

# enviro TOC

*TOC analysis of environmental water and wastewater at its best*



Ease of use



High data quality



Great flexibility



Extreme durability



elementar

enviro TOC

# enviro TOC

*Convenient handling,  
smooth & precise  
analyses*

## FEATURES

- Fully automated, 60-position sampler for 40 ml EPA vials
- Matrix separation with SALTRAP guarantees low maintenance for salt-containing samples
- Combustion temperatures up to 1200 °C crack even stable carbon compounds
- Fast conversion from liquids to solids mode ensures high flexibility
- Integrated chemiluminescence detection with a large linear measurement range for  $TN_b$
- Rinsing functions minimize carryover and increase the lifetime of the injection unit

TOC analyzers from Elementar based on catalytic high-temperature combustion have been providing remarkable performance in environmental and wastewater laboratories for decades. Now the innovative enviro TOC combines proven functions with new technologies: the powerful furnace, variable mode changes, real matrix separation

with SALTRAP and the stable, wide-range IR are complemented by a completely new autosampler system and a novel chemiluminescence detection system. This makes enviro TOC the ideal, future-oriented instrument for flexible and efficient TOC and  $TN_b$  determination in environmental and wastewater samples.

④ Fully-automated, 60-position sampler with rinsing function. Optional autosampler for solid samples.

④ Integrated  $TN_b$  determination with ECD or CLD

④ Clearly-arranged, easily accessible components enable fast and easy maintenance

④ Unique SALTRAP located within the combustion tube for a long lifetime and low running costs

④ Furnace temperatures up to 1200 °C guarantee a complete oxidation and recovery of stable compounds



## Designed for environmental samples

The analysis of TOC in wastewater to assess organic contamination or to evaluate the cleaning efficiency of sewage treatment plants is an international standard procedure. Also, TOC and  $TN_b$  determination are indispensable for monitoring organic pollution and nitrogen load in surface waters.

The enviro TOC is tailored to the analysis of TOC, NPOC, TC, TIC, DOC, POC or  $TN_b$  in these matrices. Samples are injected with a 60-position autosampler. Integrated rinsing functions minimize carryover during the analysis of particle-containing samples. In addition, the measurement of soil samples or waste is also possible without time-consuming instrument modifications. As one of the few analyzers on the market, enviro TOC offers fully automatic TOC determination in solid and liquid samples with one system.



### TOTAL ORGANIC CARBON (TOC)

The TOC measuring principle of the enviro TOC is based on catalytic high-temperature combustion of the sample in an oxygen stream  $> 680\text{ }^\circ\text{C}$ . Under these conditions, all bound and dissolved carbon is oxidized to  $CO_2$ , which is determined quantitatively with an IR detector. Sample pre-treatment steps, e.g. for removing the inorganic carbon from the sample, are fully automated. The TOC analysis provides easily evaluable results since matrix effects are negligible and the carbon concentration in the sample correlates linearly with the  $CO_2$  signal. In comparison to other techniques for the determination of organic contamination, the use of hazardous substances is avoided and the analysis time is a few minutes.

## Flexible nitrogen determination

The enviro TOC enables simultaneous  $TN_b$  determination either using the proven EC cell technology or a novel, integrated chemiluminescence detector (CLD). The innovative CLD concept provides stable conditions for NO measurement in the carrier gas. Consequently, the NO signal is linearly correlated with the  $TN_b$  concentration over a large measurement range. The built-in CLD does not require additional laboratory space and delivers extremely stable values, which simplifies calibration as well as result evaluation.

## Real matrix separation with SALTRAP

During the combustion of salt-containing samples, salts crystallize in the combustion tube. If the crystallization occurs directly on the quartz glass or in the catalyst, their lifetime is significantly reduced. The unique SALTRAP of the enviro TOC guarantees user-friendly maintenance intervals of the combustion tube and the catalyst even for concentrated salt solutions, thus saving running costs during operation. Depending on the nature of the salt, a slight decrease in crystallization can be achieved by reducing the combustion temperature. However, only SALTRAP guarantees truly effective glass corrosion protection, because the salts are trapped directly at the point where they melt.



### HIGH-TEMPERATURE COMBUSTION

In compliance with international standards, the TOC has to be oxidized at temperatures  $> 680\text{ }^\circ\text{C}$ . The temperature range from  $680\text{ }^\circ\text{C}$  to  $750\text{ }^\circ\text{C}$  is ideal for the combustion of samples with a high salt load. In addition, temperatures up to  $1200\text{ }^\circ\text{C}$  ensure optimal oxidation conditions and excellent recovery even of highly stable compounds such as humic or fulvic acids or samples containing particles, respectively. The robust furnace of the enviro TOC with its flexibly adjustable temperatures covers all these requirements and guarantees a complete oxidation.

However, reliable carbon analysis of waste or carbonates often requires higher temperatures. Consequently, in solids mode operation of the enviro TOC, the combustion enthalpy of the tin capsules ensures a temperature increase up to  $1800\text{ }^\circ\text{C}$ .

# TOC / TN<sub>b</sub> analysis has never been easier!



## INNOVATIVE SOFTWARE

The intuitive user interface of the brand new software merges easy handling with flexible use. The results are immediately processed, controlling the system components is self-explanatory and the calibration procedure is simplified. Accordingly, the software facilitates TOC analysis for every operator.

## IN ACCORDANCE WITH OFFICIAL STANDARDS

The enviro TOC works in compliance with all relevant standards for TOC, TC, TIC and TN<sub>b</sub> in liquid samples such as ISO 20236, ISO 8245, EN 1484, EN 12260, SM 5310B, EPA 415.1, and ASTM D7573. Due to the unique solids option, TOC and TC can also be determined in solids like soil or waste according to EN 15936 and ISO 10694.

## EASY AND COST-EFFECTIVE MAINTENANCE

The user-friendly maintenance concept of the enviro TOC ensures the most efficient routine analysis: Our goal is that the maximum lifetime of the instrument can be reached with minimum maintenance effort. Consequently, all consumables can be easily replaced by the user. Clearly arranged, easily accessible components guarantee that most maintenance work can be carried out independently within a very short time. This saves running costs and avoids downtime of the instrument.

## IDEAL SOLUTION FOR

- Environmental laboratories
- Research institutes
- Quality control

## SAMPLE TYPES

- Surface water
- Wastewater (influent and effluent)
- Groundwater
- Waste
- Soil



### Ease of use

Automated sample preparation and injection, intuitive calibration and result evaluation. Easy maintenance.



### High data quality

Excellent precision and accuracy through high-performance combustion. Matrix-independent results. Stable calibration.



### Great flexibility

Simple, fast conversion from liquid to solid operation. Optional nitrogen determination with an integrated CLD or ECD.



### Extreme durability

Outstanding robustness and longevity thanks to state-of-the-art technology. 10 year warranty on the furnace.

## Elementar – your partner for excellent elemental analysis

Elementar is the world leader in high performance analysis of organic and inorganic elements. Continuous innovation, creative solutions and comprehensive support form the foundation of the Elementar brand, ensuring our products continue to advance science across agriculture, chemical, environmental, energy, materials and forensics markets in more than 80 countries.

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