

Nuclear fuel technology - Dissolution of plutonium dioxide-containing materials - Part 1: Dissolution of plutonium dioxide powders (ISO 18256-1:2019)

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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 and Accreditation.
Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 10.02.2021.	Date of Availability of the European standard is 10.02.2021.
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English Version

## Nuclear fuel technology - Dissolution of plutonium dioxide-containing materials - Part 1: Dissolution of plutonium dioxide powders (ISO 18256-1:2019)

Technologie du combustible nucléaire - Dissolution des matériaux contenant du dioxyde de plutonium - Partie 1: Dissolution des poudres de dioxyde de plutonium (ISO 18256-1:2019)

This European Standard was approved by CEN on 18 January 2021.

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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

The text of ISO 18256-1:2019 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 18256-1:2021 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of an identical text or by endorsement, at the latest by August 2021, and conflicting national standards shall be withdrawn at the latest by August 2021.

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 18256-1:2019 has been approved by CEN as EN ISO 18256-1:2021 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 (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*.

A list of all the parts in the ISO 18256 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at [www.iso.org/members.html](http://www.iso.org/members.html).

## Introduction

This document describes a method to dissolve powder samples of plutonium oxide to provide suitable aliquots for subsequent analysis of elemental concentration and isotopic composition.

# Nuclear fuel technology — Dissolution of plutonium dioxide-containing materials —

## Part 1: Dissolution of plutonium dioxide powders

### 1 Scope

This document specifies the dissolution of powder samples of plutonium oxide for subsequent determination of elemental concentration and isotopic composition.

### 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:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <http://www.electropedia.org/>

### 4 Summary of the method

Among the factors affecting the formation of solid solution and hence, the ease of dissolution are:

- the method of fuel fabrication (i.e. mechanically blended oxides, co-precipitated oxides, or sol-gel oxides);
- the degree of sintering.

Therefore, different dissolution methods are applied according to the type of plutonium oxide sample to be dissolved. For high-fired plutonium oxide procedure can be different.

The radiological hazard of plutonium and the need to minimize the waste shall be taken into account when choosing the mass of the sample to be dissolved. In most cases, PuO<sub>2</sub> masses between 0,1 g and 1 g are appropriate for the subsequent analysis.

For the highest possible assay accuracy only gravimetric dissolution methods are recommended. However for a less critical assay, volumetric dissolution may be appropriate.