Mittemagnetilised katted magnetilistel aluspindadel. Katte paksuse määramine. Magnetmeetod

Non-magnetic coatings on magnetic substrates - Measurement of coating thickness - Magnetic method

EESTI STANDARDI EESSÕNA **NATIONAL FOREWORD**

Käesolev Eesti standard EVS-EN ISO 2178:1999 sisaldab Euroopa standardi EN ISO 2178:1995 ingliskeelset teksti. Käesolev dokument on jõustatud 12.12.1999 ja selle kohta on avaldatud teade Eesti standardiorganisatsiooni ametlikus väljaandes. Standard on kättesaadav Eesti standardiorganisatsioonist.	This Estonian standard EVS-EN ISO 2178:1999 consists of the English text of the European standard EN ISO 2178:1995. This document is endorsed on 12.12.1999 with the notification being published in the official publication of the Estonian national standardisation organisation. The standard is available from Estonian standardisation organisation.

Käsitlusala: Standard esitab mittepurustava mõõtemeetodi, kasutades magnetilistel aluspindadel mittemagnetilise katte (kaasa arvatud klaas- ja portselanemailkatted) paksuse määramiseks magnetinstrumente.	**Scope:**

ICS 17.040.20

Võtmesõnad: alusmetallid, klaasemailid, magnetkatsed, metallkatted, mittemetallkatted, mõõtmete määramine, portselanemailid

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Descriptors: Coatings, magnetic substrates, coating thickness, testing.

English version

Non-magnetic coatings on magnetic substrates
Measurement of coating thickness
Magnetic method
(ISO 2178:1982)

Revêtements métalliques non magnétiques sur métal de base magnétique; mesurage de l'épaisseur du revêtement; méthode magnétique (ISO 2178:1982)

Nichtmagnetische Überzüge auf magnetischen Grundmetallen; Messen der Schichtdicke; Magnetverfahren (ISO 2178:1982)

This European Standard was approved by CEN on 1994-10-03 and is identical to the ISO Standard as referred to.

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 Central Secretariat 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 Central Secretariat has the same status as the official versions.

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CEN

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

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Foreword

International Standard

ISO 2178:1982 Non-magnetic coatings on magnetic substrates; measurement of coating thickness; magnetic method

which was prepared by ISO/TC 107 'Metallic and other inorganic coatings' of the International Organization for Standardization, has been adopted by Technical Committee CEN/TC 262 'Protection of metallic materials against corrosion' as a European Standard.

This document was submitted for Formal Vote and adopted as a European Standard.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, and conflicting national standards withdrawn, by July 1995 at the latest.

In accordance with the CEN/CENELEC Internal Regulations, the following countries are bound to implement this European Standard:

Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

Endorsement notice

The text of the International Standard ISO 2178:1982 was approved by CEN as a European Standard without any modification.

NOTE: Normative references to international publications are listed in Annex ZA (normative).

1 Scope and field of application

This International Standard specifies the method of using coating thickness instruments of the magnetic type for non-destructive measurements of the thickness of non-magnetic coatings (including vitreous and porcelain enamel coatings) on magnetic basis metals.

The method is applicable only for measurements on reasonably flat specimens. In the case of nickel coatings on non-magnetic substrates, the preferred method is that specified in ISO 2361.

2 References

ISO 2064, *Metallic and other non-organic coatings — Definitions and conventions concerning the measurement of thickness.*

ISO 2361, *Electrodeposited nickel coatings on magnetic and non-magnetic substrates — Measurement of coating thickness — Magnetic method.*

3 Principle

Coating thickness instruments of the magnetic type measure either the magnetic attraction between a permanent magnet and the basis metal, as influenced by the presence of the coating, or the reluctance of a magnetic flux path passing through the coating and the basis metal.

4 Factors affecting the measuring accuracy[1)]

The following factors may affect the accuracy of measurements of coating thickness.

4.1 Coating thickness

The precision of a measurement changes with coating thickness depending on the instrument design. For thin coatings, the precision is constant, independent of the thickness. For thick coatings, the precision is an approximately constant fraction of the thickness.

4.2 Magnetic properties of the basis metal

Thickness measurements by the magnetic method are affected by variations in the magnetic properties of the basis metal. For practical purposes, magnetic variations in low carbon steels can be considered to be insignificant. To avoid the influences of several, or localized, heat treatments and cold working, the instrument should be calibrated using a calibration standard having a basis metal with the same properties as that of the test specimen or, preferably, and if available, with a sample of the part to be tested before application of the coating.

4.3 Basis metal thickness

For each instrument, there is a critical thickness of basis metal above which measurements will not be affected by an increase in thickness. Since it depends on the instrument probe and the nature of the basis metal, its value should be determined experimentally, unless it is specified by the manufacturer.

4.4 Edge effects

The method is sensitive to abrupt changes in surface contour of the test specimen. Therefore, measurements made too near an edge or inside corner will not be valid unless the instrument is specifically calibrated for such measurements. The effect may extend up to about 20 mm from the discontinuity, depending on the instrument.

4.5 Curvature

Measurements are affected by the curvature of the test specimen. The influence of curvature varies considerably with the make and type of instrument, but always becomes more pronounced as the radius of curvature decreases.

Instruments with two-pole probes may also produce different readings if the poles are aligned in planes parallel or perpendicular to the axis of a cylindrical surface. A similar effect can occur with a single-pole probe if the tip is unevenly worn.

Measurements made on curved test specimens may not, therefore, be valid unless the instrument is specifically calibrated for such measurements.

1) For the purpose of this International Standard, the measuring uncertainty is defined as that obtained with an instrument correctly calibrated and used.