

## From Practice – into Practice: Special Developments for the Determination of the COD Suitable for the Application

### COD Cooling Trough

The cooling trough prevents the overheating of the COD samples during the critical addition of sulphuric acid. In addition, it is used for cooling the samples after the heating phase.

### COD Series Magnet Stirrer

The continuously adjustable COD series magnet stirrer with 12 stirring points is used for mixing the samples during the metering process. Owing to its water-tight encapsulation and its external current supply and control, it is suitable for applications under water.

### COD Metering Funnel

The COD metering funnel, placed on top of the COD reaction vessels, makes the addition of sulphuric acid to several samples at the same time easier. The user fills the metering funnel with the standard volume of 30 ml. He can do this much more rapidly than if he metered the substance straight into the sample. The sulphuric acid is then dripped via a spindle cock onto the sample. After the device has been calibrated once, the user can in this way comparatively quickly, and without time-consuming manipulation, meter the sulphuric acid evenly into a large number of samples.

COD metering funnels, together with a cooling trough and the series magnetic stirrer, ensure increased safety during the determination of the COD and considerably ease the user's workload.

### HCl Absorber

For driving off the chloride, e.g. when determining the COD of sea water.



### Boiling Stones

behrotest® boiling stones are made from a ceramic material. Compared to conventional boiling beads made from glass, they offer optimum protection against defervescence because of their porosity and their shape, even with badly homogenised samples.

behrotest® boiling stones are chemically pure and guarantee unadulterated results from the COD measurement.

## The behrotest® COD Program Range on a Single Glance

Order number	Designation	Description of the article
80 48 12004	DOS 10	COD in accordance with ISO 6060, etc.: universal dispenser for metering potassium dichromate, 2 ... 10 ml
80 48 12005	DOS 50	COD in accordance with ISO 6060, etc.: universal dispenser for metering sulphuric acid, 5 ... 50 ml
80 48 12010	DIT 50	COD in accordance with ISO 6060, etc.: digital burette for titration, 50 ml volume
80 48 20200	TRS 200	Temperature and time controller, microprocessor-controlled unit with special COD mode, up to 10 temperature time combinations can be programmed
80 48 21006	CSB 6/E	COD in accordance with ISO 6060, etc.: precision heating block thermostat for 6 reaction vessels RG, 20 ... 300 °C
80 48 21012	CSB 12/E	COD in accordance with ISO 6060, etc.: precision heating block thermostat for 12 reaction vessels RG, 20 ... 300 °C
80 48 21024	CSB 24/E	COD in accordance with ISO 6060, etc.: precision heating block thermostat for 24 reaction vessels RG, 20 ... 300 °C
80 48 24400	DT 10	Fully automatic metering/titration unit for the determination of the COD in accordance with ISO 6060, etc.. Simultaneous metering and titration for a maximum number of 12 samples. With automatic extraction of the titrated samples
80 48 30001	E 6/B	COD in accordance with ISO 6060, etc.: insert and yoke type frame for CSB 6/E
80 48 30002	E 12/B	COD in accordance with ISO 6060, etc.: insert and yoke type frame for CSB 12/E
80 48 30003	E 12/BV	COD in accordance with ISO 6060, etc.: insert and yoke type frame for CSB 24/E
80 48 30011	RG 1	COD in accordance with ISO 6060, etc.: reaction vessel with NS 29, 175 ml volume, 100 ml marking
80 48 30012	RG 2	COD in accordance with ISO 6060, etc.: reaction vessel with adapter, NS 29 and 100 ml marking
80 48 30014	KM 1	COD reaction vessel with adapter, 250 ml volume
80 48 30031	LK 1	COD in accordance with ISO 6060, etc.: COD air cooler
80 48 30042	KW 6/N	COD in accordance with ISO 6060, etc.: cooling trough for insert frame E 6/B
80 48 30043	KW 12/N	COD in accordance with ISO 6060, etc.: cooling trough for insert frame E 12/B
80 48 30044	KW 24/N	COD in accordance with ISO 6060, etc.: cooling trough for insert frame E 12/BV
80 48 30048	SM 12/N	COD in accordance with ISO 6060, etc.: series magnetic stirrer for insert frame E 12/B
80 48 30049	MR 1	COD in accordance with ISO 6060, etc.: COD magnetic stirrer for 1 reaction vessel
80 48 30051	LS 6	COD in accordance with ISO 6060, etc.: stand for 6 COD air coolers
80 48 30052	LS 12	COD in accordance with ISO 6060, etc.: stand for 12 COD air coolers
80 48 30071	HCL 29	COD in accordance with ISO 6060, etc.: HCl absorber for driving off chloride
80 48 30095	TS 12 CSB	COD in accordance with ISO 6060, etc.: transport stand for insert frames E 6/B, E 12/B, E 12/BV
80 48 30199	CSB-PRÜF	COD in accordance with ISO 6060, etc.: test unit for checking the heating temperature
80 48 30200	DT 30	COD in accordance with ISO 6060, etc.: metering funnel, 30 ml, for sulphuric acid
80 48 30290	PTFE 29	PTFE collars for RG 1, RG 2 and, 12 part set
80 48 30300	HTI 1	COD in accordance with ISO 6060, etc.: manual titration station with digital burette and magnetic stirrer
80 48 30700	SIST 100	boiling stones, contents 100 g
80 48 30800	MRST 2	COD in accordance with ISO 6060, etc.: magnetic stirrer rod set with 12 items for reaction vessel
80 48 40200	UK 12/600	Circulation cooler, 600 W power
80 48 40201	UK 12/1000	Circulation cooler, 1,000 W power
80 48 40203	UK 12/2000	Circulation cooler, 2,000 W power

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behrotest® Devices for the Determination of the COD in  
Accordance with DEV:

The  
Standard



COD

## A Few Words about behr

behr Labor-Technik – this means over 50 years of experience in the development, production and marketing of laboratory devices. In the course of this time, a small family business has grown into a company which is active internationally. Today, users all around the world appreciate the quality, reliability and practicality of our devices.

Our main focus today is the production of laboratory equipment for environmental analysis and food analysis. For many years behr Labor-Technik has been counted among the leading German providers for water, sewage and mud analysis. The products on offer range from low-price compact devices to complete fully automated workplaces for the analysis in accordance with the international and national standards (ISO/EN, DIN/DEV etc.).

Our product range is completed by analysis devices for the determination of organic halogens, carbon and sulphur.

## As before, the Standard for Sewage Analysis: Determination of the COD

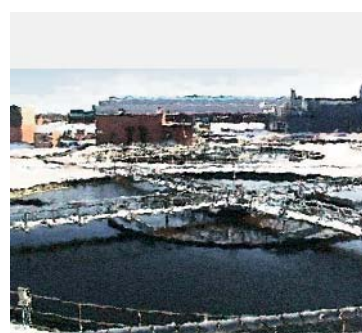
Standards for the determination of the COD using the titration method are found e.g. in ISO 6060, in ASTM (American Standard Methods) D 1252, in the French AFNOR NF T 90-101, in the Austrian ÖNORM M 6265 and in the German DIN/DEV 38 409 – H 41, DIN/DEV 38 409 – H 43 and DIN/DEV 38 409 – H 44.

## behr and COD: The Ideal Partnership

Wherever in Germany the chemical oxygen demand in accordance with DIN/DEV is being determined, it is very likely that the user will decide to choose our devices.

Our COD workplaces guarantee you the determination of the COD as required by the international and national standards.

Our complete workplaces for 6 or 12 samples with 2 accessory variants are standard configurations for the COD preparation and for the entire COD determination, including titration. We offer, of course, individual combinations of devices with the corresponding accessories for unusual sample matrices and high sample throughput.



## Standard Configurations for Nearly All Applications: behrotest® CSB Preparation Units and Complete Workplaces for the Determination of the COD



### COD Preparation Units:

Order number	Designation	Description
80 48 80000	PA-CSB 6	COD preparation unit for a maximum of 6 samples simultaneously
80 48 80001	PA-CSB 12	COD preparation unit for a maximum of 12 samples simultaneously



### COD Complete Workplaces:

Order number	Designation	Description
80 48 80002	PB-CSB 6/M	Complete COD workplace for a maximum of 6 samples simultaneously
80 48 80003	PB-CSB 12/M	Complete COD workplace for a maximum of 12 samples simultaneously

## PA-CSB: COD Preparation Units for the Sample Preparation

Unit configurations for the simultaneous preparation of a maximum of 6 or 12 COD samples. A preparation unit includes the following components:

- TRS 200 microprocessor-controlled time and temperature control unit with COD automation
- CSB/E precision heating block for RG 2 reaction vessels
- E/B insert/yoke type frame for RG 2 reaction vessels
- KW/N cooling trough with holder and stand for E/B
- RG 2 reaction vessels
- LK 1 COD air cooler
- LS air cooler stand for LK COD air cooler

## PB-CSB/M: COD Workplaces for the Determination of the COD

Complete workplaces for the simultaneous analysis of a maximum of 6 or 12 COD samples. Manual metering and titration. A workplace unit includes the following components:

- TRS 200 microprocessor-controlled time and temperature control unit with COD automation
- CSB/E precision heating block for RG 2 reaction vessels
- E/B insert/yoke type frame for RG 2 reaction vessels
- KW/N cooling trough with holder and stand for E/B
- SM 12/N series magnetic stirrer for E 12/B insert/yoke type frame (only for PB-CSB 12/M)
- RG 2 reaction vessels
- MRST 2 magnetic stirrer rod set, 12 rods
- SIST 100 boiling stones, contents 100 g
- LK 1 COD air cooler
- LS air cooler stand for LK COD air cooler
- PTFE 29 PTFE collars for LK 1, set of 12 collars
- TS COD transport stand for E/B insert/yoke type frame
- HTI 1 manual titration station

## COD Titration in Accordance with your Requirements: Manual or Automatic – Reliable and Precise with behrotest® Devices



## behrotest® Manual Titration Station

The HTI 1 manual titration station consists of

- a burette with digital display and
- a magnetic stirrer with a precisely fitted holder for COD reaction vessels.

A screen serves as a neutral background and allows the user to determine the colour change and the end of the titration precisely. He will therefore carry out the titration under similar optical conditions every time. This improves the precision and therefore the reproducibility of the results.

The precise positioning of the reaction vessel in the holder on top of the magnetic stirrer also contributes to this.

In addition, the angled wings of the screen protect against dazzling light.



## behrotest® DT 10 – the Fully Automated COD Metering and Titration Unit

The fully automated DT 10 metering/titration device is the perfect complement to the behrotest® COD programme for laboratories with a large number of samples to be processed. It automates and accelerates important stages in the process of determining the COD.

For the determination of the COD, the behrotest® DT 10 combines and automates

- the metering of the potassium dichromate solution and the concentrated sulphuric acid and the final
- titration

for a maximum of 12 samples simultaneously.

In this way behrotest® DT 10 makes the work easier for the user and helps to save time and to lower costs.

