

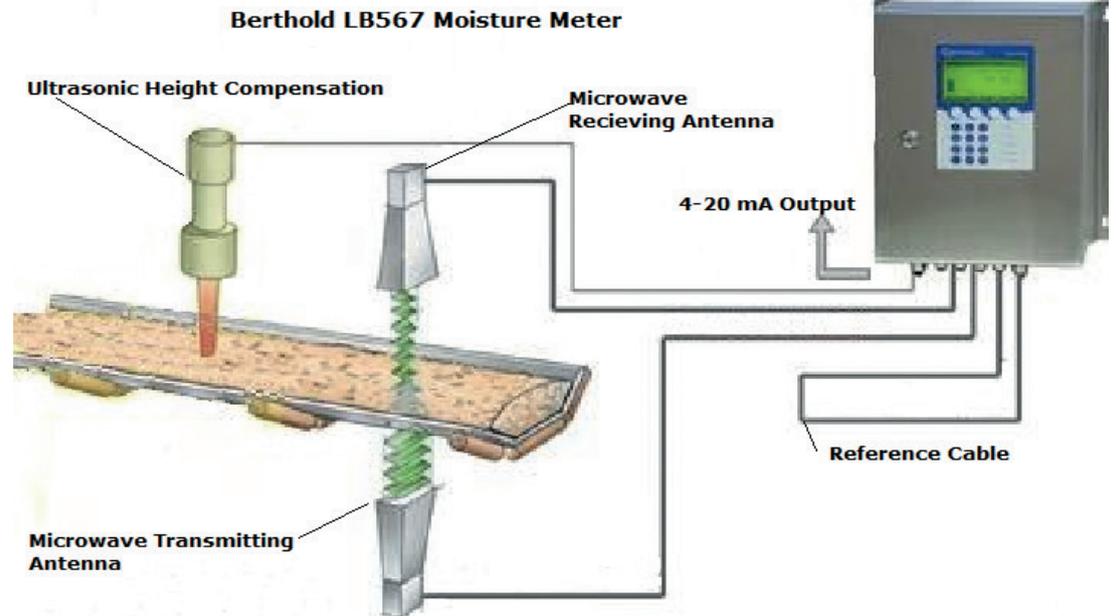
Real time measurement of moisture in biomass

By Graeme Webb*

The ever-increasing use of biomass fuels for commercial power generation, as well as domestic use, is well-documented. Today, everything from straw bales to wood chips are used as renewable fuels with great success. When it comes to such biofuels on a large scale, the moisture content of the fuel has to be taken into consideration. In some cases, wood chips, for instance, dependant on their source and time of production, can have moisture contents of up to 60% by weight, which can have a negative effect on the burning process.

This moisture content of the fuel needs to be verified by both customer and supplier alike to ensure that the required specification of the fuel is met. Biofuels with high moisture content effectively means the buyer is unnecessarily purchasing large quantities of water.

In many instances, the fuel needs to be dried to increase its calorific value. This drying procedure can be costly and wasteful if 'over-drying' is taking place. Another problem of overly moist material is that it can start to degrade. This degrading process can result in the formation of combustible gasses with associated fire risks while



in storage. Therefore, an early identification of wet product is important for site safety.

A reliable online moisture measurement of biofuels can provide significant economic and safety benefits to the user. The real-time information on the moisture can be used to monitor the fuel supply and lays the foundation for improved boiler efficiency. The drying process can be adjusted to the actual need, saving time, as well as fuel costs. Online measurement of the fuel allows identifying overly wet batches of product before the material enters the storage bunker.

Moisture gauges

Various types of moisture gauges are available for today's wood chip user. These range from simple hand-held probe type units to more sophisticated, permanently-mounted online systems giving real time measurements. However, when looking at gauges that provide an online and non-contacting measurement, then the choices tend to be limited to Near infrared (NIR) or microwave transmission systems.

Non-contact, online and real time microwave analysers offer some advantages to the operator over NIR systems. As the microwaves are beamed through the fuel, they give a representative measurement on the whole material layer rather than just the surface of the fuel.

As a second point, microwaves, unlike NIR, are not affected by any differences of the colour of the fuel or light variations in the measuring area.

Online analysers

The MicroPolar analysers from Berthold Technologies are specifically designed to meet these measurement tasks. Based on microwave transmission technology, the MicroPolar has some technical features that are very important when measuring natural products like wood chips or pellets, sugar beet, straw bales and other crop-based fuels. Due to the multi-frequency technology (measurement at different microwave frequencies), the system ensures a very stable and reliable measurement, unaffected by reflexes or resonances of the

measured product. An integrated reference line eliminates any environmental influences, making it ideal in industrial environments. However, the unique advantage of the Berthold system is the possibility to compensate for varying loading heights or bulk densities. This ensures accurate and representative results, providing a measurement that can be relied on.

Conclusion

The real-time measurement results provided by an online moisture meter are most beneficial in terms of safety and production costs. From the different technologies available on the market, the microwave transmission has proven to be the most representative and reliable technology. These analysers can be easily installed on existing conveyors and are not subject to frequent re-calibrations or maintenance.

More information from
www.berthold.com

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