

# Concrete Field

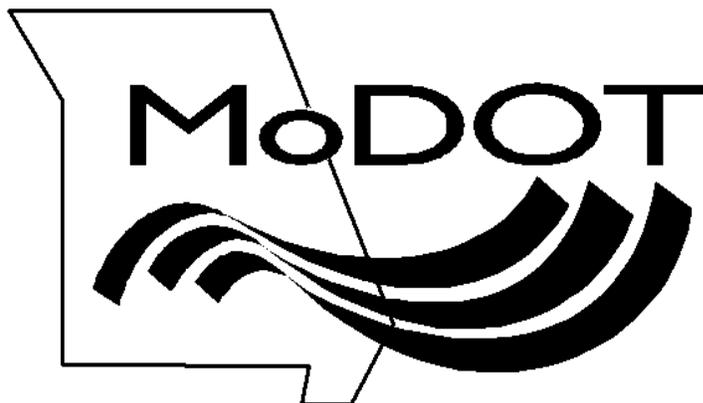
2022

## Proficiency Pack

Date: \_\_\_\_\_

Name: \_\_\_\_\_

Employer: \_\_\_\_\_



# MoDOT TM 20: Measurement of Air, Surface, and Asphalt Mixture Temperature PROFICIENCY CHECKLIST

Rev: 11/18/2019

Applicant: \_\_\_\_\_

Employer: \_\_\_\_\_

Trial #	1	2
Certificates or Report of Verification of Accuracy (Annual calibration) available?		
<b>AIR</b>		
1. Pick correct thermometer		
2. Location <ul style="list-style-type: none"> <li>- <i>Mercury, Digital, Max-Min thermometers</i></li> <li>- shade, no direct sunlight</li> <li>- position 4.5 feet above surface</li> <li>- safe location</li> </ul>		
3. Document to nearest 2° F		
<b>SURFACE</b>		
4. Pick correct thermometer		
5. Procedure <ul style="list-style-type: none"> <li>- <i>Spot Check Disc</i>; place on surface until needle stops moving</li> <li>- <i>Infrared</i>; follow manufacturer recommendations</li> <li>- <i>Mercury or Max-Min</i>; place under wooden box wait 5 minutes</li> <li>- <i>Digital</i> ; follow manufacturer recommendations</li> </ul>		
6. Document to nearest 2° F		
<b>ASPHALT MIXTURE</b>		
7. Pick correct thermometer		
8. Procedure <ul style="list-style-type: none"> <li>- <i>Infrared</i>; follow manufacturer recommendations</li> <li>- <i>Armored , BI-Therm Dial, or Digital</i>; place stem into mixture and wait until thermometer reading has stabilized</li> </ul>		
9. Document to nearest 5° F		

PASS    PASS

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Examiner: \_\_\_\_\_ Date: \_\_\_\_\_

**ASTM C 1064 Temperature of Freshly Mixed  
Hydraulic-Cement Concrete  
PROFICIENCY CHECKLIST**

Rev: 01/06/2020

Applicant: \_\_\_\_\_

Employer: \_\_\_\_\_

	Trial#	1	2
1.	Thermometer verified annually		
2.	Sensing portion of thermometer submerged a minimum of 3 inches into concrete		
3.	Concrete gently pressed around thermometer at surface of concrete		
4.	Thermometer left in concrete for at least 2 minutes but not more than 5 minutes		
5.	Read and reported the temperature to the nearest 1°F (0.5°C)		

PASS PASS

FAIL FAIL

Examiner: \_\_\_\_\_ Date: \_\_\_\_\_

# AASHTO R 60 Sampling Freshly Mixed Concrete PROFICIENCY CHECKLIST

Rev: 10/12/2021

Applicant: \_\_\_\_\_

Employer: \_\_\_\_\_

	Trial#	1	2
1. Checked for required equipment: Square nose shovel, scoop, sample container, testing equipment for Slump, Air-Content, Temperature, & Strength tests, safety equipment, PPE, tags, molds.			
2. Coordinated with the contractor about the operation of collecting samples and safety purposes			
3. Collected ticket information on the load, name of concrete plant, serial #, etc.			
4. Set-up a testing area with all testing equipment			
5. Waited until all additives and water were added and mixed into the load			
6. Collected the fresh sample(s) within 15 minutes from one of the following sources: <b>-Truck Mixed- Revolving Drum per MoDOT Method</b> *Discharged a minimum of 1 cubic yard * Diverted a discharge chute into a sample container Or Passed a receptacle completely through the discharge stream. *Collected enough fresh concrete to do all tests *Did not restrict the flow of concrete  <b>-Stationary Mixers</b> *Sampled at the middle of the batch *Obtained 2 or more portions at regular spaced intervals (combined to make composite sample) *Did not restrict flow *Collected enough fresh concrete to do all tests  <b>-Paving Mixers</b> at a paving operation *After the contents of the mixer have been discharged *Obtained samples from at least 5 locations (combined to make composite sample) *Collected enough fresh concrete to do all tests *Avoided contamination from subgrade			
7. Performed Wet-Sieving as needed (Except for concrete used for unit weight)			
8. Transported the composite sample to the testing area and remixed with a square nose shovel			
9. Within 5 minutes of mixing the composite sample started tests for Temperature, Air-Content, and Slump			
10. Started molding specimens for strength tests and completed all tests within 15 minutes of mixing the composite sample.			

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Examiner: \_\_\_\_\_ Date: \_\_\_\_\_

# AASHTO T 119

## Slump of Hydraulic Cement Concrete

### PROFICIENCY CHECKLIST

Rev: 01/06/2020

Applicant: \_\_\_\_\_

Employer: \_\_\_\_\_

Trial#	1	2
1. A Clean Slump Cone damped and placed on a moist, flat, level, nonabsorbent rigid surface		
2. Cone secured by clamps or by standing on foot pieces while filling the cone in three equal layers and while rodding		
3. Each layer approximately $\frac{1}{3}$ the volume of the mold		
4. Each layer rodded 25 times		
5. Layers rodded properly a. First layer rodded through entire depth while inclining the rod & spiraling toward center b. Second layer rodded approximately 1" into underlying layer c. Third layer was kept heaped above the cone while rodding approximately 1" into the underlying layer		
6. Used a tamping rod to strike off level with the top of the mold		
7. Cone filled and removed within 2 $\frac{1}{2}$ minutes		
8. Excess concrete cleaned away from the bottom of the mold and plate		
9. Movement/vibration of cone restricted until lift was performed		
10. Cone was lifted vertically without twisting, within 5 $\pm$ 2 seconds		
11. Immediately placed the mold upside-down next to the slumped concrete		
12. Placed the tamping rod on top of the cone, measured the vertical distance of the displaced original center of the slump to the rod		
13. Slump measured and recorded to the nearest $\frac{1}{4}$ inch		

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Examiner: \_\_\_\_\_ Date: \_\_\_\_\_

**AASHTO T 152**  
**Air content of freshly Mixed Concrete by Pressure Method**  
**PROFICIENCY CHECKLIST**  
 Rev: 01/06/2020

Applicant: \_\_\_\_\_

Employer: \_\_\_\_\_

Trial#	1	2
<b>General</b>		
1. Bowl dampened		
2. Bowl filled in three equal layers		
3. Each layer rodded 25 times		
4. After rodding each layer, bowl tapped 10 to 15 times with a mallet		
5. Excess concrete removed with sawing motion of strike-off bar		
<b>Type "B" Meter</b>		
1. flanges of bowl cleaned, and unit assembled		
2. Air valve between air chamber and bowl closed		
3. Using rubber syringe water injected through one petcock until water emerged from opposite petcock		
4. Meter jarred gently until all air was expelled		
5. Air pumped into chamber until gauge hand is on initial pressure line		
6. Waited a few seconds to allow for the gauge to stabilize at the initial pressure line.		
7. Initial pressure stabilized while tapping gauge lightly		
8. Petcocks closed. (Not before filling of air chamber, Step 5)		
9. Air valve between air chamber and measuring bowl opened		
10. Sides of measuring bowl tapped sharply		
11. Pressure gauge tapped lightly, and percentage of air read		
12. Air content of sample calculated as follows: Air content (%) = Apparent Air Content – Aggregate Correction Factor		
13. Aggregate correction factor determined for different aggregates		

PASS PASS

FAIL FAIL

Examiner: \_\_\_\_\_ Date: \_\_\_\_\_

**AASHTO R100 Making and Curing of Concrete Cylinder  
Specimens  
in the Field  
PROFICIENCY CHECKLIST**

Rev: 10/12/2021

Applicant: \_\_\_\_\_

Employer: \_\_\_\_\_

Trial#	1	2
Sampled concrete per AASHTO R60		
Conducted Slump, Air Content, and Temperature Tests a. Reported results.		
<b>Molding Cylinders</b>		
1. Each layer properly consolidated per results of Slump, AASHTO T119		
2. 4" x 8" Mold filled in 2 approx. equal layers (Vibrated = 2 layers)		
6" x 12" Mold filled in 3 approx. equal layers (Vibrated = 2 layers)		
3. Rod each layer 25 times a. 4" x 8", vibrator, one location per layer b. 6" x 12", vibrator, two locations per layer		
4. Mold tapped lightly 10 to 15 times after each layer		
5. Mold tapped with open hand for light gauge single use molds		
6. Cylinder finished using either a tamping rod, handheld float, or a trowel so that the specimen is level with the rim of the mold.		
7. Mold properly cleaned and sealed with cap		
8. Identification information written on the container		
9. Set up initial cure per AASHTO T23 at 60-80°F		
10. Reported all core information, temperatures, and curing information		

PASS PASS

FAIL FAIL

Examiner: \_\_\_\_\_ Date: \_\_\_\_\_

# AASHTO T 121M: Density (Unit Weight), Yield, and Air Content (Gravimetric) of Concrete

## PROFICIENCY CHECKLIST

(Rev. 01/07/2020)

Applicant \_\_\_\_\_

Employer \_\_\_\_\_

Trial #	1	2
<b>Standardize</b>		
1. Mass and volume of empty measure determined in yearly standardization. Note: As needed weigh the empty measure before testing.		
<b>Sample</b>		
2. Obtained sample in accordance with AASHTO R60.		
<b>Procedure</b>		
3. Determined which consolidation method to use, which size measure to use from the nominal maximum size of the aggregate, and which size mallet to use.		
4. Dampened the measure and place it on a flat, level, firm surface.		
5. Scooped representative sample of concrete into the measure, moving the scoop around the perimeter.		
<b>Consolidation</b>		
6. <b>For rodding</b> , measure filled in three equal layers.		
7. Rodded each layer with 25 or 50 strokes, depending on the volume of the measure used.		
8. Tapped 10 to 15 times after rodding each layer.		
9. Top layer filled to avoid overfilling.		
10. <b>For internal vibration</b> , measure filled in two equal layers.		
11. Vibrated each layer at three different points.		
12. Ensured proper consolidation achieved.		
<b>After Consolidation is Completed</b>		
13. Strike off top surface and finish smooth with flat cover plate.		
14. Exterior of measure cleaned, weighed, reported to nearest 0.1 lbs.		
15. Density (unit weight) calculated to nearest 0.1 lb./ft <sup>3</sup>		
16. When requested, report: Yield, Relative Yield, Cement Content, and Gravimetric Air Content.		

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Examiner: \_\_\_\_\_ Date: \_\_\_\_\_

# AASHTO T 196M: Air Content of Freshly Mixed Concrete by the Volumetric Method

## PROFICIENCY CHECKLIST

(Rev 01/07/2020)

Applicant \_\_\_\_\_

Employer \_\_\_\_\_

	Trial #	1	2
<b>Sample</b>			
1. Obtained sample in accordance with AASHTO R60			
<b>Procedure</b>			
2. Bowl filled in 2 layers			
3. Each layer rodded 25 times			
4. Bowl tapped (sharply) 10-15 times after rodding each layer			
5. Used funnel, water added, then alcohol added, then final water added until liquid level close to zero			
6. Funnel removed, adjusted the water to where the bottom of the meniscus is on zero			
7. Screw cap attached and tightened			
<b>Initial Reading</b>			
1. Unit inverted and agitated at 5 second intervals for a minimum of 45 seconds and until concrete is free from the base			
2. Unit vigorously rolled ¼ to ½ turn forward and back several times with base at a 45° angle, then turn base about ⅓ turn and rolling process resumed			
3. Meter checked for leaks; if leaking, test started over with a new sample			
4. Apparatus placed upright, cap loosened and allowed to stand until air rises to the top <ul style="list-style-type: none"> <li>a. Less than 0.25% change in 2 minutes (without excessive foam), initial reading recorded to the nearest 0.25%</li> <li>b. More than 6 minutes to stabilize or observed excessive foam, test discarded and new test ran?</li> </ul>			
<b>Confirmation of Initial Meter Reading</b>			
1. One-minute rolling repeated, and liquid level checked			
2. Confirmation reading is greater than 0.25% of initial, new meter reading recorded as new initial reading, repeat 1-minute rolling			
3. Level of liquid read less than 0.25% change; final meter reading recorded to nearest 0.25%			
4. Apparatus disassembled and checked for undisturbed concrete			
<b>Calculations</b>			
1. Correction factor from Table 1 subtracted for use of 2.5 pints or more of alcohol			
2. If required, number of calibration cups of water added to air content			
3. Air content reported to the nearest 0.25% air			

PASS    PASS

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Examiner: \_\_\_\_\_ Date: \_\_\_\_\_

# AASHTO T 23 Making and Curing of Concrete BEAM Specimens In the Field

## PROFICIENCY CHECKLIST

(Rev: 01/07/2020)

Applicant: \_\_\_\_\_

Employer: \_\_\_\_\_

Trial#	1	2
Sample concrete per AASHTO R 60		
Conducted Slump, Air Content, and Temperature Procedures a. Reported all results of these tests		
<b>Molding Beams – 6" x 6" Standard Size</b>		
1. Each layer properly consolidated per results of slump, AASHTO T 119		
2. Mold filled in 2 approximately equal layers (Vibrated = 1 layer)		
3. Rodded each layer every 2 square inches of surface area, into 1 inch of the layer below it a. If vibrator used, 1 insertion per layer, insert full depth at intervals of approximately 6 inches along the center line of the length of the mold alternating insertions between 2 lines		
4. Mold tapped lightly 10 to 15 times after each layer was rodded		
5. Beam finished using either a tamping rod, handheld float, or a trowel so that the specimen was level with the rim of the mold		
6. Identification, information written on the mold		
7. Beams cured the same as cylinders, except they are stored in water saturated with calcium hydroxide at 70-77°F at least 20 hours prior to testing		
8. Reported all beam information, temperatures, and curing information		
<b>Transportation</b>		
1. Waited at least 8 hours after final set to transport, protected specimens from the cold, moisture maintained, and did not exceed 4 hours of transport time		

PASS PASS

FAIL FAIL

Examiner: \_\_\_\_\_ Date: \_\_\_\_\_