



QuickTOC_{ultra}

TOC-ANALYSIS

Online TRUE TOC for every kind of water.
Especially for the tough stuff.

Fast. Precise. Reliable.



A MEASUREMENT SYSTEM FOR TRUE TOC

With the right method, organic content can be measured quickly, even in difficult waters with coarse material or high salt content.

APPLIED TOC THEORY.

Whether you're measuring emulsified water from a flavoring production plant, industrial wastewater in an aeration basin or the wastewater from a dairy, paper or paint factory: The QuickTOC_{ultra} can measure organic loads in water for a broad range of applications.

Aqueous streams are monitored to assure environmentally compliant discharge, to control product quality and operational costs. Through continuous monitoring, industrial processors are able to detect and reduce product loss.

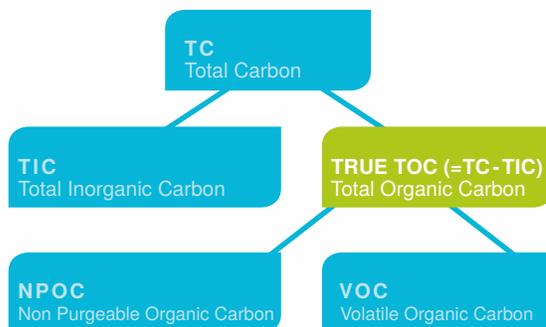


Fig. 1

Clumps, algae and slime.

Unlike many systems, the QuickTOC_{ultra} works continuously and reliable, even in the presence of coarse materials and even high salt concentrations with no increased maintenance requirements.

What is TOC and how is it measured.

Many organic compounds cannot be quantified individually without costly, time-consuming analysis. As an alternative, Total Organic Carbon (TOC) summarizes a sample's organic load as an indicator of water quality.

TOC is best detected through the difference method. Combustion at 1200°C breaks all organic and inorganic carbon bonds, producing CO₂ which is detected and quantified. As intermediate values, the Total Carbon (TC) and the Total Inorganic Carbon (TIC) are determined. The TIC value is subtracted from the TC value, resulting in the Total Organic Carbon, (TOC) (Fig.1).

Exact 1200°C Analysis provides the TRUE TOC

For an exact TOC measurement all carbon bonds must be completely broken, and carbonates only break fully

at temperatures over 1150°C. Therefore, measurements at lower temperatures deliver less exact results.

No Catalysts.

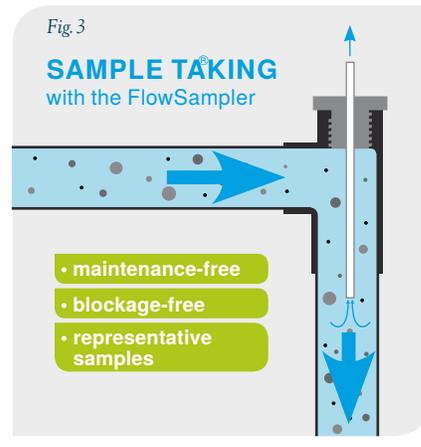
Catalysts are only necessary for lower range "high temperature" oxidation (680 – 1,100°C) to help oxidize the carbon bonds. But catalyst performance lowers over time, affecting the measurement results, necessitating re-calibration and eventually requiring catalyst replacement.

Direct method: an inexact alternative.

In contrast to the difference method, the direct method does not detect the complete TOC. Instead, using an acid the inorganic carbon (TIC) is removed from the sample prior to combustion. The problem? The volatile organic carbon (VOC) is also expelled. Thus, after combustion only the non-purgeable organic carbon (NPOC) value can be calculated. Meaning that VOCs, a component of TOC, remains undetected.

Fig. 3

SAMPLE TAKING with the FlowSampler



FlowSampler®

Maintenance-free / non-fouling

LAR's unique sampling method helps assure uninterrupted operation.

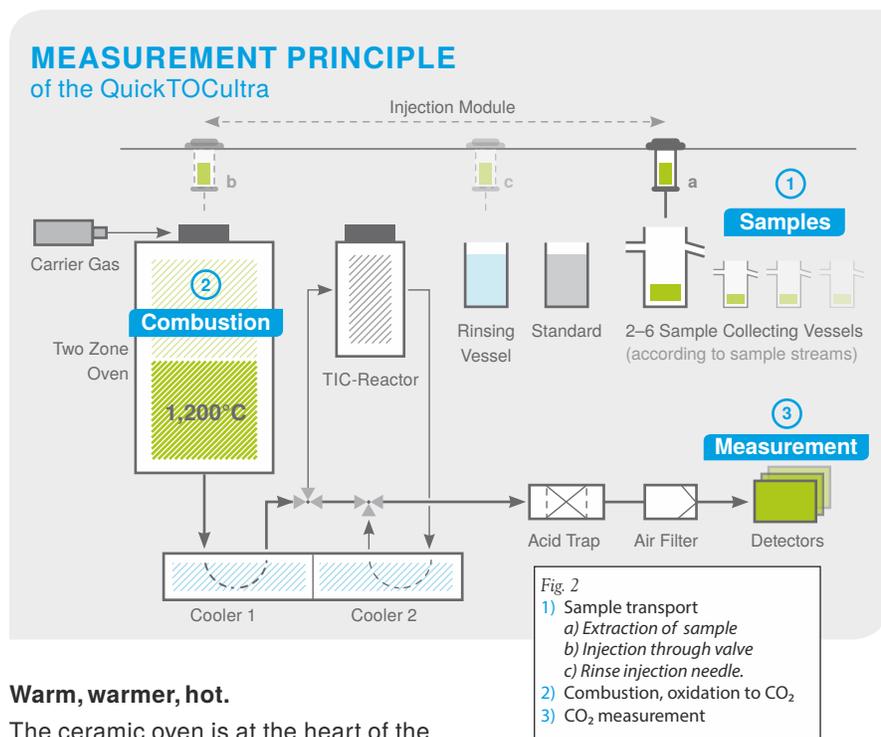
With LAR's patented FlowSampler® a stainless steel tube is centered in a pipe and draws the sample against the flow of the stream and into the analyzer. The flow velocity carries large and small solid particles past the sample tube. All other particles, even solid particles, are sampled and correspond 98% with that of a grab sample. The sampling method is maintenance-free. These results cannot be reached with any kind of filter or sieve.

Robotic injection for a perfect dose.

Inside the analyzer, the samples are kept homogeneous in collection vessels. An automated needle draws an exact dose and injects it into the oven through a valve which ensures that the oven (Fig. 2) remains sealed from the ambient air. After each injection, the needle is automatically rinsed and cleaned.

THE ANALYZER.

A hot oven: Where temperature makes the difference.



Warm, warmer, hot.

The ceramic oven is at the heart of the QuickTOC_{ultra}, breaking all carbon bonds at 1200°C, and providing a complete, catalyst-free sample analysis.

Tailor-made Instruments.

Modular and flexible, the QuickTOC_{ultra} can measure up to six different sample streams and is configurable for additional detectors to add TN_b and COD alongside TOC. A variety of housings enables the analyzer to be installed safely, even in explosive environments.

The QuickTOC_{ultra} can be configured to prepare its own carrier gas. Thus, requiring no external gas supply.

UltraQuick.

Since cycles run in less than 3 minutes, short events can be captured that might otherwise be missed. Maintenance is fast too, at less than 30 minutes per week, so the analyzer's availability is over 98%. All areas of the analyzer

have been designed for easy maintenance: from filter-less sample extraction (Fig. 3), to the oven's removable foot for quick salt residue removal.

High salts are no problem.

Unlike most TOC analyzers, the QuickTOC_{ultra} can handle salt concentrations up to 100 g/L. Our extra-high salt option can handle up to 300 g/L sodium chloride (NaCl). No need to dilute, so samples remain pure and the measurement remains accurate.

LAR's high temperature process enables salts to be easily discharged. They move through the oven in fluid form and are eventually carried out by the carrier gas and deposited in a retaining device, from which they can be easily and quickly removed. So no salt deposits can form in the oven.

Secure - you decide who does what.

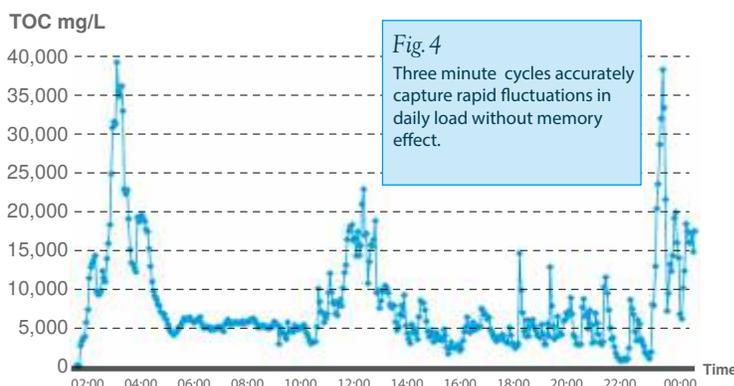
Through two separately programmable user-access levels, you can assign access rights to individual operators. Optionally, the analyzer can be controlled remotely using a networked PC.

CO₂ detection. Reliable and simple.

The gas that is produced by the combustion condenses in the cooler. The remaining gas is purified by a filter before its CO₂ concentration is determined by the detector.

Without TIC no TRUE TOC.

In the second reactor the inorganic compounds are purged out of the sample with acid. The combustion gas is again cooled and filtered and the CO₂ concentration is measured. The TIC value is subtracted from the total carbon (TC), determining the total organic carbon, the TRUE TOC.



QuickTOC_{ultra}

TECHNICAL DATA

Measurement Technique and Sample Preparation

Method	Thermal oxidation
Ranges	0.1–200 mg/l, 5–4,000 mg/L 100–50,000 mg/L TOC, others available
Response Time	3 minutes (TOC)
Sample Prep.	Maintenance-free particle cutter Optional homogenizer for continuous sample homogenization

Dimensions and Weight

Housing	Steel IP 54
Options	Stainless steel, IP 65, ATEX Zone 1 and 2 for T3, T4 classes
Dimensions	700 x 1020 x 520 mm (W x H x D)
Weight	115 kg

Electric and Hydraulic Specifications

Inflow & Outflow	Tube 30 mm ID or screw thread connection DN 25
Auxiliary Energy	230 /115 V, ~50 / 60 Hz
Analog Output	0/4– 20 mA
Serial Interface	RS 232 for remote control (option)
Safety	2/6 A internal, 16 A external
Remote Control	Through TCP/IP Protocol (Internet)

Equipment Devices and Data Output

Display: High res. 10.4-inch backlit LCD touch screen
Autostart function
Self explanatory software
Data Interface: USB

LAR's products are developed by our own research and development team. Maintenance is available globally through our own staff or by our local qualified service partners.

With the QuickTOC_{ultra} the electronics are isolated from the analytics to prevent damage and cross-contamination.

All compartments are easily accessible.



TÜV certified company

FEATURES & BENEFITS

- ✓ exact TC, TRUE TOC and TIC
- ✓ proven thermal oxidation principle
- ✓ highest temperature available (1200°C)
- ✓ catalyst-free
- ✓ response in as little as one minute (TC)
- ✓ measures up to six streams
- ✓ programmable access security
- ✓ analyzer availability greater than 98%
- ✓ weekly service & maintenance <30 min.
- ✓ low operation and maintenance costs

TOC-ANALYSIS

From complex industry wastewater to pharmaceutical pure water, our TOC analysers determine parameters quickly and precisely.

COD-ANALYSIS

With our analysers the chemical oxygen demand is cleanly and safely determined online, without using chemicals.

BOD/TOXICITY

We detect the BOD with the plant's own biomass and determine the toxicity with highly sensitive bacteria. Fast and reliably.

TN_b/TP-ANALYSIS

TN_b and TP are important parameters for wastewater treatment. Only LAR offers a combination of TOC and COD in one system.

OTHER PRODUCTS

LAR offers a specific solution for nearly all applications. With our protective housings, you are always on the safer side. To find out more: www.lar.com



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