriétés piézoélectriques des matériaux
et composants en céramique
Partie 1: Termes et définitions

Piezoelektrische Eigenschaften
von keramischen Werkstoffen
und Komponenten
Teil 1: Begriffe

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CENELEC

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

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Foreword

This European Standard was prepared by the CENELEC BTTF 63-2, Advanced technical ceramics.

The text of the draft was submitted to the formal vote and was approved by CENELEC as EN 50324-1 on 2001-12-01.

The following dates were fixed:

- latest date by which the EN has to be implemented
at national level by publication of an identical
national standard or by endorsement (dop) 2002-12-01
- latest date by which the national standards conflicting
with the EN have to be withdrawn (dow) 2004-12-01

This draft European Standard consists of three parts:

- Part 1 Terms and definitions
 - Part 2 Methods of measurement - Low power
 - Part 3 Methods of measurement - High power
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Introduction

The principles underlying the piezoelectricity of ceramics are discussed in IEC 60483 “Guide to dynamic measurements of piezoelectric ceramics with high electromechanical coupling”. Piezoelectric ceramics are polycrystalline ferroelectrics mainly based on lead zirconate titanate ($\text{Pb}(\text{ZrTi})\text{O}_3$), barium titanate (BaTiO_3) and lead titanate (PbTiO_3). Their piezoelectricity is the result of the preferential orientation of polar regions at remanent polarisation. In ceramics, the remanent polarisation is created by application of a dc electric field to the polycrystalline material. The value of this remanent polarisation results in the high level of piezoelectric activity in piezoceramics.

Both the direct and inverse piezoelectric effects are utilized. In a variety of applications, piezoelectric transducers operate at resonance. Static and quasi-static applications complete a wide range of functions.

1 Scope

This European Standard relates to piezoelectric transducer ceramics for application both as transmitters and receivers in electroacoustics and ultrasonics over a wide frequency range. They are used for generation and transmission of acoustic signals, for achievement of ultrasonic effects, for transmission of signals in communication electronics, for sensors and actuators and for generation of high voltages in ignition devices.

Piezoelectric ceramics can be manufactured in a wide variety of shapes and sizes. Commonly used shapes include discs, rectangular plates, bars, tubes, cylinders and hemispheres as well as bending elements (circular and rectangular), sandwiches and monolithic multilayers.

Relevant sections of IEC 60302 “Standard definitions and methods of measurement for piezoelectric vibrators operating over the frequency range up to 30 MHz” and IEC 60642 “Piezoelectric ceramic resonators and resonator units for frequency control and selection” have been taken into consideration when drafting this standard.

2 Normative references

This European Standard incorporates, by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references, the latest edition of the publication referred to applies (including amendments).

IEC 60302	Standard definitions and methods of measurement for piezoelectric vibrators operating over the frequency range up to 30 MHz
IEC 60483	Guide to dynamic measurements of piezoelectric ceramics with high electromechanical coupling
IEC 60642	Piezoelectric ceramic resonators and resonator units for frequency control and selection - Chapter I: Standard values and conditions - Chapter II: Measuring and test conditions

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