Performance Examination - Aggregate

Standard Test Method for Uncompacted Void Content of Fine Aggregate (as Influenced by Particle Shape, Surface Texture, and Grading) (ASTM C1252-17)

Candidate Name: _____ **NICET ID:** _____

Apparatus	Trial 1	Trial 2
Scale or Balance Accurate and readable to ± 0.1 g		
Cylindrical Measure Approximately 100-ml capacity Volume calculated to nearest 0.1 ml Inside diameter approximately 39 mm, inside height approximately 86 mm Water tube made of copper, bottom at least 6 mm thick and firmly sealed to tubing Bottom provided with means for aligning the axis of a cylinder with an axis of the funnel Calibrated according to Section 8 with freshly boiled, deionized water at 18 °C to 24 °C		
Funnel The lateral surface of a right frustum of a cone sloped 60 ± 4° from the horizontal Made of metal, smooth on the inside and at least 38 mm high Opening diameter 12.7 ± 0.6 mm At least 200 ml capacity or provided with a supplemental glass or metal container to increase the volume Round, straight steel rod approximately 600 mm (24 in.) long 16 mm (⅝ in.) in diameter with hemispherical tip		
Funnel Stand 3- or 4-legged and holds funnel firmly in position Aligns funnel with axis of cylindrical measure (within a 4° angle and a displacement of 2 mm) Funnel opening 115 ± 2 mm above the top of the cylinder		
Glass Plate For calibration of measure, at least 4 mm thick, approximately 60 by 60 mm		
Flat Metal or Plastic Pan Sufficient size to contain the funnel stand and to prevent loss of material when filling the measure, and sufficiently flat to remain steady during testing		
Metal Spatula The straight edge of blade approximately 100 mm long and at least 20 mm wide End cut at right angle to edges		

Procedures	Trial 1	Trial 2
Sampling		
1. The sample obtained by splitting and quartering (C702), sieve analysis (C136), or from an extraction sample		
Methods A and B		
1. Sample washed over 150-µm (No. 100) or 75-µm (No. 200) sieve in accordance with C117		

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2. Sample dried and sieved into separate size fractions in accordance with C136				
Procedures (continued)			**Trial 1**	**Trial 2**
3. Size fractions maintained in a dry condition in separate containers for each size				
Method C				
A split of the as-received sample dried in accordance with the drying procedure of C136				
Sample Preparation				
Method A – Standard Graded Sample Aggregate combined according to the following table:				
Individual Size Fractions	**Mass, g**			
2.36 to 1.18 mm (No. 8 to No.16)	44 ± 0.2			
1.18 mm to 600 µm (No. 16 to No. 30)	57 ± 0.2			
600 to 300 µm (No. 30 to No. 50)	72 ± 0.2			
300 to 150 µm (No. 50 to No. 100)	17 ± 0.2			
TOTAL	190 ± 0.8			
Method B – Individual Size Fractions 3 separate 190-g samples of aggregate tested according to the following table:				
Individual Size Fractions	**Mass, g**			
2.36 to 1.18 mm (No. 8 to No. 16)	190 ± 1			
1.18 mm to 600 µm (No. 16 to No. 30)	190 ± 1			
600 to 300 µm (No. 30 to No. 50)	190 ± 1			
Method C – As-Received Grading Sample (dried in accordance with C136) passed through 4.75-mm (No. 4) sieve a 190 ± 1g sample of material passing the 4.75-mm (No. 4) sieve obtained				
Relative Density (Specific Gravity) of Fine Aggregate				
If bulk dry specific gravity of aggregate from the source is unknown, specific gravity determined on material passing 4.75-mm (No. 4) sieve in accordance with C128. This value used in subsequent calculations unless some size fractions differ by more than 0.05 from the specific gravity typical of the completed sample (in which case the specific gravity of the fraction(s) being tested must be determined).				
If Relative Density (Specific Gravity) Differences Exceed 0.05				
1. The specific gravity of the individual 2.36-mm (No. 8) to 150-µm (No. 100) sizes determined for use with Method A or the individual size fractions for use with Method B				

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2. Specific gravity determined by direct measurement or by calculation using specific gravity data on gradings with and without the size fraction of interest		
Procedures (continued)	**Trial 1**	**Trial 2**
1. Each test sample mixed with a spatula until it appears to be homogeneous		
2. Jar and funnel section positioned in the stand and cylindrical measure centered		
3. Finger used to block the opening of funnel while test sample is poured into the funnel		
4. The material in funnel leveled with a spatula		
5. Finger removed and the sample allowed to fall freely into a cylindrical measure		
6. Excess heaped aggregate rapidly struck off from the cylindrical measure by a single pass of a spatula		
7. Spatula used with the blade width vertical and used the straight part of its edge in light contact with both sides of the top of the measure		
8. Care used to avoid any disturbance that could cause compaction of aggregate into a cylindrical measure		
9. Adhering grains brushed from outside of the container		
10. Mass of cylindrical measure and contents determined to nearest 0.1 g		
11. All aggregate particles retained and recombined for a second test run		
12. Sample from retaining pan and cylindrical measure recombined and the procedure repeated		
13. Mass of empty measure recorded		

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Calculation	Trial 1	Trial 2
Uncompacted voids for each determination calculated as follows: $$U = \frac{V - (F/G)}{V} \times 100$$ V = volume of cylindrical measure, ml F = mass of aggregate in measure G = bulk dry specific gravity of aggregate U = uncompacted voids in material, % For Methods A and C: average uncompacted voids determined For Method B: average uncompacted voids for each size fraction determined and mean determined		

First Attempt: Pass: _____ Fail: _____ **Second Attempt:** Pass: _____ Fail: _____

Exam Administration: Remote _____ In-Person _____

Comments:

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