

**COD MR TT****M131****20 - 1500 mg/L COD<sup>b)</sup>****Mr****Dichromate / H<sub>2</sub>SO<sub>4</sub>**

## Instrument specific information

The test can be performed on the following devices. In addition, the required cuvette and the absorption range of the photometer are indicated.

Instrument Type	Cuvette	$\lambda$	Measuring Range
MD 100, MD 110, MD 200, MD 600, MD 610, MD 640, MultiDirect	ø 16 mm	610 nm	20 - 1500 mg/L COD <sup>b)</sup>
SpectroDirect, XD 7000, XD 7500	ø 16 mm	596 nm	20 - 1500 mg/L COD <sup>b)</sup>

## Material

Required material (partly optional):

Reagents	Packaging Unit	Part Number
COD MR/25	25 pc.	2420721
COD MR/25, mercury free	25 pc.	2420711
COD MR/150	150 pc.	2420726
COD MR/150, mercury free	150 pc.	2420716

The following accessories are required.

Accessories	Packaging Unit	Part Number
Thermoreactor RD 125	1 pc.	2418940

## Application List

- Raw Water Treatment
- Waste Water Treatment



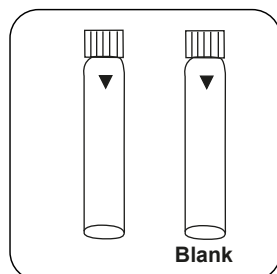
## Notes

1. The blank is stable when stored in the dark. Blanks and test vials must be from the same batch.
2. Do not place hot vials in the sample chamber. The most stable measured values can be determined if the vials are left standing overnight.
3. For samples under 100 mg/L COD it is recommended to use the tube test COD LR if a higher degree of accuracy is required.

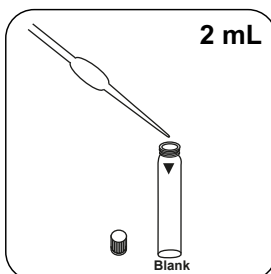


## Determination of COD MR with Vario Vial Test

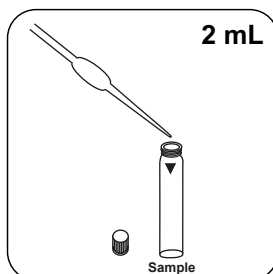
Select the method on the device.



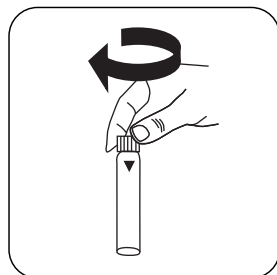
Prepare two **reaction vials**. Mark one as a blank.



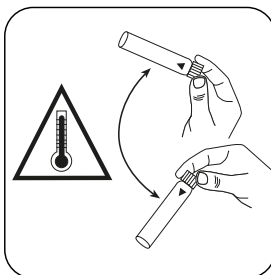
Put **2 mL deionised water** in the blank.



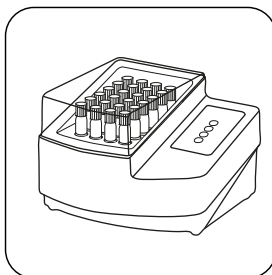
Put **2 mL sample** in the sample vial.



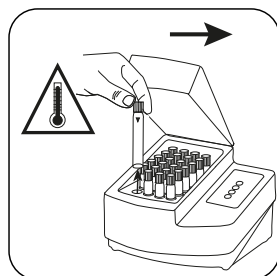
Close vial(s).



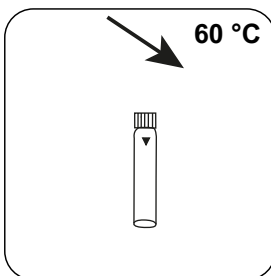
Carefully invert several times to mix the contents.  
**Note: Will get hot!**



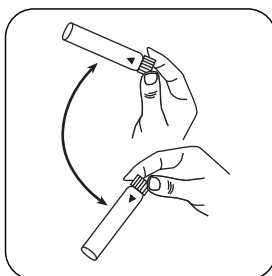
Seal the vials in the pre-heated thermoreactor for **120 minutes at 150 °C**.



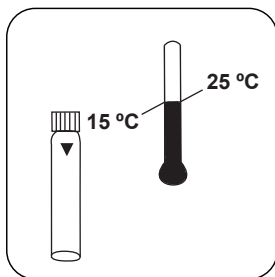
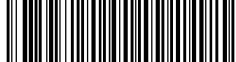
Remove the vial from the thermoreactor. (**Note: vial will be hot!**)



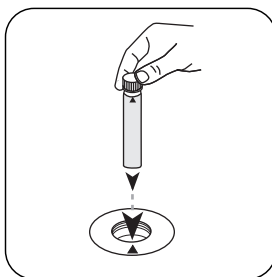
Allow vial(s) to cool to **60 °C**.



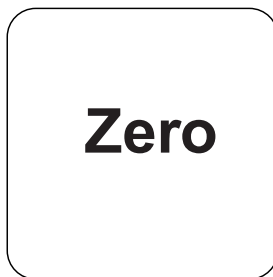
Invert several times to mix the contents.



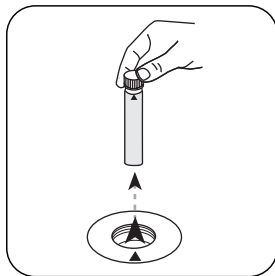
Allow the vial to cool to room temperature and then measure.



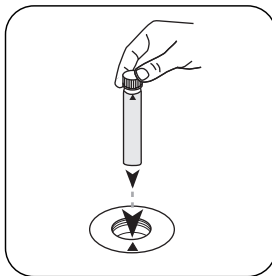
Place **blank** in the sample chamber. • Pay attention to the positioning.



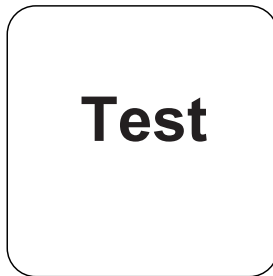
Press the **ZERO** button.



Remove **vial** from the sample chamber.



Place **sample vial** in the sample chamber. • Pay attention to the positioning.



Press the **TEST** (XD: **START**) button.

The result in mg/L COD appears on the display.



## Chemical Method

Dichromate / H<sub>2</sub>SO<sub>4</sub>

## Appendix

### Calibration function for 3rd-party photometers

$$\text{Conc.} = a + b \cdot \text{Abs} + c \cdot \text{Abs}^2 + d \cdot \text{Abs}^3 + e \cdot \text{Abs}^4 + f \cdot \text{Abs}^5$$

	ø 16 mm
a	$-1.04251 \cdot 10^{-1}$
b	$2.09975 \cdot 10^{-3}$
c	
d	
e	
f	

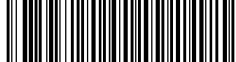
## Interferences

### Persistent Interferences

- In exceptional cases, contents, for which the oxidation capacity of the reagent is not sufficient, can lead to lower results.

### Removeable Interferences

- Suspended solids in the vial can lead to incorrect measurements and so to avoid this, it is important to place the vials carefully in the sample chamber as the method necessitates a build-up of precipitate at the bottom of the vial.
- The outer walls of the vial must be clean and dry before the analysis is carried out. Fingerprints or water droplets on the vial lead to incorrect measurements.
- In the standard version, chloride interferes from a concentration of 1000 mg/L. In the mercury-free version, the disturbance depends on the chloride concentration and the COD. Concentrations from 100 mg/L chloride can lead to significant disturbances here. To remove high chloride concentrations in COD samples, see method M130 COD LR TT.



## Method Validation

<b>Limit of Detection</b>	8.66 mg/L
<b>Limit of Quantification</b>	25.98 mg/L
<b>End of Measuring Range</b>	1500 mg/L
<b>Sensitivity</b>	2,141 mg/L / Abs
<b>Confidence Intervall</b>	18.82 mg/L
<b>Standard Deviation</b>	7.78 mg/L
<b>Variation Coefficient</b>	1.04 %

### Conformity

ISO 15705:2002

### According to

ISO 15705:2002

DIN 38409 part 43

<sup>9)</sup> Reactor is necessary for COD (150 °C), TOC (120 °C) and total -chromium, - phosphate, -nitrogen, (100 °C)