

## **The BioTector® On-line TOC Analyser monitors combined effluent from unfiltered brewery water.**

**Reports values as COD.**

Effluent from breweries contains a variety of organic and inorganic materials. Not all of the organic material is dissolved in the effluent, hence some organic material will remain as particulates. To accurately measure effluent stream quality, an on-line analyser must include both dissolved *and* particulate organic material in its analysis.

In COD laboratory analysis, all organic material - dissolved or particulate - is oxidised and analysed. To get a good correlation from on-line TOC results with laboratory COD results, the on-line analyser must also include particulates in its analysis.

Before the BioTector® on-line TOC analyser was installed in the Grolsch brewery, extensive testing was carried out to verify that the instrument was suitable for the brewery application. An essential criteria was that the BioTector® should demonstrate good correlation to laboratory COD analysis results. Test results gave a correlation coefficient of 0.94 - which was more than good enough for translating BioTector® TOC data into COD values. (See correlation graph on following page.)



**Grolsch Brewery  
The Netherlands**

### **Statement from the Grolsch brewery:**



The Royal Grolsch N.V. has a rich tradition that goes back to the year 1615. The brewery has two production locations - Enschede and Groenlo in the east of the Netherlands. In addition to the home country, Netherlands, where the main activities of the brewery lie, Grolsch is present in more than 50 countries worldwide.

*Grolsch brews only beer and is focused on the premium segment of the market. The brewing is centralised and the company slogan "Vakmanschap is Meesterchap", which translated means "Quality work makes champions," is adapted in all part of the brewery's activities.*

Grolsch plans to increase the consuming volume abroad from the current volume of a little more than 1 million hl. per year to match the home market volume of approximately 2 million hl. per year.

The brewery carries out its activities with an emphasis on safety for workers and the environment. Because of this last aspect, the brewery has installed its own wastewater treatment plant. Due to the fact that the brewery is situated in the centre of Enschede, and space was a problem, a relatively compact but very effective WWT plant was built. The WWT plant, however, is sensitive to rapid changes in the load of organic material, and had difficulty coping with "effluent peeks" because of a small buffering capacity.

*In Enschede, the BioTector® TOC analyser is used to first detect these "effluent peeks" and secondly to divert the flow into the buffer tank. Because of the TOC measurement, we have better control of our discharges and, in addition to this, we have a tool to help us even out the load to the WWT, and by doing this we will be able operate the plant more effectively and in the end this will increase the company's bottom line.*

*The BioTector® TOC analyser is tested in co-operation with ANASYS B.V. We have studied the correlation of the measurement with laboratory COD analysis. We have also tested the operational sides of the analyser where robustness and interference from inorganic components were important factors. After an extensive test period, the BioTector® met the requirements of Grolsch, and the instrument was permanently installed in February 1999.*



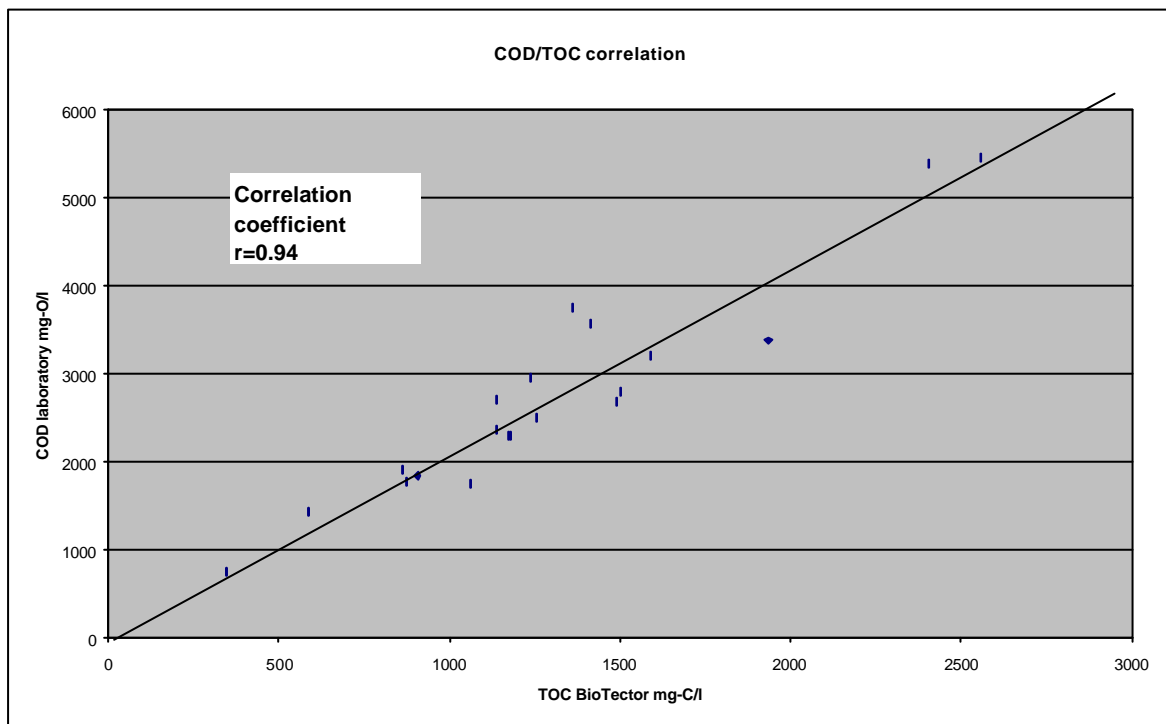
### ***The Application***

The BioTector® on-line TOC analyser monitors the waste water directly after the skimmer that separates solid materials from the effluent that is directed to the waste water plant. The measurement is carried out on unfiltered samples.

From the graph below, a wide variation in the concentration of organic material in the brewery effluent is evident : The COD level varies from approximately 800 mg-O/l to around 5,500 mg-O/l.

To effectively control this effluent and provide the WWT plant with warning of exceptional loads, the analyser used must be reliable and remain on-line at all times. An analyser that works with very accurate analysis in a laboratory test is no good for this type of application, if it cannot provide data 24 hours a day 365 days per year. Data availability from the BioTector® has proven to be very high, and calculated off-line time per year is only approximately 40 hours, all services and calibrations included. This gives 99.5% on-line data time for the application.

Service intervals are 6 monthly, and consumables (acid, base and oxygen) are refilled every 3 weeks.



***Correlation between COD laboratory results and TOC results measured with the BioTector® on-line TOC analyser.***

For more information on the BioTector® visit our web site at [www.BioTector.com](http://www.BioTector.com).