

# Alpha<sup>®</sup> Moisture Test Kit Instruction Manual



**MOISTURE TEST KIT**  
Water Vapor  
Emission Test

Job \_\_\_\_\_  
Test No. \_\_\_\_\_  
Date & Time Started \_\_\_\_\_  
Date & Time Stopped \_\_\_\_\_  
Initial Weight \_\_\_\_\_  
Final Weight \_\_\_\_\_ gms  
Gain in Weight \_\_\_\_\_ gms

**Part No: MTK005**  
**Version 1**

 **Alpha Professional Tools<sup>®</sup>**

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## INTRODUCTION

Thank you for purchasing the Alpha® Moisture Test Kit, a calcium chloride test for determining if the concrete slab is suitable for floor covering or polymer coating installations.

The test works by absorbing moisture in a vapor form that is exiting the slab's surface due to natural environmental factors over a period of time.

The test measures an approximate 70 square inches area of concrete surface for 60 to 72 hours, then a simple calculation is followed that determines the volume of the vapor emission.

The Moisture Vapor Emission Rate (MVER) is the equivalent weight of water (if the gas turned into liquid) that emits from 1,000 square feet of concrete surface area in 24 hours time.

 **CAUTION!**

To ensure correct use, read this Instruction Manual and the product's Limited Warranty and Terms of Sales prior to use of this product. The use of the product implies that the Buyer and User agrees to Manufacturer's Limited Warranty and Terms of Sale. Keep this manual in a place where operators can access it easily whenever necessary!

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## ASTM F 1869 PROTOCOL CHECKLIST FOR CONDUCTING THE CALCIUM CHLORIDE TEST

Before starting the test, make sure the following conditions are met:

1. Provide the number of test kits required.

Install 3 test kits for areas up to 1,000 sq. ft or smaller, add 1 test kit for each additional 1,000 sq. ft. area thereafter.

2. Ensure interior environment is conditioned correctly before performing tests.

A properly conditioned building interior has a temperature between 65 to 85 degrees F. with a relative humidity of 40 to 60 % for at least 48 hours before the test begins and remains consistent throughout the testing period of 60 to 72 hours. Record values on log sheet.

**3. Clean the concrete surface of any foreign substances.**

A foreign substance can be floor covering, adhesive residue, epoxy coating, paint, curing and sealing compounds, waxes, dirt or oil stains, or any other material residue on the slab surface. Remove concrete contaminants by shot blasting, abrasive grinding wheel or diamond cup wheel. The use of wire brushes or razor scraping may not be suitable for achieving a clean, open concrete slab surface.

**4. Prepare test area and schedule testing.**

ASTM requires that a minimum of 20 x 20 inches of concrete surface area be cleaned for each test (as described above) and allowed to remain open for at least 24 hours before setting the calcium chloride test. Once the test is placed, it must remain undisturbed for a period of 60 to 72 hours. Always plan carefully in advance of testing to ensure open time after preparation and exposure time during the testing period will allow for proper placement and retrieval.

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## **QUANTITATIVE TEST METHOD FOR DETERMINING MOISTURE VAPOR EMISSION RATE (ASTM F 1869)**

**► PURPOSE:**

Alpha® Moisture Test Kit is designed to quantitatively measure the rate of moisture vapor emission.

**► CONTENTS:**

Each test kit consists of one cylindrical container filled with anhydrous calcium chloride and one transparent plastic dome with pre-installed sealant around the perimeter.

**► REQUIRED TOOLS: (NOT INCLUDED)**

Surface grinder with vacuum mount, safety goggles, dust respirator, protective gloves, cloth rags, utility knife, scale capable of measuring to nearest 0.1 gram and duct tape.

**► APPLICABLE STANDARDS:**

A person using this test kit shall strictly follow the instructions given in the latest ASTM F 1869 published by American Society for Testing & Materials. The copies

of ASTM documents can be obtained from American Society for Testing and Materials. 100 Barr Harbor Drive, West Conshohocken, PA 19428. Tel: 610-832-9585 Fax: 610-832-9555. The documents may also be purchased on the internet from [www.astm.org](http://www.astm.org).

► **PREPARATION:**

1. **Survey Job Site Conditions - Verify environmental controls are operational.** The building temperature and humidity should be representative of what it would be during normal use. The temperature should be between 65 to 85 degree and the relative humidity between 40% and 60% for a minimum of 48 hours prior to conducting tests.
2. **Schedule Accordingly - The tests need to remain undisturbed for a minimum of 60 hours and a maximum 72 hours.** On the first day preparation will take place and on the following day the tests will be set and retrieved in 60 to 72 hours.
3. **Test Location & Frequency - Place tests throughout the area with some in the middle of the building, at the perimeter, over cracks and joints and especially in areas of potential moisture.** The tests should be performed at a rate of three tests for the first 1,000 square feet and one test for each additional 1,000 sq feet.

You need to keep track of the following for your records:

1. Location of the tests
2. Test number
3. Ambient room temperature
4. Ambient humidity
5. Start date/End date
6. Start time/End time
7. Exposure time (15-minute increments)
8. Start weight/Ending weight
9. Weight gain
10. Note any unusual occurrences or damage to kit
11. Results of test
12. Flooring manufacturer's moisture limits for materials to be installed.
13. Moisture testing can be done with relative accuracy; however, if one is to stray from the test methods, your test could produce faulty results.

## TEST INSTRUCTIONS

The following testing procedure is brief and is not meant to replace the most current ASTM standards. Therefore, the User must get acquainted with the applicable current ASTM standard and OSHA safety regulations prior to using this test kit.

### STEP 1

Remove any foreign objects such as overspray, curing compound and sealers from the concrete surface using mechanical devices such as a grinder (photo shows Alpha® Ecogrinder with dust carriage attached). Remove dust from the concrete surface to insure proper adhesion of the sealant. Strictly follow guidelines given by Occupational Safety & Health Administration (OSHA).



### STEP 2

Weigh the container with the vinyl tape seal at the test location immediately prior to initiating the test (W1).



**Note:** Be sure the scale is set to grams, ounce scales will not work for this test. Weigh to the nearest 0.1 gram and note this initial weight on the top of the container label using felt tip pen or permanent marker as well as the time and date the test was started (T1).

### STEP 3

Remove the sealing tape from the plastic container. Make sure the tape does not get dirty or lost since it will be needed to reseal the container at the end of the test.



**Note:** For best results, stick the tape on the outer wall of the dome unit to keep it safe.

#### STEP 4

Peel off the paper protective backing from the black sealant that is around the dome and discard. Make sure the sealant material does not contact objects or clothing as it is very sticky and intended to provide a secure, longlasting seal to the concrete throughout the duration of the test.



#### STEP 5

Carefully remove the lid from the container that holds the calcium chloride crystals. Do not spill the crystals. It is easiest to turn it over and place it under the dish as shown. It may also be secured to the top of the dome or any other location as long as it is stored safely for reuse.



#### STEP 6

Install the test kit on the concrete floor. First, place the open calcium chloride container on the concrete floor. Make sure the crystals are relatively level. If any crystals are spilled the test can be invalid.



#### STEP 7

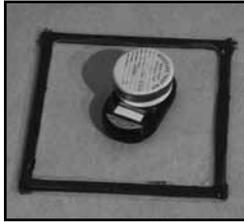
Next, immediately place the dome unit over the center of the dish. Press firmly along the edges of the sealant material to securely bond the unit to the floor. To test for an airtight seal, press firmly on the center of the cover. The cover should resist pressure, if properly sealed.

Allow the test kit to remain undisturbed for a period of 60 to 72 hours. Note the ambient temperature and humidity at the test area.



## STEP 8

After 60 to 72 hours, remove the dome with a razor. Retrieve the dish with the calcium chloride and immediately place the lid back on and reseal using saved vinyl tape. Re-weigh the container on the same gram scale used at the start of the test. Record weight, date and time (W2) (T2).



Note the weight as final weight (W2). Do not spill any of the calcium chloride crystals from the container. If any crystals are spilled, the test must be rerun with a new test kit.

## CALCULATIONS

1. Determine the Exposure Time in hours.

$$\text{Exposure time in hours: } T = T2 - T1$$

(Time = End Time - Start Time)

2. Determine the weight gain of calcium chloride.

$$\text{Weight gain in grams; } \Delta W = W2 - W1$$

(Weight Change = End Weight - Start Weight)

Moisture Vapor Emission Rate (pounds/1000 sq. ft./24 hours)

$$\text{Moisture Vapor Emission Rate} = 120 \times \frac{\Delta W}{T}$$

T

Alpha Professional Tools® also provides on-line calculator at [www.alpha-tools.com/mcalc.aspx](http://www.alpha-tools.com/mcalc.aspx).

## **BIAS & PRECISION OF THE TEST**

**Follow guide lines provided by the latest ASTM. Our experience indicates that the test results may vary with environmental and seasonal changes. The test determines the rate of moisture vapor emission at the time of the test only. It does not predict future moisture vapor emission rate or the performance of the flooring material. The test performed at the same location at a different time may produce different results.**

## **HEALTH AND SAFETY**

**The chemical product included in this kit contains Calcium Chloride Anhydrous (CaCl<sub>2</sub>). A Material Safety Data Sheet for Calcium Chloride is enclosed with the test kits. Please read it carefully. Dispose of used product in accordance with local, state or federal regulations. Keep children & pets away from the test kit and test area. Do not inhale or ingest this product. In case of emergency, contact nearest hospital and nearest Poison Control Center. National Poison Center's phone number is 1-800-222-1222.**

## **LIMITED WARRANTY & TERMS OF SALE**

**Alpha Professional Tools® sole responsibility and liability under this warranty shall be to supply replacement test kit for any test kit items warranted hereunder shown to be defective in manufacturing. Since the use of the test kit is beyond our control we cannot accept damage in excess of the purchase price of this product. Store the test kit in a dry place and use it within 1 year from receiving. Alpha Professional Tools® makes no other warranty, expressed or implied, with respect to its products. Defects in materials caused by misuse, mishandling, improper storage, improper application, improper combination with product of others, or any other failure to strictly follow Alpha Professional Tools® guidance and latest ASTM standards are not warranted under any circumstances. Alpha Professional Tools® shall not be responsible for direct, indirect, incidental, punitive or consequential damages arising from the use of the test kit regardless of the cause. Buyer and User assume all liabilities for any loss, damage or injury to persons or property arising out of, connected with or resulting from the use of Alpha Professional Tools® products, either alone or in combinations with other products. By use of this product the Buyer and User accept the Limited Warranty and Terms of Sale. Any dispute against the Alpha Professional Tools® or its Employees or agents or successors shall be resolved by a binding arbitration in accordance with the American Arbitration Association in Oakland, Bergen County, New Jersey, United States of America.**







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