

SLOVENSKI STANDARD

SIST EN ISO 14577-4:2017

01-februar-2017

Nadomešča:

SIST EN ISO 14577-4:2008

Kovinski materiali - Preskus trdote in lastnosti materialov z instrumentirano metodo vtiskovanja - 4. del: Preskusna metoda za kovinske in nekovinske prevleke (ISO 14577-4:2016)

Metallic materials - Instrumented indentation test for hardness and materials parameters - Part 4: Test method for metallic and non-metallic coatings (ISO 14577-4:2016)

Metallische Werkstoffe - Instrumentierte Eindringprüfung zur Bestimmung der Härte und anderer Werkstoffparameter - Teil 4: Prüfverfahren für metallische und nichtmetallische Schichten (ISO 14577-4:2016)

Matériaux métalliques - Essai de pénétration instrumentée pour la détermination de la dureté et de paramètres des matériaux - Partie 4 : Méthode d'essai pour les revêtements métalliques et non métalliques (ISO 14577-4:2016)

Ta slovenski standard je istoveten z: EN ISO 14577-4:2016

ICS:

77.040.10 Mehansko preskušanje kovin Mechanical testing of metals

SIST EN ISO 14577-4:2017

en,de

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN ISO 14577-4:2017

<https://standards.iteh.ai/catalog/standards/sist/9ad47811-853c-406a-9ce1-4c98a8067693/sist-en-iso-14577-4-2017>

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN ISO 14577-4

November 2016

ICS 77.040.10

Supersedes EN ISO 14577-4:2007

English Version

**Metallic materials - Instrumented indentation test for
hardness and materials parameters - Part 4: Test method
for metallic and non-metallic coatings (ISO 14577-4:2016)**

Matériaux métalliques - Essai de pénétration
instrumenté pour la détermination de la dureté et de
paramètres des matériaux - Partie 4 : Méthode d'essai
pour les revêtements métalliques et non métalliques
(ISO 14577-4:2016)

Metallische Werkstoffe - Instrumentierte
Eindringprüfung zur Bestimmung der Härte und
anderer Werkstoffparameter - Teil 4: Prüfverfahren für
metallische und nichtmetallische Schichten (ISO 14577-
4:2016)

This European Standard was approved by CEN on 1 October 2016.

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.

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 CEN-CENELEC Management Centre has the same status as the official versions.

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, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.



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

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

Contents	Page
European foreword.....	3

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[SIST EN ISO 14577-4:2017](https://standards.iteh.ai/catalog/standards/sist/9ad47811-853c-406a-9ce1-4c98a8067693/sist-en-iso-14577-4-2017)
<https://standards.iteh.ai/catalog/standards/sist/9ad47811-853c-406a-9ce1-4c98a8067693/sist-en-iso-14577-4-2017>

European foreword

This document (EN ISO 14577-4:2016) 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 May 2017, and conflicting national standards shall be withdrawn at the latest by May 2017.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN ISO 14577-4:2007.

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, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

STANDARD PREVIEW
(standards.iteh.ai)

Endorsement notice

The text of ISO 14577-4:2016 has been approved by CEN as EN ISO 14577-4:2016 without any modification.

SIST EN ISO 14577-4:2017
<https://standards.iteh.ai/catalog/standards/sist/9ad47811-853c-406a-9cef-4c98a8067693/sist-en-iso-14577-4-2017>

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN ISO 14577-4:2017

<https://standards.iteh.ai/catalog/standards/sist/9ad47811-853c-406a-9ce1-4c98a8067693/sist-en-iso-14577-4-2017>

INTERNATIONAL
STANDARDISO
14577-4Second edition
2016-11-01

**Metallic materials — Instrumented
indentation test for hardness and
materials parameters —****Part 4:
Test method for metallic and non-
metallic coatings**

iTeh STANDARD PREVIEW
(standards.iteh.ai)

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

*Partie 4: Méthode d'essai pour les revêtements métalliques et non
métalliques*

<https://standards.iteh.ai/catalog/standards/sist/9ad47811-853c-406a-9ce1-4c98a8067693/sist-en-iso-14577-4-2017>

Reference number
ISO 14577-4:2016(E)

© ISO 2016

iTeh STANDARD PREVIEW (standards.iteh.ai)

SIST EN ISO 14577-4:2017

<https://standards.iteh.ai/catalog/standards/sist/9ad47811-853c-406a-9ce1-4c98a8067693/sist-en-iso-14577-4-2017>



COPYRIGHT PROTECTED DOCUMENT

© ISO 2016, Published in Switzerland

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
Ch. de Blandonnet 8 • CP 401
CH-1214 Vernier, Geneva, Switzerland
Tel. +41 22 749 01 11
Fax +41 22 749 09 47
copyright@iso.org
www.iso.org

Contents

Page

Foreword	iv
Introduction	v
1 Scope	1
2 Normative references	1
3 Symbols and designations	2
4 Calibration and direct verification of testing machines	2
5 Test pieces	2
5.1 General.....	2
5.2 Surface roughness.....	2
5.3 Polishing.....	3
5.4 Surface cleanliness.....	3
6 Procedure	4
6.1 Test conditions.....	4
6.2 Measurement procedure.....	5
6.2.1 General.....	5
6.2.2 Force control experiments.....	5
7 Data analysis and evaluation of results for indentation normal to the surface	5
7.1 General.....	5
7.2 Coating indentation modulus.....	6
7.3 Coating indentation hardness.....	9
8 Uncertainty of the results	15
9 Test report	15
Annex A (informative) Contact point and fully elastic regime	16
Bibliography	18

ISO 14577-4:2016(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.

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 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.

The committee responsible for this document is ISO/TC 164, *Mechanical testing of metals*, Subcommittee SC 3, *Hardness testing*.

This second edition cancels and replaces the first edition (ISO 14577-4:2007), which has been technically revised.

ISO 14577 consists of the following parts, under the general title *Metallic materials — Instrumented indentation test for hardness and materials parameters*:

- Part 1: Test method
- Part 2: Verification and calibration of testing machines
- Part 3: Calibration of reference blocks
- Part 4: Test method for metallic and non-metallic coatings

Introduction

The elastic and plastic properties of a coating are critical factors determining the performance of the coated product. Indeed, many coatings are specifically developed to provide wear resistance that is usually conferred by their high hardness. Measurement of coating hardness is often used as a quality control check. Young's modulus becomes important when calculation of the stress in a coating is required in the design of coated components. For example, the extent to which coated components can withstand external applied forces is an important property in the capability of any coated system.

It is relatively straightforward to determine the hardness and indentation modulus of bulk materials using instrumented indentation. However, when measurements are made normal to a coated surface, depending on the force applied and the thickness of the coating, the substrate properties influence the result.

The purpose of this part of ISO 14577 is to provide guidelines for conditions where a significant influence of the substrate is detected and to provide possible analytical methods to enable the coating properties to be extracted from the composite measurement. In some cases, the coating property can be determined directly from measurements on a cross-section.

iTeh STANDARD PREVIEW (standards.iteh.ai)

[SIST EN ISO 14577-4:2017](https://standards.iteh.ai/catalog/standards/sist/9ad47811-853c-406a-9ce1-4c98a8067693/sist-en-iso-14577-4-2017)

<https://standards.iteh.ai/catalog/standards/sist/9ad47811-853c-406a-9ce1-4c98a8067693/sist-en-iso-14577-4-2017>

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN ISO 14577-4:2017

<https://standards.iteh.ai/catalog/standards/sist/9ad47811-853c-406a-9ce1-4c98a8067693/sist-en-iso-14577-4-2017>