**Silicate LR PP****M351****0.1 - 1.6 mg/L SiO₂****SiLr****Heteropolyblue**

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	ø 24 mm	660 nm	0.1 - 1.6 mg/L SiO ₂
SpectroDirect, XD 7000, XD 7500	ø 24 mm	815 nm	0.05 - 1.6 mg/L SiO ₂

Material

Required material (partly optional):

Reagents	Packaging Unit	Part Number
VARIO Silica LR, Set F10	1 Set	535690

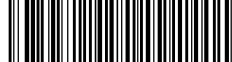
Application List

- Boiler Water

Notes

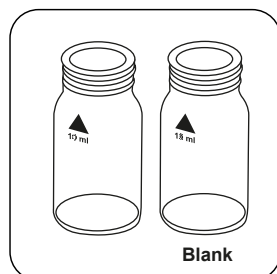
1. The given reaction time of 4 minutes refers to a sample temperature of 20 °C. At a sample temperature of 30 °C, a reaction time is 4 minutes and at 10 °C, a reaction time of 8 minutes.



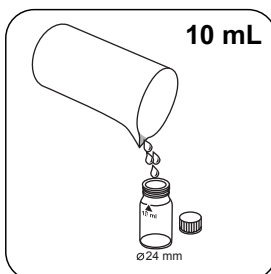


Determination of Silicon dioxide LR with Vario Powder Packs and liquid reagent

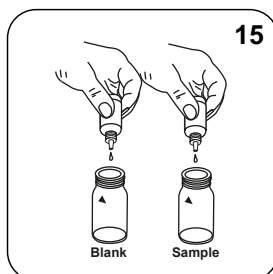
Select the method on the device.



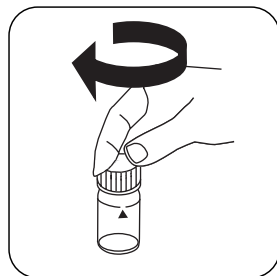
Prepare two clean 24 mm vials. Mark one as a blank.



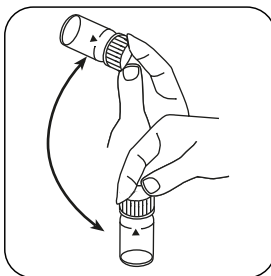
Place **10 mL sample** in each vial.



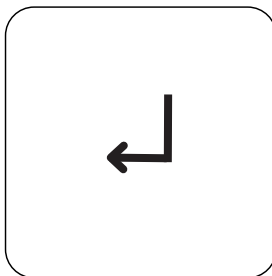
Add **15 drops Vario Molybdate 3 Reagent- solution** to each vial.



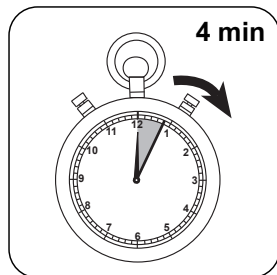
Close vial(s).



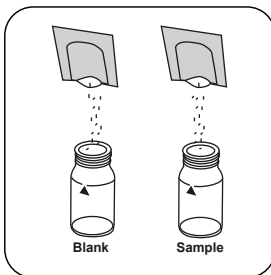
Invert several times to mix the contents.



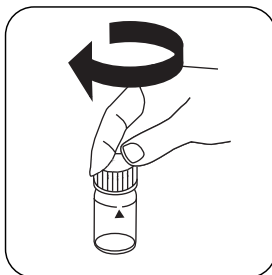
Press the **ENTER** button.



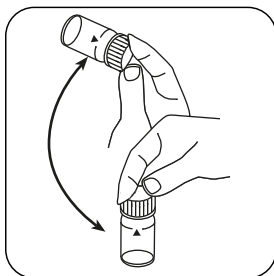
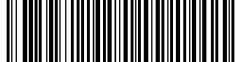
Wait for **4 minute(s) reaction time**.



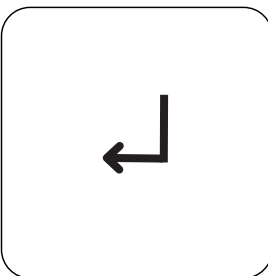
Add a **Vario Silica Citric Acid F10 powder pack** in each vial.



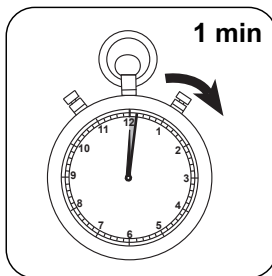
Close vial(s).



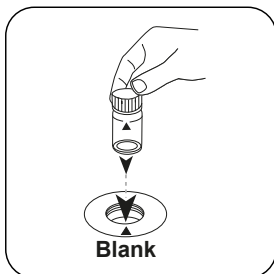
Swirl around to dissolve the powder.



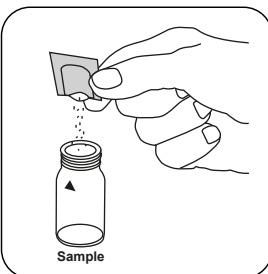
Press the **ENTER** button.



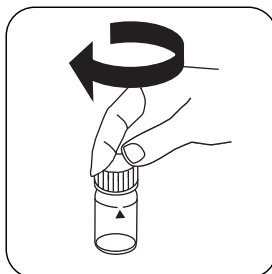
Wait for **1 minute(s) reaction time**.



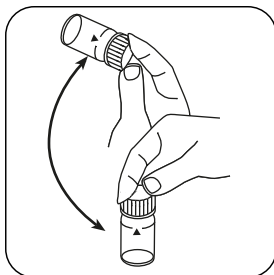
Place **blank** in the sample chamber. Pay attention to the positioning.



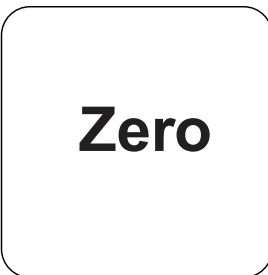
Add a **Vario Silica Amino Acid F10 powder pack** to the sample vial.



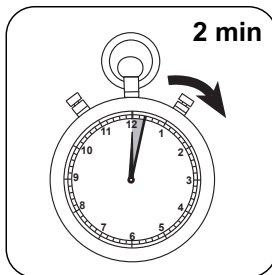
Close vial(s).



Swirl around to dissolve the powder.

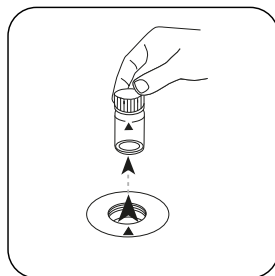
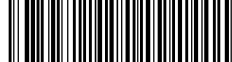


Press the **ZERO** button.

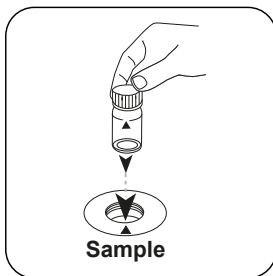


Wait for **2 minute(s) reaction time**.

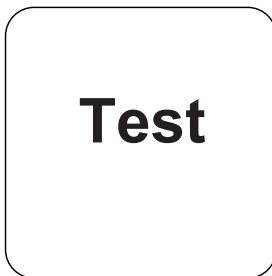
Once the reaction period is finished, the measurement takes place automatically.



Remove the 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 Silica appears on the display.



Analyses

The following table identifies the output values can be converted into other citation forms.

Unit	Cite form	Scale Factor
mg/l	SiO ₂	1
mg/l	Si	0.47

Chemical Method

Heteropolyblue

Appendix

Calibration function for 3rd-party photometers

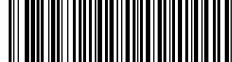
$$\text{Conc.} = a + b \cdot \text{Abs} + c \cdot \text{Abs}^2 + d \cdot \text{Abs}^3 + e \cdot \text{Abs}^4 + f \cdot \text{Abs}^5$$

	ø 24 mm	□ 10 mm
a	$-3.52432 \cdot 10^{-2}$	$-3.52432 \cdot 10^{-2}$
b	$1.45158 \cdot 10^{+0}$	$3.1209 \cdot 10^{+0}$
c	$-7.19729 \cdot 10^{-2}$	$-3.32695 \cdot 10^{-1}$
d		
e		
f		

Interferences

Removeable Interferences

1. Close the vials with the cap immediately after adding the Vario Molybdate 3 reagent solution, otherwise low readings may result.
2. Occasionally water samples contain forms of silica which reacts very slowly with Molybdate. The nature of these forms is not known. A pre-treatment with Sodium hydrogencarbonate and then with Sulphuric Acid will make these forms reactive to Molybdate (pre-treatment is given in "Standard Methods for the Examination of Water and Wastewater" under "Silica Digestion with Sodium Bicarbonate").



Interference	from / [mg/L]
Fe	large quantities
PO ₄ ³⁻	50
S ²⁻	in all quantities

Method Validation

Limit of Detection	0.01 mg/L
Limit of Quantification	0.03 mg/L
End of Measuring Range	1.6 mg/L
Sensitivity	1.35 mg/L / Abs
Confidence Intervall	0.01 mg/L
Standard Deviation	0.004 mg/L
Variation Coefficient	0.46 %

Derived from

Standard Method 4500-SiO₂ D