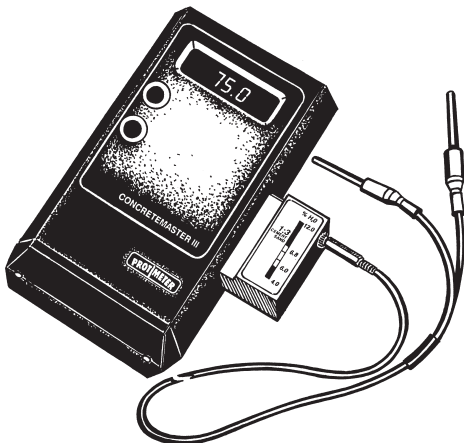


A great deal of water is introduced into a building during construction; some as mixing water for concrete, mortar or plaster, and some as rainwater due to the careless storage of building materials.

Floor Screeds

A major problem associated with the drying out of new buildings is the determination of the stage at which the floor screed is sufficiently dry to permit laying of a moisture sensitive floor covering. The rate of drying for a 50mm screed is about 1 mm per day. Two methods are used to monitor the drying process.

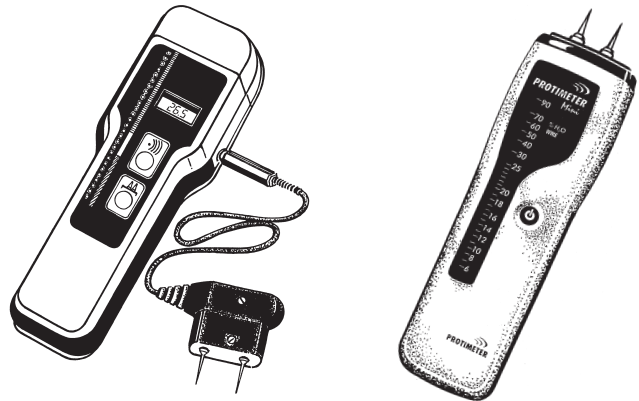
Method 1. The Conductivity Test: A specialised instrument designed for the purpose is the **Concretemaster III**, Two holes 6 mm in diameter are drilled into the screed 25 mm deep and 150 mm apart, these are filled with an electrically conductive gel and the electrodes inserted. The instrument is calibrated to give the average moisture content of the screed of up to 100 mm in depth.



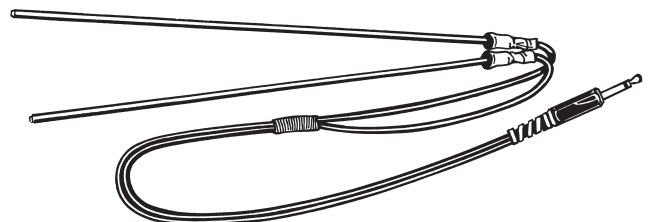
Method 2. The Hygrometry Test: This method is designed to measure the equilibrium relative humidity (**erh**) of a pocket of air at the same temperature as the screed and in equilibrium with it. This is achieved by placing an impervious 100mm² membrane on the screed with the hygrometer probe under it, sealing the edges with adhesive tape and leaving it until a steady reading is obtained (generally over 24 hours). When the reading does not exceed 75% relative humidity, the screed is said to be dry enough for flooring to be laid. The **Concretemaster III** is a suitable instrument for this purpose. (A superficial but quicker method is to drill a hole 14mm in diameter and 25 mm deep into the screed, insert a humidity probe into it and to take a reading after about 20 minutes.)

Walls

To check whether a wall is dry enough to be painted, an instrument giving an **indication** via the radio frequency interference (RFI) method, such as **Surveymaster SM**, is passed along the surface of the wall.



When an area is discovered that requires further investigation, an impervious membrane (eg a 30mm² plastic sheet) is placed on the wall surface, and left in position for about 24 hours with the edges sealed with adhesive tape. To take moisture readings the needle-electrodes of any of the Timber Moisture Meters (eg the **Mini**) are pushed through the membrane. The reading should be in the **green** zone of the meter for **oil-based** paints and in the **green** or **yellow** zone for **waterborne** paints. Dampness below the surface can be measured using **Deep Wall Probes**.

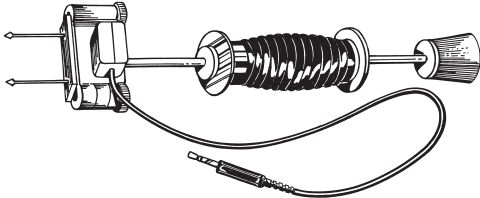


Wood

Wood should be dry when painted. It is generally considered that before an application of oil based paints the moisture content of the wood as measured with a moisture meter, such as the **Mini**, should not be greater than **18%** for **exterior** work and **12%** for **interior** work. Higher moisture contents may result in blistering owing to the evaporation of water from below the paint film, and consequent shrinkage of the wood.

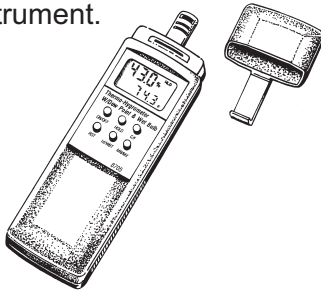
Wood (cont'd)

Heavy wooden members should be checked below the surface by using a **Hammer Electrode** with insulated pins.



Condensation on Metal Surfaces

If a surface is at a temperature lower than the dewpoint temperature, condensation will take place. Both temperatures can be established easily and quickly with a **Digital Hygrometer** due to it's built-in dewpoint measurement and usage of an optional Surface-Temperature Sensor that plugs into the instrument.



Salts

Salts contamination (eg due to rising damp) can be analysed with a **Salts Analysis Kit**.

Protimeter readings are meaningful:

The theoretical ideal is to measure the erh of a material.

moisture content of typical softwoods. Graphs could also be drawn for every other building material. Materials at an erh of about 75% or below are safe from decay. It is equivalent to 16 to 18% moisture content in wood. It is the relative humidity that determines whether or not moulds will grow; decay fungi develop in wood; or decorations be damaged.

Manual measurement of relative humidity is cumbersome and time-consuming. Fortunately it is not the only method.

The readings of a moisture meter measure only the free water in a material; therefore they closely indicate the relative dampness of different materials. Although they do not measure relative humidity, their indications are a fairly close representation of it; and their results are available immediately. A high reading on such a meter (in the absence of contaminating salts and carbonaceous materials) indicates a damp condition of equal significance in wood, brick or plaster etc, regardless of their different moisture contents.

The colour coding on the meter is as follows:

- To about 75% erh: Green = Safe
- between 75% + 85% erh: Yellow = Investigate further
- above 85% erh: Red = Danger

Per-cent moisture content readings are not meaningful because they do not tell you if a material is dry or damp.

They are computed as follows:

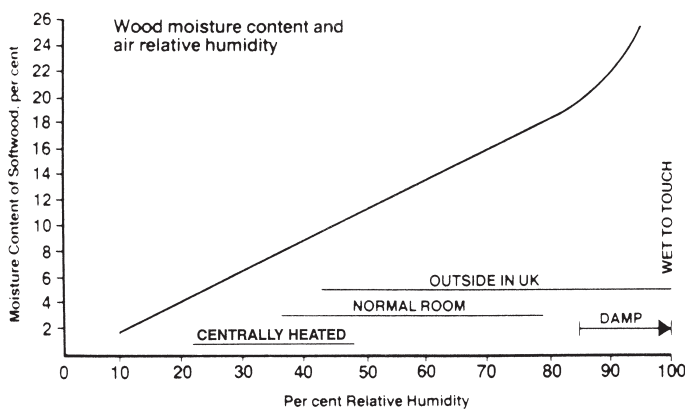
$$\frac{\text{Wet weight} - \text{Dry weight}}{\text{Dry weight}} \times 100 = \% \text{moisture content}$$

It is obvious that a heavy material will have much lower % moisture content than a light material that has the same amount of water in it, because one divides by a larger number.

For example: Is 5% dry or wet? Answer:

- In wood it is very dry.
- In mortar it is fairly dry.
- In brick it is damp.
- In plaster it is wet.

But it gets even worse: Building materials are immensely variable -so that similar materials can be dry or wet at the same % moisture content depending upon their exact composition.



This graph shows the approximate relationship between the relative humidity (Rh) of air and the