

Concrete Strength Testing Technician Study Guide

ASTM C 617 – CAPPING CYLINDRICAL CONCRETE SPECIMENS

1. Neat cement caps and high-strength gypsum-plaster shall be formed against a glass plate at least _____ in. thick, a machined metal plate at least _____ in. thick, or a polished plate of granite or diabase at least _____ in. thick. (Section 4.1)
2. The recessed area which receives molten sulfur shall not be deeper than _____ in. (Section 4.1)
3. In all cases, plates shall be at least _____ in. greater in diameter than the test specimen and the working surfaces shall not depart from a plane by more than _____ in _____ inches. (Section 4.1)
4. Guide bars or bull's-eye levels, shall be used in conjunction with capping plates to ensure that no single cap will depart from perpendicularity by more than _____°. (Section 4.2)
5. Pots used for melting sulfur mortars shall be equipped with _____ and shall be made of metal or lined with a material that is non-reactive with sulfur mortar. (Section 4.3)
6. The flash point of sulfur is approximately _____ °F therefore heating over an open flame is dangerous. (Section 4.3.1.1)
7. Use sulfur melting pots in a _____ to exhaust the fumes to the outdoors. (Section 4.3.1.1)
8. The compressive strength of capping materials shall be determined using _____ in. cubes. (Section 5.1.3)
9. The strength of capping material shall be determined on receipt of a new lot and at intervals not exceeding _____ months. (Section 5.1.4)
10. Qualification tests of neat hydraulic cement paste are used to establish the effects of the _____ - _____. (Section 5.2.1)
11. Mix the neat cement gypsum paste at the desired water-cement ratio and use it _____ since it sets _____. (Section 5.3.2)
12. Laboratory prepared sulfur mortars are permitted if allowed to harden a minimum of _____ hours before testing concrete with strength less than _____ psi. (Section 5.4.1)

13. Sulfur mortar must be allowed to harden a minimum of _____ hours before testing concrete strengths of _____ psi or greater. (Section 5.4.1)
14. Use only _____ to cap freshly molded cylinders. (Section 6.1)
15. Capping plates may be coated with a thin layer of _____ or _____ to prevent the capping material from adhering to the surface of the plate. (Section 6.2.1)
16. The distance of any point on the end of a hardened cylinder shall not exceed _____ in. from a plane that passes through the highest point and that is perpendicular to the axis of the cylinder. (Section 6.2.2)
17. Prepare sulfur mortar for use in capping by heating to a temperature between _____ to _____ °F. (Section 6.2.4)
18. Empty the pot and recharge with fresh material to ensure that the oldest material in the pot has not been used more than _____ times. (Section 6.2.4)
19. It is not permitted to reuse recovered capping compound when capping cylinders with a compressive strength of _____ psi or greater. (Section 6.2.4)
20. Check the temperature at approximately _____ intervals during capping. (Section 6.2.4)
21. The capping plate or device shall be warmed before use to _____ and _____. (Section 6.2.4)
22. The ends of moist cured specimens shall be dry enough to preclude the formation of steam or foam pockets larger than _____ in. in diameter. (Section 6.2.4)
23. During each day's capping operation, check the _____ on at least _____ specimens prior to compression testing. (Section 6.2.5.1)
24. Planeness of the sulfur caps shall be determined by making a minimum of _____ measurements across three _____ to ensure that the surface of the caps do not depart from a plane by more than _____ in. (Section 6.2.5.1)
25. During each day of compression testing, check the _____ of caps on at least _____ specimens. (Section 6.2.5.2)

26. To check cap thickness, after completing the compression test, recover at least _____ pieces of the capping material from the selected specimen and measure and record the thickness to the nearest _____ in. (Section 6.2.5.2)

ASTM C 1231 – USE OF UNBONDED CAPS IN DETERMINATION OF COMPRESSIVE STRENGTH OF HARDENED CONCRETE SPECIMENS

27. Use of unbonded caps below _____ psi or above _____ psi is not permitted. (Section 1.2)

28. Pads shall be _____ ± _____ in. thick and the diameter shall not be more than _____ in. smaller than the inside diameter of the ring. (Section 5.2.1)

29. Pads shall be made from _____. (Section 5.2.2)

30. Elastomeric pads shall be supplied with the following information: _____ (Section 5.2.4.1)
_____ (Section 5.2.4.2)
_____. (Section 5.2.4.3)

31. The user shall maintain a record indicating the date the pads are _____,
and _____. (Section 5.2.5)

32. The height of the retaining ring shall be _____ in. (Section 5.3)

33. The inside diameter of the retaining ring shall not be less than _____ % or greater than _____ % of the diameter of the cylinder. (Section 5.3)

34. The surface of the base plate of the retainer, that contacts the machine bearing block, shall be plane to within _____ in. (Section 5.3)

35. On the ends of a cylinder to be tested, depressions under a straight edge, measured with a round wire gage shall not exceed _____ in. (Section 6.2)

36. For an anticipated cylinder strength of 3500 psi, the correct pad durometer used could be _____ or _____. (Table 1)

37. The maximum number of reuses allowed on a neoprene pad durometer of 70 that will be testing concrete in the range of 4000 to 7000 psi is _____. (Table 1)

38. Replace pads that do not meet the _____ of Section 5.2 or that exceed the maximum number of reuses in _____. (Section 7.2)

39. Complete testing of unbonded capped specimens according to Test Method _____ . (Section 7.3)
40. When tests are to be made to establish a permissible number of *reuses* exceeding those in Table 1, only those reuses which are within _____ psi of the highest strength level to be qualified will be included in reuse count. (Section 8.4.2)
41. When testing for qualification or pad reuse, a minimum of _____ of cylinders shall be made at the _____ and _____ strength levels desired or anticipated. (Section 8.5.2)

ASTM C 39 – COMPRESSIVE STRENGTH OF CYLINDRICAL CONCRETE SPECIMENS

42. This test method is limited to concretes with a unit weight in excess of _____ lb/ft³. (Section 1.1)
43. The results of this test method are used as a basis for _____ of concrete proportioning, _____, and placing operations. (Section 5.3)
44. Testing machines must be verified as follows:
- Within _____ months of last calibration (Section 6.1.1.1),
 - On original _____ or immediately after relocation (Section 6.1.1.2),
 - Immediately after making _____ or _____ (Section 6.1.1.3),
 - Whenever there is a reason to suspect the _____ of the indicated loads. (Section 6.1.1.4)
45. When checking for accuracy, the percentage of error for loads within the proposed range of the testing machine, shall not exceed _____ % of the indicated load. (Section 6.1.3.1)
46. The report on the _____ of the testing machine shall state within what _____ range it was found to conform. (Section 6.1.3.4)
47. Bearing faces shall have dimensions at least _____ % greater than the nominal diameter of the specimen. (Section 6.2.2)
48. Except for the concentric circles, the bearing faces of the testing machine shall not depart from a plane by more than _____ in. (Section 6.2.3)

49. The upper bearing block shall be _____ and the center of the sphere shall coincide with the center of the bearing face within _____ % of the radius of the sphere. (Section 6.2.4.1)
50. The maximum diameter of the bearing face of the suspended spherically seated block shall not exceed _____ inches for a 6 inch diameter test specimen. (Section 6.2.4.6)
51. For a specimen that is _____ inches in diameter, the maximum diameter of the bearing face of the suspended spherically seated block shall not exceed 6.5 inches. (Section 6.2.4.6)
52. At least every _____ months, or as specified by the manufacturer, clean and lubricate the curved surface of the socket and of the spherical portion of the machine. (Section 6.2.4.8)
53. The lower bearing block shall be at least _____ in. thick when new, and _____ in. after any resurfacing. (Section 6.2.5.3)
54. If spacers are used, the spacers shall be placed under the _____ bearing block and shall be made of _____. (Section 6.3 & 6.3.1)
55. If the load of a compression machine used in concrete testing is registered on a dial, the dial shall be equipped with a graduated scale that is readable to the nearest _____ % of the full scale load. (Section 6.4.3)
56. If the testing machine load is indicated in digital form, the numerical increment shall not exceed _____ % of the full scale load of a given loading range. (Section 6.4.4)
57. Specimens shall not be tested if any individual diameter of a cylinder differs from any other diameter of the same cylinder by more than _____ %.
(Section 7.1)
58. Prior to testing, neither end of the test specimen shall depart from perpendicularity to the axis by more than _____°. (Section 7.2)
59. Any end of a test specimen that is not plane to within _____ in. shall be _____ or ground to meet that tolerance or _____.
(Section 7.2)
60. The diameter used for calculating the cross-sectional area of the specimen, shall be determined to the nearest _____ in. by averaging two diameters measured at _____ to each other at about the midheight of the specimen. (Section 7.2)

61. The number of individual cylinders measured to be used for determining average diameter is not prohibited from being reduced to one for each _____ or _____ per day, whichever is greater, provided they are from a single lot of molds and consistently produce average diameters within a range of _____ in. (Section 7.3)
62. If the purchaser requests a density measurement, the length of the specimen is measured to the nearest _____ in. at _____ locations spaced evenly around the specimen circumference. (Section 7.4.1)
63. Test specimens shall be tested in a _____ condition. (Section 8.2)
64. The permissible time tolerance on a specimen that is to be tested at 28 days is _____ hours. (Section 8.3)
65. Wipe clean the _____ of the upper and lower bearing blocks, spacers if used, and of the specimen. (Section 8.4)
66. Align the axis of the specimen with the _____ of _____ of the upper block. (Section 8.4)
67. Prior to testing, verify that the load indicator is set to _____. (Section 8.4.1)
68. Prior to applying the load on the specimen, _____ the movable head of the _____ gently by hand so that it appears parallel to the top of the test specimen. (Section 8.4.1)
69. If using unbonded caps, after application of the load, but before reaching _____% of the anticipated specimen strength, check to see that the axis of the cylinder does not depart from vertical by more than _____°. (Section 8.4.2)
70. The load applied shall be at a rate of movement corresponding to a stress rate on the specimen of _____ psi/s. (8.5.1)
71. During application of the first half of the anticipated loading phase, a _____ rate of loading shall be permitted. (Section 8.5.2)
72. When specimen has a length to diameter ratio of 1.50, a correction factor of _____ will be multiplied by the compressive strength results. (Section 9.2)
73. Report the _____ number, average measured _____, and maximum _____. Report the compressive strength to the nearest _____ psi and note the type of _____. Report the _____ of specimen at time of testing. (Section 10.1. through 10.1.9)

**ASTM C 78 – FLEXURAL STRENGTH OF CONCRETE
(USING SIMPLE BEAM WITH THIRD-POINT LOADING)**

74. The ratio of the horizontal distance between the point of application of the load and the point of application of the nearest reaction to the depth of beam measured shall be _____ (Section 5.2.2)
75. The load applying and support blocks should not be more than _____ in. high, measured from the center of the axis or pivot. (Section 5.2.3)
76. The test specimen shall have a test span within _____% of being three times the depth as tested. (Section 6.1)
77. Surface drying of the specimen before testing will result in a _____ of the measured flexural strength. (Section 7.1, Note 3)
78. When testing molded specimens, turn the specimen on its _____ with respect to its position as molded. (Section 7.2)
79. Apply between _____ and _____ % of the estimated load before checking the specimen for gaps with the feeler gages. (Section 7.2)
80. When checking for gaps, if there is a gap greater than _____ in. over a length of _____ inch but less than _____ in. over a length of one inch, then the specimen may be _____, _____, or _____.
(Section 7.2)
81. If leather shims are to be used to eliminate gaps, they must be a uniform _____ in. thickness and shall extend across the _____ width of the specimen. (Section 7.2)
82. If there is a gap that is greater than the _____ in. feeler gage over an inch, the only acceptable methods to eliminate the gap is by _____ or _____.
(Section 7.2)
83. The load shall be applied at a constant rate to increase the maximum stress on the tension face between _____ and _____ psi/min. (Section 7.3)
84. The specimen shall be loaded _____ and _____
_____. (Section 7.3)
85. To determine the dimensions of the specimen after completion of testing, take _____ measurements across the width and depth to the nearest _____ in. and average. (Section 8.1)