



MOISTURE MEASUREMENT IN POTATOES

The Requirement: A major producer of potato products required more rapid -moisture control as it dried its french-fried potatoes. Potatoes are cut to an approximate size of 2" by 3/8" by 1/2", -and travel along a continuous belt before entering a large dryer. Potato moisture ranges-45% to 60%.. Upon exiting the 'dryer, management requires potato moisture to, be within +/- 1% of indicated percent-moisture, to maintain product color and texture during later dehydration and freezing. Prior practice for 'Moisture control was occasional sampling, with resulting moisture varying in an unacceptable 2% to 3% range.

The Solution: Plant management purchased and installed a Berthold LB 354 Micro-Moist on-line moisture analyzer (**Now LB 456**). This instrument is installed across-the-belt, and provides a continuous reading of product moisture. Berthold technology relies on numerous microwave frequencies penetrating the product every half-second, with the instrument basing its moisture reading on changes in microwave attenuation and phase shift. Micro-Moist readings are independent of potato size and variation in cross-section, due in part to the addition by Berthold. of radiometric mass compensation. Output signal for use by the dryer operator is a 4-20 mA signal feeding a strip recorder and high-moisture alarm, with LED and RS-232 printer/computer outputs also available.

Implementation: Micro-Moist components were installed on synthetic by-pass belt adjacent to the stainless steel main process belt, with components positioned similar to the attached pictures* Depth of potatoes on the belt were a minimum of three inches. Initial calibration was performed in a matter of hours, using several potato samples covering the full range of expected moisture. Follow-up or dynamic calibration was performed over the following weeks, drawing samples from the stream for comparison with Micro-Moist readings. Plant management reports a Micro-Moist accuracy of well under 1.0% Repeatability is excellent.

Summary Benefits:

1. Reduce belt dryer fuel costs, provided by automatic feedback adjustment of dryer burners.
2. Increase plant yield by an estimated 3%, by reducing off-color and off-texture rejects.
3. Eliminate periodic lab. sampling during each shift.

As a result, pre-tax payback is justified at less than one year.

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Typical layout of components:

- two horn antennae
- scintillation counter and radiometric source shield
- microprocessor amplifier
- mounting hardware and connecting cables

