

**SLOVENSKI STANDARD  
SIST EN ISO 4499-1:2010****01-julij-2010****Nadomešča:  
SIST EN 24499:2000**

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**Trdine - Metalografsko določevanje mikrostrukture - 1. del: Fotomikroografi in opisi  
(ISO 4499-1:2008)****Hardmetals - Metallographic determination of microstructure - Part 1: Photomicrographs  
and description (ISO 4499-1:2008)****Hartmetalle - Metallographische Bestimmung der Mikrostruktur - Teil 1: Gefügebilder und  
Beschreibung (ISO 4499-1:2008)**  
**iTech STANDARD PREVIEW  
(standards.iteh.ai)****Métaux-durs - Détermination métallographique de la microstructure - Partie 1: Prises de  
vue photomicrographiques et description (ISO 4499-1:2008)**  
[standards.iteh.ai/standards/iso/iso-4499-1-2008-99-4980-80f7-a1a4dd0518aa/sist-en-iso-4499-1-2010](http://standards.iteh.ai/standards/iso/iso-4499-1-2008-99-4980-80f7-a1a4dd0518aa/sist-en-iso-4499-1-2010)**Ta slovenski standard je istoveten z: EN ISO 4499-1:2010**

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**ICS:**

77.040.99	Druge metode za preskušanje kovin	Other methods of testing of metals
77.160	Metalurgija prahov	Powder metallurgy

**SIST EN ISO 4499-1:2010 en,fr,de**

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**EUROPEAN STANDARD**  
**NORME EUROPÉENNE**  
**EUROPÄISCHE NORM**

**EN ISO 4499-1**

May 2010

ICS 77.040.99; 77.160

Supersedes EN 24499:1993

English Version

**Hardmetals - Metallographic determination of microstructure -  
Part 1: Photomicrographs and description (ISO 4499-1:2008)**

Métaux-durs - Détermination métallographique de la  
microstructure - Partie 1: Prises de vue  
photomicrographiques et description (ISO 4499-1:2008)

Hartmetalle - Metallographische Bestimmung der  
Mikrostruktur - Teil 1: Gefügebilder und Beschreibung (ISO  
4499-1:2008)

This European Standard was approved by CEN on 30 April 2010.

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 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 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, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

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Management Centre: Avenue Marnix 17, B-1000 Brussels

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## Foreword

The text of ISO 4499-1:2008 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 4499-1:2010.

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 November 2010, and conflicting national standards shall be withdrawn at the latest by November 2010.

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 24499:1993.

ISO 4499-1, together with ISO 4499-2, cancels and replaces ISO 4499:1978, which has been technically revised.

In ISO 4499-2, a new section has been added for the quantitative measurement of the WC grain size of hardmetals. ISO 4499-3 and ISO 4499-4 are additional parts that will deal with the microstructures of hardmetals containing cubic carbides and Ti(C, N)-based hardmetals, and miscellaneous microstructural features, such as defects and non-stoichiometric phases (e.g. carbon and eta-phase). ISO 4499-3 and ISO 4499-4 are currently in development.

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In standard WC/Co hardmetals the density is generally controlled so that only two phases WC and Co are present. The Co phase is an alloy and contains some W and C in solid solution. The WC phase is stoichiometric. If the composition is either high or low in total carbon content then it is possible to see a third phase in the structure. For a high C content this is graphite; for a low C content it is eta phase ( $\eta$ ), typically an M<sub>6</sub>C or M<sub>12</sub>C carbide where M is (CoxW<sub>y</sub>). Metallographic determination of these phases will be outlined in ISO 4499-3.

ISO 4499 consists of the following parts, under the general title Hardmetals — Metallographic determination of microstructure:

- *Part 1: Photomicrographs and description*
- *Part 2: Measurement of WC grain size*

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, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

### Endorsement notice

The text of ISO 4499-1:2008 has been approved by CEN as a EN ISO 4499-1:2010 without any modification.

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# INTERNATIONAL STANDARD

ISO  
**4499-1**

First edition  
2008-09-15

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## **Hardmetals — Metallographic determination of microstructure —**

### **Part 1: Photomicrographs and description**

*Métaux-durs — Détermination métallographique de la microstructure —*

**iTeh STANDARD PREVIEW**  
*Partie 1 : Prises de vue photomicrographiques et description*  
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Reference number  
ISO 4499-1:2008(E)

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