



Standard Practice for Comparing Test Methods¹

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1. Scope

1.1 This practice provides a procedure for evaluating and comparing test methods under controlled conditions using the same materials tested during the same time span. The practice describes how to obtain and compare estimates on precision, sensitivity, and bias.

1.2 This practice covers the following topics:

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2. Referenced Documents

2.1 ASTM Standards:

D 123 Terminology Relating to Textiles²

D 2905 Practice for Statements on Number of Specimens for Textiles²

D 2906 Practice for Statements on Precision and Bias for Textiles²

E 456 Terminology Relating to Quality and Statistics³

2.2 ASTM Adjuncts:

TEX-PAC⁴

NOTE 1—Tex-Pac is a group of PC programs on floppy disks, available through ASTM Headquarters, 100 Barr Harbor Drive, Conshohocken, PA 19428, USA. The calculations for comparing the precision, sensitivity and bias of two test methods can be done using one of these programs and

statements on the relative merits of the two test methods are part of the output.

3. Terminology

3.1 Definitions:

3.1.1 *accuracy, n*—of a test method, the degree of agreement between the true value of the property being tested (or an accepted standard value) and the average of many observations made according to the test method, preferably by many observers. (See also *bias* and *precision*.)

3.1.1.1 *Discussion*—Increased accuracy is associated with decreased bias relative to the true value; two methods with equal bias relative to the true value have equal accuracy even if one method is more precise than the other. The true value is the exact value of the property being tested for the statistical universe being sampled. When the true value is not known or cannot be determined, and an acceptable standard value is not available, accuracy cannot be established. No valid inferences on the accuracy of a method can be drawn from an individual observation.

3.1.2 *bias, n*—in statistics, a constant or systematic error in test results.

3.1.2.1 *Discussion*—Bias can exist between the accepted reference value and a test result obtained from one method, between test results obtained from two methods, or between two test results obtained from a single method, for example, between operators or between laboratories.

3.1.3 *confidence interval, n*—the interval estimate of a population parameter computed so that the statement “the population parameter lies in this interval” will be true, on the average, in a stated proportion of the times such statements are made.

3.1.4 *confidence level, n*—the stated proportion of times the confidence interval is expected to include the population parameter.

3.1.4.1 *Discussion*—Statisticians generally accept that, in the absence of special consideration, 0.95 or 95 % is a realistic confidence level. If the consequences of incorrectly estimating the confidence interval would be grave, then a higher confidence level might be considered. If the consequences of incorrectly estimating the confidence interval are of less than usual concern, then a lower confidence interval might be considered.

¹ This practice is under the jurisdiction of ASTM Committee D13 on Textiles and is the direct responsibility of Subcommittee D13.93 on Statistics.

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² Annual Book of ASTM Standards, Vol 07.01.

³ Annual Book of ASTM Standards, Vol 14.02.

⁴ PC programs on floppy disks are available through ASTM. For a 3½ inch disk request PCN:12-429040-18, for a 5¼ inch disk request PCN:12-429041-18.