

<b>STN</b>	<b>Skúšobná metóda na mechanickú pevnosť jadier z magnetických oxidov</b>	<b>STN EN IEC 61631</b>  35 8465
------------	---	--

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

Táto norma obsahuje anglickú verziu európskej normy.  
This standard includes the English version of the European Standard.

Táto norma bola oznámená vo Vestníku ÚNMS SR č. 09/20

Obsahuje: EN IEC 61631:2020, IEC 61631:2020

Oznámením tejto normy sa od 11.06.2023 ruší  
STN EN 61631 (35 8465) z júla 2002

**131706**

EUROPEAN STANDARD

**EN IEC 61631**

NORME EUROPÉENNE

EUROPÄISCHE NORM

June 2020

ICS 29.100.10

Supersedes EN 61631:2001 and all of its amendments  
and corrigenda (if any)

English Version

**Test method for the mechanical strength of cores made of  
magnetic oxides  
(IEC 61631:2020)**Méthode d'essai pour la résistance mécanique des noyaux  
en oxydes magnétiques  
(IEC 61631:2020)Prüfverfahren zur Bestimmung der mechanischen Festigkeit  
von magnetischen Oxidkernen  
(IEC 61631:2020)

This European Standard was approved by CENELEC on 2020-06-11. 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 CEN-CENELEC Management Centre 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 CEN-CENELEC Management Centre has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.



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

**CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels**

**EN IEC 61631:2020 (E)****European foreword**

The text of document 51/1312/CDV, future edition 2 of IEC 61631, prepared by IEC/TC 51 "Magnetic components, ferrite and magnetic powder materials" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN IEC 61631:2020.

The following dates are fixed:

- latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2021-03-11
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2023-06-11

This document supersedes EN 61631:2001 and all of its amendments and corrigenda (if any).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC shall not be held responsible for identifying any or all such patent rights.

**Endorsement notice**

The text of the International Standard IEC 61631:2020 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following notes have to be added for the standards indicated:

IEC 63093-6	NOTE	Harmonized as EN IEC 63093-6
IEC 63093-8	NOTE	Harmonized as EN IEC 63093-8
IEC 63093-12	NOTE	Harmonized as EN IEC 63093-12

## **Annex ZA** (normative)

### **Normative references to international publications with their corresponding European publications**

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

NOTE 1 Where an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: [www.cenelec.eu](http://www.cenelec.eu).

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
ISO 7500-2	-	Metallic materials - Verification of static uniaxial testing machines – Part 2: Tension creep testing machines - Verification of the applied force	EN ISO 7500-2	-



**IEC 61631**

Edition 2.0 2020-05

# **INTERNATIONAL STANDARD**

---

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



**THIS PUBLICATION IS COPYRIGHT PROTECTED****Copyright © 2020 IEC, Geneva, Switzerland**

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either IEC or IEC's member National Committee in the country of the requester. If you have any questions about IEC copyright or have an enquiry about obtaining additional rights to this publication, please contact the address below or your local IEC member National Committee for further information.

IEC Central Office  
3, rue de Varembe  
CH-1211 Geneva 20  
Switzerland

Tel.: +41 22 919 02 11  
[info@iec.ch](mailto:info@iec.ch)  
[www.iec.ch](http://www.iec.ch)

**About the IEC**

The International Electrotechnical Commission (IEC) is the leading global organization that prepares and publishes International Standards for all electrical, electronic and related technologies.

**About IEC publications**

The technical content of IEC publications is kept under constant review by the IEC. Please make sure that you have the latest edition, a corrigendum or an amendment might have been published.

**IEC publications search - [webstore.iec.ch/advsearchform](http://webstore.iec.ch/advsearchform)**

The advanced search enables to find IEC publications by a variety of criteria (reference number, text, technical committee,...). It also gives information on projects, replaced and withdrawn publications.

**IEC Just Published - [webstore.iec.ch/justpublished](http://webstore.iec.ch/justpublished)**

Stay up to date on all new IEC publications. Just Published details all new publications released. Available online and once a month by email.

**IEC Customer Service Centre - [webstore.iec.ch/csc](http://webstore.iec.ch/csc)**

If you wish to give us your feedback on this publication or need further assistance, please contact the Customer Service Centre: [sales@iec.ch](mailto:sales@iec.ch).

**Electropedia - [www.electropedia.org](http://www.electropedia.org)**

The world's leading online dictionary on electrotechnology, containing more than 22 000 terminological entries in English and French, with equivalent terms in 16 additional languages. Also known as the International Electrotechnical Vocabulary (IEV) online.

**IEC Glossary - [std.iec.ch/glossary](http://std.iec.ch/glossary)**

67 000 electrotechnical terminology entries in English and French extracted from the Terms and Definitions clause of IEC publications issued since 2002. Some entries have been collected from earlier publications of IEC TC 37, 77, 86 and CISPR.



IEC 61631

Edition 2.0 2020-05

# INTERNATIONAL STANDARD

---

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

INTERNATIONAL  
ELECTROTECHNICAL  
COMMISSION

---

ICS 29.100.10

ISBN 978-2-8322-8266-3

**Warning! Make sure that you obtained this publication from an authorized distributor.**

## CONTENTS

FOREWORD .....	3
INTRODUCTION .....	5
1 Scope .....	6
2 Normative references .....	6
3 Terms and definitions .....	6
4 Apparatus .....	6
4.1 Test core support and loading wedge .....	6
4.2 Testing device .....	7
4.3 Humidity measuring device .....	7
5 Test cores .....	7
5.1 General .....	7
5.2 Number of test cores .....	7
5.3 Precautions .....	7
6 Testing .....	7
6.1 Test conditions .....	7
6.2 Test procedures .....	7
6.2.1 General .....	7
6.2.2 Test of E-cores .....	8
6.2.3 Test of I-cores .....	10
6.2.4 Test of ring-cores .....	10
Annex A (normative) Standard dimensions of E-cores and their support for strength test .....	13
A.1 General .....	13
A.2 Designation .....	13
A.3 Test core support .....	13
Annex B (normative) Standard dimensions of ring-cores and methods for strength test .....	15
B.1 General .....	15
B.2 Selection of mechanical strength test method for ring-core .....	15
Bibliography .....	16
Figure 1 – E test .....	8
Figure 2 – W test .....	9
Figure 3 – T test .....	9
Figure 4 – M test .....	10
Figure 5 – I test .....	10
Figure 6 – Stretching method .....	11
Figure 7 – Shearing method .....	12
Figure 8 – Pressure method .....	12
Figure A.1 – Designation of E-core .....	13
Figure B.1 – Dimensions of ring-core .....	15
Table A.1 – Test core support .....	14
Table B.1 – Ring-core dimension designations .....	15



## INTERNATIONAL ELECTROTECHNICAL COMMISSION

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

## FOREWORD

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of 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, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). 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. 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 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 IEC National Committees.
- 3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
- 4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
- 5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
- 6) All users should ensure that they have the latest edition of this publication.
- 7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
- 8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
- 9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

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

This second edition cancels and replaces the first edition published in 2001. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

- a) the phrase: "This document is also applicable to the mechanical strength measurement of magnetic powder cores" has been added in the scope;
- b) IEC 61246 has been replaced by IEC 63093-8; EN 1002-2 has been replaced by ISO 7500-1; ISO 4677-1 and ISO 4677-2 have been withdrawn;
- c) dimensions  $D$  and  $F$  in Figure A.1 and Table A.1 have been changed to be consistent with Figure 1 of IEC 63093-8:2018;
- d) addition of the content of ring-cores test;
- e) addition of Annex B;

- f) the location of the jig is amended in Figure 3;
- g) in Figure 5, the roller bars are moved to the edge of the I-core, aligned with the core.

The text of this International Standard is based on the following documents:

CDV	Report on voting
51/1312/CDV	51/1333/RVC

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

This document has been drafted in accordance with the ISO/IEC Directives, Part 2.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under "<http://webstore.iec.ch>" in the data related to the specific document. At this date, the document will be

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

## INTRODUCTION

The method specified in this document 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 stated in the test report for 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 the state of the surface in the report should be mentioned, 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, multi-axial stressing, other rates of stressing or 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 microstructure 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 are interpreted with caution.

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

### 1 Scope

This document 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, I-cores and ring-cores but other core types such as U-cores could be tested according to a derived method agreed by the parties concerned. This document is also applicable to the mechanical strength measurement of magnetic powder cores.

### 2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 7500-2, *Metallic materials – Verification of static uniaxial testing machines – Part 2: Tension creep testing machines – Verification of the applied force*

**koniec náhľadu – text ďalej pokračuje v platenej verzii STN**