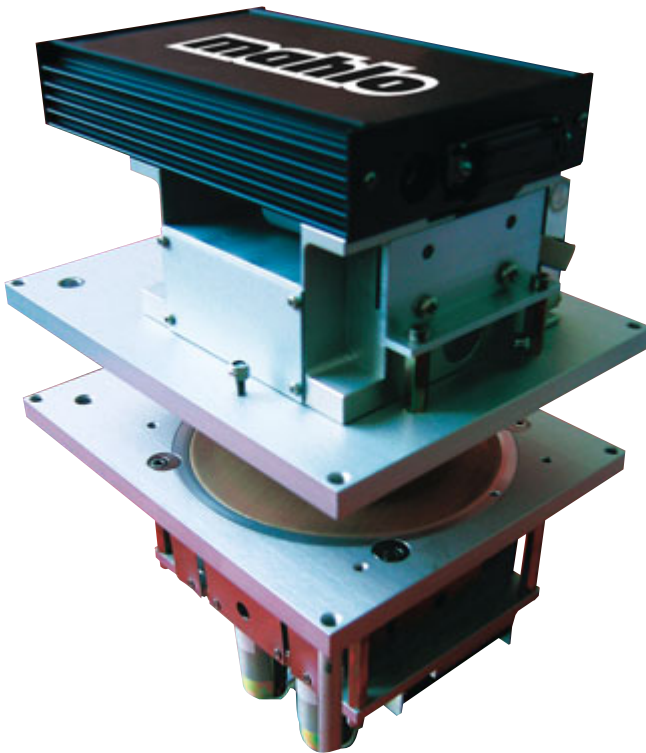


MAHLO AQUALOT HMF

Microwave-Resonance
Moisture Gauge

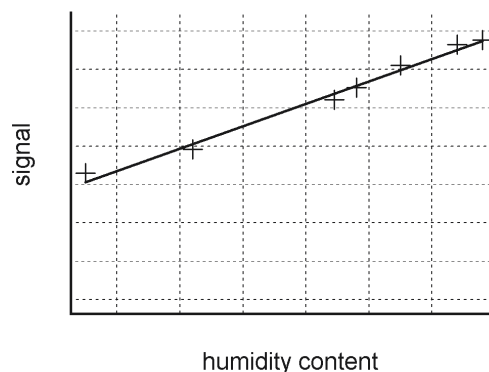


Microwave-Resonance Moisture Gauge

Product moisture is a critical parameter during the production processes of a variety of different web based products, such as paper, textiles, board and nonwovens. Microwave technology has been used since several years to determine product moisture online, but was limited to higher moisture contents due to the insensitivity of the microwave absorption technology. The MAHLO HMF sensors overcome these limitations and allow the users to measure product moisture online with highest possible accuracy and stability, by using the 'Microwave-Resonance' Principle that was introduced by Lorentzen + Wettre AB, Sweden, in their well known ScanPro sensor series. This patented measurement principle is capable of detecting very small amounts of water in the web product and to resolve them with an unrivalled reproducibility. As a result if this the gauges can be used even on very thin web products such as printing paper, airbag materials or nonwovens for hygiene purposes, providing the customer with a very stable measurement that is not affected by product colour or composition changes.

Measurement Principle

The instrument consist of two parts being installed on opposite sides of the web product to be measured, and forming a resonance chamber. When being used on a traversing frame two fast servo motors, controlled by a hall detector device, will automatically correct mechanical misalignment of both halves of the chamber. A microwave sender will initiate two resonating waves in this chamber, of which one is a typical resonance frequency of the water molecule in the microwave band, while the other is used as a reference wave. Different to classical microwave absorption instruments, the HMF sensor will not detect the total absorption of the microwave, but the variation of the resonance



* Deviations of the measured points from the straight line reflect the uncertainties of determining moisture gravimetrically.

Measurement

Control

Automation

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Technical Data

Type of measurement	displacement of microwave resonances			
	double sided			
	1	2	3	
Range	max. 25 g/m ²	max. 50 g/m ²	max. 100 g/m ²	max. 600 g/m ²
Resolution	± 0.01 g/m ²	± 0.02 g/m ²	± 0.04 g/m ²	± 0.1 g/m ²
Scanning gap	10 mm			13 mm
Ambient limits	70°C			

frequency introduced by the number of water molecules in the measurement gap, compared to the reference resonance wave. This patented 'Microwave-Resonance' measurement principle is more or less insensitive to changes of product composition, and will thus result in an extremely stable measurement and require minimal calibration effort

in a production environment. As it is also much more sensitive to product moisture changes, it can extend the measurement range to very low moistures where microwave based gauges could not be used before.

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