

VACUUM DRYING COMPACTED ASPHALT SPECIMENS FOP FOR AASHTO R 79

Scope

This practice covers the process of drying compacted field and laboratory specimens using a vacuum device in accordance with AASHTO R 79-22.

Overview

The specimens dried by this procedure remain near room temperature, which helps in maintaining specimen integrity during the drying process and allows the operators to run repeated tests on the same sample, if necessary.

Specimens are kept and stored at temperatures above 15°C (60°F) and below 54°C (130°F).

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

Apparatus

- Vacuum device:
 - Attached to a pump capable of evacuating a sealed chamber to a pressure of 1 kPa (6 mm Hg) when at sea level.
 - Capable of controlling the vacuum, airflow, and temperature in order to properly dry the specimen at close to room temperature.
 - With a display that indicates a pressure value, the dry point in the chamber, and number of cycles.
 - With a plate for removing water from the bottom surface of the specimen chamber.
 - With means to trap moisture that is removed from the sample.
- Chamber (attached to the vacuum device): Large enough to hold cylindrical specimens, 150 mm (6 in.) diameter by 180 mm (7 in.) height, or cubical samples, 150 mm (6 in.) length by 150 mm (6 in.) width by 180 mm (7 in.) height.
- Thermometer: meeting the requirements of M 339/ M 339 or infrared thermometer: accurate to $\pm 5^{\circ}\text{C}$ ($\pm 9^{\circ}\text{F}$) to be used to measure surface temperature of the specimen.

Note 1: The thermometer types suitable for use include a handheld infrared thermometer with a D:s ratio of 6:1.

- Balance or scale: Capacity sufficient for the sample mass and conforming to the requirements of M 231, Class G2.

Daily Equipment Preparation

1. Dry the moisture trap (if necessary) and the specimen (vacuum) chamber.
2. Run the device without any specimens. The device should display a pressure value that indicates a known dry point.

Note 1: If the unit fails to achieve a dry point pressure value, as recommended by the manufacturer, check that the lid and all hose connections are well sealed. If needed, refer to the manufacturer's troubleshooting instructions.

Test Specimens

Test specimens may be either laboratory-molded or sampled from asphalt mixture pavement.

Procedure

Note 2: Keeping the device in the off position when not in use can prolong the operating life of its components.

1. Measure the sample temperature with a handheld infrared thermometer. Make sure the specimen surface temperature is above 15°C (60°F).
2. Remove any standing water from the surface of the specimen by using a paper towel or an absorptive cloth.
3. Place the specimen inside the vacuum chamber, closing the lid to the vacuum chamber and moisture trap (if applicable).
4. Initiate the vacuum drying cycle. The pressure is monitored throughout the drying cycle to ensure dry specimen condition pressure is achieved in the device.
5. The device will automatically stop when the specimen is dry.

Note 3: The device is calibrated at the factory or by the operator according to manufacturer's recommended procedures to sense a dry specimen condition.

6. Remove the specimen from the chamber.
7. Determine and record the specimen mass to the nearest 0.1 g.
8. Repeat steps 5 through 7 until specimen weight after vacuum drying cycle is less than 0.3 g from previous drying cycle.

Note 4: Between drying cycles, wipe off any free-standing water in the moisture trap to speed up the specimen drying cycles.

Note 5: Excessive temperature may damage the specimen. Between drying cycles, verify that the specimen temperature has not exceeded 54°C (130°F).