



Aqua-Check Moisture Tester MA-26X Manual



Safety Instructions

Review and understand all of the operating and safety instructions before using this unit.

WARNING!!

The calcium carbide reagent used with this test must be handled with great care. When exposed to water, calcium carbide produces highly flammable or explosive acetylene gas.

- Users must understand and follow local regulations and calcium carbide Material Safety Data Sheet guidelines and procedures regarding transportation, storage, handling and disposal.
- Testing must not be performed in confined spaces or in the vicinity of an open flame, lighted cigarettes, embers or any potential source of ignition.
- When releasing the gas from the apparatus, make sure to direct it away from your face and body.
- DO NOT store, dispose of, or place the calcium carbide reagent where it may come into contact with water, because it can produce explosive acetylene gas.
- Any application not specifically covered in this manual will be considered improper use and will void the warranty.
- Testing excessively wet material, adding water to the testing chamber, or improper use of the equipment could cause pressures to exceed the safe level for the apparatus.
- Long sleeves, gloves and eye protections should be worn at all times when performing the test.

Introduction

The Aqua-Check Moisture Tester is designed to measure the water content of soils, aggregates, and other non-reactive materials. The Aqua-Check consists of an aluminum sample chamber vessel with integral pressure gauge, electronic balance for sample weighing, two steel pulverizing balls, and assorted brushes and containers as required for proper completion of the test.

Pulverized calcium carbide is used as a reagent, and reacts when combined with water in the sample material to form acetylene gas. The most accurate results are obtained when pressure gauge readings are correlated with data from over-dry methods.

Unpacking & Set-Up

NOTE: Each Aqua-Check is carefully inspected prior to packaging and shipment. Immediately unpack and inspect the apparatus for signs of damage once received. If any damage has occurred, report it immediately to the shipping company.

The MA-26 Aqua-Check consists of:

- Cast aluminum Sample Chamber Vessel with integral
- 0-21% Pressure Gauge
- 200 x 0.1g Electronic Balance for weighing of test specimens
- (2) 1.25in (32mm) Steel Pulverizing Balls
- Long-handled Reagent Scoop
- Large, coarse clean-out Brush
- Small, fine-bristle brush
- Sample cup
- Heavy-duty plastic case



1.25in Steel Balls



Long-handled Reagent Scoop



Aqua-Check Pressure Gauge

Operating Instructions

NOTE: By following these steps closely and consistently will increase the accuracy and repeatability of your test results.

STEP 1: Use the dry, coarse-bristle brush to clean all residue from the Aqua-Check vessel and chamber cap.

STEP 2: Select a sample of the test material. Materials that do not readily separate into individual particles, such as clay or silt soils, need to be reduced by hand into small clumps.

STEP 3: Set-up and zero the electronic balance. Place the plastic sample cup on the balance and zero again. Add small amount of sample material to the cup until the balance shows the required 20g.

NOTE: If the moisture content of the material is expected to exceed 20% a 10g sample should be used, but the value read on the gauge must then be doubled.

STEP 4: Place the prepared and weighed sample into the Aqua-Check vessel. For cohesive samples also place the two steel pulverizing balls into the vessel.

STEP 5: Using the long-handled reagent scoop, add at least two full scoops of calcium carbide reagent to the chamber cap.

STEP 6: Hold the Aqua-Check vessel horizontally, place the chamber cap on the end of the chamber. Position the black cap dot on the cap so it is facing away from your body when the pressure is released. Move the stirrup into place over the cap and tighten the top screw to the seal chamber. DO NOT mix the reagent and sample before the chamber has been sealed.

STEP 7:

- Without Pulverizing Balls: Hold the Aqua-Check vertical so the gauge is facing down. Start to agitate vigorously for 5-10 seconds. Turn the Aqua-Check around so the gauge is facing up and agitate again for 5-10 seconds. Tap the sides to make the sample fall into the chamber cap. This process should be repeated for 1-3 minutes, or until the gauge reading in Step 8 has stabilized.
- With Pulverizing Balls: Hold the Aqua-Check horizontal and use an orbital motion to spin the balls around inside the chamber. Agitate for 20 seconds and rest for 20 seconds, repeat this process three times. Periodically check the position of the gauge indicator and continue the cycle until the indicator has stabilized.

Operating Instructions Continued

STEP 8: At eye level, hold the vessel horizontally to read the pressure gauge. Wait for the indicator needle to stop moving. The gauge will read in percent water content of wet weight.

STEP 9: Make sure the black dot on the chamber cap is facing away from your face and body, then slowly loosen the top screw to vent pressurized gas from the vessel.

STEP 10: Place the used sample mixture and residue in an open dry container and dispose. Use the coarse bristle brush to clean the vessel and prepare for the next test.

Accuracy

When testing soils, it is recommended that the procedures are in *Standard Test Method for Field Determination of Water Content of Soil by the Calcium Carbide Gas Pressure Tester Method*. This will insure accurate and reliable results. For optimum accuracy with most materials the Aqua-Check results should be correlated with oven-dry tests for each material.

1. Select several samples of the material to be tested that have a wide range of water content.
2. Carefully divide each sample into two representative specimens.
3. Run a test on one specimen in the Aqua-Check and record the gauge reading. Oven dry the other and calculate the percent of moisture.
4. Plot the oven-dry moistures on a graph vs. the gauge reading and draw a best-fit curve through the points. If there is a wide scatter in points on the graph this could indicate operation errors or that the material is not suitable for this comparison.
5. On your graph, find the point where the gauge reading intersects the correlation curve and record that value as the corrected percent.

Exceptionally cool or warm ambient temperatures may cause fluctuations in the test results. Repeated testing or hot weather may heat up the vessel body and show test results that are artificially high. Allow the vessel time to cool down before re-testing.

Troubleshooting

- **Testing procedure errors:** Review instructions and procedures.
- **Incorrect sample weights:** Check the balance operation and re-zero.
- **Errors in corrected values:** Change in material type. Repeat correlation procedure with new material.
- **Insufficient agitation:** Some cohesive materials may need 3 minutes or more, using the steel pulverizing balls.
- **Insufficient quantity of reagent:** Add an additional scoop of reagent.
- **Ineffective reagent:** Replace with fresh calcium carbide reagent.
- **Premature contact between reagent and specimen:** Insure the vessel is held horizontal when mating with cap.
- **Insufficient sample preparation:** Break cohesive material into finer sizes and use pulverizing balls.
- **Inadequate pressure seal:** Check and clean chamber cap gasket. Inspect the vessel, cap and stirrup for damage or cracks.
- **Defective gauge:** Gauge needle should rest at zero and move smoothly, repeat if defective.
- **Low temperature:** Run two or three cycles to warm up vessel.
- **High temperature:** Allow vessel to cool down.
- **Moisture inside vessel prior to testing:** Insure vessel and cap are completely dry before testing.
- **Gauge reading error:** Hold the vessel horizontally at eye level when reading the gauge.
- **Residue from previous tests:** Use included coarse-bristle brush to clean the vessel thoroughly between tests.

