

**Metallic and other inorganic coatings -
Vickers and Knoop microhardness tests**

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Knoop microhardness tests

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

<p>Käesolev Eesti standard EVS-EN ISO 4516:2002 sisaldab Euroopa standardi EN ISO 4516:2002 ingliskeelset teksti.</p> <p>Käesolev dokument on jõustatud 15.11.2002 ja selle kohta on avaldatud teade Eesti standardiorganisatsiooni ametlikus väljaandes.</p> <p>Standard on kättesaadav Eesti standardiorganisatsioonist.</p>	<p>This Estonian standard EVS-EN ISO 4516:2002 consists of the English text of the European standard EN ISO 4516:2002.</p> <p>This document is endorsed on 15.11.2002 with the notification being published in the official publication of the Estonian national standardisation organisation.</p> <p>The standard is available from Estonian standardisation organisation.</p>
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<p>Käsitlusala: This International Standard describes the application of the Vickers and Knoop micro-indentation tests for determining the microhardness of metallic and other inorganic coatings</p>	<p>Scope: This International Standard describes the application of the Vickers and Knoop micro-indentation tests for determining the microhardness of metallic and other inorganic coatings</p>
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Võtmesõnad: coatings, hardness measurement, knoop, knoop hardness, layers, materials, metal coatings, metal films, metallic, metals, microhardness testing, test equipment, testing, tests, vickers, vickers hardness, vickers hardness measurement

English version

Metallic and other inorganic coatings

Vickers and Knoop microhardness tests
(ISO 4516 : 2002)

Revêtements métalliques et autres
revêtements inorganiques – Essais de
microdureté Vickers et Knoop
(ISO 4516 : 2002)

Metallische und andere anorganische
Überzüge – Mikrohärteprüfungen nach
Vickers und Knoop (ISO 4516 : 2002)

This European Standard was approved by CEN on 2002-06-08.

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.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Management Centre or to any CEN member.

The European Standards exist in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, the Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Malta, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, and the United Kingdom.

CEN

European Committee for Standardization
Comité Européen de Normalisation
Europäisches Komitee für Normung

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

Foreword

International Standard

ISO 4516 : 2002 Metallic and other inorganic coatings – Vickers and Knoop microhardness tests (ISO 4516 : 2002),

which was prepared by ISO/TC 107 ‘Metallic and other inorganic coatings’ of the International Organization for Standardization, has been adopted by Technical Committee CEN/TC 262 ‘Metallic and other inorganic coatings’, the Secretariat of which is held by BSI, as a European Standard.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, and conflicting national standards withdrawn, by December 2002 at the latest.

In accordance with the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard:

Austria, Belgium, the Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Malta, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, and the United Kingdom.

Endorsement notice

The text of the International Standard ISO 4516 : 2002 was approved by CEN as a European Standard without any modification.

NOTE: Normative references to international publications are listed in Annex ZA (normative).

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1 Scope

This International Standard describes the application of the Vickers and Knoop micro-indentation tests for determining the microhardness of metallic and other inorganic coatings. This method is applicable where indenter forces generally need to be below 10 N such as for electrodeposited coatings, autocatalytic coatings, sprayed coatings and anodic coatings on aluminium. It is applicable to measurements normal to the coated surface as described in 7.4 and to measurements on cross-sections as described in 7.3.

NOTE 1 Attention is drawn to ISO 4545, ISO 6507-1, ISO 6507-2 and ISO 6507-3, which describe Knoop and Vickers hardness testing of metallic materials. Other International Standards for instrumental indentation testing, the verification of microindentation testing instruments and for the verification of reference blocks to be used with such instruments are currently being developed (e.g. ISO 14577 Parts 1 to 4).

NOTE 2 Usually for hardness measurements of coating test forces in the microhardness range in accordance with ISO 6507-1 are used. However, since the largest possible test force should be selected, test forces of the low force and hardness ranges may also be used.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this International Standard. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

ISO 1463, *Metallic and oxide coatings — Measurement of coating thickness — Microscopical method*

ISO 6507-1, *Metallic materials — Vickers hardness test — Part 1: Test method*

ISO 9002, *Quality systems — Model for quality assurance in production, installation and servicing*

3 Principle

A testing instrument slowly lowers an indenter vertically on to the test surface and holds it there for a specified time under a specified load (see 6.2). The tolerance of the applied test force is within 1 % of that specified.

An indenter is forced into the coating and the diagonal(s) of the indentation left in the surface after removal of the indenter is measured using a microscope. The indenter is applied such that the resultant indentation does not contain artefacts of the loading apparatus or procedure but rather is characteristic of the coating.

A number, known as the Vickers or Knoop hardness number, is derived from this measurement using the symbols and designations given in clause 4.