

**OHD L-7  
METHOD OF TEST FOR  
BULK IMPREGNATED SPECIFIC GRAVITY OF AGGREGATE**

- I. **SCOPE.** This test method covers procedures for determination of the bulk impregnated specific gravity of aggregates used for bituminous mix aggregates, and is applicable to both coarse and fine aggregates and to blended aggregate including mineral filler, but not to mineral filler by itself.
- II. **APPARATUS.** The apparatus shall consist of the following:
- A. **Balance**, having a capacity of at least 4,000 grams and sensitive to 0.1 gram.
  - B. **Oven**, capable of maintaining a temperature of  $280^{\circ} \pm 5^{\circ} \text{ F}$  ( $137.8^{\circ} \pm 2^{\circ} \text{ C}$ ).
  - C. **Metal Container**, approximately 4 inches diameter x 5 inches height (102 mm Dia. X 127 mm high), equipped with wire handle for suspending in water.
  - D. **Immersion Assembly**, for weighing container and contents in water.
  - E. **Pans**, of size suitable for retaining 500 grams of aggregate.
  - F. **One Metal Strip**, about 1 inch (2.5 cm) wide for stirring contents of each container.
- III. **MATERIAL.** The asphalt used shall be the same as proposed for use on the project.
- IV. **PREPARATION OF SAMPLE.** Prepare a representative sample of the aggregate in the following approximate quantities:
- |                             |           |
|-----------------------------|-----------|
| Coarse Aggregate . . . . .  | 500 grams |
| Blended Aggregate . . . . . | 500 grams |
| Fine Aggregate.. . . . .    | 500 grams |
- NOTE:** Due to the small sample size, it is extremely important that the sample of the aggregate represents the prototype grading.
- V. **TEST PROCEDURE:**
- A. Dry sample to constant weight at a temperature not less than  $230^{\circ} \text{ F}$  ( $110^{\circ} \text{ C}$ ), nor greater than  $325^{\circ} \text{ F}$  ( $163^{\circ} \text{ C}$ ), cool to room temperature and weight to 0.1 gram.
  - B. Heat the asphalt to  $280^{\circ} \pm 5^{\circ} \text{ F}$  ( $137.8^{\circ} \pm 2^{\circ} \text{ C}$ ) and pour sufficient amount into the container to fill to approximately one fourth of its depth. Insert metal stirrer and allow asphalt to cool to  $77^{\circ} \pm 2^{\circ} \text{ F}$  ( $25^{\circ} \pm 1^{\circ} \text{ C}$ ). (Should cool for not less than 15 hours.)
  - C. Weigh container and contents in air at room temperature and in water at  $77^{\circ} \pm 2^{\circ} \text{ F}$  ( $25^{\circ} \pm 1^{\circ} \text{ C}$ ).
  - D. Place container and contents and the sample of aggregate in oven at  $280^{\circ} \pm 5^{\circ} \text{ F}$  ( $137.8^{\circ} \pm 2^{\circ} \text{ C}$ ) and leave until temperatures are equalized (a minimum of four (4) hours).

- E. Remove aggregate and container with contents from oven and add aggregate to asphalt, stirring thoroughly as aggregate is gradually added to the hot asphalt; continue stirring for 2 minutes after all the aggregate is added. After stirring, tap the container gently on a hard surface several times to bring the entrapped air bubbles to the surface of the asphalt. After approximately one hour, remove the container and tap it gently on a hard surface several times again (this step may be repeated 3 or 4 times if necessary to remove all of the entrapped air). Cool to  $77^{\circ} \pm 2^{\circ} \text{ F}$  ( $25^{\circ} \pm 1^{\circ} \text{ C}$ ). (Should cool for not less than 15 hours.) During the cooling period, flame surface of asphalt to remove air bubbles if they are present.
- F. Weigh container plus stirrer plus asphalt plus aggregate in air at room temperature and in water at  $77^{\circ} \pm 2^{\circ} \text{ F}$  ( $25^{\circ} \pm 1^{\circ} \text{ C}$ ).

VI. **CALCULATIONS.**

- A. Calculate the bulk impregnated specific gravity from the following formula:

$$\text{Bulk Impregnated Specific Gravity} = \frac{A}{(D-E)-(B-C)}$$

Where:

- A = Weight of oven-dry aggregate in grams.  
B = Weight of container plus stirrer plus asphalt in air.  
C = Weight of container plus stirrer plus asphalt in water.  
D = Weight of container plus stirrer plus asphalt plus aggregate in air.  
E = Weight of container plus stirrer plus asphalt plus aggregate in water.

- B. To calculate the percent asphalt absorbed by the aggregate when the bulk specific gravity (oven dry basis) and the bulk impregnated specific gravity are known, use the following formula:

$$\% \text{ AC Absorbed} = \left[ \frac{1}{\text{Bulk Sp. Gr.}} - \frac{1}{\text{Bulk Imp. Sp. Gr.}} \right] \times 100$$