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AMERICAN SOCIETY FOR TESTING AND MATERIALS
100 Barr Harbor Dr., West Conshohocken, PA 19428
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Standard Practice for Use of the Terms Precision and Bias in ASTM Test Methods¹

This standard is issued under the fixed designation E 177; 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 The purpose of this practice is to present concepts necessary to the understanding of the terms “precision” and “bias” as used in quantitative test methods. This practice also describes methods of expressing precision and bias and, in a final section, gives examples of how statements on precision and bias may be written for ASTM test methods.

NOTE 1—The term “accuracy”, used in earlier editions of Practice E 177, embraces both precision and bias (see Section 20 and Note 4).

1.2 Informal descriptions of the concepts are introduced in the text as the concepts are developed, and appear in the following sections:

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1.3 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 ASTM Standards:

E 178 Practice for Dealing with Outlying Observations²

E 456 Terminology Relating to Quality and Statistics²

E 691 Practice for Conducting an Interlaboratory Study to Determine the Precision of a Test Method²

E 1169 Guide for Conducting Ruggedness Tests²

2.2 ANSI/ASQC Standard:

A1-1978 Definitions, Symbols, Formulas and Tables for Control Charts³

2.3 Other Documents:

TAPPI Collaborative Reference Program, Reports 25 through 51, Aug. 1973 through Jan. 1978⁴

ASQC Glossary and Tables for Statistical Quality Control³

3. Terminology

3.1 The terminology defined in Terminology E 456 applies in all areas affected by this practice, except where modified by this practice.

¹ This practice is under the jurisdiction of ASTM Committee E-11 on Quality and Statistics and is the direct responsibility of Subcommittee E11.20 on Test Method Evaluation and Quality Control.

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

³ Available from American Society for Quality Control, 230 West Wells St., Milwaukee, WI 53203.

⁴ Available from the Technical Association of the Pulp and Paper Industry, Technology Park/Atlanta, P.O. Box 105113, Atlanta, GA 30348.