



ONLINE MOISTURE MEASUREMENT OF BAUXITE

THE REQUIREMENT: A major bauxite mining company required online moisture measurement to efficiently control their dryer. As mined bauxite moisture will range from 7 to 10%. Upon exiting the dryer, blended bauxite is conveyed on a 40 inch belt, delivering 3,000 tons per hour to an ocean-bound ship. Management needs the bauxite moisture to be 8.%, within +/- 1% of indicated moisture to maintain acceptable and cost-effective shipping requirements. If their moisture is too low, the bauxite literally blows away. If the moisture content is too high, shipping costs will increase due to the additional weight of water. A prior method for moisture control was occasional sampling, with resulting moisture varying in an unacceptable range, and overextended analysis times,

THE SOLUTION: Plant management purchased and installed a Berthold LB 354 Micro-Moist on-line moisture analyzer (**Now LB 456 MicroMoist**), to provide (first) manual and (next) automatic feedback to the dryer, The Micro-Moist is mounted across a 40 inch belt after the dryer, and provides a continuous reading of bauxite moisture. Berthold's 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/or phase shift. The Micro-Moist readings are independent of particle size and variation in bed depth due in part to the inclusion of a Berthold radiometric mass compensation, The output for use by the dryer operator is a 4-20 mAmp signal, feeding a strip recorder and high moisture alarm. LED and RS-232 outputs are also available,

IMPLEMENTATION: Initial calibration was performed in a matter of hours, using several product samples which cover the range of expected moistures. Follow-up or dynamic calibration was subsequently performed over the following weeks. During dynamic calibration, the QC staff took multiple samples from the belt stream for laboratory comparison with Micro-Moist readings.

After 3 months of operation, management reported Micro-Moist accuracy of 0.6% (one. sigma, SSD). Berthold expects this to be reduced to 0.5% or below, as samples of high and low moisture become available for calibration purposes.

SUMMARY BENEFITS:

1. Reduced shipping costs and product loss by keeping the bauxite moisture within acceptable limits.
2. Reduced firing costs by enabling maximized efficiency of their dryer.
3. Eliminated the need for off-line laboratory analysis.

PAYBACK: As a result, pre-tax payback was well under one year.