

Measuring moisture in wood waste in a screwfeeder

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Online moisture analysis specialist Callidan Instruments recently custom built a moisture analyser for a large US company that generates industrial steam and electrical power from waste biomass.

Late in 2009, the company contacted Callidan through their East Coast US distributor Kanawha Scales and Systems when they “came up blank” after scouring the market place for an online moisture analyser to suit their application.

The US Company recycles and reuses the waste generated by agriculture, construction, felled trees and a variety of other sources, reducing both solid waste and atmospheric pollutants. Biomass waste is currently unnecessarily filling landfills or burned or left to decompose at the production site, increasing air pollution.

Measuring and controlling moisture in the biomass waste is integrally important to the energy generation process. The material is delivered, pulverized, stored and dried before being blown into a cyclonic combustor where it is combusted to produce steam for electricity generation.

The moisture of the pulverized wood waste has a direct affect on the efficiency of the dryer and the combustion process. The wood waste is fed into the dryers by screwfeeders. To keep a tight control on the moisture the engineering team wanted to measure the moisture in real time and wanted to measure it as close to the inlet of the dryers as possible. In the screwfeeder was the obvious choice.

Callidan Instrument engineering division went about designing an online moisture analyser capable of measuring the moisture in all the material as it was being conveyed in the screwfeeder. This required the fabrication of special antenna and housings that fitted to tube of the screw. It also required specialist programming to “blank out” any interference from the flight of the screw on the microwave reading.

Using Callidan’s MoistScan® microwave technology, the customized antenna creates a microwave zone of analysis that measures all the material in the screwfeeder. The moisture percentage is output as a 4-20mA current signal which is fed into the plant DCS. Here it is used in a feed forward control loop to regulate the operation of the dryer. The ultimate objective is to ensure that the pulverized biomass is at the ideal moisture before it is fed to the cyclonic combustor.

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