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Metallic materials - Knoop hardness test - Part 1: Test method (ISO 4545-1:2023)

EESTI STANDARDIMIS- JA AKREDITEERIMISKESKUS
ESTONIAN CENTRE FOR STANDARDISATION AND ACCREDITATION

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NATIONAL FOREWORD

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See Eesti standard EVS-EN ISO 4545-1:2023 sisaldab Euroopa standardi EN ISO 4545-1:2023 ingliskeelset teksti.	This Estonian standard EVS-EN ISO 4545-1:2023 consists of the English text of the European standard EN ISO 4545-1:2023.
Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas	This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation and Accreditation.
Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 11.10.2023.	Date of Availability of the European standard is 11.10.2023.
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ICS 77.040.10

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN ISO 4545-1

October 2023

ICS 77.040.10

Supersedes EN ISO 4545-1:2018

English Version

Metallic materials - Knoop hardness test - Part 1: Test method (ISO 4545-1:2023)

Matériaux métalliques - Essai de dureté Knoop - Partie 1: Méthode d'essai (ISO 4545-1:2023)

Metallische Werkstoffe - Härteprüfung nach Knoop - Teil 1: Prüfverfahren (ISO 4545-1:2023)

This European Standard was approved by CEN on 9 September 2023.

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Ref. No. EN ISO 4545-1:2023 E

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European foreword

This document (EN ISO 4545-1:2023) has been prepared by Technical Committee ISO/TC 164 "Mechanical testing of metals" in collaboration with Technical Committee CEN/TC 459/SC 1 “Test methods for steel (other than chemical analysis)” the secretariat of which is held by AFNOR.

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of an identical text or by endorsement, at the latest by April 2024, and conflicting national standards shall be withdrawn at the latest by April 2024.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

This document supersedes EN ISO 4545-1:2018.

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Endorsement notice

The text of ISO 4545-1 has been approved by CEN as EN ISO 4545-1:2023 without any modification.

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Foreword

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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 164, *Mechanical testing of metals*, Subcommittee SC 3, *Hardness testing*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 459, *ECISS - European Committee for Iron and Steel Standardization,* in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This third edition of ISO 4545-1, together with ISO 6507-1:2023, cancels and replaces ISO 4516:2002, ISO 4545-1:2017 and ISO 6507-1:2018, which have been technically revised.

The main changes are as follows:

— Scope revised to include testing on metallic coatings and other inorganic coatings;

— added subclause 7.5 on metallic and other inorganic coatings;

— added Annex F to cover coatings specific requirements;

— updated references.

A list of all parts in the ISO 4545 series can be found on the ISO website.

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Metallic materials — Knoop hardness test —

Part 1: Test method

1 Scope

This document specifies the Knoop hardness test method for metallic materials for test forces from 0,009 807 N to 19,613 N.

This document specifies Knoop hardness tests for length of the long diagonal ≥0,020 mm. Using this method to determine the Knoop hardness from smaller indentations is outside the scope of this document as results would suffer from large uncertainties due to the limitations of optical measurement and imperfections in tip geometry.

The Knoop hardness test specified in this document is also applicable for metallic and other inorganic coatings including electrodeposited coatings, autocatalytic coatings, sprayed coatings and anodic coatings on aluminium. This document is applicable to measurements normal to the coated surface and to measurements on cross-sections, provided that the characteristics of the coating (smoothness, thickness, etc.) permit accurate readings of the diagonal of the indentation. This document is not applicable for coatings with thickness less than 0,007 mm when testing normal to the coating surface. This document is not applicable for coatings with thickness less than 0,020 mm when testing a cross-section of the coating. ISO 14577-1 can be used for the determination of hardness from smaller indentations.

A periodic verification method is specified for routine checking of the testing machine in service by the user.

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 4545-2:2017, *Metallic materials — Knoop hardness test — Part 2: Verification and calibration of testing machines*

ISO 4545-3, *Metallic materials — Knoop hardness test — Part 3: Calibration of reference blocks*

3 Terms and definitions

No terms and definitions are listed in this document.

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/

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