Product Information

On-line Moisture Measurement for Wood Chips

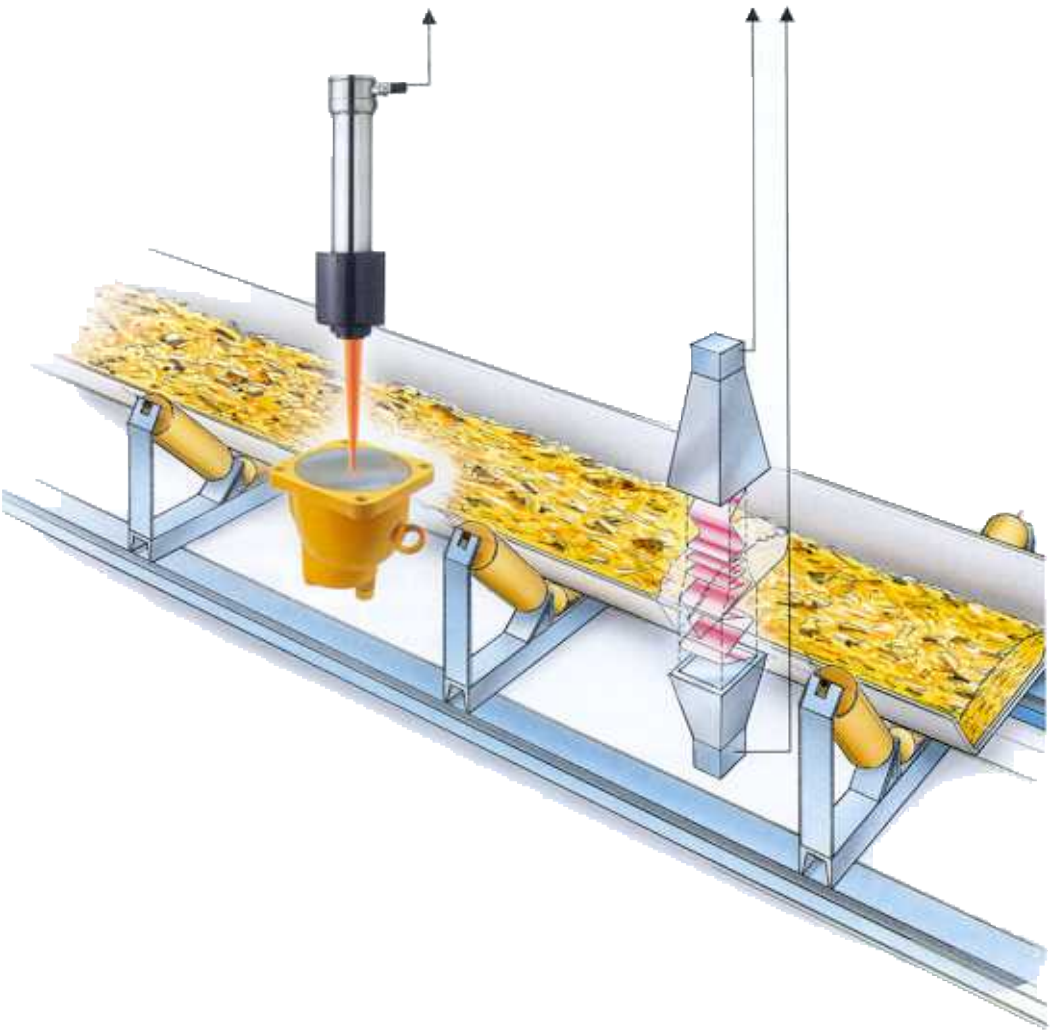
BERTHOLD TECHNOLOGIES

On-line Moisture Measurement for Wood Chips

Using the Micro-Moist Microwave Moisture Analyzer

- The problem is to measure the moisture of the wood chips, a necessary prerequisite for process optimization in the digester.
- On-line measurement of the moisture on the belt conveyor provides an immediate indication to the plant operator to enable him to optimize the addition of white liquor to the digester.
- Control has resulted in improvements in pulp yield and quality as well as reduction of kappa number variations.
- **Berthold Micro-Moist Analyzer.** Measures the total volume of material on the conveyor compared to the other technologies, which only measure the surface moisture.
- Having a **Berthold on-line Moisture Analyzer** with dynamic information displayed in the control room is clearly of benefit to the process.

Area weight compensation **Moisture**



Features & Benefits

- **Plausibility control**
  Reliable average.
- **Contactless sensors installed below & above the belt**
  No sampler needed, whole layer thickness is measured.
- **Microwave Principle**
  Unaffected by colour & capacitance variations.
  Whole arrangement mounted on a single frame.
  Easy to install & no moving parts.
- **Microwaves and radiometrics are non intruding sensors**
  No wear of probes, reducing maintenance.
- **Accurate measurement and long term stability**
  No need for frequent recalibration.
- **Measures continuously and instantaneously**
  Real time information enables process control at right time.
- **Selective to water**
  No influence of chemically bound hydrogen.
- **Area weight compensation**
  Unaffected by change in layer thickness & bulk density.

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Berthold On-line Moisture Analyzer

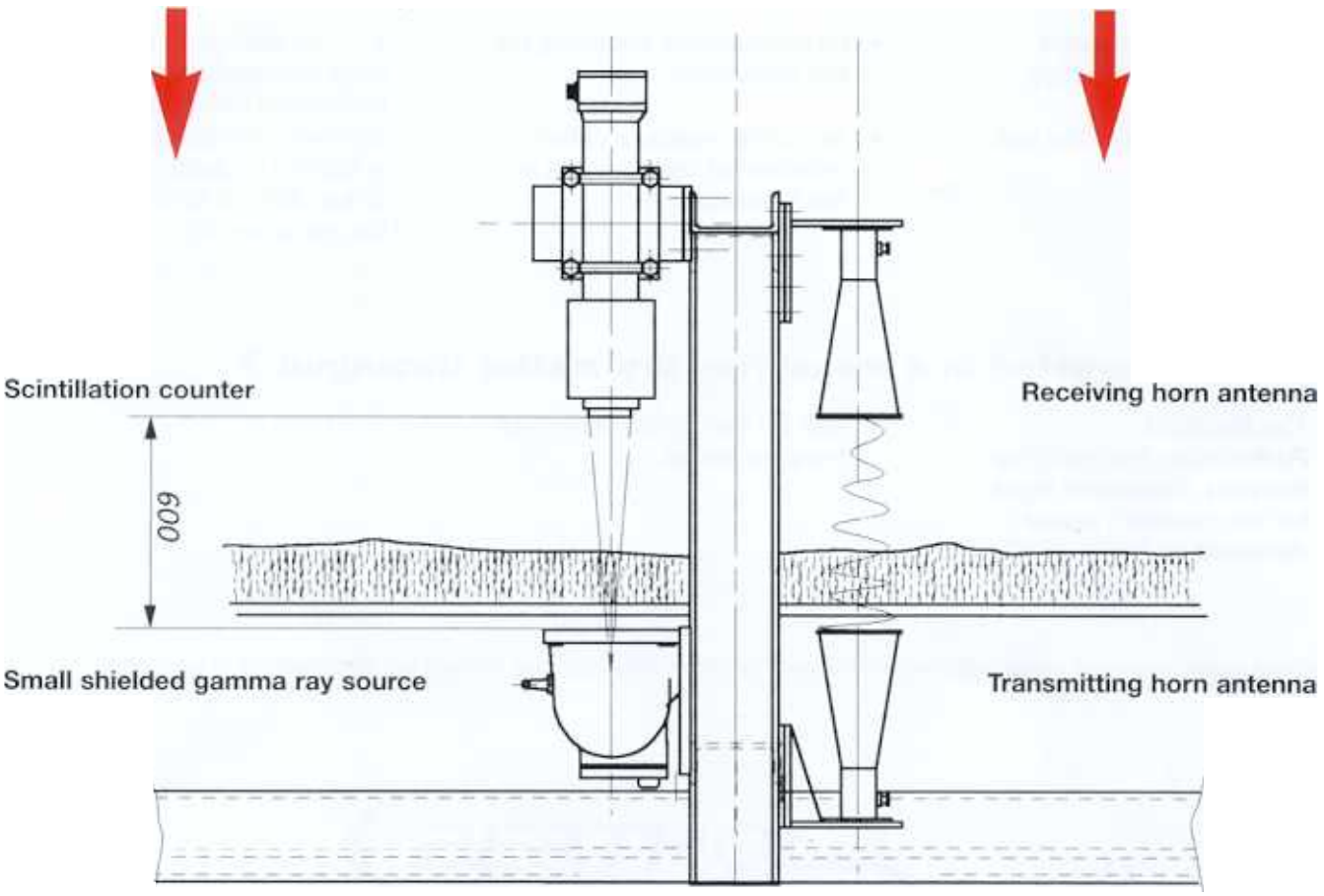
- **Berthold** installs its **Analyzer** providing on-line and real time measurement.
- The monitor is installed on the conveyor to the digester.
- The On-line Moisture Analyzer develops multiples microwaves in a wide frequency range. These microwaves are transmitted via horn antennae through the wood chips and received by the other antenna at the opposite side. The signal is then sent back to the evaluation unit.
- A radiometric area mass unit compensates for variations in layer thickness and bulk density, providing a mass expressed moisture indication.

Components provided by Berthold include:

- **Micro-Moist electronic evaluation unit.**
- **A pair of horn antennae.**
- **Accessories for installation.**
- **Scintillation counter.**
- **Shielding with gamma ray source.**

Gamma transmission

Microwave transmission



Typical installation on a conveyor belt

- Gauges installed on the conveyor belt before the digester Evaluation unit is mounted close to the gauges (2 m cables).
- For the sampling representativity as well as for a representative measurement a correct profile of the wood chips is required.
- Horn antennae, perpendicular to the belt conveyor.
- Scintillation counter and low activity shielded gamma ray source, also perpendicular to the belt conveyor.
- Distance between the horn antennae approx. 600 mm.
- Distance between the source and scintillator approx. 600 mm.
- Wood chips bed depth is between 100 mm/ 200 mm.

Calibration

- The initial procedure consists of performing a zero measurement. Theoretical coefficients are entered into the microprocessor (essentially a slope and offset), putting the instrument in operation.
- Thereafter the analyzer is fine-tuned by taking samples from the conveyor belt every few hours, and the averaged laboratory results are compa-red with the analyzer readings taken at the time of sampling.
- The comparative laboratory values versus the moisture readings are plotted. The linear coefficients are determined by means of a linear regression. Thus, the calibration coefficients obtained during the start-up procedure are fine-tuned.

Some rules to observe for all on-line Analyzers

- **Ensuring the required amount of wood chips.**
- **Correct profile of the belt loading.**
- **Representative sampling for the calibration.**
- **Accurate moisture determination of the samples in the laboratory.**
- Depending on the sampling representativity and the labo-ratory accurracy, a typical measuring accuracy of ± 1,25% (1 sigma) in a range of e.g. **30% to 55% moisture** can be achieved.

Are you interested in a measuring dry matter througput ?

- **The Berthold Radiometric belt weigher includes a moisture input, for the moisture signal delivered by MICRO-MOIST!**
- **Ask for the Radiometric belt weigher leaflet.**

We have subsidiaries and representatives worldwide. For further details please contact our headquarters in Germany

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