

## Nonwovens: Quality guarantee basis weight measurement

**Mahlo GmbH + Co. KG uses near infrared technology**

There is hardly any way around nonwovens at the moment. Face masks, PPE or hygiene filters: nonwoven products have become an important commodity in the wake of the corona pandemic. However, the upswing in nonwovens is also accompanied by new challenges for manufacturers. Production has to be fast and efficient - and above all safe and high-quality. To ensure the required quality, the correct basis weight is an important parameter. Mahlo GmbH + Co. KG enables precise results in this area through a measuring method using near-infrared technology.



For spunlace products mainly fibres such as cotton, PE, PET or rayon are used. These have the pleasant property that they absorb light in the near infrared range. Water and all other materials have different spectral ranges and can thus be distinguished. By measuring the attenuated radiation, the moisture content and the basis weight of different materials can be determined. Mahlo infrared sensors, calibrated to the respective fiber types, generate and evaluate the required data. The measuring process is contactless, non-destructive and without unwanted influence on the product properties.

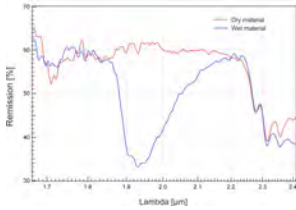


Fig. 1: Absorption of IR energy through water

## Qualität und Wirtschaftlichkeit

If the basis weight of a product meets the desired specifications, this brings both qualitative and economic advantages. For example, if filter material is too thin, it can be too permeable. In the worst case, an entire batch may have to be destroyed. If, on the other hand, it is too thick, the function is not guaranteed and the material consumption is too high. The different versions of nonwoven products also place different demands on the measuring technology. Mahlo therefore has two sensors with near-infrared technology in its portfolio as part of the modular quality measurement system Qualiscan QMS.



Fig. 2: Transmission principle

## Infracot IMF

The Infracot IMF is available as a version Infracot IMF-T in transmission mode, which is used for thick materials. With Mahlo's newly developed simultaneous filter, all wavelengths are measured simultaneously and at the same point without a rotating filter wheel. Instead, the light is distributed simultaneously to six detectors. This eliminates measurement inaccuracies and enables true same-spot measurement of reference and absorption resonances. With conventional filter wheel systems, the wavelengths for dry (reference) and wet are measured with a time delay. This can lead to measurement inaccuracies, which are particularly disadvantageous for inhomogeneous products such as thin nonwovens. A measurement for nonwovens is possible with a basis weight between 10 - 500 g/m<sup>2</sup>. The measurement with IR-reflection with the Infracot IMF-R is primarily used to determine the top cover layer or coating without measuring the underlying substrate. The measuring tolerance of the basis weight is between 10 and 60 g/m<sup>2</sup> for nonwovens.

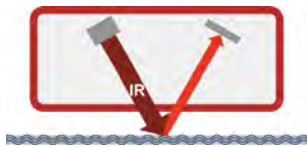


Fig. 3: Reflection principle

## Infracope NIR

The Infracope NIR sensor monitors the absorption of infrared light from all components on or in the web in the near infrared range. Due to its very high spectral resolution, the sensor can distinguish between components with very similar but not identical IR absorption. Therefore, if the substance to be measured absorbs IR light at a certain wavelength without being superimposed, e.g. by the substrate, the layer thickness can be determined with a very high accuracy. An accuracy of approx. 0.05 g/m<sup>2</sup> of the respective coating weight can be achieved. This method requires an appropriate calibration of the sensor, as the colour also has an influence on the measurement. Ideally, the calibration data is determined in advance in a laboratory test and then simply integrated into the system.

Measurement using near-infrared is particularly useful if a manageable quantity of different products is produced. The calibration is adapted to the products and stored in the article memory. Mahlo has already successfully implemented many such applications and offers the user a perfect tool with high measuring accuracy and easy handling. Our technical service ensures that the desired measures are implemented 100%. Not only can products with "zero defects" be manufactured continuously, but quality, efficiency and profit can also be increased in the long term.

*More detailed information about the products, brochures for download as well as topic-related technical articles can be found on the website of Mahlo GmbH + Co KG at [www.mahlo.com](http://www.mahlo.com).*

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