

# Performing Correct and Accurate RH Testing

*Ensure accurate moisture readings for your concrete slabs*

In order to prevent a moisture-related failure to a floor covering or coating installation, it is necessary to have the proper moisture level in the slab. Therefore, accuracy of the moisture (relative humidity) readings is obviously critical. The patented Rapid RH<sup>®</sup> Smart Sensor design is superior in a number of ways to other relative humidity test methods, because the sensor portion is permanently embedded into the concrete.

All of the competitive relative humidity testing methods use some type of reusable sensor, inserted into a plastic “sleeve” in the hole. These reusable probe methods require much more time and careful use in order to obtain accurate results while meeting the ASTM F2170 requirements. Improper use of reusable sensor probes can leave you at risk of a moisture-related flooring failure.

On the other hand, the patented design of the Rapid RH<sup>®</sup> makes it quick and easy to obtain rapid and accurate relative humidity readings as outlined by ASTM F2170. Regardless of the methods or tools you use, we want you to be aware of the following issues, so you can obtain accurate relative humidity readings and mitigate your risk of a flooring failure.

## Problems with “Leap-Frogging”

The non-Wagner relative humidity probes can often take many hours to initially equilibrate once they are inserted into their “sleeves” in the concrete slab. Depending on the probe manufacturer, it may take an hour to several hours to equilibrate before a reading can be taken. Sometimes these competitive probes can take up to 12 hours just to reach full equilibration. Some users expect to move a probe quickly from hole to hole (Leap-Frogging) without letting the probe have ample (in some cases hours) equilibration time. The result of insufficient equilibration time is that the relative humidity readings will be inaccurate, usually significantly underestimating the true relative humidity. With the patented Rapid RH<sup>®</sup> method, you never have to be concerned with waiting for the Rapid RH<sup>®</sup> Smart Sensors to equilibrate each time you need to take a reading. Once the short initial equilibration time (15-20 minutes)\* has occurred for an embedded Smart Sensor, you can obtain subsequent readings immediately and anytime thereafter.

## Lack of Calibration Verification

ASTM F2170 indicates that probe calibration must be verified for accuracy within 30 days of each use. With re-use, reusable relative humidity probes will fall out of calibration (contaminants, etc). Contamination of these relative humidity probes can lead to inaccurate relative humidity readings. According to Section 8 in ASTM F2170, verifying a probe’s measurement accuracy requires testing the probe with a salt solution or with a humidity chamber. Rapid RH<sup>®</sup> sensors come with a certificate of NIST traceable calibration. You never need to be concerned with verifying calibration and the associated costs if you are using the Rapid RH<sup>®</sup> method.

## Improper Depth of Installation

ASTM F2170 requires that relative humidity readings be performed at 40 percent of the depth of the concrete (slab drying from one side; 20% if drying from two sides). Many reusable probes require the user to knock out holes at the proper location in their plastic sleeve inserts, and other sleeves actually have multiple openings vertically along the sleeve insert. Often times these types of sleeve inserts lead to inaccurate readings because they do not always adhere to the very specific depth requirement of ASTM F2170. The design of the Rapid RH<sup>®</sup> ensures the user can easily obtain a reading at the correct depth of the concrete for every installation. Just drill the hole to the correct depth and insert the Rapid RH<sup>®</sup> Smart Sensor to that depth. The Rapid RH<sup>®</sup> patented small dead volume design ensures conformance to the ASTM depth requirement while also providing very rapid equilibration times.

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\* Section 10.3.4 of ASTM F2170 currently states: “Allow 72 hours to achieve moisture equilibrium within the hole before making relative humidity measurements.” Wagner’s Rapid RH<sup>®</sup> patented design allows for obtaining initial readings in the first 15-20 minutes that will generally be within 3% of the reading at 72 hours. Generally, within one hour, Rapid RH<sup>®</sup> Smart Sensors will be fully equilibrated, and remain so, but it is recommended that the ASTM F2170 specification is strictly adhered to.