



Standard Practice for Development and Use (Preparation) of Samples for Collaborative Testing of Methods for Analysis of Sediments¹

This standard is issued under the fixed designation D3975; 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 practice establishes uniform general procedures for the development, (preparation) and use of samples in the collaborative testing of methods for chemical analysis of sediments and similar materials.

1.2 The principles of this practice are applicable to aqueous samples with suitable technical modifications.

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

D596 Guide for Reporting Results of Analysis of Water

D1129 Terminology Relating to Water

D2777 Practice for Determination of Precision and Bias of Applicable Test Methods of Committee D19 on Water

D3670 Guide for Determination of Precision and Bias of Methods of Committee D22

D3976 Practice for Preparation of Sediment Samples for Chemical Analysis

E691 Practice for Conducting an Interlaboratory Study to Determine the Precision of a Test Method

3. Terminology

3.1 *Definitions*—For definition of terms used in this practice, refer to Terminology [D1129](#).

4. Summary of Practice

4.1 Test samples of adequately defined composition and homogeneity are required for evaluating the precision and bias

of test methods. These samples should be typical in all respects to the sample for which the test method is applicable. Samples with three levels of concentration of the measurand are recommended to evaluate the linearity of the test method. Acceptable test materials, in order of preference are: three samples of different compositions; mixtures of two samples to obtain the desired concentration levels; samples prepared by dilution of a single sample.

4.2 In the absence of samples of known composition, the use of the spiking technique, in which standard additions of known constituents are made by established techniques, will be acceptable for evaluating the linearity and the bias of test methods. In such a case, the bias statement will consist of the accuracy of recovery of the spike.

4.3 Comparison of a candidate test method with a standard test method of known precision and bias will constitute an acceptable technique for evaluation of precision and bias. In such comparative measurements, any convenient test samples may be used, provided they are shown to be stable during the time required to make the intercomparison, and that the measurement sequences are chosen to minimize or eliminate errors due to sample instability.

5. Significance and Use

5.1 The objective of this practice is to provide guidelines for the preparation of samples for use in collaborative tests, to evaluate methods during their development, and for the evaluation of the precision and bias of proposed test methods.

5.2 Statements of the precision and bias are a mandatory part of ASTM test methods. Such an evaluation is necessary to provide guidance to the user as to the reliability of measurements that can be expected by its use. The statements are developed on the basis of user experience (ordinarily collaborative tests) with the test method.

5.3 The availability of test samples is a key requirement for collaborative evaluation of test methods.

6. Rationale

6.1 The use of materials of demonstrated adequate homogeneity and known composition enable evaluation of the precision and bias of a test method. Materials of known

¹ This practice is under the jurisdiction of ASTM Committee [D19](#) on Water and is the direct responsibility of Subcommittee [D19.07](#) on Sediments, Geomorphology, and Open-Channel Flow.

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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.