Designation: D 6631 – 01

Standard Guide for Committee D01 for Conducting an Interlaboratory Study, and Determining the Precision of a Test Method[1]

This standard is issued under the fixed designation D 6631; 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 covers a simplified statistical procedure for planning and conducting interlaboratory evaluations of test methods.

2. Referenced Documents

2.1 *ASTM Standards:*

E 177 Practice for Use of the Terms Precision and Bias in Test Methods[2]

E 456 Terminology for Relating to Quality and Statistics[2]

E 691 Practice for Conducting an Interlaboratory to Determine the Precision of a Test Method[2]

E 1345 Practice for Reducing the Variability of Color Measurements by Use of Multiple Measurements[3]

3. Significance and Use

3.1 The purpose of an interlaboratory evaluation, as defined in this guide, is to determine the variability of results obtained in different laboratories on equivalent equipment using a prescribed test method.

3.2 The definitions of statistical terms used in this guide are contained in Terminology E 456.

4. Problem Formulation

4.1 The objective of the evaluation should be to clearly define the expected precision of the test method. Within the current limits of both the software, and the statistical protocols currently available, this effectively restricts the use of this guide to test methods which yield results that are continuous. This generally means a measured quantity, such as pH or brightness. Results that are discrete (such as counts or pass-fail), or ordered (ranked), present three special problems in the creation of a meaningful precision statement:

4.1.1 The amount of information contained in discrete and ordered data is much less than in continuous data, necessitating the collection of much more data.

4.1.2 The sensitivity (the ability to discriminate between similar samples) is much less in discrete and ordered data than continuous data.

4.1.3 Since the precision statement relies on the normal distribution, and the distributions of discrete and ordered data are usually decidedly non-normal, the normal precision statement is invalid.

4.2 Given these concerns with discrete and ordered data, a simple statement of the results obtained in these types of studies might be the most useful information for a prospective user of a test method.

5. Preliminary

5.1 Flow chart the test method.

5.2 Survey known sources of information related to the test method to establish how results are affected by variations in operating conditions, atmospheric conditions, differences between operators, etc. Select what appears to be the optimum procedure.

5.3 Provide instructions for the test method and, without comment, observe a laboratory technician perform a test according to these instructions. Revise any parts of the draft causing difficulty.

5.4 If desirable, make a comparative study with other test methods for measuring the property by using specimens with a wide range of values of the property under test (and possibly with wide ranges in other properties).

6. Preparation for Interlaboratory Study

6.1 Prepare a clear statement of the type of information required from the interlaboratory evaluation.

6.2 Based on the study made in one laboratory (Section 5), prepare a proposed master plan for the interlaboratory evaluation. Discuss the plan, in an open meeting, if possible, with other participants in the study.

6.3 Select the materials to be used in the interlaboratory evaluations so as to:

[1] This guide is under the jurisdiction of ASTM Committee D01 on Paint and Related Coatings, Materials, and Applications and is the direct responsibility of Subcommittee D01.20 on Quality Assurance and Statistics.

Current edition approved Feb. 10, 2001. Published April 2001.

[2] *Annual Book of ASTM Standards*, Vol 14.02.

[3] *Annual Book of ASTM Standards*, Vol 06.01.