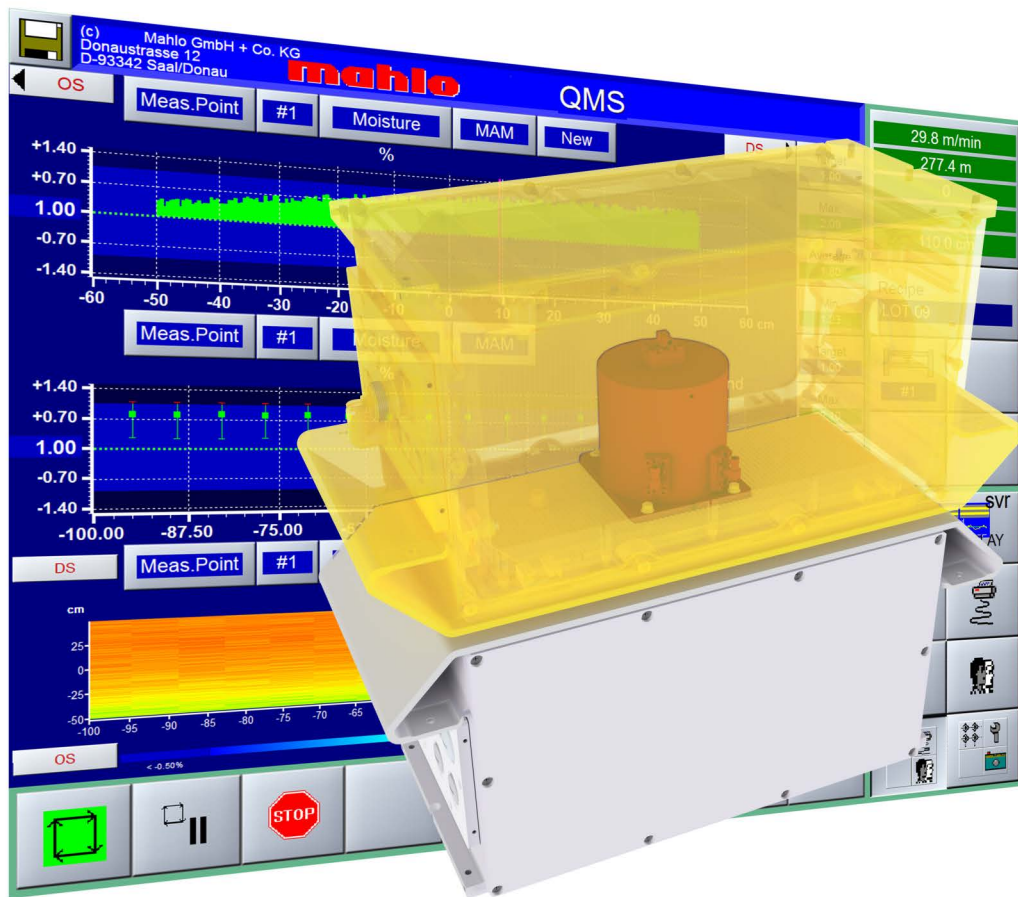


# Aqualot HMF-T

New microwave moisture sensor for Qualiscan QMS



Aqualot HMF-T

## AQUALOT HMF-T

### New microwave moisture sensor for Qualiscan QMS

#### Microwave Resonance: Moisture

#### Area of application



Sensor Aqualot HMF-T

Product moisture is an extremely important parameter for the manufacturer and processor of web products such as paper, textiles, cardboard and nonwovens. Microwave-absorption technology has been used for quite some time to determine this quantity online in the process. However, up to now, limited resolution has restricted its use to measurement of larger quantities of water, thus preventing it from being used to measure thinner products or lower levels of moisture.

With this special measuring technique employed here it is now possible to detect even the smallest amounts of water exceedingly stable and with a high degree of accuracy. This enables it to be used on even thin printing paper, airbag materials or the nonwovens used in the hygiene sector without its accuracy being affected by product colour or composition.



#### Customer benefits

- ✓ *Non-destructive, continuous determination of the amount of moisture (H<sub>2</sub>O) in product webs*
- ✓ *Extremely accurate and stable measurements; calibration reduced to a minimum*
- ✓ *Long life expectancy through the use of high-quality components*
- ✓ *Wide measuring range through the use of various resonance configurations*

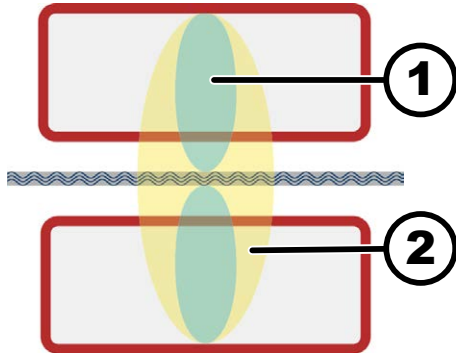
#### Principle of operation

The measuring devices consist of two parts, which together form a resonance chamber, and the product passes through the centre of this divided chamber. A microwave emitter stimulates two standing waves in the resonance chamber, whereby one of the two corresponds to the absorption wavelengths of the water molecules in the microwave spectrum and the second serves as a reference.

Contrary to the traditional absorption technique, the Aqualot HMF sensors evaluate the shift in the resonant frequency of the two standing waves with respect to each other rather than the attenuation of the microwaves by the quantity of water molecules in the measuring gap. This special “microwave resonance” measuring principle is virtually insensitive to changes in product composition, which in daily practice helps keep the number of product-specific calibrations to a minimum. In addition, the device is characterised by its ability to resolve to an exceedingly high degree even the lowest percentages of moisture, thereby extending the use of microwave technology significantly in comparison with traditional measuring techniques.

## Measuring method

### Microwave resonance measurement



Microwave resonance principle

### Moisture

- ① Reference resonance
- ② Measuring resonance

Two standing microwaves are generated in the sensor. One is used as reference. The second is absorbed by water and therefore dampened as well, in addition, the resonance frequency changes. The moisture content in the material can be determined by comparing both waves. Measurement of the microwave resonance is suitable for residual and high moisture of all non-metallic products.



### Product highlights

- ✓ Highly accurate and stable measurement thanks to microwave resonance analysis
- ✓ Unaffected by the color of the product web or its chemical composition
- ✓ Temperature compensation by using a pyrometer to detect product temperature
- ✓ Durable and fail-safe as there are no moving parts

## Technical data

### Aqualot HMF-T

Specification	Value	Unit	
Measurements	Moisture		
Measuring principle	Microwave resonance measurement		
Measuring gap	10	mm	
Measuring range	2 - 70	%	H <sub>2</sub> O
	3 - 1200	g/m <sup>2</sup>	
Temperature range	without Cooling	10 - 50	°C
	with Cooling	10 - 85	

## Monitoring and control systems, automation

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