



**MEASURING
CONDENSATION IN
BUILDINGS**

**BUILDING SURVEYOR'S
GUIDE**

[BUILDING SURVEYOR'S GUIDE] MEASURING CONDENSATION IN BUILDINGS



Sometimes it doesn't take much to size up a dampness issue.

With simply a visual inspection or just a few quick meter measurements, the problem is apparent. Perhaps there's a major plumbing leak or maybe the freeze-thaw cycle finally got the better of a building's roof.

But sometimes a dampness issue isn't so cut and dry. Excessive condensation is a prime example of this.

For as much as its presence can be obvious, pinpointing the exact source of the problem and areas with a high potential for may require a bit more investigation as does understanding what is causing it to begin with.

Regardless, condensation in buildings is like any other instance of intrusive dampness – even a little bit is too much.

In this guide, we'll take a deep dive into:

- The Causes, Signs & Problems With Condensation
- Using a Hygrometer to Measure for Condensation
- Using a Dual-function Damp Meter to Investigate Condensation
- & Much More

Condensation: Causes, Signs, & Problems

In small doses, condensation build-up inside a building is very common. In fact, most of us see it every day inside our homes – e.g. the mirror in your bathroom after a hot shower.

Excessive condensation inside a building is indicative of a much bigger moisture issue, as it can be the result of several underlying causes.

Condensation Causes

Condensation forms when warm, moist air inside the building comes into contact with an area or surface that's cooler and/or has lower ventilation, such as windows or walls. In addition to this, high levels of indoor humidity can make it difficult for any moisture inside a building to evaporate properly. This means that excess moisture may remain in the air or condense onto surfaces, both of which are problematic for long-term building health.

Condensation Signs

When condensation is a bigger issue – one that requires investigation and remediation – it presents itself inside a building in several ways. It goes beyond noticing condensation on walls and windows. You'll also note condensation build-up causing:

1. Water stains or discoloration on ceilings, walls, or floors
2. Mold or mildew growth
3. Musty or unpleasant odors
4. Peeling paint or wallpaper
5. Increased humidity levels



Condensation Problems

In many respects, the signs of condensation are also problems caused by the excessive indoor moisture.

Still, persistent condensation can lead to other more serious issues. Left untreated, condensation over time can cause:

- Wood rot
- Structural damage
- Weakened walls
- Corrosion on metal components

Beyond structural issues, excess indoor humidity can also create an environment conducive to pests – e.g. termites and rodents – which will thrive in areas with plenty of moisture. Additionally, high levels of indoor humidity may make it difficult for occupants to breathe properly and sleep soundly.

Condensation issues are especially noticeable – and problematic – [during the colder months of the year](#). As many building owners turn toward supplemental heating sources – such as propane, butane, and gas heaters – in order to stay warm, the moisture produced by these sources often exacerbates any existing condensation problems. This is particularly true for propane heaters, as water is a byproduct of the gas as it's burned.

Investigating Condensation | Using a Digital Hygrometer & a Dual-Function Damp Meter

The first step in resolving condensation problems is identifying the exact source and extent of the issue. To do this, a digital hygrometer and a dual-function damp meter are both tools that can be used to measure condensation in buildings.

A digital hygrometer is an instrument that measures relative humidity (RH) – i.e. the amount of water vapor in the air compared to what would be considered saturated – as well as temperature readings. These devices are typically small and portable, making them ideal for taking multiple measurements throughout a building quickly.

Dual-function damp meters are designed to not only quantify moisture content in a material but also qualify its presence. These devices feature the functionality of both a [pin-type and pinless \(non-invasive\) damp meter](#).

Let's look at how both devices are used to detect condensation in a building.

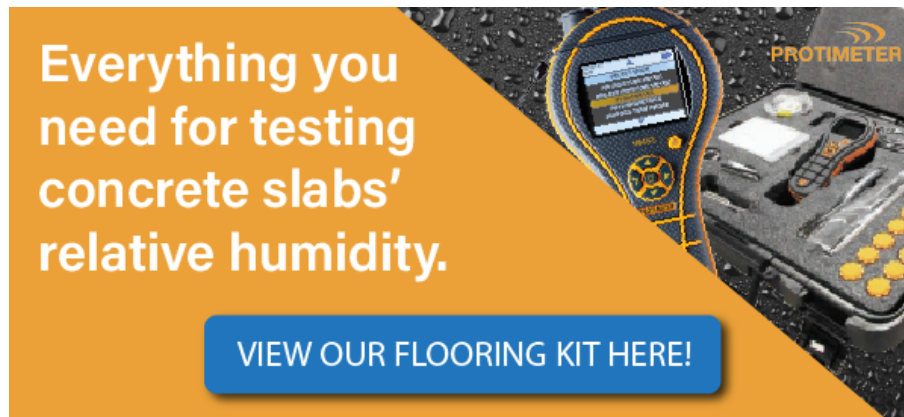
Detecting Condensation With a Hygrometer

As condensation is driven by many ambient elements in an environment, a hygrometer – particularly one that is outfitted with an infrared thermometer – is ideal for locating areas with a high potential for moisture.

When using a hygrometer to determine condensation presence inside a space:

1. Complete an initial [visual inspection](#), Check for signs of condensation, such as water droplets on windows or walls, damp spots on ceilings or floors, or a musty odor.
2. Place the hygrometer in the area where you suspect there may be condensation. Be sure to keep it away from windows, doors, or other areas where it may be exposed to direct sunlight or drafts.
3. Allow the hygrometer to acclimate to the room temperature for at least 15-20 minutes and make sure the room stays undisturbed.
4. Take an RH reading on the hygrometer. FYI: If the RH is above 60%, this may indicate that there is excess moisture in the air, which could lead to condensation.
5. Using the hygrometer's non-contact infrared thermometer, take temperature measurements of any surfaces that have had condensation issues in the past.

With both RH readings, ambient temperature, and surface temperature readings, your hygrometer will be able to calculate whether a surface is above or below the dew point – or the point that condensation will form.



Everything you need for testing concrete slabs' relative humidity.

VIEW OUR FLOORING KIT HERE!

A Word on Temperature & Hygrometer Readings

As hygrometers measure a space's RH – something that's directly impacted by temperature – a sudden change in the environment's temperature has an immediate impact on the device's ability to work properly.

For instance, if a window is opened and the outside environment is hotter than inside the building, the warm air flooding the space can make humidity increase and condensation form on cooler surfaces.

That's why step #3 is critical to completing a successful condensation survey with a hygrometer. Even a slight disturbance in a space's temperature can have a big impact on readings.

Further Reading: [Hygrometers & Temperature: Effects & Best Practices](#)



PROTIMETER

Detecting Condensation With a Dual-Function Protimeter Damp Test Meter

To an extent, using a dual-function meter to detect condensation requires a mindset of stepping into taking the readings sideways. While the device is not designed to detect condensation, both its functions do allow the user to still find areas of concern for the surface-level moisture.

Pin Mode

Pin-type meters determine actual moisture content in a material by measuring electrical resistance between its probes. Taking accurate measurements requires that the pins simply make contact with the surface of the material being tested. In other words, there's no need to jam the probes into the material.

With a Protimeter damp meter, when its pins make contact with surface-level dampness (such as condensation), the meter will give a much higher damp reading. That's because condensation provides a path of least resistance to the electricity traveling between the meter's probes.



Using a pin meter to test for condensation does require taking multiple readings of the same material to ensure that you're not simply measuring high moisture content because of a different issue.

Pinless Mode

In non-invasive or non-penetrating mode, detecting condensation presence happens in a different way.

Protimeter pinless meters are used to assess the average moisture within its depth of measurement. Note some other meters will give you the highest reading found first which is not good for condensation detection if the wall is only wet on the surface (condensation) or completely wet though water ingress. Though they'll never give you an exact moisture content reading as a pin-type meter would, they confirm moisture presence.

When condensation is present, Protimeter pinless mode readings are impacted nominally, seeing only a slight increase in the average dampness within its depth of measurement.



PROTIMETER

Bringing Pin & Pinless Mode Readings Together to Gauge Condensation Potentials

With a high pin mode reading combined with a low pinless mode reading, a user can extrapolate that the dampness detected is indeed surface level.

However, high readings in both pin and pinless modes indicate moisture has saturated the material being tested and the detected dampness is part of another issue, such as a leak.

[Using Protimeter Surveymaster to Detect Surface Moisture and Condensation](#)

Hygrometers Vs. Dual-Function Damp Meters – Which to Use?

Though both hygrometers and dual-function damp meters play different roles in measuring condensation in a building, a hygrometer should be your first choice.

Put simply, its functionality is best suited for pinpointing which areas throughout the building may be affected by condensation.

Still, there's no reason to leave a dual-function meter out of an inspection for condensation. Even though it helps identify condensation and areas of concern in a different manner, it's helpful in confirming areas of moisture, as well as ruling out other issues.

Just like in a standard building-wide dampness inspection – for which a damp meter is the go-to tool – having both devices on-hand only helps a surveyor do a more thorough job.

The bottom line: Though both devices are useful tools in assessing indoor humidity issues, having both on hand ensures that you'll have all your bases covered when investigating condensation problems inside a building.

Correctly Identifying Condensation

Compared to other major dampness issues (a burst pipe, for example) condensation is a relatively easy problem to remedy.

In the majority of cases, stopping condensation means:

- Installing appropriate ventilation in a space
- Increasing heat or addressing poor insulation for consistent temperatures
- Using a dehumidifier



PROTIMETER

However, condensation can be misdiagnosed as another common dampness issue: rising damp. When misidentified, condensation remediation efforts are for naught.

Like condensation, rising damp appears as moisture on surfaces – primarily walls and foundation floors – inside a building. However, the key distinction between [rising damp vs. condensation](#) is that the former only reaches a height of 1 meter from the floor in a space. In addition, rising damp often leaves salt efflorescence in its wake.



Thoroughly Measuring for Condensation in Buildings

As with investigating excessive dampness of any sort, measuring condensation in buildings is a process that requires patience and attention to detail. And left unaddressed, a small condensation issue now can equate to a much larger – and costly – issue later.

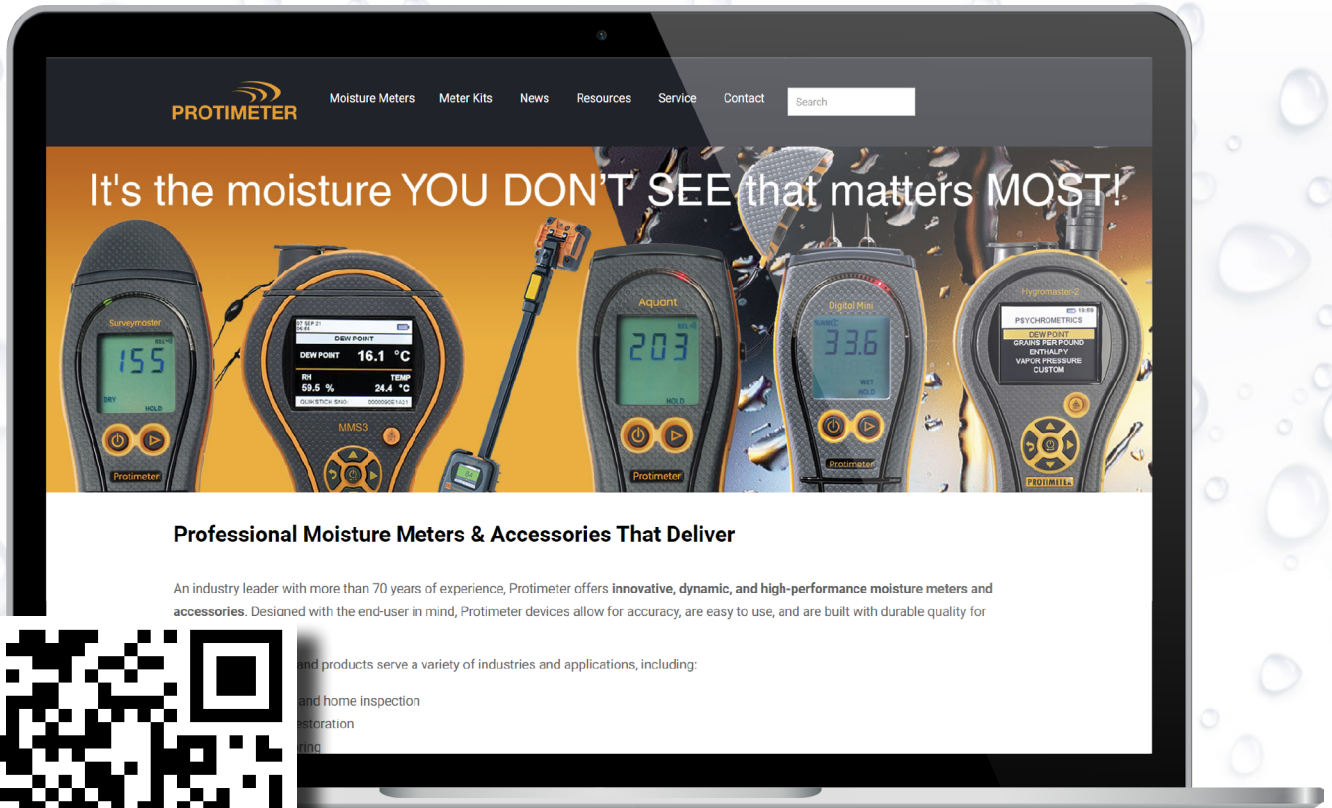
Though taking measurements with a hygrometer is the most practical way to begin pinpointing where condensation may be present in a building, both digital hygrometers and dual-function damp meters should be used together for best results. Taking readings from both devices helps ensure that any areas of high moisture are accurately identified as such, rather than mistakenly attributed to another issue.

No Matter What Kind of Dampness You're Measuring, There's Nothing Like a Reliable Meter in Your Toolkit

Find yours:



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



www.protimeter.com



PROTIMETER

www.protimeter.com

