

Beverage Industry uses Isco/Stip Phoenix Thermcat TOC Analyzer to monitor effluent discharge for COD

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Isco-STIP on-line TOC analyzer

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Since 1980 Procter & Gamble has quadrupled the number of consumers it can serve with its brands -- to about five billion people around the world. P&G now has operations in more than 70 countries and its products are sold in over 140 countries, making P&G one of the biggest and most successful consumer goods companies in the world.

Part of this success can be directly attributed to growth in the beverage industry, more specifically Sunny Delight manufactured by Sundor Brands Inc. in Atlanta Georgia. Sunny D is a popular citrus beverage. Sundor Brands also produces Hawaiian Punch.

Procter & Gamble recognizes that environmental progress is a never-ending journey of continuous effort and improvement. However, by focusing on improving the lives of consumers through innovative technologies that work better and more efficiently, Procter & Gamble continues to sustain both the growth of its business and the health of the environment.

Description of the Project

Meeting effluent discharge requirements

Procter and Gamble's growth and concern for the environment resulted in examining ways of better monitoring and controlling wastewater discharges arising from production processes.

Mr. David Loundenslager, Site Environmental Leader for the Procter & Gamble/Sundor manufacturing facility in Atlanta Georgia, was given this task. The goal for Sundor was to have a continuous monitoring device installed to measure COD (chemical oxygen demand) in effluent wastewater. This would provide a means of controlling the discharge so as not to exceed their daily permitted organic load to the municipal treatment plant, and thereby avoid costly surcharges and notices of violation. Increases in COD would also help prevent potentially costly loss of product by providing an indication of any potential leak in the process.

The ultimate goal, once correlation with laboratory COD tests could be shown, was to interface the on-line COD analyzer using a 4-20ma output with Sundor Brands internal supervisory control and data acquisition system (SCADA). This would be used to further control discharge of concentrate under automatic control from three large holding tanks.

Continuous on-line COD analysis was chosen because the traditional method of grabbing samples for laboratory analysis introduces long delays in receiving information on the daily loading. For this reason laboratory sampling does not provide a timely and reliable means too effectively control the process.

Procter & Gamble wished to evaluate available technologies that would allow them to continuously monitor their effluent discharge of COD for effective automated process control.

The decision was made to install an Isco-STIP Phoenix Thermcat continuous on-line COD analyzer for purposes of this evaluation. The Isco-STIP COD analyzer was leased with the option to purchase. It was

installed in an analyzer shelter built specifically for this project. Figure 1 shows Mr. David Loundenslager standing next to the analyzer.

Principles of Operation

The Phoenix-Thermcat is a continuous on-line analyzer using high temperature catalytic oxidation, with the measured parameter reported as Chemical Oxygen Demand (COD). The analyzer comes equipped with a coarse filtration and sample delivery system that eliminates the need for costly and complicated micro- and ultra-filtration. Automatic self-calibration is performed according to an appropriate standard.

In the furnace the analysis stream is thermally and catalytically oxidized. After the evolved gas is dried and neutralized, it is measured as CO₂ in the IR detector and reported as COD. The furnace is equipped with an easily accessible salt trap, which can be quickly changed without shutting down. The catalyst is attached to the outside of the furnace. This increases the useful life and facilitates easy catalyst exchange.

In addition to controlling the chemical analysis and parameter measurement, the onboard computer with its graphical user interface handles the operational control of all maintenance and test routines. Multitasking capability allows simultaneous handling of special and routine operations. For example, the operator can recall and view or print the stored parameter charts and maintenance data of the last fourteen (14) days without interrupting the ongoing analysis and data acquisition. The built-in floppy disc drive allows storage of ninety-(90) days worth of data on a single diskette. Data can be easily imported into popular spreadsheet programs like Excel. For monitoring and control the analyzer is equipped with a 4-20 ma output.

Procedure

Samples were to be grabbed daily such that a comparison could be made between laboratory analysis and the Isco-STIP COD analyzer. These data would be used, as part of the evaluation criteria, to calculate a correlation factor to determine how closely the continuous on-line COD measurements would trend with the laboratory results.

Grab samples were collected using standard procedure, and as each sample was taken the digital output of the Isco-STIP analyzer was recorded in mg/liter COD. The EPA approved laboratory method was used to determine the concentration of COD in each sample.

Mr. Loundenslager commented “ the analyzer was simple to install and maintain. Preventive maintenance consists of a simple weekly cleaning which takes approximately one hour. The computer guided graphical interface and help menus make it very easy to go through each procedure as recommended by the manufacturer. I have found that if the maintenance routines are performed as recommended the analyzer works extremely well.”

Summary

In conclusion, the Isco-STIP Phoenix - Thermcat provides reliable, continuous monitoring of effluent discharge for COD. It eliminated the delays in receiving laboratory results while correlating extremely well with Procter & Gambles in house laboratory results. Procter & Gamble have purchased the analyzer and are in the process of interfacing it with their in-house SCADA system to provide automated discharge control.

Figure 1

David Loundenslager, Site Environmental Leader Sundor Brands Inc., Atlanta Georgia, shown with Isco/STIP Phoenix Thermcat continuous on-line COD analyzer.

Literature cited

<http://www.pg.com>

Isco/Stip Solutions for Wastewater Process Monitoring and Control

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