



OPERATING MANUAL

Lightweight Roll-A-Meter HM-32L



Rev: 07/14/2016

UNPACKING:

Examine the shipping carton for signs of damage before opening. Report damage to the shipping company immediately. Retain all shipping materials to facilitate return shipping if necessary.

OPERATING INSTRUCTIONS:

NOTE: These instructions are intended only as a guide for general operation of the meter. For complete and detailed test operating instructions, please refer to current ASTM C 173, C 173M, and C 172 specifications.

1. Wet the inside of the bowl and dry it to a damp but not shiny appearance.
2. Using a scoop, place an amount of freshly mixed concrete in the bowl equal to one-half the bowl volume. Rod this layer 25 times with the tamping rod. **DO NOT** strike the bottom of the bowl with the tamping rod. Tap the sides of the bowl 10 to 15 times with the mallet to close voids left by the tamping rod and release large bubbles of air that may have been trapped.
3. Add a second equal layer of concrete to fill the bowl. Rod the second layer 25 times, penetrating into the first layer approximately 1 in (25mm) with the tamping rod. Tap the sides of the bowl 10 to 15 times with the mallet. A slight excess of concrete, in. (3mm) or less, above the bowl rim is acceptable. Add or remove a representative sample of concrete to obtain the required amount of concrete.
4. Strike off the excess concrete with the strike-off bar until the surface is flush with the top of the bowl. Wipe the flange of the bowl clean.
5. Wet the inside of the top section of the meter, including the O-Ring gasket.
6. Attach the top section of the meter to the bowl and rotate both clamp levers down so that they are at a 90° angle to the bowl and stop. Push both clamp tabs inward so the tab hooks are fully covered by the bowls flange, then simultaneously push both clamp levers down until they lock in place securing them together.
7. Insert the baffle funnel into the top section of the meter. Add at least 1pt (0.5L) of water followed by the selected amount of 70% Isopropyl Alcohol. Record the amount of alcohol added.

NOTE: The amount of Isopropyl Alcohol necessary to obtain a stable reading with a minimum of foam can vary from less than 0.5pt (200ml) to more than 3pt (1400ml), depending on the concrete mix design. See Table 1 for correction factors. Refer to ASTM C 173, C 173M for more information.

8. Continue adding water until it appears in the graduated neck of the top section. Stop and remove the funnel.

NOTE: Refer to ASTM C 173, C 173M, note 3.

9. Use the rubber syringe to adjust the liquid level until the bottom of the meniscus is level with the ZERO mark. Attach and tighten the water tight cap.
10. Invert the meter, shake the base horizontally for 5 seconds and return the meter to the upright position. Repeat the inversion and shaking process for a minimum of 45 seconds, and until the concrete has broken free and the aggregate can be heard moving in the meter as it is inverted.

NOTE: To prevent the aggregate from lodging in the meters graduated neck, **DO NOT** keep it inverted for more than 5 seconds at a time.

11. With the meter sitting on the work surface, place one hand on the meter neck and the other on the flange. Tilt the meter to approximately 45° and maintain this position throughout the procedure. With the hand holding the flange, vigorously roll the meter 1/4 to 1/2 turn forward and back several times, quickly starting and stopping the roll. Rotate the base of a turn and repeat the rolling procedure. Continue the turning and rolling procedure for approximately 1 minute. The aggregate **MUST** be heard sliding in the meter during this process.

NOTE: If at any time during the inversion and rolling procedures liquid is found to be leaking from the meter, the test is invalid and a new test should be started.

**Correction for the Effect of 70% Isopropyl Alcohol
on ASTM C 173, C 173M Air Meter Reading**

TABLE 1

Pints	Alcohol Used, Ounces	Liters	Correction ^{1,2}
2.0	32	0.9	0.0
3.0	45	1.4	0.3
4.0	64	1.9	0.6
5.0	80	2.4	0.9

¹ Subtract the Correction Factor from the final meter reading.

² Corrections less than 0.125 are not significant and are to be applied only when 2.5pt (1.2L) or more alcohol is used. Values given are for air meters with a bowl volume of 0.075ft³ (2.1L) and a top section 1.2 times the volume of the bowl.

Determining Test Results:

1. Set the unit upright and loosen the top cap to allow pressure to stabilize. Allow the meter to stand while the air rises to the top and until the liquid level stabilizes. The liquid level is considered stable when it does not change more than 0.25% air within a 2 minute period.

NOTE: If it takes more than 6 minutes for the liquid level to stabilize or if there is more foam than that equivalent to 2 full percent air content divisions on the meters scale over the liquid level, the test is invalid and must be started over, and will require an additional amount of alcohol be used.

2. If the liquid level is stable without excessive foam, read the bottom of the meniscus to the nearest 0.25% and record the initial meter reading.
3. If the air content is greater than the 9% range of the meter, and the liquid level can not be read, add water using the calibrated cup to bring the liquid level within the graduated range of the meter. Be sure to count the number of cups of water that have been added and record the number. Read the bottom of the meniscus to the nearest 0.25%. Record the final meter reading and the number of cups of water added.

Confirmation of the Initial Meter Reading:

1. Record the initial reading and retighten the top cap. Repeat the 1 minute rolling procedure and the process for determining test results from the previous page.
2. When the liquid level is stable and all test procedure requirements are met, make a direct reading of the meniscus and estimate to 0.25% air. If the reading has not

changed more than 0.25% from the initial meter reading, record it as the final meter reading of the sample test.

3. If the reading has changed from the initial meter reading by more than 0.25% air, record this reading as a new initial reading. Repeat the 1 minute rolling procedure and read the indicated air content. If this reading has not changed by more than 0.25% air from the "newest initial reading" record it as the final reading. If the reading has changed by more than 0.25%, discard the test and start a new test on a new sample of concrete, using more alcohol.
4. Disassemble the meter, empty the base 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.

Calibration:

Refer to ASTM C 173, C 173M; AASHTO T 196 and applicable local and state specification procedures regarding the operation and calibration of Volumetric Air Meters.

ACCESSORIES:

ACCESSORIES & REPLACEMENT PARTS

Description	Model
Bottom Tube Gasket	RPHM-32L-TUBE GASKET
Graduated Tube Cap	RPHM-32LKEY1
Measuring Bowl, Base	RPHM-32LKEY10
Baffle Funnel Assembly	RPHM-32LKEY11
Steel Tamping Rod, 5/8x12in	RPHM-32LKEY12
Metal Measuring Cup	RPHM-32LKEY13
Plastic Measure, 16oz	RPHM-32LKEY14
Tube Cap Gasket	RPHM-32LKEY2
Graduated Tube	RPHM-32LKEY3
Wrench Accessory	RPHM-32LKEY4
Tube Clamp Ring	RPHM-32LKEY5
Tube O-Ring	RPHM-32LKEY6
Plastic Carrying Case Assembly	RPHM-32LKEY62
Plastic Sight Tube	RPHM-32LKEY7
Upper Chamber Body	RPHM-32LKEY8
Upper Chamber O-Ring	RPHM-32LKEY9
Latch Assembly	RPHM-30KEY22R