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Responsible committee: ISE/101/5 Indentation hardness testing

Interested committees:

Title: Draft BS ISO 14577-6 Metallic materials — Instrumented indentation test for hardness and materials parameters. Part 6: Instrumented indentation test at elevated temperature.

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Introduction

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For international standards, comments will be reviewed by the relevant UK national committee before sending the consensus UK vote and comments to the international committee, which will then decide appropriate action. If the international standard is approved, it is usual for the text to be published as a British Standard.

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Template for comments and secretariat observations

Date: xx/xx/20xx	Document: ISO/DIS xxxx
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1	2	(3)	4	5	(6)	7
MB	Clause No./ Subclause No./Annex (e.g. 3.1)	Paragraph/ Figure/Table/Note	Type of comment	Comment (justification for change) by the MB	Proposed change by the MB	Secretariat observations on each comment submitted
	3.1	Definition 1	ed	Definition is ambiguous and needs clarifying.	Amend to read '...so that the mains connector to which no connection...'	
	6.4	Paragraph 2	te	The use of the UV photometer as an alternative cannot be supported as serious problems have been encountered in its use in the UK.	Delete reference to UV photometer.	



DRAFT International Standard

ISO/DIS 14577-6

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

Part 6: Instrumented indentation test at elevated temperature

Matériaux métalliques — Essai d'indentation instrumenté pour les paramètres de dureté et de matériaux —

Partie 6: Essai d'indentation instrumenté à température élevée

ICS: 77.040.10

ISO/TC 164/SC 3

Secretariat: DIN

Voting begins on:
2024-12-10

Voting terminates on:
2025-03-04

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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).

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

A list of all parts in the ISO 14577 series can be found on the ISO website.

- *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*
- *Part 5: Linear elastic dynamic instrumented indentation testing (DIIT)*

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

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 (all parts) 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.

This part of ISO 14577 has been prepared to enable the user to obtain hardness and other materials parameters using instrumented indentation testing at elevated temperature. The elastic and plastic properties of material components at elevated temperature is critical for determining the performance representative of in-service condition above ambient temperature. Typical applications include hard coatings, nuclear materials, welded materials, fuel cell materials, aerospace materials, etc.

This part of ISO 14577 covers the instrumented indentation testing systems with independently controlled indenter and test piece heating, where the indenter tip and test piece are both actively heated with feedback control and equipped with temperature sensing. This type of instrumented indentation testing system is suitable for testing materials of high or low thermal conductivity in air, in inert/reducing gaseous environment and in vacuum, offering the potential for higher testing temperature.

