



Standard Practice for Conducting an Interlaboratory Test Program to Determine the Precision of Test Methods for Construction Materials¹

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1. Scope

1.1 This practice describes techniques for planning, conducting, and analyzing the results of an interlaboratory study of a test method. It is designed to be used in conjunction with Practice C 670. Thus, the procedures recommended in this practice have the limited purpose of providing reliable information on which precision statements of the type described in Practice C 670 can be based. It is not appropriate for use in programs whose purpose is to develop a test method or to assess the relative merits of two or more test methods.

2. Referenced Documents

2.1 ASTM Standards:

C 109/C109M Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-in. or 50-mm Cube Specimens)²

C 136 Test Method for Sieve Analysis of Fine and Coarse Aggregates³

C 670 Practice for Preparing Precision and Bias Statements for Test Methods for Construction Materials³

C 1067 Practice for Conducting a Ruggedness or Screening Program for Test Methods for Construction Materials³

E 105 Practice for Probability Sampling of Materials⁴

E 177 Practice for Use of the Terms Precision and Bias in ASTM Test Methods⁴

E 178 Practice for Dealing with Outlying Observations⁴

3. Significance and Use

3.1 Certain criteria need to be met before undertaking an interlaboratory study to determine the precision of a test method. It is not necessary that all of the following conditions described be completely fulfilled in every case; however, if some conditions are not met or are met incompletely, the program will become more complicated and require more work

and expense, or may result in impaired information. The recommendations outlined in this section are intended to ensure that the test method is free of technical difficulties to the greatest extent possible before an expensive and time-consuming interlaboratory study is undertaken.

3.1.1 The first requirement is the existence of a valid and well-written test method that has been developed in one competent laboratory (or by cooperative work in a small number of laboratories), and has been subjected to a screening procedure, or to ruggedness testing as described in Practice C 1067. As a result of the screening procedure and some experience with the test method in the sponsoring laboratory and one or two others, a written version of the test method has been developed (but not necessarily published as a standard method) that describes the test procedure in terms that can easily be followed in any properly equipped laboratory. Conditions that affect the test results should be identified and the proper degree of control of those conditions should be specified in the description of the test procedure (see Note 1).

NOTE 1—The desired degree of control of conditions that affect test results may not always be practically achievable, and tolerances in the test method should recognize this fact. Variations in test results due to variations in such conditions contribute to the total variation which determines the precision of the test method. If the resulting variation is so great that uncertainties in average values obtained by the test method are unacceptably high, then the test method itself is at fault, and efforts should be made to improve it or to replace it by a better one. An expensive and time-consuming interlaboratory study should not be undertaken on such a test method.

3.1.2 Any apparatus required for performing the test should be appropriately designed and available at reasonable cost.

3.1.3 Personnel in participating laboratories should have enough experience with the test method so that they are competent to run the test. The importance of this requirement will vary with the complexity of the method and the degree to which it departs from familiar procedures.

3.1.4 Preliminary knowledge should exist about how changes in materials and conditions affect the test results. There should be a reasonable degree of certainty that the within-laboratory variances are the same in different laboratories, and that troublesome interactions do not exist. These

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² *Annual Book of ASTM Standards*, Vol 04.01.

³ *Annual Book of ASTM Standards*, Vol 04.02.

⁴ *Annual Book of ASTM Standards*, Vol 14.02.