

GAIN REAL-TIME INSIGHT INTO YOUR PROCESS

Process Insights manufactures and delivers premium sensors, monitors, detectors, analyzers, instrumentation, and software that are mission-critical to keep your operations, personnel, and the environment safe – every day across the globe.

Get the most reliable, precision analytical technologies available on the market today. We will work to match your needs and budget, and provide the optimal, and most stable process analysis solution for your application.

CENTERS OF EXCELLENCE | PROVIDING PROVEN SOLUTIONS

Process Insights is committed to solving our customers' most complex analytical, process, and measurement challenges everyday.

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For a complete list of sales & manufacturing sites, please visit: <https://www.process-insights.com/about-us/locations/>

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REVOLUTIONIZING MEASUREMENT

EVERYWHERE

PRODUCT BROCHURE

QuickTOCultra™

For TRUE TOTAL ORGANIC CARBON (TOC)
Water Analysis for Every Type of Water.



Fast

Precise

Reliable

- Water Influent
- Water Effluent
- Discharge Control
- Industrial Wastewater
- De-Icing Wastewater
- Process Water
- High Salt Concentrations

Water Quality Analysis Solutions for the Harshest Water Applications

With the right method, organic waste can be quickly measured without problems even in harsh and difficult water with course material content.

Whether you have to measure emulsified water from a flavoring production plant, industrial wastewater in an aeration tank of a clarification plant or the wastewater from dairies, paper or paint factories:, our QuickTOCultra™ is very versatile and able to handle the most diverse water applications.

With regards to ecology and industrial and municipal applications, such as the influent and effluent should be continually monitored.

Clumps, Algae & Slime: What We Are Able to Handle

Difficult types of water like process water and industrial wastewater often contain course materials as well as fluids which must be detected and analyzed. Additionally, the measurement system should work continuously and reliably, so that impurities can be recognized early on and the appropriate countermeasures can be put in place. It should also be able to handle water containing high salt concentration without an increase in maintenance or cost.

What is TOC? How It Is Measured?

A whole variety of organic matter can be present in water, which is difficult to determine and monitor individually. This is why TOC (total organic carbon) is used and is an important indicator for water quality.

The TOC content is best detected by using the difference method. Through a combustion at 1,200°C all organic and inorganic carbon bonds are broken, producing CO₂ which can then be detected and quantitatively measured. As an intermediate value the total carbon (TC) of the sample is given. Finally, a separate analysis of the total inorganic carbon (TIC) takes place. The TIC value is subtracted from the TC value. The result being the organic carbon, TOC (Fig.1).

At 1,200 °C, water samples are completely and precisely analysed

Exact Analysis: TRUE TOC Is Determined

Vital to this method: For an exact TOC measurement, all carbon bonds must be reliably combusted. Using a temperature of 1,200°C, we have developed a high temperature method which makes this possible! This temperature was chosen due to the proven fact that a complete oxidation of a sample cannot occur at temperatures below it. For example, the carbon bonds of carbonates only break fully when reaching a combustion temperature of 1,200°C. Basically, the lower temperatures deliver less exact measurement results. For this reason, we describe this as TRUE TOC.

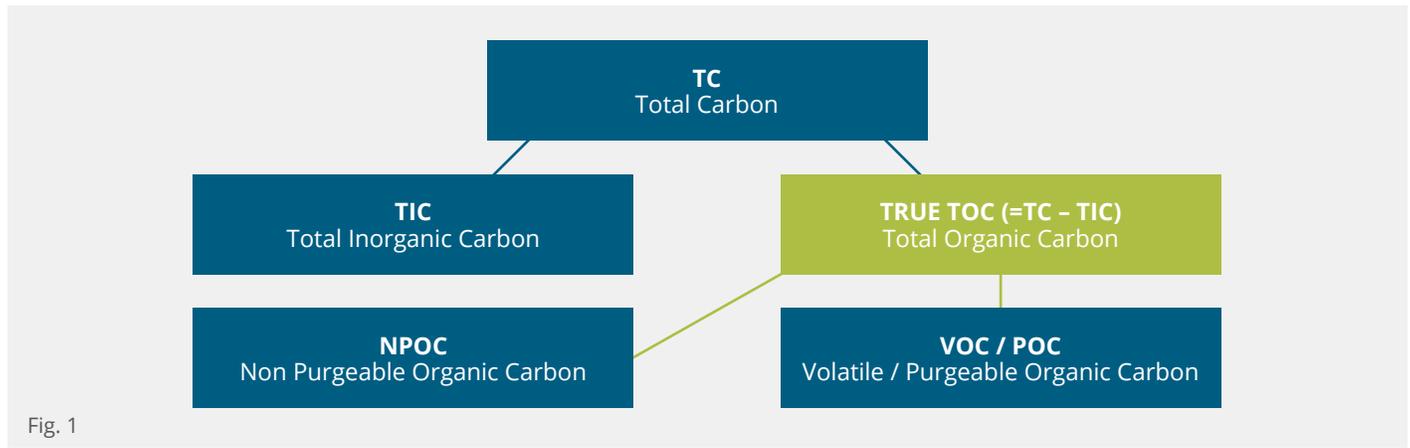
Catalysts. Simply Not Necessary

Because of their high temperature capability, our analyzers do not require any catalysts. Catalysts are only necessary for the low temperature catalytic "high temperature" oxidation (680 – 1,100°C) to support the oxidization of the carbon bonds. However, the performance of the catalysts is lowered over time. This affects the measurement, necessitates continual new calibration, and eventually requires that the catalysts be replaced. Our QuickTOCultra, saves you the time and trouble.

Is There An Alternative Method?

In contrast to our method, the direct method does not detect the complete -TRUE TOC. By using an acid, the inorganic carbon (TIC) is removed from the sample prior to the combustion process. Moreover, the volatile organic carbon (VOC) and the purgeable organic carbon (POC) are also expelled. Thus, after the combustion, only the non-purgeable organic carbon (NPOC) value can be calculated. The direct method is best used for samples without VOC or samples with a high TIC content.

What Is TRUE TOC? What Is It Composed Of?



What We Do At A Glance

- TOC value is measured seamlessly for the organic load in a water sample.
- TRUE TOC value determined using the difference method at 1,200°C.
- Able to analyze the coarse material in water.
- Complete oxidation is guaranteed and no catalysts are necessary.

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

QuickTOCultra continually checks the TOC content of waste water. Optionally, other sum pa-rameters can be detected, too. At 1,200°C, samples are completely oxidized and within 3 minutes the TRUE TOC result is determined.

Tracking Organic Load At 1,200°C

The catalyst-free ceramic oven is the centrepiece of the QuickTOCultra. At 1,200°C, it reliably dissolves all carbon bonds and thus enables a complete analysis of samples. Despite the high temperatures used, absolute safety is guaranteed in all settings. The QuickTOCultra can be delivered with a number of different housings, depending on the intended location. It can be installed in high corrosive environments and hazardous areas. The determination is in accordance to DIN EN 1484:1997-08, ISO 8245:1999-03 and EPA 415.1.

The Principle For A Tailor Made Analyzer

Our modular water analysis system is flexible. You can measure up to six different sample streams with one device. Or when the time is right, you can decide add-on additional analysis to determine the TNb and COD parameters alongside measuring the TOC value. With QuickTOCultra, the electronic compartment is conveniently separated from the analytical compartment.

Ultra Quick Measurements and Low Maintenance

Our analyzer provides the TRUE TOC measurement in less than 3 minutes. Thereby, short measurement value peaks can be reliably shown. The maintenance is also fast: Less than 30 minutes per week. The analyzer's availability is over 98%. Moreover, all areas of the analyzer have been designed for easy maintenance – from the filterless sample extraction with the patented FlowSampler® (Fig. 3), and by way of the generously measured and blockage-free tubes, to the catalyst-free high temperature oven with the removable oven foot for the quick removal of salt residues. We make it simple to use and maintain.

High Salt Concentrations: No Problem

In contrast to many other analyzers, the QuickTOCultra can handle salt concentrations up to 10 g/l. There is also an extra high salt option available that can handle up to even 300 g/l sodium chloride (NaCl). This means that even with a high salt concentration the sample does not need to be diluted. This, again, has a positive effect on the accuracy of the measurements.



Peace of Mind With Permission-Level Access

Through separately programmable user-access levels, you can assign access rights to individual operators. With a 10.4 inch touchscreen, the QuickTOCultra is easy to operate. Another convenient option, is remote control using a PC, which can be connected to your network.

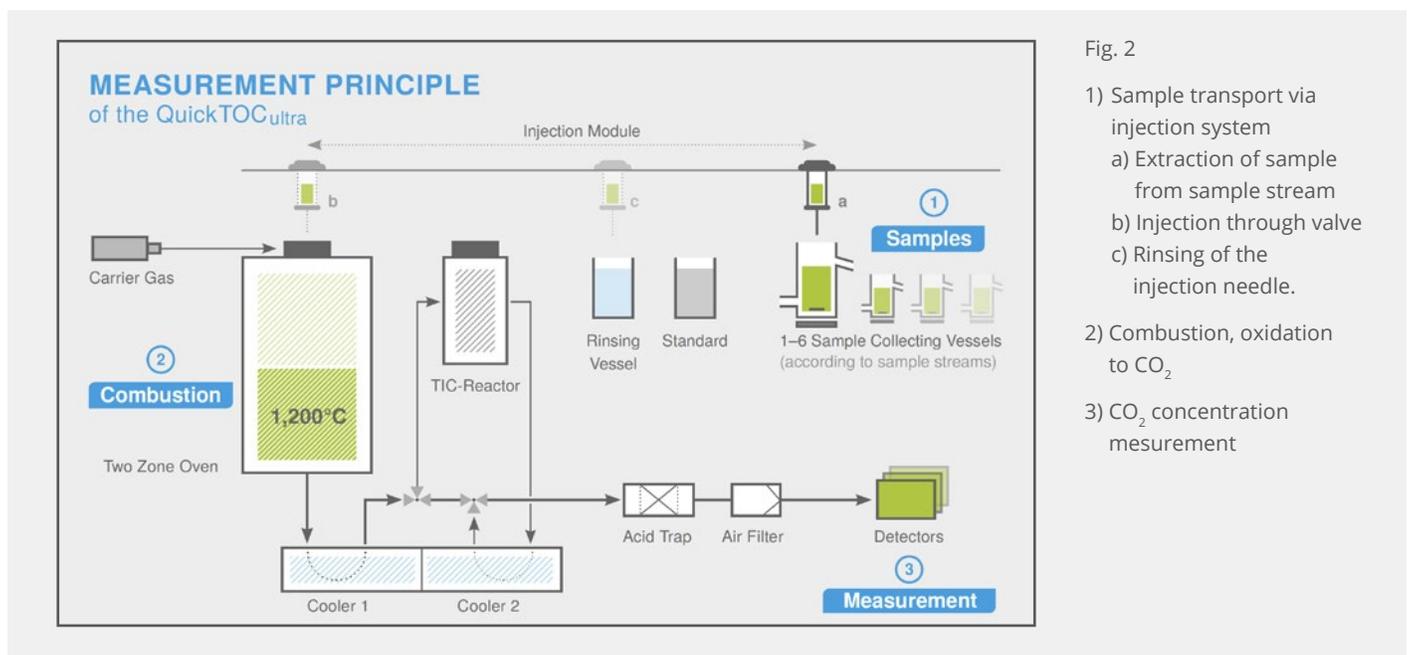


Fig. 2

- 1) Sample transport via injection system
 - a) Extraction of sample from sample stream
 - b) Injection through valve
 - c) Rinsing of the injection needle.
- 2) Combustion, oxidation to CO₂
- 3) CO₂ concentration measurement

The Principle

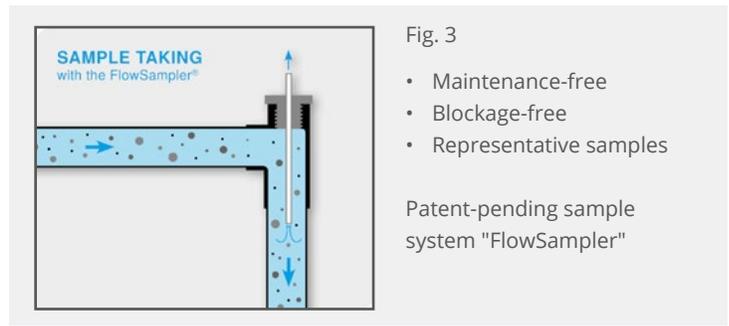
Even when the water is dirty – the measurement is clean!

Sample Extraction: How it Works

The water flows through the patented FlowSampler®. In the middle of the FlowSampler there is a stainless steel tube (Fig. 3) through which the sample is pulled into the analyzer by a pump. Both big and small solid particles, like sand grains or wood splinters, carry on past the tube due to the flow speed. However, all other particles relevant to the measurement are captured, even the solid particles. Therefore, the taken sample corresponds 98% with that of a grabbed sample. While at the same time it is free of maintenance. These results cannot be reached with any kind of filter, filter sieve or rotating sieve.

Robotic Injection System For The Perfect Sample

Inside the analyzer, the samples are kept in collection vessels in a homogenous state. The robotic horizontally and vertically moving needle takes an exact sample dose and injects it into the oven through the valve. This patent-pending valve ensures that the oven (Fig. 2) stays 100% sealed from the ambient air at all times. After every injection, the needle is cleaned.



Inside The Ceramic Oven: It's Hot

And it is – HOT! – without catalysts – the inorganic and organic carbon is completely converted into CO₂. It is oxidized with a carrier gas, whose supply is provided by filtered ambient air. Optionally, the QuickTOCUltra can prepare the gas itself. Thus, requiring no extra external gas supply at all. Through the high temperature, the salts present can easily be discharged. They move through the oven in fluid form and are eventually carried out of the oven by the condensate. Finally, they are deposited in a retaining device, from which they can easily and quickly be removed. That way, no salt deposits can form in the oven.

Seamless CO₂ Detection: Reliable and Simple

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

Inorganic Component Measurement: Without TIC – No TRUE TOC

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

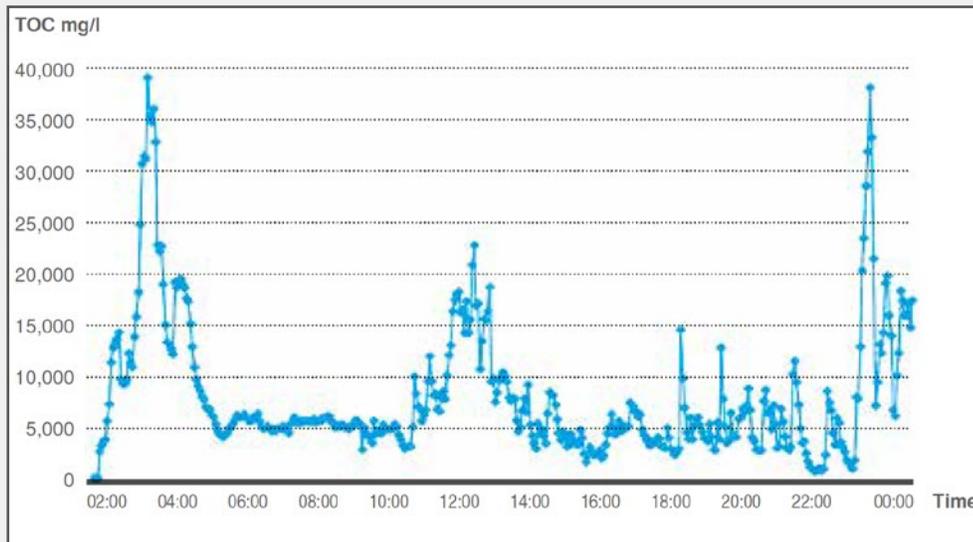


Fig. 4

Measurement peaks during a daily cycle with a measurement cycle of 3 minutes.

Accurately capturing the rapid increases and decreases of load without memory effects.

Water is matters and we do everything to protect it

We are the leading provider for water quality analyzers for industrial and municipal wastewater, process monitoring, as well as for pure water and drinking water analysis. Further products in the areas of industrial process and environmental technology complete our product range. We offer application specific analyzers and maintenance is carried out globally by our technicians or by our local qualified service partners.

Advantages

- Exact determination of TC, TOC, (TRUE TOC) and TIC
- Proven thermal oxidation principle
- Highest combustion temperature available (1,200°C)
- Catalyst-free
- Fast response time: one minute (TC)
- Multi-stream measurements (optional)
- Individual programmable operator access levels
- Analyzer availability min. 98%
- Low maintenance and service: max. 30 minutes per week

TOC-ANALYSIS – From complex industry wastewater to pharmaceutical pure water, our TOC analyzers determine parameters quickly and precisely.

COD-ANALYSIS – With our analyzers, the chemical oxygen demand analysis is "chemical-free" and safely determined online.

BOD/TOXICITY – Detect the BOD quickly and reliably with the plant's own biomass and determine toxicity with highly sensitive bacteria.

TN_b/TP-ANALYSIS – TN_b and TP are important parameters for wastewater treatment. We are the only ones who offer this combination with TOC and COD in one water analysis system.

FURTHER PRODUCTS – We offer a specific solution for nearly all applications. With our protective housings, you are always on the safer side. Find out more: www.process-insights.com

TECHNICAL DATA

QuickTOCultra



Measurement Technique and Sample Preparation

| | |
|---------------------------|--|
| Measurement Method | Thermal oxidation at 1,200°C |
| Measurement Ranges | 0.1 – 50,000 mg/l TOC, with optional, dilution up to 500,000 mg/l possible |
| Parameters | TOC, TC, TIC, combinations with COD, TNb possible |
| Response Time TOC | 3 minutes |
| Sample Preparation | FlowSampler – Maintenance-free particle separator, optional homogeniser for the continuous homogenisation of samples |

Dimensions and Weight

| | |
|-------------------|---|
| Housing | Steel IP 54, powdercoated |
| Options | Stainless steel, IP 65, EXp Zone 1 and 2 for T3, T4 classes (ATEX, IECex) |
| Dimensions | W 600/848 x H 1,062 x D 608 mm |
| Weight | from 125 kg (standard housing) |

Electric and Hydraulic Specifications

| | |
|----------------------------|---|
| Inflow and Outflow | Tube 4,8 mm ID, Tube 8 mm ID, Tube 12 mm ID |
| Power Supply | 230 /115 V~, 50 / 60 Hz |
| Analogue Output | 0/4– 20 mA |
| Serial Interface | RS 232 |
| Safety | 2/6 A internal, 16 A external |
| Internet Capability | LAN, Option for WLAN |
| Option | Remote control via TCP/IP protocol |

Equipment Devices and Data Output

High resolution and back lit TFT touchscreen graphic display, 10.4"

Self explanatory software, Autostart function

Standard data interfaces to office

Areas of application

Municipal & Government Facilities / Industrial

Industries

Environmental Monitoring / Waste Water Treatment / Waste Processing / Petrochemical / Refineries / Chemical / Airports / Paper Manufacturing / Breweries / Food Manufacturing

For types of water

Water Influent / Water Effluent / Discharge Control / Industrial Wastewater / De-Icing Water / Process Water / High Salt Concentration / Oil-In-Water