SLOVENSKI STANDARD
SIST EN IEC 60404-13:2019

01-januar-2019

Nadomešča:
SIST EN 60404-13:2008

Magnetni materiali - 13. del: Metode za meritve upornosti, gostote in skladnega faktorja električnih jeklenih trakov in pločevine (IEC 60404-13:2018)

Magnetic materials - Part 13: Methods of measurement of resistivity, density and stacking factor of electrical steel strip and sheet (IEC 60404-13:2018)

Magnetische Werkstoffe - Teil 13: Verfahren der Messung des spezifischen elektrischen Widerstandes, der Dichte und des Stapelfaktors von Elektroband und -blech (IEC 60404-13:2018)

Magnetic materials - Part 13: Methods of measurement of density, resistivity and stacking factor of electrical steel sheet and strip (IEC 60404-13:2018)

Ta slovenski standard je istoveten z: **EN IEC 60404-13:2018**

ICS:

17.220.20	Merjenje električnih in magnetnih veličin	Measurement of electrical and magnetic quantities
29.030	Magnetni materiali	Magnetic materials

SIST EN IEC 60404-13:2019 **en**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN IEC 60404-13

October 2018

ICS 17.220.20; 29.030

Supersedes EN 60404-13:2007

English Version

Magnetic materials - Part 13: Methods of measurement of resistivity, density and stacking factor of electrical steel strip and sheet (IEC 60404-13:2018)

Matériaux magnétiques - Partie 13: Méthodes de mesure de la résistivité, de la masse volumique et du facteur de foisonnement des bandes et tôles en acier électrique (IEC 60404-13:2018)

Magnetische Werkstoffe - Teil 13: Verfahren der Messung des spezifischen elektrischen Widerstandes, der Dichte und des Stapelfaktors von Elektroband und -blech (IEC 60404-13:2018)

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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.

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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

European foreword

The text of document 68/574/CDV, future edition 2 of IEC 60404-13, prepared by IEC/TC 68 "Magnetic alloys and steels" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN IEC 60404-13:2018.

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) 2019-05-14
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2021-08-14

This document supersedes EN 60404-13:2007.

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 60404-13:2018 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:

ISO 1183-1:2012	NOTE	Harmonized as EN ISO 1183-1:2012 (not modified)
ISO 2738:1999	NOTE	Harmonized as EN ISO 2738:1999 (not modified)

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.

Publication	Year	Title	EN/HD	Year
IEC 60050-121	-	International Electrotechnical Vocabulary - Part 121: Electromagnetism	-	-
IEC 60050-221	-	International Electrotechnical Vocabulary. Chapter 221: Magnetic materials and components	-	-
IEC 60404-2	-	Magnetic materials - Part 2: Methods of measurement of the magneticproperties of electrical steel sheet and strip by means of an Epstein frame	EN 60404-2	-
IEC 60404-3	-	Magnetic materials - Part 3: Methods of measurement of the magnetic properties of magnetic sheet and strip by means of a single sheet tester	-	-
ISO 1183-3	-	Plastics - Methods for determining the density of non-cellular plastics - Part 3: Gas pyknometer method	EN ISO 1183-3	-

IEC 60404-13

Edition 2.0 2018-07

INTERNATIONAL STANDARD

NORME INTERNATIONALE

Magnetic materials –
Part 13: Methods of measurement of resistivity, density and stacking factor of electrical steel strip and sheet

Matériaux magnétiques –
Partie 13: Méthodes de mesure de la résistivité, de la masse volumique et du facteur de foisonnement des bandes et tôles en acier électrique

INTERNATIONAL ELECTROTECHNICAL COMMISSION

COMMISSION ELECTROTECHNIQUE INTERNATIONALE

ICS 17.220.20; 29.030

ISBN 978-2-8322-5869-9

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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MAGNETIC MATERIALS –

Part 13: Methods of measurement of resistivity, density and stacking factor of electrical steel strip and sheet

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.
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International Standard IEC 60404-13 has been prepared by IEC Technical Committee 68: Magnetic alloys and steels.

This second edition cancels and replaces the first edition published in 1995 and constitutes a technical revision.

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

a) the sequence of the density and resistivity sections is changed and the title of the document revised to reflect this;
b) the van-der-Pauw method (Method R2) is also applicable to Epstein strip specimens;
c) the gas pyknometer method is introduced, and the liquid immersion method and the calculation method based on the chemical composition are quoted;

d) the requirements of the stacking factor section, such as the tolerance of the dimensions of the test specimen and the repeatability of measurement, are changed;

e) an example of the apparatus for determination of the resistivity using a rectangular sheet, which was previously part of the main body of the text, is moved to constitute informative Annex A;

f) an example of the determination of the density by using the gas pyknometer method is added as an informative Annex B;

g) an example of the determination of density based on the calculation of silicon and aluminium contents is added as an informative Annex C.

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

CDV	Report on voting
68/574/CDV	68/586A/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.

A list of all the parts in the IEC 60404 series, under the general title *Magnetic materials*, can be found on the IEC web site.

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.

MAGNETIC MATERIALS –

Part 13: Methods of measurement of resistivity, density and stacking factor of electrical steel strip and sheet

1 Scope

This part of IEC 60404 specifies the methods used for determining the resistivity, density and stacking factor of grain-oriented and non-oriented electrical steel strip and sheet. These quantities are necessary to establish the physical characteristics of the material. Moreover, the density is necessary to allow specified values of the magnetic polarization, resistivity and stacking factor to be determined.

Since these properties are functions of temperature, the measurements will be made at an ambient temperature of (23 ±5) °C except when specified in this document.

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.

IEC 60050-121, *International Electrotechnical Vocabulary – Part 121: Electromagnetism*

IEC 60050-221, *International Electrotechnical Vocabulary – Chapter 221: Magnetic materials and components*

IEC 60404-2, *Magnetic materials – Part 2: Methods of measurement of the magnetic properties of electrical steel sheet and strip by means of an Epstein frame*

IEC 60404-3, *Magnetic materials – Part 3: Methods of measurement of the magnetic properties of magnetic sheet and strip by means of a single sheet tester*

ISO 1183-3, *Plastics – Methods for determining the density of non-cellular plastics – Part 3: Gas pyknometer method*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 60050-121, IEC 60050-221 and ISO 1183-3 apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at http://www.electropedia.org/
- ISO Online browsing platform: available at http://www.iso.org/obp