The Rapid RH™ moisture testing system should be a part of the overall moisture testing program on any project where moisture-sensitive finishes are to be applied. Owners, General Contractors, Flooring Contractors and Installers need to be sure the tests they perform are accurate, repeatable, and available to all who want to know the current moisture condition of a slab on their projects.

The Rapid RH™ is a tool that significantly improves the 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™ enables you to take periodic readings without having to conduct other types of testing. The factory-calibrated “Smart Sensors” using CMOS Sens™ technology insures the sensor’s accuracy and fast equilibration.

**Installation Instructions**

**Step 1: Drill the Hole**

Drill hole to the desired depth in concrete using a rotary-hammer drill and a ¾” SDS drill bit*. Per ASTM F2170-02 standards, drill the hole to a depth of 1¾” (44 mm), which is approximately 40% of the depth of a 4” (100 mm) concrete floor slab poured on grade. For proper RAPID RH™ installation, be sure to position the drill perpendicular (90˚) to the surface being tested. It is recommended that a drill capable of approximately 750 rpm be used with the SDS drill bits.

For other slab thicknesses and drying conditions, please consult ASTM F2170-02 to determine the proper depth of the hole.

If the drill bit becomes extremely hot from drilling several holes in rapid succession, allow the bit to cool before drilling more holes.

*Champion, Hilti, Milwaukee, Bosch, DeWalt, Relton

**Step 2: Clean the Hole**

Use a vacuum cleaner, or dustpan and brush to sweep up the dust around the hole. Attach the Rapid RH™ vacuum attachment to the straight extension of a Shop-Vac vacuum cleaner hose. Insert the vacuum attachment into the hole and vacuum the dust within.

Remove the vacuum cleaner extension from the hole and insert the special wire bristle brush (provided with the kit) into the hole. Turn the brush several times to loosen pulverized concrete from the walls of the hole. Vacuum again and repeat this step twice.

*Vacuum hose diameters vary. Vacuum Attachment may require 2 ½” - 1 ¾” coupler depending on vacuum model.
Step 3: **Place the Probe**

Remove a Smart Sensor probe from its protective package. Remove white serial number strip from inside the Smart Sensor (see step 4 below for serial number strip placement instructions). If this is the first time you have used a Rapid RH™ system, please place the Rapid RH™ Reader into the Smart Sensor. This preliminary test will make it easier to align the reader once the Smart Sensor is inserted into the concrete.

To properly insert the Reader, line up the white serial number strip on the Smart Sensor with the white serial number strip on the Rapid RH™ Reader. Insert the Reader, twist 45 degrees clockwise and press the “ON” button. Verify that numbers appear on the screen (see step 4 for instruction on taking readings).

Next, insert the Smart Sensor into the drilled hole. (Make sure that the Rapid RH™ Reader is not installed in the Smart Sensor.) Use the orange plastic insert tube attached to an orange cap and firmly press the Smart Sensor into the hole until the Smart Sensor seats itself at the bottom of the hole.

For a 1¾” (44.5mm) deep hole, the top of the Smart Sensor will be approximately ¼” below the surface of the concrete.

For holes deeper than 1¾” (44.5mm) use the white insertion tool (available at rapidrh.com).

To keep debris from getting into the Smart Sensor place the protective cap with the orange insert into the Smart Sensor until ready to take readings.

Follow ASTM F2170-02 procedures pertaining to stabilization time. The Smart Sensor has an equilibration time of 30 minutes to several hours depending on concrete and conditions.

Step 4: **Take Readings**

Remove the orange protective cap. Line up the white serial number strip on the Rapid RH™ Reader with the white serial number strip on the Smart Sensor. Insert the Rapid RH™ Reader, push down slightly, twist 45 degrees clockwise and press the “ON” button. If the display shows “- -” or “ER” the Rapid RH™ Reader has not been inserted properly or has been twisted too far. Remove the Rapid RH™ Reader and try inserting again. Press the “ON” button. The display will toggle from the %RH reading and °F temperature reading. The probe will shut off automatically after approximately 1 minute (you can remove the Reader at any time).

Record readings on the enclosed report form that has spaces for information required by ASTM F2170-02 including the date, time, %RH and temperature. You can use the grid at the bottom of the report form to record probe locations. Each Smart Sensor is serialized on the outside of the Smart Sensor. A copy of the serial number is located inside the Smart Sensor and must be removed and may be used on the enclosed report form. Extra copies of the report form can be obtained from our website, rapidrh.com.

After the initial equilibration time of 1-2 hours, subsequent readings can be taken instantly. If future testing is needed, replace the orange tube attached to the orange protective cap. The Rapid RH™ Reader can be left in the Smart Sensor covered by an orange cap. However, if the relative humidity is above 95% it is recommended that you remove the Rapid RH™ Reader between readings.

Step 5: **Encapsulate the Probe**

If the probe will be covered (for example, applied floor covering or coating), place the stainless steel metal disk over the probe and skim-coat the hole using a cementitious patching compound compatible with the flooring manufacturer’s installation instructions.
The Rapid RH™ 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™ is not to be used in concrete less than 28 days old. Follow ASTM F2170-02, Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs using in situ Probes.\(^1\)

NIST\(^2\) traceable accuracy:
Readings at +/- 2% from 50% to 90% (at service conditions\(^1\))
Readings at +/- 3% up to 97% (at service conditions\(^3\))
Avoid severe cold or hot storage environments (i.e. vehicles)

Avoiding Condensation

It is important to avoid condensation on the Rapid RH™ 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 avoid condensation on the sensor allow the probes to stabilize at room temperature before removing from the package. This action is especially important if you bring the Rapid RH™ Smart Sensor from a cold environment (such as an unheated area of a vehicle) into a building.

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\(^1\)Available from ASTM International, P.O. Box C700, West Conshohocken, PA 19428-2959, http://www.astm.org

\(^2\)National Institute of Standards and Technology