ITW resin TECHNOLOGIES

ANHYDROUS CALCIUM CHLORIDE

concrete moisture vapor emission test kit

INTRODUCTION

The calcium chloride vapor emission test was developed in the 1950's to quantify the volume of water vapor emitting from a 1,000 square area of concrete slab surface over 24 hours. This test is directly specified by the vast majority of the Floor Covering Industry as the primary measure of moisture acceptability for floor covering/coating installation.

Use this test to model the volume of moisture that emits from 1,000 square feet of slab surface in 24 hours. The result is expressed as "pounds" which is the equivalent weight of water, emitted as vapor, over 1,000 square feet in 24 hours. Use this result to compare to Manufacturer's specifications for floor covering or coating tolerances. Always reference a copy of the Manufacturer's specifications when reporting results using this test.

This test requires the use of a gram-weight scale with a gradation of 1/10th (0.1) gram. The calcium chloride container is weighed before and after exposure to the concrete slab. It is highly recommended that the test be weighed prior to, and directly after exposure on the same scale. This is a very sensitive and highly accurate test when conducted properly. Differences between two scales and extended time between weighing can offset the test result.

DO NOT conduct this test unless the building environment is representative of the actual working climate. While the test can measure moisture in a wide range of building climates, the results are only meaningful when conducted in a similar building environment as the finished floor system. Obtaining meaningful results is only possible when tests are conducted in a representative interior climate.

CONDUCTING THE MOISTURE TEST

1. Plan Your Test Carefully: Before you test, make sure you have basic tools for cleaning the slab, including a scraper and wire brush. Make sure you have a quality gram scale and a proper supply of test kits and protective cones. Ensure building climate is between 65 & 85 degrees Fahrenheit with relative humidity between 40-60% for at least 48 hours prior to, and during testing.

2. Prepare Your Test Site(s): The slab must be clean of debris and adhesive residue. Shot blast surface or wire brush slab clean. Remove dust thoroughly. Do not use chemicals of any kind to clean the floor. Avoid test locations near cracks or joints, or in direct sunlight. Prepare 3 test sites for the first 1,000 sq. ft. and include 1 more test for each additional 1,000 square feet of area.

3. Record Starting Values: Read the warning label on package and then open the container bag. Set the entire tape sealed dish on the gram scale and record its weight on the dish lid and on the test kit booklet. Record the starting date and time as well. Ensure that the same scale will be available for re-weighing the dish, or the validity of this test will be compromised.

4. Carefully Open Container: Remove the blue vinyl tape from the dish. Be careful not to lose the tape as you will need it to reseal the dish later. Store the dish lid carefully and stick the tape along the side of the plastic dome to keep it safe. Some people prefer to tape the dish's lid to the inside of the dome where it can be read through the top. Do not touch or spill the calcium chloride.

5. Place the Test Kit: Place the open dish on the slab making sure the calcium chloride inside is fairly level. Do not set the kit directly over a control joint or crack. Remove the white paper on the dome, and center the dome over the dish. The only moisture absorbed by the calcium chloride must be within the 70 square inch area of the dome that is in contact with the concrete slab.

130 Commerce Drive
Montgomeryville, PA 18936
Ph ▪ 800-825-6566
Fx ▪ 215-855-4688
www.itwresintech.com

data sheet

CONDUCTING THE MOISTURE TEST *(cont)*

6. Seal the Dome to Slab: Using the handle of your wire brush or other tool, firmly squash the gasket under the flanges of the dome. The ideal installation will seat the outer flange of the dome to the slab. Then the gasket material will move to line up with the inside edge of the dome. Place your hand over the dome and gently apply pressure. There should be no leaks in the gasket.

7. Expose the test Properly: Place the optional safety cone over the dome and let the test remain undisturbed for 60 to 72 hours. Most manufacturers of flooring products recommend at least one kit per 1,000 square feet. The test only measures a small area of slab surface and moisture levels can vary greatly over 1,000 sq. ft. Test several areas whenever possible.

8. Terminate Test and Calculate: After 60 to 72 hours, cut open the dome and carefully retrieve the dish. Replace the lid and seal it back up with the blue tape. Weigh the dish again on the same gram scale. Record the ending weight, date, and time on the dish lid as well as on the test kit booklet. Follow the instructions in this booklet to compute the moisture vapor emission rate.

CALCULATING RESULTS

Use the following equation to determine the vapor emission volume in pounds per 1,000 square feet in 24 hours. See footnote.

Equation to determine vapor emission in pounds.

$$\frac{\text{Weight Gain X 118.932}}{\text{Total Hours}} = \text{Pounds}$$

Numeric example with a 4.5 gain in 64.5 hours.
Always round to the nearest tenth.

$$\frac{4.5 \text{ X } 118.932}{64.5} = 8.3$$

$$\frac{\text{Weight Gain X 118.932}}{\text{Total Hours}} = \boxed{}$$

Pounds
Per 1,000 square feet in 24 hours

POUNDS PER 1,000 SQUARE FEET IN 24 HOURS

The Vaprecision anhydrous calcium chloride test kit conforms to the American Society for Testing & Materials documentation ASTM E-1907-97 and ASTM- F_1869-98 and is actually pictured in the ASTM E-1907 specification. ASTM documents are the copyright property of ASTM, and can be purchased easily from their web site at www.astm.org.

Footnote: The formula above complies to ASTM documentation as of 8/99 and deducts he area of the calcium chloride dish in contact with the slab. There is a debate regarding this issue. To calculate the test result without deducting the area of the dish, use 108.846 instead of 118.932.

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