

MOISTURE AND BULK FLOW IN THE ETHANOL INDUSTRY

Ideal measuring solution to optimize
efficiency of production processes



 **BERTHOLD**

BULK FLOW MEASUREMENT ON THE CONVEYOR BELT

Ethanol industry professionals continually seek ways to save money and improve the efficiency of their production processes. One such solution is implementing radiometric bulk flow measurements in critical areas, such as measuring whole corn, ground corn, and dried distillers' grains. Moisture also plays an important role as it affects not only the quality but also the handling of the product.

The Berthold LB 472 bulk measurement system provides an accurate, non-contacting, and reliable measurement solution for optimizing the milling process and reducing costs. 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.

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

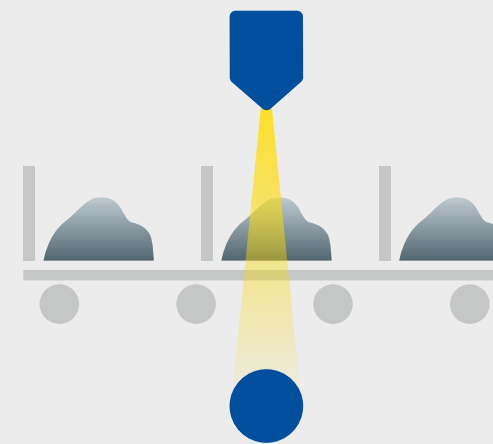
In this measurement method, microwaves penetrate the product to be measured and cause a rotation of the free water molecules. This rotation slows down (phase shift) and weakens (attenuation) the microwave signals. Since this slowing attenuation is directly proportional to the water content, the moisture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

Possible applications

- Flow rate measurement of whole corn, grain or sugar beets by entering the grinding process, allowing operators to adjust the speed and feed rate for optimal efficiency. It also provides real time production numbers for plant managers reports.
- Flow rate measurement of ground corn, grain or sugar beets to accurately measure the flow rate of ground corn going into the fermentation process, helping optimize the milling process, ensuring accurate proportioning of ingredients, and ultimately reducing costs.
- Measurement of dried distillers' grains (DDG) to measure the flow rate and mass produced during ethanol production.
- Online moisture measurement of ground product or DDG

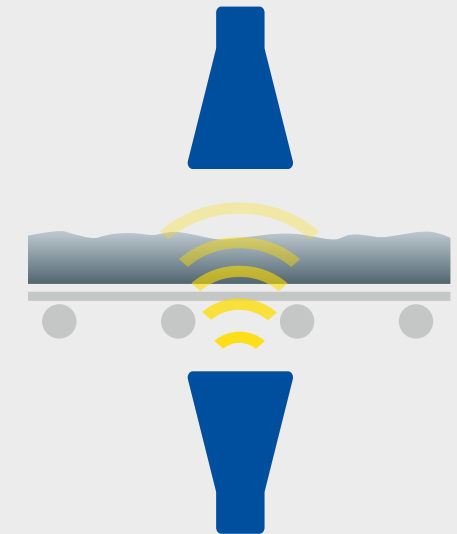


Radiometric bulk flow measurement with detectors



- Reliable measurement of bulk materials, throughput, and mass flow on all conveyor systems, even where conventional methods cannot be used
- Increasing efficiency of the milling process, thereby saving costs and minimizing waste
- Wide application range due to typical measuring range between 100 kg/h and 1000 t/h
- Reliable adherence to delivery/production quantities
- No drift, recalibration or cleaning necessary
- Non contacting and maintenance free

Microwave moisture measurement with horn antennas



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



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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