



Designation: D6689 – 01 (Reapproved 2019)^{ε1}

Standard Guide for Optimizing, Controlling, and Reporting Test Method Uncertainties from Multiple Workstations in the Same Laboratory Organization¹

This standard is issued under the fixed designation D6689; 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.

^{ε1} NOTE—Reapproved with editorial changes throughout in March 2019.

1. Scope

1.1 This guide describes a protocol for optimizing, controlling, and reporting test method uncertainties from multiple workstations in the same laboratory organization. It does not apply when different test methods, dissimilar instruments, or different parts of the same laboratory organization function independently to validate or verify the accuracy of a specific analytical measurement.

1.2 *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, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.3 *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

D1129 Terminology Relating to Water

D6091 Practice for 99 %/95 % Interlaboratory Detection Estimate (IDE) for Analytical Methods with Negligible Calibration Error

D6512 Practice for Interlaboratory Quantitation Estimate

E135 Terminology Relating to Analytical Chemistry for Metals, Ores, and Related Materials

E415 Test Method for Analysis of Carbon and Low-Alloy Steel by Spark Atomic Emission Spectrometry

E1763 Guide for Interpretation and Use of Results from Interlaboratory Testing of Chemical Analysis Methods (Withdrawn 2015)³

2.2 Other Documents:

ISO/IEC 17025 General Requirements for the Competence of Calibration and Testing Laboratories⁴

MNL7-9TH ASTM Manual on Presentation of Data and Control Chart Analysis, 9th Edition, Prepared by Committee E11 on Quality and Statistics²

3. Terminology

3.1 *Definitions*—For definitions of terms used in this Guide, refer to Terminologies **E135** and **D1129**.

3.2 Definitions of Terms Specific to This Standard:

3.2.1 *laboratory organization, n*—a business entity that provides similar types of measurements from more than one workstation located in one or more laboratories, all of which operate under the same quality system.

NOTE 1—Key aspects of a quality system are covered in ISO/IEC 17025 and include documenting procedures, application of statistical control to measurement processes and participation in proficiency testing.

3.2.2 *maximum deviation, n*—the maximum error associated with a report value, at a specified confidence level, for a given concentration of a given element, determined by a specific method, throughout a laboratory organization.

3.2.3 *measurement quality objectives, n*—a model used by the laboratory organization to specify the maximum error associated with a report value, at a specified confidence level.

3.2.4 *workstation, n*—a combination of people and equipment that executes a specific test method using a single specified measuring device to quantify one or more parameters,

¹ This guide is under the jurisdiction of ASTM Committee **D19** on Water and is the direct responsibility of Subcommittee **D19.02** on Quality Systems, Specification, and Statistics.

Current edition approved March 15, 2019. Published April 2019. Originally approved in 2001. Last previous edition approved in 2011 as D6689 – 01 (2011). DOI: 10.1520/D6689-01R19E01.

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>.