

<b>STN</b>	<b>Technológia jadrového paliva Spekané pelety (U,Pu)O<sub>2</sub> Návod na keramografickú prípravu na skúšku mikroštruktúry (ISO 22765: 2025)</b>	<b>STN EN ISO 22765</b>  40 1008
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Nuclear fuel technology - Sintered (U,Pu)O<sub>2</sub> pellets - Guidance for ceramographic preparation for microstructure examination (ISO 22765:2025)

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

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EN ISO 22765

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English Version

## Nuclear fuel technology - Sintered (U,Pu)O<sub>2</sub> pellets - Guidance for ceramographic preparation for microstructure examination (ISO 22765:2025)

Technologie du combustible nucléaire - Pastilles  
(U,Pu)O<sub>2</sub> frittées - Recommandations relatives à la  
préparation céramographique pour examen de la  
microstructure (ISO 22765:2025)

Kernbrennstofftechnologie - Gesinterte (U,Pu)O<sub>2</sub>-  
Pellets - Leitfaden für die keramographische  
Herstellung der Proben zur Untersuchung des  
Feingefüges (ISO 22765:2025)

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**EN ISO 22765:2025 (E)**

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## **European foreword**

This document (EN ISO 22765:2025) has been prepared by Technical Committee ISO/TC 85 "Nuclear energy, nuclear technologies, and radiological protection" in collaboration with Technical Committee CEN/TC 430 "Nuclear energy, nuclear technologies, and radiological protection" the secretariat of which is held by AFNOR.

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## **Endorsement notice**

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# International Standard

**ISO 22765**

## **Nuclear fuel technology — Sintered (U,Pu)O<sub>2</sub> pellets — Guidance for ceramographic preparation for microstructure examination**

*Technologie du combustible nucléaire — Pastilles (U,Pu)  
O<sub>2</sub> frittées — Recommandations relatives à la préparation  
céramographique pour examen de la microstructure*

**Second edition  
2025-01**

## ISO 22765:2025(en)



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**ISO 22765:2025(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](http://www.iso.org/directives)).

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This document was prepared by Technical Committee ISO/TC 85, *Nuclear energy, nuclear technologies, and radiological protection*, Subcommittee SC 5, *Nuclear installations, processes and technologies*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 430, *Nuclear energy, nuclear technologies, and radiological protection*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This second edition cancels and replaces the first edition (ISO 22765:2016), which has been technically revised.

The main changes are as follows:

- in [Clause 1](#), additional comments about equipment and preparation;
- in [Clause 4](#), addition of required steps according to analyses to be carried out;
- in [Clauses 7](#) and [8](#), update of the parameters used for polishing.

A list of all parts in the ISO 22765 series can be found on the ISO website.

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# Nuclear fuel technology — Sintered (U,Pu)O<sub>2</sub> pellets — Guidance for ceramographic preparation for microstructure examination

## 1 Scope

This document is applied to fuel fabrication. It describes the ceramographic procedure used to prepare sintered (U,Pu)O<sub>2</sub> pellets for qualitative and quantitative examination of the (U,Pu)O<sub>2</sub> pellet microstructure.

The examinations are performed

- a) before any treatment or any etching, and
- b) after thermal treatment or after chemical or ion etching.

They allow

- observation of any cracks, intra- and intergranular pores or inclusions, and
- measurement of the grain size, porosity and plutonium homogeneity distribution.

The mean grain diameter is measured by one of the classic methods: counting (intercept method), comparison with standard grids or typical images, etc.<sup>[2]</sup>. The measurement of individual grain sizes requires uniform development of the microstructure over the entire specimen.

The plutonium cluster and pore distribution and localization are generally analysed by automatic image analysis systems. The plutonium distribution is usually revealed by chemical etching or by alpha autoradiography. A scanning electron microscope (SEM) or a microprobe can also be used. In this case an additional preparation can be needed depending on the equipment used. This preparation is not in the scope of this standard.

## 2 Normative references

There are no normative references in this document.

**koniec náhľadu – text ďalej pokračuje v platenej verzii STN**