More than 50 years experience

brabender Messtechnik®

Mobile Moisture Meter for Plastics

AQUATRAC®-3E

Brabender Messtechnik® GmbH & Co. KG

AQUATRAC®-3E

Moisture Meter for Plastics

The water content of High-Tech plastic material has a great influence on the quality of the finished product. The test should be made swiftly on an instrument with a simple test procedure.

AQUATRAC® - 3E is the result of continuous development of the popular **AQUATRAC®** product, which has been on the market for over 20 years. Developed primarily for the plastics-processing industry, the device measures the moisture content of granular solids.

AQUATRAC® - 3E is robust, compact and easily transportable. This means there are many different ways to use **AQUATRAC® - 3E** directly at the production site, for example:

- To check incoming granulates
- To monitor and optimise the drying of granulates
- To measure granulates right at the machine
- To take measurements from a finished component, e.g. after conditioning
- To take laboratory measurements
- And many more!

As the principle of operation is an absolute chemical method, no calibration is required for each different substance tested.

AQUATRAC® - 3E can be used independently of a computer or other peripheral.

AQUATRAC®-3E with open reaction vessel

Ranges

With the **AQUATRAC® - 3E** different ranges are obtained by different sample weights. **AQUATRAC® - 3E** is able to detect even the most minute traces of moisture (less than 0,01% H_2O) in large, representative testing samples (up to 100 g). In the case of lower-weight samples, the measuring range can be increased to detect very high degrees of moisture.

Since **AQUATRAC® - 3E** is now able to achieve ultra-precise readings using a single measuring cup, it is no longer necessary to switch from one measuring cup to another.

Measuring procedure

The measuring volume consists mainly of the sample container, which contains the sample and the reagent.

Weighing the sample there is no need to meet the exact value. The actual weight is fed into the instrument. This simplifies the handling. The sample is placed into the sample container which is then evacuated by the built - in vacuum pump, which takes approx. 30 sec. The pressure obtained is lower than 10mbar. The sample container is then heated up to the selected temperature (between 60°C to 200°C).

Operating the **AQUATRAC® - 3E** involves only a few simple steps, which are executed via the device's touch screen. If the user prefers, he can also have the touch screen guide him step by step through the measurement process.

Measuring principle

Water and calcium hydride react according the following equation, producing hydrogen:

$CaH_2+2H_2OCa(OH)_2+2H_2$

This reaction takes place in the sealed reaction vessel of **AQUATRAC® - 3E**. It is evacuated by using a built - in vacuum pump, before the measurement. The container is then heated up to the measuring temperature. The evaporating water reacts with the reagent calcium hydride to generate a gas. The gas produced is hydrogen; the gas pressure is proportional to the water content in the sample and is monitored by means of a piezoelectric transducer. **AQUATRAC® - 3E** calculates the ratio of pressure to sample weight and displays the result in terms of H_2O content, either as a percentage or in parts per million (ppm). Volatiles other than water do not react with the reagent and will condense, hence not influencing the reading. The reagent is placed in a mesh based insert above the sample. The partial pressure in the gas system is zero; therefore the total water content is accurately measured. This, in combination with the heat applied and the vacuum, means results are obtained in a short time. Furthermore the test is not affected by the presence of oxygen and no carrier gas is needed.

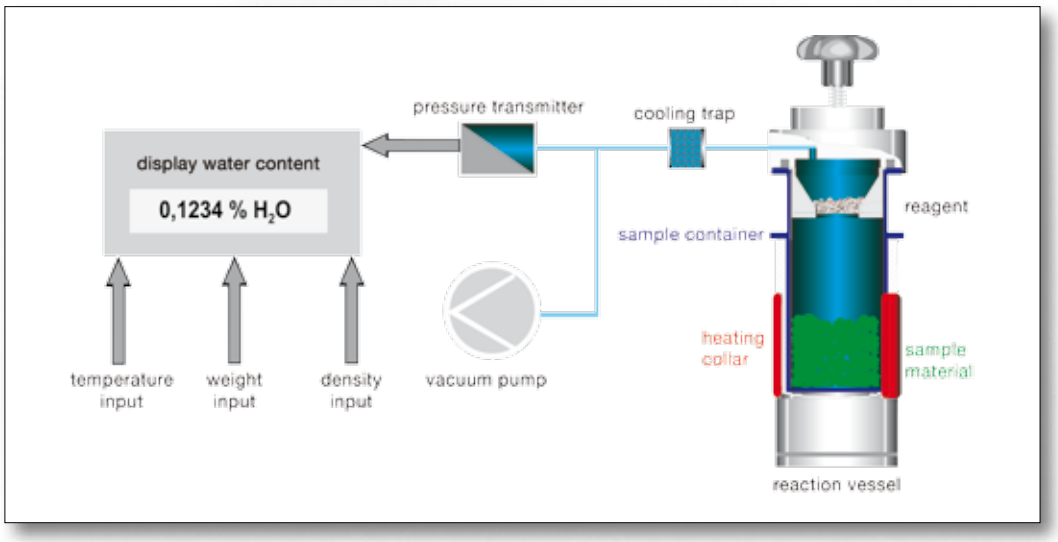
Reagent

The reagent calcium hydride used by **AQUATRAC® - 3E** is in a granular form and is specific to water. It is non-polluting and non-toxic, so no special disposal is required. By using the dosing spoon, the mesh based insert is filled with a certain amount of the reagent. The quantity of one filling is sufficient material for a couple of measurements and the amount of hydrogen produced by each measurement is very low. The calcium hydride can be supplied in quantities of 250g, which is sufficient for approx. 1000 tests.

Product data bank

AQUATRAC® - 3E contains an extensive product data bank with the required default settings for bulk density and measuring temperature. This allows measurements to be taken quickly, without having to input the necessary parameters each time.

The databank can be expanded or updated at any time, ensuring a perfect fit for individual customer needs!



All dimensions in mm

AQUATRAC®-3E

Applications

Thermoplastics, e.g.:
Acrylonitrile butadiene styrene ABS
Polybutyleneterephthalate PBT
Polyamide 6.6 PA 6.6
Polyamide 6 PA 6 GF 30
Polyamide 12 PA 12
Polycarbonate PC
Polyester PET
Polyester elastomer TPE
Polyetherimide PEI
Polyethylene HDPE
Polyethylene LDPE
Polyethyleneterephtalate PETP
Polymethylmethacrylate PMMA
Polypropylene PP

Duroplastics, e.g.:
Epoxide resin
Acrylate
Silicon resin
Vinyl resin

Elastomers, e.g.:
Styrene-butadiene rubber SBR
Chloroprene rubber CR
Polyurethane rubber PUR

Calibration

For calibration of **AQUATRAC® - 3E** the standard sodium molybdate dihydrat according DIN EN ISO 15512 is used.

Calibration is made like a standard test and can be done on site.

Data storage

The **AQUATRAC® - 3E**'s internal hard drive can store up to 500 readings. Measurement results can be easily transferred to a computer for further processing via an USB stick. The **AQUATRAC® - 3E** is optional via an Ethernet interface network-compatible, too.

By connecting a printer, results data can be directly printed from **AQUATRAC® - 3E**.

Technical data

Measuring principle	Chemical reaction with calcium hydride
Sample weight	0,1 g - 100 g according to range
Test temperature	80 °C - 200 °C in 1 °C - steps
Accuracy	• Measurement accuracy: ± 2% of reading / ± 1% of range • Reproductibility: approx. ± 1% of reading
Ranges	3 different ranges: • lower 0,1% • 0,1% - 0,5% • higher 0,5%
Test time	10 - 45 min. dependent on material
Display	% H_2O or ppm
Power supply	100 - 230V (50/60 Hz, 450W) / dependent on version
Dimensions (W x D x H)	51 * 32,5 * 23 cm
Weight	13,0 kg / 14,8 kg

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