



SLOVENSKI STANDARD SIST EN ISO 2360:1999

01-oktober-1999

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Non-conductive coatings on non-magnetic basis metals - Measurement of coating thickness - Eddy current method (ISO 2360:1982)

Nichtleitende Überzüge auf nichtmagnetischen Grundmetallen - Messen der Schichtdicke - Wirbelstromverfahren (ISO 2360:1982)

Revetements non conducteurs sur métal de base non magnétique - Mesurage de l'épaisseur - Méthode des courants de Foucault (ISO 2360:1982)

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Ta slovenski standard je istoveten z: EN ISO 2360:1995

ICS:

| | | |
|-----------|---------------------|------------------------|
| 17.040.20 | Lastnosti površin | Properties of surfaces |
| 25.220.20 | Površinska obdelava | Surface treatment |

SIST EN ISO 2360:1999

en

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EUROPEAN STANDARD

EN ISO 2360

NORME EUROPÉENNE

EUROPÄISCHE NORM

January 1995

ICS 25.220.30

Descriptors: Non metal coatings, oxide coatings, dimensional measurements, thickness, Eddy current tests

English version

**Non-conductive coatings on non-magnetic basis
metals - Measurement of coating thickness - Eddy
current method (ISO 2360:1982)**

Revêtements non conducteurs sur métal de base - Mesurage de l'épaisseur - Méthode des courants de Foucault (ISO 2360:1982) - Nichtleitende Überzüge auf nichtmagnetischen Grundmetallen - Messen der Schichtdicke - Wirbelstromverfahren (ISO 2360:1982)

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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

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Ref. No. EN ISO 2360:1995 E

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.

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Endorsement notice

The text of the International Standard ISO 2360:1982 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).

| <u>Publication</u> | <u>Year</u> | <u>Title</u> | <u>EN</u> | <u>Year</u> |
|--------------------|-------------|--|-------------|-------------|
| ISO 2178 | 1982 | Non-magnetic coatings on magnetic substrates - Measurements of coating thickness - Magnetic method | EN ISO 2178 | 1995 |

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International Standard



2360

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

Non-conductive coatings on non-magnetic basis metals — Measurement of coating thickness — Eddy current method

Revêtements non conducteurs sur métal de base non magnétique — Mesurage de l'épaisseur — Méthode des courants de Foucault

iTeh STANDARD PREVIEW

Second edition — 1982-08-01

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UDC 621.794 : 621.317.432 : 531.717

Ref. No. ISO 2360-1982 (E)

Descriptors : non-metallic coatings, oxide coatings, dimensional measurements, thickness, eddy current tests.

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 2360 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 | India | South Africa Rep. of |
| Bulgaria | Italy | Spain |
| Czechoslovakia | Japan | Sweden |
| Egypt, Arab Rep. of | Netherlands | Switzerland |
| France | Poland | United Kingdom |
| Germany, F.R. | Portugal | USA |
| Hungary | Romania | USSR |

No member body expressed disapproval of the document.

This second edition cancels and replaces the first edition (i.e. ISO 2360-1972).

Non-conductive coatings on non-magnetic basis metals — Measurement of coating thickness — Eddy current method

1 Scope and field of application

This International Standard specifies the method of using eddy current instruments for non-destructive measurements of the thickness of non-conductive coatings on non-magnetic basis metals.

The method is applicable for measurements of the thickness of most oxide coatings produced by anodizing, but it is not applicable to all conversion coatings, some of which are too thin to be measured by this method (see clause 7).

Although, theoretically, the method can be used for measurements of the thickness of coatings on magnetic basis metals, its use for this application is not recommended. In such cases, the magnetic method specified in ISO 2178 should be used.

2 Reference

ISO 2178, *Non-magnetic coatings on magnetic substrates — Measurement of coating thickness — Magnetic method.*

3 Principle

Eddy current instruments work on the principle that a high frequency electromagnetic field generated in the probe system of the instrument will produce eddy currents in a conductor upon which the probe is placed, and that the amplitude and phase of these currents is a function of the thickness of a non-conductive coating present between the conductor and the probe.

4 Factors affecting the measuring accuracy

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

4.1 Coating thickness

A measuring uncertainty is inherent in the method. For thin coatings, this measuring uncertainty (in absolute terms) is constant, independent of the coating thickness, and, for a single measurement, is at least 0,5 μm . For coatings thicker than about 25 μm , this uncertainty is an approximately constant fraction of the coating thickness.

If measuring coatings of thickness 5 μm or less, it is advisable to take the average of several readings.

It may be impossible to obtain the accuracy requirement specified in clause 7 with coatings of thickness less than 3 μm .

4.2 Electrical properties of the basis metal

Measurements using eddy current instruments can be affected by the electrical conductivity of the basis metal, which is a function of the composition and heat treatment of the material. The influence of electrical conductivity on the measurement varies considerably with the make and type of instrument.

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 this thickness depends on both the measuring frequency of the probe system and the electrical conductivity of the basis metal, its value should be determined experimentally, unless it is specified by the manufacturer.

In general, for a given measuring frequency, the higher the conductivity of the basis metal, the smaller is its critical thickness. For a given basis metal, the higher the measuring frequency, the smaller is the critical thickness of the basis metal.

4.4 Edge effects

Eddy current instruments are sensitive to abrupt changes in the 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.

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