

MOISTURE AND MASS FLOW IN THE BULK INDUSTRY

Ideal measuring solution on the conveyor
belt for optimization of product quality



MOISTURE AND BULK FLOW ON THE CONVEYOR BELT

In several industries, it is essential to know the throughput and moisture content of the extracted materials during extraction and processing. With the help of a bulk flow measurement, the conveying capacity or solids mass can be determined. This enables, among other things, optimum utilization of storage capacities and compliance with delivery and production quantities. Moisture also plays an important role as it affects not only the quality but also the handling of the product. With the combined measurement solution of radiometry and microwave technology Berthold makes it possible to determine in real time the throughput as well as the product moisture precisely and contact-free. Thanks to the measurement principle and the patented stabilization methods, the measurements remain completely unaffected by external influences such as dust, vibrations, fluctuations in belt tension, temperature, aging, or external radiation.

Example: Gravimetric measuring systems, such as load cells, can result in costs of up to 40,000 €/day caused by inaccuracies due to their measuring principle. Using our system solution, you can expect a measurement accuracy of ± 0.5 (single standard deviation). This means that the investment will pay for itself in a very short time.

The measuring principles

Bulk flow measurement using radiometry

A radiometric measurement system usually consists of a source that emits gamma radiation and a scintillation detector that can detect this radiation. The radiometric bulk flow measurement is non-contact and is installed by means of a measuring frame around the conveying element. Consequently, retrofitting to any existing conveying system is possible. When passing through the measuring point, the radiation is weakened depending on the product and belt load. This now weakened gamma radiation is in turn detected by the detector. In combination with a speed signal, the bulk flow is ultimately determined.

Moisture analysis using microwave technology

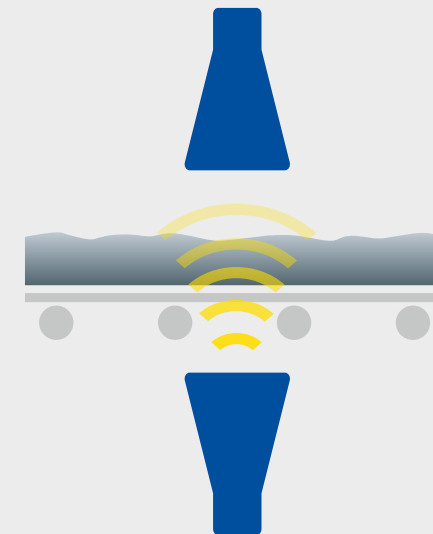
In this measurement method, microwaves penetrate the product to be measured and cause a rotation of the free water molecules. This rotation slows down (phase shift) and weakens (attenuation) the microwave signals. Since this slowing attenuation is directly proportional to the water content, the moisture content can be accurately determined.

Typical applications for bulk flow and moisture

- Recycling industry, e.g. plastic domestic waste
- Agrar industry for example NPK fertiliser
- Mining industry, e.g. concentrated apatite rock or sulfur extraction
- Food industry, e.g. bagasse processing after sugar extraction
- Construction industry, e.g. gypsum (phosphoric co-product/residuum)

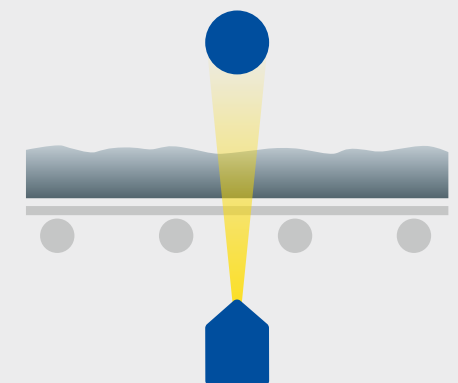


Microwave moisture measurement with horn antennas



- Known moisture content when tendering / loading of bulk material ensures consistently high quality of the products
- Multifrequency technology for dynamic plausibility control of the raw signal
- Easy installation, also on already existing conveyor systems
- Wear-resistant and maintenance-free due to contactless measurement
- Reliable long-term measurement without recalibration

Radiometric bulk flow measurement with detectors



- Reliable online monitoring on all conveyor systems, even where conventional methods cannot be used
- Reliable adherence to delivery/production quantities
- Optimal utilization of storage capacities
- Optimal addition of raw materials in mixing processes hence, very fast amortization of the measurement
- No recalibration or cleaning necessary



THE EXPERTS IN MEASUREMENT TECHNOLOGY

Berthold Technologies stands for excellent know-how, high quality and reliability. The customer is always the focus of our solution. We know our business!

Using our varied product portfolio, our enormous specialized knowledge and extensive experience, we develop suitable solutions together with our customers for new, individual measurement tasks in a wide variety of industries and applications. Berthold Technologies is specialised in radiometric process measurements for 70 years. More than 30 years ago Berthold expanded their portfolio and introduced microwave technology to the sugar industry. Today sugar mills worldwide depend on measurement solutions from Berthold. Our expertise in microwave technology is one of our core competences – the vast amount of systems in operation in the sugar industry worldwide speaks for itself.

We are here for you – worldwide!

The engineers and service technicians from Berthold Technologies are wherever you need them. Our global network assures you fast and above all competent and skilled assistance in case of need. No matter where you are, our highly qualified experts and specialists are ready and waiting and will be with you in no time at all with the ideal solution for even the most difficult measurement task.

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