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PIEZOELECTRIC PROPERTIES OF CERAMIC MATERIALS AND COMPONENTS -- PART 1: TERMS AND DEFINITIONS

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English version

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
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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– latest date by which the national standards conflicting with the EN have to be withdrawn	(dow)	2004-12-01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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Contents

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 ($Pb(ZrTi)O_3$), 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.