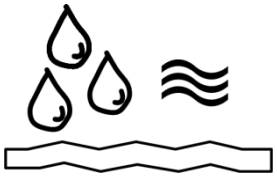
Description



Microwave moisture measurement MRP MW-DS 2003

Moisture measurement by evaluating the dielectric constant in the microwave range

The continuous and non-contact measurement of the moisture content is, in addition to the weight per unit area measurement on running webs, an essential tool in many processes for assessing the quality of the product. Here it is important to measure the moisture with a high degree of accuracy under extreme environmental conditions in the various technical processes. The use of a moisture sensor therefore helps to ensure product quality and minimize waste.

The basis for the microwave-based MRP moisture sensor is the well-known and proven Scanpro sensors.

Characteristics / Features

Microwave moisture measurement is characterized by the following features:

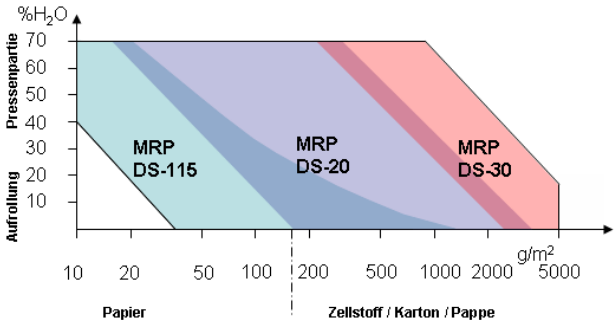
- contactless
- online available
- applicable in industrial environment
- filler independent as far as possible
- independent of surface and colour

Physical principle

Water has a much higher dielectric constant (about 75) than cellulose (about 2.5). The proportion of moisture in the paper is therefore well expressed by the dielectric constant. This effect can be measured with high accuracy by using microwave technology.
The DS series moisture sensors are microwave cavity resonators in which 2 standing waves are excited. One of these resonance frequencies responds to the absorption wavelength of the water. Another resonance frequency, which does not respond to the material, is used as reference. The difference between the two frequencies is the basic measured value.

The measured value obtained with the MRP-DS sensors is combined with the measured value of a grammage sensor - as a result the moisture content in percent and the dry basis weight of the paper can be determined.

From newsprint to heavy board



The MRP microwave sensor MRP-DS115 is suitable for all types of paper - from fine paper to cardboard. For measurements on pulp or very heavy cardboard, MRP supplies the proven MRP-DS20 and MRP-DS30 moisture sensors.

Single-contact moisture sensors based on the micro-wave principle are also available.

Further electrical processing

The signals of the MRP-DS115 sensor are digitized in the sensor housing and are available as a Profibus signal. With the MRP-DS20 and MRP-DS30, the humidity signals are only digitized after the central unit (which is usually located near the measuring frame).

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Measurement accuracy

Typ	MRP-DS115	MRP-DS20	MRP-DS30
Measuring range	0 – 70 g H_2O 2-70% H_2O	15 – 600 g H_2O 2-70% H_2O	600 – 1500 g H_2O 2-70% H_2O2
Resolution	0,01 % H_2O 0,01 g/m^2	0,05 % H_2O 0,1gsm	0,05 % H_2O 1gsm
accuracy - 2 sigma at 1 sec	±0,05 H_2O abs. ±0,1g/m^2	±0,1% H_2O abs. ±0,1 gsm	±0,1% H_2O abs. ±1gsm
Operating temperature	10°C-70°C	10°C-70°C	10°C-70°C

High temperature sensors are also available.

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