Copper T 150
0.05 - 5 mg/l Cu[a)] Cu
Biquinoline

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, PM 600, PM 620, PM 630	ø 24 mm	560 nm	0.05 - 5 mg/l Cu[a)]
SpectroDirect, XD 7000, XD 7500	ø 24 mm	559 nm	0.05 - 5 mg/l Cu[a)]

Material

Required material (partly optional):

Reagents	Packaging Unit	Part Number
Copper No. 1	Tablet / 100	513550BT
Copper No. 1	Tablet / 250	513551BT
Copper No. 2	Tablet / 100	513560BT
Copper No. 2	Tablet / 250	513561BT
Set Copper No. 1/No. 2 100 Pc.[#]	100 each	517691BT
Set Copper No. 1/No. 2 250 Pc.[#]	250 each	517692BT

Application List

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

Implementation of the provision Copper, free with tablet

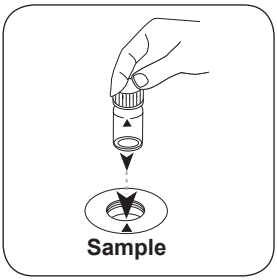
Select the method on the device

In addition, choose the test: free

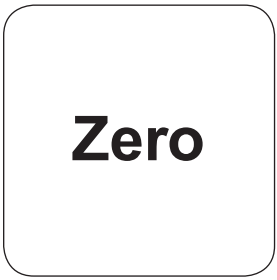
For this method, no ZERO measurements are to be carried out with the following devices: XD 7000, XD 7500

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

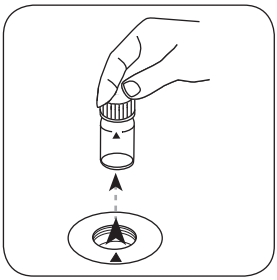
Close vial(s).



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

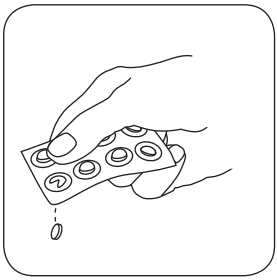


Press the **ZERO** button.

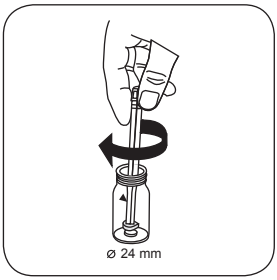


Remove the vial from the sample chamber.

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

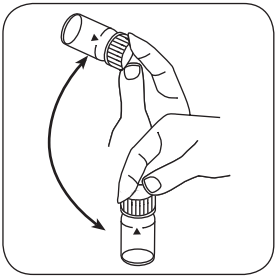


Add **COPPER No. 1 tablet**.

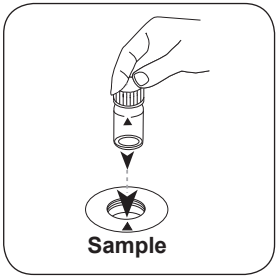


Crush tablet(s) by rotating slightly.

Close vial(s).

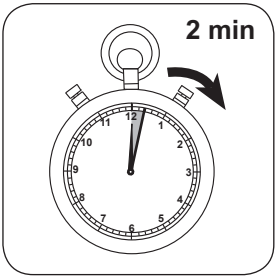


Dissolve tablet(s) by inverting.



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 free Copper appears on the display.

Implementation of the provision Copper, total with tablet

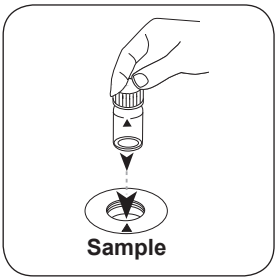
Select the method on the device

In addition, choose the test: total

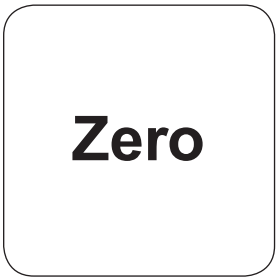
For this method, no ZERO measurements are to be carried out with the following devices: XD 7000, XD 7500

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

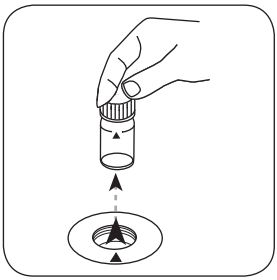
Close vial(s).



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

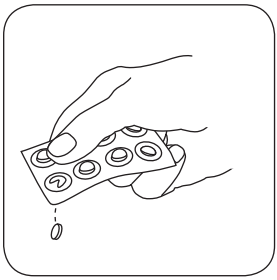


Press the **ZERO** button.

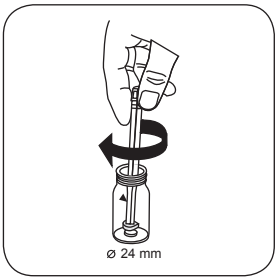


Remove the vial from the sample chamber.

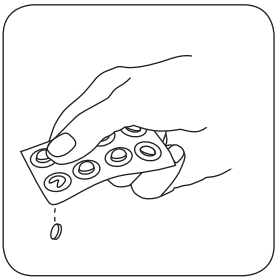
For devices that require **no ZERO measurement** , **start here**.



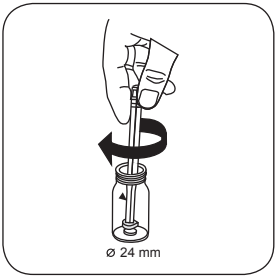
Add **COPPER No. 1 tablet**.



Crush tablet(s) by rotating slightly and dissolve.

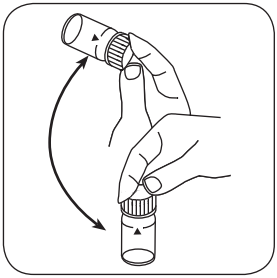


Add **COPPER No. 2 tablet**.

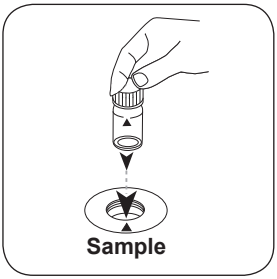


Crush tablet(s) by rotating slightly.

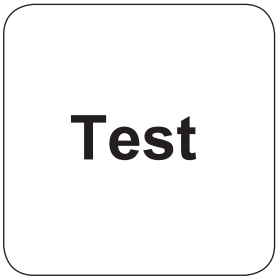
Close vial(s).



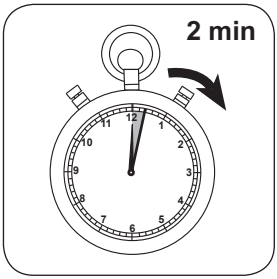
Dissolve tablet(s) by inverting.



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 total Copper appears on the display.

Implementation of the provision Copper, differentiated determination with Tablet

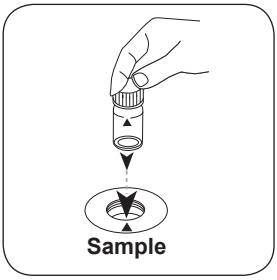
Select the method on the device

In addition, choose the test: differentiated

For this method, no ZERO measurements are to be carried out with the following devices: XD 7000, XD 7500

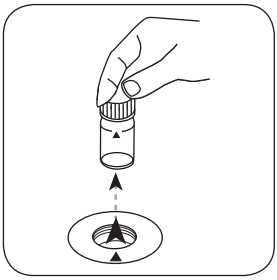
Fill 24 mm vial with **10 ml sample**.

Close vial(s).



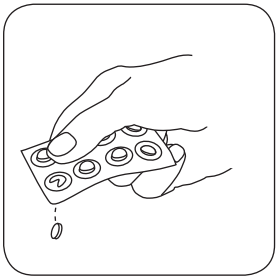
Place **sample vial** in the sample chamber. • Pay attention to the positioning.

Press the **ZERO** button.

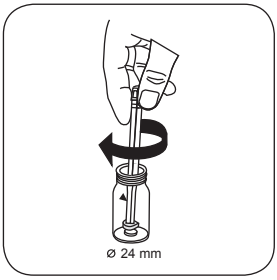


Remove the vial from the sample chamber.

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

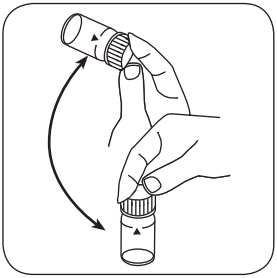


Add **COPPER No. 1 tablet**.

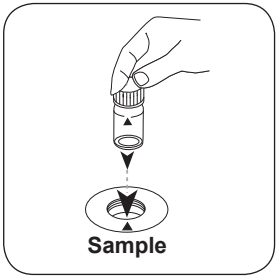


Crush tablet(s) by rotating slightly.

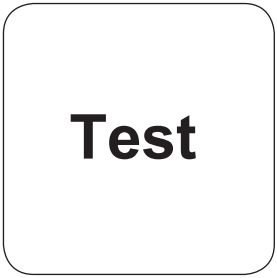
Close vial(s).



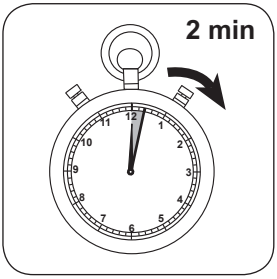
Dissolve tablet(s) by inverting.



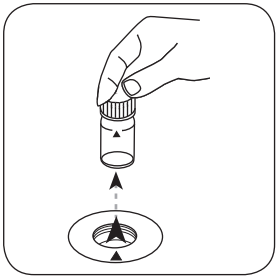
Place **sample vial** in the sample chamber. • Pay attention to the positioning.



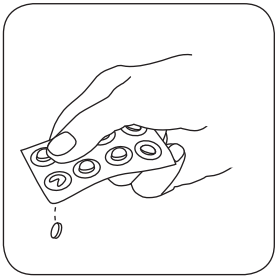
Press the **TEST** (XD: **START**) button.



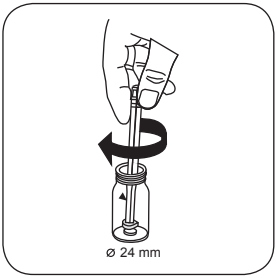
Wait for **2 minute(s) reaction time**.



Remove the vial from the sample chamber.

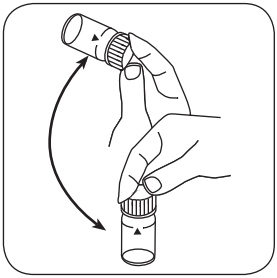


Add **COPPER No. 2 tablet**.

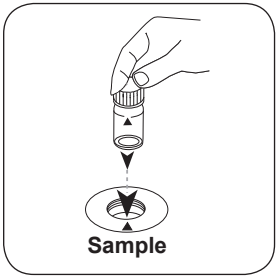


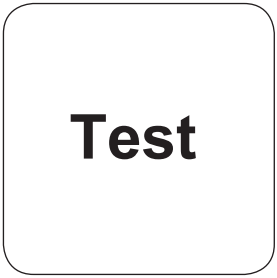
Crush tablet(s) by rotating slightly.

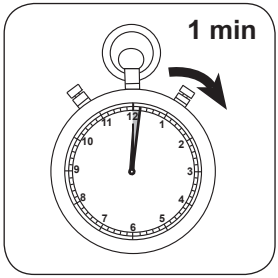
Close vial(s).



Dissolve tablet(s) by inverting.







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

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

Wait for **1 minute(s) reaction time**.

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

The result in mg/l free Copper; combined Copperr; total Copper appears on the display.

Chemical Method

Biquinoline

Appendix

Interferences

Persistant Interferences

1. Ag, Cd, Co, Hg, Sb, Sn, larger quantities of iron, and phosphates, sulphites, oxalate or all-reducing substances are all classed as interfering ions.

Method Validation

Limit of Detection	0.051 mg/l
Limit of Quantification	0.153 mg/l
End of Measuring Range	5 mg/l
Sensitivity	3.79 mg/l / Abs
Standard Deviation	0.011 µg

Bibliography

Photometrische Analyse, Lange/Vedjelek, Verlag Chemie 1980

[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