A study by the University of Florence (Forestry Plantation and Technology Institute) and by CNR/IRL (Wood Research Institute, Florence) to determine the accuracy of Wagner Moisture Meters as compared to the traditional Pin (Resistance) Meters when used in Industrial Conditions.

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The Use of Wagner Handheld Moisture Meters.

Wagner Moisture Meters are well-known amongst professionals for their accuracy, reliability and durability under industrial conditions of use. The type of sensor used gives an accurate and completely non-destructive read-out of the moisture content of the wood. In addition, the fact that these sensors are unaffected by the ambient temperature and the actual size of the wood being measured, means they are particularly suitable for fast and efficient quality control, giving the user peace of mind that the "moisture" problem can be controlled both easily and economically. For these reasons Wagner Moisture Meters are most widely used throughout the USA and Canada and are rapidly becoming established in Europe.

However, the nature and specific requirements of Italian companies are not always comparable with those of companies in other countries. In order to determine whether Wagner Moisture Meters offer the same advantages of accuracy and reliability under typical conditions of use in Italian companies, a study was commissioned from the University of Florence (Forestry Plantation and Technology Institute) and from the CNR/IRL (Wood Research Institute, Florence). Some parts of the study are still being carried out, but some results have already been made available.

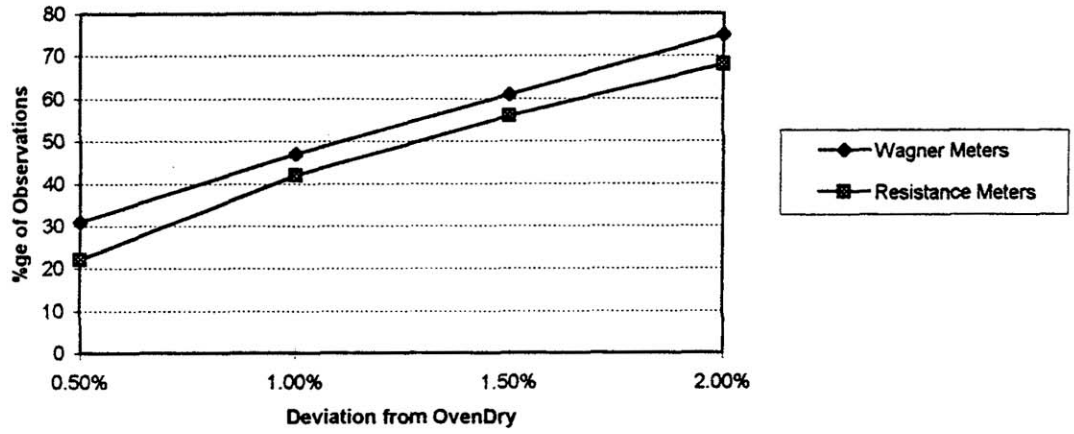
Accuracy and Reliability under Industrial Conditions

The definitive reference for measuring the Moisture Content of wood is the gravimetric method, which consists in weighing the sample, putting it in a ventilated kiln at 103±2(C until it reaches a constant weight) and then calculating the humidity by the difference in weight. This method is described in the UNI standard 9091/2 and is only infrequently used in industrial conditions, because of its destructive nature. The majority of Italian companies use Resistance Meters (Pin Meters), which are inserted into the wood and measure its resistance to the passage of an electric current).

In order to compare the accuracy and reliability of Wagner Handmeters, approximately 200 measurements were taken at 8 different companies which work with solid wood (parquet, window and door frames, packaging and panels), using both the device operated by the company and the Wagner device which was most similar in size and performance to this and comparing the values with those obtained by means of the gravimetric method on the same pieces. The operating conditions were as close as possible to those adopted by the company for their controls (measuring position, calibration of the instruments, etc.).

During the course of the work, the greater ease and speed of use of Wagner devices could be noted, and their accuracy exceeded that of the Resistance Meters. The following graph shows how, out of a total of 200 measurements taken, the Wagner devices gave values closer to those obtained by the gravimetric method in a greater percentage of cases. For example, allowing an admissible deviation in humidity of 1% between the read-out on the device and the gravimetric result, Wagner meters were accurate 47 times out of 100, whilst the Pin Meters scored 42 out of 100.

Comparison of Accuracy of Resistance Meters and Wagner Meters



In assessing the reliability of the device for the purposes of quality control, other factors must also be taken into consideration:

- increased speed of use which allows many more measurements to be carried out in the same amount of time, thus increasing the statistical data base;
- the possibility of storing and processing data (devices L610 and L612),
- providing exact average, maximum and minimum values;
- the devices are unaffected by temperature variations, thus avoiding errors due to faulty calibration.

In addition, the possibility of using the device with the sensor positioned on a probe also speeds up the measurement of bundled parcels, without the need to open these. In this case, the Wagner Moisture Meter becomes a device which simplifies the process of surveying "humid" zones in the driers, thus optimizing loading methods, or determining the most suitable drying cycles for the operating conditions. As with any type of device, in order to ensure maximum accuracy, the correct calibration for the density of the wood should be used.