

**Standard Test Method for Density, Relative Density (Specific Gravity), and Absorption of Fine Aggregate  
 ASTM C128 – 15**

**APPARATUS / SECTION 6**

1. Balance / Clause 6.1

- a. One kg capacity, sensitive to 0.1 g or less, and accurate to within 0.1% of test load at any point within the range of use ..... \_\_\_\_\_
- b. Difference between readings shall be accurate within 0.1 g..... \_\_\_\_\_

2. **Volumetric Flask** or Fruit Jar / Clause 6.2

- a. **Volumetric flask** of 500-cm<sup>3</sup> capacity ..... \_\_\_\_\_
- b. Fruit jar fitted with a pycnometer top (for 500-g test sample) ..... \_\_\_\_\_

Note: Determine mass of Flask filled to its calibrated capacity with water at 23.0 ± 2.0°C.

3. Mold / Clause 6.4

- a. Metal in the form of a frustum of a cone..... \_\_\_\_\_
  - 40 ± 3 mm - inside diameter at top ..... \_\_\_\_\_
  - 90 ± 3 mm - inside diameter at bottom ..... \_\_\_\_\_
  - 75 ± 3 mm – in height ..... \_\_\_\_\_

4. Tamper / Clause 6.4

- a. Metal tamper ..... \_\_\_\_\_
  - 340 ± 15 g ..... \_\_\_\_\_
  - Flat circular tamping face / 25 ± 3 mm in diameter ..... \_\_\_\_\_

5. Oven / Clause 6.5

- a. Capable of maintaining a uniform temperature of 110 ± 5.0°C (230 ± 9.0°F) .... \_\_\_\_\_

**SAMPLING / CLAUSE 7.1**

- a. Sample obtained in accordance with Practice D 75? ..... \_\_\_\_\_

**SAMPLE PREPARATION / SECTIONS 7 & 8**

- a. Thoroughly mix sample and reduce it in accordance with ASTM C702 to approx. 1 kg (Section 7)..... \_\_\_\_\_
- b. Sample placed into a suitable pan and oven dried at temperature of 110 ± 5.0°C? ..... \_\_\_\_\_
- c. Allow sample to cool then cover with water for 24 ± 4 h or alternatively add 6% moisture to the fine aggregate and let stand for 24 ± 4 h? ..... \_\_\_\_\_

Note: Seal or protect material to prevent evaporation during the 24 ± 4 h waiting period after adding 6% moisture.

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**SAMPLE PREPARATION / SECTION 8.0 (CONTINUED)**

Note: Determinations based on relative density of material with the P/75µm particles having been removed (ASTM C117) prior to testing, more accurately reflects the relative density of the material. Refer to C128/ Appendixes X1.1. for further details.

- d. Decant water carefully to avoid loss of fines? ..... \_\_\_\_\_
- e. Spread material on a flat nonabsorbent surface? ..... \_\_\_\_\_
- f. Material exposed to a current of warm air and stirred frequently to maintain homogeneous drying?  
..... \_\_\_\_\_
- g. SSD condition also achieved by tumbling or stirring with the use of mechanical aids or by  
the use of a suitable stainless steel pan having a large surface area  
and high walls to prevent loss of material? ..... \_\_\_\_\_
- h. Continue operation until material approaches a free-flowing condition? ..... \_\_\_\_\_
- i. Hold mold firmly on a smooth nonabsorbent surface (upright like a pyramid)? ..... \_\_\_\_\_
- J. With the other hand, fill the mould with the partially dried FA to overflowing? ... \_\_\_\_\_
- k. Lightly drop the tamper from approximately 5 mm above the top surface of  
the mold onto the fine aggregate 25 times? ..... \_\_\_\_\_
- l. Starting height adjusted to the new surface elevation after each drop – distribute  
the drops evenly over the surface? ..... \_\_\_\_\_
- m. Remove material from the base and vertically lift the mold? ..... \_\_\_\_\_
- n. Test complete if slight slumping occurs (SSD condition) – if not, continued the mixing procedure  
followed by the tamping procedure until SSD is achieved? ..... \_\_\_\_\_
- o. Material dried past SSD – followed procedure indicated in clause 8.2? ..... \_\_\_\_\_
- p. For material that does not readily slump followed procedure indicated in clause 8.3 and Note 2  
(ASTM C128)? ..... \_\_\_\_\_

**PROCEDURE / SECTION 9**

Gravimetric (Pycnometer) Procedure / Clause 9.2

- a. Partially filled pycnometer (500-cm<sup>3</sup> flask) with water at approx. 23.0 ± 2.0°C? \_\_\_\_\_
- b. Introduce 500 ± 10 g of SSD material followed by additional water at approx.  
90% of capacity? ..... \_\_\_\_\_
- c. Agitate flask manually or mechanically to eliminate visible air bubbles? ..... \_\_\_\_\_

Note 3:

- Avoid degradation of material when agitating mechanically.
- Mechanical to be compared with manual for each six-month period of use – Refer to  
clause 9.2.1.2 for details.
- d. Air bubbles eliminated, temperature of flask and contents adjusted to 23.0 ± 2.0°C by partial  
immersion in water, if necessary? ..... \_\_\_\_\_
- e. Water level brought to calibration capacity in flask? ..... \_\_\_\_\_
- f. Dry flask with absorbent cloth or paper towel, then determine total mass of flask, specimen and  
water? ..... \_\_\_\_\_
- g. Empty sample from flask, dry in oven at 110 ± 5.0°C (230 ± 9.0°F)? ..... \_\_\_\_\_
- h. Remove from oven and cool in air at room temp. for 1 ± ½ h, and determine  
mass? ..... \_\_\_\_\_

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**CALCULATIONS / SECTION 10**

- a. Calculate Relative density (specific gravity) (OD) of oven dried sample? ..... \_\_\_\_

Example: Relative Density (specific gravity) (OD) =  $A/(B + S - C)$  Where:

- A = Mass of oven-dry test sample in air, g.
- B = Mass of pycnometer (flask) filled with water, to calibration mark, g
- C = Mass of pycnometer filled with specimen and water to calibration mark, g
- S = Mass of saturated-surface-dry sample, g

- b. Calculate Relative density (specific gravity) (SSD) – Saturated Surface Dry? ... \_\_\_\_

Example: Relative Density (specific gravity) (SSD) =  $S/(B + S - C)$

- c. Calculate Apparent Relative Density (apparent specific gravity)? ..... \_\_\_\_

Example: Apparent Relative Density (apparent specific gravity) =  $A/(B + A - C)$

- d. Calculate % of Absorption

Example: Absorption, % =  $100 [(S - A)/A]$

**REPORTING / SECTION 11**

- a. Report Relative Density to the nearest 0.01? ..... \_\_\_\_
- b. Report Absorption to the nearest 0.1%? ..... \_\_\_\_

**COMMENTS**

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