



**SLOVENSKI STANDARD**  
**SIST EN ISO 14577-1:2004**

**01-marec-2004**

---

**Kovinski materiali - Instrumentirano vtiskanje pri preskušanju trdote in drugih lastnosti materialov - 1. del: Metoda preskušanja (ISO 14577-1:2002)**

Metallic materials - Instrumented indentation test for hardness and materials parameters - Part 1: Test method (ISO 14577-1:2002)

Metallische Werkstoffe - Instrumentierte Eindringprüfung zur Bestimmung der Härte und anderer Werkstoffparameter - Teil 1: Prüfverfahren (ISO 14577-1:2002)

Matériaux métalliques - Essai de pénétration instrumenté pour la détermination de la dureté et de paramètres des matériaux - Partie 1: Méthode d'essai (ISO 14577-1:2002)

<https://standards.iteh.ai/catalog/standards/sist/7987107c-ac7a-40fe-b2d7-1b8a6ce5ce68/sist-en-iso-14577-1-2004>

**Ta slovenski standard je istoveten z: EN ISO 14577-1:2002**

---

**ICS:**

77.040.10 Mehansko preskušanje kovin Mechanical testing of metals

**SIST EN ISO 14577-1:2004**

**en**

**iTeh STANDARD PREVIEW**  
**(standards.iteh.ai)**

SIST EN ISO 14577-1:2004

<https://standards.iteh.ai/catalog/standards/sist/7987107c-ac7a-40fe-b2d7-1b8a6ce5ce68/sist-en-iso-14577-1-2004>

EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

**EN ISO 14577-1**

October 2002

ICS 77.040.10

English version

**Metallic materials - Instrumented indentation test for hardness  
and materials parameters - Part 1: Test method (ISO 14577-  
1:2002)**

Matériaux métalliques - Essai de pénétration instrumenté  
pour la détermination de la dureté et de paramètres des  
matériaux - Partie 1: Méthode d'essai (ISO 14577-1:2002)

Metallische Werkstoffe - Instrumentierte Eindringprüfung  
zur Bestimmung der Härte und anderer Werkstoffparameter  
- Teil 1: Prüfverfahren (ISO 14577-1:2002)

This European Standard was approved by CEN on 9 September 2002.

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.

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 Management Centre has the same status as the official versions.

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

<https://standards.iteh.ai/catalog/standards/sist/7987107c-ac7a-40fe-b2d7-1b8a6ce5ce68/sist-en-iso-14577-1-2004>



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

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

EN ISO 14577-1:2002 (E)

<b>CORRECTED 2003-03-05</b>
-----------------------------

## Foreword

This document (EN ISO 14577-1:2002) has been prepared by Technical Committee ISO/TC 164 "Mechanical testing of metals" in collaboration with Technical Committee ECISS/TC 1 "Steel - Mechanical testing", 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 2003, and conflicting national standards shall be withdrawn at the latest by April 2003.

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, Malta, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

## Endorsement notice

The text of ISO 14577-1:2002 has been approved by CEN as EN ISO 14577-1:2002 without any modifications.

**(standards.iteh.ai)**

NOTE Normative references to International Standards are listed in Annex ZA (normative).

[SIST EN ISO 14577-1:2004](https://standards.iteh.ai/catalog/standards/sist/7987107c-ac7a-40fe-b2d7-1b8a6ce5ce68/sist-en-iso-14577-1-2004)

<https://standards.iteh.ai/catalog/standards/sist/7987107c-ac7a-40fe-b2d7-1b8a6ce5ce68/sist-en-iso-14577-1-2004>

## Annex ZA (normative)

### Normative references to international publications with their relevant European publications

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

NOTE Where an International Publication has been modified by common modifications, indicated by (mod.), the relevant EN/HD applies.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN</u>	<u>Year</u>
ISO 14577-2	2002	Metallic materials - Instrumented indentation test for hardness and materials parameters - Part 2: Verification and calibration of testing machines	EN ISO 14577-2	2002

[SIST EN ISO 14577-1:2004](https://standards.iteh.ai/catalog/standards/sist/7987107c-ac7a-40fe-b2d7-1b8a6ce5ce68/sist-en-iso-14577-1-2004)  
<https://standards.iteh.ai/catalog/standards/sist/7987107c-ac7a-40fe-b2d7-1b8a6ce5ce68/sist-en-iso-14577-1-2004>

**iTeh STANDARD PREVIEW**  
**(standards.iteh.ai)**

SIST EN ISO 14577-1:2004

<https://standards.iteh.ai/catalog/standards/sist/7987107c-ac7a-40fe-b2d7-1b8a6ce5ce68/sist-en-iso-14577-1-2004>

# INTERNATIONAL STANDARD

# ISO 14577-1

First edition  
2002-10-01

---

---

## Metallic materials — Instrumented indentation test for hardness and materials parameters —

### Part 1: Test method

iTeh **STANDARD PREVIEW**

*Matériaux métalliques — Essai de pénétration instrumenté pour la  
détermination de la dureté et de paramètres des matériaux —*

*Partie 1: Méthode d'essai*

[SIST EN ISO 14577-1:2004](https://standards.iteh.ai/catalog/standards/sist/7987107c-ac7a-40fe-b2d7-1b8a6ce5ce68/sist-en-iso-14577-1-2004)

<https://standards.iteh.ai/catalog/standards/sist/7987107c-ac7a-40fe-b2d7-1b8a6ce5ce68/sist-en-iso-14577-1-2004>



Reference number  
ISO 14577-1:2002(E)

© ISO 2002

## ISO 14577-1:2002(E)

**PDF disclaimer**

This PDF file may contain embedded typefaces. In accordance with Adobe's licensing policy, this file may be printed or viewed but shall not be edited unless the typefaces which are embedded are licensed to and installed on the computer performing the editing. In downloading this file, parties accept therein the responsibility of not infringing Adobe's licensing policy. The ISO Central Secretariat accepts no liability in this area.

Adobe is a trademark of Adobe Systems Incorporated.

Details of the software products used to create this PDF file can be found in the General Info relative to the file; the PDF-creation parameters were optimized for printing. Every care has been taken to ensure that the file is suitable for use by ISO member bodies. In the unlikely event that a problem relating to it is found, please inform the Central Secretariat at the address given below.

## iTeh STANDARD PREVIEW (standards.iteh.ai)

[SIST EN ISO 14577-1:2004](https://standards.iteh.ai/catalog/standards/sist/7987107c-ac7a-40fe-b2d7-1b8a6ce5ce68/sist-en-iso-14577-1-2004)

<https://standards.iteh.ai/catalog/standards/sist/7987107c-ac7a-40fe-b2d7-1b8a6ce5ce68/sist-en-iso-14577-1-2004>

© ISO 2002

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office  
Case postale 56 • CH-1211 Geneva 20  
Tel. + 41 22 749 01 11  
Fax + 41 22 749 09 47  
E-mail [copyright@iso.ch](mailto:copyright@iso.ch)  
Web [www.iso.ch](http://www.iso.ch)

Printed in Switzerland



## Contents

	Page
Foreword .....	iv
Introduction.....	v
1 Scope.....	1
2 Normative references.....	1
3 Symbols and designations.....	2
4 Principle .....	4
5 Testing machine .....	4
6 Test piece .....	5
7 Procedure.....	5
8 Uncertainty of the results .....	7
9 Test report.....	8
Annex A (normative) Materials parameters determined from the force/indentation depth data set .....	9
Annex B (informative) Types of control use for the indentation process.....	19
Annex C (normative) Machine compliance and indenter area function.....	20
Annex D (informative) Notes on diamond indenters .....	22
Annex E (normative) Influence of the test piece surface roughness on the accuracy of the results.....	23
Annex F (informative) Correlation of indentation hardness $H_{IT}$ to Vickers hardness .....	24
Bibliography.....	25

## ISO 14577-1:2002(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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 3.

The main task of technical committees is to prepare International Standards. 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.

Attention is drawn to the possibility that some of the elements of this part of ISO 14577 may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 14577-1 was prepared by Technical Committee ISO/TC 164, *Mechanical testing of metals*, Subcommittee SC 3, *Hardness testing*.

ISO 14577 consists of the following parts, under the general title *Metallic materials — Instrumented indentation test for hardness and materials parameters*: **(standards.iteh.ai)**

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

Annexes A, C and E form a normative part of this part of ISO 14577. Annexes B, D and F are for information only.

## Introduction

Hardness has typically been defined as the resistance of a material to permanent penetration by another harder material. The results obtained when performing Rockwell, Vickers and Brinell tests are determined after the test force has been removed. Therefore, the effect of elastic deformation under the indenter has been ignored.

ISO 14577 has been prepared to enable the user to evaluate the indentation of materials by considering both the force and displacement during plastic and elastic deformation. By monitoring the complete cycle of increasing and removal of the test force, hardness values equivalent to traditional hardness values can be determined. More significantly, additional properties of the material, such as its indentation modulus and elasto-plastic hardness, can also be determined. All these values can be calculated without the need to measure the indent optically.

ISO 14577 has been written to allow a wide variety of post test data analysis.

## iTeh STANDARD PREVIEW (standards.iteh.ai)

[SIST EN ISO 14577-1:2004](https://standards.iteh.ai/catalog/standards/sist/7987107c-ac7a-40fe-b2d7-1b8a6ce5ce68/sist-en-iso-14577-1-2004)

<https://standards.iteh.ai/catalog/standards/sist/7987107c-ac7a-40fe-b2d7-1b8a6ce5ce68/sist-en-iso-14577-1-2004>

**iTeh STANDARD PREVIEW**  
**(standards.iteh.ai)**

SIST EN ISO 14577-1:2004

<https://standards.iteh.ai/catalog/standards/sist/7987107c-ac7a-40fe-b2d7-1b8a6ce5ce68/sist-en-iso-14577-1-2004>