

Quality assurance from Mahlo – in the service of health

Control of basis weight and material thickness with Mahlo sensor technology

Manufacturers of medical goods are currently under pressure to deliver their products as quickly as possible, but still with high quality. Weight and thickness greatly influence the functionality of nonwoven goods such as masks or protective gowns. With process control systems from Mahlo GmbH + Co KG, this balancing act is not only easier to master – production costs are also further reduced.

Thanks to decades of experience and a wide range of measurement and control technology, the Bavarian machine manufacturers are able to support manufacturers in monitoring and controlling important parameters during the production process. Different sensors are available depending on the application.



Matthias Wulbeck, expert for quality measurement at Mahlo, explains the differences: "Our Gravimat DFI sensor is part of the modular system Qualiscan QMS and measures the basis weight with the help of isotope radiation". The measurement is based on the attenuation of radioactive radiation by the substrate in the measuring gap. This attenuation in intensity is an indication of the basis weight of the product. If the density is uniform, the basis weight measurement can also be used to draw direct conclusions about the thickness of the nonwoven fabric. In order to do justice to different material properties, Mahlo works with different isotope variants. "For products with a weight between 10 and 1400 g/m² we use Krypton-85, for 100 to 6000 g/m² we use Strontium-90".

No measurement inaccuracies due to fabric flutter

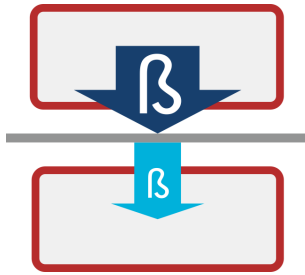


Fig. 1: Principle of beta measurement

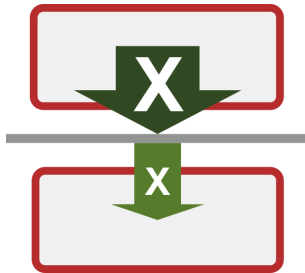


Fig. 2: Measuring principle with X-ray radiation

The transmitter in the traversing sensor radiates onto the running web. Due to their mass, the radiation reaches the receiver in a damped manner. Mahlo uses a multi-channel receiver where the incoming measurement radiation is distributed to different areas of the product surface. Precise values are obtained this way, regardless of the current position of the web. This method also solves one of the major problems of manufacturers of web-shaped products such as hygiene fleece: Measurement inaccuracies due to fabric flutter.

Measurement with X-rays

As an alternative to the measuring technique with isotopes, Mahlo uses a measuring method with X-rays. "The Gravimat FMX-T sensor is ideal for products that consist of only one component and determines basis weight and thickness just as reliably as the models with beta radiation," says Wulbeck. It measures thin film, nonwovens and other fabric with high resolution, measuring accuracy and absence of flaws. The sensor variant <5 kV is completely exempt from radiation safety requirements in Europe and many other countries. "A plus for many manufacturers."

The Gravimat FMX measuring head consists of a compact X-ray tube and its high-voltage power supply as well as special, modern X-ray detectors with the electronics for data acquisition. Thanks to the optimized sensor design, it is completely insensitive to environmental impact such as temperature and relative humidity.

Another very interesting alternative is infrared absorption measurement, which measures the individual fibre components and can thus determine not only the basis weight but also the fibre content. This version is also exempt from safety requirements, as only infrared light is used for measurement.

No matter which method is used to suit the application – both have one thing in common: The automatic basic weight control significantly reduces the spread of the basis weight and thereby ensure a more consistent end product. Suitable defined set-points with minimum tolerance ranges save material and energy costs to a significant degree, in addition to safeguarding product quality. In addition, a safety margin is eliminated, which otherwise means loss of goods and time.

More detailed information on 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

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