



Standard Practice for Conducting an Interlaboratory Study to Evaluate the Performance of an Analytical Method¹

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1. Scope

1.1 This practice covers procedures and statistics for an interlaboratory study (ILS) of the performance of an analytical method. The study provides statistical values which are useful in determining if a method is satisfactory for the purposes for which it was developed. These statistical values may be incorporated in the method's precision and bias section. This practice discusses the meaning of the statistics and what users of analytical methods may learn from them.

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

2. Referenced Documents

2.1 *ASTM Standards:*²

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

E177 Practice for Use of the Terms Precision and Bias in ASTM Test Methods

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

E1169 Practice for Conducting Ruggedness Tests

E1763 Guide for Interpretation and Use of Results from Interlaboratory Testing of Chemical Analysis Methods

3. Terminology

3.1 *Definitions*—For definitions of terms used in this practice, refer to Terminology **E135**.

3.2 *Definitions of Terms Specific to This Standard:*

¹ This practice is under the jurisdiction of ASTM Committee **E01** on Analytical Chemistry for Metals, Ores, and Related Materials and is the direct responsibility of Subcommittee **E01.22** on Laboratory Quality.

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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.

3.2.1 *interlaboratory test*—measures the variability of results when a test method is applied many times in a number of laboratories.

3.2.2 *replicate results*—results obtained by applying a test method a specified number of times to a material.

3.2.3 *test protocol*—gives instructions to each participating laboratory, detailing the way it is to conduct its part of the interlaboratory test program.

4. Summary of Practice

4.1 Instructions are provided for planning and conducting a cooperative evaluation of a proposed analytical method.

4.2 The following list describes the organization of this practice:

4.2.1 Sections **1-5** define the scope, significance and use, referenced documents, and terms used in this practice.

4.2.2 Section **6** helps users of analytical methods understand and use the statistics found in the Precision and Bias section of methods.

4.2.3 Sections **7 and 8** instruct the ILS coordinator and members of the task group on how to plan and conduct the experimental phase of the study.

4.2.4 Section **9** discusses the procedures for collecting, evaluating, and disseminating the data from the interlaboratory test.

4.2.5 Section **10** presents the statistical calculations.

4.2.6 Sections **11 and 12** discuss the use of statistics to evaluate a test method and the means of incorporating the ILS statistics into Precision and Bias statements.

4.2.7 The **Annex A1** gives the rationale for the calculations in Section **10**.

5. Significance and Use

5.1 Ideally, interlaboratory testing of a method is conducted by a randomly chosen group of laboratories that typifies the kind of laboratory that is likely to use the method. In actuality, this ideal is only approximated by the laboratories that are available and willing to undertake the test work. The coordinator of the program must ensure that every participating laboratory has appropriate facilities and personnel and performs the method exactly as written. If this goal is achieved, the statistics developed during the ILS will be adequate for