



**SLOVENSKI STANDARD
SIST EN ISO 2808:2007**

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**BUXca Yý U
SIST EN ISO 2808:1999**

Barve in laki - Ugotavljanje debeline plasti (ISO 2808:2007)

Paints and varnishes - Determination of film thickness (ISO 2808:2007)

Beschichtungsstoffe - Bestimmung der Schichtdicke (ISO 2808:2007)

Peintures et vernis - Détermination de l'épaisseur du feuillet (ISO 2808:2007)

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ICS:

87.040 Barve in laki Paints and varnishes

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English Version

Paints and varnishes - Determination of film thickness (ISO
2808:2007)

Peintures et vernis - Détermination de l'épaisseur du feuill
(ISO 2808:2007)

Beschichtungsstoffe - Bestimmung der Schichtdicke (ISO
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This European Standard was approved by CEN on 16 December 2006.

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

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

Foreword

This document (EN ISO 2808:2007) has been prepared by Technical Committee ISO/TC 35 "Paints and varnishes" in collaboration with Technical Committee CEN/TC 139 "Paints and varnishes", 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of an identical text or by endorsement, at the latest by August 2007, and conflicting national standards shall be withdrawn at the latest by August 2007.

This document supersedes EN ISO 2808:1999.

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

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**Paints and varnishes — Determination of
film thickness**

Peintures et vernis — Détermination de l'épaisseur du feuil

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established 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. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 2808 was prepared by Technical Committee ISO/TC 35, *Paints and varnishes*, Subcommittee SC 9, *General test methods for paints and varnishes*.

This fourth edition cancels and replaces the third edition (ISO 2808:1997), which has been technically revised. The main changes are as follows: **(standards.iteh.ai)**

- a) The structure of the standard has been changed into four main clauses:
- 1) determination of wet-film thickness;
 - 2) determination of dry-film thickness;
 - 3) determination of the thickness of uncured powder layers; and
 - 4) measurement of film thickness on rough surfaces.
- b) Methods using photothermal, radiological and acoustic techniques have been added.
- c) The split-beam method has been deleted as such instruments are no longer manufactured.

Introduction

Measurement of film thickness depends on the following steps:

- a) calibration of the measurement instrument, typically performed by the manufacturer or by any qualified laboratory;
- b) verification of the instrument (an accuracy check performed by the user at regular intervals, typically before each series of measurements);
- c) subsequent adjustment, if necessary, of the instrument so that the thickness readings it gives match those of a specimen of known thickness. For a dry-film thickness gauge this would mean zeroing it on the uncoated surface, using devices of known thickness such as shims, or using a coated specimen of known film thickness;
- d) measurement.

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Paints and varnishes — Determination of film thickness

1 Scope

This International Standard describes a number of methods that are applicable to the measurement of the thickness of coatings applied to a substrate. Methods for determining wet-film thickness, dry-film thickness and the film thickness of uncured powder layers are described. Reference is made to individual standards where these exist. Otherwise the method is described in detail.

An overview on the methods is given in Annex A, in which the field of application, existing standards and the precision are specified for the individual methods.

This International Standard also defines terms concerning the determination of film thickness.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 463, *Geometrical Product Specifications (GPS) — Dimensional measuring equipment — Design and metrological characteristics of mechanical dial gauges*

ISO 3611, *Micrometer callipers for external measurement*

ISO 4618:2006, *Paints and varnishes — Terms and definitions*

ISO 8503-1, *Preparation of steel substrates before application of paints and related products — Surface roughness characteristics of blast-cleaned steel substrates — Part 1: Specifications and definitions for ISO surface profile comparators for the assessment of abrasive blast-cleaned surfaces*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 4618 and the following apply.

3.1

substrate

surface to which a coating material is applied or is to be applied

[ISO 4618:2006]

3.2

coating

continuous layer formed from a single or multiple application of a coating material to a substrate

[ISO 4618:2006]

- 3.3**
film thickness
distance between the surface of the film and the surface of the substrate
- 3.4**
wet-film thickness
thickness of a freshly applied wet coating material, measured immediately after application
- 3.5**
dry-film thickness
thickness of a coating remaining on the surface when the coating has hardened
- 3.6**
thickness of uncured powder layer
thickness of a freshly applied coating material in powder form, measured immediately after application and before stoving
- 3.7**
relevant surface area¹⁾
part of an article covered or to be covered by the coating and for which the coating is essential for serviceability and/or appearance
- 3.8**
test area¹⁾
representative part of the relevant surface area within which an agreed number of single measurements is made as a spot-check
- 3.9**
measurement area¹⁾
area over which a single measurement is made
- 3.10**
minimum local film thickness¹⁾
lowest value of the local film thickness found on the relevant surface area of a particular test specimen
- 3.11**
maximum local film thickness¹⁾
highest value of the local film thickness found on the relevant surface area of a particular test specimen
- 3.12**
mean film thickness¹⁾
arithmetic mean of all the individual dry-film thicknesses in the test area or the result of a gravimetric determination of the thickness
- 3.13**
calibration
controlled and documented process of measuring traceable calibration standards and verifying that the results are within the stated accuracy of the measurement instrument

NOTE Initial calibration is typically performed by the instrument manufacturer or by a qualified laboratory in a controlled environment using a documented process. This initial calibration will normally be verified by the user at regular intervals. The standards used in the calibration are such that the combined uncertainties of the resultant measurement are less than the stated accuracy of the instrument.

¹⁾ Measurement of this property is only required for the extended evaluation of film thickness measurements; see Clause 8 (test report), items k) and l).

3.14**verification**

accuracy check performed by the user using reference standards

3.15**reference standard**

specimen of known thickness against which a user can verify the accuracy of the measurement instrument

NOTE Reference standards may be coated thickness standards, or shims. If agreed to by the contracting parties, a part of the test specimen may be used as a thickness standard for a particular job.

3.16**adjustment**

act of aligning the measurement instrument's thickness readings to match those of a reference standard

NOTE Most electronic measurement instruments can be adjusted on a thickness standard or on a shim, where the thickness of the coating or of the shim is known.

3.17**accuracy**

consistency between a measured value and the true value of the thickness standard

4 Determination of wet-film thickness**4.1 General**

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Annex A gives an overview of the methods used for the determination of wet-film thickness.

4.2 Mechanical methods

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4.2.1 Principle

In all mechanical methods the substrate surface is contacted by part of the measurement instrument through the coating, and the surface of the coating is contacted simultaneously (see Figure 1) or subsequently (see Figures 2 and 3) by another part of the instrument. The wet-film thickness is the height difference between these two points of contact, which can be read directly.

4.2.2 Field of application

The mechanical principle is suitable for all film-substrate combinations. The substrate has to be flat in at least one direction in the area where the measurement is conducted. Curvature of the surface in a single plane is permissible (e.g. internal or external surface of pipes).

4.2.3 General

Classification as a destructive or non-destructive method depends on:

- a) the rheological properties of the coating material;
- b) the nature of the wetting contact between the contact surfaces of the measurement instrument and the coating material;
- c) whether the thickness measurements will make the coating unsuitable for the purpose for which it is intended.

Since the possibility of pigment particles remaining between the gauge and the substrate cannot be excluded, all mechanical methods contain a systematic error: the film thickness displayed is smaller than the actual wet-film thickness by at least the mean diameter of the pigment particles.