

Proposed Project 9: Review of Technology for Online Moisture Analysis

Objective(s): Review the advances that have been made in online moisture analysis, and determine whether any technologies can yet achieve the level of accuracy and reliability needed by the industry.

Justification: Rapid online moisture analysis of iron ore concentrate filter cake would be of great value in controlling the filtration and pelletization processes. To date, the online instrumentation that has been considered has not performed adequately, due to the similarity in the electrical and optical properties of magnetite and water. However, the technology has continued to advance since the online moisture analysis was last attempted in the industry, and it is not yet known whether the new generation of instruments will prove adequate.

Description of Proposed Work: A thorough literature review will be carried out to determine all of the available technologies that could potentially be able to measure moisture content of iron ore concentrate to the desired level of $\pm 0.1\%$ moisture. Methods of particular interest will be able to measure the bulk moisture content on a conveyor belt, and not simply measure the surface moisture, which may be significantly different due to evaporation. Once suitable instrument suppliers are identified, samples of concentrate will be selected from several Minnesota plants, and will be taken to the manufacturers to evaluate the accuracy and reproducibility of their instruments. Any instruments that have adequate performance will be considered for in-plant studies. Sampling considerations will also be examined, as it is important that the concentrate being measured is actually a representative sample of the entire material stream, and has not been partially dried or otherwise altered.