Standard Recommended Practice for

Establishing and Implementing a Quality Management System for Construction Materials Testing Laboratories

AASHTO Designation: R 18-18¹

Technical Subcommittee: 5c, Quality Assurance and Environmental

Release: Group 1 (April)



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Establishing and Implementing a Quality Management System for Construction Materials Testing Laboratories

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SCOPE This document contains criteria and guidelines for establishing and implementing a quality management system (QMS) for use by a construction materials testing (CMT) laboratory. The criteria in this document only apply to the following testing areas: soil, aggregate, asphalt

1.2. The criteria in this document only apply to the following testing areas: soil, aggregate, asphalt binder, cutback asphalt, emulsified asphalt, asphalt mixtures, hydraulic cement, portland cement concrete, unit masonry, metals, plastic pipe, and sprayed fire-resistive material.

2. REFERENCED DOCUMENTS

- 2.1. *AASHTO Standards*:
 - M 92, Wire-Cloth Sieves for Testing Purposes
 - M 152M/M 152, Flow Table for Use in Tests of Hydraulic Cement
 - R 28, Accelerated Aging of Asphalt Binder Using a Pressurized Aging Vessel (PAV)
 - R 39, Standard Practice for Making and Curing Concrete Test Specimens in the Laboratory
 - R 59, Recovery of Asphalt Binder from Solution by Abson Method
 - R 61, Establishing Requirements for Equipment Calibrations, Standardizations, and Checks
 - R 68, Preparation of Asphalt Mixtures by Means of the Marshall Apparatus
 - T 19M/T 19, Bulk Density ("Unit Weight") and Voids in Aggregate
 - T 22, Compressive Strength of Cylindrical Concrete Specimens
 - T 23, Making and Curing Concrete Test Specimens in the Field
 - T 48, Flash and Fire Points by Cleveland Open Cup
 - T 49, Penetration of Bituminous Materials
 - T 50, Float Test for Bituminous Materials
 - T 51, Ductility of Asphalt Materials
 - T 53, Softening Point of Bitumen (Ring-and-Ball Apparatus)
 - T 59, Emulsified Asphalts
 - T 72, Saybolt Viscosity

- T 79, Flash Point with Tag Open-Cup Apparatus for Use with Material Having a Flash Point Less Than 93°C (200°F)
- T 84, Specific Gravity and Absorption of Fine Aggregate
- T 88, Particle Size Analysis of Soils
- T 89, Determining the Liquid Limit of Soils
- T 96, Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine
- T 98M/T 98, Fineness of Portland Cement by the Turbidimeter
- T 99, Moisture–Density Relations of Soils Using a 2.5-kg (5.5-lb) Rammer and a 305-mm (12-in.) Drop
- T 100, Specific Gravity of Soils
- T 104, Soundness of Aggregate by Use of Sodium Sulfate or Magnesium Sulfate
- T 106M/T 106, Compressive Strength of Hydraulic Cement Mortar (Using 50-mm or 2-in. Cube Specimens)
- T 119M/T 119, Slump of Hydraulic Cement Concrete
- T 121M/T 121, Density (Unit Weight), Yield, and Air Content (Gravimetric) of Concrete
- T 129, Amount of Water Required for Normal Consistency of Hydraulic Cement Paste
- T 131, Time of Setting of Hydraulic Cement by Vicat Needle
- T 134, Moisture–Density Relations of Soil–Cement Mixtures
- T 135, Wetting-and-Drying Test of Compacted Soil–Cement Mixtures
- T 136, Freezing-and-Thawing Tests of Compacted Soil–Cement Mixtures
- T 137, Air Content of Hydraulic Cement Mortar
- T 152, Air Content of Freshly Mixed Concrete by the Pressure Method
- T 153, Fineness of Hydraulic Cement by Air Permeability Apparatus
- T 154, Time of Setting of Hydraulic Cement Paste by Gillmore Needles
- T 162, Mechanical Mixing of Hydraulic Cement Pastes and Mortars of Plastic Consistency
- T 167, Compressive Strength of Hot Mix Asphalt
- T 176, Plastic Fines in Graded Aggregates and Soils by Use of the Sand Equivalent Test
- T 179, Effect of Heat and Air on Asphalt Materials (Thin-Film Oven Test)
- T 180, Moisture–Density Relations of Soils Using a 4.54-kg (10-lb) Rammer and a 457-mm (18-in.) Drop
- T 186, Early Stiffening of Hydraulic Cement (Paste Method)
- T 190, Resistance R-Value and Expansion Pressure of Compacted Soils
- T 192, Fineness of Hydraulic Cement by the 45-µm (No. 325) Sieve
- T 193, The California Bearing Ratio
- T 196M/T 196, Air Content of Freshly Mixed Concrete by the Volumetric Method
- T 201, Kinematic Viscosity of Asphalts (Bitumens)
- T 202, Viscosity of Asphalts by Vacuum Capillary Viscometer
- **T** 209, Theoretical Maximum Specific Gravity (G_{mm}) and Density of Hot Mix Asphalt (HMA)
- T 228, Specific Gravity of Semi-Solid Asphalt Materials
- T 231, Capping Cylindrical Concrete Specimens
- T 240, Effect of Heat and Air on a Moving Film of Asphalt Binder (Rolling Thin-Film Oven Test)
- T 245, Resistance to Plastic Flow of Asphalt Mixtures Using Marshall Apparatus
- T 246, Resistance to Deformation and Cohesion of Hot Mix Asphalt (HMA) by Means of Hveem Apparatus

- T 247, Preparation of Test Specimens of Hot Mix Asphalt (HMA) by Means of California Kneading Compactor
- T 300, Force Ductility Test of Asphalt Materials
- T 301, Elastic Recovery Test of Asphalt Materials by Means of a Ductilometer
- T 308, Determining the Asphalt Binder Content of Asphalt Mixtures by the Ignition Method
- T 312, Preparing and Determining the Density of Asphalt Mixture Specimens by Means of the Superpave Gyratory Compactor
- T 313, Determining the Flexural Creep Stiffness of Asphalt Binder Using the Bending Beam Rheometer (BBR)
- T 314, Determining the Fracture Properties of Asphalt Binder in Direct Tension (DT)
- T 315, Determining the Rheological Properties of Asphalt Binder Using a Dynamic Shear Rheometer (DSR)
- T 316, Viscosity Determination of Asphalt Binder Using Rotational Viscometer

ASTM Standards:

- C29/C29M, Standard Test Method for Bulk Density ("Unit Weight") and Voids in Aggregate
- C31/C31M, Standard Practice for Making and Curing Concrete Test Specimens in the Field
- C39/C39M, Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens
- C67/C67M, Standard Test Methods for Sampling and Testing Brick and Structural Clay Tile
- C88/C88M, Standard Test Method for Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate
- C109/C109M, Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-in. or [50-mm] Cube Specimens)
- C115/C115M, Standard Test Method for Fineness of Portland Cement by the Turbidimeter (withdrawn 2018)
- C128, Standard Test Method for Relative Density (Specific Gravity) and Absorption of Fine Aggregate
- C131/C131M, Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine
- C138/C138M, Standard Test Method for Density (Unit Weight), Yield, and Air Content (Gravimetric) of Concrete
- C143/C143M, Standard Test Method for Slump of Hydraulic-Cement Concrete
- C173/C173M, Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method
- C185, Standard Test Method for Air Content of Hydraulic Cement Mortar
- C187, Standard Test Method for Amount of Water Required for Normal Consistency of Hydraulic Cement Paste
- C191, Standard Test Methods for Time of Setting of Hydraulic Cement by Vicat Needle
- C192/C192M, Standard Practice for Making and Curing Concrete Test Specimens in the Laboratory
- C204, Standard Test Methods for Fineness of Hydraulic Cement by Air-Permeability Apparatus
- C230/C230M, Standard Specification for Flow Table for Use in Tests of Hydraulic Cement
- C231/C231M, Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method
- C266, Standard Test Method for Time of Setting of Hydraulic-Cement Paste by Gillmore Needles

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