

State of Nevada
Department of Transportation
Materials Division

**METHOD OF TEST FOR THEORETICAL MAXIMUM SPECIFIC GRAVITY OF BITUMINOUS
PAVING MIXTURES (FIELD METHOD)**

SCOPE

This method covers the determination of the theoretical maximum specific gravity of uncompacted bituminous paving mixtures.

APPARATUS

1. Pycnometer, 2 L (2 qt) glass.
2. Balance, readable to 0.1 g.
3. Stop watch, or suitable timing device.
4. Vacuum pump, and miscellaneous equipment to evacuate air from the pycnometer.
5. Oven, capable of maintaining temperatures up to 110°C (230°F).
6. Thermometer, to measure and maintain water bath temperature.
7. Sieve, 6.3 mm (1/4 in.).
8. Water bath, 20 L (5 gal) maintained at $25 \pm 3^\circ\text{C}$ ($77 \pm 5^\circ\text{F}$).

SAMPLE PREPARATION

1. Obtain sample of bituminous mixture per Test Method Nev. T200, under PROCEDURES number 10.
2. By the method of splitting or quartering, obtain a representative sample of 1200 to 1300 g.
3. Separate the particles of the paving mixture sample by hand, taking care to avoid fracturing the aggregate, so that the particles of the fine aggregate portion are not larger than 6.3 mm (1/4 in.). A 6.3 mm (1/4 in.) sieve may be used to aid in particle separation. If the sample of paving mixture is not sufficiently soft to be separated manually, place it in a large flat pan and warm in an oven until it can be separated as described.

4. Cool the sample to room temperature and record its combined weight (coarse and fines) as A.

PROCEDURE

1. If needed, clean and lightly lubricate the pycnometer gasket with petroleum jelly.
2. Fill the pycnometer with water $25 \pm 3^{\circ}\text{C}$ ($77 \pm 5^{\circ}\text{F}$), weigh and record its weight as B.
Note 1: When water forms a meniscus the pycnometer is considered full.
3. Mark the pycnometer lid to register its position relative to the jar. Return the lid to this position after it is removed and replaced.
4. Place the room temperature sample in the partially drained pycnometer, and fill with water at $25 \pm 3^{\circ}\text{C}$ ($77 \pm 5^{\circ}\text{F}$) to slightly below the jar rim. Replace and tighten the lid to the marked position.
5. Remove entrapped air by subjecting the contents to a partial vacuum of 30 mm Hg or less absolute pressure for 15 ± 2 minutes. Agitate the container and contents manually by vigorously shaking at intervals of approximately 2 minutes, while evacuating, to the aid in the removal of entrapped air.
6. Place the pycnometer (with sample) in the temperature controlled water bath for 10 ± 1 minute to stabilize any temperature changes caused during evacuation.
7. Top off the pycnometer with water $25 \pm 3^{\circ}\text{C}$ ($77 \pm 5^{\circ}\text{F}$) and thoroughly dry the outside (see Note 1). Weigh and record the weight of the filled pycnometer as C.
8. Care should be taken to maintain a constant water temperature throughout the test procedure.
9. All weights shall be to the nearest 0.1 g.

CALCULATIONS

Calculate the specific gravity of the sample as follows:

$$\text{S.G} = \frac{A}{A+B-C}$$

where:

A = Mass of dry sample in air

B = Mass of pycnometer and water

C = Mass of evacuated sample, pycnometer and water

REPORT

Specific gravity shall be reported to the nearest 0.001.