



# User manual

## Activity of water measuring chamber

### supplement to manual for humimeter RH2



# User manual

## Measurement

To switch on the instrument, press the  key for three seconds. After showing the logo, the measuring window opens and the current  $a_w$  value is displayed.

If a different calibration curve is set, select the curve “aw value” using the  or  button. The calibration curves saved in the device can be found in the following list:

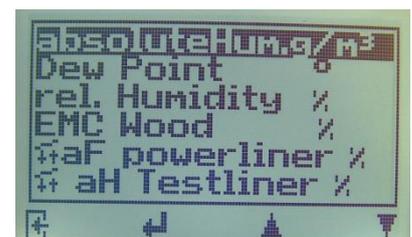


## Calibration curves

calibration curve	description	unit	measuring range
rel. humidity	rel. air humidity	%rh	0 to 100%
dew point	dew point	°C resp. °F	-55 to +60°C -67 to 140°F
abs. humidity	abs. air humidity	g/m <sup>3</sup>	0 to 130 g/m <sup>3</sup>
EMC wood	equilibrium moisture content of wood	%EMC	2 to 15% (wood moisture)
EMC POM	equilibrium moisture content of POM	%EMC	0 to 2%
aw value	water activity		0 to 1
empty	free curve for own calibration	%rh	
CO <sub>2</sub>	CO <sub>2</sub> value	ppm	0 to 5000ppm
IR temperature	temperature infrared sensor	°C or °F	-25 to 125 °C -13 to 257 °F

## List of calibration curves

Pressing the  or  key in the measuring window for at least 3 seconds, a list with all available calibration curves appears. Select your sort by pressing  or  and confirm by pressing the  key.



# Water activity

Water activity is also described as free, not cellularly bound water in products such as food.

## Correct definition:

Water activity or  $a_w$  is the relationship between the partial water vapour pressure in food ( $p$ ) and the saturation vapour pressure of pure water ( $p_0$ ). It is an important indicator for product quality in the food, tobacco and pharmaceutical industry and is indicated in an  $a_w$  value from 0...1.

The water activity is synonymous with the equilibrium moisture content – the relative humidity of air in equilibrium with the sample product.

The relative humidity of air however is indicated in %.

The water activity value is temperature dependent. For the determination of water activity at a desired temperature, the measuring device and the product sample should be stored at the same temperature before starting the measurement.

The humimeter RH2 water activity meter is suited for the measurement of materials like cereal products, coffee, cocoa, muesli, butter, mixtures of dried fruit, spices, granulates, mushrooms, sugar, xylitol, biscuits or dry sausages and many other types of food where a check of the water activity is required.

The humimeter RH2 is in general not suited for liquids and juices (syrup), acidic food like onions, fruits and tropical fruits or food and beverages containing alcohol, e.g. filled chocolates. Vinegar and acids destroy the calibration and the sensor.

Materials with moisture above the fibre saturation point, this means an  $a_w$  value above 1, cannot be measured. For such materials only the water content can be determined.

**The water activity must not be confused with the water content – the percentage of water contained in a product.**

The water content is used for billing according to the dry content of food and materials, it indicates the ratio of water to the total mass in percent ( $\text{kg/kg} \times 100$ ).

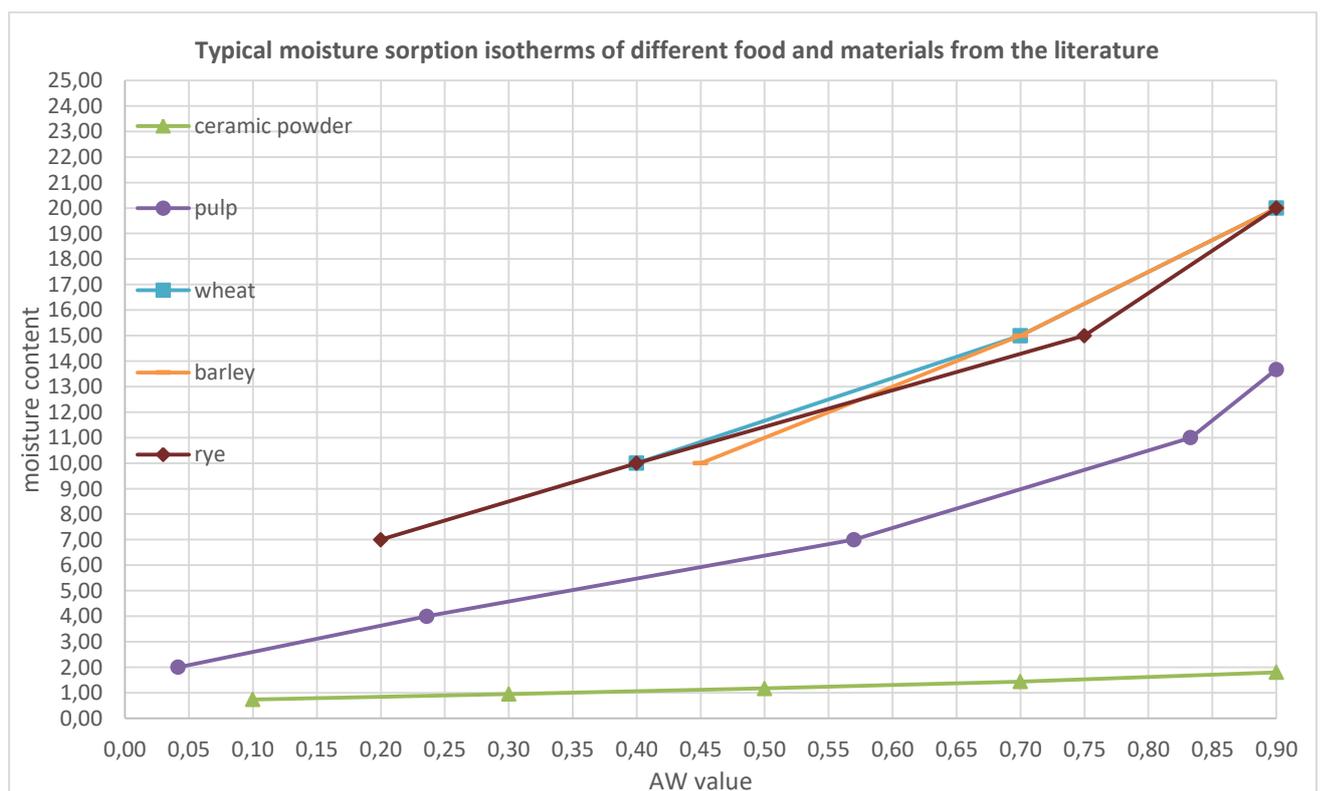
## The water activity influences the following characteristics of a product:

- microbiological stability
- chemical stability
- enzymatic stability
- colour, taste and nutritional value
- content of proteins and vitamins
- stability of composition
- shelf life
- storage and packaging

All forms of life depend on water. The water activity indicates the amount of water available for microorganisms as bacteria, fungi, moulds etc. Each type of microorganism needs a certain minimum water activity value being able to grow. A lower water activity value doesn't allow any growth.

### Minimum water activity:

<u>Water activity</u>	<u>Organism</u>
aw = 0.91...0.95	bacteria
aw = 0.88	yeasts
aw = 0.80	moulds
aw = 0.75	halophilic bacteria
aw = 0.70	osmiophilic yeasts
aw = 0.65	xerophilic mould



## Handling of water activity measuring chamber

Connect the sensor plug of the aw sensor to the basic device. Now the switched on device shows the current temperature and activity of water value.

**Fill the glass container with material at least two thirds full. In case of coarse, lumpy material the container should be filled at least half-way so that the moisture conditioning can be guaranteed.** The higher the filling, the faster the conditioning. A too low material quantity may cause a deviation of the measuring result.

**The material to measure must not come into contact with the metal protective grid (the red line on the picture below is the absolute maximum level)**

**The material must not enter the inside of the grid!!**

After the filling, close the measuring chamber tightly.

The right measuring value can be read off when the displayed value does not change any more over a longer period.

(Experience value for adjustment time: Change of aw value from 0.4 to 0.6 within 10 minutes).

With unpeeled materials such as nuts it may take longer until the sample releases moisture in its surroundings for the measurement.

For a rapid conditioning, the water activity measuring chamber is equipped with a ventilator. If the humimeter RH2 basic device is switched off, the conditioning time is extended. In case of using the automatic datalog with a datalog time of more than 30 seconds, the device switches off automatically between the measurements.

**The filled and closed measuring chamber must not be turned over. Otherwise the measuring sensor positioned in the cap may be polluted by the sample material, which leads to wrong measuring results.**

Maximum filling





## Checking of calibration

In order to avoid the impairment of the measuring accuracy due to pollution or a drift of the sensor by aggressive gases, we recommend a periodical calibration check of the water activity measuring chamber with certified calibration ampoules.

The check should be effected in the smaller glass bowl and in the approximate normal scope of application.

Examples:

When the measuring is effected in a range between 0.2 and 0.5  $a_w$ , the calibration ampoules of 35% rh should be used.

If the measured range is between 0.4 and 0.75  $a_w$ , the calibration ampoules of 50% rh should be used.

See manual of humimeter RH2, chapter Single-point adjustment with 50% humidity standard



Subsequently the glass has to be cleaned thoroughly.

## Exemption from liability

For mis-readings and wrong measurements and of this resulting damage we refuse any liability. This is a device for quick determination of moisture. The moisture depends on multiple conditions and multiple materials. Therefore we recommend a plausibility check of the measuring results. Each device includes a serial number and the guarantee stamp. If those are broken, no claims for guarantee can be made.

If the battery symbol appears in the measuring window or if a critical charge of battery is shown in the status, the batteries have to be changed IMMEDIATELY. Also if you do not use your humimeter device for a longer period, remove the batteries. For eventual resulting damages we cannot provide any warranty.

In case of a faulty device, please contact Schaller GmbH ([www.humimeter.com](http://www.humimeter.com)) or your dealer.



### Common reasons for incorrect measurements: air humidity measurement

- **Sunlight or other sources of heat or cold that doesn't correspond to the surrounding temperature**
- **Measuring errors due to too short conditioning**
- **Irreversible damage of the sensor due to aggressive gases**
- **Danger of condensation because of changing temperature**
- **Polluted moisture sensor**  
Foreign objects on the sensor can be removed with gentle and dry compressed air.
- **Too low filling volume**

