

Cake Solids Measurement Proves Successful at Duffin Creek Incineration Facility.

Background:

Duffin Creek WPCP in Ontario, Canada, treats an average of 96 MGD. The waste stream is a combination of sanitary and industrial waste. In 2005 a BioSolids Master Plan Study was completed to identify current and future biosolids management requirements. Expanding and optimizing their existing incineration facility is a crucial part to meeting their preferred biosolids strategy. Beginning in early 2007, the staff at Duffin Creek began testing the kajaaniTS Total Solids Sensor on their "cake solids" feed to a fluid bed incineration process.



General Incinerator Process:

The objective is to seek efficient combustion of the wastewater solids while minimizing fossil fuel consumption. The combustion of the biosolids in the incinerator is achieved by preheating a chamber at the bottom of the incinerator with Natural Gas and feeding the biosolids (sludge) into a fluidized sand bed in the main reactor. In order to maintain a preset temperature range in the main reactor, fuel can also be injected into the reactor depending on the temperature of the fluidized sand bed.

Therefore, one of the key parameters for optimizing the process is the percent dry solids of the sludge being pumped to the incinerator. Until recently, the only effective way to measure this was by manual laboratory analysis, which is a long tedious process. Also, when the results of the analysis are obtained, it is much too late to adjust the burning process.

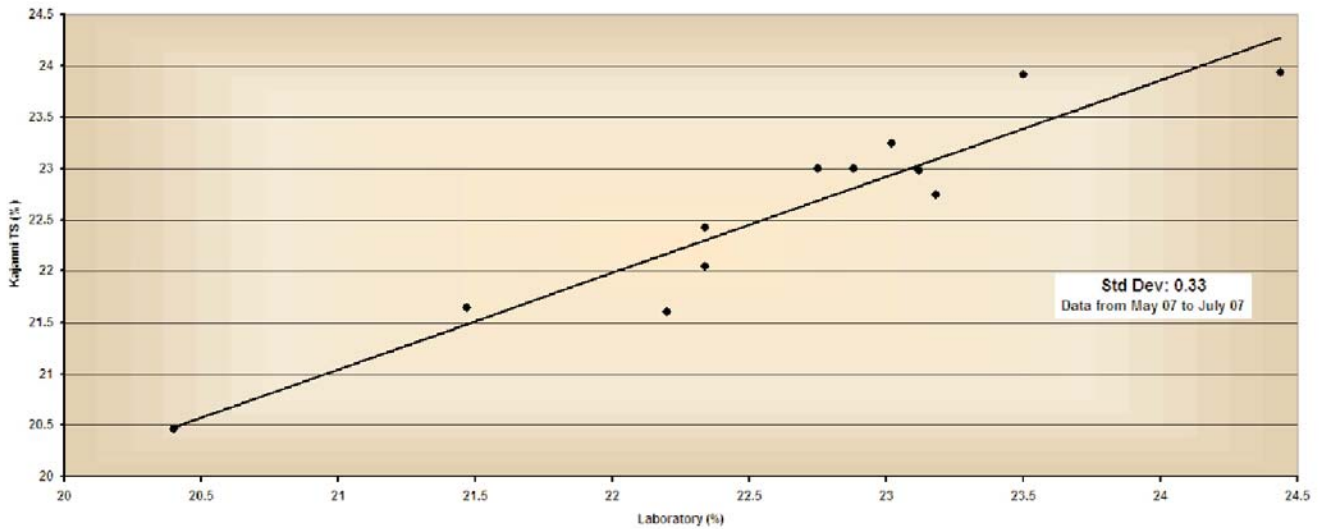
Sensor Testing and Results

The kajaaniTS was installed in a 6" feed line to the incinerator where solids are in the 18-28% range. The start-up and calibration was performed within a few hours. The sampling point is located immediately after the sludge cake pump, which is of the piston type. Lubrication water is added at the outer wall of the piping of the sludge cake pump in order to minimize friction. Since sensor commissioning in April 2007 Duffin Creek personnel have been taking samples and comparing to the sensor reading. The sensor's output is being compared to laboratory analysis and a very accurate correlation was found between the two sets of data.

Benefits of using the cake sensor:

Using the KajaaniTS the operator can now proactively adjust the feed rate of both the natural gas and the fuel oil based on the incoming solids of the sludge. In addition, in the future an

automatic control system will be able to temperature control (both sand bed and freeboard) adjustments thus providing a more finite control of purchased fuels. Because of this new window into this process, we expect that there will be significant energy cost savings for the Region of Durham.



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