Designation: C888 – 18

Standard Specification for Nuclear-Grade Gadolinium Oxide (Gd_2O_3) Powder[1]

This standard is issued under the fixed designation C888; 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 provides the chemical and physical requirements for nuclear-grade gadolinium oxide powder intended for subsequent processing and use in nuclear fuel applications, for example, as an addition to uranium dioxide.

1.2 This specification does not include requirements for health and safety. Observance of this specification does not relieve the user of the obligation to be aware of and comply with all federal, state, and local regulations pertaining to possessing, shipping, processing, or using this material.

1.3 The values stated in SI units are to be regarded as standard. No other units of measurement are included in this standard.

1.4 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 *ASTM Standards:*[2]

B329 Test Method for Apparent Density of Metal Powders and Compounds Using the Scott Volumeter

C493 Test Method for Bulk Density and Porosity of Granular Refractory Materials by Mercury Displacement (Discontinued 2002) (Withdrawn 2002)[3]

C859 Terminology Relating to Nuclear Materials

C889 Test Methods for Chemical and Mass Spectrometric Analysis of Nuclear-Grade Gadolinium Oxide (Gd_2O_3) Powder

E11 Specification for Woven Wire Test Sieve Cloth and Test Sieves

E105 Practice for Probability Sampling of Materials

2.2 *ANSI Standard:*

ASME NQA-1 Quality Assurance Requirements for Nuclear Facility Applications[4]

2.3 *U.S. Government Document:*

Code of Federal Regulations, Title 10, Part 50 Energy (10 CFR 50), Domestic Licensing of Production and Utilization Facilities[5]

3. Terminology

3.1 *Definitions of Terms Specific to This Standard:*

3.1.1 Terms shall be defined in accordance with Terminology C859 except as defined herein.

3.1.1.1 *buyer*—the organization issuing the purchase order.

3.1.1.2 *powder lot*—a quantity of gadolinium oxide powder that has been processed in a manner such that samples taken in accordance with the procedures of 8.1 can be considered as representative of the entire powder lot.

3.1.1.3 *seller*—the gadolinium oxide powder supplier.

4. Ordering Information

4.1 The buyer shall specify the following information for all orders where this specification applies:

4.1.1 Powder lot size (allowable range),

4.1.2 Quantity (weight of delivered product),

4.1.3 Nominal particle size range and applicable tolerances in accordance with Specification E11,

4.1.4 Density (optional), Scott Volumeter (Test Method B329) and Mercury Displacement (Test Method C493) are referenced as guides to density measurement techniques,

4.1.5 Shape factor and method of determination (optional),

4.1.6 Sampling requirements,

4.1.7 Crystal structure (optional), and

4.1.8 Quality requirements.

[1] This specification is under the jurisdiction of ASTM Committee C26 on Nuclear Fuel Cycle and is the direct responsibility of Subcommittee C26.03 on Neutron Absorber Materials 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] The last approved version of this historical standard is referenced on www.astm.org.

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

[5] 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.