



7. Remove the flask from the bath, remove the collar, and dry the outside of the flask.
8. Read and record the temperature of the water bath to the nearest 0.1°C and the level of the kerosene to the nearest 0.1 mL.
9. Weigh the flask and kerosene to the nearest 0.1 g.
10. Slowly pour a portion of the test sample into the flask until the level of the kerosene is between 19 and 23 mL.
  - a. Gently roll and shake the flask as necessary to cause all the aggregate to fall into the bulb.
  - b. Brush any adhering dust down into the flask below the position of the stopper.
  - c. Insert the stopper in the flask.
11. Remove trapped air by rolling the flask in an inclined position and by gently whirling it in a horizontal circle.
12. If the level of the kerosene falls below the graduated section of the stem, repeat Sections C-2 and C-3 until the kerosene remains at a level within the graduated section.
13. Weigh the flask, kerosene, and sample to the nearest 0.1 g.
14. Place the weighted collar on the flask and immerse the flask in the water bath for a minimum of 4 h.
15. At the end of the immersion period, remove the flask from the water bath and remove any remaining trapped air by rolling the flask in an inclined position

and by gently whirling it in a horizontal circle.

16. Read and record the temperature of the water bath to the nearest 0.1°C and the level of the kerosene to the nearest 0.1 mL.
17. Discard the sample and rinse the flask with kerosene.

#### D. CALCULATIONS

1. Calculate the test sample mass by subtracting the mass of the flask and kerosene, determined in Section D-9, from the total mass of the flask, kerosene, and test sample, determined in Section D-13.
2. Calculate the volume of displaced kerosene by subtracting the initial volume reading in Section D-8 from the final volume reading in Section D-16.
3. Determine the change in temperature between the initial and final volume readings and correct the volume of displacement as follows:
  - a. For each 0.6°C increase in temperature, subtract 0.1 mL from the calculated displacement.
  - b. For each 0.6°C decrease in temperature, add 0.1 mL to the calculated displacement.
4. Record the volume after the temperature correction as the corrected displacement.
5. Calculate the apparent specific gravity using the formula:

$$\text{Gravity} = \frac{\text{Oven-dry sample mass}}{\text{Corrected displacement}}$$

Where: Oven-dry sample mass, in g  
Corrected displacement, in mL

#### E. 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 ensure that it is representative.
3. Be sure to apply temperature corrections properly.
4. Handle the LeChatelier flasks gently. They are fragile.

#### F. SAFETY AND HEALTH

Aggregates may contain bacteria and/or organisms which can be harmful to one's health. Dust masks and protective gloves are required when handling materials.

Heat resistant gloves/mitts or pot holders is required when removing samples from the ovens.

Observe the following procedures when using kerosene or stoddard solvent:

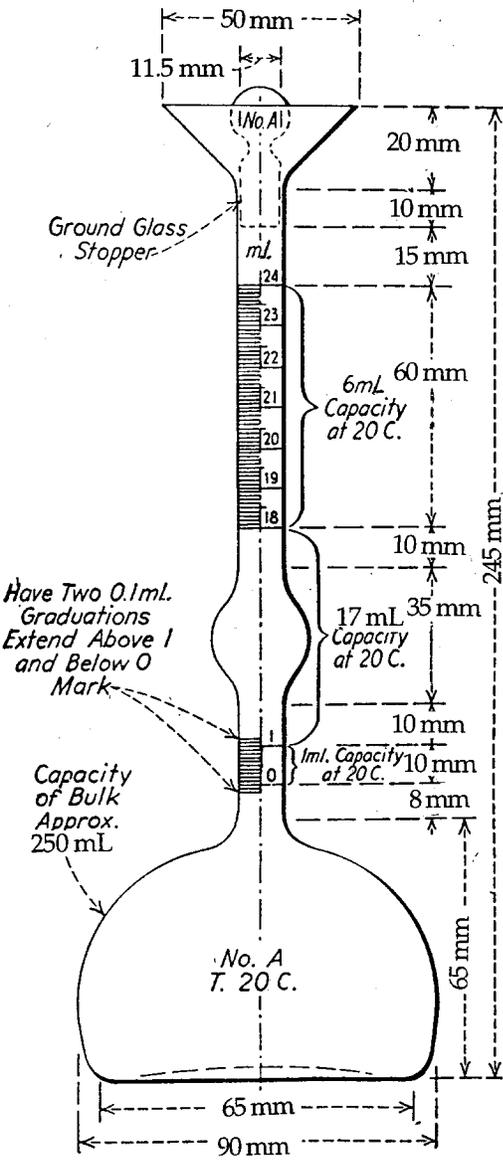
- a. Store in cool, dry, well-ventilated area away from ignition source, direct sunlight and oxidizing materials.

- b. Use in a well-ventilated area.
- c. The wearing of protective gloves and eyeglasses or chemical safety goggles is required.
- d. If spilled on skin rinse with flooding amounts of water and consult a physician for red or blistered skin. Wash affected area with soap and water.
- e. For eye contamination, gently lift eyelids and flush immediately and continuously with large quantities of water and seek medical attention.

Prior to handling, testing or disposing of any materials, testers are required to read Caltrans Laboratory Safety Manual: Part A, Section 5.0, Hazards and Employee Exposure; Part B, Sections: 5.0, Safe Laboratory Practices; 6.0, Chemical Procurement Distribution and Storage; and 10.0, Personal Protective Apparel and Equipment; and Part C, Section 1.0, Safe Laboratory Practices. Users of this method do so at their own risk.

#### REFERENCE: AASHTO Designation T 133

End of Text (California Test 208 contains 4 pages)



NOTE: Variations of a few millileters in such dimensions as total height of flask, diameter of base, etc., are to be expected and will not be considered sufficient cause for rejection.

FIGURE 1 - FLASK FOR SPECIFIC GRAVITY TEST





