

Döscher & Döscher

Moisture Measurement in Process



P₂MR -

fast and precise
moisture detection

MoistureScan

Water Content Control

In many industrially manufactured products and processes the quality of a product plays, besides the cost effectiveness, a decisive role. An essential parameter for optimal process control and a quality characteristic of many products is the water content.

It makes thus sense to use online-analyzers for continuous supervision of the water content, in order to be able to quickly intervene into the process if necessary. The new **MoistureScan** allows a direct determination of water content in the production process.



MoistureScan - a useful tool with comprehensive service

As a system for automated continuous moisture measurement, the **MoistureScan** provides the necessary data for process control. A more exact process control within the tolerances and an improved quality assurance allow to reduce costs and achieve economic advantages, which permit a quick amortization.

As an additional service, we offer remote maintenance of the measurement tools. From our location in Hamburg we can carry out diagnosis and maintenance works. Low calibration expenses as well as precision and long-time stability make the **MoistureScan** a reliable and useful tool. The MoistureScan has been constructed for continuous moisture detection in a production environment.

The **MoistureScan** works independent of filling height or density variations of the product. The measuring system can be used in the product stream without the requirement of particular product densities of filling heights to be kept.

The resistant and insensitive probe surface permits integration of the probe into the product stream.

installation in bunker



The large diameter of the probe and the depth of penetration of the microwave field into the product provide an extensive measuring volume. Contamination of the probe surface is uncritical as its influence on the measuring volume is of minimal significance.

Various probes for integration into the product stream are available for numerous applications.



- current informationen for process control
- quick and due detection of disturbances
- detection of product characteristics for quality assurance
- optimization of process flow
- reduction of rejects
- automation of process control
- opportunity to save raw materials
- reduction of objection costs
- energy economy
- less ecological damage

The **2^{MR}** - Method:

2 parameters for exact measurements

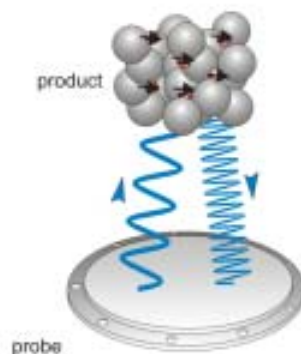
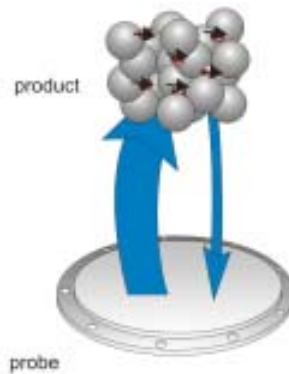
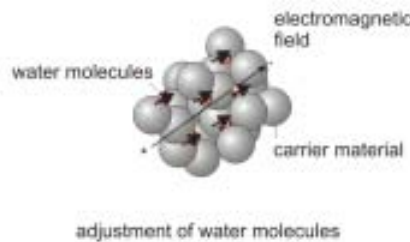
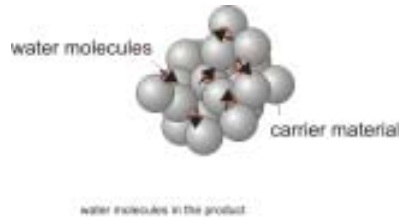
- fast Measurement
- precision due to high water selectivity
- independent of density and weight
- non-destructive measurement
- independent of colour, structure or surface of product
- up to 5cm measuring depth, detection of core and surface moisture
- long-time stable and to a great extent specimen-independent calibration

Innovative Technology

The MoistureScan combines the advantages of microwave technology with a density-independent measurement technique.

For an exact moisture detection with microwaves it is necessary to determine the number of water molecules and the mass. The two parameters allow to detect moisture independent of density.

These two parameters are determined via the loss of energy of the radiated electromagnetic field and the slowing-down of the electromagnetic waves. Thus the the water content can be determined online independent of bulk density height of the product stream.



The Technology

Water molecules within the product are found orderless, they can direct themselves freely.

Alignment

Water molecules are strong dipoles. When an electromagnetic field is produced they adjust themselves due to their positive and negative ends according to the polarity of the field.

If the field changes its polarity quickly, only the water molecules can follow this change of direction, because they are small and have a strong dipole.

1st Parameter: Energy Loss

For this movement energy is needed and drawn from the electromagnetic field. The loss of energy is being detected and depends on the number of water molecules.

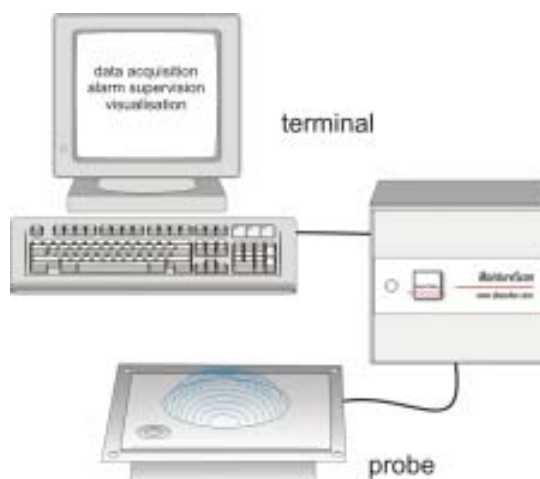
The number of water molecules in the measuring volume can, in spite of a constant moisture content, vary due to changing densities, different product heights on top of the probe or compression of the product.

2nd Parameter: Propagation Speed

These changes of density lead to a reduced propagation speed of the waves. This change in propagation speed is being detected and compensated for. The measurement technique thus allows moisture detection in materials independent of height or package density of the product stream.

In-line measurement

MoistureScan



The **MoistureScan** was developed for industrial applications in the chemistry, pharmacy, food, natural products and building materials sector. The low calibration expenses and long-time stability of the measuring system allow low-maintenance and reliable use. These characteristics are the requirements for realization of the economy you expect in your production process.

technical data

Measuring range:	subranges to select, depending on probe and product characteristics
Repetition accuracy:	1% of the final value of the selected measuring range (i.e. measuring range 0-10%: + 0,1% accuracy)
Measuring time:	5ms typ.
Product temperature:	0 - 70°C
Max. number of different articles:	50
Max. number of measurement data:	200.000
Data safeguarding:	Hard disk
Data outlets:	4 - 20mA for moisture signal and temperature the measuring system is controlled via a separate interface
Power supply:	230 VAC, 50 Hz
Environment temperature:	0 - 40° C
Size and weight:	
Probe :	180 mm Ø, Weight 2,5 kg

technical data are subject to change

Döcher & Döcher GmbH