SLOVENSKI STANDARD
SIST EN ISO 2178:1999

01-junij-1999

Nemagnetne prevleke na magnetnih osnovah – Merjenje debeline prevleke – Magnetna metoda (ISO 2178:1982)

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

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

Revetements métalliques non magnétiques sur métal de base magnétique - Mesurage de l'épaisseur du revetement - Méthode magnétique (ISO 2178:1982)

Ta slovenski standard je istoveten z: **EN ISO 2178:1995**

ICS:

17.040.20	Lastnosti površin	Properties of surfaces
25.220.40	Kovinske prevleke	Metallic coatings
25.220.50	Emajlne prevleke	Enamels

SIST EN ISO 2178:1999 **en**

EUROPEAN STANDARD

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EUROPÄISCHE NORM

EN ISO 2178

January 1995

ICS 25.220.40

Descriptors: Metal coatings, non-metal coatings, vitreous enamels, porcelain enamels, dimensional measurements, magnetic tests, base metal

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. 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.

The European Standards exist 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.

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

CEN

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

Central Secretariat: rue de Stassart,36 B-1050 Brussels

Foreword

This European Standard has been taken over by the Technical Committee CEN/TC 262 "Protection of metallic materials against corrosion" from the work of ISO/TC 107 "Metallic and other inorganic coatings" of the International Organization for Standardization (ISO).

This document was submitted to the formal vote and was adopted by CEN 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, at the latest by July 1995, and conflicting national standards shall be withdrawn at the latest by July 1995.

In accordance with the CEN/CENELEC Internal Regulations, 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 has been approved by CEN as a European Standard without any modification.

Annex ZA (normative)
Normative references to international publications with their relevant European publications

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).

Publication	Year	Title	EN	Year
ISO 2064	1980	Metallic and other non-organic coatings - Definitions and conventions concerning the measurement of thickness	EN ISO 2064	1994
ISO 2361	1982	Electrodeposited nickel coatings on magnetic and non-magnetic substrates - Measurement of coating thickness - Magnetic method	EN ISO 2361	1995

International Standard 2178

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION•МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ•ORGANISATION INTERNATIONALE DE NORMALISATION

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

Revêtements métalliques non magnétiques sur métal de base magnétique — Mesurage de l'épaisseur du revêtement — Méthode magnétique

Second edition — 1982-08-01

UDC 669.058 : 531.717 : 621.317.49 **Ref. No. ISO 2178-1982 (E)**

Descriptors : metal coatings, non-metallic coatings, vitreous enamels, porcelain enamels, dimensional measurement, magnetic tests, base metal.

Price based on 4 pages

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards institutes (ISO member bodies). The work of developing International Standards is carried out through ISO technical committees. Every member body interested in a subject for which a technical committee has been set up has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work.

Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council.

International Standard ISO 2178 was developed by Technical Committee ISO/TC 107, *Metallic and other non-organic coatings*, and was circulated to the member bodies in November 1980.

It has been approved by the member bodies of the following countries :

Australia	Italy	Sweden
Bulgaria	Japan	Switzerland
Czechoslovakia	Netherlands	United Kingdom
France	Poland	USA
Germany, F. R.	Romania	USSR
Hungary	South Africa, Rep. of	
India	Spain	

No member body expressed disapproval of the document.

This second edition cancels and replaces the first edition (i.e. ISO 2178-1972).

Printed in Switzerland

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

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.