

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

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

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English Version

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

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

Magnetische Werkstoffe - Verfahren zur Messung der Koerzivität magnetischer Werkstoffe in einem offenen Magnetkreis

This European Standard was approved by CEN on 23 July 2015.

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European foreword

This document (EN 10330:2015) has been prepared by Technical Committee ECISS/TC 108 “Steel sheet and strip for electrical applications”, 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of an identical text or by endorsement, at the latest by February 2016, and conflicting national standards shall be withdrawn at the latest by February 2016.

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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

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. 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*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 60050-121 and IEC 60050-221 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 1 to entry: 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 tesla (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).