Metallic materials – Vickers hardness test

National foreword

This British Standard is the UK implementation of EN ISO 6507-1:2018. It is identical to ISO 6507-1:2018. It supersedes BS EN ISO 6507-1:2005, which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee ISE/101/5, Indentation hardness testing.

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

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

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Compliance with a British Standard cannot confer immunity from legal obligations.

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Amendments/corrigenda issued since publication

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This European Standard was approved by CEN on 18 January 2018.

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 CEN-CENELEC Management Centre or to any CEN member.

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CEN members are the national standards bodies of 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 United Kingdom.
European foreword

This document (EN ISO 6507-1:2018) 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of an identical text or by endorsement, at the latest by September 2018, and conflicting national standards shall be withdrawn at the latest by September 2018.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.

This document supersedes EN ISO 6507-1:2005.

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 6507-1:2018 has been approved by CEN as EN ISO 6507-1:2018 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 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).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

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 fourth edition cancels and replaces the third edition (ISO 6507-1:2005), which has been technically revised.

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

— requirements for testing hardmetals and other cemented carbides have been added;
— all references of indentation diagonals, <0,020 mm, have been removed;
— resolution requirements for the measuring system have been defined;
— the lower test force limit of the Vickers microhardness test has been expanded to 0,009 807 N;
— requirements for the periodic (weekly or daily) verifications of the testing machine are normative, and the maximum permissible bias value has been revised. Requirements for the maximum permissible error in measuring a reference indentation have been revised;
— recommendations for inspection and monitoring of the indenter have been added;
— requirements have been added 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 have been revised to indicate target time values;
— Figure 2, which illustrates the requirements for the minimum distance between indentations, has been added, but the requirements have not changed;
— requirements have been added to the test report for reporting the test date and any hardness conversion method used;
— **Annex D** has been revised;

— **Annexes E, F and G** have been added concerning Vickers hardness measurement traceability, the CCM — Working group on hardness and adjustment of Köhler illumination systems.

A list of all parts in the ISO 6507 series can be found on the ISO website.
Metallic materials – Vickers hardness test —

Part 1:
Test method (ISO 6507-1:2018)

1 Scope

This document specifies the Vickers hardness test method for the three different ranges of test force for metallic materials including hardmetals and other cemented carbides (see Table 1).

<table>
<thead>
<tr>
<th>Ranges of test force, $F$ N</th>
<th>Hardness symbol</th>
<th>Designation</th>
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<tbody>
<tr>
<td>$F \geq 49,03$</td>
<td>$\geq HV 5$</td>
<td>Vickers hardness test</td>
</tr>
<tr>
<td>$1,961 \leq F &lt; 49,03$</td>
<td>HV 0,2 to &lt; HV 5</td>
<td>Low-force Vickers hardness test</td>
</tr>
<tr>
<td>$0,009 807 \leq F &lt; 1,961$</td>
<td>HV 0,001 to &lt; HV 0,2</td>
<td>Vickers microhardness test</td>
</tr>
</tbody>
</table>

The Vickers hardness test is specified in this document for lengths of indentation diagonals between 0,020 mm and 1,400 mm. Using this method to determine Vickers 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.

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

For specific materials and/or products, particular International Standards exist.

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.


3 Terms and definitions

No terms and definitions are listed in this document.

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

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