

Material Moisture Measurement with GREISINGER - handheld instruments

We offer several measuring methods for material moisture gauging:

- Resistive measuring method (GMR 100, GMH 3810, GMH 3830, GMH 3850)**
 The electrical resistance often depends on the material moisture. Therefore the devices measure the (possibly extremely high) values of resistance and convert them to the displayed value by means of integrated characteristic curves. The temperature has to be compensated especially at the measurement of wood – all GREISINGER-instruments have an integrated temperature compensation. In most cases the contact is realised by nails that are driven into the material are used to contact.
- Capacitive measuring method (GMI 15)**
 The dielectric properties of an object are often a good indicator for its material moisture. The dielectric coefficient of water is considerably higher than that of dry lumbers or building materials. Therefore the total dielectric coefficient of the measuring object can be easily used to get its material moisture. For the measurement the device has to be applied on the material. Precondition therefore: planar surfaces, no metallic elements.

Another method is to measure the material moisture indirectly by means of the relative humidity (i.e. with GMH 3330 + TFS 0100 E): The humidity in a sealed hole within a material depends on the material moisture. By means of a so-called sorption isotherm or a corresponding table the material moisture can be calculated from the humidity.

The oven dry method can be used for reference point measurement with highest accuracy. The moist material is weighed and afterwards dried at increased temperature (i.e. 105 °C) until no weight loss is detectable anymore. The material moisture can be calculated from the moist and arid weight.

Units

- Material moisture u (also „atro“): relating to dry mass

$$\text{material moisture } u [\%] = (\text{mass wet} - \text{mass dry}) / \text{mass dry} * 100$$
 Particularly important for carpenters, joiners, etc.
- Moisture content w : material moisture related to wet total mass

$$\text{moisture content } w [\%] = (\text{mass wet} - \text{mass dry}) / \text{mass wet} * 100$$
 Particularly important for the evaluation of combustibles.
- “Digit“ (GMI 15)
 The displayed value is relative, that means without a physical unit. This can be used to get comparative moisture information of the same materials. Lower values indicate less moisture, higher values indicate therefore more moisture.
Example: Rising moisture in walls: dry areas have considerably lower values than wet, damaged areas.

Device and applications

Application:	Device:	GMI 15 (only relative display "digit")	GMR 100	GMH 3810	GMH 3830 / GMH 3850 + suitable electrode
Wood: carpenter, joiner		+	+	+	++
Wood: do-it-yourselfer / hobby		+	+	+	++
Accredited glued timber construction		-	-	-	++
Firewood: piece of wood		0	+	+	++
Firewood: wood chips		-	0 ³⁾	+	++ ¹⁾
Building: aerated concrete, pavement		+	+	+	++ ²⁾
Building: concrete, brick, plaster, lime mortar		+	+	+	+
Structural damage survey		++	+	+	+
Remediation of water damage		++	+	+	+

- ++ especially recommendable**
- + well suited**
- 0 conditionally suited**
- not adequate**

- 1) with injection probe GSF 38
- 2) with brush-type probe
- 3) with injection probe GSF 38 and adapter
- 4) with brush-type probe and adapter

For further information on this topic please see the devices' manuals and our homepage www.greisinger.de under Download -> Documents

Capacitive moisture detection without damaging of material up to 4 cm of depth



Indicator for moisture in wood and buildings

GMI 15

Device for high-speed determination of moisture in buildings, contracting work etc. The GMI 15 allows detection of moisture in wood down to a depth of approx. 3 cm and in concrete or wash floor down to a depth of approx. 4 cm. Detection of moisture behind ceramic tiles and/or various wall or floor coverings. To check moisture simply place device on the surface to be measured - no injection into the measuring object required.

Application e.g. for:

- estate agents (for fast control state of buildings)
- property management, house owners
- architects
- building experts
- building contractors
- mobile homes (moist in insulations)
- polyester / GRP boats

Specification:

Display: 3½-digits, 13 mm high LCD
Power supply: 9V-battery (type IEC 6F22)
Power consumption: approx. 5 mA
Low battery warning: „BAT“ displayed automatically in case of low battery.
Working temperature: 0 to 50 °C
Storage temperature: -20 to +70 °C
rel. humidity: 0 to 80 %RH (non-condensing)
Housing: Impact resistant ABS plastic housing, approx. 106 x 67 x 30 mm (H x W x D).
Weight: approx. 150 g (ready for use)
Display range:
concrete / floor pavement
 0 ... 5 = dry
 6 ... 9 = humid, normal humidity level
 10 ... = wet
wood / fibre glass reinforced polyester
 0 ... 3 ~ 0...12% : dry
 3 ... 6 ~ 12...20% : air-dry
 6 ... 11 ~ 20...30% : wind-dry
 11 ... ~ 30% ... : wet

*"an easy to use
but very effective device"*

Note: The GMI 15 is an indicator for the fast estimation - it does not replace precision instruments like the GMH 3810, GMH 3830 and GMH 3850