COD LMR TT 133
15 - 300 mg/l COD[b)] MLr
Dichromate / H_2SO_4

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	λ	Measuring Range
MD 100, MD 110, MD 200, MD 600, MD 610, MD 640, MultiDirect	ø 16 mm	430 nm	15 - 300 mg/l COD[b)]
SpectroDirect, XD 7000, XD 7500	ø 16 mm	445 nm	15 - 300 mg/l COD[b)]

Material

Required material (partly optional):

Reagents	Packaging Unit	Part Number
COD LMR	25 pc.	2423120

Application List

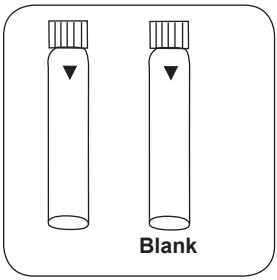
- Raw Water Treatment
- Waste Water Treatment

Notes

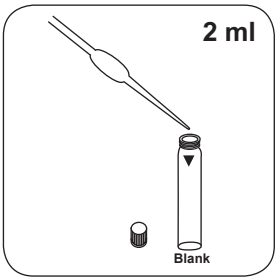
1. The blank is stable when stored in the dark. Blanks and test vials must be from the same batch.
2. Do not place hot vials in the sample chamber. The most stable measured values can be determined if the vials are left standing overnight.

Implementation of the provision COD LMR with tube test

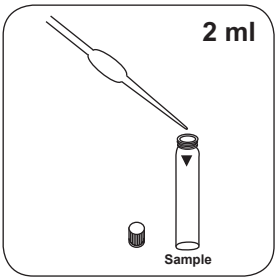
Select the method on the device



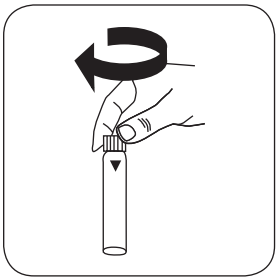
Prepare two **reaction vials**. Mark one as a blank.



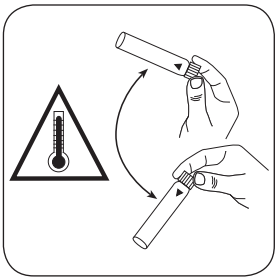
Put **2 ml deionised water** in the blank.



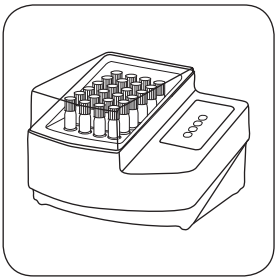
Put **2 ml sample** in the sample vial.



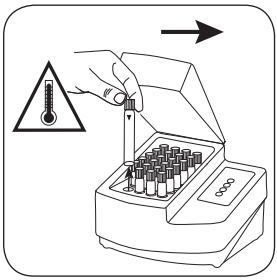
Close vial(s).



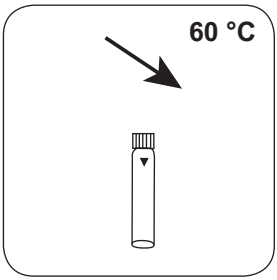
Carefully invert several times to mix the contents. **Note: Will get hot!**



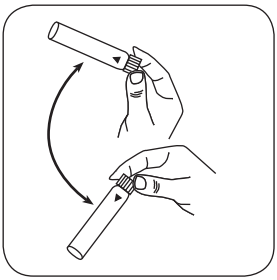
Seal the vials in the pre-heated thermoreactor for **120 minutes at 150 °C** .



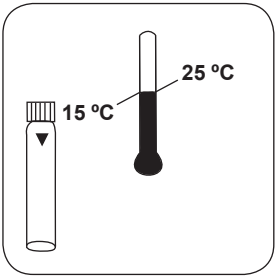
Remove the vial from the thermoreactor. **Note: vial will be hot!)**



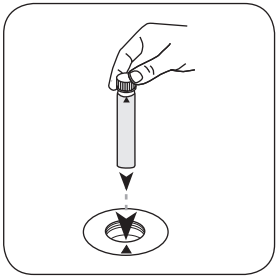
Allow vial(s) to cool to 60°C.



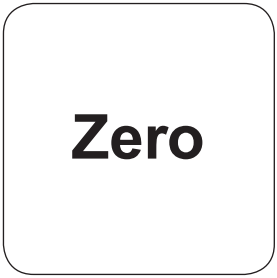
Invert several times to mix the contents.



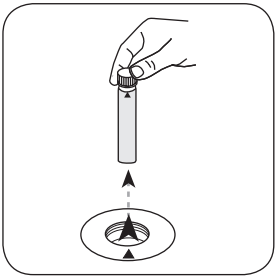
Allow the vial to cool to room temperature and then measure.



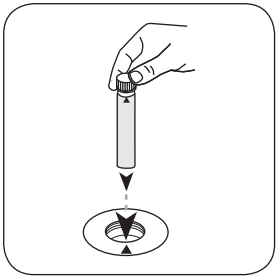
Place **blank** in the sample chamber. • Pay attention to the positioning.



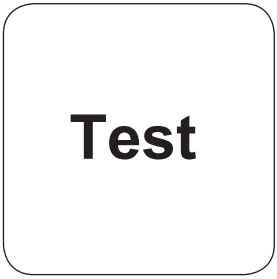
Press the **ZERO** button.



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_2SO_4

Appendix

Interferences

Persistant 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.

Interference	from / [mg/l]
Cl-	1000

Method Validation

Limit of Detection	3.1 mg/l
Limit of Determination	9.3 mg/l
End of Measuring Range	150 mg/l
Sensitivity	0.003 mg/l
Confidence Range	2 %
Standard Deviation	0.8 µg
Variation Coefficient	1 %

Conformity

ISO 15705:2002

According to

DIN 380402 part 41

[a] determination of free, combined and total | [b] Reactor is necessary for COD (150 °C), TOC (120 °C) and total -chromium, - phosphate, -nitrogen, (100 °C) | [c] MultiDirect: Adapter is necessary for Vacu-vials® (Order code 19 20 75) | [d] Spectroquant® is a Merck KGaA Trademark | [e] alternative reagent, used instead of DPD No.1/No.3 in case of turbidity in the water sample caused by high concentration of calcium and/or high conductivity | [f] additionally required for determination of bromine, chlorine dioxide and ozone in the presence of chlorine | [g] Reagent recovers most insoluble iron oxides without digestion | [h] additionally required for samples with hardness values above 300 mg/l $CaCO_3$ | [i] high range by dilution | [#] including stirring rod, 10 cm