

Operating Instructions for RH BluePeg



Moisture Testing in Concrete using in-situ Probes



Lignomat USA Ltd

14345 NE Morris Ct. Portland OR 97230 USA

800-227-2105

503-257-8957

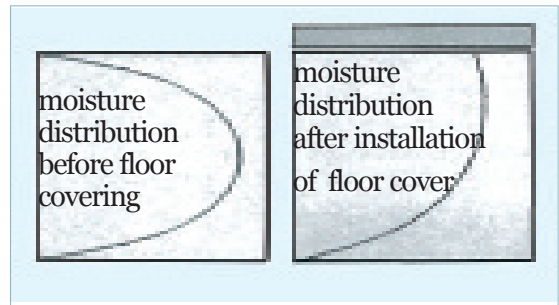
Table of Contents

Using the RH BluePeg System	1
Preparations	2
Measurements	3
Obtaining Measurements	4
Lignomat's RH BluePeg System	5 - 7

Using the RH BluePeg System to avoid Floor Covering Failure

The RH BluePeg is a relative humidity and temperature sensor, designed to be placed inside a hole liner (sleeve), which has been inserted into a predrilled hole in the concrete test area. The cap is used to seal the sleeve to allow acclimation to the moisture released by the concrete inside the hole. To conform to ASTM F2170-11 standards, the sleeve should be in the concrete and sealed from the outside atmosphere for 72 hrs before taking readings. After approval of ASTM 2170-11, the RH Probe and the sleeves were changed to comply with the new standard 2170-11.

So far the Calcium Chloride test has been commonly used to determine concrete moisture. Over the years the experts have found that the in-situ probe test is more reliable. One reason is that the Calcium Chloride test is mostly a surface test and not a core test, and in some cases moisture will remain undetected in the core. Another reason is the dependability on ambient conditions. A floor will evaporate more moisture on a dry day than on a humid day.



It has been a common practice to use pin or pinless meters to measure the moisture in concrete slabs. The NWFA recommends any of the pin or pinless meters only as qualitative testing tools. The in-situ probe method or the Calcium Chloride test are recommended, in order to determine if a concrete slab is dry enough to put a wood floor down. When selecting a test method, follow the installation guide lines of the floor manufacturer.



Preparations

Test Site Conditions before Test starts

To obtain relevant test results the concrete floor slab should be at service temperature and the air space above the floor should be at service temperature and at service relative humidity for at least 48 hrs before drilling the holes.

Number of Tests per locations

Recommended are 3 tests for the first 1000 ft² (100m²) and at least one additional test for each additional 1000 ft² (100m²). Choose test areas where high moisture levels are suspected. The non-invasive scanning meters Ligno-DuoTec BW or the Ligno-VersaTec can be useful to detect high and low moisture areas.

Measuring Depth

The standard sleeve from Lignomat is designed for 4-5" thick slabs drying from the top only. Measuring depth does not need to exceed 40% of the slab thickness.

For 4-5" thick slabs drying from both sides, the required measuring depth does not need to exceed 20% of the slab thickness. The standard sleeve can be shortened accordingly and an extension piece for the top of the sleeve is available from Lignomat. For a required measuring depth of more than 2" we provide an extension for the bottom of the sleeve. Contact Customer Service at 1-800-227-2105, if you have any questions.

Preparing Test Hole, Placing Sleeve and Cap

Once the location has been determined, drill one hole for the first sleeve with a carbide drill bit 5/8" (16mm) in diameter using a rotary hammer drill (observe all safety precautions as outlined by the manufacturer). To accommodate the sleeve, the hole should be 1 15/16" (50mm) deep. Take extra care in drilling straight down. Clean the area around the hole with a vacuum cleaner and vacuum the dust out of the hole. Next, use a brush to remove loose particles in the hole and vacuum the hole clean. Repeat brushing and cleaning one more time. Insert the hole needs to be brushed out and cleaned out again with the vacuum cleaner. Immediately, set the sleeve by tapping the sleeve into the hole with a hammer or mallet. To protect the outer ring of the sleeve, put cap on before using hammer or mallet. Make sure the outer ring of the sleeve is flush with the floor. After all steps are finished, drill the next hole for another sleeve.

Measurements

The RH in-situ probe measurement is regulated by the ASTM F2170-11 standard guidelines. Following the ASTM F2170-11 guidelines, the sleeves have to be placed in the concrete for 72 hrs and the sensors have to be acclimated before test results are valid and can be documented. If waiting times are cut short the resulting measurements could be too high or too low.

Test Procedure

The ASTM F2170-11 requires the sleeves to be set in the concrete slab and capped off for 72 hrs before recording any readings. If the sensors are inserted after 72 hrs, they still need acclimatization time to show true readings. If the acclimatization time is cut short, readings could be too low. In your report note: times when the sleeves are placed, the sensors are inserted and the readings are taken. If not enough sensors are on hand, the sensors can be leap-frogged and used to measure the next set of holes, an advantage of removable sensors. Leap frogged sensors acclimate fast to the true readings.

To avoid extended waiting periods beyond the 72 hrs required by ASTM F2170-11, ** you can insert the sensors at the time the sleeves are placed. Wait at least one hour for the drilling heat to dissipate before inserting the sensors. Then, after 15 minutes the readings from the sensors are a good indication of the moisture conditions. Wait 72 hrs before documenting readings.

If you are on site, a good time to insert the sensors would be 48 hours after the holes have been drilled. Then for sure the drilling heat has dissipated and after 72 hrs the sensors are acclimated. And again, the sensors can be leap-frogged.

These “acclimated” leap frogged sensors show true readings within 15 minutes.

In any case, the sleeves have to sit for at least 72 hrs and readings have to be stable.

The same sensor can be read multiple times in short time intervals, if the sensor is not removed from the sleeve. The “soft seal” on top of the sensor prohibits outside air from entering the sleeve. Between readings, either cover the sleeve with the red cap or leave cable-end-cover in place.

Please note, that the dust protection over the sensing element slows acclimation to ambient air conditions once the sensor is removed from the concrete. For that reason we recommend using a different sensor if the ambient air temperature and relative humidity are to be measured in the room/building after the tests have been completed.

** The manufacturer of the sensing element recommends not to expose the sensors over an extended period of time to high relative humidity (over 95%). Please check if those high humidity conditions exist inside the sleeves and make sure the sensors are not left for hours in these conditions.

Obtaining Measurements

-Connect RH BluePeg Probe to meter via RH cable or RH Adaptor.

(RH meters: Ligno-Tec RH, Ligno-DuoTec BW or Ligno-VersaTec)

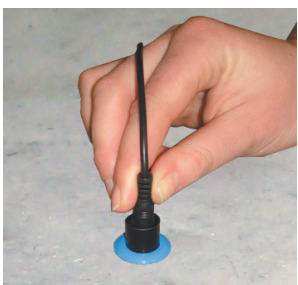
-Press the READ button. RH, T, DP, GPP and the sensor number appear on the left side of the display. The corresponding measured value appears to the right.

-Press ▲ or ▼ keys to toggle between RH, T, GPP, DP.

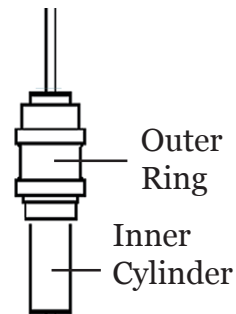
Taking Readings in Concrete: Remove red cap, connect 3.5 mm Plug (P). The plug fits into the sensor easily. Do not remove the sensor from the sleeve to connect the cable, this disturbs the acclimatization of the sensor and the climate in the hole. Next, push cable-guard (C) firmly into the lip of the sleeve and press the middle cylinder down to secure cable connection while taking readings.

Set Sensor:

Remove blue cap and drop RH BluePeg into the sleeve. Use red cap to mark sleeve with sensor inside.

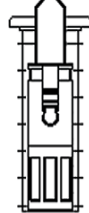


Connect Cable to RH Probe after Acclimation :



- Remove red cap. Pull cable-end-cover back and connect 3.5mm plug to Probe. Do not remove the sensor from the sleeve, this disturbs the acclimation of the sensor and the climate in the hole.

- Push outer ring into the lip of the sleeve and push inner cylinder down towards the probe. If the inner cylinder already touches the top of the probe, the cylinder will not move down any further. Connect cable to meter and take a reading.



Inner Cylinder
Outer Ring



Remove Cable: Hold the inner cylinder in place with one hand and pull the end of the cable about 3/4" towards you. This disconnects the sensor from the cable. Now you can remove the cable-end-cover and the sensor will stay in the sleeve.

Remove Sensor: After removing the cable as described above, simply connect the cable again and pull the sensor out of the sleeve.

After a test series is finished, all sensors should be removed. The sleeves are unusable after the test, since the fins which seal the air are rubbed off. Remove the lip of the sleeve and close the hole with a cementitious patching compound to produce a smooth surface.

Once a test series is finished, the same holes should not be used for another test series at a later time.

Maintenance

After testing is finished the RH BluePeg sensors should be stored in the original packaging and kept in a dry location. We recommend 20 to 60% relative humidity and 50°F to 120°F (10°C to 50°C). Visible dust should be removed.

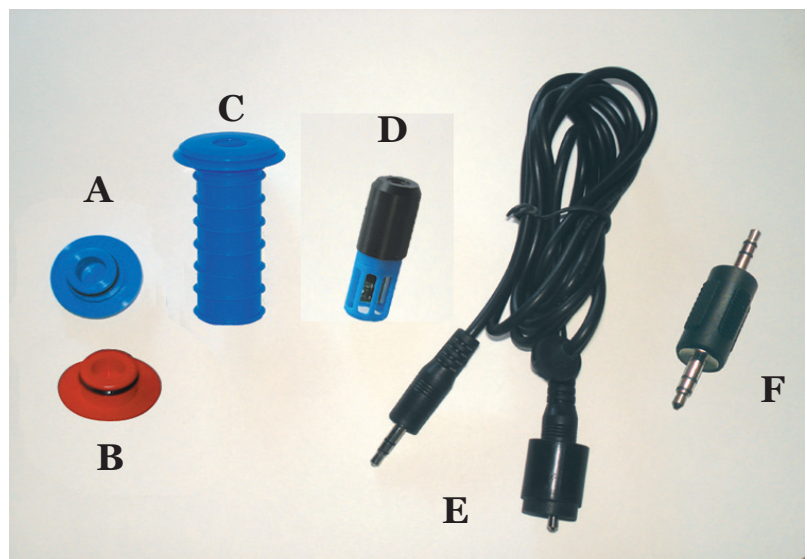
Calibration

The RH Blue Peg uses a single microchip calibrated to NIST standards. The microchip manufacturer assures long term calibration stability.

According to ASTM F2170-11 probes should be checked within 30 days before use. During the one year warranty period, Lignomat offers to check the calibration free of charge three times.

Lignomat's RH BluePegSystem:

- A- Cap to cover sleeve
- B- Red Cap to mark sleeve with sensor inside
- C- Sleeve
- D- RH BluePeg sensor
- E- RH-C Cable with cable-end-cover to plug into sleeve
- F- RH Adaptor for direct connection of sensor to meter



Accuracy of Humidity Readings: +/-2% for 10% to 90%,
up to +/-3% below 10% and above 90%.
Accuracy of Temperature Readings: +/-1°F for 32°F to 120°F,
up to +/-1.8°F for 5°F to 32°F and 120°F to 160°F.

RH BluePeg 5, 10, 25 Pack:

Convenient and time-saving and re-usable.

Since multiple test locations are necessary to obtain representative moisture data for each test site, using several RH BluePeg sensors per test site cuts down on waiting time for the sensors to be acclimated.



Sleeves with Caps 20 Pack:

The sleeve is the liner for the test hole, drilled with a 5/8" concrete drill bit. The cap seals the opening.

RH-S20 pack contains 20 sleeves and 20 caps with seal rings. Following ASTM standard, the slots have been removed and the opening is at the bottom.



RH Cable with Cable-End-Cover:

Easy-to-use 3.5 mm plug connects and disconnects the cable from the RH-BluePeg sensor. Cable-end-cover holds the cable in place while taking readings and is used to disconnect the cable from the RH BluePeg sensor, while the sensor stays in the sleeve and the cap can be put back.

RH Adaptor:

The RH Adaptor can be used for any application where the long RH cables become cumbersome to manage. Ideal for measuring ambient conditions of relative humidity and temperature.

3.5 mm male plugs on both ends to connect meter to RH BluePeg sensor.



Readers for Lignomat RH BluePeg Sensor

Ligno-Tec RH: A, B

Ligno-DuoTec BW: A, B, C, D

Ligno-VersaTec: A, B, C, D plus Pin Mode

A Measurement of relative humidity, temperature, dewpoint, and GPP of air

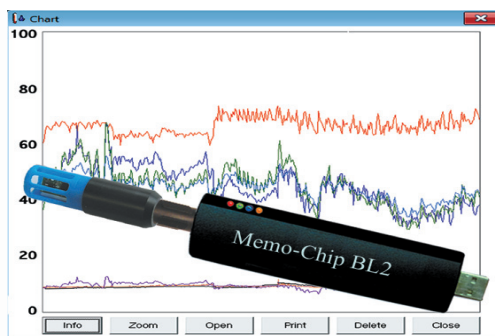


B Measurement of relative humidity, temp. in concrete



C Non-invasive meter for concrete

D Non-invasive meter for wood



BL2 is a data logger for Lignomats RH Probe. The data logger can be used to keep track of ambient conditions in the test location. Or, can be connected to the RH probe in the sleeve, to make sure the probe is acclimated.