Description

Basis weight measurement MRP BW 2002

Basis weight measurement using the beta-absorption principle

The continuous and contactless monitoring of the basis weight (or more correctly the surface mass) on running webs is an essential instrument for assessing the quality of the product in many processes. Here it is important to measure the basis weight with a high precision under extreme environmental conditions in the various processes. The use of a basis weight sensor therefore helps to ensure product quality and to minimize waste. In addition, the usual safety margins can be dispensed with. The use of a basis weight sensor thus increases production and minimizes material and energy costs.

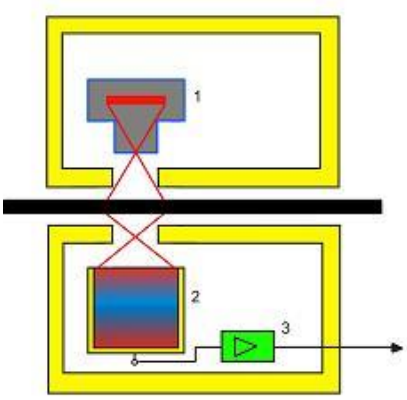
Indicator / Characteristics

The basis weight measurement according to the transmitted beam principle is characterized by the following features:

- contactless
- colour insensitive
- online available
- usable in industrial environment

Physical principle

When radiation of radioactive isotopes penetrates through material, the radiation intensity is reduced (absorption). The reduction depends on the quantity of the transmitted mass, i.e. on the mass per unit area and the ratio Z/A (Z = atomic number, A = atomic weight) of the measured material.



1 radioactive source
2 Ionization chamber
3 Analysis electronics with Profibus DP Connection

Electrical principle

In a shielded housing there is an capsuled radioactive isotope, which serves as a radiation source.
The radiation is only emitted towards the material to be measured. On the opposite side there is a radiation detector (usually an ionisation chamber, but today also semiconductor detectors) which generates a current depending on the amount of radiation received. The currents resulting from this ion flow are in the range of pico amperes (pA, 10^{-12} amperes) for ionization chambers. Such small currents can only be detected with special amplifiers and are therefore a measure for the basis mass between emitter and detector. The measurement is continuous, non-destructive and has no damaging effect on the product. Special procedures and additional detectors for the compensation of disturbing effects (web flutter, temperature influences) help the radiometric basis weight measurement to a highly precise measuring instrument. In order to be able to cover the widest possible weight range, MRP Automatisierungstechnik uses various radiation sources / isotopes.

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Measurement accuracy

Typ	BW-Pm147	BW-Kr85	BW-Sr90
Measuring range	0-130 gsm	20-1300 gsm	300-5000 gsm
Resolution	0,01 gsm	0,08 gsm	0,4 gsm
Accuracy - 2-sigma at 1 sec	0.15% but not better than ±0,1 gsm depending on product	0.25% but not better than ±0,25 gsm depending on product	0.25% but not better than ±0,5 gsm depending on product
Zero profile 2-sigma with 3 scans	0,1 gsm	0,15 gsm	0,6 gsm
Measuring gap	10 mm	12 – 20 mm	12 – 20 mm
Measuring spot diameter	15 mm	8 mm	15 mm
Operating temperature	10°C-70°C / 110°C	10°C-70°C / 110°C	10°C-70°C / 110°C

In special cases larger measuring gaps are also available. Please contact us, we will help you to solve your measuring job.

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