



Designation: D6607 – 21

Standard Practice for Inclusion of Precision Statement Variation in Specification Limits¹

This standard is issued under the fixed designation D6607; 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 practice covers a method of determining rational specification limits by inclusion of the precision of the test method used in the specification.

1.2 The values stated in SI units are to be regarded as standard. No other units of measurement are included in this standard.

1.3 The text of this standard references notes and footnotes which provide explanatory material. These notes and footnotes (excluding those in tables and figures) shall not be considered as requirements of the standard.

1.4 *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, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.5 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 ASTM Standards:²

C670 Practice for Preparing Precision and Bias Statements for Test Methods for Construction Materials

C802 Practice for Conducting an Interlaboratory Test Program to Determine the Precision of Test Methods for Construction Materials

D2172/D2172M Test Methods for Quantitative Extraction of Asphalt Binder from Asphalt Mixtures

D2726/D2726M Test Method for Bulk Specific Gravity and Density of Non-Absorptive Compacted Asphalt Mixtures
E177 Practice for Use of the Terms Precision and Bias in ASTM Test Methods

2.2 *Federal Highway Administration Report:*³

FHWA Report HI-93-047 Materials Control and Acceptance—Quality Assurance, Federal Highway Administration, May 1993

3. Terminology

3.1 For definitions of terms used in this practice, consult Practice **E177**.

4. Significance and Use

4.1 Each test method has a limited precision. Even if a test is performed as carefully and as correctly as possible on a material which is as homogeneous as can be obtained, the test will still vary from one to another. A widely used measure of the variation of the test results from a test method is the standard deviation (σ). In an ASTM standard test method, the standard deviation of the test method can be found in the Precision and Bias statement for the test. The “Blue Book,” *Form and Style for ASTM Standards*, requires that all test methods include Precision and Bias statements. Practices **C670** and **C802** provide guidance for determination of these values.

4.2 If the precision of a test method is low and the precision of the test has not been properly considered in a material specification, a uniform material with the right quality may still be rejected most of the time because of the wide variation of the test results. In order to have rational specification limits, the precision of the test used should be properly included in a specification.

4.3 This practice provides a guideline for proper inclusion of precision of the test method in a rational specification.

5. Procedure

5.1 Determine the effective standard deviation (σ_x) of the test results due to the combined effects of materials variation and test variation using **Eq 1**:

¹ This practice is under the jurisdiction of Committee **D04** on Road and Paving Materials and is the direct responsibility of Subcommittee **D04.94** on Statistical Procedures and Evaluation of Data.

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² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

³ Available from National Technical Information Service (NTIS), U.S. Department of Commerce, 5285 Port Royal Rd., Springfield, VA 22161.