Copper PP M153

0.05 - 5 mg/L Cu Cu

Bicinchoninate

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 600, MD 610, MD 640, MultiDirect, PM 620, PM 630, SpectroDirect, XD 7000, XD 7500	ø 24 mm	560 nm	0.05 - 5 mg/L Cu

Material

Required material (partly optional):

Reagents	Packaging Unit	Part Number
VARIO CU1 F10	Powder / 100 pc.	530300
VARIO CU1 F10	Powder / 1000 pc.	530303

Application List

- Cooling Water
- Boiler Water
- Waste Water Treatment
- Pool Water Control
- Drinking Water Treatment
- Galvanization

Preparation

1. Digestion is required for the determination of total copper.
2. The pH value of the sample must be adjusted between 4 and 6 before analysis (with potassium hydroxide solution or nitric acid). Any resulting dilution must be taken into account in the result.
   Note: pH values above 6 can lead to Copper precipitation.

Notes

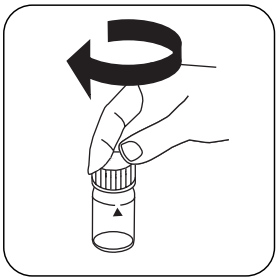
1. Accuracy is not affected by undissolved powder.

Determination of Copper, free with Vario Powder Pack

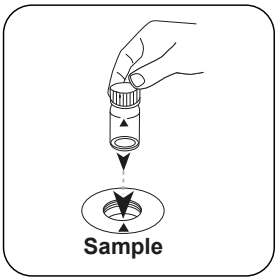
Select the method on the device.

For this method, a ZERO measurement does not have to be carried out every time on the following devices: XD 7000, XD 7500

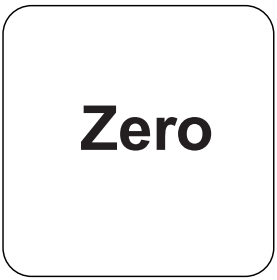
Fill 24 mm vial with **10 mL sample**.



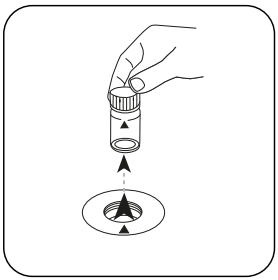
Close vial(s).



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

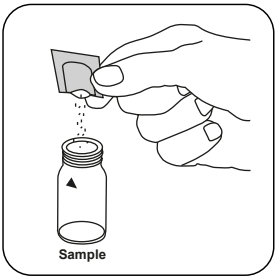


Press the **ZERO** button.

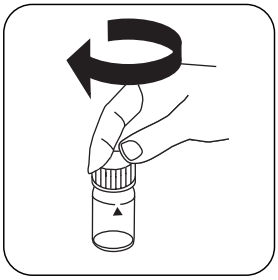


Remove the vial from the sample chamber.

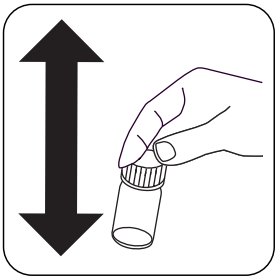
For devices that require **no ZERO measurement** , **start here**.



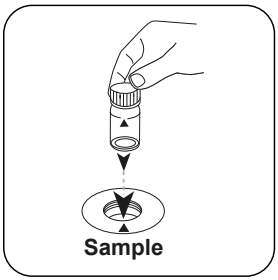
Add **Vario Cu 1 F10 powder pack**.



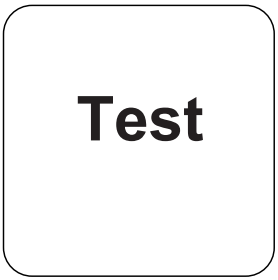
Close vial(s).



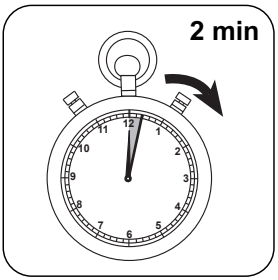
Mix the contents by shaking.



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



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



Wait for **2 minute(s) reaction time**.

Once the reaction period is finished, the measurement takes place automatically.

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

Chemical Method

Bicinchoninate

Appendix

Calibration function for 3rd-party photometers

Conc. = a + b•Abs + c•Abs^2 + d•Abs^3 + e•Abs^4 + f•Abs^5

	ø 24 mm	**□ 10 mm**
a	-6.44214 • 10^{-2}	-7.44232 • 10^{-2}
b	3.7903 • 10^{+0}	8.16011 • 10^{+0}
c		
d		
e		
f		

Interferences

Persistant Interferences

Hardness, Al and Fe produce lower test results.

Removeable Interferences

1. Cyanide, CN^-: Cyanide prevents full colour development.
   Cyanide interference is eliminated as follows: Add 0.2 ml Formaldehyde to 10 ml water sample and wait for a
   reaction time of 4 minutes. (Cyanide is masked). After this perform the test as described. Multiply the result by 1.02 to correct the sample dilution by Formaldehyde.
2. Silver, Ag^+: If a turbidity remains and turns black, silver interference is likely. Add 10 drops of saturated Potassium chloride solution to 75 ml of
   water sample and filter it through a fine filter. Use 10 ml of the filtered water sample to perform test.

Method Validation

Limit of Detection	0.05 mg/L
Limit of Quantification	0.15 mg/L
End of Measuring Range	5 mg/L
Sensitivity	3.77 mg/L / Abs
Confidence Intervall	0.064 mg/L
Standard Deviation	0.027 mg/L
Variation Coefficient	1.07 %

Bibliography

S. Nakano, Y. Zasshi, 82 486 - 491 (1962) [Chemical Abstracts, 58 3390e (1963)]

Derived from

APHA Method 3500Cu