Nuclear fuel technology - Sintered (U,Pu)O2 pellets - Guidance for ceramographic preparation for microstructure examination (ISO 22765:2016)

EESTI STANDARDIKESKUS
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NATIONAL FOREWORD

See Eesti standard EVS-EN ISO 22765:2019 sisaldab Euroopa standardi EN ISO 22765:2019 ingliskeelset teksti.	This Estonian standard EVS-EN ISO 22765:2019 consists of the English text of the European standard EN ISO 22765:2019.
Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas.	This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation.
Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 12.06.2019.	Date of Availability of the European standard is 12.06.2019.
Standard on kättesaadav Eesti Standardikeskusest.	The standard is available from the Estonian Centre for Standardisation.

Tagasisidet standardi sisu kohta on võimalik edastada, kasutades EVS-i veebilehel asuvat tagasiside vormi või saates e-kirja meiliaadressile standardiosakond@evs.ee.

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Nuclear fuel technology - Sintered (U,Pu)O2 pellets - Guidance for ceramographic preparation for microstructure examination (ISO 22765:2016)

Technologie du combustible nucléaire - Pastilles (U,Pu)O2 frittées - Préconisations relatives à la préparation céramographique pour examen de la microstructure (ISO 22765:2016)

Kernbrennstofftechnologie - Gesinterte (U,Pu)O2-Pellets - Leitfaden für die keramographische Herstellung der Proben zur Untersuchung des Feingefüges (ISO 22765:2016)

This European Standard was approved by CEN on 8 March 2019.

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

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European foreword

The text of ISO 22765:2016 has been prepared by Technical Committee ISO/TC 85 "Nuclear energy, nuclear technologies, and radiological protection" of the International Organization for Standardization (ISO) and has been taken over as EN ISO 22765:2019 by Technical Committee CEN/TC 430 "Nuclear energy, nuclear technologies, and radiological protection" the secretariat of which is held by AFNOR.

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 December 2019, and conflicting national standards shall be withdrawn at the latest by December 2019.

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.

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Endorsement notice

The text of ISO 22765:2016 has been approved by CEN as EN ISO 22765:2019 without any modification.

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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. www.iso.org/directives

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The committee responsible for this document is ISO/TC 85, *Nuclear energy, nuclear technologies, and radiological protection*, Subcommittee SC 5, *Nuclear installations, processes and technologies*.

Nuclear fuel technology — Sintered $(U,Pu)O_2$ pellets — Guidance for ceramographic preparation for microstructure examination

1 Scope

This document describes the ceramographic procedure used to prepare sintered $(U,Pu)O_2$ pellets for qualitative and quantitative examination of the pellet microstructure.

The examinations are performed before and after thermal treatment or chemical 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.[2] 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 but alpha-autoradiography can also be used. The first technique avoids the tendency for autoradiography to exaggerate the size of plutonium-rich clusters due to the distance the alpha particles travel away from the source.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

No terms and definitions are listed in this document.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— IEC Electropedia: available at http://www.electropedia.org/

— ISO Online browsing platform: available at http://www.iso.org/obp

4 Principle

The ceramographic preparation of $(U,Pu)O_2$ pellets involves two steps:

— specimen polishing, after embedding or not the specimen in a specific resin;

— thermal treatment or chemical etching to reveal the specimen microstructure.