

**Test method for the mechanical strength of cores made
of magnetic oxides**

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EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

Käesolev Eesti standard EVS-EN 61631:2002 sisaldab Euroopa standardi EN 61631:2001 ingliskeelset teksti.

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This standard is ratified with the order of Estonian Centre for Standardisation dated 15.10.2002 and is endorsed with the notification published in the official bulletin of the Estonian national standardisation organisation.

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The standard is available from Estonian standardisation organisation.

ICS 29.100.10

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EUROPEAN STANDARD

EN 61631

NORME EUROPÉENNE

EUROPÄISCHE NORM

October 2001

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English version

**Test method for the mechanical strength
of cores made of magnetic oxides**
(IEC 61631:2001)

Méthode d'essai pour la résistance
mécanique des noyaux en oxydes
magnétiques
(CEI 61631:2001)

Prüfverfahren zur Bestimmung der
mechanischen Festigkeit von
magnetischen Oxidkernen
(IEC 61631:2001)

This European Standard was approved by CENELEC on 2001-09-01. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the Central Secretariat has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

CENELEC

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

Central Secretariat: rue de Stassart 35, B - 1050 Brussels

Foreword

The text of document 51/599/FDIS, future edition 1 of IEC 61631, prepared by IEC TC 51, Magnetic components and ferrite materials, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 61631 on 2001-09-01.

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) 2002-06-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 2004-09-01

Annexes designated "normative" are part of the body of the standard. In this standard, annexes A and ZA are normativ. Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 61631:2001 was approved by CENELEC as a European Standard without any modification.

Annex ZA (normative)

Normative references to international publications with their corresponding European publications

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).

NOTE When an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 61246	1994	Magnetic oxide cores (E-cores) of rectangular cross-section and associated parts - Dimensions	-	-
-	-	Tensile testing of metallic materials Part 2: Verification of the force measuring system of the tensile testing machine	EN 10002-2	1992
ISO 4677-1	1985	Atmospheres for conditioning and testing - Determination of relative humidity Part 1: Aspirated psychrometer method	-	-
ISO 4677-2	1985	Part 2: Whirling psychrometer method	-	-

INTERNATIONAL
STANDARD

IEC
61631

First edition
2001-06

**Test method for the mechanical strength
of cores made of magnetic oxides**

*Méthode d'essai pour la résistance mécanique
des noyaux en oxydes magnétiques*



Reference number
IEC 61631:2001(E)

Publication numbering

As from 1 January 1997 all IEC publications are issued with a designation in the 60000 series. For example, IEC 34-1 is now referred to as IEC 60034-1.

Consolidated editions

The IEC is now publishing consolidated versions of its publications. For example, edition numbers 1.0, 1.1 and 1.2 refer, respectively, to the base publication, the base publication incorporating amendment 1 and the base publication incorporating amendments 1 and 2.

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

TEST METHOD FOR THE MECHANICAL STRENGTH OF CORES MADE OF MAGNETIC OXIDES

FOREWORD

- 1) The IEC (International Electrotechnical Commission) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of the IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, the IEC publishes International Standards. Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. The IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
- 2) The formal decisions or agreements of the IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested National Committees.
- 3) The documents produced have the form of recommendations for international use and are published in the form of standards, technical specifications, technical reports or guides and they are accepted by the National Committees in that sense.
- 4) In order to promote international unification, IEC National Committees undertake to apply IEC International Standards transparently to the maximum extent possible in their national and regional standards. Any divergence between the IEC Standard and the corresponding national or regional standard shall be clearly indicated in the latter.
- 5) The IEC provides no marking procedure to indicate its approval and cannot be rendered responsible for any equipment declared to be in conformity with one of its standards.
- 6) Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. The IEC shall not be responsible for identifying any or all such patent rights.

International Standard IEC 61631 has been prepared by technical committee 51: Magnetic components and ferrite materials.

The text of this standard is based on the following documents:

FDIS	Report on voting
51/599/FDIS	51/610/RVD

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

This publication has been drafted in accordance with the ISO/IEC Directives, Part 3.

The committee has decided that the contents of this publication will remain unchanged until 2005. At this date, the publication will be

- reconfirmed;
- withdrawn;
- replaced by a revised edition, or
- amended.

A bilingual version of this publication may be issued at a later date.

INTRODUCTION

The method specified in this standard is intended to be used for obtaining agreements between parties for material development, quality checking, characterization and data acquisition purposes. The method places closely defined restrictions on the arrangement of the test-piece and the function of the test apparatus, including the test-jigs, in order to minimize the errors that can arise as a consequence of the test method.

All other factors are required to be stated in the test report in order to be allowed for in the comparison of the behavior of the magnetic oxide cores. It is not possible to rigorously standardize particular surface finishes, since it is difficult to control all the mechanical factors. But, it is absolutely essential to mention the state of the surface in the report, as surface defects can have a large effect on mechanical strength in certain types of tests (see clause 6). The extrapolation of mechanical strength data to other geometries, to multi-axial stressing, to other rates of stressing or to other environmental conditions, should be viewed with caution. The origin of a fracture in a mechanical test piece can be a valuable guide to the nature and position of strength-limiting defects (such as pores, large grains and impurity concentration).

The results of strength tests are influenced by a combination of the following factors: the micro-structure of the material, the surface finishing procedure applied to the test cores, the size and shape of the test cores, the mechanical parameters of the testing apparatus, the rate of load application and the relative humidity of the ambient atmosphere. Because of the ceramic nature of magnetic oxide cores, a considerable range of results is usually obtained from a number of nominally identical test cores. Thus test results need to be interpreted with caution.

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TEST METHOD FOR THE MECHANICAL STRENGTH OF CORES MADE OF MAGNETIC OXIDES

1 Scope

This International Standard specifies a test method for the mechanical strength of cores made of magnetic oxides. This test method is suitable for most of the E-cores, ETD-cores and I-cores but other core types such as U-cores could be tested according to a derived method agreed by the parties concerned.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this International Standard. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

IEC 61246:1994, *Magnetic oxide cores (E-cores) of rectangular cross-section and associated parts – Dimensions*

EN 10002-2:1992, *Tensile testing of metallic materials – Part 2: Verification of the force measuring system of the tensile testing machine*

ISO 4677-1:1985, *Atmospheres for conditioning and testing – Determination of relative humidity – Part 1: Aspirated psychrometer method*

ISO 4677-2:1985, *Atmospheres for conditioning and testing – Determination of relative humidity – Part 2: Whirling psychrometer method*

3 Definitions

For the purpose of this International Standard, the following definition applies.

3.1

mechanical strength

the maximum recorded force at the instant of fracture of a magnetic oxide core when it is loaded in bending

4 Apparatus

4.1 Test core support and loading wedge

Test cores shall be supported on free moving roller bars or on a flat support depending on their size (see 6.2). The loading wedge and the roller bars or the flat support shall be made of hardened steel with a hardness of 40 HRC to 60 HRC. The loading wedge and the roller bars shall have a radius of 2 mm. The loading wedge shall be connected to a device for measuring and recording the load applied.