



Designation: C 1462 – 00 (Reapproved 2005)

## Standard Specification for Uranium Metal Enriched to More than 15 % and Less Than 20 % <sup>235</sup>U<sup>1</sup>

This standard is issued under the fixed designation C 1462; 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 nuclear grade uranium metal that has either been processed through an enrichment plant, or has been produced by the blending of highly enriched uranium with other uranium, to obtain uranium of any <sup>235</sup>U concentration below 20 % (and greater than 15 %) and that is intended for research reactor fuel fabrication. The scope of this specification includes specifications for enriched uranium metal derived from commercial natural uranium, recovered uranium, or highly enriched uranium. Commercial natural uranium, recovered uranium and highly enriched uranium are defined in Section 3. The objectives of this specification are to define the impurity and uranium isotope limits for commercial grade enriched uranium metal.

1.2 This specification is intended to provide the nuclear industry with a standard for enriched uranium metal which is to be used in the production of research reactor fuel. In addition to this specification, the parties concerned may agree to other appropriate conditions.

1.3 The scope of this specification does not comprehensively cover all provisions for preventing criticality accidents or requirements for health and safety or for shipping. Observance of this standard does not relieve the user of the obligation to conform to all applicable international, federal, state, and local regulations for processing, shipping, or any other way of using uranium metal (see, for example, C 996 regarding references).

### 2. Referenced Documents

#### 2.1 ASTM Standards:<sup>2</sup>

C 696 Test Methods for Chemical, Mass Spectrometric, and Spectrochemical Analysis of Nuclear-Grade Uranium Dioxide Powders and Pellets

C 799 Test Methods for Chemical, Mass Spectrometric, Spectrochemical, Nuclear, and Radiochemical Analysis of Nuclear-Grade Uranyl Nitrate Solutions

C 859 Terminology Relating to Nuclear Materials

C 996 Specification for Uranium Hexafluoride Enriched to less than 5 % <sup>235</sup>U

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

C 1295 Test Method for Gamma Energy Emission from Fission Products in Uranium Hexafluoride and Uranium Solutions

C 1347 Practice for Preparation and Dissolution of Uranium Materials for Analysis

#### 2.2 ANSI Standard

ANSI-ASME NQA-1 Quality Assurance Program Requirements for Nuclear Facility Applications<sup>3</sup>

#### 2.3 U.S. Government Documents

Code of Federal Regulations, Title 10, Part 50, (Appendix B)<sup>4</sup>

### 3. Terminology

3.1 *Definitions of Terms Specific to This Standard*—Terms shall be defined in accordance with Terminology C 859, except for the following:

3.1.1 *commercial grade enriched uranium metal*—uranium metal derived from commercial natural uranium, recovered uranium, or uranium obtained from the blending of highly enriched uranium with commercial natural uranium, recovered uranium, or depleted uranium.

3.1.2 *commercial natural uranium*—any form of natural unirradiated uranium (containing 0.711 + 0.004 g <sup>235</sup>U per 100 g U).

3.1.3 *depleted uranium*—any form of unirradiated uranium with a <sup>235</sup>U content less than commercial natural uranium.

3.1.4 *highly enriched uranium*—any form of uranium having a <sup>235</sup>U content equal to or in excess of 20 %.

3.1.5 *recovered uranium*—any form of uranium that has been exposed in a neutron irradiation facility and either has been subsequently chemically separated from the fission products and transuranic isotopes so generated, or may be used as is, due to low irradiation levels.

<sup>1</sup> 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.

Current edition approved June 1, 2005. Published December 2005. Originally approved in 2000. Last previous edition approved in 2000 as C 1462-00.

<sup>2</sup> Annual Book of ASTM Standards, Vol 12.01.

<sup>3</sup> Available from the American National Standards Institute, 11 W. 42nd St, 13th Floor, New York, NY 10036.

<sup>4</sup> Available from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.