

STN	Jadrová energia Hodnotenie homogenity rozloženia Gd v gadoliniových palivových zmesiach a stanovenie obsahu Gd₂O₃ v gadoliniových palivových peletách meraním prvkov uránu a gadolína (ISO 16424: 2012)	STN EN ISO 16424 40 1006
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Nuclear energy - Evaluation of homogeneity of Gd distribution within gadolinium fuel blends and determination of Gd₂O₃ content in gadolinium fuel pellets by measurements of uranium and gadolinium elements (ISO 16424:2012)

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. 02/18

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Podľa zákona č. 264/1999 Z. z. o technických požiadavkách na výrobky a o posudzovaní zhody a o zmene a doplnení niektorých zákonov v znení neskorších predpisov sa slovenská technická norma a časti slovenskej technickej normy môžu rozmnožovať alebo rozširovať len so súhlasom slovenského národného normalizačného orgánu.

EUROPEAN STANDARD

EN ISO 16424

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EUROPÄISCHE NORM

October 2017

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English Version

Nuclear energy - Evaluation of homogeneity of Gd
distribution within gadolinium fuel blends and
determination of Gd₂O₃ content in gadolinium fuel pellets
by measurements of uranium and gadolinium elements
(ISO 16424:2012)

Énergie nucléaire - Évaluation de l'homogénéité de la
distribution du Gd dans les mélanges de combustibles
au gadolinium et détermination de la teneur en Gd₂O₃
dans les pastilles combustibles au gadolinium par
mesurage des éléments uranium et gadolinium (ISO
16424:2012)

Kernenergie - Bewertung der Homogenität der Gd-
Verteilung in Gadolinium-Brennstoffgemischen und
Bestimmung des Gd₂O₃-Gehaltes in Gadolinium-
Brennstofftabletten durch Messung der Uran- und
Gadolinium-Bestandteile (ISO 16424:2012)

This European Standard was approved by CEN on 13 September 2017.

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European foreword

The text of ISO 16424:2012 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 16424:2017 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 April 2018, and conflicting national standards shall be withdrawn at the latest by April 2018.

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Endorsement notice

The text of ISO 16424:2012 has been approved by CEN as EN ISO 16424:2017 without any modification.

**Nuclear energy — Evaluation of
homogeneity of Gd distribution
within gadolinium fuel blends and
determination of Gd₂O₃ content
in gadolinium fuel pellets by
measurements of uranium and
gadolinium elements**

*Énergie nucléaire — Évaluation de l'homogénéité de la distribution
du Gd dans les mélanges de combustibles au gadolinium et
détermination de la teneur en Gd₂O₃ dans les pastilles combustibles
au gadolinium par mesurage des éléments uranium et gadolinium*





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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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ISO 16424 was prepared by Technical Committee ISO/TC 85, *Nuclear Energy, Nuclear Technologies, and Radiological Protection*, Subcommittee SC 5, *Nuclear Fuel Cycle*.

Nuclear energy — Evaluation of homogeneity of Gd distribution within gadolinium fuel blends and determination of Gd_2O_3 content in gadolinium fuel pellets by measurements of uranium and gadolinium elements

1 Scope

This International Standard is applicable to the evaluation of the homogeneity of Gd distribution within gadolinium fuel blends, and the determination of the Gd_2O_3 content in sintered fuel pellets of $Gd_2O_3+UO_2$ from 1 % to 10 %, by measurements of gadolinium (Gd) and uranium (U) elements using ICP-AES.

After performing measurements of Gd and U elements using ICP-AES, if statistical methodology is additionally applied, homogeneity of Gd distribution within a Gd fuel pellet lot can also be evaluated. However, this International Standard covers the statistical methodology only on a limited basis.

NOTE 1 ISO 16796 also provides a method for Gd_2O_3 content determination by atomic emission spectrometry using an inductively coupled plasma source (ICP-AES). The methodology of ISO 16796 is different from the one of this International Standard.

NOTE 2 In this International Standard, gadolinium fuel blend represents a mixture of uranium dioxide (UO_2) powder and gadolinium oxide (Gd_2O_3) powder. The physically blended and homogenized powder may additionally contain in it rather large quantities of uranium oxide (U_3O_8) powder particles and/or the M_3O_8 powder particles obtained by oxidation of Gd pellets. In this International Standard, the symbol "M" in the chemical formula " M_3O_8 " and in the terminology "O/M ratio" represents metallic elements U and Gd.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including amendments) applies.

ISO 3696:1987, *Water for analytical laboratory use — Specification and test methods*

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