

Moisture Measurement on Cat Litter

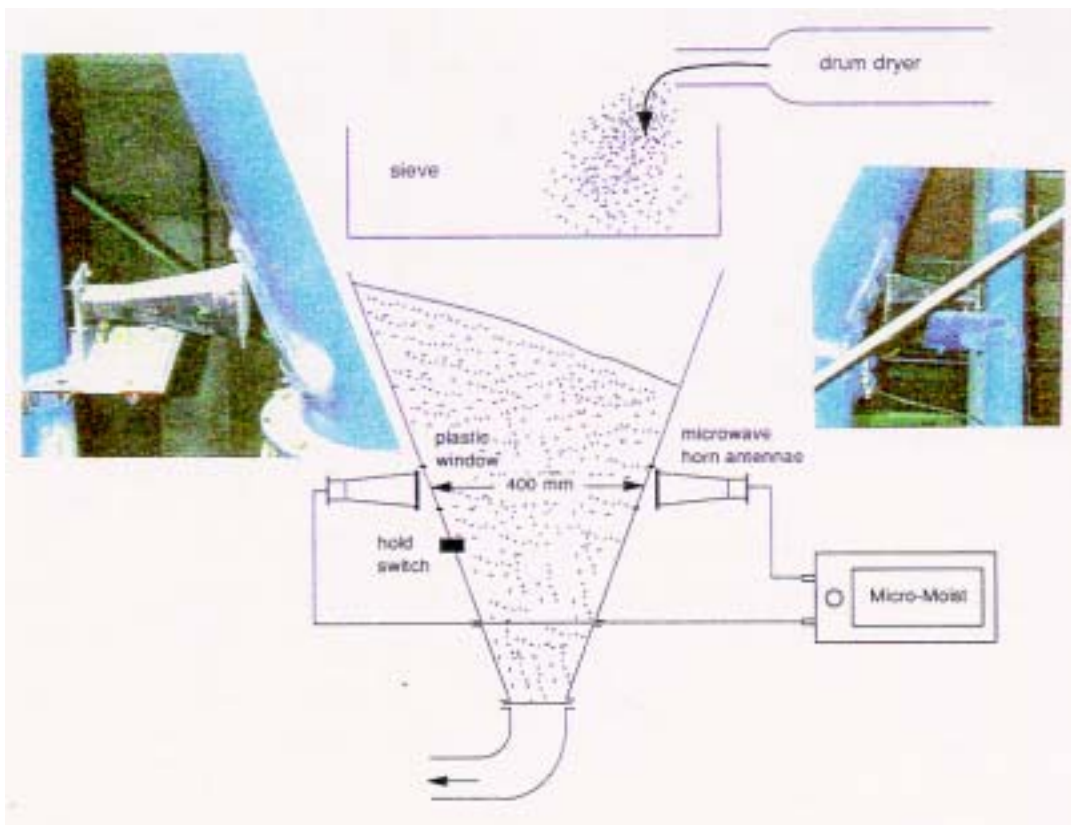
Cat litter is made from raw bentonite. Raw bentonite is crushed and dried in a drum dryer. In the dryer the product is available as granulates. The moisture of the dried product is approx. 3-10%

Goal

The non-contacting moisture measuring system MICRO-MOIST (LB 456) is to be used for quality control. MICRO-MOIST will save you a lot of time which is normally required for laboratory analysis. Trouble in the production process can be identified quickly and reliably. The optimum moisture lies in the range from 7-10%. At a moisture of less than 7% the product shows a distinct tendency toward dust formation. Above 10% moisture the water binding capability of the product is severely restricted.

Measurement Conditions

Cat litter is passed through a sieve and filled into a hopper from where it is carried out pneumatically. In this hopper we have selected a irradiation path of 400 mm. The microwaves enter the hopper through 10mm thick plexiglass windows, size 200 x 200 mm. This setup ensures constant irradiation of a representative material cross-section. A radiometric weight per area measurement was not installed.



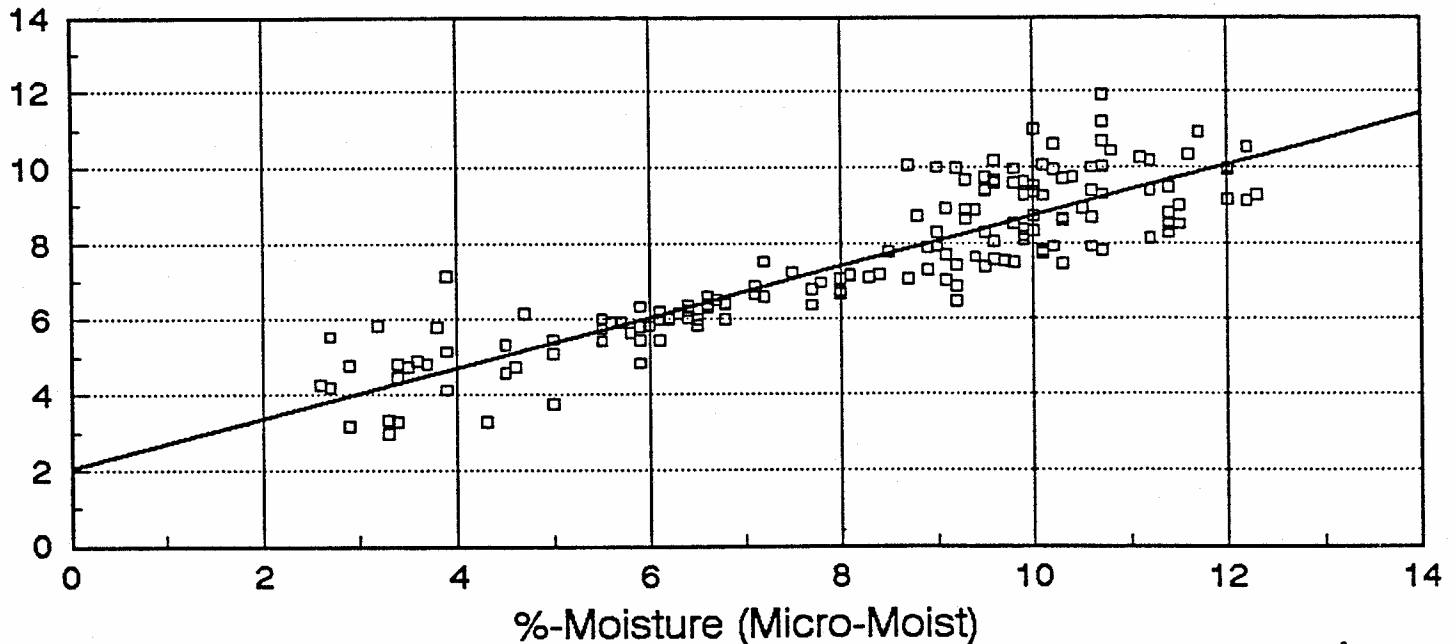
Result of the Measurement

The moisture measurement is based on a pure-attenuation measurement of the transmitted microwaves. The material has a rather constant bulk density at the measuring point; an additional separate measurement of the weight per area was therefore not required. To assess the accuracy of the measurement, a multitude of comparative samples were used and their moisture content determined according to conventional laboratory methods.

The comparative laboratory values were plotted on a diagram versus the instrument reading; the linear curve was determined by means of a linear regression. Thus, the calibration coefficients obtained during the start-up procedure could be fine-tuned. The result is shown in the diagram below.

Microwave Moisture Measurement on Cat Litter

%-Moisture (Laboratory)



Microwave attenuation measurement

A simple standard deviation of less than $\pm 1\%$ has been obtained. This value is truly remarkable, considering that no additional weight per area measurement was used.

The performance of the MICRO-MOIST measuring system fully came up to expectation. Thus, a continuous measurement without the drawback of sampling is available for this type of application. Moisture variations are displayed and can be corrected through control of the production process.