



Standard Guide for Qualification of Measurement Methods by a Laboratory Within the Nuclear Industry¹

This standard is issued under the fixed designation C1068; 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 provides guidance for selecting, validating, and qualifying measurement methods when qualification is required for a specific program. The recommended practices presented in this guide provide a major part of a quality assurance program for the laboratory data (see Fig. 1). Qualification helps to assure that the data produced will meet established requirements.

1.2 The activities intended to assure the quality of analytical laboratory measurement data are diagrammed in Fig. 1. Discussion and guidance related to some of these activities appear in the following sections:

	Section
Selection of Measurement Methods	5
Validation of Measurement Methods	6
Qualification of Measurement Methods	7
Control	8
Personnel Qualification	9

1.3 *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:²

- C859 Terminology Relating to Nuclear Materials
- C1009 Guide for Establishing and Maintaining a Quality Assurance Program for Analytical Laboratories Within the Nuclear Industry
- C1128 Guide for Preparation of Working Reference Materials for Use in Analysis of Nuclear Fuel Cycle Materials
- C1156 Guide for Establishing Calibration for a Measurement Method Used to Analyze Nuclear Fuel Cycle Materials

2.2 ISO Standards:³

- C1210 Guide for Establishing a Measurement System Quality Control Program for Analytical Chemistry Laboratories Within the Nuclear Industry
- C1297 Guide for Qualification of Laboratory Analysts for the Analysis of Nuclear Fuel Cycle Materials
- E177 Practice for Use of the Terms Precision and Bias in ASTM Test Methods
- E2554 Practice for Estimating and Monitoring the Uncertainty of Test Results of a Test Method Using Control Chart Techniques
- E2655 Guide for Reporting Uncertainty of Test Results and Use of the Term Measurement Uncertainty in ASTM Test Methods

2.3 Other Standards:

- ASME NQA-1 Quality Assurance Requirements for Nuclear Facility Applications⁴
- IEEE/ASTM SI 10 American National Standard for Metric Practice⁵
- JCGM-100 Evaluation of Measurement Data – Guide to the Expression of Uncertainty in Measurement (GUM)⁶
- JCGM-200 International Vocabulary of Metrology – Basic and General Concepts and Associated Terms (VIM)⁶

3. Terminology

3.1 Except as otherwise defined herein, definitions of terms are as given in Terminology C859.

3.2 Definitions of Terms Specific to This Standard:

¹ This guide is under the jurisdiction of ASTM Committee C26 on Nuclear Fuel Cycle and is the direct responsibility of Subcommittee C26.08 on Quality Assurance, Statistical Applications, and Reference Materials.

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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 American Society of Mechanical Engineers (ASME), ASME International Headquarters, Two Park Ave., New York, NY 10016-5990, <http://www.asme.org>.

⁵ Available from Institute of Electrical and Electronics Engineers, Inc. (IEEE), 445 Hoes Ln., Piscataway, NJ 08854-4141, <http://www.ieee.org>.

⁶ Available from International Organization for Standardization (ISO), 1, ch. de la Voie-Creuse, CP 56, CH-1211 Geneva 20, Switzerland, <http://www.iso.org>.