

Magnetic materials —

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

The European Standard EN 60404-13:2007 has the status of a British Standard

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National foreword

This British Standard is the UK implementation of EN 60404-13:2007. It is identical to IEC 60404-13:1995. It supersedes BS 6404-13:1996 which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee ISE/NFE/5, Magnetic alloys and steels.

A list of organizations represented on this committee can be obtained on request to its secretary.

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**Magnetic materials -
Part 13: Methods of measurement of density, resistivity
and stacking factor of electrical steel sheet and strip
(IEC 60404-13:1995)**

Matériaux magnétiques -
Partie 13: Méthodes de mesure
de la masse volumique, de la résistivité
et du facteur de foisonnement des tôles
et bandes magnétiques
(CEI 60404-13:1995)

Magnetische Werkstoffe -
Teil 13: Prüfverfahren zur Messung der
Dichte, des spezifischen Widerstandes
und des Stapelfaktors von Elektroblech
und -band
(IEC 60404-13:1995)

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CENELEC

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Europäisches Komitee für Elektrotechnische Normung

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Foreword

The text of the International Standard IEC 60404-13:1995, prepared by IEC TC 68, Magnetic alloys and steels, was submitted to the Unique Acceptance Procedure and was approved by CENELEC as EN 60404-13 on 2007-10-01 without any modification.

The following dates were fixed:

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- latest date by which the national standards conflicting
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Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 60404-13:1995 was approved by CENELEC as a European Standard without any modification.

CONTENTS

Clause

1	Scope and object.....	4
2	Normative references	4
3	Determination of the density	4
3.1	Field of application	4
3.2	Test specimens	5
3.2.1	Strip specimens	5
3.2.2	Sheet specimens.....	5
3.3	Principles of measurement.....	5
3.3.1	General	5
3.3.2	Method of measuring the product $\rho_m \cdot \rho$ using Epstein strips (method A)	6
3.3.3	Method of measuring the product $\rho_m \cdot \rho$ using sheet specimens (method B).....	7
3.4	Apparatus	8
3.4.1	Requirements for methods A and B.....	8
3.4.2	Requirements for method A	9
3.4.3	Requirements for method B	9
3.5	Procedure.....	10
3.5.1	General.....	10
3.5.2	Procedure with strip specimens (method A)	10
3.5.3	Procedure with sheet specimens (method B)	10
3.5.4	Determination of the density	11
3.6	Test report	11
3.7	Reproducibility	11
4	Determination of the resistivity	11
4.1	Object	11
4.2	Field of application	11
4.3	Test specimen	11
4.4	Principle of measurement	11
4.4.1	Method based on the determination of the product $\rho_m \cdot \rho$	11
4.4.2	Method based on the determination of thickness d	12
4.5	Test report.....	13
4.6	Reproducibility	13
5	Determination of the stacking factor	13
5.1	Object	13
5.2	Field of application	13
5.3	Measuring procedure	13
5.4	Test report.....	14
5.5	Reproducibility.....	14
	Annex A - Bibliography	15
	Annex ZA (normative) Normative references to international publications with their corresponding European publications.....	16

MAGNETIC MATERIALS -

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

1 Scope and object

This part of IEC 404 specifies the methods used for determining the density, resistivity and stacking factor of electrical steel sheet and strip. These quantities are necessary to establish the magnetic characteristics of the material. In particular, the density is necessary to allow specified values of the flux density to be set without knowing the thickness of the test specimen.

For the determination of the density, the immersion method was earlier considered to be a fundamental method for use in cases of arbitration. However, experience has shown that this method is very difficult to use in the case of sheet samples with a relatively large surface area. This method is therefore not included. It is described in ISO 2738 and ISO 1183.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this part of IEC 404. At the time of publication, the editions indicated were valid. All normative documents are subject to revision, and parties to agreements based on this part of IEC 404 are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

IEC 404-2: 1978, *Magnetic materials - Part 2: Methods of measurement of magnetic, electrical and physical properties of magnetic sheet and strip*

IEC 404-3: 1992, *Magnetic materials - Part 3: Methods of measurement of magnetic properties of magnetic sheet and strip by means of a single sheet tester*

IEC 404-10: 1988, *Magnetic materials - Part 10: Methods of measurement of magnetic properties of magnetic steel sheet and strip at medium frequencies*

ISO 1183: 1987, *Plastics - Methods for determining the density and relative density of non-cellular plastics*

ISO 2738: 1987, *Permeable sintered metal materials - Determination of density, oil content and open porosity*

3 Determination of the density

3.1 Field of application

The method of measurement of the density defined in this clause applies only to non-oriented iron-silicon electrical sheet and strip with or without insulation, with the following range of chemical composition by mass:

- silicon: $p(\text{Si}) \leq 4 \%$;
- aluminium: $0,17 p(\text{Si}) - 0,28 \leq p(\text{Al}) \leq 0,17 p(\text{Si}) + 0,28$ and $p(\text{Al}) \geq 0$;
- total of other alloy constituents: $p \leq 0,4 \%$