

Piezoelectric properties of ceramic materials and components —

Part 1: Terms and definitions

The European Standard EN 50324-1:2002 has the status of a British Standard

ICS 31.140

National foreword

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The UK participation in its preparation was entrusted by Technical Committee GEL/15, Insulating materials, to Subcommittee GEL/15/3/1, Ceramics and glass, which has the responsibility to:

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This British Standard, having been prepared under the direction of the Electrotechnical Sector Policy and Strategy Committee, was published under the authority of the Standards Policy and Strategy Committee on 10 October 2002

Summary of pages

This document comprises a front cover, an inside front cover, the EN title page, pages 2 to 15 and a back cover.

The BSI copyright date displayed in this document indicates when the document was last issued.

Amendments issued since publication

Amd. No.	Date	Comments

© BSI 10 October 2002

ISBN 0 580 40539 7

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with the EN have to be withdrawn (dow) 2004-12-01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.