

Brand: LAR

<https://www.lar.com/home.html>

LAR's philosophy

With its high quality products for online measurements and their accuracy, LAR AG decisively contributes to the improvement of the environment. At the same time, the industry concerned also profits from LAR's provision of accurate data for process water applications. Hence, our innovative and precise measurement technique ensures the balance between environmental protection and industry. In order to do this a fair and constructive cooperation with our customers and our partners is an important maxim for any of LAR's activity.

LAR AG was established in 1986 and has always been a customer-oriented company. Its main business scopes are the development, manufacture and distribution of state-of-the-art products for water analysis, based on a constant dialogue with users.

LAR AG has a quality management system certified in accordance with DIN EN ISO 9001:2008, continuously making adjustments to meet the current quality requirements to the latest standards.

- [TOC-Analysis](#)

Total organic carbon (TOC) is one of the most important parameters in the evaluation of organic pollutants in water,

- It contains all the carbon compounds that are a definite definition and determine the absolute amount.

- [COD 分析](#)

Chemical Oxygen Demand (COD) shows the amount of oxidation required for organic matter in water and is an important index of water analysis. COD measurement is considered to be in the planning and water treatment control, to assess the efficiency of waste water to make an important basis for the calculation of charges. Chemical oxygen demand can be determined in the laboratory or measured by the line, so these methods significantly differ in the duration and use of the consumables.

- [BOD / 毒性](#)

Biodegradation (BOD) is the amount of oxygen required for biodegradation of organic matter in water. The general use of BOD5 will exclude the nitrification process, so this parameter is generally not suitable for the control of the WWTP. But the total BOD is suitable, it can determine the biodegradable nitrogen and carbon part.

- [TNb / TP-Analysis](#)

Total nitrogen (TNB) can give back the effect of nitrogen compounds on water pollution. Nitrogen is generally derived from ammonia, ammonium salts, nitrites, nitrates and other nitrogen-containing organic compounds. In contrast to the individual measurements mentioned above, the TNb assay is a single analytical process that encompasses all of these substances.

- [Further Products](#)

Online TOC analyzer for the plant's effluent



LAR's analyzer QuickTOCeffluent is an online TOC analyzer especially designed for water with a low-particle density at the plant's effluent.

Custom-fitted TOC process analyzer



The total organic carbon process analyzer is a measuring system for complex water applications for monitoring and optimization of industrial processes and municipal as well as industrial waste water treatment plants.

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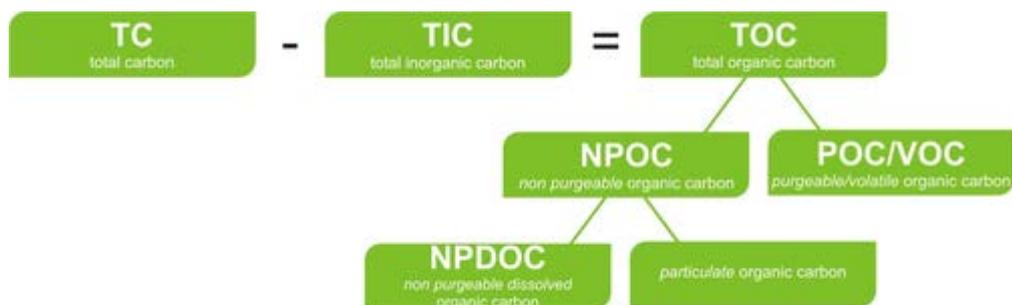
Quick TOC Online Analyser for Pure Water



LAR's online total organic carbon analyser determines the TOC in less than three minutes and thus, allows the operators to take fast countermeasures in case of water pollution.

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TC, TIC, and TOC definition



German Standard DIN 1484: 1997-08

TC: Organic carbon and inorganic carbon in water, including elemental carbon ◦

TIC: Including inorganic carbon in water, elemental carbon, and total carbon dioxide ◦

TOC: Total organic carbon is a measure of dissolved organic carbon and non-dissolved carbon in water

On - line TOC measurement

In general, TOC is oxidized by oxidative solutions. The resulting carbon dioxide is tested to determine the content. However, not all methods are able to completely oxidize the sample. The lack of oxidation often results in only SOC (partial organic carbon) representing the TOC content.

Thermal oxidation

When this oxidation method is used, the sample is combusted in a reactor. Usually the maximum temperature will be controlled at about 1,000 ° C, but this does not make all the carbon compounds can be completely oxidized. Therefore, in this case it is necessary to use a catalyst such as copper oxide or platinum. Typically, the catalytic combustion process can handle up to 4,000 mg / L of TOC concentration. To handle higher concentrations of the sample, it is usually necessary to dilute with softened water.

LAR offers a unique, patented, 1,200 ° C high temperature (HT) oxidation process. Such high temperatures allow all carbon compounds to be completely oxidized without the need for a catalyst. This method can measure the TOC concentration in the case of undiluted up to 50,000 mg / l. The water samples are gasified in a special heat-resistant ceramic reactor, and all the carbon is completely oxidized to carbon dioxide gas. The concentration of carbon dioxide was analyzed using a non-dispersive infrared (NDIR) detector. Therefore, TC, TOC and TIC can be measured in just 3 minutes.

This ultra-high temperature method is suitable for two different water quality applications, namely the most challenging, highly polluted waters (QuickTOCultra, QuickTOCAirport) and relatively non-solid water (QuickTOCeffluent). LAR uses a batch injection method, which has the advantage that the analyzer can easily handle viscous matter, greasy material, speed up the reaction rate of difficult oxidizing substances, to ensure that the dissolved organic matter and suspended organic matter can be accurately and reliably analyzed. Even if the TOC level fluctuates rapidly during the measurement process, the measured concentration remains correct so that the peak of the total organic carbon fluctuation per day can be determined without being affected by the memory effect and the adsorption effect.

For applications in pure water, the LAR method allows the patent to be simplified at any time to be calibrated and verifiable (QuickTOCpurity, QuickTOCpharma). °

Photochemical oxidation (UV-persulfate method)

In this method, TOC is oxidized by ultraviolet light, digestion reagent, sodium persulfate, and the resulting carbon dioxide is measured by the NDIR detector. This method is suitable for the determination of TOC (Drinking Water, Condensate, Boiler Make-up Water). QuickTOCuv combines this technique using a direct TOC method or a nonvolatile organic carbon (NPOC) method because the particles are always difficult to be completely oxidized The continuous supply of water samples for multi-stage processing.

Wet chemical oxidation

The water samples of this method are oxidized by strong oxidizing agents, such as ozone, a substance that is less harmful to health and the environment. The acid and 碱 in the ozone oxidation process are used to adjust the pH, whereas the oxidation potential of this method is relative because the particles and the more complex carbon compounds can only be partially digested or can not be oxidized at all. These methods are not recommended in the relevant standards for occupational safety and environmental protection. °

COD - chemical oxygen demand

COD represents the amount of oxidant required to oxidize organic matter in water, in mg / L or g / m³.

COD (chemical oxygen demand) laboratory standard method for the potassium dichromate method, this method by calculating the consumption of dichromate in the digestion process to determine the load of organic matter in water. COD based on this method is a common parameter for wastewater analysis. It is an important basis for the planning, control, calculation and treatment efficiency of sewage treatment plants and sewage treatment. are not recommended in the relevant standards for occupational safety and environmental protection. °

Common Detection Methods

Potassium dichromate method (wet chemical oxidation)

Since the potassium dichromate method requires about 2 hours of oxidation and uses hazardous chemicals such as chromic acid, sulfuric acid and the like, it is not suitable for on-line analysis. The use of toxic chemicals on the safety of laboratory personnel is also a great risk. Based on occupational safety, environmental protection and lower follow-up maintenance costs and other considerations, the current industry and operators are looking for a safe and clean way to prevent secondary pollution °

Environmentally friendly COD measurement method

In the United States, TOD (total oxygen demand) has become a standardized indicator of the oxygen content of organic matter in water. Another environmentally friendly COD measurement method is the use of hydroxyl radicals for the oxidation of organic matter

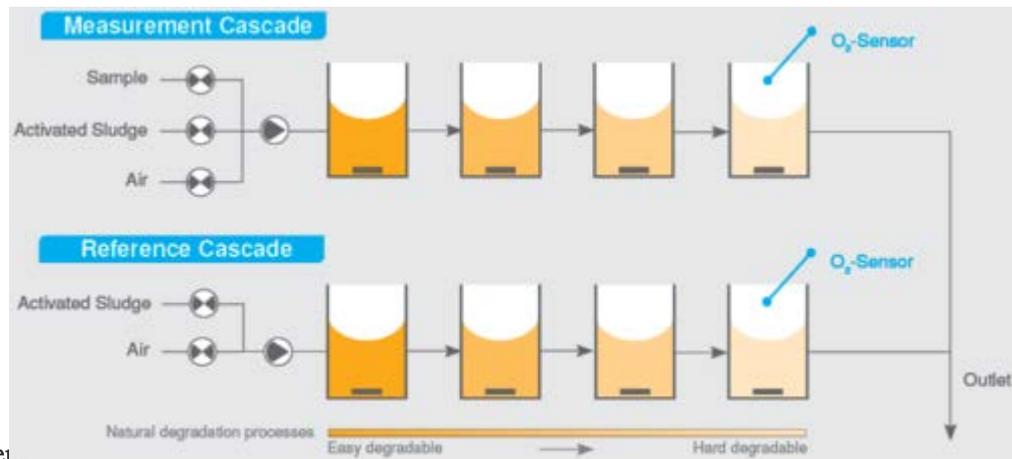
BOD - Biological Oxygen Demand

BOD (Biochemical or Biochemical Oxygen Demand) Measured value represents the biodegradable oxygen demand for organic matter in water containing mg O₂ / liter of oxygen. In general, the biological oxygen demand is used as an evaluation parameter for sewage pollution.

5 days BOD and total BOD

The special factor BOD₅ is based on the standard non-nitrifying biochemical oxygen demand after the laboratory method on day 5, and the total BOD includes ammonia, which is oxidized by nitric acid, which allows continuous real-time monitoring.

The nitrification process is an important part of the wastewater treatment process, and this process is taken into account for optimal control of the wastewater treatment plant. Therefore, the determination of 5 days BOD is difficult to apply to the best control of the sewage treatment plant. °



BOD online measurement

Process scheme of LAR's biochemical oxygen demand measurement system

Measure the use of cascade and O₂ sensors

Similar to the working principle of the biological treatment plant, in the simulation of the sewage treatment plant, the mixed effluent in the sewage sludge resulted in continuous passage through the cascade. The volume of the remaining oxygen, waste water, activated sludge and air is determined by the specific definition and monitoring of the O₂ sensor when leaving the reactor cascade. In this way, it is important to use the plant's own biomass to simulate the real life of a particular wastewater treatment plant. Thus, the measurement results are directly related to the wastewater treatment plant and its unique performance.

BioMonitor not only optimizes the control of the activated sludge reactor, which is fed to the WWTP, but also monitors the incoming contaminants in the WWTP. This allows the operator to level the possible peak contamination, thereby keeping the aeration at the regulated level. Often, the additional aeration caused by the contamination of these peaks increases energy consumption and increases process costs °

O₂ electrode determines BOD

The common BOD analyzer takes only 10 to 30 minutes to measure, and thus through the O₂ electrode short-term measurement dominates the determination of oxygen consumption. However, since oxygen is hardly soluble in water, very often, very low measurement results have found that this requires extrapolation. Essentially, this method is appropriate to determine only very easily degradable substances.

Activated sludge respiration (ASR) and sludge activity

The biomass or sludge of the wastewater treatment plant requires not only oxygen to decompose the substance but also endogenous breathing, which is the activity of the so-called activated sludge or sludge. This is the unit of measurement of the oxygen turnover of the bacteria in mg / l * min (volume / time).

The total oxygen consumption is measured independently by BioMonitor on the web, using only the sludge and the air is lead based cascade. The oxygen concentration of the inlet air corresponds to a decrease in ASR.

The results of the comparison of the results of the sludge effluent cascade Conclusion For anaerobic decomposition of biomass and even poisoning °

Product DM Link

Ammonitor1 Continuous, Rapid Ammonia Nitrogen Measurement System

Four in one TOCnpo continuous, 4 in one TOC, COD, TN, TP analytical instruments

QuickCODultra Continuous COD Measurement Instrument

BOD-BioMonitor Continuous BOD measuring instrument

Germany original assembly equipment and its parts, are sold