

The *Protimeter Floor Testing Kit* enables you to make quick assessments of the relative moisture condition of solid floors and to take precise equilibrium relative humidity (**ERH**) measurements in accordance with relevant flooring industry codes of practice.

Kit Contents

The following parts are included in the *Protimeter Floor Testing Kit*:

Table 1: BLD7705-AQ Contents

Description	Part No.	Qty.
Protimeter Aquant® Moisture Detector	BLD5760	1
Protimeter Hygromaster® c/w Hygrostick® Humidity/Temperature Probe	BLD7700	1
Hygrostick Extension Lead	BLD5802	1
Humidity Sleeves	BLD4902	20
Humidity Box	BLD4711	1

Protimeter Aquant

The *Protimeter Aquant* is used to make a quick assessment of the relative moisture condition of the solid floor. It is very helpful for identifying the areas where the more time-consuming *equilibrium relative humidity (ERH)* measurements should then be taken.



To use the Aquant, hold it against the slab as shown and note the reading. The instrument should be held at an angle of ~30°, so that both the sensor bulge and the front edge of the meter are in contact with the surface.



The nominal depth of measurement is 15-20 mm in dense, homogenous materials. The Aquant readings are defined as follows:

- *Green Zone (0-160)*: Safe dry condition.
- *Yellow Zone (161-200)*: Dry/borderline condition.
- *Red Zone (201-1000)*: At risk/damp condition. Potential for moisture related failure of floor coverings at exits. Before laying the floor, establish the actual moisture level in terms of **ERH** by using the *Hygromaster* and humidity box or humidity sleeves.

For detailed product instructions please refer to the enclosed *Aquant Manual* (INS5760) Protimeter Hygromaster, or download the manual at: <http://www.protimeter.com>

The *Protimeter Hygromaster* measures relative humidity and temperature. For flooring applications, it is used in combination with a humidity box or humidity sleeves to measure the *equilibrium relative humidity (ERH)* of solid floors prior to laying decorative floor coverings. The humidity (and temperature) measurement is made with the removable and replaceable *Hygrostick* sensor, shown at right plugged into the top of the instrument.



For detailed product instructions please refer to the enclosed *Hygromaster Manual* (INS7700), or download the manual at: <http://www.protimeter.com>.

Surface ERH Readings - Using Hygromaster and Humidity Box

The *humidity box* is a block of closed-cell, high-density foam that is used to isolate a pocket of air at the floor surface from the surrounding environment. The box is placed on the floor slab and left for sufficient time for the air pocket to equilibrate with the relative humidity within the slab itself. The *Hygromaster* is then used to measure the relative humidity of the air pocket.



Amphenol Advanced Sensors recommends that you use the Hygromaster and humidity box in accordance with the guidelines of applicable standards. The quick reference guideline is as follows:

1. Use the Aquant to identify the areas that require measuring with the Hygromaster and humidity box.
2. Place the box or boxes in position, ensuring that the hole in the side of the box is plugged.
3. Put a brick (or similar item) on top of the box to ensure that it stays in position.
4. Leave for sufficient time for equilibrium to be reached (this will be a minimum of 24 hours and is subject to slab thickness and surface finish - refer to relevant standards for more information).

5. Remove the plug from the box and insert the Hygrostick into the hole. The conical sleeve fitted to the Hygrostick makes a seal with the hole when pushed firmly into position.



6. Leave the Hygrostick in place for minimum of 30 minutes to allow it to acclimatize to the conditions within the humidity box.

7. Connect the Hygromaster to the Hygrostick using the extension lead as shown and take the humidity measurement.



8. Check the readings at 5-minute intervals. It is safe to assume the probe has acclimatized when 3 consecutive readings are within $\pm 0.3\%rh$ of each other.
9. *Interpret the readings (per BS 8201, 8203 and 5325) as follows:* readings of $\leq 75\%rh$ are considered dry. If there is any doubt or ambiguity regarding the slab moisture level, consult the manufacturers of the specified adhesives and/or decorative floor coverings **before laying**.

Sub-surface ERH readings - Using Hygromaster and Humidity Sleeve

As an alternative to surface ERH readings, Hygrosticks can be put into humidity sleeves that are placed into holes drilled into the slab. While this technique is not incorporated into British Standards it is widely used in the UK, Scandinavia and Continental Europe. The sleeve technique offers the following advantages:

- It provides a more accurate measurement for the ERH of the concrete.
- It is unobtrusive and tamper-proof (when compared with humidity boxes).

Amphenol Advanced Sensors recommends that you use the Hygromaster and humidity sleeves in accordance with the guidelines of applicable standards. The quick reference guideline is as follows:

1. Check that it is suitable or desirable to drill holes in the floor; if not, use the surface humidity box test method. The sleeve test is only suitable for solid slabs where the DPM (or under floor heating system, if incorporated) is known to be at a depth of at least 75 mm below the surface.
2. Use the Aquant to identify the areas that require measuring with the Hygromaster and humidity sleeve.
3. At these points, drill a 16 mm diameter clearance hole to a nominal depth of 50 mm.



Sub-surface ERH readings - Using Hygromaster and Humidity Sleeve (cont.)

4. Push the sleeve into the hole. Ensure that the sleeve flange is flush with the surface and ensure that the sleeve cap is put in place.
5. Before taking measurements, wait for 24 hours minimum for equilibrium conditions to be reached.
6. Remove the humidity sleeve cap and insert the Hygrostick. When pushed firmly into place, the conical sleeve fitted to the Hygrostick makes a seal with the humidity sleeve.
7. Leave the Hygrostick in place for minimum of 30 minutes, to allow it to acclimatize to the conditions within the humidity sleeve.
8. Connect the Hygromaster to the Hygrostick using the extension lead as shown and take the humidity measurement.
9. Check the readings at 5-minute intervals. It is safe to assume the probe has acclimatized when 3 consecutive readings are within $\pm 0.3\%rh$ of each other.
10. *Interpret the readings as follows:* generally speaking, readings of $\leq 80\%rh$ are considered dry. If there is any doubt or ambiguity regarding the slab moisture level, consult the manufacturers of the specified adhesives and/or decorative floor coverings **before laying**.



American Standards - www.astm.org

- ASTM F2420-05 Standard Test Method for Determining Relative Humidity on the Surface of Concrete Floor Slabs Using Relative Humidity Probe Measurement and Insulated Hood

The Hygromaster and humidity sleeves can be used to measure moisture levels in accordance with the requirements of the following standards:

American Standards - www.astm.org

- ASTM F2170-02 Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes

Hygrostick Calibration

For confidence, the calibration of the Hygrostick sensors should be checked at regular intervals against a reference probe or over saturated salts solutions. *Certified Reference Hygrosticks* are available as part number **BLD4750B**.

Useful Sources of Information

Additional information may be found at the following:

- Flooring Industry Training Association - www.fita.co.uk
- Contract Flooring Association - www.cfa.org.uk
- Building Research Establishment - www.bre.co.uk

Relevant Flooring Industry Standards

The Hygromaster and humidity box can be used to measure moisture levels in accordance with the requirements of the following standards:

British Standards - www.bsi-global.com

- BS 8203 - Code of practice for installation of resilient floor coverings
- BS 8201 - Code of Practice for flooring of timber, timber products and wood based panel products
- BS 5325 - Code of practice for installation of textile floor coverings

www.protimeter.com

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