



Standard Practice for Statements on Precision and Bias for Textiles¹

This standard is issued under the fixed designation D 2906; 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.

INTRODUCTION

Work was begun in August 1966 on recommendations for statements on precision and accuracy. The first recommendations were issued as ASTM D-13 White Paper, Statements on Precision and Accuracy, MARK I, December 1968, prepared by Subcommittee C-6 on Editorial Policy and Review. After a decision that the recommendations should be a recommended practice under the responsibility of Subcommittee D13.93, Sampling, Presentation and Interpretation of Data, the recommendations were revised and published as Practice D 2906 – 70 T.

Information was added in Practice D 2906 – 73 on methods (1) for which precision has not been established, (2) for which test results are not variables, and (3) for which statements are based on another method. Practice D 2906 – 74 was expanded to include test methods in which test results are based on the number of successes or failures in a specified number of observations or on the number of defects or instances counted in a specified interval of time or in a specified amount of material. The present text provides for a nontechnical summary at the beginning of recommended texts based on normal distributions or on transformed data and for a more positive statement on accuracy when the true value of a property can be defined only in terms of a test method.

In 1984, changes were introduced to replace the term “accuracy” with “bias” as directed in the May 1983 edition of *Form and Style for ASTM Standards*.

1. Scope

1.1 This practice serves as a guide for using the information obtained as directed in Practice D 2904 or obtained by other statistical techniques from other distributions, to prepare statements on precision and bias in ASTM methods prepared by Committee D-13. The manual on form and style for standards specifies that statements on precision and bias be included in test methods.² Committee D-13 recommends at least a statement about single-operator precision in any new test method, or any test method not containing a precision statement that is put forward for 5-year approval, in both instances with a complete statement at the next reapproval. If a provisional test method is proposed, at least a statement on single-operator precision is expected.

1.2 The preparation of statements on precision and bias requires a general knowledge of statistical principles including

the use of components of variance estimated from an analysis of variance. Instructions covering such calculations are available in Practice D 2904 or in any standard text (**1,2,3,4**, and **5**).³

1.3 The instructions in this practice are specifically applicable to test methods in which test results are based (1) on the measurement of variables, (2) on the number of successes or failures in the specified number of observations, (3) on the number of defects or incidents counted in a specified interval or in a specified amount of material, and (4) on the presence or absence of an attribute in a test result (a go, no-go test). Instructions are also included for methods of test for which precision has not yet been estimated or for which precision and accuracy have been reported in another method of test. For observations based on the measurement of variables, the instructions of this practice specifically apply to test results that are the arithmetic average of individual observations. With qualified assistance, the same general principles can be applied to test results that are based on other functions of the data such as standard deviations.

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 *Form and Style for ASTM Standards*, May 1983, available from American Society for Testing and Materials, 100 Barr Harbor Drive, West Conshohocken, PA 19428.

³ The boldface numbers in parentheses refer to the list of references at the end of this practice.