

Please go to [www.protimeter.com](http://www.protimeter.com) and review the installation video in the flooring section of the web site to supplement these instructions.

The instructions below detail a procedure for use with the American ASTM standard F2170-11. Please refer to local standards if outside the USA. Obtain a copy and familiarize yourself with this standard that can be acquired from [www.ASTM.org](http://www.ASTM.org).



**Caution:** Please take the appropriate precautions in line with local standards and instructions with regard to using powered equipment and prevention of dust inhalation.

### 1. Site Survey

Use the Protimeter MMS2 to take and record the following readings. A sample report form is available for you to record all readings at [www.protimeter.com](http://www.protimeter.com).

Determine the following, using the short QuikStick provided, not the floor humidity probes:

- Ambient relative humidity
- Ambient temperature
- Surface temperature
- Surface proximity to dew point
- Make sure that the conditions are in line with the requirements for the standard you are using. Record these measurements both before you drill the test hole, and also at the time of testing.
- Using the non-invasive mode on the MMS2 we recommend that you survey the floor in multiple areas to determine the overall moisture level in the floor slab. Select sites for humidity test that are at least 3ft (1M) from outside walls or pillars. Select locations that show wetter readings on the MMS2. ASTM F2170-11 recommends 3 test sites for the first 1000 sq. ft. (100 sq. M) then one test per 1000 sq. ft. (100 sq. m).
- Refer to the MMS2 manual to make these measurements and make sure the meter or probes are not excessively hot or cold before using.



### 2. Drilling the Test Hole

- Determine the depth of the slab in the test location. ASTM F2170-11 standard recommends that measurements should be made at 40% of the concrete slab depth.
- The sleeves are adjustable by screwing the two half's of the sleeve in and out. With the sleeve fully screwed it will be set for a 4" (100mm) slab. You can adjust the sleeve to the depth of the slab using the markers as indicators. Tests can be made from 4"-6" (100mm-150mm). Set the sleeve to the desired depth.
- Using the supplied drill (3/4" or 19mm) set the drill stop and tighten with the supplied Allen key.
- Drill the hole using a hammer action drill.
- Vacuum the hole and use the supplied brush to clean the hole until no dust or debris is present. Clean the area around the hole so that the sleeve flange can sit directly on top of the slab.
- Check the bottom of the hole with a flashlight to make sure the bottom of the hole has no large pieces of aggregate. If large aggregate is present re-drill.



### 3. Inserting the Humidity Sleeve and Humidity Probe

- With the sleeve set at the correct depth, push the sleeve into the hole and tap with a rubber mallet until the sleeve is fully seated and the upper sleeve flange is up against the concrete surface.
- Connect the Mini Hygrostick humidity probe to the insertion and extraction tool and insert into the sleeve pushing until the probe reaches a firm stop. Rotate the tool counter clockwise to disengage the probe and remove the tool. Cap the sleeve and probe using the cap provided.



#### 4. Taking Readings

- a) Refer to the local standards for equilibrium times. ASTM F2170-11 requires a soak time of 72 hours, however this time period is under review at the time of producing this document.
- b) After the minimum wait time, take the relative humidity and temperature readings by removing the short Quikstick from the back of the MMS2 and replacing it with the Mini Hygrostick extension lead.
- c) Remove the cap from the humidity sleeve and connect the extension lead to the probe using the guides to ensure proper orientation.
- d) Wait a few seconds for the reading to stabilize and record the readings. The serial number of each probe can be seen on the MMS2 screen - we recommend you record the serial number.
- e) Consult the Manufactures documentation for the floor covering or adhesive you intend to use for the recommended humidity levels.
- f) When you are satisfied with the readings, remove the probe using the extraction tool and place the probe back in the case. The humidity sleeve should not be reused and the top can be chiseled off and the hole filled.
- g) If the reading is too high, simply replace the cap and re-test at a later date.



#### 5. Leap Fogging Probes

The sleeves can be placed in the concrete without inserting the humidity probes, capped, then left for the required time period. This is not a recommended practice as once the probe is inserted you will need to wait approximately two hours for stable readings. However, you may want use this method if you do not have enough probes for the number of sleeves for a site location test. We recommend you purchase additional probes as a more economical solution.

#### 6. Care of the Humidity Probes and Calibration Check

- a) After use, wipe the Mini Hygrostick humidity probe with a clean, dry cloth and return it to the case.
- b) Standards such as ASTM F2170-11 recommend you test the probe within 30 days of use.
- c) A Salt Calibration test bottle is provided in the kit - this can be used to test the probe at ~75% relative humidity.
- d) To test the probes, inset the probe into the adaptor then place the adaptor into the salts bottle. Make sure the probe is fully inserted until it meets resistance.
- e) Place the salts bottle into its compartment in the case. The foam will provide a more stable temperature environment for the test.
- f) Leave the probe in the salts bottle at stable room temperature for several hours - overnight for best results.
- g) Check the reading using the extension lead and record the result, check 10 minutes later and if the reading has not changed by more than 0.1% RH then record this as the final reading.
- h) Using the table below check if the probe is in calibration. If the readings show more than a 2% RH error then discard the probe and replace it.



| Temp °C | Temp °F | Min. Acceptable | Reference | Max. Acceptable |
|---------|---------|-----------------|-----------|-----------------|
| 15      | 59      | 73.6            | 75.6      | 77.6            |
| 20      | 68      | 73.5            | 75.5      | 77.5            |
| 22      | 71.6    | 73.4            | 75.4      | 77.4            |
| 25      | 77      | 73.3            | 75.3      | 77.3            |

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