



FACILITIES &  
MAINTENANCE

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## Why Moisture Meters and Thermo-Hygrometers are Essential for Successful Wood Floor Installation

BY GRETE HEIMERDINGER

Moisture can have a large impact on the beauty and sustainability of anything made out of wood, from cabinets and furnishings to wood flooring. It also affects other hygroscopic, water-absorbing materials in the building envelope such as drywall, ceiling panels, carpets, etc. Before the installation of a wood floor, the team will need to examine building conditions. If there is too much moisture in the sub floor in a newly erected building, or after water intrusions in older buildings, the excess moisture will be released into the building—and the last place you want to see water seeping is onto your new wood floor.

To avoid that risk, the first step before proper floor installation is making sure all materials surrounding the floor are dry from the concrete substrate to the roof. Two instruments are helpful with accomplishing that task: a moisture meter for materials and a thermo-hygrometer for air, relative humidity, and ambient temperature. If concrete slabs are to be measured, the Lignomat RH system follows the ASTM F2170 procedure for measuring moisture in concrete slabs before installing resilient floor coverings. The floor manufacturers also list conditions for a successful floor installation in their installation manual. To keep the floor manufacturer's warranty, the recommendations should be followed.

### Thermo-Hygrometers

When choosing a hygrometer, accuracy rating and humidity range are important. Standard off-the-shelf hygrometers usually have an accuracy rating of +/- 5% for relative humidity



ambient conditions, there should be no more changes. If the moisture remains unchanged, the floor is dimensionally stable. The floor planks will not move, and no warping or cupping occurs. Continuous moisture checks even after installation can prove no changes or warn that moisture is absorbed or lost by the floor planks.

**Note:** Most floor manufacturers indicate that the acclimation and installation should take place under the same ambient conditions that are normal for the space when in use. Doors and windows should be installed and closed. The air conditioner or heat should be running. Acclimation and installation only make sense if these conditions are warranted. If you are crisscrossing the conditions below, a wood floor is not happy, even when the temperature is a comfortable 72°F. The moisture meter and thermo-hygrometer will indicate if the floor is stable:

- 25% relative humidity stable moisture content is 5.5%

- 35% relative humidity stable moisture content is 7%
- 45% relative humidity stable moisture content is 8.5%
- 55% relative humidity stable moisture content is 10%
- 65% relative humidity stable moisture content is 12%

**With pins:** In theory, pin moisture meters measure the electrical resistance between two metal pins kept a certain distance apart. The electrical resistance changes with the moisture content of the wood. If moisture varies within the small segment of the non-insulated part of the pins, the highest value is indicated. That means if the uninsulated part of the pin touches a wet surface, the indicated moisture values will be high.

Wood species corrections are necessary to obtain accurate moisture percentages. Most pin moisture meters have built-in corrections for different wood species. If lumber is hot

or cold, the electrical resistance in the wood changes, so temperature correction is necessary for hot or cold lumber.

In practice, the pins of the moisture meter have to be pushed or pounded into the wood, and the moisture in the area between the pins is measured. Pin moisture meters allow for the testing of small areas. This is important when the moisture content within the material to be measured is changing, specifically between core and surface moisture. For the floor industry, that becomes important when the floor planks have absorbed moisture from the subfloor at the bottom of the planks or from the air above the floor at the top of the planks.

For an inspector, a pin moisture meter with longer insulated pins allows checking the subfloor without removing the floor planks. The pins need to be hammered through the floor planks and into the subfloor below to indicate the moisture percentage of the subfloor. Pinless meters are not able to indicate different moisture levels within their measuring field and the measuring field is limited to 3/4" unless mentioned otherwise by the moisture meter manufacturer.

The ideal is to have access to both a pin and pinless meter such as the Ligno-VersaTec from Lignomat, which has the added benefit of different attachments available to tackle any moisture problems that may occur during maintenance. A slim electrode can be added to the pin-pinless-RH moisture meter Ligno-VersaTec to fit into tight spaces. Long pins will measure through insulation in search of moisture infiltration. Pinless mode allows scanning large areas quickly, floors, walls or ceilings, but when a problem is detected, the pin electrode helps with further investigation.

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Heimerdinger has been the technical adviser for the moisture meter division for Lignomat. She graduated from the technical university in Stuttgart and started Lignomat with her husband in 1982. Lignomat now offers a full line of pin, pinless and RH meters as well as wireless monitoring devices for buildings.