

INCREASED PLANT YIELDS AND REGULATORY COMPLIANCE WITH ON-LINE TOC MONITORING

Hach BioTector B7000 on-line TOC analyzers helped Carbery obtain the real-time data it needed to continuously improve its operations

ABOUT CARBERY

Established in 1965, Carbery is a major international food ingredients, flavors and cheese manufacturer headquartered in Ireland. It employs approximately 530 people, processes about 120 million gallons of milk each year, and had sales of \$338.5 million in 2011. Carbery operates from nine locations including Ireland, UK, USA, Brazil and Thailand.



Carbery has an impressive reputation as an innovative supplier of ingredients that works with leading manufacturers of foods, drinks and nutritional products globally. The company also produces a wide range of cheese—the Carbery site in Cork is the largest single cheese-producing facility in Ireland, producing almost 30% of Ireland’s annual cheese output. This site is also quite unique in that it produces ethanol (neutral spirit) from whey which is sold mainly to Irish and UK markets.

DRIVE FOR INCREASED EFFICIENCY

In summary, three complementary initiatives combined to form a very strong progression for the Carbery plant:

1. LEAN BUSINESS EXCELLENCE PROGRAM
2. INSTALLATION OF THE FIRST BIOTECTOR ANALYZER
The environmental and commercial value of this analyzer justified purchasing 10 more analyzers within 8 months.
3. INVESTMENT IN A SCADA SYSTEM, which gives at-a-glance BioTector measurements as well as various other site information

MOTIVATION TO PURCHASE BIOTECTOR

“We had environmental and commercial reasons for wanting to install BioTector,” the Environmental Manager of Carbery, Ireland stated.

1. “The foremost corporate objectives for this analyzer are to meet our environmental requirements in our IPPC license and to increase overall plant yield by reducing product loss to effluent at the Carbery Plant.”

Some product loss is inevitable in a processing environment, but the Carbery team believed that there were areas for improvement, even though they were not able to track losses in real time. Carbery previously used other analyzers labeling them “unreliable and inconsistent”, and relied upon composite samples to monitor their wastewater loading. However, according to the Environmental manager, “The information was not instantaneous and was 24 hours too late.”

2. A second objective is to reduce WWTP operating costs. A major portion of Carbery WWTP running costs is the aeration required to reduce COD loadings—a very energy-intensive process. Lost Product also contains Phosphorous (P) so the wastewater can have both a high COD (as measured by TOC analyzers) and high P, resulting in substantial additional treatment costs. Reducing COD at source in the production departments reduces the cost of treatment to the WWTP and helps Carbery attain the Emission Limit Values for final effluent to the local river by lessening the initial effluent load.

“We view every kg of COD treated as lost product that should have gone into a packet or carton,” stated a Carbery WWTP Operator.

BIOTECTOR INSTALLATION

Carbery purchased the first Hach BioTector B7000 in April, 2011. It was put onto the main drain at Carbery to catch losses or spills. This proved very effective, very quickly, however, while they could see what was happening at the main drain, the Carbery team recognized that they needed additional analyzers in order to track back any losses or incidents to the source. Confidence was built up with the initial analyzer and by January, 2012, Carbery had installed 10 more BioTector Analyzers on process discharge points, each of which is integrated with their SCADA system. This drives the responsibility for corrective action on product losses down to plant operator level with real time results displayed on operator dashboards. This best practice approach is already showing strong commercial results for Carbery.

“The difference with BioTector is that it’s reliable and accurate compared to other analyzers which have proven to be unreliable in the past,” commented a Carbery manager.

A high-COD stream is fed into 2 anaerobic digesters—a 24/7 process with implications for the WWTP operation if overloads occur. Carbery found BioTector to be particularly valuable in keeping this loading monitored and allowing improved control.

Cooling water is also analyzed by the BioTector system at Carbery prior to discharge on a continuous basis. BioTector information is displayed in units of TOC; process control and decision making are carried out using these units.

When Carbery were asked why BioTector was their analyzer of choice, they replied simply, “Robustness, Reliability and Accuracy.”

COMMERCIAL IMPACT FOR CARBERY

BioTector is a contributing factor in the overall increased plant yield by reducing product loss at source in the production departments.



A core objective of Carbery in 2011 was to reduce WWTP loadings significantly; this was achieved in 2012.

Consequently, energy costs of the WWTP are also reduced. This is the combined result of the reduced COD loading and installation of diffused air equipment at the WWTP. The Aeration process is much easier to regulate with BioTector as the volumetric flow can be adjusted to achieve the optimal performance consistently with real-time TOC measurement.

All the BioTector Analyzers were installed with BioTector Venturi Samplers, resulting in a system that takes an accurate sample irrespective of the viscosity of the effluent sample for analysis.

BioTector has proven very useful for TIC measurements also. Inorganic components can sometimes come via the effluent from the IC Reactors on the waste farm, possibly bicarbonate, and this can affect the WWTP with regard to sludge volume and settlement. Monitoring TIC allows the WWTP Operators to adjust their approach and to regulate the feed balance tank as required. They have been given much greater visibility in particular of wastewater leaving these IC Reactors.

Now that the team at Carbery has confidence in their TOC measurements, the Production Departments have better visibility of their output to the WWTP and are therefore more accountable for the WWTP loading. All teams are working better together to meet overall commercial goals.

THE FUTURE

“We wouldn’t go back,” commented the Environmental Manager when summing up the Carbery experience with BioTector. “It’s very easy to use and gives us the information that we need as quickly as we need it. Also, the ability to cross check a sample on the BioTector manual sample system is excellent. Prior to installation of these BioTector Analyzers, it took us up to 3 hours to analyze a sample for COD; now TOC measurements take just 7 minutes. Overall, our lost product levels are down and our plant yield is up.”

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