

State of Nevada
Department of Transportation
Materials and Testing Division

METHOD OF TEST FOR APPARENT SPECIFIC
GRAVITY OF FINE AGGREGATES

SCOPE

This method of test, which is a modification of AASHTO T133, is used for determining the apparent specific gravity of fine aggregates proposed for use in bituminous mixtures.

A. APPARATUS

The apparatus shall consist of the following:

1. Flask. The standard Le Chatelier flask conforming to the dimensions shown in Figure I.

2. Tank. A constant temperature bath is required if the test is not performed in a constant temperature room.

3. Balance. A balance having a capacity of 100 g. and sensitive to 0.1 g. or less.

B. MATERIAL

Kerosene free of water.

C. TEST RECORD FORM

Use appropriate specific gravity work sheet.

D. PREPARATION OF SAMPLE

Obtain a representative sample of the fine aggregate (passing 4.75 mm (No. 4) sieve) weighing approximately 100 g., dry to constant weight at 212-230° F (100-110° C), and cool to room temperature.

E. TEST PROCEDURE

1. Fill the Le Chatelier flask with kerosene to a point on the stem slightly above the zero line, and dry the inside of the flask above the 24 ml. line.

Test Method Nev. T224C

2. Immerse the flask in the constant temperature bath until the flask contents attain the same temperature as the bath. Maintain the water level of the bath near the 24 ml line of the immersed flask. The use of a loose-fitting lead ring collar of such diameter that it can be placed over the stem of the flask and rest on the bulb to keep the flask upright in the water bath.

3. Remove the flask from the bath. Read and record the temperature of the bath to the nearest degree F (C). Read the level of the kerosene to the nearest 0.1 ml., and record the kerosene level and temperature along with the flask and sample identification numbers.

4. Weigh the flask and kerosene to the nearest 0.1 gram. Slowly pour a portion of the test sample into the flask until the level of the kerosene is between 19 and 23 milliliters. Gently roll and shake the flask as necessary to cause all the aggregate to fall into the bulb. Insert the stopper into the flask. Remove entrapped air by rolling and shaking the flask as necessary. Weigh the flask, kerosene and sample to the nearest 0.1 gram.

5. Immerse the flask in the water bath, and allow it to remain for a minimum of 4 hours. Several times during the 4 hour period take the flask from the bath and remove entrapped air by rolling and whirling the flask, then place the flask back in the water bath.

6. After the 4 hour period (minimum) read the temperature of the bath, and record. Remove the flask, and read the level of the kerosene to the nearest 0.1 ml., and record this final reading. Then pour out the sample and rinse the flask clean with kerosene.

F. CALCULATIONS

1. The difference between the initial reading and the final reading represents the volume of kerosene displaced by the volume of the fine aggregate used in the test, provided the temperature of the bath has not varied.

2. If the temperature of the water bath at the final reading differs from that of the initial reading, the volume of the kerosene differs also and a correction must be applied to the indicated displacement. Correct for the change in volume of the kerosene by subtracting 0.1 ml. from the indicated displacement for every 1° F (0.6° C) increase in temperature or by adding 0.1 ml. for every 1° F (0.6° C) decrease in temperature.

3. Calculate the apparent specific gravity from the following formula:

$$\text{Apparent specific gravity} = \frac{\text{Weight of oven-dry sample in grams}}{\text{Corrected displacement in milliliters}}$$

G. PRECAUTIONS

1. Be sure that the material is free of all air bubbles before the final reading is taken.
2. Since the sample tested is small, care must be taken to insure that it is representative.
3. Be sure to apply temperature corrections properly.
4. Handle the Le Chatelier flasks gently. They are fragile.

REFERENCE

AASHTO Designation T133
California Test 208

