

Sintered metal materials, excluding hardmetals — Determination of apparent hardness and microhardness

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National foreword

This British Standard is the UK implementation of EN ISO 4498:2007. It is identical with ISO 4498:2005. It supersedes BS EN 24498-1:1993 and BS ISO 4498:2005 which are withdrawn.

The UK participation in its preparation was entrusted to Technical Committee ISE/65, Sintered metal components.

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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English Version

Sintered metal materials, excluding hardmetals - Determination of apparent hardness and microhardness (ISO 4498:2005)

Matériaux métalliques frittés, à l'exclusion des métaux-durs
- Détermination de la dureté apparente et de la microdureté
(ISO 4498:2005)

Metallische Sinterwerkstoffe, ausgenommen Hartmetalle -
Bestimmung der Sinterhärte und der Mikrohärte (ISO
4498:2005)

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Foreword

The text of ISO 4498:2005 has been prepared by Technical Committee ISO/TC 119 "Powder metallurgy" of the International Organization for Standardization (ISO) and has been taken over as EN ISO 4498:2007 by Technical Committee CEN/SS M11 "Powder metallurgy", the secretariat of which is held by CMC.

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of an identical text or by endorsement, at the latest by August 2007, and conflicting national standards shall be withdrawn at the latest by August 2007.

This document supersedes EN 24498-1:1993.

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Endorsement notice

The text of ISO 4498:2005 has been approved by CEN as EN ISO 4498:2007 without any modifications.

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Introduction

Sintered metal materials generally have a porous structure. Therefore, they can be understood as composite metal/pore materials. That is why this International Standard describes two procedures to determine their hardness:

- Procedure 1 for the macro hardness (this is the apparent hardness);
- Procedure 2 for the micro hardness (this is the hardness of the metallic phase only).

Tests in Procedure 1 determine Vickers, Brinell and/or Rockwell macrohardnesses — their acronyms are: HV, HB, and HR. These tests determine the apparent hardness (macrohardness) of the materials because indentations generally include both the solid phase and a number of pores. The usual test forces applied to an indenter are from 10 N to 2 000 N.

The apparent hardness value is often used as an expression of the mechanical strength of the material as a whole; it is usually lower than that of a solid material of the same composition and metallurgical condition. However, this does not imply that the functional characteristics (for example wear resistance) are necessarily inferior to those of an equivalent full-density material.

The apparent hardness is a macrostructural property. It characterises the material taken as a whole.

Tests in Procedure 2 determine the Vickers and/or Knoop microhardnesses of the material — their acronyms are: HV_a , HK_a ¹⁾. The usual test forces applied to an indenter are from 0,147 N to 1,960 N for Vickers, and 0,981 N for Knoop.

The microhardness is a microstructural property used to control chemical composition, heat treatment or surface treatment. For these purposes, it is necessary to ensure that hardness test indentations are small enough not to include any visible pores, but only the solid phase.

1) Where a is the test load, in kilograms.