

SLOVENSKI STANDARD
SIST EN ISO 4499-4:2016**01-maj-2016****Nadomešča:**
SIST EN 24505:2000

Trdine - Metalografsko določevanje mikrostrukture - 4. del: Opis značilnosti poroznosti, ogljikovih hib in vsebine v eta-fazi (ISO 4499-4:2016)

Hardmetals - Metallographic determination of microstructure - Part 4: Characterisation of porosity, carbon defects and eta-phase content (ISO 4499-4:2016)

Hartmetalle - Metallographische Bestimmung der Mikrostruktur - Teil 4: Charakterisierung von Porosität, Kohlenstofffehlern und Anteil an Eta-Phase (ISO 4499-4:2016)

SIST EN ISO 4499-4:2016

Métaux-durs - Détermination métallographique de la microstructure - Partie 4: Caractérisation de la porosité, des défauts carbone et de la teneur en phase éta (ISO 4499-4:2016)

Ta slovenski standard je istoveten z: EN ISO 4499-4:2016**ICS:**

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

SIST EN ISO 4499-4:2016 en

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EUROPEAN STANDARD

EN ISO 4499-4

NORME EUROPÉENNE

EUROPÄISCHE NORM

March 2016

ICS 77.040.99; 77.160

Supersedes EN 24505:1993

English Version

Hardmetals - Metallographic determination of microstructure - Part 4: Characterisation of porosity, carbon defects and eta-phase content (ISO 4499-4:2016)

Métaux-durs - Détermination métallographique de la
microstructure - Partie 4: Caractérisation de la
porosité, des défauts carbone et de la teneur en phase
êta (ISO 4499-4:2016)

Hartmetalle - Metallographische Bestimmung der
Mikrostruktur - Teil 4: Charakterisierung von
Porosität, Kohlenstofffehlern und Anteil an Eta-Phase
(ISO 4499-4:2016)

This European Standard was approved by CEN on 4 February 2016.

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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.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
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European foreword

This document (EN ISO 4499-4:2016) has been prepared by Technical Committee ISO/TC 119 "Powder metallurgy".

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 September 2016, and conflicting national standards shall be withdrawn at the latest by September 2016.

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 24505:1993.

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.

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The text of ISO 4499-4:2016 has been approved by CEN as EN ISO 4499-4:2016 without any modification.

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INTERNATIONAL
STANDARD

ISO
4499-4

First edition
2016-02-15

**Hardmetals — Metallographic
determination of microstructure —**

Part 4:

**Characterisation of porosity, carbon
defects and eta-phase content**

iTeh STANDARD PREVIEW
*Métaux-durs — Détermination métallographique de la
microstructure —*
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*Partie 4: Caractérisation de la porosité, des défauts carbone et de la
teneur en phase êta*

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ISO 4499-4:2016(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 WTO principles in the Technical Barriers to Trade (TBT) see the following URL: [Foreword - Supplementary information](#).

The committee responsible for this document is ISO/TC 119, *Powder metallurgy*, Subcommittee SC 4, *Sampling and testing methods for hardmetals*.

This first edition of ISO 4499-4 cancels and replaces ISO 4505:1978, which has been technically revised.

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*
- Part 3: *Measurement of microstructural features in Ti (C,N) and WC/cubic carbide based hardmetals*
- Part 4: *Characterisation of porosity, carbon defects and eta-phase content*

Introduction

In standard WC/Co hardmetals, the chemistry, magnetic properties and density are generally controlled so that only two phases WC and Co are present.^{[1][2][3]} 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 high C, this is graphite; for low C, it is eta phase (η); typically, an M_6C or $M_{12}C$ carbide where M is (Co_xW_y) . This part of ISO 4499 is concerned with the detection and measurement of these microstructural features together with the measurement of porosity levels. Porosity is important since these materials are manufactured by a powder metallurgical route and although the technique of liquid phase sintering is used to consolidate the multiphase structure, low levels of porosity can arise in some instances and affect properties such as density and strength.

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