



Standard Specification for Sintered Uranium Dioxide Pellets¹

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INTRODUCTION

This specification is intended to provide the nuclear industry with a general specification for uranium dioxide pellets. It recognizes the diversity of manufacturing methods by which uranium dioxide pellets are produced and the many special requirements for chemical and physical characterization which may be imposed by the operating conditions to which the pellets will be subjected in specific reactor systems. Therefore, it is anticipated that the purchaser may supplement this specification with additional requirements for specific applications.

1. Scope

1.1 This specification is for finished sintered uranium dioxide pellets. It applies to uranium dioxide pellets containing uranium of any ²³⁴U concentration for use in nuclear reactors.

1.2 This specification does not include (a) provisions for preventing criticality accidents or (b) requirements for health and safety. Observance of this specification does not relieve the user of the obligation to be aware of and conform to all federal, state, and local regulations pertaining to possessing, shipping, processing, or using source or special nuclear material. Examples of U.S. Government documents are Code of Federal Regulations (Latest Edition), Title 10, Part 50, Title 10, Part 71, and Title 49, Part 173.

1.3 The following precautionary caveat pertains only to the technical requirements portion, Section 4, of this specification: *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability or regulatory limitations prior to use.*

2. Referenced Documents

2.1 ASTM Standards:

- C 696 Test Methods for Chemical, Mass Spectrometric, and Spectrochemical Analysis of Nuclear-Grade Uranium Dioxide Powders and Pellets²
- C 753 Specification for Nuclear-Grade, Sinterable Uranium Dioxide Powder²
- C 859 Terminology Relating to Nuclear Materials²
- C 996 Specification for Uranium Hexafluoride Enriched to

Less than 5 % ²³⁵U²

C 1233 Practice for Determining the Equivalent Boron Content of Nuclear Materials²

E 105 Practice for Probability Sampling of Materials³

2.2 ANSI Standard:⁴

NQA-1 Quality Assurance Program Requirements for Nuclear Facilities

2.3 U.S. Government Documents:

Code of Federal Regulations, Title 10, Part 50, Energy (10 CFR 50) Domestic Licensing of Production and Utilization Facilities⁵

Code of Federal Regulations, Title 10, Part 71, Packaging and Transportation of Radioactive Material⁵

Code of Federal Regulations, Title 49, Part 173, General Requirements for Shipments and Packaging⁵

3. Terminology

3.1 *Definitions*—For definitions of terms, refer to Terminology C 859.

4. Technical Requirements

4.1 *Chemical Requirements*—All chemical analyses shall be performed on portions of the representative sample prepared in accordance with Section 6. Analytical chemistry methods used shall be as stated in Test Methods C 696 (latest edition) or demonstrated equivalent as mutually agreed upon between the seller and the buyer.

4.1.1 *Uranium Content*—The uranium content shall be a minimum of 87.7 weight % on a dry weight basis. (Dry weight is defined as the sample weight minus the moisture content.)

4.1.2 *Impurity Content*—The impurity content shall not

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² *Annual Book of ASTM Standards*, Vol 12.01.

³ *Annual Book of ASTM Standards*, Vol 14.02.

⁴ Available from American National Standards Institute, 11 W. 42nd St., 13th Floor, New York, NY 10036.

⁵ Available from Superintendent of Documents, U. S. Government Printing Office, Washington, DC 20402.

