Real time moisture analysis in mining using MoistScan moisture analyzers

The minerals industry is understanding the benefits of onbelt microwave monitors being used to provide operators with moisture analysis of their ore every minute. For example, if plants have regular, minute by minute analysis of the moisture content of the incoming ROM, then down-stream processes may be adjusted to achieve greater efficiencies and in fact, increase yields.

One of the most common moisture monitor applications in recent times has been to monitor ore shipments as they are being loaded, so as to ensure that the moisture content is less that the transportable moisture limit (TML). TML represents the maximum safe moisture content before the shipment is at risk of toppling. Data from an onbelt moisture monitor can alert the operators of a high moisture content during the loading, who many then decide to stop the loading.

Real Time Instruments has designed, manufacture and market their MoistScan microwave moisture monitor for these purposes. Analyses are updated every minute, which, along with average values, are communicated to the plant usually via 4-20 mA current loop outputs.

Moisture is very difficult to measure accurately. Whilst the laboratory moisture measurement of a few grams of ore is accurate, sampling and preparation errors are often significant. As soon as the ore is handled, moisture is lost. As it is crushed and divided dust is lost, ie the dry fines are being lost and thereby lowering the average moisture content.

The crushing and dividing process adds heat to the ore, which again dries and lowers the measured moisture content. These problems are greater in heavy, dense ores like copper than in fine, light, homogenous ores. However, an onbelt moisture monitor does not suffer from these issues, providing the operators with an accurate measure of the entire ore body every minute.

RTI is aware of at least one copper plant, where, because of these sampling problems, they assume an average moisture content of their ore. Rather than using even a simple sampling system, they assume a moisture content of about 4%, even during the couple of months of extreme rain and during the long, hot dry season. They are aware that this strategy leads to errors in processing and accounting, and so they are looking to install moisture analysers to have an understanding of the day to day moisture variability.

As an example of the benefits of having access to results every minute, operators will know and react to very wet ore. At such times, the ore becomes sticky, and may cause blockages as it cannot flow through their plant. Such blockages are a major problem. Having access to real time results means that operators are able to stop receiving ore when it is very wet.

Over the last two decades the use of online moisture analysers that provide real-time data on the moisture content of the ore as it travels on a conveyor belt has become increasingly common. Real time Instruments (RTI) is the global leader in online moisture analysis. With over 700 MoistScan analysers installed throughout the world it is the most popular online moisture analyser on the market today. In the minerals industries, the analysers are installed at strategic places including on the ROM (Run-of-Mine) belt after the primary crusher, on the outfeed conveyor of an underground operation, on the feed conveyor to the beneficiation plant, on the product conveyor from the beneficiation plant, and on the train load out conveyor after the product stockpile.

Please contact Michael Edwards, RTI's African Sales Manager, ***MichealE@rtiaustralia.com****, to discuss your particular application.*