

Q. What is the history of wood moisture meter calibration in the UK?

A. Electrical resistance wood moisture meter calibration is based upon post-war research in the UK by Marconi and the Forest Products Research Laboratory via equilibrium moisture conditioned and oven-dried European wood specimens undertaken on a large scale particularly in the 1950s. The temperatures and weighing used in this work are traceable to national standards. The actual calibration of meters today is conducted, not directly through wood specimens, but using precision electrical resistances, the ohmic values of which represent particular wood species at specific moisture contents. Harmonisation of data between wood using countries is not available and as a result, very little regarding measurements in the field of resistance-type moisture meters for wood is truly traceable to national standards of measurement since there are no officially agreed wood moisture measurement standards. For this reason there can exist no UKAS or European laboratories accredited for the calibration of wood moisture meters. This is not to say that moisture meters cannot, however, be accurately calibrated.

It was a missed opportunity that the European standard EN 13183-2: 2002: "Moisture content of a piece of sawn timber - Estimation by electrical resistance method" does not specify traceability by resistance measurement via listings of species and their equivalent moisture content resistance. It does not cover nor make any reference to this matter. However, VERUS resistance values have been accepted by UKAS since the 1980s for use in accredited timber testing laboratories as the best solution until international standards are developed. Verus values are based upon FPRL, inter-laboratory and inter-instrument comparisons and has led to listings and occasional modifications of species in terms of scale position. These derived ohmic resistances are periodically measured by a UKAS accredited electrical calibration laboratory and this 10 point resistance set is maintained by VERUS for calibration of customer's equipment. Our values aligned with Protimeter's in the 1980s and differ little now, generally only at very dry levels of less than 10%. We continue to follow these older values because we do not find that our research nor work done overseas varies significantly from Protimeter's earlier work based on FPRL research as published during the 1960s. In our view Protimeter calibration values are the closest to what the EN 13183-2: 2002 should have specified, the EN committee decision to omit calibration values for mainstream species, nor give any guidance on calibration means the document offers little of value.

Improvements: The 17.5% European redwood value on older models of VERUS calibrators has been changed on all models to what we believe to be a more accurate 17.3%. There is a 0.2% error in our older models. The 1985 model reference Protimeter Analogue Timbermaster meter and 10 point 'Checkbox' which we use align with our later values. The maximum tolerance that VERUS believes should apply to moisture meter and calibrator accuracy is  $\pm 0.4\%$  emc, Verus Calibrators are normally better than  $\pm 0.2\%$  emc (equilibrium moisture content).

Customers still using earlier Protimeter Timbermaster models 68T, 71T, D375T and 377T should note that European redwood (*Pinus sylvestris*) is classified in a different electrical grouping in later Protimeter models. Protimeter moved redwood from Scale B (Douglas fir group) to Scale A (pine, oak and ash group) on their meters from model number D378T (1978) onwards. VERUS Calibrators follow this convention and all European redwood readings should be made on Scale A on all Protimeter Timbermaster instruments old and new. The different grouping is due to experience that average samples of redwood relate more accurately to Scale A, and not due to any variation in the circuitry of the meters themselves. This species grouping seems to be followed by at least one other European manufacturer. We are aware of no other changes of this nature that affect either VERUS Calibrators or Timbermasters.

Wood based processed materials such as chipboard, mdf and paper are only suitable for measurement by electrical wood moisture meter as a very rough guide (see our Datasheet 77b) since chemical make-up can affect accuracy greatly.

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77c/JH/JN/23/11/06