

Magnetic materials - Method of measurement of the coercivity of magnetic materials in an open circuit

Magnetic materials - Method of measurement of the coercivity of magnetic materials in an open circuit

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

<p>Käesolev Eesti standard EVS-EN 10330:2003 sisaldab Euroopa standardi EN 10330:2003 ingliskeelset teksti.</p> <p>Käesolev dokument on jõustatud 16.05.2003 ja selle kohta on avaldatud teade Eesti standardiorganisatsiooni ametlikus väljaandes.</p> <p>Standard on kättesaadav Eesti standardiorganisatsioonist.</p>	<p>This Estonian standard EVS-EN 10330:2003 consists of the English text of the European standard EN 10330:2003.</p> <p>This document is endorsed on 16.05.2003 with the notification being published in the official publication of the Estonian national standardisation organisation.</p> <p>The standard is available from Estonian standardisation organisation.</p>
--	---

<p>Käsitlusala:</p> <p>This European standard specifies the method of measurement of the coercivity of magnetic materials in an open magnetic circuit. It applies to magnetic materials having a coercivity up to 500 kA/m. Special precautions to take in measuring coercivities below 40 A/m and above 160 kA/m are given in annex A</p>	<p>Scope:</p> <p>This European standard specifies the method of measurement of the coercivity of magnetic materials in an open magnetic circuit. It applies to magnetic materials having a coercivity up to 500 kA/m. Special precautions to take in measuring coercivities below 40 A/m and above 160 kA/m are given in annex A</p>
---	---

ICS 29.030

Võtmesõnad:

English version

**Magnetic materials - Method of measurement of the coercivity of
magnetic materials in an open circuit**

Matériaux magnétiques - Méthode de mesure du champ
coercitif des matériaux magnétiques en circuit magnétique
ouvert

Magnetische Werkstoffe - Verfahren zur Messung der
Koerzitivität magnetischer Werkstoffe im offenen
Magnetkreis

This European Standard was approved by CEN on 21 February 2003.

CEN 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 Management Centre or to any CEN 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 CEN member into its own language and notified to the Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Slovakia, Spain, Sweden, Switzerland and United Kingdom.



EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

Management Centre: rue de Stassart, 36 B-1050 Brussels

Contents

	page
Foreword.....	3
1 Scope	4
2 Normative references	4
3 Terms and definitions.....	4
4 Principle	4
5 Test specimen	5
6 Measurement	5
6.1 Magnetization	5
6.2 Measuring devices	5
6.2.1 General.....	5
6.2.2 Method A.....	5
6.2.3 Method B.....	6
6.3 Determination of coercivity.....	6
6.4 Reproducibility	6
7 Test report	7
Annex A (normative) Precautions to be taken for measurements of coercivity below 40 A/m and above 160 kA/m	10

Foreword

This document (EN 10330:2003) has been prepared by Technical Committee ECISS/TC 24, "Electrical steel sheet and strip qualities - Qualities dimensions, tolerances and specific tests", the secretariat of which is held by DIN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by October 2003, and conflicting national standards shall be withdrawn at the latest by October 2003.

This document is equivalent to IEC 60404-7.

Annex A is normative.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Slovakia, Spain, Sweden, Switzerland and the United Kingdom.

1 Scope

This European Standard specifies the method of measurement of the coercivity of magnetic materials in an open magnetic circuit.

It applies to magnetic materials having a coercivity up to 500 kA/m. Special precautions to take in measuring coercivities below 40 A/m and above 160 kA/m are given in annex A.

2 Normative references

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).

IEC 60050-121:1998, *International Electrotechnical Vocabulary (IEV) – Chapter 121: Electromagnetism*.

IEC 60050-221:1990, *International Electrotechnical Vocabulary (IEV) – Chapter 221: Magnetic materials and components*.

3 Terms and definitions

For the purposes of this European Standard, the terms and definitions given in IEC 60050-121:1998 and IEC 60050-221:1990 and the following apply

3.1

coercivity, H_{cJ}

magnetic field strength required to reduce the magnetic polarization to zero in a magnetic specimen which has previously been magnetized to saturation

NOTE The coercivities H_{cB} and H_{cJ} are respectively discriminated depending on the hysteresis loop being defined in the $B = f(H)$, or $J = f(H)$ system (see Figure 1). It can be shown that, for materials of high-incremental permeability in the region $B = 0$, the difference between the intrinsic coercivity H_{cJ} and the coercivity H_{cB} is negligible since :

$$H_{cB} = H_{cJ} \left(1 - \mu_0 \frac{\Delta H}{\Delta B} \right)$$

where

H_{cB} is the induction coercivity, in amperes per metre ;

H_{cJ} is the polarization coercivity, in amperes per metre ;

ΔB is the incremental change in magnetic flux density, in teslas (for $B = 0$) ;

ΔH is the corresponding change in magnetic field strength, in amperes per metre ;

μ_0 is the magnetic constant = $4\pi \times 10^{-7}$ H/m (henrys per metre).

4 Principle

If a magnetic specimen is placed in a uniform magnetic field then it will distort this magnetic field unless no flux (additional to that previously carried by the air space it now occupies) enters or emerges from it. This condition represents a state of complete demagnetization which occurs when a demagnetizing coercive magnetic field strength is applied to the specimen such that the magnetic polarization is zero.