

DIELECTRIC MOISTURE METERS *versus* RESISTANCE TYPE MOISTURE METERS

Dielectric meters, also known as capacitive, inductive, or proximity meters, operate by emitting an invisible electric field that is modified by moisture and density in wood. The meter touches the material measured and the signal penetrates some 10 to 15mm, it is then electrically modified by the material measured. The returning signal is collected and gives an auidial and visual reading on the meter related to moisture, species and nearby objects (which happen to be present within say 30mm). Dielectric meters are often used by building surveyors who need to avoid disturbing household decorations and want approximate measurements fast, eg. is this timber at 30% (a definite problem), or is this timber 18% (usually not a problem).

During the 1990s the European CEN technical committee that created the EN 13183-2: 2002: *Moisture content of a piece of sawn timber - Estimation by electrical resistance method*, considered the dielectric type and the scientific evidence for its inclusion. When the Parts 1 and 2 were created they decided against it, so that only 2 methods were finally included in EN 13183-2. These were the slow but accurate oven drying method *Part 1: Moisture content of a piece of sawn timber - Determination by oven dry method* and the wood resistance meter method described in *Part 2*. The committee did not publish traceable calibration standards because although there is broad agreement between the manufacturers this hardly amounts to traceable calibration. (Much of the European calibration work was done by the same two laboratories FPRL in the UK and Delft University in the Netherlands during the 1960/70 period.)

In 2006 a new part was added to the two earlier parts, EN 13183-3: 2005: *Moisture content of a piece of sawn timber - Estimation by capacitance method*. This was presumably after new input to the committee but no comment was made as to accuracy, which is a similar approach to the other parts.

Several manufacturers in Europe and the USA sell a dielectric type meter but make no attempt to put a fixed moisture content scale on their instruments, merely an indicative scale. This may be because when dielectric type meters are calibrated against oven dry wood samples it is often found that using either the oven drying method as reference, or the resistance type as reference, dielectric meters can often be substantially in error. (The oven drying method and the resistance method generally agree.)

The dielectric type meter is unsurpassed for fast measurements of a range of building materials but not always accurate for moisture content of wood. Companies in UKAS accredited labs or ISO 9000 schemes who require traceable calibration will find this is not available for the dielectric type meter. If the species and the exact density of the measured wood is known then the dielectric meters can often provide a better level of accuracy, but this is not a practical proposition.

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