



# SLOVENSKI STANDARD SIST EN ISO 6507-3:1998

01-junij-1998

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Metallische Werkstoffe - Härteprüfung nach Vickers - Teil 3: Kalibrierung von Härtevergleichsplatten (ISO 6507-3:1997)

Metallische Werkstoffe - Härteprüfung nach Vickers - Teil 3: Kalibrierung von Härtevergleichsplatten (ISO 6507-3:1997)

Matériaux métalliques - Essai de dureté Vickers - Partie 3: Etalonnage des blocs de référence (ISO 6507-3:1997)

Matériaux métalliques - Essai de dureté Vickers - Partie 3: Etalonnage des blocs de référence (ISO 6507-3:1997)

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**Ta slovenski standard je istoveten z: EN ISO 6507-3:1997**

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## **ICS:**

77.040.10 Mehansko preskušanje kovin Mechanical testing of metals

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EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

EN ISO 6507-3

November 1997

ICS 77.040.10

Descriptors: see ISO document

English version

## Metallic materials - Vickers hardness test - Part 3: Calibration of reference blocks (ISO 6507-3:1997)

Matériaux métalliques - Essai de dureté Vickers - Partie 3:  
Etalonnage des blocs de référence (ISO 6507-3:1997)

This European Standard was approved by CEN on 22 October 1997.

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 Central Secretariat or to any CEN member.

This European Standard exists 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 Central Secretariat has the same status as the official versions.

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EUROPEAN COMMITTEE FOR STANDARDIZATION  
COMITÉ EUROPÉEN DE NORMALISATION  
EUROPÄISCHES KOMITEE FÜR NORMUNG

Central Secretariat: rue de Stassart, 36 B-1050 Brussels

## Foreword

The text of the International Standard ISO 6507-3:1997 has been prepared by Technical Committee ISO/TC 164 "Mechanical testing of metals" in collaboration with Technical Committee ECISS/TC 1 "Steels - Mechanical and physical tests", 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 May 1998, and conflicting national standards shall be withdrawn at the latest by May 1998.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

## Endorsement notice

The text of the International Standard ISO 6507-3:1997 was approved by CEN as a European Standard without any modification.

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# INTERNATIONAL STANDARD

**ISO**  
**6507-3**

Second edition  
1997-11-15

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## **Metallic materials — Vickers hardness test —**

### **Part 3: Calibration of reference blocks**

*Matériaux métalliques — Essai de dureté Vickers —  
Partie 3: Étalonnage des blocs de référence*  
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Reference number  
ISO 6507-3:1997(E)

## ISO 6507-3:1997(E)

## 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.

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.

International Standard ISO 6507-3 was prepared by Technical Committee ISO/TC 164, *Mechanical testing of metals*, Subcommittee SC 3, *Hardness testing*.

This second edition of ISO 6507-3 cancels and replaces ISO 640:1984 and ISO 640-2:1993 as follows:

- Combination of the two different International Standards for the calibration of the hardness reference blocks (ISO 640:1984 and ISO 640-2:1993) into this part of ISO 6507.
- Addition of a new figure 1 for the demonstration of the permissible difference of the sectional planes of the square form of the indenter.
- Addition of a new table (table 1) for the estimation capability and the maximum permissible error of the measuring device.
- Changing of the values for the maximum permissible value of non-uniformity of the reference blocks in table 3.
- Addition of a new clause 9 concerning the validity of the reference blocks.

ISO 6507 consists of the following parts, under the general title *Metallic materials — Vickers hardness test*:

- *Part 1: Test method*
- *Part 2: Verification of testing machines*
- *Part 3: Calibration of reference blocks*

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# Metallic materials — Vickers hardness test —

## Part 3: Calibration of reference blocks

### 1 Scope

This part of ISO 6507 specifies a method for the calibration of reference blocks to be used for the indirect verification of Vickers hardness testing machines, as specified in ISO 6507-2.

The method is applicable only for indentations with diagonals  $\geq 0,020$  mm.

The force values in this part of ISO 6507 were calculated from kilogram force values. They were introduced before the SI-system was adopted. It was decided to keep the values based on the old units for this edition, but for the next revision it will be necessary to consider the advantage of introducing rounded values of test force and the consequence on the hardness scales.

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### 2 Normative references

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The following standards contain provisions which, through reference in this text, constitute provisions of this part of ISO 6507. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this part of ISO 6507 are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 376:—<sup>1)</sup>, *Metallic materials — Calibration of force-proving instruments used for the verification of uniaxial testing machines.*

ISO 468:1982, *Surface roughness — Parameters, their values and general rules for specifying requirements.*

ISO 4287:1997, *Geometrical Product Specifications (GPS) — Surface texture: Profile method — Terms, definitions and surface texture parameters.*

ISO 6507-1:1997, *Metallic materials — Vickers hardness test — Part 1: Test method.*

ISO 6507-2:1997, *Metallic materials — Vickers hardness test — Part 2: Verification of testing machines.*

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1) To be published. (Revision of ISO 376:1987)

### 3 Manufacture of reference blocks

**3.1** The block shall be specially prepared and the attention of the manufacturer is drawn to the need to use a manufacturing process which will give the necessary homogeneity, stability of structure and uniformity of surface hardness.

**3.2** Each metal block to be calibrated shall be of a thickness not less than 6 mm.

**3.3** The reference blocks shall be free of magnetism. It is recommended that the manufacturer shall ensure that the blocks, if of steel, have been demagnetized at the end of the manufacturing process.

**3.4** The maximum deviation in flatness of the test and support surfaces shall not exceed 0,005 mm. The maximum error in parallelism shall not exceed 0,010 mm in 50 mm.

**3.5** The test surface shall be free from scratches which interfere with the measurement of the indentations. The surface roughness  $R_a$  shall not exceed 0,000 05 mm for the test surface and 0,000 8 mm for the bottom surface (see ISO 468). The sampling length  $l$  shall be 0,80 mm (see ISO 4287).

**3.6** In order to check that no material has been subsequently removed from the reference block, its thickness at the time of calibration shall be marked on it to the nearest 0,01 mm, or an identifying mark shall be made on the test surface (see clause 8).

### 4 Calibrating machine

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**4.1** In addition to fulfilling the general requirements specified in ISO 6507-2, the calibrating machine shall also meet the requirements of 4.2.

**4.2** The calibrating machine shall be verified directly at intervals not exceeding 12 months.

Direct verification involves

- a) verification of the test force;
- b) verification of the indenter;
- c) verification of the measuring device;
- d) verification of the testing cycle.

The equipment used to verify the calibrating machine shall have a certified traceability to the International System of Units (SI).

**4.2.1** Each test force shall be accurate to within

- $\pm 0,1$  % for the normal and low-force hardness;
- $\pm 0,5$  % for the microhardness;

of the nominal test force specified in ISO 6507-1.

The force shall be measured with force-proving instruments of class 0,5 according to ISO 376 or by another method having the same accuracy.

**4.2.2** The four faces of the square-based diamond pyramid shall be highly polished, free from surface defects, and flat within 0,000 3 mm.

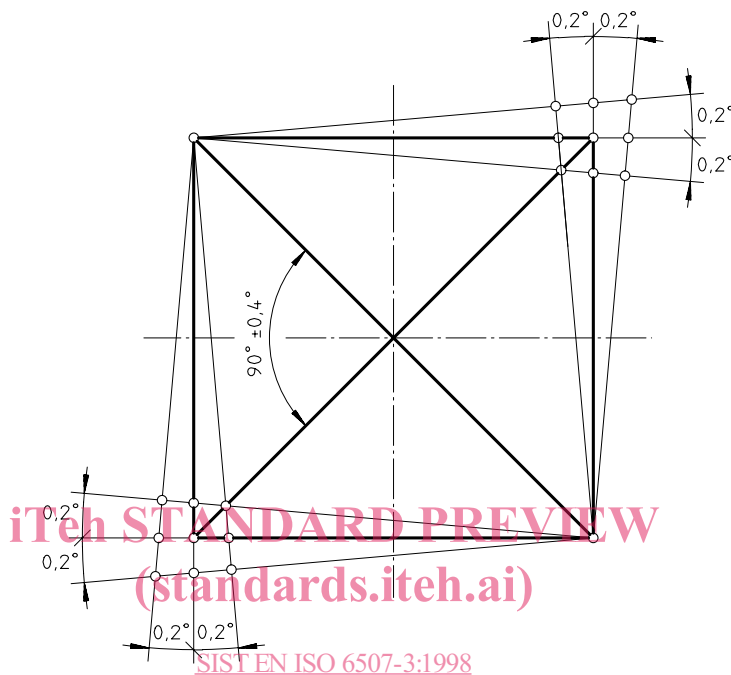
**4.2.3** The angle between the opposite faces of the vertex of the diamond pyramid shall be  $136^\circ \pm 0,1^\circ$ .

The angle between the axis of the diamond pyramid and the axis of the indenter-holder (normal to the seating surface) shall be less than  $0,3^\circ$ .



**4.2.4** The point of the diamond indenter shall be examined with a high-power measuring microscope or preferably with an interference microscope and, if the four faces do not meet in a point, the line of conjunction between opposite faces shall be less than 0,001 mm in length. For microhardness testing, the length shall not exceed 0,000 25 mm.

**4.2.5** It shall be verified that the quadrilateral which would be formed by the intersection of the faces with a plane perpendicular to the axis of the diamond pyramid has angles of  $90^\circ \pm 0,2^\circ$  (see figure 1).



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**Figure 1 — Permissible difference of the sectional planes of the square form**

**4.2.6** The estimation capability required of the measuring device depends on the size of the smallest indentation to be measured.

The scale of the measuring device shall be graduated to permit estimation of the diagonals of the indentation in accordance with table 1.

**Table 1**

Diagonal length $d$ mm	Estimation capability of the measuring device	Maximum permissible error
$d \leq 0,040$	0,000 1 mm	0,000 2 mm
$d > 0,040$	0,25 % of $d$	0,5 % of $d$

**4.2.7** The measuring device shall be verified by measurements made on a stage micrometer at a minimum of five intervals over each working range.

The maximum permissible error shall not exceed the values given in table 1.

**4.2.8** For microhardness testing, the maximum allowable vibrational acceleration reaching the calibration machine shall be 0,005  $g_n$  ( $g_n$  equals the standard acceleration of free fall:

$g_n = 9,806\ 65\ \text{m/s}^2$ ).