

CALIFORNIA COUNCIL OF TESTING & INSPECTION AGENCIES

Laboratory Internal Auditing ASTM C39

Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens

Company Name:	Company Address:
Telephone No.:	
Completed by:	Signature:

This test method covers determination of compressive strength of cylindrical concrete specimens such as molded cylinders and drilled cores by applying a compressive axial load at a rate which is within a prescribed range until failure occurs. The compressive strength of the specimen is calculated by dividing the maximum load attained during the test by the cross-sectional area of the specimen. It is limited to concrete having a unit weight in excess of 50 psf.

1.00 PERSONNEL	Ref	Yes	No	N/A	Comments
1.1 Has the individual testing concrete cylinders demonstrated a knowledge and ability to perform the test procedure equivalent to the minimum guidelines for certification of Concrete Laboratory Technician, Level I in accordance with ACI-CP16?	4.4				
1.2 How does the agency ensure that the training of its personnel is kept up-to-date?	E329 7.1.1				
1.3 Does the agency maintain records of relevant certifications, qualifications, training, skills and experience of the technical staff?	E329 7.1.2				
1.4 Does the laboratory supervisor have at least five years of experience performing the relevant test method?	E329 7.2.2				
1.5 Has the laboratory supervisor demonstrated a knowledge and ability to perform the test procedure equivalent to the minimum guidelines for certification of Concrete Laboratory Technician, Level II?	E329 7.2.2				

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2.00 APPARATUS	Ref	Yes	No	N/A	Comments
2.1 Has the testing machines been calibrated within the past 12 months?	5.1.1.1	*			
2.1.1 Ask the operator if he has any question about the machines accuracy and if he has acted upon his doubt?	5.1.1.4		*		
2.2 Has the testing machines been moved within the past 12 months?	5.1.1.2				
2.3 Is the testing machine power operated and capable of applying a continuous load?	5.1.2.1	*			
2.4 Does the verification report for the testing machine state what loading range it was found to conform to specifications?	5.1.3.4	*			
2.5 Does the indicated load of a testing machine require correction by calculation or calibration diagram?	5.1.3.6		*		
2.6 Do the bearing blocks depart from plane by more than	5.2	*			

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0.001 inch in any 6 inches?					
2.7 Is the bottom-bearing block at least 0.9 inches thick?	5.2.1.3	*			
2.8 Is the ball and socket of the top bearing clean and well oiled? What type of lubrication was used?	5.2.2.4	*			Motor Oil (yes <input type="checkbox"/> no <input type="checkbox"/>)
2.9 Can the top bearing face be rotated freely and tilted at least 4 degrees in any direction?	5.2.2.6	*			
2.10 DIAL MACHINE Only - Is the dial readable to at least the nearest 0.1% of the full-scale load?	5.3.1	*			
2.11 DIGITAL MACHINE Only - Are the numerical increments equal to or less than 0.10% of the full-scale load of a given loading range?	5.3.2	*			
2.12 Has the calipers been calibrated within the past 12 months? <input type="checkbox"/> In-house <input type="checkbox"/> Calib. Agency					

3.00 SPECIMENS	Ref	Yes	No	N/A	Comments
3.1 If any individual diameter of a cylinder differs from any other diameter of the same cylinder by more than 2% (0.12" for 6 x 12) does the technician discard the cylinder?	6.1	*			
3.2 Does the technician check the specimen for perpendicularity? What is the max. he allows?	6.2	*			Approx. 0.12" in 12"
3.3 Does the technician use the average of two diameters (to the nearest 0.01") measured at right angles to each other at about midheight of the specimen.	6.2	*			
3.4 If the technician is measuring diameters at a reduced frequency. What is the frequency?	6.3				One in ten, min 3/day
3.5 If the cylinders are not made from a single lot of molds, how does the frequency change?	6.3				
3.6 When a reduced frequency is used for measuring cylinder diameters is the cross-sectional area computed based on the average of the diameters of the cylinders representing the group tested that day?	6.3				

4.00 PROCEDURE	Ref	Yes	No	N/A	Comments
4.1 Are the specimens kept in a moist condition once removed from the curing facility?	7.1				
4.2 Are the specimens in a moist condition when tested?	7.2				
4.3 Is the 7 day strength test performed within ±6 hours?	7.3				
4.4 Is the 28day strength test performed within ± 20 hours	7.3				
4.5 Did the technician verify that the load indicator was set to zero prior to testing?	7.4.1				
4.6 Was the spherically seated block rotated for uniform seating just prior bearing on the specimen?	7.4.1				
4.7 Was the loading rate within 20 to 20 psi/s?	7.5.1				
4.8 Did the technician maintain the loading until failure was recorded?	7.6				
4.9 Was the type of failure and the appearance of the concrete noted?	7.6				

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5.00 CALCULATIONS		Yes	No	N/A	Comments
5.1 Was the compressive strength calculated based on the average cross-sectional area as described in Section 3.6	8.1				
5.2 Has the compressive strength been expressed to the nearest 10 psi?	8.1				

6.00 REPORTS	Ref	Yes	No	N/A	Comments
6.1 Does the report contain the following information:	9.1				
6.1.1 Identification number					
6.1.2 Diameter (and length) if outside the range of 1.8D to 2.2D.					
6.1.3 Cross-sectional area					
6.1.4 Maximum load					
6.1.5 Compressive strength calculated to the nearest 10 psi					
6.1.6 Type of fracture, if other than the usual cone.					
6.1.7 Age of specimen.					
6.2 Does the report state that the test was performed in accordance with ASTM C39 and whether it passed or failed the specified strength requirement?		*			

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7.00 PRECISION & BIAS	Ref	Yes	No	N/A	Comments
7.1 Has the Proficiency Testing results been reviewed for operator and equipment performance?	C1077				
7.2 If the calipers mentioned in Section 2.12 are calibrated in-house has the precision been recalculated?					

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