Designation: C 1128 – 01

Standard Guide for Preparation of Working Reference Materials for Use in the Analysis of Nuclear Fuel Cycle Materials[1]

This standard is issued under the fixed designation C 1128; 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 guide covers the preparation and characterization of working reference materials (WRM) that are produced by a laboratory for its own use in the analysis of nuclear materials. Guidance is provided for establishing traceability of WRMs to certified reference materials by a defined characterization process. The guidance provided is generic; it is not specific for a given material.

1.2 The information provided by this guide is found in the following sections:

	Section
Planning	6
Preparation	7
Packaging and Storage	8
Characterization	9
Statistical Analysis	10
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1.3 The values stated in SI units are to be regarded as the standard.

1.4 *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 of regulatory limitations prior to use.*

2. Referenced Documents

2.1 *ASTM Standards:*

C 859 Terminology Relating to Nuclear Materials[2]

C 1009 Guide for Establishing a Quality Assurance Program for Analytical Chemistry Laboratories Within the Nuclear Industry[2]

C 1068 Guide for Qualification of Measurement Methods by a Laboratory Within the Nuclear Industry[2]

C 1215 Guide for Preparing and Interpreting Precision and Bias Statements in Test Method Standards in the Nuclear Industry[2]

2.2 *ISO Standards:*

ISO Guide to the Expression of Uncertainty in Measurement[3]

ISO 17025 General Requirements for the Competence of Calibration and Testing Laboratories[3]

ISO Guide 30 Terms and Definitions Used in Connection with Reference Materials[3]

3. Terminology [4]

3.1 *Definitions of Terms Specific to This Standard:*

3.1.1 *certified reference material (CRM)*[5]—a reference material with one or more property values that are certified by a technically valid procedure, accompanied by or traceable to a certificate or other documentation that is issued by a certifying body (as defined by ISO Guide 30). A certifying body is a technically competent body (organization or firm, public or private) that issues a reference material certificate (as defined by ISO Guide 30). A reference material certificate is a document certifying one or more property values for a certified reference material, stating that the necessary procedures have been carried out to establish their validity (as defined by ISO Guide 30).

3.1.2 *reference material (RM)*[5]—a material or substance one or more properties of which are sufficiently well established to be used for the calibration of an apparatus, the assessment of a measurement method, or assigning values to materials (as defined by ISO Guide 30). A reference material may be referred to in this guide also as a standard, such as calibration standard or control standard.

3.1.3 *working reference material (WRM)*[5]—a RM usually prepared by a single laboratory for its own use as a calibration standard, as a control standard, or for the qualification of a measurement method (see Guide C 1068) as indicated in Fig. 1.

4. Summary of Guide

4.1 This guide covers the preparation of WRMs from nuclear fuel cycle materials. These materials are compounds and metal of uranium and plutonium, absorber materials such

[1] This guide is under the jurisdiction of ASTM Committee C26 on Nuclear Fuel Cycle and is the direct responsibility of Subcommittee C26.8 on Quality Assurance Applications.

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

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

[4] See C 859 for other terms specific to the nuclear fuel cycle.

[5] It is important that a well defined uncertainty in the stated value(s) be given in the certificate.

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