
Paints and varnishes - Determination of film thickness (ISO/DIS 2808:2004)

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English version

Paints and varnishes - Determination of film thickness (ISO/DIS 2808:2004)

Peintures et vernis - Détermination de l'épaisseur du feuillet
(ISO/DIS 2808:2004)

This draft European Standard is submitted to CEN members for parallel enquiry. It has been drawn up by the Technical Committee CEN/TC 139.

If this draft becomes a European Standard, 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.

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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

prEN ISO 2808:2004 (E)

Foreword

This document (prEN ISO 2808:2004) has been prepared by Technical Committee ISO/TC 156 "Corrosion of metals and alloys" in collaboration with Technical Committee CEN/TC 139 "Paints and varnishes", the secretariat of which is held by DIN.

This document is currently submitted to the parallel Enquiry.

This document will supersede EN ISO 2808:1999.

Endorsement notice

The text of ISO 2808:2004 has been approved by CEN as prEN ISO 2808:2004 without any modifications.

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Paints and varnishes — Determination of film thickness

Peintures et vernis — Détermination de l'épaisseur du feuil

[Revision of third edition (ISO 2808:1997)]

ICS 87.040

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The CEN Secretary-General has advised the ISO Secretary-General that this ISO/DIS covers a subject of interest to European standardization. **In accordance with the ISO-lead mode of collaboration as defined in the Vienna Agreement, consultation on this ISO/DIS has the same effect for CEN members as would a CEN enquiry on a draft European Standard.** Should this draft be accepted, a final draft, established on the basis of comments received, will be submitted to a parallel two-month FDIS vote in ISO and formal vote in CEN.

In accordance with the provisions of Council Resolution 15/1993 this document is circulated in the English language only.

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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.

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

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

Introduction

Measurement of film thickness consists of the following steps:

- a) calibration, typically performed by the manufacturer or by any qualified laboratory;
- b) verification, an accuracy check performed by the user;
- c) adjustment, aligning the gage's thickness readings to match those of a known sample. For a dry film thickness gage this would mean adjustment to Zero on the uncoated surface or to known film thickness such as shims;
- d) measurement.

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Paints and varnishes — Determination of film thickness

1 Scope

This International Standard specifies a number of methods that are applicable to the measurement of thickness of coatings applied to a substrate. Methods for determining wet-film thickness, dry-film thickness and film thickness of uncured coating powder films are described.

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

An overview on the methods is given in Annex A. The field of application (characterisation), existing standards and the precision are specified for the individual methods. Where test standards exist for the individual methods, reference is made to these. Otherwise the method is described in detail.

This International Standard does not deal with measurement on blasted rough surfaces and acceptance criteria. Evaluation of measurements is dealt with in ISO 19840.

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.

<https://standards.iteh.ai/catalog/standards/sist/f5ff2c5c-af68-4681-b716-1f8ec8d8d735/sist-ISO-2808:2007>
ISO 463, *Geometrical Product Specification (GPS) — Dimensional measuring equipment — Design and metrological characteristics of mechanical dial gauges (Revision of ISO/R 463:1965)*.

ISO 1101, *Technical drawings — Geometrical tolerancing — Tolerancing of form, orientation, location and run-out — Generalities, definitions, symbols, indications on drawings*.

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

ISO 2360, *Non-conductive coatings on non-magnetic basic metals — Measurement of coating thickness — Eddy current method*.

ISO 3543, *Metallic and non-metallic coatings — Measurement of thickness — Beta backscanner method*.

ISO 3611, *Micrometer callipers for external measurement*.

ISO 4287, *Geometrical Product Specification (GPS) — Surface texture: Profile method — Terms, definitions and surface texture parameters*.

ISO 4618¹⁾, *Paints and varnishes — Terms and definitions for coating materials — Part 1: General terms*.

1) Under revision.

ISO 8501-1, *Preparation of steel substrates before application of paints and related products — Visual assessment of surface cleanliness — Part 1: Rust grades and preparation grades of uncoated steel substrates and of steel substrates after overall removal of previous coatings.*

DIN 863, *Verification of geometrical parameters — Micrometers — Part 2: Micrometer callipers heads, Depth micrometer; concepts, requirements, testing.*

DIN 50992-2, *Thickness measurement of coatings and characterisation of surfaces with surface waves — Part 2: Thickness measurement of coatings by photometric method.*

3 Terms and definitions

For the purposes of this International Standard, 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]
- 3.2 coating**
continuous layer formed from a single or multiple application of coating material to a substrate [ISO 4618]
- 3.3 film thickness**
distance between the surface of the film and the surface of the substrate
- 3.4 wet-film thickness**
the thickness of a freshly applied wet coating material, measured immediately after application
- 3.5 dry-film thickness²⁾**
thickness of a coating remaining over the peaks of a rough surface when the coating has hardened
- 3.6 thickness of uncured coating powder film**
the thickness of a freshly applied coating material in powder form, measured immediately after application and before stoving
- 3.7 significant surface area²⁾**
that 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 reference area²⁾**
that part of the significant surface area within which an agreed number of single measurements is made (spot-check which is representative for the film thickness of the relevant layer)
- 3.9 measurement area²⁾**
the area over which a single measurement is made

²⁾ This term is only required for the extended evaluation of the film thickness measurements; see test report j) and k).

3.10**minimum local film thickness²⁾**

the lowest value of the local film thickness found on the significant surface area of a particular article

3.11**maximum local film thickness²⁾**

highest acceptable dry film thickness above which the performance of the paint or the paint system may be impaired

3.12**mean film thickness²⁾**

arithmetic mean of all the individual dry film thicknesses in the inspection area

3.13**calibration**

the controlled and documented process of measuring traceable calibration standards and verifying that the results are within the stated accuracy of the gage

NOTE Calibrations are typically performed by the gage manufacturer or by a qualified laboratory in a controlled environment using a documented process. The standards used in the calibration are such that the combined uncertainties of the resultant measurement are less than the stated accuracy of the gage.

3.14**verification**

an accuracy check performed by the user using known reference standards

3.15**reference standard**

a sample of known thickness against which a user may verify the accuracy of the gage

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

3.16**adjustment**

the act of aligning the gage's thickness readings to match those of a known sample in order to improve the accuracy of the gage on a specific surface or in a specific portion of its measurement range

NOTE Most electronic gages can be adjusted on a coated part 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**

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

4.2 Mechanical determination**4.2.1 Principle**

In all mechanical methods the substrate surface is touched through the coating and the surface of the coating is touched simultaneously (method 1A) or subsequently (methods 1B and 1C). The wet-film thickness is the difference between these contacts which can be read directly.