



Standard Specification for Uranium Oxides with a ^{235}U Content of Less Than 5 % for Dissolution Prior to Conversion to Nuclear-Grade Uranium Dioxide¹

This standard is issued under the fixed designation C1334; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This specification covers uranium oxides, including processed byproducts or scrap material (powder, pellets, or pieces), that are intended for dissolution into uranyl nitrate solution meeting the requirements of Specification C788 prior to conversion into nuclear grade UO_2 powder with a ^{235}U content of less than 5 %. This specification defines the impurity and uranium isotope limits for such uranium powders that are to be dissolved prior to processing to nuclear grade UO_2 as defined in Specification C753.

1.2 This specification provides the nuclear industry with a general standard for such uranium oxide powders. It recognizes the diversity of conversion processes and the processes to which such powders are subsequently to be subjected (for instance, by solvent extraction). It is therefore anticipated that it may be necessary to include supplementary specification limits by agreement between the buyer and seller.

1.3 The scope of this specification does not comprehensively cover all provisions for preventing criticality accidents, for health and safety, or for shipping. Observance of this specification does not relieve the user of the obligation to conform to all international, national, state and local regulations for processing, shipping, or any other way of using uranium powders (see 2.2 and 2.3).

2. Referenced Documents

2.1 ASTM Standards:²

C696 Test Methods for Chemical, Mass Spectrometric, and Spectrochemical Analysis of Nuclear-Grade Uranium Dioxide Powders and Pellets

C753 Specification for Nuclear-Grade, Sinterable Uranium Dioxide Powder

C788 Specification for Nuclear-Grade Uranyl Nitrate Solution or Crystals

C799 Test Methods for Chemical, Mass Spectrometric, Spectrochemical, Nuclear, and Radiochemical Analysis of Nuclear-Grade Uranyl Nitrate Solutions

C859 Terminology Relating to Nuclear Materials

C996 Specification for Uranium Hexafluoride Enriched to Less Than 5 % ^{235}U

C1233 Practice for Determining Equivalent Boron Contents of Nuclear Materials

E105 Practice for Probability Sampling of Materials³

2.2 ANSI Standard:³

ANSI/ASME NQA-1 Quality Assurance Requirements for Nuclear Facility Applications

2.3 U.S. Government Document:⁴

Federal Regulations Title 10, (Energy) Part 50, Domestic Licensing of Production and Utilization Facilities

3. Terminology

3.1 Definitions of Terms Specific to This Standard:

3.1.1 Terms shall be defined in accordance with Terminology C859, except for the following:

3.1.2 *Commercial Grade Uranium Oxide, n*—any oxide of uranium made from unirradiated uranium. It is recognized some contamination with reprocessed uranium may occur during routine processing; this is acceptable provided that the specification for Commercial Grade Uranium Oxide as set forth in 4.1 is met.

3.1.3 *scrap, n*—in the nuclear industry, residues that contain sufficient quantities of source or special nuclear material to be worthy of recovery.

4. Isotopic Content

4.1 For Commercial Grade Uranium Oxide with an isotopic content of ^{235}U between that of natural uranium and 5 %, the isotopic and radionuclide limits of Specification C996 shall

¹ This specification is under the jurisdiction of ASTM Committee C26 on Nuclear Fuel Cycle and is the direct responsibility of Subcommittee C26.02 on Fuel and Fertile Material Specifications.

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² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

³ Available from American National Standards Institute (ANSI), 25 W. 43rd St., 4th Floor, New York, NY 10036, http://www.ansi.org.

⁴ Available from U.S. Government Printing Office Superintendent of Documents, 732 N. Capitol St., NW, Mail Stop: SDE, Washington, DC 20401, http://www.access.gpo.gov.