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STN	**Kovové materiály Knoopova skúška tvrdosti Časť 1: Skúšobná metóda (ISO 4545-1: 2017)**	**STN EN ISO 4545-1 42 0376**

Metallic materials - Knoop hardness test - Part 1: Test method (ISO 4545-1:2017)

Táto norma obsahuje anglickú verziu európskej normy.
This standard includes the English version of the European Standard.

Táto norma bola oznámená vo Vestníku ÚNMS SR č. 08/18

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EUROPEAN STANDARD

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EUROPÄISCHE NORM

EN ISO 4545-1

March 2018

ICS 77.040.10 Supersedes EN ISO 4545-1:2005

English Version

Metallic materials - Knoop hardness test - Part 1: Test method (ISO 4545-1:2017)

Matériaux métalliques - Essai de dureté Knoop - Partie 1: Méthode d'essai (ISO 4545-1:2017)

Metallische Werkstoffe - Härteprüfung nach Knoop - Teil 1: Prüfverfahren (ISO 4545-1:2017)

This European Standard was approved by CEN on 30 November 2017.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
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Ref. No. EN ISO 4545-1:2018 E

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European foreword

This document (EN ISO 4545-1:2018) has been prepared by Technical Committee ISO/TC 164 "Mechanical testing of metals" in collaboration with Technical Committee ECISS/TC 101 "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of an identical text or by endorsement, at the latest by September 2018, and conflicting national standards shall be withdrawn at the latest by September 2018.

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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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, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Endorsement notice

The text of ISO 4545-1:2017 has been approved by CEN as EN ISO 4545-1:2018 without any modification.

INTERNATIONAL STANDARD

ISO 4545-1

Second edition
2017-12

Metallic materials — Knoop hardness test —

Part 1: Test method

Matériaux métalliques — Essai de dureté Knoop —

Partie 1: Méthode d'essai

Reference number
ISO 4545-1:2017(E)

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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 documents 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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Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 164, *Mechanical testing of metals*, Subcommittee SC 3, *Hardness testing*.

This second edition cancels and replaces the first edition (ISO 4545-1:2005), which has been technically revised.

The main changes compared to the previous edition are as follows:

— all references have been removed of indentation diagonals <0,020 mm;

— the resolution requirements have been defined for the measuring system;

— the lower test force limit of the Knoop hardness test has been expanded to 0,009 807 N;

— the requirements for the periodic (weekly or daily) verifications of the testing machine have been defined as normative, the maximum permissible bias value has been revised, and the requirements for the maximum permissible error in measuring a reference indentation have been revised;

— the recommendations for inspection and monitoring of the indenter have been added (moved from ISO 4545-2);

— the requirements have been revised for the approach velocity of the indenter prior to contact with the sample surface;

— the timing requirements for the test force application and the duration at maximum test force are revised to indicate target time values;

— Figure 3 has been added illustrating the requirements for the minimum distance between indentations; the distances have been stated with respect to the indentation centres rather than the indentation limits, but the requirements have not changed;

— the requirements have been added to the test report for reporting the test date and any hardness conversion method used;

— Annexes C, D and E have been added concerning Knoop hardness measurement traceability, the CCM — Working group on hardness and adjustment of Köhler illumination systems, respectively.

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

INTERNATIONAL STANDARD **ISO 4545-1:2017(E)**

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.

The Knoop hardness test is specified in this document for lengths of indentation diagonals ≥0,020 mm. Using this method to determine 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. ISO 14577-1 allows 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.

Special considerations for Knoop testing of metallic coatings can be found in ISO 4516.

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, *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*

