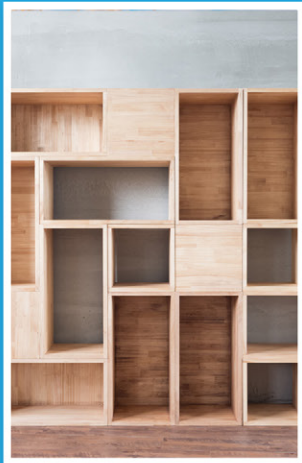


THE CRAFTSMAN'S GUIDE TO USING WOODWORKING MOISTURE METERS



DELMHORST
INSTRUMENT CO.
WHEN ACCURACY IS THE POINT.™

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Why Use Moisture Meters for Woodworking

There are few feelings as satisfying as crafting something with your own two hands. The tougher the project, the more pride there is in a job well done. Woodworking projects can be especially challenging, but are all the more worth it when you've finished.

One of the things that can mar hobbyist woodworking projects is excess moisture in wooden materials.

Most hobbyists and craftsmen don't worry about moisture too much when completing a woodworking project. This can be a major mistake as excess moisture in wood can lead to warping, cupping, cracking, delamination, and other problems in your materials.

Moisture issues can ruin a woodworking project after the fact, wasting not just the material you used to complete the project in the first place, but the time, blood and sweat that you put into the project.

This is why, if you're a craftsman or a hobbyist, you should check the moisture content of your wood before you use it.

How Moisture Meters Help

Moisture meters are used by professionals in the flooring, manufacturing, restoration, and lumber industries every day to check the moisture content of wood materials. With a moisture meter, it's possible to check the %MC of the wood, helping you spot excess moisture so that you can address the problem before you start your project.

[These woodworking tools](#) can help to improve the quality of your woodworking projects. Simply use moisture meters to test your wood before you use them for furniture, flooring, or other projects. If wood tests high, you know that it isn't ready for use yet.

In short, moisture meters help you make woodworking projects you can be proud of, and have the satisfaction of a job well-done. Since moisture meters are such useful tools for ensuring high quality results in woodworking projects, it's important for you to be able to use them to their greatest potential.

This means picking the right moisture meter for your needs and knowing how to use it.

To help you out, here are a few tips for using a moisture meter for your DIY woodworking projects:



Tips for Using Moisture Meters for DIY Woodworking Projects

1: Choosing the Best Moisture Meter for Your Needs

Professional woodworkers usually have a big enough budget to be able to buy several high end moisture meters that have all the bells and whistles they may need for whatever situations they'll run into.

However, as a craftsman on a personal budget, you'll probably want to pick one moisture meter and stick with it.

The first thing you'll want to do is decide between a pin-type moisture meter and a pinless one.

How Pin Meters Work

Pin-type moisture meters operate on the principle of electrical resistance. These meters use two electrodes to push through the surface of wood materials. Once the pins are at the desired depth, the user pushes a button that sends an electrical signal through one pin and the wood to the other.

Since wood is an insulator and water is a conductor, drier wood has a higher resistance to the electrical current than wet wood, resulting in a lower reading. By measuring the electrical resistance, or the current between the two points of contact, the meter gives you a reading of the amount of moisture in the wood between the pins.



How Pinless Meters Work

Pinless moisture meters work a bit differently. These devices use electromagnetic waves to scan materials rather than electrical current. The distortion of the electromagnetic wave caused by the material being scanned is what the meter uses to measure moisture here.

Each meter type has its own strengths and weaknesses.

- ❑ Pros of pin-type meters include:
 - ❑ Ability to determine the moisture distribution in a board
 - ❑ Useful on irregularly-shaped surfaces
 - ❑ Insulated pins ignore surface moisture
 - ❑ Can often be used with specialized probes for measuring moisture in different building materials
- ❑ Cons of pin-type meters include:
 - ❑ Limited scanning area (just between the pins)
 - ❑ Leaves pin-holes in material surface
- ❑ Pros of using pinless moisture meters include:
 - ❑ Large scanning area reduces time needed to thoroughly check wood
 - ❑ Does not damage materials being scanned
- ❑ Cons of pinless meters include:
 - ❑ Requires flat surface to work properly
 - ❑ Gives general indication of moisture location in wood rather than specific
 - ❑ If the wood being scanned is too thin, you may get moisture content readings for objects behind the wood
 - ❑ Surface moisture can throw off readings



Generally speaking, pin-type meters are better for woodworking projects where you're handling irregularly-shaped pieces of wood, such as bent wood for furniture, or for when you need more precise information about the location of moisture within a piece of wood.

[Pinless meters are often the go-to choice](#) for hobbyists that are working with finished wood, or in places where pin holes would be visible if using a pin-type meter.



If your budget allows, a combination 2-in-1 meter can give you the best of both worlds.

2: Using Pinless Meters

When using a pinless meter, be sure to check that the contact plate is making full contact with the material you're testing. Gaps between the plate and the wood can cause fluctuations that throw off reading results.

Check the owner's manual to see what depth your pinless meter will scan while taking a reading. If the wood you're checking is thinner than that depth, try stacking multiple boards on top of one another to ensure the meter isn't reading the air behind a thin piece of wood.

On the other hand, if the wood you are checking is thicker than the scanning depth of your meter, try taking readings from both sides of the wood if possible. This can help you get a more complete reading of the moisture conditions in the wood you're using.

Also, you should be aware that moisture on the surface of wood can significantly skew reading results.

3: Using Pin-Type Meters

With [pin-type meters](#), you may want to pick a few nondescript areas of the wood where the pinholes won't show. You can also determine the distribution of moisture throughout a wooden board using pin-type meters by:

- ❑ Using insulated pins/probes, take two or three quick readings at different levels of penetration. A normal moisture gradient usually develops from a wetter core to a drier surface, with the average reading occurring at 1/4 to 1/5 of the board's thickness.
- ❑ Using non-insulated pins/probes, push the pins roughly 1/16" into the board's surface and take a reading. Then, push the pins to their full depth. For air-dried lumber, the final reading is usually between 12 and 19 percent, while the initial reading is 2-3 percent lower. For kiln-dried stock, the final reading should be between 6 and 12 percent; with your first reading about 1 percent lower.

Insulated pins are recommended for determining moisture distribution in a board, but the non-insulated method is still useful. Just be mindful of surface moisture, as this can affect meter readings when using non-insulated pins.

4: Make Species Corrections

Both pin and pinless meters have a specific challenge: any one meter is usually calibrated for a specific species of wood (or other building material), and different species will yield different readings at the same moisture content.

To get accurate readings in different types of wood, it's necessary to make species corrections. One way to do this is by using a table to adjust your reading results after the fact.



Some models of moisture meter feature built-in species corrections for different kinds of wood. These meters make getting quick, accurate readings much easier in a variety of wood species.

5: Checking Moisture Meter Accuracy

Even the most rugged and reliable moisture meters need to be checked for accuracy every once in a while. After all, you're relying on these tools for accurate information about the moisture content of the wood you're working with.

There are several ways to test moisture meter accuracy, including:

- ❑ Using a Moisture Content Standard. Some moisture meter manufacturers provide a device for their pin-type moisture meters called a Moisture Content Standard, or MCS. An MCS is designed to return a specific reading when the meter is used on it. If the reading is off, then you know the meter is out of calibration and needs to be returned to the manufacturer.
- ❑ Sensor Blocks. Since pinless moisture meters work differently from pin-type meters, they need a different kind of testing device. Like moisture content standards, sensor blocks provide a constant %MC reading when the meter is placed on them, they're just built to work with pinless meters rather than pin-type meters.
- ❑ Built in [Calibration Checks](#). Higher-end moisture meters might have a built-in calibration check. Simply push a few buttons and check the reading to see if it matches the right value. This is widely considered the most convenient way to check meter calibration.



Common Causes of Inaccurate Readings

If your moisture meter is giving you inconsistent readings, check for signs of damage to the meter and run a calibration check. Sometimes, damage to the pins or the scanning plate can affect readings. If this is the case, try replacing the damaged pins and check the calibration. If there is damage to the sensor plate on a pinless meter, return it to manufacturer for repair.

Other issues that can throw off readings include:

- ❑ Using the wrong species correction setting
- ❑ Low batteries
- ❑ Internal damage to meter components



Checking for the above issues might help explain inaccurate readings. Problems such as low batteries and using the wrong moisture testing mode are easy enough to fix. Internal damage to the meter, however, usually requires professional repair by the manufacturer.

6: Protecting Moisture Meters When Not in Use

High-quality, accurate moisture meters aren't cheap. You'll probably want to make sure that your hobbyist moisture meter lasts for as long as possible so that you can get the most out of it.

With this in mind, here are a couple of tips for protecting your moisture meter when not in use:

- ❑ **Keep the meter in its carrying case.** Most moisture meters come with a carrying case to protect it in between uses. Placing your meter in such a case can protect it from the elements and from shocks or impacts that it would otherwise be subjected to.
- ❑ **Store the meter in a cool, dry place.** While the purpose of a moisture meter is to detect moisture in different materials, no meter should be directly exposed to hot, humid environments 24/7. Keeping the meter in a cool, dry place will help to prolong its useful life.

7: Things You Should NEVER Do with a Moisture Meter

Speaking of protecting your moisture meter, here are a few things you should NEVER do to your moisture meter:

1. Never drag a pinless meter along the surface of an object—this can scratch the material you are testing.
2. Never open up the casing for your meter to try and fix a problem—this can actually cause more harm than good, and void your warranty with nearly any moisture meter manufacturer.
3. Never leave the meter unattended in extremely hot or cold environments—this can cause internal damage to the meter.
4. Never try to force the insertion of pins if they feel stuck—this might mean that you've hit a pocket of harder material, and applying too much extra force might break or bend the pins and place unnecessary stress on the meter case itself.

Avoiding some of these common mistakes can help prolong the useful life of your moisture meter.



Moisture Meter Solutions

8: Acclimating Wood Before You Use it

One thing that even some professionals might forget to check for is whether or not wood has reached its equilibrium moisture content (EMC). What does equilibrium moisture content mean?

Wood is a hygroscopic material, meaning that it absorbs or gives off moisture until it reaches equilibrium with the surrounding environment. The point where wood stops taking on or letting out moisture is its equilibrium moisture content.

If the wood you're using for your craftsman project hasn't reached equilibrium with its surroundings, there could be several negative consequences. Because, as the wood continues to try and reach equilibrium, it can:

- ❑ **Warp.** As moisture enters or leaves a piece of wood, the wood can swell or shrink accordingly. In severe cases, wood can become warped by this action.
- ❑ **Crack.** When moisture leaves wood, it can shrink and split. This creates unsightly cracks in the finished product.
- ❑ **Buckle.** In the case of wood flooring, adjacent floor planks that take on too much moisture can swell, pressing up against one another and causing the wood to separate from the sub floor.
- ❑ **Prevent adhesives from bonding properly.** If wood absorbs too much moisture, it can cause adhesive-bonded joints to fail. This can separate flooring, cause furniture to fall apart, and other issues.



Acclimating wood before use can help to prevent a nasty surprise later on. In most cases it's best to store your wood in the same area it will be used in, or an area with similar temperature and humidity.

Checking to see if wood is acclimated by using a moisture meter is relatively easy, but it does take time. Simply check the moisture content of the wood over the course of a few days at morning, noon, and night. When the %MC reading in the wood stops changing, it has reached equilibrium and should be ready for use.

Depending on the difference between the wood's moisture content and the humidity of the room, the time it takes for the wood to finish acclimating may change.



Conclusion

For hobbyists and craftsmen, completing a woodworking project is a matter of pride. The better the results, the prouder you can be of the time and effort you put into your project.

Whatever your project, [woodworking moisture meters](#) designed for the needs of hobbyists can help you ensure high-quality work that you can be proud of.

However, it's important to pick the right moisture meter for the job. This means more than just choosing between pin and pinless meter types. It means choosing a moisture meter from the right manufacturer, one that you can rely on to provide a rugged, reliable tool with top-notch service.

Finding a meter that is accurate, durable, and backed by a strong warranty and customer support can mean the difference between years of reliable moisture readings and having to constantly replace broken meters every time you have a new project.





Feel free to give us a call or email for answers to your questions about what kind of meter to use for your project, and where to purchase. And remember, we value our customers and look forward to your feedback.

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