



QuickCOD_{ultra}

COD-ANALYSIS

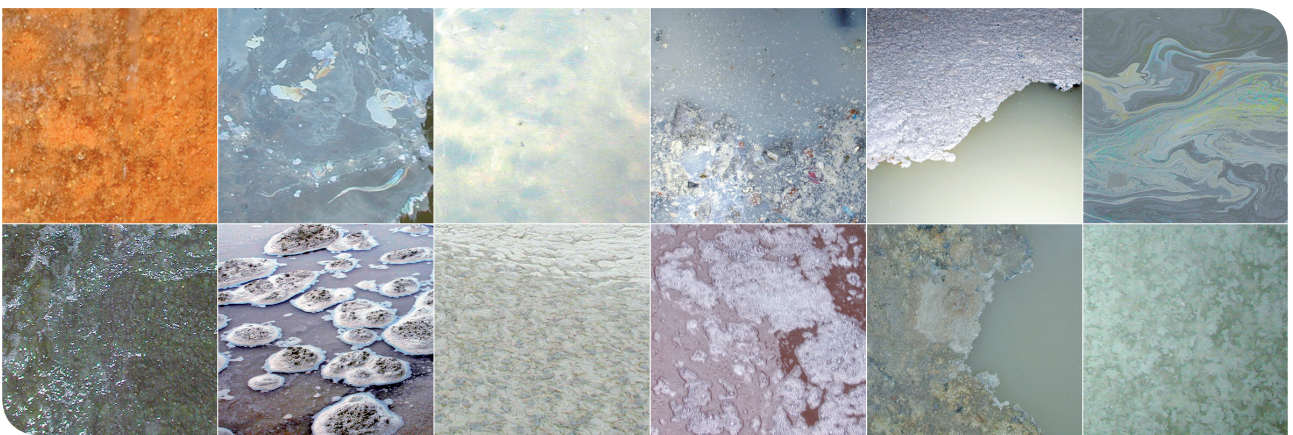
Online COD for every kind of water.
Especially for the rough stuff.

Fast. Precise. Reliable.



A MEASUREMENT SYSTEM FOR THE ROUGH STUFF.

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



Whether you have to measure emulsified water from a flavouring production plant, industrial waste water in an aeration tank of a clarification plant or the waste water from dairies, paper or paint factories: The QuickCOD_{ultra} is very versatile and able to handle the most diverse applications and types of water.

With regards to ecology as well as company economy, industrial and communal applications, such as the influent and effluent of a clarification plant, should be continually monitored. Through continual measurements, the chemical and food industries are also able to detect production loss.

Clumps, algae and slime are what a measurement system has to be able to deal with.

Difficult types of water like process water and industrial waste water can contain coarse materials as well as fluids which must be detected and analysed. Additionally, the measurement system should work continuously and reliably, so that impurities can be recognised early on and the appropriate countermeasures can be put in place. Plus, it should also be able to cope with waters with a high salt concentration without an increase in maintenance.

What COD means. And how it is measured.

A whole variety of organic matter can be present in water, which cannot be determined individually. At least not without considerable analytical effort and within a short time. This is why the so-called sum parameter COD (chemical oxygen demand) is used.

It characterizes the amount of oxygen which is needed to oxidise the samples total organic loads and is thus an important indicator for water analysis. It is considered for planning, controlling as well as efficiency of treatment and thus it is basis for the calculation of waste water charges.

The COD can be determined in laboratory or online, whereby the single methods significantly differ in duration and consumables used. The thermal combustion at 1,200°C is most suitable to determine the COD online. With this method the sample is thermally oxidised and the O₂ demand is detected.

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

Exact Analysis.

Clean, fast and accurate.

In contrast to the common standard methods, which are time consuming and require dangerous reagents, the QuickCOD_{ultra} uses the combustion method. It is fast and takes up the original idea of the complete consideration of all organic compounds.

The most crucial aspect of this method is: LAR's high temperature method – at a temperature of 1,200°C – ensures the reliable chemical digestion of all compounds in the sample. The complete sample including any particles is oxidised. Afterwards, the amount of oxygen needed is detected by an oxygen detector. This method goes without any use of dangerous and etching substances so that a high operational safety is ensured.

The real COD.

Even with changing sample matrixes.

Because of their high temperatures our analysers do not need any catalysts. They also can do without any filtration of the sample. The entire raw waste water sample including all particles is directly injected into the furnace via the unique injection system. This direct injection through the special lock valves avoids that volatile and purgable organic carbons (VOC/ POC) escape from the sample. The QuickCOD_{ultra} determines the COD of all components.

With our ULTRA high temperature method oxygen is used to digest all components. This demand is detected by a special oxygen detector so that the analyser truly measures the real oxygen demand. Even with applications with changing sample compositions the QuickCOD_{ultra} reliably determines the COD.

Total determination. Free of chloride disturbances.

The standard method using hazardous dichromate sulfuric acid detects only some ingredients, but not all organics. Additionally, to ensure stronger oxidation, silver is used as catalyst. Due to the chemical reaction, disturbances with chloride need to be masked with mercury, which is used as complexing agent.

The advantage of our ULTRA high temperature method is: The complete oxidation without the use of any chemicals together with the system's unique and fast operation. Both ensure a clean COD determination which is free of any disturbances with chloride.



AT A GLANCE

- The COD is the amount of oxygen which is needed to oxidise organic components of a water sample.
- The COD can be determined fast and environmentally friendly at 1,200°C.
- A reliable measurement system must be free of any chloride disturbances.
- At 1,200°C, a complete oxidation is guaranteed making the use of chemicals unnecessary.
- The complete oxidation without the use of catalysts and filtration enables the measurement of the real COD.

THE ANALYSER.

A hot oven: Where temperature makes the difference.

Warm, warmer, hot.

Tracking organic load at 1,200°C.

The catalyst-free ceramic oven is the centrepiece of the QuickCOD_{ultra}. 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. For this end, the QuickCOD_{ultra} can be delivered with a number of different housings, depending on the intended location. That way the analyser itself can be safely at high corrosive places as well as in Ex-Zones.

The building blocks principle for a tailor made measurement instrument.

The modular system offers high flexibility. When your application demands it, you can measure up to

six different sample streams with one machine for example. Furthermore, it can be decided whether to build in additional detectors to determine the TN_b and TOC parameters alongside measuring the COD value.

The QuickCOD_{ultra}. Ultra quick measurements and maintenance.

The COD measurement takes place in less than 2 minutes. Thereby, short measurement value peaks can also be reliably shown. The maintenance service that is required is also fast: Less than 30 minutes per week are necessary. The analyser's availability is over 98%. Moreover, all areas of the analyser have been designed for easy maintenance: From the filterless sample extraction with the patented FlowSampler® (↗ Fig. 2), 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.

High salt concentrations.

No problem for the QuickCOD_{ultra}.

In contrast to many other COD analysers, the QuickCOD_{ultra} 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). That 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.

Who is allowed to do what?

It's up to you to decide.

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

With the QuickCOD_{ultra} the electronic compartment is separated from the analytical compartment.

The separated compartments are easily accessible.



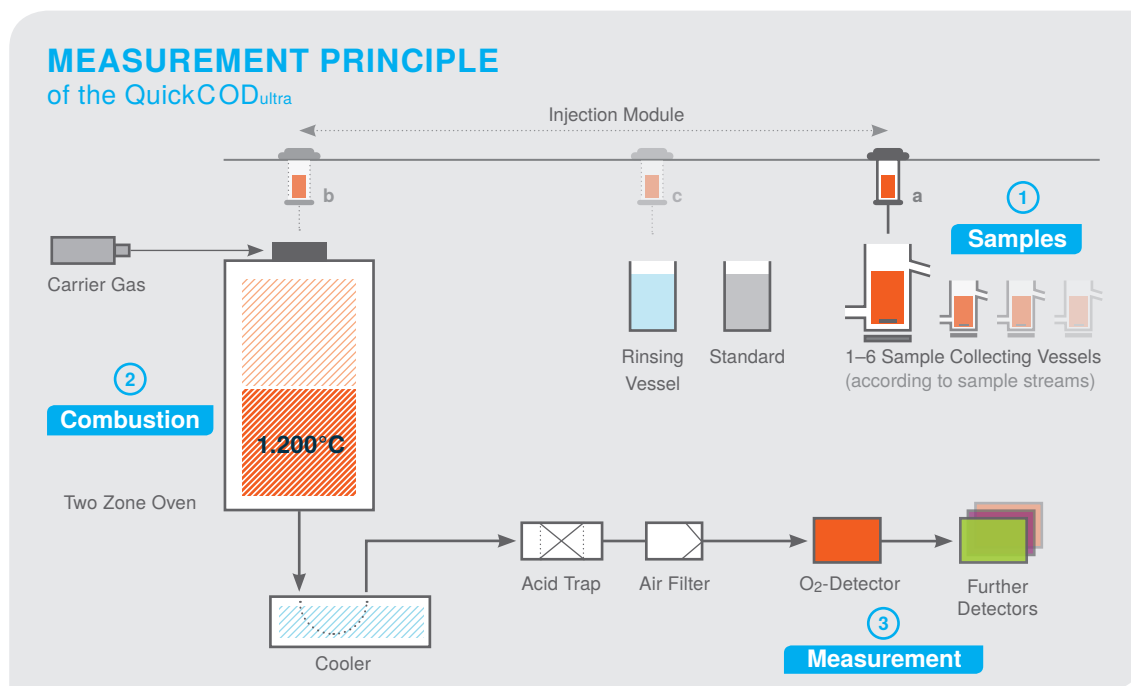


Fig. 1

- 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, oxygen consumption
- 3) O₂ measurement

THE PRINCIPLE.

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

Sample extraction: Almost as though taken by hand.

The water flows through the patented FlowSampler®. In the middle of the FlowSampler® there is a stainless steel tube (→ Fig. 2), through which the sample is sucked into the analyser by a pump. The trick: Big and small solid particles, for example 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.

The robotic injection system for the perfect sample dosage.

Inside the analyser, 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. 1) stays 100% sealed from the ambient air at all times. After every injection, the needle is cleaned.

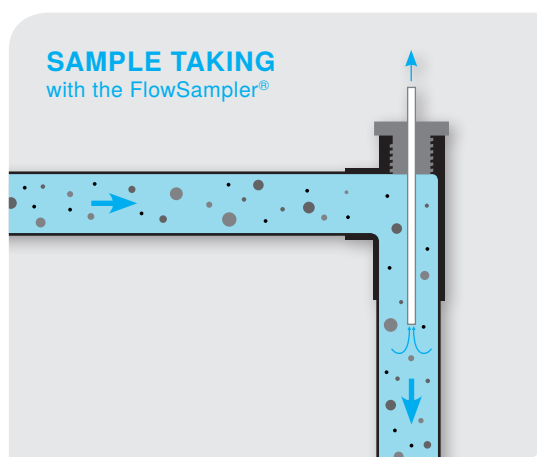


Fig. 2

- maintenance-free
- blockage-free
- representative samples

The maintenance-free and patented sample taking system „FlowSampler®“

The carrier gas. Transportation and oxidant.

The lower measurement ranges provide that nitrogen is used as carrier gas. For the oxidation, however, oxygen is necessary. This is added to the carrier gas via the permeation cabinet considering defined conditions. By diffusion a certain

O₂ concentration is set up within the permeation unit which corresponds to the measuring range. The upper ranges allow the use of pretreated ambient air.

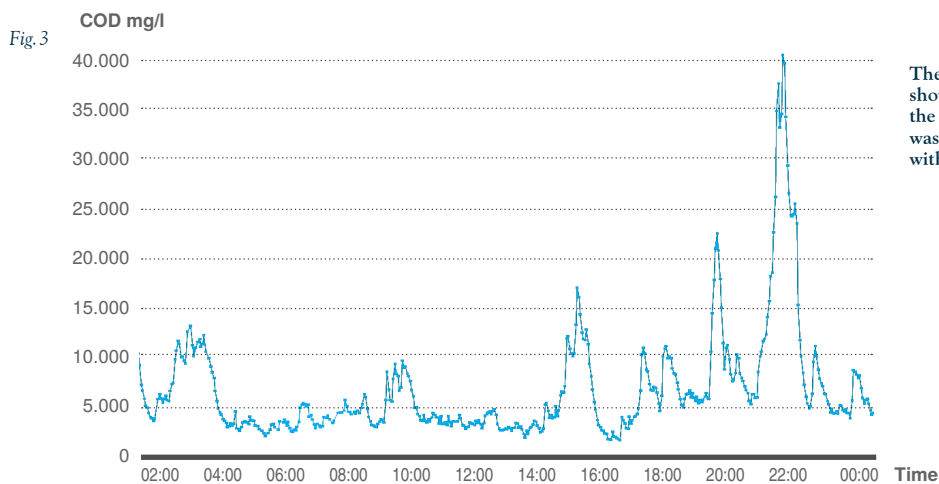
The O₂ detection. Reliable and simple.

Inside the furnace the entire sample is completely oxidised and analysed at a temperature of 1200°C without the use of catalysts. The oxygen consumption for this determination is measured by way of a special detector so that the QuickCOD_{ultra} determines the true COD measurement. Even with changing sample matrices the analyser delivers reliable and accurate results.

Salts are easily discharged at a temperature of 1200°C. They move through the oven in fluid form and are eventually carried out of the oven together with the condensate. That way, no salt deposits can form in the oven.

Thermal oxidation. The clean solution.

The QuickCOD_{ultra} fulfills the high demands in respect of operational safety and environmentally friendly disposal without problem. Due to chemicals not being used it is not necessary to dispose of analyser residues just as cleaning solutions or reagents are not needed.



ALL cLeAR?

LAR Process Analysers AG: Water is our Element.
We do everything for its protection.

We are the leading provider for water analysis instruments for industrial and communal waste water technology, process monitoring, as well as for pure water analysis. Further products in the areas of industrial process and environmental technology complete our product range.

LAR offers application specific analysers developed by our research and development team. Maintenance is carried out globally by our own technicians or by our local qualified service partners. Technical support per telephone or e-mail is available at all times.

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 waste water treatment. We are the only ones who offer them in combination with TOC and COD in one system.

FURTHER PRODUCTS

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

QuickCOD_{ultra} AN OVERVIEW

Online COD for every kind of water. Especially for the rough stuff.

QuickCOD_{ultra} continually checks the COD content of waste water. Optionally, other sum parameters can be detected, too. At 1,200°C, samples are completely oxidised and within 1-2 minutes the COD result is determined.

TECHNICAL DATA

Measurement Technique and Sample Preparation

Measurement Method	Thermal oxidation at 1,200°C
Measurement Ranges	50 - 250,000 mg/l COD, with optional dilution up to 1,500,000 mg/l possible
Parameters	COD, combination with TOC, TN _b possible
Response Time	1-2 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)

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 PC (USB 2.0)



Fast, precise and reliable
the QuickCOD_{ultra} is
dependable.



ADVANTAGES & FEATURES

- ✓ exact determination of the real COD
- ✓ proven thermal oxidation principle
- ✓ highest combustion temperature available (1,200°C)
- ✓ catalyst-free
- ✓ clean measurements without reagents
- ✓ multi-stream measurements (optional)
- ✓ high salt concentrations of up to 100 g/l
- ✓ individually programmable user levels
- ✓ analyser availability minim. 98%
- ✓ maintenance and service max. 30 min per week
- ✓ exceptionally low maintenance and operational costs

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TÜV certified company

COD-ANALYSIS

QuickCOD_{ultra}

AREAS OF APPLICATION

ENVIRONMENT / MUNICIPAL FACILITIES / INDUSTRY

INDUSTRIES

**ENVIRONMENTAL MONITORING / WASTE WATER TREATMENT /
WASTE PROCESSING / PHARMACEUTICAL / LABORATORY / PETRO-
CHEMICAL / REFINERIES / CHEMICAL / COAL AND STEEL / POWER /
AIRPORTS / AUTOMOBILE / PAPER MANUFACTURE / BREWERIES /
FOOD MANUFACTURE / DRINK MANUFACTURE / MILK PROCESSING /
SEMICONDUCTOR MANUFACTURE**

TYPES OF WATER

**GROUNDWATER / SURFACE WATER / DRINKING WATER /
WATER INFLUENT / WATER EFFLUENT / DISCHARGE CONTROL /
INDUSTRIAL WASTE WATER / DE-ICING WATER / PROCESS
WATER / HIGH SALT CONCENTRATION / OIL-IN-WATER / COOLING
WATER / PURE WATER / BOILER FEED WATER / CONDENSATE
RETURN / PHARMA HPW / PHARMA WFI / SEMICONDUCTOR UPW**