



Designation: D7227 – 06

Standard Practice for Rapid Drying of Compacted Asphalt Specimens Using Vacuum Drying Apparatus¹

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1. Scope

1.1 This practice covers the process of drying compacted asphalt specimens using vacuum drying apparatus.

1.2 The specimens dried by this practice remain at room temperature, which helps in maintaining specimen integrity during the drying process.

1.3 This practice can be used for compacted cylindrical and cubical bituminous laboratory and field specimens

1.4 This practice can also be used for drying other construction materials such as concrete, soils, aggregates and loose asphalt mixtures. Use manufacturers recommendations for drying other construction materials.

1.5 The values stated in SI units are to be regarded as the standard.

1.6 *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 requirements prior to use.*

2. Referenced Documents

2.1 *ASTM Standards:*²

D5361 Practice for Sampling Compacted Bituminous Mixtures for Laboratory Testing

3. Significance and Use

3.1 Specimen dry weight is a critical measure in determination of accurate density and many other tests in the construction and raw materials industries. Drying specimens at room temperature is required for some tests and provides an advantage for other tests to ensure the integrity and to preserve the characteristics of specimens.

¹ This practice is under the jurisdiction of ASTM Committee D04 on Road and Paving Materials and is the direct responsibility of Subcommittee D04.21 on Specific Gravity and Density of Bituminous Mixtures.

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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.

3.2 This practice covers drying compacted asphalt specimens in a vacuum chamber that is capable of keeping the specimen at close to room temperature. A vacuum pump reduces the pressure inside the chamber, thus allowing water to evaporate at low temperature. Since the specimen naturally cools during the evaporation process, making water harder to evaporate, it is important to have proper temperature controls in the chamber to ensure specimen remains at close to room temperature. Automatic controls within the unit allow the specimen to remain at close to room temperature by periodically allowing a flow of warm air to enter the vacuum chamber. Cycling between vacuum and airflow conditions allows the specimen to dry in a short period of time. Completely saturated specimens with over 30 g of retained water can be dried in about 30 minutes. For most field cores that are not completely saturated the drying time is generally less than 15 minutes.

NOTE 1—Cycle time (period) can depend on the material composition. Each cycle involves an alternating period of 30 to 180 seconds of vacuum operation and 30 to 120 seconds of air flow.

3.3 This method can be used for 100 mm diameter, 150 mm diameter cylindrical, and cubical compacted bituminous specimens.

3.4 This method can also be used for drying loose asphalt mixtures, aggregate samples and other solid specimens. Follow manufacturers recommended procedures for drying specimens other than compacted bituminous specimens.

3.5 This method can be used to determine moisture content and amount of water loss during drying by weighing the sample before and after the drying operations.

4. Apparatus

4.1 Absorbent cloth or paper towels, for drying water from surface of the specimens.

4.2 *Vacuum Chamber*, with a pump capable of evacuating a sealed and enclosed chamber to a pressure of 6 mm Hg, when at sea level. The chamber shall be large enough to accommodate specimens of 150 mm width or diameter and 180 mm in height. The device shall have an automatic vacuum, airflow and temperature control features to ensure proper drying of the specimen at close to room temperatures. Automatic controls of the unit shall be calibrated by the manufacturer prior to initial