# RAPID RH 4.0

▸ Fast, Accurate Moisture Test for Concrete Floors

PATENT & PATENTS PENDING



CE

# Installation Instructions

## Step 1: Drill the Hole

Drill a hole in the concrete slab to the required depth using a rotary-hammer drill and a ¾"-diameter masonry drill bit. Per the ASTM F2170 standard, drill the hole to a depth equaling 40% of the slab's thickness for slabs that are drying from one side, or 20% depth for a slab drying from two sides. For proper RAPID RH® 4.0 installation, be sure to position the drill perpendicular (90˚) to the surface being tested.

**The correct hole-depth is important in complying with the ASTM F2170 standard.**



## Step 2: Clean the Hole

Attach the vacuum attachment to the straight extension of a shop vacuum cleaner hose* and thoroughly vacuum up the dust in and around the hole.

Next, insert the wire bristle brush into the hole. Turn the brush several times to loosen pulverized concrete from the walls of the hole. Vacuum again. Repeat this step twice to ensure no loose concrete particles remain in the hole.

*The vacuum attachment may require an adapter depending on vacuum model.*



## Step 3: Insert the Smart Sensor

Remove a Smart Sensor from its protective package and insert it into the drilled hole using the white insertion tool. Firmly press into the hole until the Smart Sensor seats itself at the bottom of the hole. **DO NOT use the *Easy Reader* to install the Smart Sensor.**

To protect the Smart Sensor housing, attach the protective cap to the short orange tube and place into the Smart Sensor until ready to take readings.



Insert Smart Sensor

Insert protective cap

# Step 4: Take Readings

When ready to take readings, remove the orange protective cap from the Smart Sensor, and ensure no dust or debris are inside. Insert the Rapid RH® 4.0 *Easy Reader* firmly until it comes fully into contact with the bottom of the Smart Sensor. Hold the *Easy Reader* in place until the first relative humidity reading appears on the screen (about three seconds), then immediately remove the *Easy Reader.* The display will toggle back and forth between the relative humidity value (when the cursor is next to the %RH symbol) and the temperature value (when the cursor is next to the °F or °C symbol*). Once the *Easy Reader* is removed from the Smart Sensor, the readings from that Smart Sensor will continue to display for


*Easy Reader* powering on after inserted into Smart Sensor

approximately 5 minutes or until the *Easy Reader* is reinserted into another Smart Sensor. After removal, wait at least 5 seconds before reinserting the *Easy Reader* into a Smart Sensor.  Replace the *Easy Reader's* plastic end caps when not in use.

In most cases, one hour after installation, the Smart Sensor will give a reading within 3% of final equilibration. Follow the ASTM F2170 procedures pertaining to equilibration time.

After the initial equilibration has been reached per ASTM F2170 requirements, subsequent readings can be taken instantly. If future testing is needed, replace the protective cap, with orange tube attached, back into the Smart Sensor.

Record readings on the enclosed report form in the spaces provided for information required by ASTM F2170, including the date, time, %RH and temperature. The grid at the bottom of the report form can be used to record test-hole locations. Each Smart Sensor is serialized on the outside of the Smart Sensor. Extra copies of the report form and an ASTM F2170 checklist can be downloaded at www.RapidRH.com.

**For questions on what RH levels are appropriate, please contact the manufacturer of the product to be applied to the concrete slab.**

*\*Rapid RH® 4.0 Easy Readers that display temperature in Celsius can be identified by their blue labels and blue plastic protective caps.*


Record readings on report form included with Smart Sensors

# Step 5: Encapsulate Smart Sensor

If future readings are no longer needed (for example, when ready to apply a floor covering or coating), place the stainless steel metal disk over the Smart Sensor and skim-coat the hole with a cementitious patching compound compatible with the flooring manufacturer's installation instructions.


Place metal disk over Smart Sensor before encapsulating

## Trouble Shooting

**Display shows "ER":** The Rapid RH® 4.0 *Easy Reader* may not be properly communicating with the Smart Sensor for the following reasons: (1) The *Easy Reader* was not in contact with the Smart Sensor long enough. Hold the *Easy Reader* in the Smart Sensor until the first relative humidity reading appears on the screen, then remove.  (2) Debris is blocking proper contact. Check the Smart Sensor housing for any debris. Try twisting the Rapid RH® 4.0 *Easy Reader* gently back and forth a few times to "sweep" away any particles that may have blocked complete contact. If this does not work, vacuum out the housing.

**Display becomes non-responsive:** Reset the *Easy Reader* by pushing the recessed white reset button, located near the base of the *Easy Reader*, using the tip of a pen or pencil.

**Replace the batteries:** The *Easy Reader* comes with two AAAA alkaline batteries. If batteries are low, the display will read "LO." Replace batteries immediately. To replace the batteries, open up the battery cover by removing the one battery cover screw with a jeweler's Phillips screwdriver. DO NOT OPEN UP THE FULL BODY OF THE *EASY READER* AT ANY TIME.

## Use Conditions

The Rapid RH® 4.0 is intended for interior use only. It is imperative that the interior application area be protected from weather elements such as rain and snow to prevent water intrusion. The Rapid RH® 4.0 is not to be used in concrete less than 28 days old. **Follow ASTM F2170, Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs using *in situ* Probes[1].**

NIST[2] traceable accuracy:
Readings at +/- 2% RH from 50% to 90%
Readings at +/- 3% RH from 90% to 95%
Avoid severe cold or hot storage environments (i.e. vehicles)

[1]Available from ASTM International, P.O. Box C700, West Conshohocken, PA 19428-2959, www.astm.org

[2]National Institute of Standards and Technology

**RAPIDRH4.0**
**Fast, Accurate Moisture Test for Concrete Floors**

The Rapid RH® 4.0 moisture testing system should be used on any project where moisture-sensitive floor coverings or coatings are to be applied over concrete slabs. Owners, General Contractors, Flooring Contractors/Installers and Testing Companies need to be sure the tests they perform are accurate, repeatable and available to all who need to know the current moisture condition of concrete slabs.

Rapid RH® 4.0 significantly improves your project team's ability to instantly test and/or monitor the drying progress of a concrete slab without adding substantial cost to the project. The Rapid RH® 4.0 enables you to take fast, accurate periodic readings that fully comply with industry standards. The Rapid RH® 4.0 "Smart Sensors" are factory-calibrated and use CMOS Sens® technology, to ensure the sensor's accuracy and fast equilibration.

**WAGNER®**
**ELECTRONICS**

**For more information on relative humidity testing and to order online go to**

**www.RapidRH.com**

**Wagner Electronics**
326 Pine Grove Road
Rogue River, OR 97537
(800) 634-9961

The RAPID RH® 4.0 is registered under U.S. Patent 7,231,815 Additional Patents Pending

CE

500-R0000-002 Rev A

## ASTM F2170 Best Practices

Concrete slabs should be allowed to cure and dry as long as possible before performing any type of moisture testing. Even though some methods state to wait at least 28 days after a concrete pour before setting up test instruments, it is often prudent to wait longer. Minimizing the duration between initiating any moisture testing on a slab (such as roughing up the surface or drilling a hole) and obtaining the final results per testing standards increases the chance that the test results will more accurately indicate the condition of the concrete around the test location

If extended periods of time have elapsed since initially setting up test locations and obtaining the final results per testing standards, then it is good practice to set a few new tests to confirm and validate what the older test locations are currently indicating. If it is known ahead of time that an extended period of time will elapse, then it is also good practice to initially only setup a portion of the test locations ultimately required and use those few locations as a means to indicate when the rest of the tests should be performed.

It is important to avoid condensation on the Rapid RH® 4.0 Smart Sensor. If the sensor is colder than the dew point temperature of the environment being tested, condensation can occur causing inaccurate readings and potentially damaging the sensor. To help avoid condensation on the sensor, allow the Rapid RH® 4.0 Smart Sensors to stabilize at room temperature before removing from the package. This action is especially important if the Rapid RH® 4.0 Smart Sensor is taken from a cold environment (such as an unheated area of a vehicle) into a building.

For more information on relative humidity in concrete floors and moisture testing, go to www.cement.org to order the book "Concrete Floors and Moisture" by Howard Kanare.

## Wagner Electronics Limited Warranty

Wagner Electronics warrants the Rapid RH® 4.0 Smart Sensor and Rapid RH® 4.0 *Easy Reader* products against defects in material and workmanship for one (1) year from the date of purchase, subject to the following terms and conditions:

Wagner Electronics' liability under this warranty shall be limited, at Wagner Electronics' option, to the repair or replacement of products or any part thereof, which is demonstrated to be defective. To exercise this warranty, customer must send product back with a copy of the proof of purchase date, the reason for return and, if Wagner determines it is under warranty, Wagner will replace your product. This limited warranty does not apply if the product has been damaged by accident, negligent handling, misuse, alteration, damage during shipment or improper service. Wagner Electronics shall in no event be liable for any breach of warranty or defect in this product, which exceeds the amount of purchase price of the product.

Relative humidity is one of many factors necessary for construction decisions. Wagner Electronics does not assume responsibility for any particular construction decision based on the readings of this instrument and does not guarantee any specific construction results.

The method of use of this instrument and the interpretation of the readings are beyond the control of the manufacturer. Wagner Electronics cannot accept responsibility for any loss, consequential or otherwise, resulting from the use of the Rapid RH® 4.0 and its accessories.

The Rapid RH® 4.0 Smart Sensor should be used before the specified expiration date included in the certificate of calibration. If the *Easy Reader* does not appear to function properly for any reason, contact Wagner Electronics for remedy.

**This warranty is in lieu of all other warranties, whether oral or written, express or implied. Any implied warranties, including implied warranties of merchantability and fitness for a particular purpose, are excluded.** If this product is not in good working order as warranted above, the customer's sole remedy shall be repair or replacement as provided above.

This warranty is personal to the customer purchasing the product from Wagner Electronics or from its authorized distributors and is not transferable.

The agents and employees of Wagner Electronics are not authorized to make modifications of this warranty or additional warranties binding on Wagner Electronics. Accordingly, additional statements, whether oral or written, except written statements from an officer of Wagner Electronics do not constitute warranties and should not be relied upon by the customer.