
Standard Method of Test for Determination of the Voids of Dry Compacted Filler

AASHTO Designation: T 409-23¹

Adopted without Revisions: 2023

Technical Subcommittee: 2c, Asphalt–Aggregate Mixtures



**American Association of State Highway and Transportation Officials
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1. SCOPE

- 1.1. This document specifies the procedure for determining the voids of dry compacted filler by means of a Rigden Apparatus. This test allows for measuring the percent volume of free asphalt that a filler can carry. The test is applicable to natural and manufactured fillers.
- 1.2. The values stated in SI units are to be regarded as the standard.
- 1.3. *This standard does not purport to address all of the safety concerns associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and to determine the applicability of regulatory limitations prior to use.*
- 1.4. *The quality of the results produced by this standard are dependent on the competence of the personnel performing the procedure and the capability, calibration, and maintenance of the equipment used. Agencies that meet the criteria of R 18 are generally considered capable of competent and objective testing/sampling/inspection/etc. Users of this standard are cautioned that compliance with R 18 alone does not completely assure reliable results. Reliable results depend on many factors; following the suggestions of R 18 or some similar acceptable guideline provides a means of evaluating and controlling some of those factors.*

2. REFERENCED DOCUMENTS

- 2.1. *AASHTO Standards:*
 - M 339M/M 339, Thermometers Used in the Testing of Construction Materials
 - R 18, Establishing and Implementing a Quality Management System for Construction Materials Testing Laboratories
- 2.2. *ASTM Standards:*
 - D4753, Standard Guide for Evaluating, Selecting, and Specifying Balances and Standard Masses for Use in Soil, Rock, and Construction Materials Testing
 - D5550, Standard Test Method for Specific Gravity of Soil Solids by Gas Pycnometer
 - E1, Standard Specification for ASTM Liquid-in-Glass Thermometers
 - E145, Standard Specification for Gravity-Convection and Forced-Ventilation Ovens
 - E230/E230M, Standard Specification for Temperature-Electromotive Force (emf) Tables for Standardized Thermocouples
 - E2877, Standard Guide for Digital Contact Thermometers

- 2.3. *International Electrotechnical Commission Standard:*
< IEC 60584-1: 2013 Thermocouples - Part 1: EMF Specifications and Tolerances
- 2.4. *Other:*
< European Norm (EN) 1097-4: Determination of the voids of dry compacted filler

3. TERMINOLOGY

- 3.1. *Definitions:*
- 3.1.1. *air voids*—volume of space in a filler occupied by air.
- 3.1.2. *filler*—aggregate passing a 0.075-mm sieve.

4. SUMMARY OF TEST METHOD

- 4.1. This test allows for measuring the percent volume of free asphalt a filler can carry using the Rigden apparatus.

5. SIGNIFICANCE AND USE

- 5.1. This test allows for measuring the percent of voids in compacted filler that can be used in determination of the volume of free asphalt a filler can carry.

6. APPARATUS

- 6.1. The assembly of the Rigden apparatus is illustrated in Figure 1. Details of the system components are as follows: