BS EN ISO 3882:2024

BSI Standards Publication

Metallic and other inorganic coatings — Review of methods of measurement of thickness

National foreword

This British Standard is the UK implementation of EN ISO 3882:2024. It is identical to ISO 3882:2024. It supersedes BS EN ISO 3882:2003, which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee STI/33, Electrodeposited and related coatings.

A list of organizations represented on this committee can be obtained on request to its committee manager.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
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European foreword

This document (EN ISO 3882:2024) has been prepared by Technical Committee ISO/TC 107 "Metallic and other inorganic coatings" in collaboration with Technical Committee CEN/TC 262 “Metallic and other inorganic coatings, including for corrosion protection and corrosion testing of metals and alloys” the secretariat of which is held by BSI.

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of an identical text or by endorsement, at the latest by July 2024, and conflicting national standards shall be withdrawn at the latest by July 2024.

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

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Endorsement notice

The text of ISO 3882:2024 has been approved by CEN as EN ISO 3882:2024 without any modification.

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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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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This document was prepared by Technical Committee ISO/TC 107, *Metallic and other inorganic coatings*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 262, *Metallic and other inorganic coatings, including for corrosion protection and corrosion testing of metals and alloys*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This fourth edition cancels and replaces the third edition (ISO 3882:2003), which has been technically revised.

The main changes are as follows:

— editorial revisions;

— restructuring of the document;

— former Tables 2 and 3 moved to Annex A;

— new subclause 6.5.1.2 for the STEP method;

— review of measurement uncertainties;

— phase-sensitive eddy current, as described in ISO 21968, added to measurement methods and Tables A.1 and A.2.

Any feedback or questions on this document should be directed to the user’s national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

This document summarizes the various methods used for the measurement of coating thickness and describes their working principles. Methods of measuring coating thickness are either destructive or non-destructive (see Table 1). The information given in Annex A, Table A.1 will assist in the choice of typical instrumental methods suitable for thickness measurements. For all instrumental methods, manufacturers' instructions contain useful information on the correct handling of the instruments.

The thickness ranges covered by the different methods depend on the coating materials, thickness of the coating, substrates and instruments used (see Annex A, Table A.2); for example, although X-ray spectrometry can be used to measure the thickness of a chromium coating, thicknesses of 20 µm or more cannot be measured with sufficient precision. Similarly, while magnetic methods can be used to measure the thickness of a gold coating over a magnetic steel substrate, many magnetic instruments do not have the sensitivity to measure accurately thicknesses of gold coatings less than 2 µm.

Where a referee method is required, the appropriate coating specification can contain useful information on the preferred method.

International Standard **ISO 3882:2024(en)**

Metallic and other inorganic coatings — Review of methods of measurement of thickness

1 Scope

This document reviews methods for measuring the thickness of metallic and other inorganic coatings on both metallic and non-metallic substrates (see Tables 1, A.1 and A.2). It is limited to tests already specified, or to be specified, in International Standards and excludes certain tests that are used for special applications.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 2064, *Metallic and other inorganic coatings — Definitions and conventions concerning the measurement of thickness*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 2064 apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

4 Overview

Table 1 summarizes the methods of measuring coating thickness that are discussed in this document.

Table 1 — Methods of measuring coating thickness

Non-destructive		Destructive	
Split beam microscope (light section)	ISO 2128[a]	Microscopical (optical)	ISO 1463
Magnetic	ISO 2178 and ISO 2361	Fizeau multiple-beam interferometry	ISO 3868[b]
Eddy current — amplitude-sensitive	ISO 2360	Profilometric (stylus and optical)	ISO 4518[b]
Eddy current — phase-sensitive	ISO 21968		
X-ray spectrometric	ISO 3497	Scanning electron microscope	ISO 9220
Beta backscatter	ISO 3543	Dissolution methods:	
		Gravimetric strip and weigh method and gravimetric analytical method	ISO 10111
		Coulometric method	ISO 2177
		STEP method	ISO 16866

[a] Can be destructive in some applications.

[b] Can be non-destructive in some applications.