

In-Kiln Moisture Measurements Using PK Probes and PK-Cables



Mini-Ligno MD/C, and mini-Ligno DX/C
with PK-mini Cables (up to 12' long) and
PK Probes.



Lignometer K or Ligno-VersaTec
with PK-H Cables up to (50' long),
PK Probes and Adapter H

Lignomat offers everything from a 1 PK-Probe cable set
with a moisture meter to wireless moisture monitors and
computerized kiln control systems.

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In-Kiln Monitor

To obtain wood moisture measurements from the center of a kiln without entering the hot kiln, PK probes are distributed throughout the stack and connected to extension cables. The open cable end should be left outside the kiln to be easily reached for wood moisture measurements.

We offer a short extension cable # E-H to allow an in-between connect-disconnect cable junction for easier cable handling and installation through the kiln wall.

The number of PK probe and cable sets depends on the size of the kiln. Even for small kilns we recommend 3 PK probe sets. Select PK probes with the correct measuring depth for your lumber so that at least 1/3 of the board can be penetrated. We recommend to use the PT tool to insert and remove PK probes correctly, along with our wood probe template to ensure the correct placement of the probes.

Lignomat offers 5 different length PK probes:

PKA for 4/4 lumber
PKC for 8/4 lumber
PKE for 2 3/4" measuring depth
PKB for 6/4 lumber
PKD for 12/4 lumber

Selecting the correct locations for probed boards

The probed boards should not be located too close to the edge of the package. The outer zones of the package might dry faster and may not be representative for the package.

Selecting the right boards for probing

The PK probes should be set into the slowest drying boards with the highest moisture content. This is especially important when drying different wood species, thicknesses and different initial moisture contents within the same kiln charge.

Why multiple PK/cable sets?

We recommend using at least 3 PK probe sets distributed throughout the kiln. Multiple probe readings enable the operator to find out if:

- all boards are drying at the same speed
- the drying process is too fast
- the kiln charge is ready to be unloaded
- the drying process is too slow

After evaluation of moisture readings, the drying schedule can be modified to achieve more even and more efficient drying. Multiple probe readings can also be used to evaluate kiln performance. For the first kiln charge PK Probes could be placed in top, center and bottom locations. For the next kiln charge PK Probes could be placed in right, middle and left sections of the kiln charge. By changing probe locations, slower and faster drying areas can be identified. Airflow throughout the kiln charge could be improved accordingly.



Placing PK probes

PK probes are best placed into center boards while the lumber is being stacked. If the lumber is already stacked, remove the top layers and place the PK probes. A forklift could also be used to lift a part of the stack and pull a center board out for probing (see photo). If this is not feasible, use the longer probes #PKD or #PKE. The PK probes can then be inserted into the sides of outer boards. We do not recommend placing the PK probes into the end grain of a board.

Probing of boards

Once a board has been selected for probing, two holes have to be drilled across the grain with a 5/32" drill bit 1 1/4" apart. Make sure the hole is deep enough, so that the probe will bottom out in the hole.

Placement and removal of PK probes without PT pulling tool

Drill holes as described above. Then, hammer PK probes into the board, until there is a 1/16" gap between the board and the head of the PK probe. To extract PK probes thread a nail through the hole in the PK Probe head and wiggle the probe out of the board.

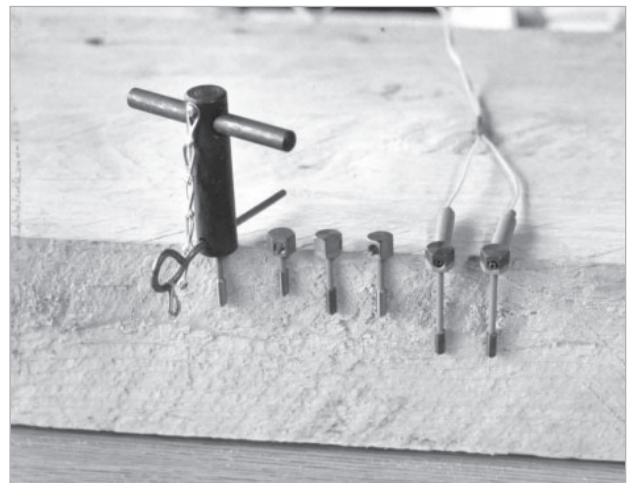
Placement and removal of PK probes with PT pulling tool

Place the PK probe over a predrilled hole.

Position the PT tool over the PK probe head without threading the pin through the hole.

Hammer on top of the PT tool until the tool touches the wood. Remove the PT pulling tool. The PK probe is now placed correctly with a gap between the board and the probe head.

To extract the PK probe, place the PT tool over the probe head so that the pin can be threaded through the hole in the head of the probe. Thread the pin through the hole and wiggle the probe out of the board with cork screw like motions.



Once both probes are set, connect the cable through the probe head and place the open end of the cable outside the kiln. All measuring cables should be installed **away from in-kiln wiring** for motors or fans to avoid electric interference from the live cables.

Obtaining Moisture Readings

Connect open end cable (end left outside the kiln) to the moisture meter and obtain readings. The readings should be corrected for wood species and wood temperature. For mini-Lignos, the wood temperature corrections have to be done manually with the wood temperature correction chart in the instruction manual. When the kiln has heated up and the lumber is all the way warmed up, the wood temperature can be assumed to be the same as the air temperature inside the kiln (dry-bulb temperature).

Record Drying History

Moisture readings of all probes should be recorded with the corresponding kiln temperature, the relative humidity (measured as wet bulb temperature, EMC or relative humidity) and elapsed time since drying began. This information can be used by the kiln operator to optimize the drying schedule and reduce degrade.