



# Performance Examination - Concrete

## Standard Method of Test for Compressive Strength of Cylindrical Concrete Specimens (AASHTO T22-17) (ASTM C39 / C39M-18)

Candidate Name: \_\_\_\_\_ NICET ID: \_\_\_\_\_

Apparatus	Trial 1	Trial 2
<b>Testing Machine</b> Verify calibration of the testing machines in accordance with Practices E4, within 13 months of the last calibration.		
Documentation of the calibration and maintenance of the testing machine shall be in accordance with Practice C1077. The machine must be power operated and must apply the load continuously rather than intermittently, and without shock.		
The testing machine shall be equipped with two steel bearing blocks with hardened faces, one of which is a spherically seated block that will bear on the upper surface of the specimen, and the other a solid block on which the specimen shall rest.		
<b>Bearing Blocks</b> Bearing faces of the blocks shall have a minimum dimension of at least 3% greater than the diameter of the specimen to be tested.		
Except for the concentric circles, the bearing faces shall not depart from a plane by more than 0.001 in. (0.02 mm) in any 6 in. (150 mm) Of blocks 6 in. (150 mm) in diameter or larger, or by more than 0.001 in. (0.02 mm) in the diameter of any smaller block. New blocks shall be manufactured within one half of this tolerance. When the diameter of the bearing face of the spherically seated block exceeds the diameter of the specimen by more than 0.5 in. (13 mm), concentric circles not more than 0.03 in. ( 0.8 mm) deep and not more than 0.04 in. (1 mm) wide shall be inscribed to facilitate proper centering.		
The bottom bearing block is specified for the purpose of providing a readily machinable surface for maintenance of the specified surface conditions. The top and bottom surfaces shall be parallel to each other. If the testing machine is so designed that the platen itself is readily maintained in the specified surface condition, a bottom block is not required. Its least horizontal dimension shall be at least 3% greater than the diameter of the specimen to be tested. Concentric circles are optional on the bottom block.		
Final centering must be made concerning the upper spherical block. When the lower bearing block is used to assist in centering the specimen, the center of the concentric rings, when provided, or the center of the block itself must be directly below the center of the spherical head. Provision shall be made on the platen of the machine to assure such a position.		
The bottom bearing block shall be at least 1 in. (25 mm) thick when new and at least 0.9 in. (22.5 mm) thick after any resurfacing operations.		
At least every six months, or as specified by the manufacturer of the testing machine, clean and lubricate the curved surfaces of the socket and of the spherical portion of the machine. The lubricant shall be a petroleum-type oil such as conventional motor oil or as specified by the manufacturer of the testing machine.		

Examiner Name: \_\_\_\_\_ Examiner Signature: \_\_\_\_\_ Date: \_\_\_\_\_



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Procedures	Trial 1	Trial 2
1. Remove specimen from moist storage but keep moist.		
2. Check specimen for perpendicularity (less than 0.5°) to the axis and planeness (0.002 in.) of ends		
3. Determine diameter to nearest 0.01 in. by averaging two diameters measured at right angles to each other at about mid-height of the specimen.		
4. Wipe clean the bearing faces of the upper and lower bearing blocks and of the test specimen.		
5. Place test specimen on the lower bearing block.		
6. Align the axis of the specimen with the center of thrust of the top (spherically seated) block.		
7. Verify that the load indicator is set to zero.		
8. Before applying the load on the specimen, tilt the movable portion of the spherically seated block gently by hand so that the bearing face appears to be parallel to the top of the test specimen.		
9. Verify the alignment of the specimen after application of load, but before reaching 10% of the anticipated specimen strength.		
10. Check to see that the axis of the cylinder does not depart from vertical by more than 0.5° and the ends of the cylinder are centered within the retaining rings.		
11. Apply load continuously and without shock, at a rate of movement corresponding to a stress rate of 35 ± 7 psi/sec, during the latter half of the anticipated loading phase.		
12. Not adjust the rate of movement as the ultimate load is being approached and the stress rate decreases due to cracking.		
13. Apply the load until complete failure occurs and the specimen displays a well-defined fracture pattern.		
14. Record maximum load.		
15. Note the type of fracture pattern.		
16. Calculate the compressive strength and report with required precision according to T 22.		

First Attempt: Pass: \_\_\_\_\_ Fail: \_\_\_\_\_ Second Attempt: Pass: \_\_\_\_\_ Fail: \_\_\_\_\_

**Comments:**

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Examiner Name: \_\_\_\_\_ Examiner Signature: \_\_\_\_\_ Date: \_\_\_\_\_