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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 4340.1-2024

**Metallic materials - Vickers hardness test - Part 1: Test method
(English Translation)**

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Foreword

This Document was drafted as per the rules specified in GB/T 1.1-2020 Directives for Standardization - Part 1.Rules for the Structure and Drafting of Standardizing Documents.

This Document is Part 1 of GB/T 4340 Metallic Materials - Vickers Hardness Test. GB/T 4340

consists of the following parts.

- Part 1.Test Method;
- Part 2.Verification and Calibration of Testing Machines;
- Part 3.Calibration of Reference Blocks;
- Part 4.Tables of Hardness Values.

This Document replaced GB/T 4340.1-2009 Metallic Materials - Vickers Hardness Test - Part

1 Test Method; partially replaced GB/T 9790-2021 Metallic Materials - Vickers and Knoop

Microhardness Tests of Metallic and Other Inorganic Coatings. This Document mainly based

on GB/T 4340.1-2009, integrating partial contents of GB/T 9790-2021. Compared with GB/T 4340.1-2009, the major technical changes of this Document are as follows besides the structural

adjustments and editorial modifications.

--- Change the scope to include the application of this document to cemented carbide, other cemented carbides, metals, and other inorganic coatings. Extended the lower limit of the Vickers hardness test force to 0.009 807 N (see Clause 1 of this Document; Clause 1 of GB/T 4340.1-2009).

--- Add the resolution requirements for the indentation measurement system for different diagonal length measurement ranges (see Table 3 of this Document).

--- Add the requirement that the specimen thickness for cemented carbide be at least 1 mm (see 7.3 of this Document).

--- Add the determination of Vickers hardness of metals and other inorganic coatings (see **7.6 of this Document**).

--- Add the typical test forces HV0.001, HV0.002, HV0.003, and HV0.005 (see Table 4 of this Document).

--- Add periodic verification (see 8.3 of this Document).

--- Change the target values for force application time and hold time at maximum force (see

8.6 of this Document; Clause 7 of GB/T 4340.1-2009);

--- Add the minimum distance between adjacent indentations and the minimum distance between any indentation and the specimen edge (see Figure 2 of this Document);

--- Add requirements for curvature correction and hardness conversion methods (see Clause

10 of this Document);

--- Add the normative annex "Determination of Vickers Hardness of Metals and Other Inorganic Coatings" (see Annex C of this Document);

--- Change Annex D into a normative annex; add the content on the periodic verification of the diagonal length measurement system and indenter; and add Table D.1, HV maximum

permissible percentage deviation and indenter inspection (see Annex D of this Document; Annex C of GB/T 4340.1-2009).

This Document modified and adopted ISO 6507-1:2023 Metallic Materials - Vickers Hardness

Test - Part 1. Test Method.

The technical differences and causes between this Document and ISO 6507-1:2023 are as follows.

- Use the normative reference of GB/T 4340.2 to replace ISO 6507-2:2018 (see Clause 6, Annex D of this Document) to adapt to China's technical conditions and add operability;
- Add normative reference to JJG 151 (see 6.1 of this Document) to adapt to China technical conditions and add operability;
- Use normative reference of GB/T 4340.3 to replace ISO 6507-3 (see Annex D of this Document) to adapt to China technical conditions and add operability.

This Document made the following editorial modifications.

- Use informative reference of GB/T 21838.1 to replace ISO 14577-1 (see Clause 1, 8.9, Annex C of this Document);
- Use informative reference of GB/T 21838.2 to replace ISO 14577-2 (see 8.9 of this Document);
- Use informative reference of GB/T 21838.3 to replace ISO 14577-3 (see 8.9 of this Document);
- Use informative reference of GB/T 4340.4 to replace ISO 6507-4 (see 8.10 of this Document);
- Add informative reference to JJF 1059.1 (see Clause 9 of this Document);
- Use informative reference of GB/T 6462 to replace ISO 1463 (see Annex C of this Document);

Metallic Materials - Vickers Hardness Test - Part 1. Test Method

1 Scope

This Document specifies the principles, hardness testers, specimens, test procedures, uncertainty of results, and test report for the Vickers hardness test of metals.

This Document specifies methods for determining the Vickers hardness of metallic materials

within three test force ranges (see Table 1).

This Document specifies the range of Vickers hardness indentation diagonal lengths from 0.020

mm to 1.400 mm. For indentation diagonals smaller than this range, the determination of Vickers hardness using this method may result in significant uncertainty due to limitations in the optical measurement system and imperfections in the indenter geometry.

This Document also specifies procedures for periodic inspections of hardness testers by the user.

This Document applies to cemented carbides, other cemented carbides, and metallic and other

inorganic coatings, including electrophoretic, autocatalytic, sprayed, and anodic coatings on aluminum substrates.

This Document applies to indentation measurements perpendicular to the coating surface and

to cross-sectional measurements, provided that the coating characteristics (smoothness, thickness, etc.) permit accurate reading of the indentation diagonal.

This Document is not applicable to coatings with a thickness less than 0.030 mm when tested

perpendicular to the coating surface or coatings with a thickness less than 0.100 mm when tested in cross-sectional areas. GB/T 21838.1 can be used to determine the hardness of smaller

indentations.

The Vickers hardness test for special materials or products is specified in the relevant standards.

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