



Using a Protimeter Moisture Meter To Check Damp within a Building

This white paper highlights basic understanding of moisture, some of the techniques to look for damp and how to use a digital moisture meters to diagnose moisture levels

Developed by



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Introduction

Checking damp and moisture within a building structure, is a very comprehensive subject. This white paper highlights basic understanding of moisture, some of the techniques to look for damp and how to use a digital moisture meter to diagnose moisture levels.

1. What Is Damp?

Damp is caused by water getting into the property (structural) and moisture building up within the property causing condensation (lifestyle).

a. Damp ingress into a property (Structural)

Damp occurs when water penetrates into the fabric of a building.

Common causes are:

- Rainwater seeping through the roof where a tile or slate is missing, spilling from a blocked gutter or penetrating around window frames.
- Rising damp due to a defective damp-course or because there is no damp-course.
- Leaking pipes, wastes or overflows. Often you can see damp as “tide marks” on walls and ceilings.

b. Condensation (Lifestyle)

Lifestyle moisture issues are caused by normal daily activities (taking showers and baths, washing and drying clothes, cooking and boiling kettles), all produce warm air containing large amounts of water vapour.

If the warm air can't escape through an open window or air vent, it moves around until it finds a cold surface where it cools and forms condensation.

Condensation occurs on any cold surface which records a below dew point temperature (temperature at which saturated air releases surplus moisture vapour). This can be seen on a mirror in a bathroom or a window in a kitchen when cooking.





2. Difference in damp of materials

Building materials will absorb different levels of moisture content, some materials, like wood, can absorb more water than brick.

Commonly timber will absorb more water molecules than a brick wall. Wood is like a sponge, absorbing moisture directly from the buildings structure and retain higher levels of moisture before directly being affected by the damp process.

The follow table provides examples showing the percentage moisture and the readings interpretation.

Material	Moisture content %	Interpretation
Wood	4	Extremely dry
Mortar	4	Dry
Brick	4	Damp
Plaster	4	Very wet
Wood	12	Air dry
Brick	12	Saturated
Plaster	12	Not possible

As shown, wood can be classed as dry at 12%, but brick would be saturated at the same reading.

Example

A timber skirting which records a moisture reading of 12% (air dry), the plaster could be around 0.5% and the brick about 1%. In severe conditions you may see higher readings of skirting 22%, plaster 1% - 3% and brick around 2% - 5%.

Readings are taken on a reference scale as it is only a relative degree of dampness. Wood moisture scale (wood moisture equivalent 'WME') is the most common and is recognised by professional bodies. Wood is the first material to degrade due to damp.



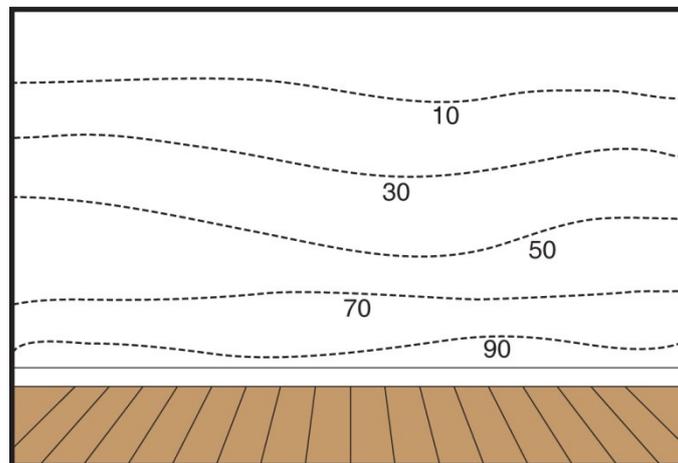


3. How To Pinpoint Moisture within a Structure

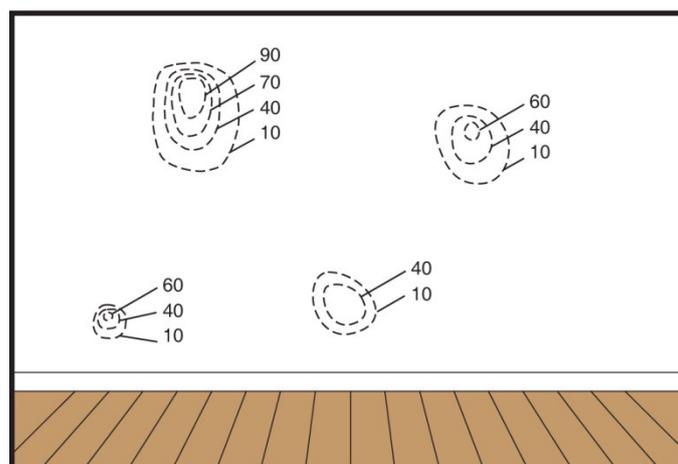
First conduct a visual check to review the property for any signs of visible moisture damage. When verifying the buildings moisture condition, look for discolouration first. This will allow you to target the affected areas first.

Pinpointing the damp is only possible with an electronic moisture meter. These instruments can detect moisture levels below levels that are visible or can be felt.

When measuring moisture, take regular readings over the suspected area and mark the boundaries of moisture levels. Develop a scaled drawing of the moisture readings recording the levels within the affected areas to determine the severity.



Pinpointing Rising Damp



Pinpointing Damp Spots

For a definitive guide into damp, I would recommend the Dampness In Buildings book distributed by Protimeter. This is a comprehensive guide to moisture in buildings. A copy can be purchased directly through our online store.



4. Measuring Moisture

Reliable electronic moisture meters from Protimeter are the preferred instruments due to the renowned reliability, accuracy and quality.

Models include the Protimeter Digital Mini (surface moisture) or Protimeter Aquant2 (subsurface moisture). Alternatively, you can combine the two functions by using a Protimeter Surveymaster2 which features both surface and subsurface moisture readings.

a. Surface Moisture

A pin type moisture meter, like the Protimeter Digital Mini, can be utilised to measure the surface moisture of a wall, wood and building structure. Simply place the pins on the surface of the wall to take a reading.



Protimeter Digital Mini taking a surface moisture reading

The Protimeter Digital Mini measures using the %Wood Moisture Equivalent (%WME) scale.

With a pin type instrument, it may be required to push the pins into the wall. Some types of wall coverings will restrict the reading. But a word of caution, pushing pins into a surface will leave a mark especially glossed paint, venires and laminated surfaces.

Taking readings in a kitchen or bathroom can be problematic with a pin type instrument. Floor coverings and tiles will provide a barrier stopping a direct reading with a pin type instrument. This is where you can use the radio waves of the Protimeter Aquant2 to detect the subsurface moisture levels.



b. Subsurface Moisture

A non-invasive (pin less) moisture meter will measure the subsurface moisture to a depth of 20mm. This is advised where wall, floor and wood covering prohibit moisture readings with a pin type instrument.



Protimeter Aquant2 taking a non-invasive moisture reading

The Protimeter Aquant2 will measure using radio waves, penetrating beneath the wall surface including wall paper, paint and even tiles. This allows the user to undertake a very quick reading without damaging the surface. The Protimeter Aquant2 can also measure moisture in veneered wood like a build-in wardrobe, kitchen or fibreglass.

With the Protimeter Aquant2, moisture level is displayed as a relative moisture level between 0-999 %REL. The lower the reading, the drier the moisture content, higher the reading indicates higher moisture levels.



c. Moisture Readings



Protimeter Digital Mini



Protimeter Aquant2

All Protimeter moisture meters will display the readings through a digital LCD display and a simple colour coded LED display.

The digital LCD display will provide the moisture reading (%WME or %REL). When undertaking readings, write down this measurement for future records.

To support the digital reading, Protimeter has developed a simple colour coded LED scale to indicating the moisture condition severity. This provides a very simple way to determine if the readings are **Dry**, **Borderline** and **Damp**.

Green - Dry

Air dry moisture content

Amber - Borderline

Excess of moisture is present. This moisture cannot be attributed to high atmospheric humidity but to a definite source. If the reading in this zone persists or increases, remedial action is needed. Decay likely.

Red - Damp

A serious moisture condition exists and immediate remedial treatment must be effected. Decay inevitable.

Any material displaying a red / damp reading is too damp.



5. How To Check For Condensation

Condensation is caused by high air humidity levels created by common household tasks which produce high levels of water vapour (having a bath, running a shower and boiling water).

Condensation occurs on cold surfaces (window, mirror, tiles, glass) where the air borne water vapour condensates back into a liquid. Condensation is usually an intermittent phenomenon, occurring frequently in winter and at night. Therefore a range of readings will be required throughout the day in all rooms of the property.

When looking for condensation problems, check bathrooms, showers and kitchens. If condensation keeps occurring in the same place, it can cause black mould growth. The distribution of mould growth can be a useful guide to where condensation is occurring.

If you feel that condensation is a cause for some of the moisture problems, a digital hygrometer will accurately measure the airborne moisture which creates condensation. When measuring humidity, air temperature should be recorded at the same time.

Hygrometers from Protimeter are recommended like the Protimeter Hygromaster or Protimeter Physclone for their quality and accuracy.

Measure for levels of humidity first, if high levels are recorded then there will be a potential of condensation occurring in the property.



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a. Measuring Relative Humidity (%RH)

Air humidity is measured against Relative Humidity (%RH) and is a simple procedure.

When undertaking humidity readings with the Protimeter Hygromaster and Protimeter Psychrone, the sensor is located at the top of the instrument.

The standard sensor has a reading range of 30 -100 %RH. A digital sensor featured in the Protimeter Psychrone records a range of 1.0 - 99.0 %RH.



Protimeter Hygromaster

Protimeter Psychrone





After turning on the instrument, ensure the instrument is displaying %RH and air temperature (TA). The instrument will then read both airborne humidity and air temperature. Depending on lifestyle issues, different measurements will be required throughout the day to develop a pattern when humidity occurs, which room and cause of the humidity.

Internal humidity readings will increase if the outside weather conditions are damp.

Any reading over 70%RH will cause damage to natural materials.

	Low %RH	High %RH
Central Heating	20	45
Normal Room	35	75
Damp	75	100
Outside UK	45	100

The simplest way to record the humidity levels within a property is to develop a spreadsheet recording date, time, room, %RH and air temperature. Over the period of a day, a picture of the humidity fluctuations will be seen.

If high levels of humidity have been recorded, it is best to check the surface temperature to verify the potential of condensation.



b. Measuring For Condensation

Condensation is measured against the dew-point scale and requires surface temperature readings.

Both the Protimeter Hygromaster and Protimeter Psychrone can measure for condensation, reporting back the potential of condensation. An optional Surface Temperature Probe accessory is required to undertake this procedure.

By operating the Temp Diff function, the operator will be able to determine if surfaces are colder than the surrounding air temperature, creating condensation.



Protimeter Hygromaster measuring surface temperature for condensation readings

However with the Protimeter MMS2 instrument, the Condensator Mode enables the user to assess the risk of condensation occurring on surfaces or to confirm whether or not condensation is present on a surface.



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For more information on the Protimeter range, visit our Protimeter website

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new Protimeter Digital Mini digital moisture meter

Protimeter Digital Mini Protimeter Aquant2 Protimeter Surveymaster2 Protimeter Hygromaster Protimeter Timbermaster Protimeter MMS2

Welcome to Protimeter

The complete Protimeter range of moisture meters are available: Mini, Digital Mini, Aquant2, Surveymaster2, Timbermaster, Hygromaster, Psychrone, MMS2, Speedy and Hygrotrac.

Protimeter are the market leaders in the development and manufacture of precision moisture meters. Founded in 1959 the range has now grown to include both moisture and humidity meters and with the support of their parent company, Amphenol Sensors, quality will always be assured.

Protimeter Moisture Meters

We stock a complete range of Protimeter moisture meters and as the UK leading dealer advice will always be provided on the best instrument to meet your requirements. The range comprises of the simple Protimeter Mini with simplified colour-coded scale, the Protimeter Digital Mini with enhanced screen, the Protimeter Aquant2 with radio search mode, the Protimeter Surveymaster2 with search / measure modes and the Protimeter Timbermaster designed for reading moisture in timber. When measuring humidity there is a choice of the Protimeter Hygromaster, or the Protimeter Psychrone. If you would prefer a combination of moisture and humidity meter then the multi-purpose Protimeter MMS2 is best suited for you. We also stock more specialist instruments, the Protimeter Speedy 2000 series which pressure test a samples or the Protimeter Hygrotrac which remotely monitor 600 sensors.

Introducing the new Protimeter Surveymaster Newly developed dual mode moisture meter

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