



QuickTOC_{airport}

TOC-ANALYSIS

Online TRUE TOC for airport applications.
Especially for de-icing run-off.

Fast. Precise. Reliable.



QuickTOC_{airport} continually monitors for de-icer contaminants in surface run-off. Auto-ranging allows fast and precise measurements of widely changing loads. At 1200°C, samples are completely oxidized, with results in 1-3 minutes.

AIRPORT RUNOFF MANAGEMENT

Monitoring for de-icer accurately and reliably through high temperature combustion.



Aircraft de-icing: Existing or forming ice is removed by de-icing fluids directly before take-off. The de-icers in use (acetates, glycols or formates) are mixed with water and additives.

Surface water and de-icing waste water should be continuously monitored - from an ecological as well as economic point of view. By using reliable online measurement systems high wastewater surcharges can be avoided.

Widely fluctuating loads and sticky substances are what an analyzer has to be able to deal with.

In the winter months airplanes, runways and landing strips are de-iced with the help of de-icing agents. Chemicals such as glycol, acetates or formates are used. De-icers must also be able to stick to vertical surfaces to prevent the formation of new ice, so they are mixed with thickening agents in order to improve surface adhesion.

De-icer run-off leads to surface water contamination, and the adhesive nature of the thickening agents may result in memory effects or carry-over effects in environmental monitoring systems, since trace residuals from an earlier measurement can falsify the results of a following measurement. These memory effects can blind an

analyzer to the widely fluctuating loads that are typical in stormwater run-off, resulting in inaccurate monitoring results. Therefore, within the analyzer, the sample should come into contact with wetted parts as little as possible.

Also, a TOC analyzer's range must be wide enough to accurately determine the loads being monitored. On one hand, the critical values for public discharge are very low, yet the analyzer must be able to reliably measure concentrations of up to 50,000 mg/l C.

What TOC is and how it is measured.

A variety of organic matter can be present in water which cannot be individually quantified without considerable time and analytical effort.

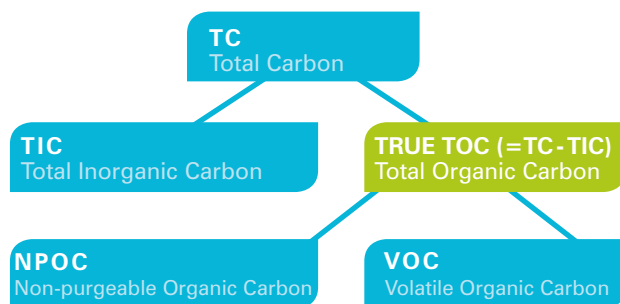


Fig 1

This is why the sum parameter TOC (total organic carbon) is used. It measures a sample's combined organic load and is thus an important indicator for water quality.

The Difference Method

TOC is best detected using the difference method. In this method, combustion at 1200°C breaks all organic and inorganic carbon bonds, producing CO₂ which is then detected and quantified. An intermediate value is determined for total carbon (TC). A separate analysis of the inorganic carbon (TIC) takes place. The TIC value is then subtracted from the TC value, giving a result showing the organic carbon, TOC present (Fig. 1).

THE ANALYZER.

A hot oven: Where temperature makes the difference.

Exact Analysis.

At 1200°C, the TRUE TOC.

For exact TOC measurement all carbon bonds must be reliably oxidized. Through combustion at 1200°C LAR has developed a high temperature analyzer to make this possible!

This temperature was chosen because it has been proven that complete oxidation of a sample cannot occur at temperatures below this: For example, the carbon bonds of carbonates only break fully at temperatures above 1150°C. Therefore, lower temperatures deliver less exact measurements. For this reason, to distinguish ourselves from such methods, we at LAR talk of the TRUE TOC.

Catalysts.

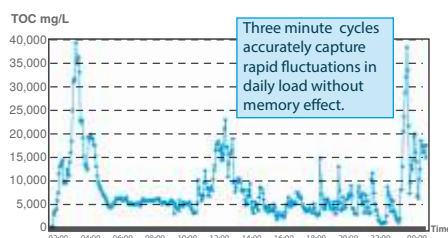
For our analyzers simply not necessary.

Thanks to high temperature combustion, our analyzers measure total carbon without catalysts. Catalysts are only necessary for lower temperature catalytic oxidation (680 – 1100°C) to support the oxidation of the carbon bonds. However, the performance of the catalysts is reduced over time, affecting the measurement results, necessitating re-calibration and eventual replacement of the catalysts. We want to save you the trouble with the QuickTOC_{airport}.

Warm, hot, ultra hot.

Tracking organic load at 1,200°C.

The catalyst-free ceramic oven is the centerpiece of the QuickTOC_{airport}. At 1200°C, it reliably breaks all carbon bonds and thus enables a complete sample analysis. Despite the high temperatures used, absolute safety is



guaranteed by offering a number of different housings for a range of operating environments. The analyzer can be safely positioned in highly corrosive locations as well as in Ex-Zones.

The QuickTOC_{airport}. Ultra quick measurements and maintenance.

The TRUE TOC measurement takes place in less than 3 minutes, so even brief events are reliably captured as short measurement value peaks.

Maintenance and service requirements are also short, needing less than 30 minutes per week and resulting in more than 98 percent availability. All areas of the analyzer have been designed for ease of maintenance; from filterless sample extraction with the optional FlowSampler®, to the catalyst-free high temperature oven with an easy to handle high salt option.

The building blocks principle for a tailor made measurement instrument.

Within the QuickTOC_{airport} the amount of wetted surfaces is kept to a minimum. The use of inert materials as

well as a pump, which is installed downstream from the sample, prevent carryover and memory effects caused by absorption and adsorption.

The automatic ranging feature ensures reliable measurements from 0.1 to 50,000 mg/l without dilution or pretreatment of samples. This means, fluctuating loads and adhesive samples are easily analyzed.

High salt concentrations. No problem.

The QuickTOC_{airport} can handle salt concentrations up to 100 g/L, and the special high salt option extends this range up to even 300 g/L sodium chloride (NaCl).

You control three secure access levels.

Through separately programmable user-access levels, you can assign access rights to individual operators. And with a 10.4 inch touchscreen, the QuickTOC_{airport} is easy to operate. Alternatively, control the analyzer remotely through a network-connected PC.

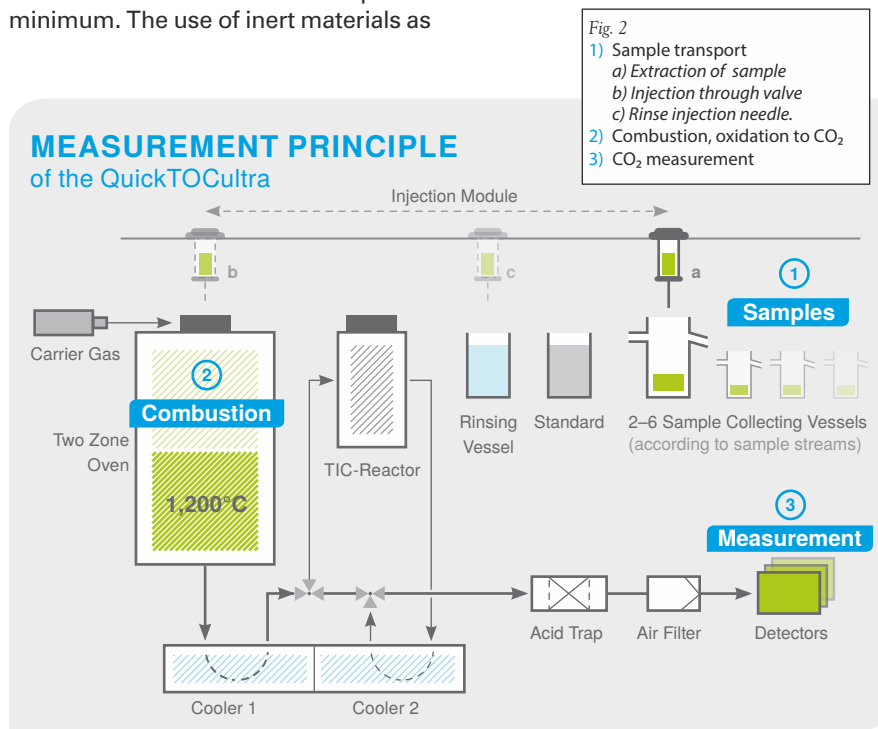


Fig. 2
1) Sample transport
a) Extraction of sample
b) Injection through valve
c) Rinse injection needle.
2) Combustion, oxidation to CO₂
3) CO₂ measurement

QuickTOC_{airport}

Online TOC to monitor for deicer and fuel in airfield surface water runoff.

The QuickTOC_{airport} continuously monitors organic compounds like glycol and fuel with no need for catalysts or reagents. Also, the QuickTOC_{airport} can be shut down during warm weather since the measurement is not dependent upon liquid processes.

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

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

All compartments are easily accessible.



FEATURES & BENEFITS

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



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