

PRODUCT DATASHEET

# QuickCODlab™

Reliable Chemical-Free Chemical Oxygen Demand (COD) Water Quality Analyzer for the Laboratory



**Reliable**

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**Fast**

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**Accurate**

- Response time: 3 minutes
- Determine real oxygen demand
- Proven thermal temperature combustion
- Chemical-free technique
- Reliable measurement without reagents

## The Environmentally Friendly COD Analysis

You can now determine chemical oxygen demand quickly, cleanly and safely with the right measurement procedure – without any chemicals.

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Chemical oxygen demand (COD) is one of the most important sum parameters in water analysis. It is considered as a reference for the organic load of waste water, both in the industrial and municipal sectors. In general, analytical processes are based on the use of different reagents. However, the safe and environmentally friendly procedure is thermal oxidation.

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### What COD Means. Relevance And Versatility

Chemical oxygen demand (COD) describes the amount of oxygen that is needed to chemically oxidize organic compounds in water, using an (often environmentally dubious) oxidant. The aim is to determine the demand for oxygen, which is primarily required to oxidize organic matter. This oxygen demand is relevant for the planning, control and cleaning efficiency of waste water treatment plants, as well as a basis for the calculation of sewage charges.

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### COD Measurement Methods. Still Up-To-Date?

The standard potassium dichromate method (DIN 38409 H41-H44) dominates the market. It is also available in a modified form as cuvette tests (DIN ISO 15705:2003). Here, potassium dichromate is used as an oxidizing agent, silver sulfate as a catalyst, as well as sulfuric acid. Mercuric chloride is also used to mask chloride interferences. This risky chemical cocktail is heated after the aqueous sample has been added, and then simmered for approx. two hours. The oxygen demand is calculated from the concentration of residual dichromate.

The high consumption of hazardous substances has long been the subject of lively debate.

At **1,200 °C**, analyse water samples completely and accurately.

### Economic efficiency and results in comparison

The cost-effectiveness of both wet chemical COD procedures needs to be assessed, due to the difficulty of automating them and because of the staff costs involved. With a larger sample throughput, the personnel costs for non-automated procedures take up a typically disproportionate proportion of the annual costs. The cuvette tests are cheaper, due to the low procurement costs, if the annual throughput remains less than around 250 samples. Automated procedures (such as the LAR QuickCODultra or QuickTOCultra) are preferable with increasing numbers of samples.

Until now, no reagent-free and rapid method has been used to determine the oxygen demand in the laboratory.

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### LAR's solution: The QuickCODlab

The COD procedure from LAR Process Analysers AG is based on the thermal oxidation of the sample at 1,200 °C, with subsequent detection of the oxygen consumption. This method (ASTM D6238-98) has been employed hundreds of times in the field of online monitoring and has been specially developed for use in the laboratory.

The crucial point with QuickCODlab: The high-temperature procedure developed by LAR enables the reliable oxidization of all the organic compounds in the sample at a temperature of 1,200 °C. The procedure does not need any catalysts or other hazardous or corrosive reagents. Furthermore, the measurement results are free of chloride interference due to the unique process management. The homogenized sample is injected directly into the reactor, where it is completely oxidized and accurately analysed with an O<sub>2</sub> detector.

## Fast. Clean. Precise. Determining the COD within minutes

The QuickCODlab ensures a high operational reliability and is easy to use. The measured values are output directly to a standard computer and can be quickly and easily processed. The COD measurement is available in just a few minutes.



Fig. 1 The innovative eSyringe is part of the scope of delivery of the QuickCODlab and allows the exact dosage of different sample volumes.

### At A Glance

- The COD value indicates the amount of oxygen consumed during the oxidation of organic substances of a water sample.
- Standard COD procedures are subject to criticism, due to their high consumption of hazardous chemicals.
- A reliable measurement system needs to be environmentally friendly and free of chloride interference.
- A temperature of 1,200 °C guarantees complete combustion and eliminates the need for chemicals.
- The QuickCODlab precisely determines the COD within minutes.

## The COD-Analyzer

A hot oven. The high temperature makes the difference.

### Warm, Warmer, Hot. Tracking Organic Loads At 1,200 °C

The catalyst-free ceramic oven forms the heart of the QuickCODlab. It reliably decomposes all the constituents of the sample at 1,200 °C, so permitting a complete analysis of the oxygen that is required – without any chloride interference. Because of this high oxidation potential, the use of chemicals and/or catalysts is unnecessary.

### COD Analysis. Fast And Reliable

The sample is injected directly into the reactor with a precision syringe. Due to the predefined injection volumes, any possible handling errors are minimized during pipetting. The measurements are fed directly to the computing device present, where they are quickly and easily further processed.

### The Real Oxygen Demand. Even With Changing Sample Matrices

The process management of the QuickCODlab also makes filtration of the sample unnecessary. The homogenised waste water sample is injected directly into the oven. The measuring device provides accurate and reliable results, even with varying sample matrices.

### The QuickCODlab. Ultrafast Measurement

COD measurement is accomplished in less than 3 minutes. Thus, 3 replication measurements per sample can be determined within just 10 minutes. The QuickCODlab offers enormous time and cost savings in comparison to standard procedures.

## O<sub>2</sub> Detection. Simple And Reliable

An O<sub>2</sub> detector determines the oxygen used to digest all the constituents. The determination of the oxygen demand is performed over a wide variety of measurement ranges. The QuickCODlab also reliably measures the real COD in relevant measurement ranges from 5 to 100 mg/l.

## Very High Salt Concentrations. No Problem

The QuickCODlab easily masters salt concentrations of up to 10 g/l, and even up to 300 g/l of sodium chloride (NaCl) with the additional high salt option. The salts move through the oven, are taken from the system with the condensate and are then collected as solids in a special retaining device. This means that no salt residues can form in the oven and the sample does not have to be diluted, even at the highest salt concentrations. This, in turn, has a positive effect on the accuracy of the measurements.



With the extension AutoSampler (Option) the QuickCODlab is able to analyse series of up to 60 samples automatically.

## Thermal Oxidation. The Clean Solution

The QuickCODlab meets the high requirements of occupational safety and environmental protection. This not only means a very high level of operational reliability and ease of use for the staff, but also the avoidance of any additional pollution of the environment from using chemicals.

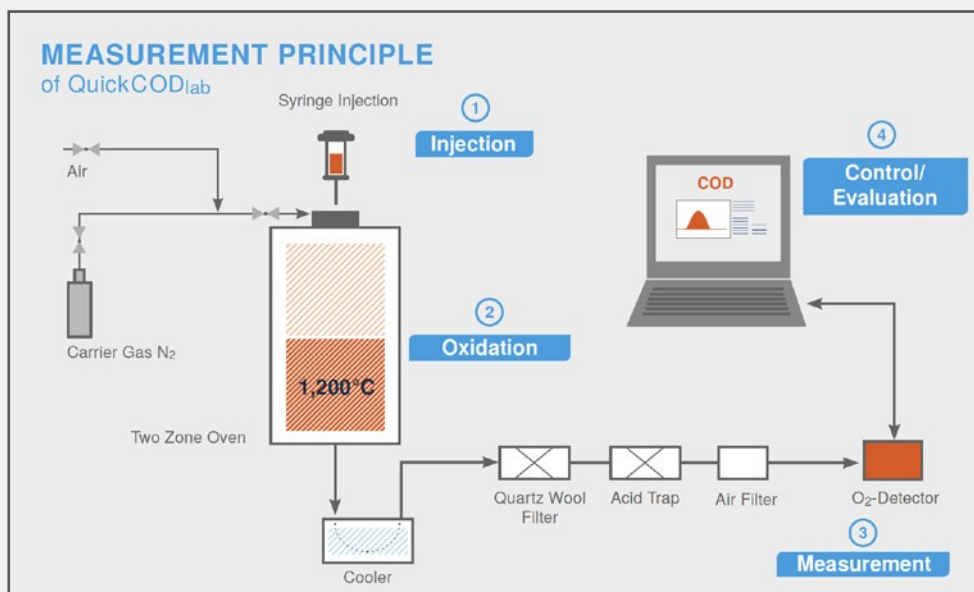


Fig. 2

- 1) Manual injection of the sample
- 2) Combustion and oxygen consumption
- 3) Measurement of the O<sub>2</sub> required
- 4) Control and evaluation using the EDP unit

## The Principle

Even if the water is dirty – the measurements are clean!

## The LAR Procedure. Better Than The Standard

The QuickCODlab works analogously to the American standard method for determining Total Oxygen Demand (ASTM D6238-98). The procedure has been recognized for years and is already widely in use. Instead of the standardised 900 °C, LAR uses 1,200 °C. Thus, the catalyst-free measurement of the COD can also be optimized for measuring ranges from 5 to 100 mg/l.

## Injection By Precision Syringe

No more inaccuracies while pipetting. The precision syringe can hold exactly set quantities of 1-200 µg/l, is easy to use and allows the optimal injection into the oven.

## Measurement. Fast And Reliable

The automatic supply of carrier gas ensures a sufficient, accurately determined O<sub>2</sub> concentration for complete oxidation (Fig. 2). This is closely related to the expected oxygen demand and is adjusted by individual selection of the appropriate measuring range via the software. A special oven valve prevents gas exchange, so that the O<sub>2</sub> detector can securely determine the oxygen consumption.

## The Software. Easy to use

The software is very easy to use by means of tabs. It includes an extensive selection of measuring ranges, as well as calibration and parameter settings, which permit a quick and accurate analysis of the sample. The measurement series, which can be exported for further processing, are automatically evaluated, internally stored and displayed in the form of data tables and measuring curves (Fig. 3).

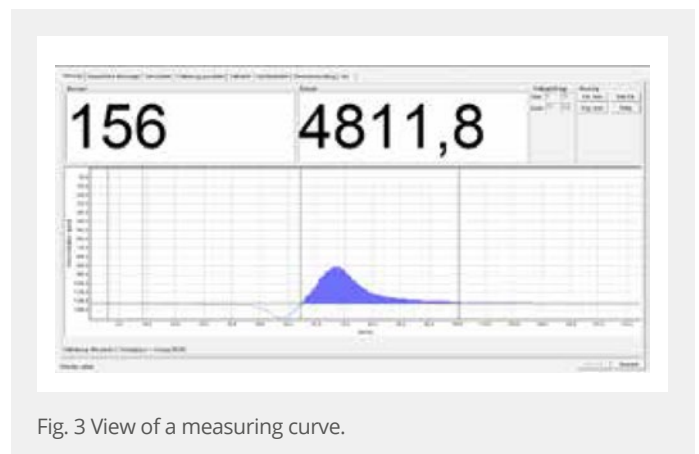


Fig. 3 View of a measuring curve.

## QuickCODlab An Overview

Laboratory COD measurement for all water samples – even the rough stuff.

QuickCODlab analyses water samples for their COD content. Neither chemicals nor catalysts are required thanks to the process management involved. The samples are oxidized completely at 1,200 °C – the actual COD is determined in just three minutes.

## Advantages & Features

- Accurate determination of the real COD
- Measurements in just three minutes
- Extensive measuring ranges
- Proven thermal oxidation principle at 1,200 °C
- No catalyst needed
- Reliable measurement without reagents
- Easy to operate
- Predefined injection volumes
- Excellent chloride acceptance
- Very low measurement costs
- High operational reliability
- Very low operating and maintenance costs



# Technical Data

## Measurement Technique

Measuring Technique	Thermal combustion
Measurement Ranges	1 – 100 mg/l, 10 – 200 mg/l, 100 – 1,000 mg/l, 1,000 – 3,000 mg/l, 2,000 – 10,000 mg/l, Further available
Response Time	3 minutes
Sample Injection	Manual sample injection using the eSyringe, AutoSampler (option)

## Dimensions and Weight

Housing	Steel, IP 54, powder-coated
Dimensions	W 500 x H 450 x D 450 mm
Weight	37 kg

## Electrical Connection Data

Power Supply	230 VAC, 50/60 Hz
Safety	Internal 2/6 A, external 16 A

## Device Handling and Data Output

Software	LAR QuickCODlab
Operating Systems	Microsoft Windows 7 or higher
Data Interface	USB 2.0, LAN (optional)
Data Output	Export as CSV-file

## Installation Requirements

Gas Supply	Nitrogen (N <sub>2</sub> ) as carrier gas (via pressure bottle) Clean, oil-free air
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## 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



Fast and precise – you can rely on the QuickCODlab.

## 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

We are the leading manufacturer of water analysers for industrial and municipal waste water treatment, process monitoring, as well as for pure water analysis. Further products in the areas of environmental technology and industrial processing complete our product portfolio.

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## Unique And State Of The Art. Lar's Ultra High Temperature Method At 1,200 °C!

LAR formed in 1986, gained prominence through their TOC and COD analyzers. LAR is the only company worldwide that, using a high temperature method at 1,200 °C, can completely oxidize a sample to accurately determine sum parameters. Particularly when measuring the TRUE TOC with differing concentrations.

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## LAR Is Only Satisfied Once The Customer Is

We offer application specific analyzers developed by our research and development team. In addition, we maintain close contact with our clients and continually analyse the exact problem areas of every application.

Since the availability of our devices is a deciding criteria, they are constructed in a very user-friendly way. All important areas require little effort to be accessed and the protective housing offers additional safety.

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## After Sales. A Familiar Word To Us

Servicing is carried out by our qualified partners worldwide. Technical support, via telephone or email is available at all times. Additionally, we offer practically orientated seminars and trainings, operator meetings and workshops, that leave no questions unanswered.

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## We Always Take A Closer Look

Setting ourselves the highest quality standards, we closely cooperate with our partners to fulfill the customers expectations throughout the world. Thus, we regularly evaluate our distributors and when necessary, introduce measures to improve our collaboration with them.

LAR has established its own system for guaranteeing its standards of quality. Not only do we fulfill the requirements of the ISO 9001, but we also work continually on improving our standards of quality. To enable this, we collect information about all applications in our database that are subsequently analysed and evaluated. Regular meetings are held to address every issue guaranteeing highest quality standards.

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

**COD-ANALYSIS** – With our analyzers 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.

**TNb/TP-ANALYSIS** – TNb 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](http://www.lar.com)

## 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.

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## 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 range of products, applications, systems, and service options, please contact us at: [info@process-insights.com](mailto:info@process-insights.com)

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**