

STN	Kovové prášky Stanovenie obsahu kyslíka redukčnými metódami Časť 3: Kyslík redukovateľný vodíkom (ISO 4491-3: 2025)	STN EN ISO 4491-3 42 0890
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Metallic powders - Determination of oxygen content by reduction methods - Part 3: Hydrogen-reducible oxygen (ISO 4491-3:2025)

Táto norma obsahuje anglickú verziu európskej normy.
This standard includes the English version of the European Standard.

Táto norma bola oznámená vo Vestníku ÚNMS SR č. 01/26

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EUROPEAN STANDARD

EN ISO 4491-3

NORME EUROPÉENNE

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English Version

Metallic powders - Determination of oxygen content by reduction methods - Part 3: Hydrogen-reducible oxygen (ISO 4491-3:2025)

Poudres métalliques - Dosage de l'oxygène par les méthodes de réduction - Partie 3: Oxygène réductible par l'hydrogène (ISO 4491-3:2025)

Metallpulver - Bestimmung des Sauerstoffgehaltes durch Reduktionsverfahren - Teil 3: Wasserstoffreduzierbarer Sauerstoff (ISO 4491-3:2025)

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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EN ISO 4491-3:2025 (E)

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European foreword

This document (EN ISO 4491-3:2025) has been prepared by Technical Committee ISO/TC 119 "Powder metallurgy" in collaboration with CCMC.

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of an identical text or by endorsement, at the latest by March 2026, and conflicting national standards shall be withdrawn at the latest by March 2026.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN ISO 4491-3:2006.

Any feedback and questions on this document should be directed to the users' national standards body/national committee. A complete listing of these bodies can be found on the CEN website.

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Endorsement notice

The text of ISO 4491-3:2025 has been approved by CEN as EN ISO 4491-3:2025 without any modification.



International Standard

ISO 4491-3

Metallic powders — Determination of oxygen content by reduction methods —

Part 3: Hydrogen-reducible oxygen

Poudres métalliques — Dosage de l'oxygène par les méthodes de réduction —

Partie 3: Oxygène réductible par l'hydrogène

**Third edition
2025-09**

ISO 4491-3:2025(en)



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ISO 4491-3:2025(en)**Foreword**

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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 document 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 119, *Powder metallurgy*, Subcommittee SC 2, *Sampling and testing methods for powders (including powders for hardmetals)*, in collaboration with the European Committee for Standardization (CEN), in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This third edition cancels and replaces the second edition (ISO 4491-3:1997), of which it constitutes a minor revision.

The main changes are as follows:

- normative references in [Clause 2](#) have been updated;
- editorial revisions and alignment with current ISO drafting directives.

A list of all parts in the ISO 4491 series can be found on the ISO website.

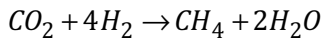
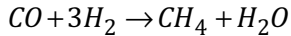
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ISO 4491-3:2025(en)**Introduction**

This document is intended to be used for the determination of hydrogen reducible oxygen content of metallic powders, including powders containing carbon.

If carbon is present in the powder, some metal oxides which can otherwise have been reduced by hydrogen are instead reduced by carbon, producing carbon monoxide or carbon dioxide. These products are not measured by the titration with Karl Fischer reagent which is used to determine the amount of water produced. Consequently, a lower result will be obtained for the hydrogen-reducible oxygen content.

This interference is eliminated by passing the gases emerging from the reduction furnace over a catalyst which converts the CO and CO₂ formed into methane and water, in accordance with the following equations:



The conversion reaction is carried out at 380 °C, over a nickel catalyst.

Certain oxides can be partially reduced by carbon which otherwise would not be reduced by hydrogen. In such cases the interpretation of results should be made with great care (see ISO 4491-1:2023, 5.1.2 d).

Metallic powders — Determination of oxygen content by reduction methods —

Part 3: Hydrogen-reducible oxygen

1 Scope

This document specifies a method for the determination of the hydrogen-reducible oxygen content of metallic powders containing mass percentage of 0,05 % to 3 % oxygen.

This document is applicable to unalloyed, partially alloyed or completely alloyed metal powders and also to mixtures of carbides and binder metal. This document is not applicable to powders containing lubricants or organic binders.

This document can be extended to powders containing carbon by the use of a special catalytic device. This document is intended to be used in conjunction with ISO 760 and ISO 4491-1.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 760, *Determination of water — Karl Fischer method (General method)*

ISO 4491-1, *Metallic powders — Determination of oxygen content by reduction methods — Part 1: General guidelines*

koniec náhľadu – text ďalej pokračuje v platenej verzii STN