



Designation: D3666 – 24

Standard Specification for Minimum Requirements for Agencies Testing and Inspecting Road and Paving Materials¹

This standard is issued under the fixed designation D3666; 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.

This standard has been approved for use by agencies of the U.S. Department of Defense.

1. Scope*

1.1 This specification covers the minimum requirements for field and laboratory personnel, for establishing and maintaining a quality management system, and establishes minimum qualifications for agencies engaged in the testing and inspection of road and paving materials.

1.2 Criteria are provided for evaluating the capability of an agency to properly perform designated tests on road and paving materials, and for establishing guidelines pertaining to an agency's organization, personnel, facilities, and quality system. This specification may be supplemented by more specific criteria, such as that in Specification **E329**, and requirements for particular projects.

1.3 This specification can be used as a basis to evaluate testing or inspection agencies, or both, and is intended for use for the qualifying or accrediting, or both, of testing or inspection agencies, public or private, engaged in the testing and inspection of road and paving materials.

1.4 Accreditation is required to comply with this standard. Accreditation for this standard shall include at least one field. (See **8.1.3**.)

1.5 The users of the accredited agency must review the agency's scope of accreditation to ensure the agency has been accredited for its technical competence to perform the tasks requested by the user.

1.6 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.

1.7 *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 appro-*

priate safety, health, and environmental practices and determine the applicability of regulatory limitations prior to use.

1.8 *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 The following referenced documents are those that are specifically mentioned in this specification. These referenced documents are not meant to be all inclusive, as this specification applies, as appropriate, to all test methods under the jurisdiction of Committee D04.

2.2 ASTM Standards:²

- C29/C29M** Test Method for Bulk Density ("Unit Weight") and Voids in Aggregate
- C88/C88M** Test Method for Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate
- C128** Test Method for Relative Density (Specific Gravity) and Absorption of Fine Aggregate
- C131/C131M** Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine
- C1252** Test Methods for Uncompacted Void Content of Fine Aggregate (as Influenced by Particle Shape, Surface Texture, and Grading)
- D5/D5M** Test Method for Penetration of Bituminous Materials
- D8** Terminology Relating to Materials for Roads and Pavements
- D36/D36M** Test Method for Softening Point of Bitumen (Ring-and-Ball Apparatus)
- D70/D70M** Test Method for Specific Gravity and Density of Semi-Solid Asphalt Binder (Pycnometer Method)

¹ This specification is under the jurisdiction of ASTM Committee **D04** on Road and Paving Materials and is the direct responsibility of Subcommittee **D04.95** on Quality Control, Inspection and Testing Agencies.

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

*A Summary of Changes section appears at the end of this standard

D92 Test Method for Flash and Fire Points by Cleveland Open Cup Tester

D113/D113M Test Method for Ductility of Asphalt Materials

D139 Test Method for Float Test for Asphalt Materials

D1074 Test Method for Compressive Strength of Asphalt Mixtures

D1560 Test Methods for Resistance to Deformation and Cohesion of Asphalt Mixtures by Means of Hveem Apparatus (Withdrawn 2024)³

D1561/D1561M Practice for Preparation of Bituminous Mixture Test Specimens by Means of California Kneading Compactor (Withdrawn 2022)³

D1754/D1754M Test Method for Effects of Heat and Air on Asphaltic Materials (Thin-Film Oven Test)

D1856 Test Method for Recovery of Asphalt from Solution by Abson Method

D2872 Test Method for Effect of Heat and Air on a Moving Film of Asphalt Binder (Rolling Thin-Film Oven Test)

D3143/D3143M Test Method for Flash Point of Cutback Asphalt with Tag Open-Cup Apparatus

D4402/D4402M Test Method for Viscosity Determination of Asphalt at Elevated Temperatures Using a Rotational Viscometer

D5506 Practice for Organizations Engaged in the Certification of Personnel Testing and Inspecting Bituminous Paving Materials (Withdrawn 2015)³

D6084/D6084M Test Method for Elastic Recovery of Asphalt Materials by Durometer

D6307 Test Method for Asphalt Content of Asphalt Mixture by Ignition Method

D6521 Practice for Accelerated Aging of Asphalt Binder Using a Pressurized Aging Vessel (PAV)

D6648 Test Method for Determining the Flexural Creep Stiffness of Asphalt Binder Using the Bending Beam Rheometer (BBR)

D6925 Test Method for Preparation and Determination of the Relative Density of Asphalt Mix Specimens by Means of the Superpave Gyrotory Compactor

D6926 Practice for Preparation of Asphalt Mixture Specimens Using Marshall Apparatus

D6927 Test Method for Marshall Stability and Flow of Asphalt Mixtures

D7115 Test Method for Measurement of Superpave Gyrotory Compactor (SGC) Internal Angle of Gyration Using Simulated Loading

D7175 Test Method for Determining the Rheological Properties of Asphalt Binder Using a Dynamic Shear Rheometer

D7226 Test Method for Determining the Viscosity of Emulsified Asphalts Using a Rotational Paddle Viscometer

D7496 Test Method for Viscosity of Emulsified Asphalt by Saybolt Furol Viscometer

E329 Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection

E1301 Guide for Proficiency Testing by Interlaboratory Comparisons (Withdrawn 2012)³

3. Terminology

3.1 *Definitions*—The approved standard definitions are listed below.

3.1.1 *agency, n*—the organization engaged to test or inspect road and paving materials as required by a specification or contract.

3.1.2 *calibration, n*—a process that establishes the relationship (traceability) between the results of a measurement instrument, measurement system, or material measure and the corresponding values assigned to a reference standard.

3.1.2.1 *Discussion*—The purpose of calibration is to establish the traceability of a measurement on certain types of equipment, such as balances (measurement instrument) and dynamic shear rheometer (measurement system). Uncertainty estimates obtained during calibration are used to judge if an instrument is suitable for its intended purpose. There is a need to re-establish traceability or recalibrate only when instrument measurements drift out of control (as determined through verification of calibration).

3.1.3 *check, n*—a specific type of inspection and/or measurement performed on equipment and materials to indicate compliance or otherwise with stated criteria.

3.1.3.1 *Discussion*—Checks are performed on items of equipment that do not make measurements, such as specimen molds and ovens. Stated criteria can be dimensional tolerances.

3.1.4 *quality management system (QMS), n*—the organizational structure, responsibilities, procedures, activities, capabilities, and resources that together aim to ensure that the agency is operating in a repeatable and competent manner.

3.1.5 *standardization, n*—a process that determines whether adjustments are needed to a specific piece of equipment, such as pycnometers and flow meters, when its performance is compared with that of a generally accepted standard.

3.1.6 *traceability, n*—the property of a result of a measurement whereby it can be related to stated references, usually national or international standards, through an unbroken chain of comparisons all having stated uncertainties.

3.1.6.1 *Discussion*—There is a need for traceable measurements. Measurements, not the instrument, can be traceable. Measurement traceability is established through calibration. Measurement traceability is maintained through check of calibration (a regular check of instrument output using a control standard).

3.1.7 *uncertainty, n*—a parameter associated with the result of a measurement that defines the range of the values that could be attributed to the measured quantity.

3.1.7.1 *Discussion*—The uncertainty of a measurement is required in order to establish its traceability. The uncertainty estimates obtained during calibration are used to judge if an instrument is suitable for its intended purpose.

3.1.8 *user, n*—the person or organization engaging the agency to provide inspections or tests; or using this specification to evaluate or accredit the agency.

³ The last approved version of this historical standard is referenced on www.astm.org.

3.1.9 *verification, n*—a process that establishes whether the results of a previously calibrated measurement instrument, measurement system, or material measure are stable.

3.1.9.1 *Discussion*—Verification is used to maintain the traceability of a measurement and to determine when to recalibrate. Control charts are often used to plot verification results and determine if instrument measurements have drifted out of control.

3.2 Other Definitions:

3.2.1 Refer to Terminology **D8**.

4. Significance and Use

4.1 This specification provides the basic minimum criteria for use in evaluating the qualifications of testing or inspection agencies, or both, for road and paving materials. The criteria may be supplemented by more specific criteria and requirements. An individual user can also use it to judge the qualification of an agency.

4.2 The intent of this specification is to provide a consensus basis for evaluating a testing or inspection agency, or both, with respect to that agency's capability to objectively and competently provide the specific services needed by the user.

4.3 This specification can be used as a basis for accreditation.

5. Responsibilities and Duties

5.1 The agency shall ensure that only inspections or tests for which it is adequately equipped and staffed are performed.

5.2 The agency shall ensure that personnel perform only inspections and tests for which they are adequately trained, qualified, and certified in accordance with applicable specifications.

5.3 The agency shall ensure that all equipment is properly maintained in good operating condition and is calibrated as applicable.

5.4 The agency shall perform all testing and inspection in accordance with appropriate standards and quality control criteria. Documents unique to the user shall be furnished to the agency.

6. General Capabilities

6.1 *Laboratory Testing*—The laboratory testing services of a road and paving materials testing agency shall include some or all of the following capabilities:

6.1.1 Testing of road and paving materials and mixtures in the laboratory,

6.1.2 Testing of aggregate for compliance with specification requirements,

6.1.3 Preparation and evaluation of mix design in accordance with the proper method common to the geographical area in which it offers services or in accordance with the appropriate standard procedure,

6.1.4 Determination of percent binder and gradation of plant aggregates in plant mix, and

6.1.5 Determination and verification of mix properties for comparison with the mix design.

6.2 *Field Testing and Inspection*—The field services of a road and paving materials testing and inspection agency shall include some or all of the following capabilities:

6.2.1 Investigation of aggregate at the source for compliance with specification requirements,

6.2.2 Inspection of proportioning and mixing at the plant or project site in accordance with user's requirements.

6.2.3 Inspection of handling, laying, and rolling operations of the mixture at the site,

6.2.4 Determination of thickness of compacted mixture, and

6.2.5 Determination of density and the percent compaction of an asphalt pavement after construction.

NOTE 1—Since the requirements for construction control can vary widely from project to project depending upon the nature of the mixture, location, and intended use of the asphalt mixture in the project, the capability of the agency for testing and inspection should be that necessary to accomplish construction control of the user's specific project or special requirements.

7. Personnel Qualifications

7.1 *Management*—The testing and inspection services of the agency shall be under the direction of a person charged with scientific or engineering managerial responsibility. This person shall:

7.1.1 Be a full-time employee of the agency for the location(s) listed in the QMS and shall have a minimum of five years experience in inspecting and testing of road and paving materials and construction.

7.1.2 Be a licensed engineer or a person with equivalent science-oriented education and experience in having satisfactorily directed testing or inspection services, or both, of road and paving materials.

7.2 *Supervision of Field/Plant Inspectors or Testing Technicians*—This person shall:

7.2.1 Have a minimum of three years of relevant and progressively more responsible experience in testing or inspection, or both, of road and paving materials and hot mix asphalt construction as appropriate to their job classification.

7.2.2 Have applicable technician level or inspector level, or higher, certifications/qualifications (see **Note 2**) through a program approved by a state DOT or a national or regional authority.

7.3 *Field/Plant Inspector or Testing Technician*:

7.3.1 This person shall have applicable technician level or inspector level certifications/qualifications (see **Note 2**) through a program approved by a state DOT or a national or regional authority.

7.3.2 Trainees can be used to perform the inspection or test, or both, if they work under the supervision of a certified/qualified individual as described in **7.2.2** or **7.3.1**, at the same facility, project, or plant. The trainee cannot evaluate the test or inspection results or sign acceptance reports.

7.4 It is satisfactory for a person to fill one or more of the levels of management, supervision, inspector, or technician positions in accordance with **7.1**, **7.2**, and **7.3** provided that person qualifies for the highest level. It is also recognized that frequently a few agency control tests are conducted by a small