



Standard Practice for Interlaboratory Testing of a Textile Test Method that Produces Normally Distributed Data¹

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1. Scope

1.1 This practice serves as a guide for planning interlaboratory tests in preparation for the calculation of the number of tests to determine the average quality of a textile material as discussed in Practice D 2905 and for the development of statements on precision as required in Practice D 2906.

1.2 The planning of interlaboratory tests requires a general knowledge of statistical principles including the use of variance components estimated from an analysis of variance. Interlaboratory tests should be planned, conducted, and analyzed after consultation with statisticians who are experienced in the design and analysis of experiments and who have some knowledge of the nature of the variability likely to be encountered in the test method.

1.3 The instructions in this practice are specifically applicable to design and analysis of:

- 1.3.1 Single laboratory preliminary trial,
- 1.3.2 Pilot-scale interlaboratory tests, and
- 1.3.3 Full-scale interlaboratory tests.

1.4 Guides for decisions pertaining to data transformations prior to analysis, the handling of missing data, and handling of outlying observations are provided.

1.5 Procedures given in this practice are applicable to test methods based on the measurement of continuous variates from normal distributions or from distributions which can be made normal by a transformation. Get qualified statistical help to (1) decide if the data are from another known distribution, such as the Poisson distribution, (2) make a judgment on normality, (3) transform data to a more nearly normal distribution, or (4) use Practice D 4467. Use the procedures in Practice D 4467 for test methods that produce data that are (1) continuous data that are not normally distributed or (2) discrete data, such as ratings on an arbitrary scale, counts that may be modelled by use of the Poisson distribution, or proportions or counts of successes in a specified number of trials that may be modelled by the binomial distribution.

NOTE 1—Additional information on interlaboratory testing and on statistical treatment of data can be found in Practice D 1749, D 3040,

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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E 173, E 177, E 691, and Terminology E 456.

2. Referenced Documents

2.1 ASTM Standards:

- D 123 Terminology Relating to Textiles²
- D 1749 Practice for Interlaboratory Evaluation of Test Methods Used with Paper and Paper Products³
- D 2905 Practice for Statements on Number of Specimens for Textiles²
- D 2906 Practice for Statements on Precision and Bias for Textiles²
- D 3025 Practice for Standardizing Cotton Fiber Test Results by Use of Calibration Cotton Standards²
- D 3040 Practice for Preparing Statements for Standards Related to Rubber and Rubber Testing⁴
- D 4270 Guide for Using Existing Practices in Developing and Writing Test Methods⁵
- D 4467 Practice for Interlaboratory Testing of a Textile Test Method that Produces Non-Normally Distributed Data⁵
- D 4853 Guide for Reducing Test Variability^{5,6}
- E 173 Practices for Conducting Interlaboratory Studies of Methods for Chemical Analysis of Metals⁷
- E 177 Practice for Use of the Terms Precision and Bias in ASTM Test Methods⁸
- E 178 Practice for Dealing with Outlying Observations⁸
- E 456 Terminology Relating to Quality and Statistics⁸
- E 691 Practice for Conducting an Interlaboratory Study to Determine the Precision of a Test Method⁸

2.2 ASTM Adjuncts:

TEX-PAC⁹

NOTE 2—Tex-Pac is a group of PC programs on floppy disks, available through ASTM Headquarters, 100 Barr Harbor Drive, West Conshohocken, PA 19428, USA. The calculations required by the Annexes of this practice can be performed using this adjunct and the output is printed in a format suitable for direct insertion in the Research Report required when

² Annual Book of ASTM Standards, Vol 07.01.

³ Annual Book of ASTM Standards, Vol 15.09.

⁴ Discontinued. See 1988 Annual Book of ASTM Standards, Vol 09.01.

⁵ Annual Book of ASTM Standards, Vol 07.02.

⁶ Discontinued. See 1993 Annual Book of ASTM Standards, Vol 07.02.

⁷ Annual Book of ASTM Standards, Vol 03.05.

⁸ Annual Book of ASTM Standards, Vol 14.02.

⁹ PC programs on floppy disks are available through ASTM. Request ADJD2904.