
**Magnetni materiali - 3. del: Metode merjenja magnetnih lastnosti električnih
jeklenih trakov in pločevine z uporabo enolistnega preskuševalnika (IEC 60404-
3:2022)**

Magnetic materials - Part 3: Methods of measurement of the magnetic properties of
electrical steel strip and sheet by means of a single sheet tester (IEC 60404-3:2022)

Magnetische Werkstoffe - Teil 3: Verfahren zur Bestimmung der magnetischen
Eigenschaften von Elektroband und -blech mit Hilfe eines Tafelmessgerätes (IEC 60404-
3:2022)

Matériaux magnétiques - Partie 3: Méthodes de mesure des caractéristiques
magnétiques des bandes et tôles magnétiques en acier à l'aide de l'essai sur tôle unique
(IEC 60404-3:2022)

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**Magnetic materials - Part 3: Methods of measurement of the
magnetic properties of electrical steel strip and sheet by means
of a single sheet tester
(IEC 60404-3:2022)**

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der magnetischen Eigenschaften von Elektroband und -
blech mit Hilfe eines Tafelmessgerätes
(IEC 60404-3:2022)

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

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EN IEC 60404-3:2022 (E)**European foreword**

The text of document 68/699/CDV, future edition 3 of IEC 60404-3, prepared by IEC/TC 68 "Magnetic alloys and steels" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN IEC 60404-3:2022.

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) 2023-09-13
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2025-12-13

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In the official version, for Bibliography, the following note has to be added for the standard indicated:

<https://standards.iteh.ai/catalog/standards/sist/b9b503dd-d144-42dd-9c7d-3d0811111111>
IEC 60404-8-7:2020 NOTE Harmonized as EN 10107:2022 (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.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60050-121	-	International Electrotechnical Vocabulary - Part 121: Electromagnetism	-	-
IEC 60050-221	-	International Electrotechnical Vocabulary. Chapter 221: Magnetic materials and components	-	-
IEC 60404-13	-	Magnetic materials - Part 13: Methods of measurement of resistivity, density and stacking factor of electrical steel strip and sheet	EN IEC 60404-13	-

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INTERNATIONAL STANDARD

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Magnetic materials –
Part 3: Methods of measurement of the magnetic properties of electrical steel
strip and sheet by means of a single sheet tester

Matériaux magnétiques –
Partie 3: Méthodes de mesure des caractéristiques magnétiques des bandes et
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INTERNATIONAL ELECTROTECHNICAL COMMISSION

MAGNETIC MATERIALS –**Part 3: Methods of measurement of the magnetic properties of electrical steel strip and sheet by means of a single sheet tester**

FOREWORD

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IEC 60404-3 has been prepared by IEC technical committee 68: Magnetic alloys and steels. It is an International Standard.

This third edition cancels and replaces the second edition published in 1992, Amendment 1:2002 and Amendment 2:2009. This edition constitutes a technical revision.

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

- a) Annex A was revised. The method of determining the yokes' lamination resistance was added to Annex A;
- b) Annex B of the consolidated version of 2010 referred to calibration of the SST using the Epstein method. It was cancelled;
- c) Annex B (new), Annex C and Annex D were revised, they are for information only;
- d) Annex C was modified taking account of the new situation regarding P and R grades;
- e) Annex D was amended by addition of Clause D.4 on the numerical air flux compensation.

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

Draft	Report on voting
68/699/CDV	68/710/RVC

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

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/publications.

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

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under 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.

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MAGNETIC MATERIALS –

Part 3: Methods of measurement of the magnetic properties of electrical steel strip and sheet by means of a single sheet tester

1 Scope

This part of IEC 60404 is applicable to grain-oriented and non-oriented electrical steel strip and sheet for measurement of AC magnetic properties at power frequencies.

The object of this document is to define the general principles and the technical details of the measurement of the magnetic properties of electrical steel strip and sheet by means of a single sheet tester (SST).

The single sheet tester is applicable to test specimens obtained from electrical steel strips and sheets of any grade. The AC magnetic characteristics are determined for sinusoidal induced voltages, for specified peak values of the magnetic polarization, for specific peak values of the magnetic field strength and for a specified frequency.

The measurements are made at an ambient temperature of $(23 \pm 5)^\circ\text{C}$ on test specimens which have first been demagnetized.

NOTE Throughout this document, the quantity "magnetic polarization" is used as defined in IEC 60050-221. In some standards of the IEC 60404 series, the quantity "magnetic flux density" was used.

In order to support the long-term reliability of the performance of this set up and to understand better the relationship between the Epstein method and the SST method, the informative Annexes B and C, respectively, have been included.

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 – Part 221: Magnetic materials and components*

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

3 Terms and definitions

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

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

- IEC Electropedia: available at <https://www.electropedia.org/>