

TESTING BASICS FOR FRESH PROPERTIES OF CONCRETE

- Obtain the sample in accordance with ASTM C 172.
- Once the individual samples are obtained from the middle portion of the load, remix to form a composite sample of at least 1 ft³ prior to testing (typically 2 ft³ - 3 ft³).
- Temperature, slump, and air must be started within 5 minutes of obtaining the final portion to make the composite sample.
- Casting of strength specimens must be started within 15 minutes of fabricating composite sample.
- As per ASTM C 94, field testing technician must be a certified technician in accordance with ASTM C 1077.
- All equipment must be pre-wet prior to testing, except for strength specimen molds and thermometers.
- All equipment must be calibrated at least at the frequency specified in the ASTM test methods, or whenever there is a question of accuracy.



SCAN FOR VIDEO
C 172

ASTM C 31

Concrete Test 4" x 8" Cylinders

(This procedure is for consolidation by rodding only with slump greater than or equal to 1" and coarse aggregate nominal maximum size of 1" or smaller. Vibration is required when slump is less than 1".)

- Fill cylinder in 2 equal layers.
- Rod each layer 25 times using a smooth 3/8" rod with rounded tip.
- Rod each layer throughout its depth and penetrate the underlying layer by approximately 1".
- After each rodding tap the side of the cylinder 10-15 times with a mallet to close holes or voids left by the rodding.
- Strike off the top using the tamping rod, handheld float or trowel to produce a flat, even surface.
- Cover the cylinders with plastic cap or plastic bag with rubber band to prevent moisture loss and mark the date, time, psi of concrete, and set number on the side of the test mold.
- Move no later than 15 minutes after molding to the place of initial curing.

ASTM C 31

Casting Flexural Beams

(This procedure is for consolidation by rodding only with slump greater than or equal to 1". Vibration is required when slump is less than 1".)

- Fill the mold in two equal layers with the second layer slightly overfilling the mold.
- Consolidate each layer with the tamping rod once for every 2 sq. inches using a smooth 3/8" rod with a rounded end. (Example: 60 roddings per layer for a 6" X 6" x 20" beam.)
- Rod each layer throughout its depth. Rod the second layer throughout its depth, penetrating approximately 1" into the underlying layer.
- After rodding each layer, strike the mold 10 to 15 times with a mallet to close any holes left by rodding.
- Spade along the sides and end using a trowel or other suitable tool.
- Strike off to a flat surface using a handheld float or trowel to produce a flat, even surface.
- Move no later than 15 minutes after molding to the place of initial curing.

ASTM C 31

Concrete Test 6" x 12" Cylinders

(This procedure is for consolidation by rodding only with slump greater than or equal to 1". Vibration is required when slump is less than 1".)

- Wet sieve out all aggregate larger than 2" through a 2" sieve.
- Fill cylinder in 3 equal layers.
- Rod each layer 25 times using a smooth 5/8" rod with rounded tip.
- Rod each layer throughout its depth and penetrate the underlying layer by approximately 1".
- After each rodding tap the side of the cylinder 10-15 times with a mallet to close holes or voids left by the rodding.
- Strike off the top using the tamping rod, handheld float or trowel.
- Cover the cylinders with plastic cap or plastic bag with rubber band to prevent moisture loss and mark the date, time, psi of concrete, and set number on the side of the test mold.
- Move no later than 15 minutes after molding to the place of initial curing.

ASTM C 31

Initial Curing of Strength Specimens

- Cure all strength specimens in an area that is level and free of vibration.
- For normal strength concrete, cure between 60° F and 80° F. For high strength concrete (6000 psi or greater), cure between 68° F and 78° F. Initial cure up to 48 hours.
- Record the minimum and maximum temperature during initial curing.
- Specimens shall not be transported until at least 8 hours after final set.
- Transport strength specimens in less than 4 hours to the lab by means not to damage them.
- Strip and label strength specimens immediately on reaching the lab and store in a lime-water bath or moist room.
- Begin final curing within 52 hours of casting the strength specimens at 70°F to 77°F with free water maintained on the surface until time of testing.



SCAN FOR VIDEO
C 31

ASTM C 1064

Concrete Temperature

- Composite sample is not required if the only purpose is to determine temperature, but sample must be a minimum of 1 ft³.
- Insert the thermometer into the concrete a minimum of 3", with 3" of concrete on all directions.
- Gently press concrete around thermometer, closing all air voids.
- Wait at least 2 minutes, but no more than 5 minutes.
- Read temperature before removing thermometer from concrete.
- Report to the nearest 1°F.

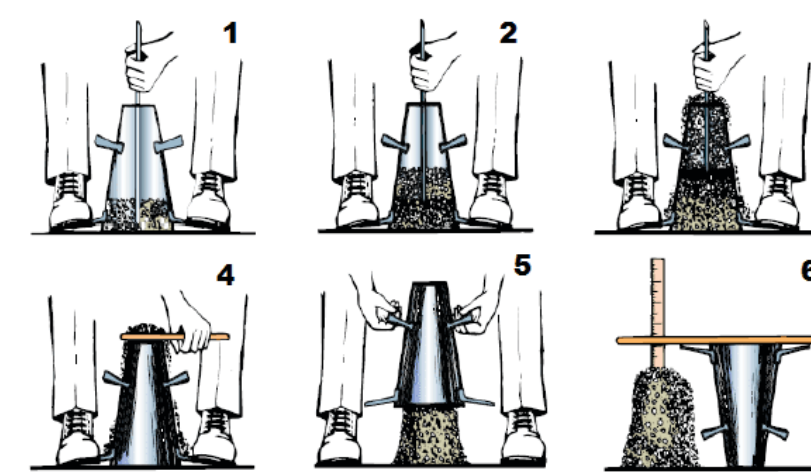


SCAN FOR VIDEO
C 1064

ASTM C 143

Slump Test

- Fill the slump cone in 3 equal layers by volume (heights of 2 5/8" for first layer and 6 1/8" for second layer).
- Rod each layer 25 times using a smooth 3/8" rod with rounded tip. Rod each layer throughout its depth and penetrate the underlying layer by approximately 1".
- When rodding the top layer, add additional concrete, if necessary, to maintain an excess above the top of the mold at all times.
- Strike off the top of the cone with the rod.
- Remove all excess material from the base of the mold.
- To aid in the determination of the displaced center, a small rock or coin may be placed in the center of the top surface before removing cone.
- With a steady upward lift, remove the mold in 3 to 7 seconds.
- Measure from the height of the inverted slump cone placed on the base plate (not on the ground beside the base plate), and measure from the bottom of the rod placed across the cone down to the displaced center of the top surface of the specimen.
- Report to the nearest 1/4".
- Must complete test in less than or equal to 2 1/2 minutes.



SCAN FOR VIDEO
C 143

GET CERTIFIED!

For more details, go to
www.MississippiConcrete.com

ASTM C 138

Concrete Density

(This procedure is for consolidation by rodding only with slump greater than or equal to 1" and a measure of a 1/2 cubic foot or less. Vibration is required when slump is less than 1".)

- Weigh the empty measure.
- Fill the measure in 3 equal layers.
- Rod each layer 25 times using a smooth 5/8" rod with rounded tip.
- Rod each layer throughout its depth and penetrate the underlying layer by approximately 1".
- After each rodding tap the side of the cylinder 10-15 times with a mallet to close holes or voids left by the rodding.
- Use a strike off plate to remove excess concrete.
- Clean off the flange and any concrete on the measure.
- Determine the full weight of the measure and concrete.
- Determine the net weight of the concrete by subtracting the empty measure weight from the full measure weight.
- Divide net weight by the measure volume.
- Report density to the nearest 0.1 lb/ft³.



SCAN FOR VIDEO
C 138

ASTM C 231

Concrete Air Test Pressure Method Type B Meter

Not suitable for lightweight or highly porous aggregate
(This procedure is for consolidation by rodding only with slump greater than or equal to 1". Vibration is required when slump is less than 1".)

- Fill the measure in 3 equal layers.
- Rod each layer 25 times using a smooth 5/8" rod with rounded tip.
- Rod each layer throughout its depth and penetrate the underlying layer by approximately 1".
- After each rodding tap the side of the cylinder 10-15 times with a mallet to close holes or voids left by the rodding.
- Use a strike off plate or a strike off bar to remove the excess concrete.
- Clean off the flange and any concrete on the measure.
- Attach the top of the air meter.
- Add water through one petcock until water emerges from the opposite petcock. Jar meter to remove all air bubbles.
- Pump air into the chamber to the initial pressure line, allowing a few seconds for the gauge to stabilize. If necessary, use the air bleeder valve and tap the gauge by hand to stabilize at the initial pressure line.
- Close both petcocks.
- Release the air and tap the sides of the measure smartly with the mallet.
- Stabilize the gauge by lightly tapping by hand. Read the percentage of air on the dial and release the air valve.
- Report total air to the nearest 0.1%.



SCAN FOR VIDEO
C 231