

## IA Checklist

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

Procedure	P	F	NA
1 Obtain a sample of freshly mixed concrete in accordance with R 60.			
2 Dampen the inside of the bowl. Fill the bowl in 2 equal layers.			
3 Rod each layer 25 times. When rodding the second layer, penetrate the prior layer approximately 1".			
4 Tap the sides of the measure 10 to 15 times with the mallet after each layer is rodded.			
5 Strike off a slight excess of concrete flush with top of the bowl using the strike-off bar and wipe the flange clean.			
6 Wet the inside of the top section and the gasket.			
7 Attach the top section to the bowl, insert funnel, add at least 1 pint [0.5 L] of water, add the selected amount of alcohol, and then add water until it appears in the neck of the top section.			
8 Remove the funnel and adjust the liquid level until the bottom of meniscus is level with zero mark.			
9 Attach and tighten the watertight cap.			
10 Repeatedly invert and agitate the air meter, for no more than 5 seconds at a time and for a minimum of 45 seconds in total, to free concrete from the base.			
11 Vigorously roll the air meter, in 1/4 to 1/2 turns, for a minimum of 1 minute. Occasionally turn the base about 1/3 of a turn during the rolling process.			
12 If the meter leaks while inverting or rolling, start a new test on a new sample.			
13 Place the meter upright, loosen the cap, and allow the liquid level to stabilize.			
14 If it takes more than 6 minutes for the liquid level to stabilize <u>or</u> there is more than 2% (in air division) of foam above the liquid, discard the sample and start a new test; increase the amount of alcohol used.			
15 When rolling has occurred once, read the liquid level in the neck to the nearest 0.25%. Record the initial meter reading. Retighten the cap and repeat steps 11 through 14.			
16 When rolling has occurred twice, read the liquid level in the neck to the nearest 0.25%. If the second reading has changed from the initial reading by more than 0.25%, record this reading as the new initial reading. Repeat 11 through 14. If the second reading has not changed from the initial reading by more than 0.25%, record this as the final meter reading.			
17 If/when rolling has occurred three times, read the liquid level in the neck to the nearest 0.25%. If the third reading has changed from the initial reading by more than 0.25%, discard the sample and start a new test; increase the amount of alcohol used. If the third reading has not changed from the initial reading by more than 0.25%, record this reading as the final meter reading.			
18 Disassemble the apparatus and examine the contents to be sure that there are no portions of undisturbed, tightly packed concrete in the base. If portions of undisturbed concrete are found, the test is invalid.			
19 Calculate the air content. Air content = meter reading minus (-) alcohol correction, if needed, plus (+) number of cups of water, if used.			
20 Report air content to the nearest 0.25%.			

## T 196 Air Content of Freshly Mixed Concrete by the Volumetric Method contd.

Equipment		P	F	NA
<b>Air Meter</b>				
1	Bowl and top sections have a sufficient thickness and rigidity to withstand rough field use.			
2	Material is impervious to attack by high PH cement paste and will not deform when stored at high temperatures in closed spaces and will not become brittle or crack at low temperatures.			
3	A watertight seal is obtained when the top section is attached to the bowl.			
4	Bowl has a diameter equal to 1 to 1.25 times the height and is constructed with a flange at or near the top surface.			
5	Top section is equipped with a flexible gasket and a device to attach the top section to the bowl.			
6	Top section is equipped with a transparent scale graduated in increments not greater than 0.5% from 0 at the top to 9% or more of the volume of the bowl. Graduations are accurate to plus or minus 0.1% by volume of the bowl.			
7	Upper end of the neck has a watertight cap that will maintain a watertight seal when the meter is inverted and rolled.			
8	Meter is calibrated initially and at 3 year intervals or whenever there is a reason to suspect damage.			
<b>Funnel</b>				
9	Funnel has a spout of a size permitting it to be inserted through the neck of the top section and long enough to extend to a point just above the bottom of the top section.			
10	Discharge end to the spout is constructed so that when water is added to the container there will be a minimum disturbance of the concrete.			
<b>Tamping Rod</b>				
11	Tamping rod is round, smooth, straight, $5/8 \pm 1/16$ " [ $16 \pm 2$ mm] in diameter, at least 12" [300 mm] long with both ends rounded to a hemispherical tip of the same diameter.			
12	Rod is made of steel, high-density polyethylene or other plastic of equal or greater absorption resistance.			
<b>Strike-Off Bar</b>				
13	Bar is a flat straight steel bar at least $1/8 \times 3/4 \times 12$ " [ $3 \times 20 \times 300$ mm] or a flat straight high-density polyethylene or other plastic of equal or greater abrasion resistance bar at least $1/4 \times 3/4 \times 12$ " [ $6 \times 20 \times 300$ mm].			
<b>Calibration Cup</b>				
14	Metal or plastic cup has a capacity of or is graduated in increments equal to $1.00 \pm 0.04\%$ of the volume of the bowl and is calibrated.			
<b>Syringe</b>				
15	Syringe has a capacity of at least 2 oz [50 mL]			
<b>Isopropyl Alcohol</b>				
16	Isopropyl alcohol is 70% by volume (approximately 65% by weight)			
<b>Mallet</b>				
17	Mallet has a rubber or rawhide head with a mass of approximately $1.25 \pm 0.5$ lb [ $600 \pm 200$ g].			

**Remarks:**