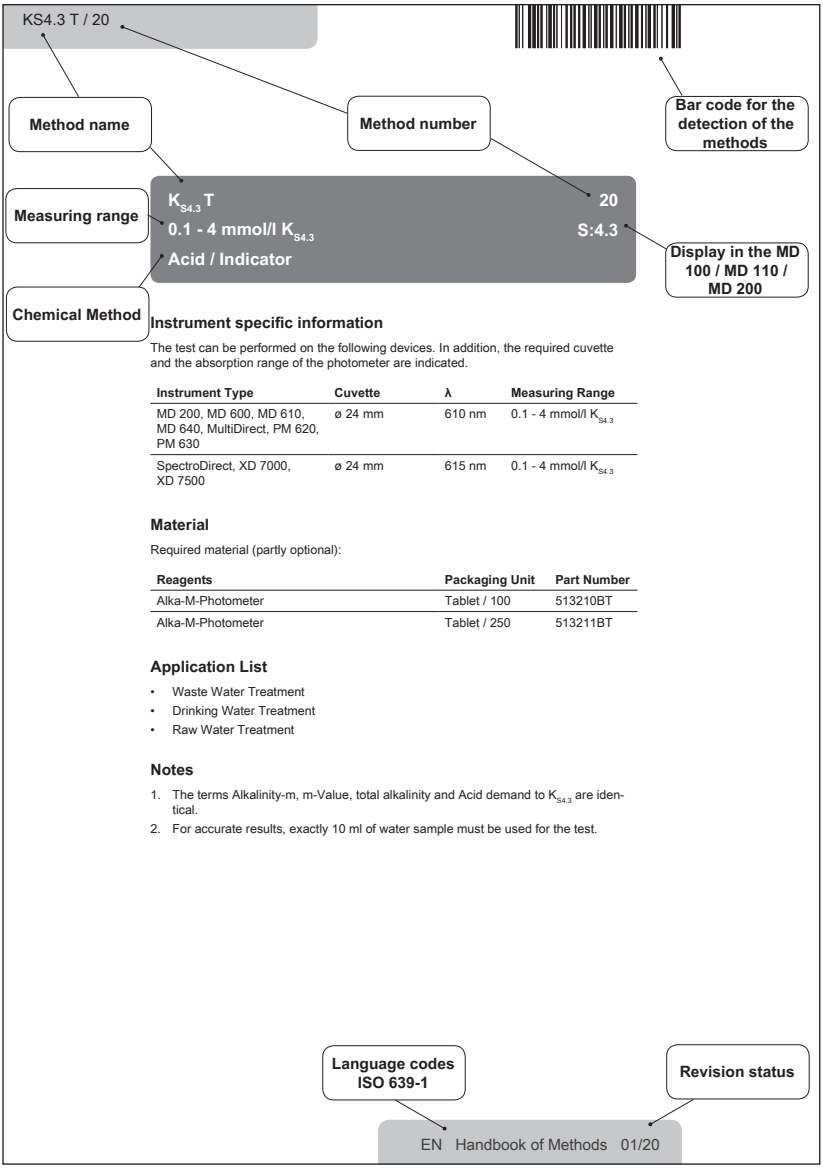
Lovibond® Water Testing

Tintometer® Group

Manual of Methods

MD 100 • MD 110 • MD 200

Silica



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 200, MD 600, MD 610, MD 640, MultiDirect, PM 620, PM 630	ø 24 mm	610 nm	0.1 - 4 mmol/l $K_{S4.3}$
SpectroDirect, XD 7000, XD 7500	ø 24 mm	615 nm	0.1 - 4 mmol/l $K_{S4.3}$

Material

Required material (partly optional):

Reagents	Packaging Unit	Part Number
Alka-M-Photometer	Tablet / 100	513210BT
Alka-M-Photometer	Tablet / 250	513211BT

Application List

- Waste Water Treatment
- Drinking Water Treatment
- Raw Water Treatment

Notes

1. The terms Alkalinity-m, m-Value, total alkalinity and Acid demand to $K_{S4.3}$ are identical.
2. For accurate results, exactly 10 ml of water sample must be used for the test.

Performing test procedure

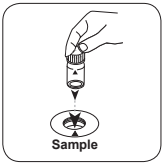
Implementation of the provision Acid capacity $K_{S4.3}$ with Tablet

Select the method on the device

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**.

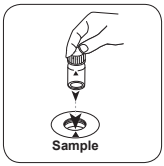
Close vial(s).



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

• • •

Dissolve tablet(s) by inverting.



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

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

The result in Acid Capacity $K_{S4.3}$ appears on the display.

Silicate T **M350**

0.05 - 4 mg/L SiO_2 **Si**

Silicomolybdenum Blue

EN

Material

Required material (partly optional):

Reagents	Packaging Unit	Part Number
Silica No. 1	Tablet / 100	513130BT
Silica No. 1	Tablet / 250	513131BT
Silica No. 2	Tablet / 100	513140BT
Silica No. 2	Tablet / 250	513141BT
Silica PR	Tablet / 100	513150BT
Silica PR	Tablet / 250	513151BT
Set Silica No. 1/No. 2 100 Pc.#	100 each	517671BT
Set Silica No. 1/No. 2 250 Pc.#	250 each	517672BT

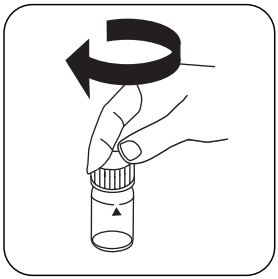
Notes

1. The tablets must be added in the correct sequence.

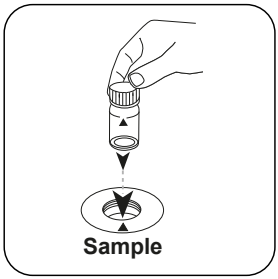
Determination of Silicon Dioxide with Tablet

Select the method on the device.

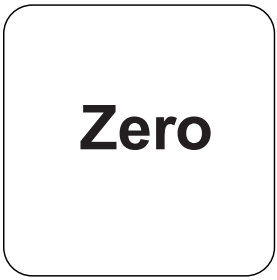
Fill 24 mm vial with **10 mL sample**.



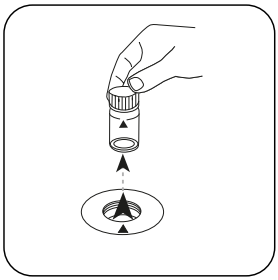
Close vial(s).



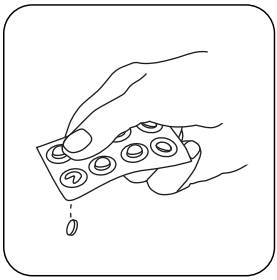
Place **sample vial** in the sample chamber. Pay attention to the positioning.



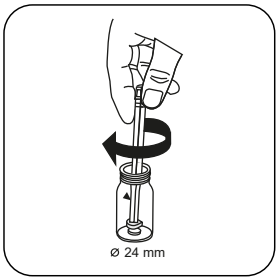
Press the **ZERO** button.



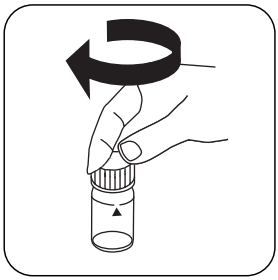
Remove the vial from the sample chamber.



Add **SILICA No. 1 tablet** .

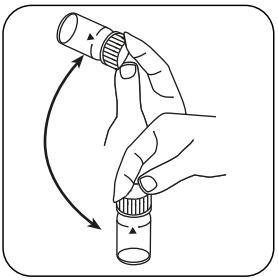


Crush tablet(s) by rotating slightly.

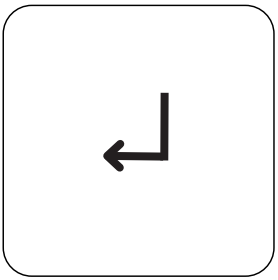


Close vial(s).

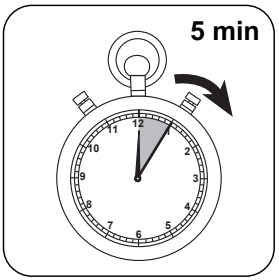
EN



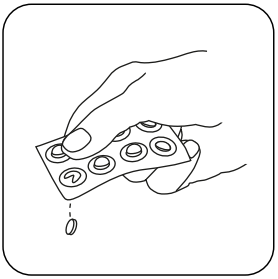
Dissolve tablet(s) by inverting.



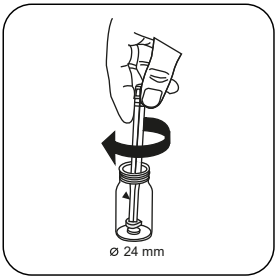
Press the **ENTER** button.



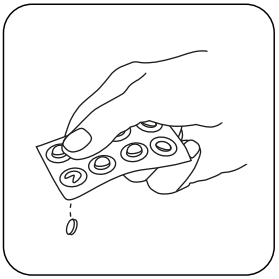
Wait for **5 minute(s) reaction time**.



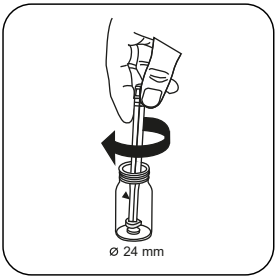
Add **SILICA PR tablet**.



Crush tablet(s) by rotating slightly.

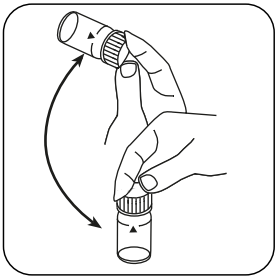


Add **SILICA No. 2 tablet** .

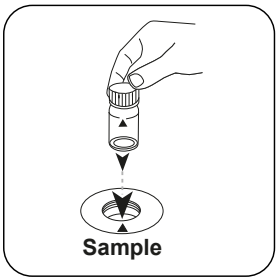


Crush tablet(s) by rotating slightly.

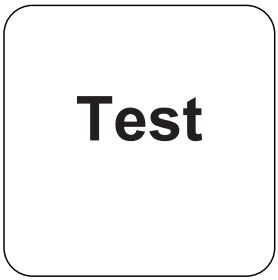
Close vial(s).



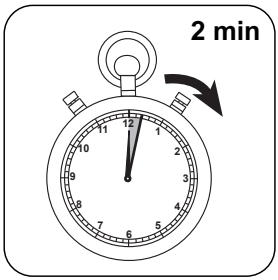
Dissolve tablet(s) by inverting.



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 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

EN

Chemical Method

Silicomolybdenum Blue

Appendix

Interferences

Removeable Interferences

- Phosphate does not interfere under the reaction conditions.

Derived from

Standard Method 4500-SiO2 C

including stirring rod, 10 cm

Silicate LR PP **M351**

0.1 - 1.6 mg/L SiO_2 **SiLr**

Heteropolyblue

EN

Material

Required material (partly optional):

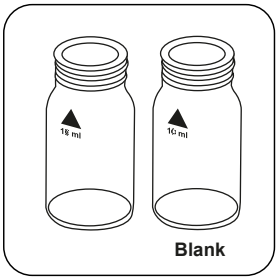
Reagents	Packaging Unit	Part Number
VARIO Silica LR, Set F10	1 Set	535690

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.

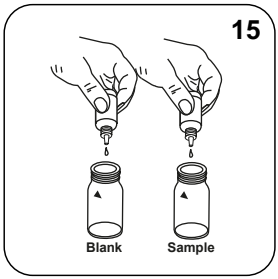
Determination of Silicon dioxide LR with Vario Powder Packs and liquid reagent

Select the method on the device.

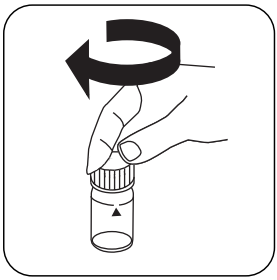


Prepare two clean 24 mm vials. Mark one as a blank.

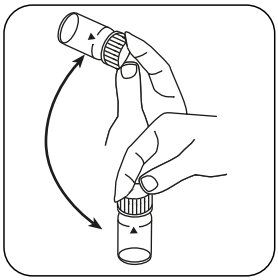
Place **10 mL sample** in each vial.



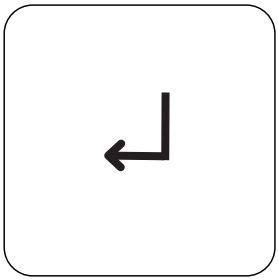
Add **15 drops Vario Molybdate 3 Reagenz-solution** to each vial.



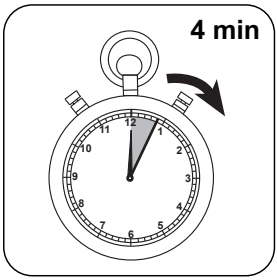
Close vial(s).



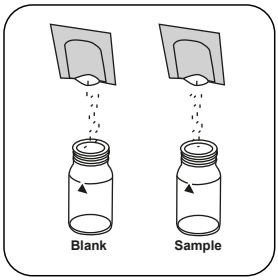
Invert several times to mix the contents.



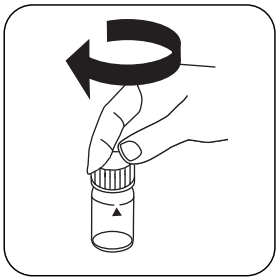
Press the **ENTER** button.



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



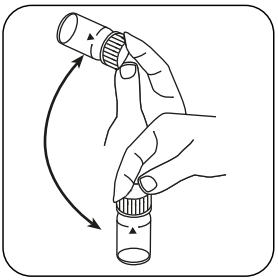
Add **a Vario Silica Citric Acid F10 powder pack** in each vial.



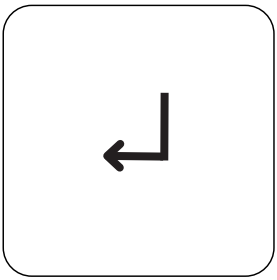
Close vial(s).

EN

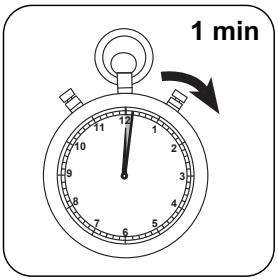
EN



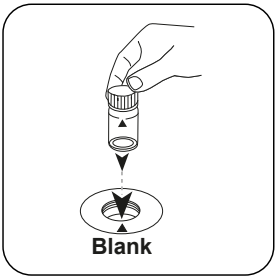
Swirl around to dissolve the powder.



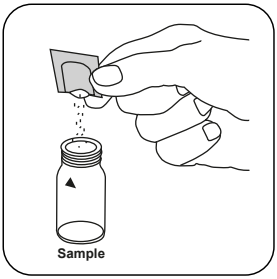
Press the **ENTER** button.



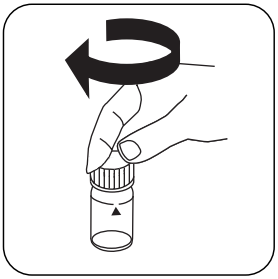
Wait for **1 minute(s) reaction time**.



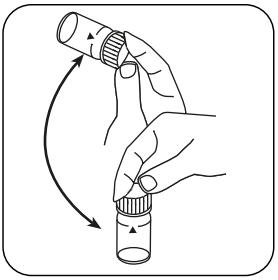
Place **blank** in the sample chamber. Pay attention to the positioning.



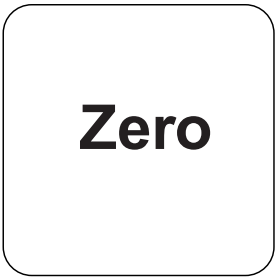
Add a **Vario Silica Amino Acid F10 powder pack** to the sample vial.



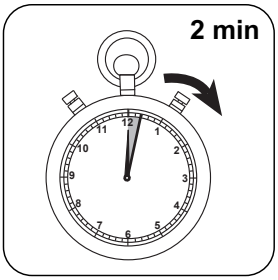
Close vial(s).



Swirl around to dissolve the powder.

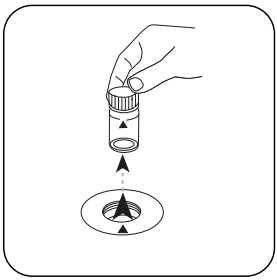


Press the **ZERO** button.

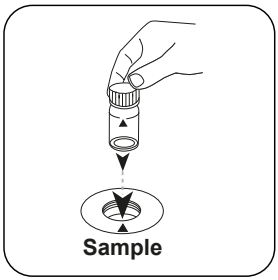


Wait for **2 minute(s) reaction time**.

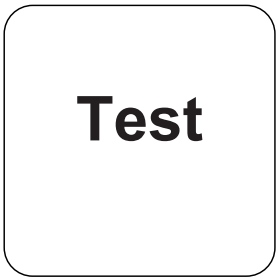
Once the reaction period is finished, the measurement takes place automatically.



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

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

Silicate HR PP **M352**

1 - 90 mg/L SiO_2 **SiHr**

Silicomolybdate

EN

Material

Required material (partly optional):

Reagents	Packaging Unit	Part Number
VARIO Silica HR Reagent, Set F10	1 Set	535700

Preparation

1. The temperature of the sample should be between 15 °C and 25 °C.

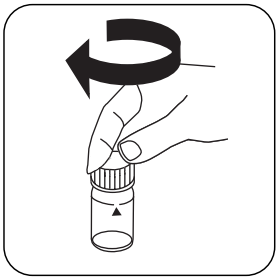
Notes

1. The method measures in the flank of the absorption curve of the resulting coloration. For filter photometers, the accuracy of the method can therefore be improved, if necessary, by user adjustment using a silicate standard (approx. 70 mg/L SiO_2).

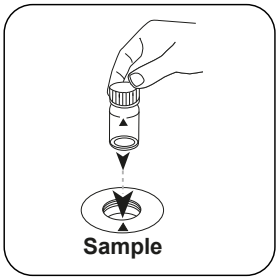
Determination of Silicate dioxide HR with Vario Powder Packs

Select the method on the device.

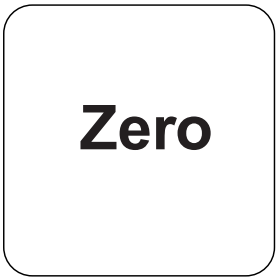
Fill 24 mm vial with **10 mL sample**.



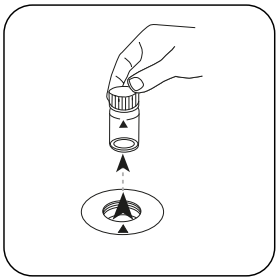
Close vial(s).



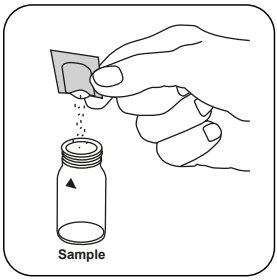
Place **sample vial** in the sample chamber. Pay attention to the positioning.



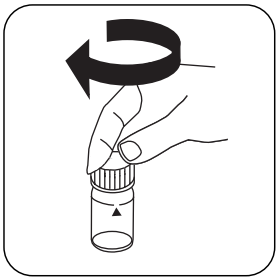
Press the **ZERO** button.



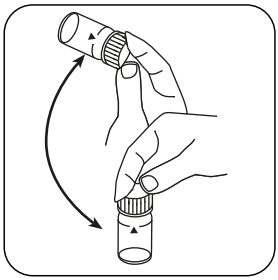
Remove the vial from the sample chamber.



Add **Vario Silica HR Molybdate F10 powder pack**.



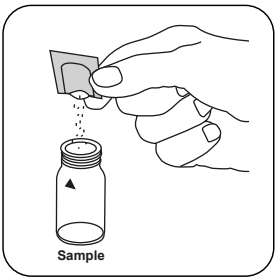
Close vial(s).



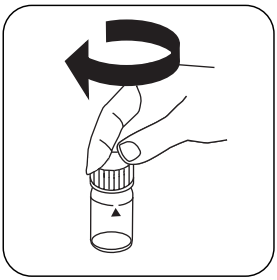
Swirl around to dissolve the powder.

EN

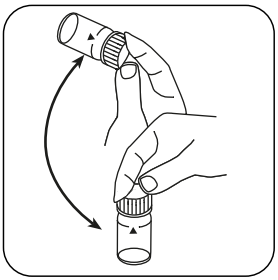
EN



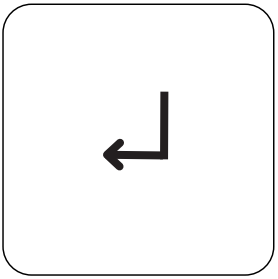
Add **Vario Silica HR Acid Rgt. F10 powder pack**.



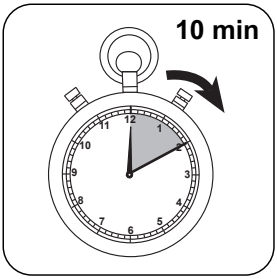
Close vial(s).



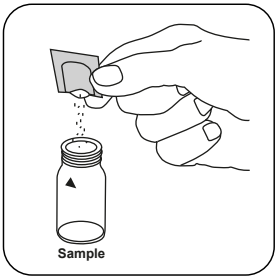
Invert several times to mix the contents.



Press the **ENTER** button.

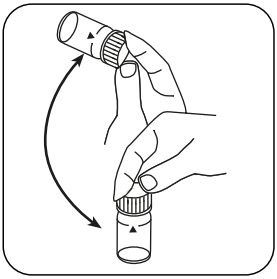


Wait for **10 minute(s) reaction time**.

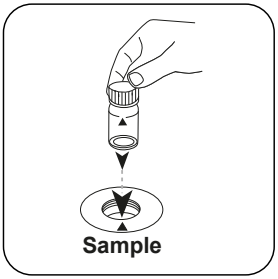


Add **Vario Silica Citric Acid F10 powder pack**.

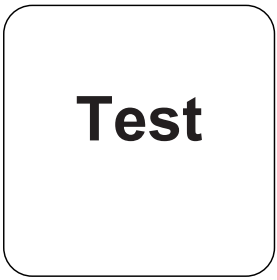
Close vial(s).

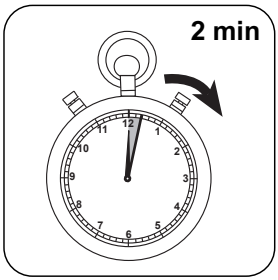


Swirl around to dissolve the powder.



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 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

Silicomolybdate

Appendix

Interferences

Removeable Interferences

- 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”).
- If silicon dioxide or phosphate are present, a yellow colour develops. The yellow colour caused by phosphate is eliminated by the addition of silica citric acid F10 powder packets.

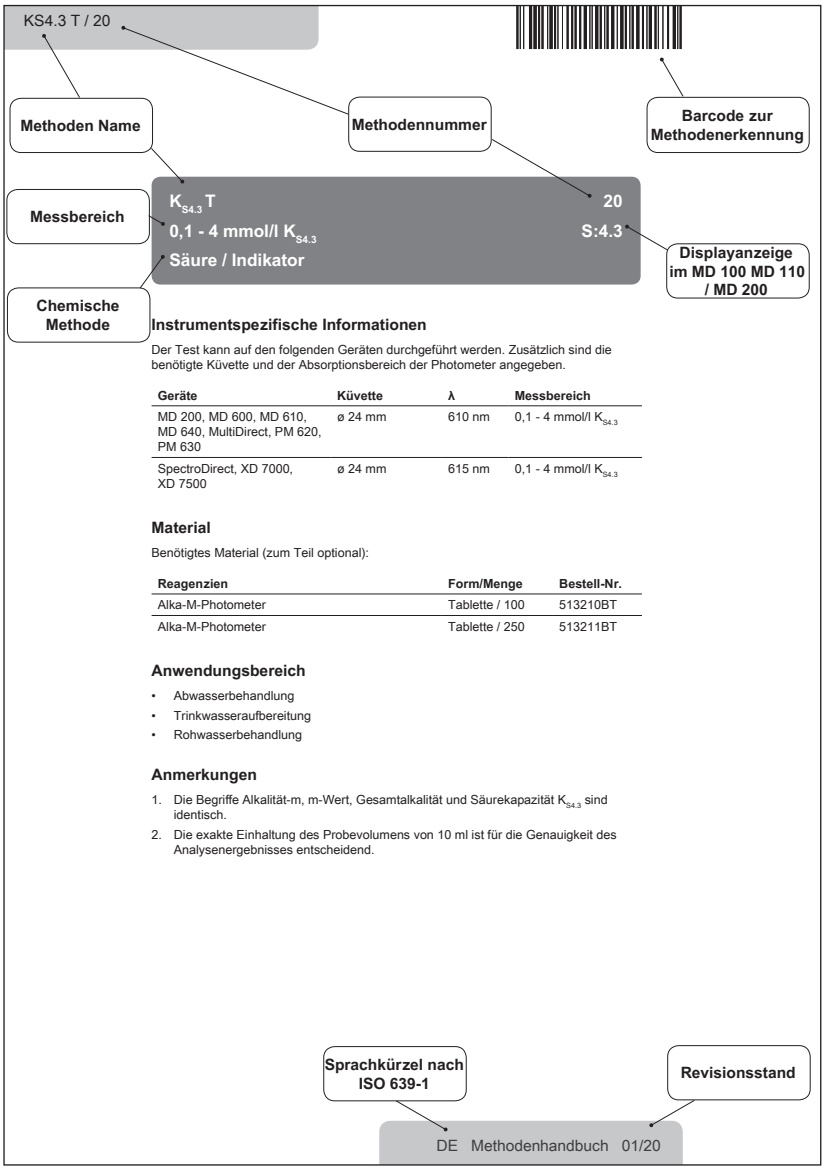
Interference	from / [mg/L]	Influence
Fe	large quantities	
PO_4^{3-}	50	
PO_4^{3-}	60	The disturbance is about -2 %
PO_4^{3-}	75	The disturbance is about -11 %
S^{2-}	in all quantities	

Method Validation

Limit of Detection	0.38 mg/L
Limit of Quantification	1.14 mg/L
End of Measuring Range	100 mg/L
Sensitivity	120 mg/L / Abs
Confidence Intervall	1.69 mg/L
Standard Deviation	0.70 mg/L
Variation Coefficient	1.38 %

Derived from

Standard Method 4500-SiO2 C



Instrumentspezifische Informationen

Der Test kann auf den folgenden Geräten durchgeführt werden. Zusätzlich sind die benötigte Küvette und der Absorptionsbereich der Photometer angegeben.

Geräte	Küvette	λ	Messbereich
MD 200, MD 600, MD 610, MD 640, MultiDirect, PM 620, PM 630	ø 24 mm	610 nm	0,1 - 4 mmol/l $K_{S4.3}$
SpectroDirect, XD 7000, XD 7500	ø 24 mm	615 nm	0,1 - 4 mmol/l $K_{S4.3}$

Material

Benötigtes Material (zum Teil optional):

Reagenzien	Form/Menge	Bestell-Nr.
Alka-M-Photometer	Tablette / 100	513210BT
Alka-M-Photometer	Tablette / 250	513211BT

Anwendungsbereich

- Abwasserbehandlung
- Trinkwasseraufbereitung
- Rohwasserbehandlung

Anmerkungen

1. Die Begriffe Alkalität-m, m-Wert, Gesamtalkalität und Säurekapazität $K_{S4.3}$ sind identisch.
2. Die exakte Einhaltung des Probevolumens von 10 ml ist für die Genauigkeit des Analysenergebnisses entscheidend.

Durchführung der Messung

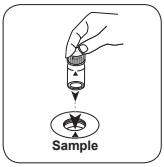
Durchführung der Bestimmung Säurekapazität $K_{S4.3}$ mit Tablette

Die Methode im Gerät auswählen.

Für diese Methode muss bei folgenden Geräten keine ZERO-Messung durchgeführt werden: XD 7000, XD 7500

24-mm-Küvette mit **10 ml Probe** füllen.

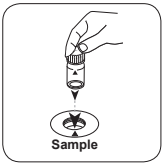
Küvette(n) verschließen.



Die **Probenküvette** in den Messschacht stellen. Positionierung beachten.

• • •

Tablette(n) durch Umschwenken lösen.



Die **Probenküvette** in den Messschacht stellen. Positionierung beachten.

Taste **TEST** (XD: **START**) drücken.

In der Anzeige erscheint das Ergebnis als Säurekapazität $K_{S4.3}$.

Silikat T **M350**

0,05 - 4 mg/L SiO_2 **Si**

Siliciummolybdänblau

DE

Material

Benötigtes Material (zum Teil optional):

Reagenzien	Form/Menge	Bestell-Nr.
Silica No. 1	Tablette / 100	513130BT
Silica No. 1	Tablette / 250	513131BT
Silica No. 2	Tablette / 100	513140BT
Silica No. 2	Tablette / 250	513141BT
Silica PR	Tablette / 100	513150BT
Silica PR	Tablette / 250	513151BT
Set Silica No. 1/No. 2#	je 100	517671BT
Set Silica No. 1/No. 2#	je 250	517672BT

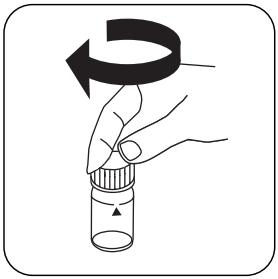
Anmerkungen

1. Die Reihenfolge der Tablettenzugabe ist unbedingt einzuhalten.

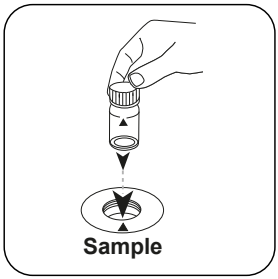
Durchführung der Bestimmung Siliciumdioxid mit Tablette

Die Methode im Gerät auswählen.

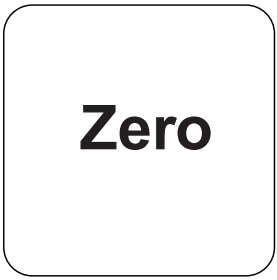
24-mm-Küvette mit **10 mL Probe** füllen.



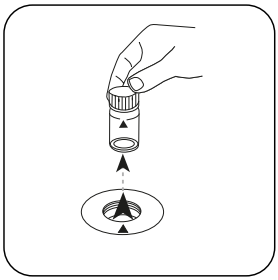
Küvette(n) verschließen.



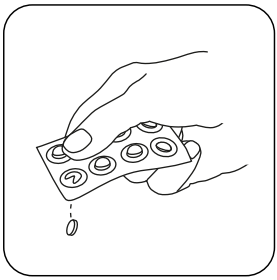
Die **Probenküvette** in den Messschacht stellen. Positionierung beachten.



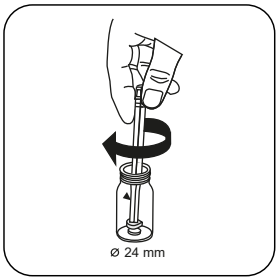
Taste **ZERO** drücken.



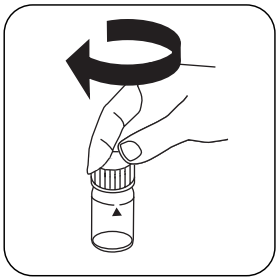
Küvette aus dem Messschacht nehmen.



Eine **SILICA No. 1 Tablette** zugeben.

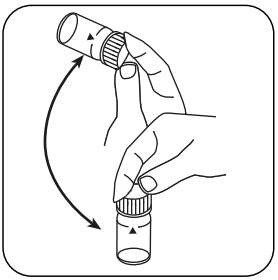


Tablette(n) unter leichter Drehung zerdrücken.

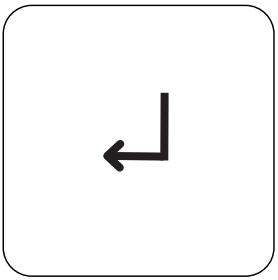


Küvette(n) verschließen.

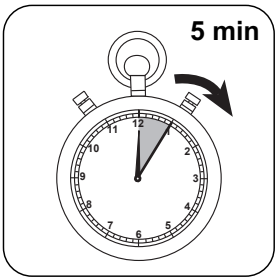
DE



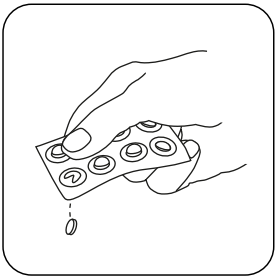
Tablette(n) durch Umschwenken lösen.



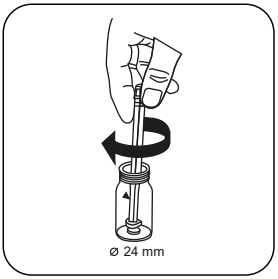
Taste **ENTER** drücken.



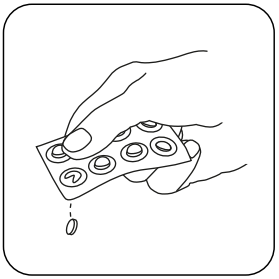
5 Minute(n) Reaktionszeit abwarten.



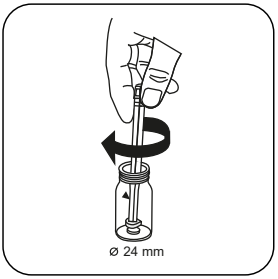
Eine **SILICA PR Tablette** zugeben.



Tablette(n) unter leichter Drehung zerdrücken.

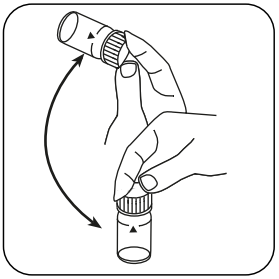


Eine **SILICA No. 2 Tablette** zugeben.

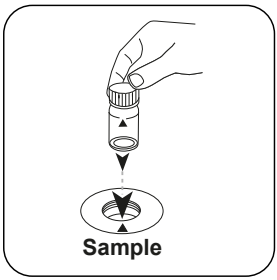


Tablette(n) unter leichter Drehung zerdrücken.

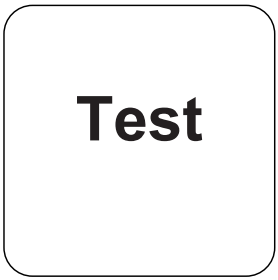
Küvette(n) verschließen.



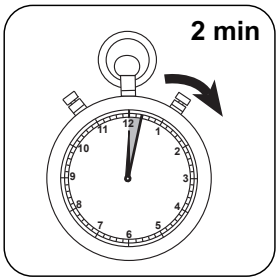
Tablette(n) durch Umschwenken lösen.



Die **Probenküvette** in den Messschacht stellen. Positionierung beachten.



Taste **TEST** (XD: **START**) drücken.



2 Minute(n) Reaktionszeit abwarten.

Nach Ablauf der Reaktionszeit erfolgt automatisch die Messung.

In der Anzeige erscheint das Ergebnis in mg/L Siliciumdioxid.

Auswertung

Die folgende Tabelle gibt an wie die ausgegebenen Werte in andere Zitierformen umgewandelt werden können.

Einheit	Zitierform	Umrechnungsfaktor
mg/l	SiO_2	1
mg/l	Si	0.47

Chemische Methode

Siliciummolybdänblau

Appendix

Störungen

Ausschließbare Störungen

- Phosphate stören unter den gegebenen Reaktionsbedingungen nicht.

Abgeleitet von

Standard Method 4500-SiO2 C

inklusive Rührstab

Silikat LR PP **M351**

0,1 - 1,6 mg/L SiO_2 **SiLr**

Heteropolyblau

DE

Material

Benötigtes Material (zum Teil optional):

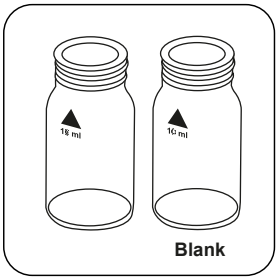
Reagenzien	Form/Menge	Bestell-Nr.
VARIO Silica LR, F10 Set	1 Satz	535690

Anmerkungen

1. Die angegebene Reaktionszeit von 4 Minuten bezieht sich auf eine Probentemperatur von 20 °C. Für 30 °C ist eine Reaktionszeit von 2 Minuten, für 10 °C ist eine Reaktionszeit von 8 Minuten einzuhalten.

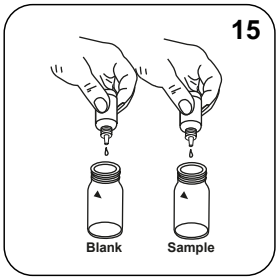
Durchführung der Bestimmung Siliciumdioxid LR mit Vario Pulverpäckchen und Flüssigreagenz

Die Methode im Gerät auswählen.

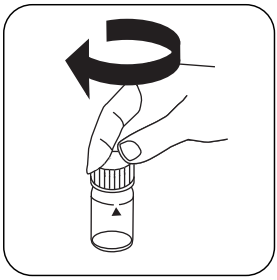


Zwei saubere 24-mm-Küvetten bereitstellen. Eine als Nullküvette kennzeichnen.

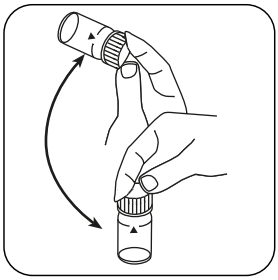
In jede Küvette **10 mL Probe** geben.



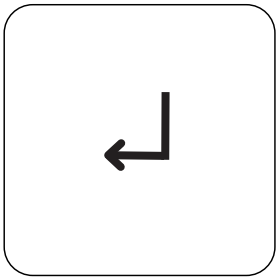
In jede Küvette **15 Tropfen Vario Molybdate 3 Reagenz- Lösung** geben.



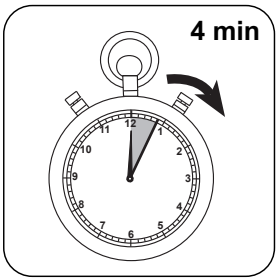
Küvette(n) verschließen.



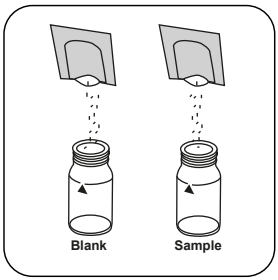
Inhalt durch Umschwenken mischen.



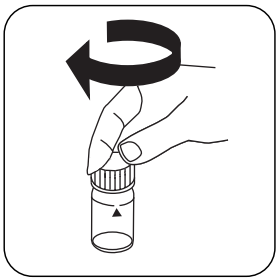
Taste **ENTER** drücken.



4 Minute(n) Reaktionszeit abwarten.

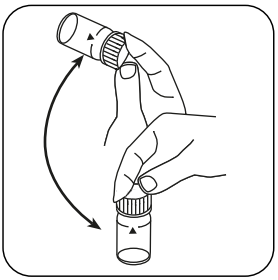


In jede Küvette **ein Vario Silica Citric Acid F10 Pulverpäckchen** geben.

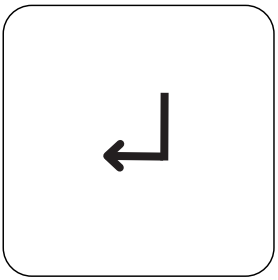


Küvette(n) verschließen.

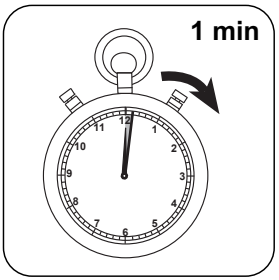
DE



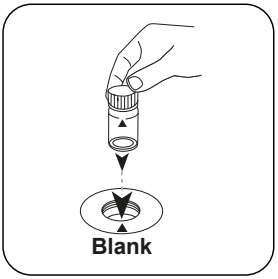
Das Pulver durch Umschwenken lösen.



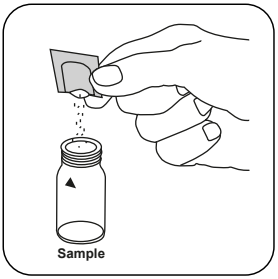
Taste **ENTER** drücken.



1 Minute(n) Reaktionszeit abwarten.

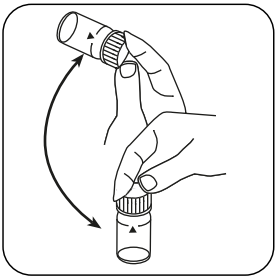


Die **Nullküvette** in den Messschacht stellen. Positionierung beachten.

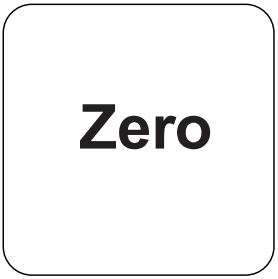


Der Probenküvette ein **Vario Silica Amino Acid F10 Pulverpäckchen** zugeben.

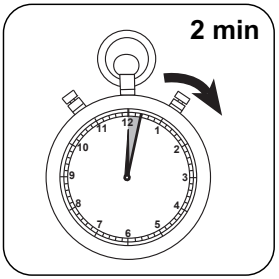
Küvette(n) verschließen.



Das Pulver durch Umschwenken lösen.

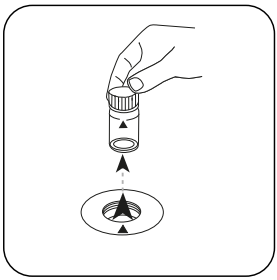


Taste **ZERO** drücken.

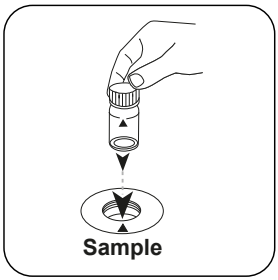


2 Minute(n) Reaktionszeit abwarten.

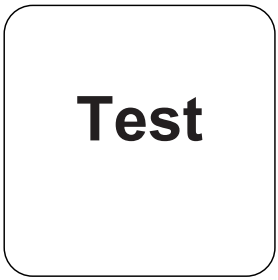
Nach Ablauf der Reaktionszeit erfolgt automatisch die Messung.



Küvette aus dem Messschacht nehmen.



Die **Probenküvette** in den Messschacht stellen. Positionierung beachten.



Taste **TEST** (XD: **START**) drücken.

In der Anzeige erscheint das Ergebnis in mg/L Siliciumdioxid.

Auswertung

Die folgende Tabelle gibt an wie die ausgegebenen Werte in andere Zitierformen umgewandelt werden können.

Einheit	Zitierform	Umrechnungsfaktor
mg/l	SiO_2	1
mg/l	Si	0.47

Chemische Methode

Heteropolyblau

Appendix

Störungen

Ausschließbare Störungen

1. Die Küvetten müssen sofort nach Zugabe der Vario Molybdate 3 Reagenzlösung mit dem Küvettendeckel verschlossen werden, da es sonst zu Minderbefunden kommen kann.
2. Gelegentlich enthalten Wasserproben Formen von Kieselsäuren, die sehr langsam mit Molybdat reagieren. Die genaue Art dieser Formen ist derzeit nicht bekannt. Durch eine Vorbehandlung mit Natriumhydrogencarbonat und anschließend mit Schwefelsäure können diese in reaktionsfreudige Formen umgewandelt werden (Beschreibung in "Standard Methods for the Examination of Water and Wastewater" unter "Silica-Digenstion with Sodium Bicarbonate").

Störung	Stört ab / [mg/L]
Fe	große Mengen
PO_4^{3-}	50
S^{2-}	in allen Mengen

Methodenvalidierung

Nachweisgrenze	0.01 mg/L
Bestimmungsgrenze	0.03 mg/L
Messbereichsende	1.6 mg/L
Empfindlichkeit	1.35 mg/L / Abs
Vertrauensbereich	0.01 mg/L
Verfahrensstandardabweichung	0.004 mg/L
Verfahrensvariationskoeffizient	0.46 %

Abgeleitet von

Standard Method 4500-SiO2 D

Silikat HR PP **M352**

1 - 90 mg/L SiO_2 **SiHr**

Silicomolybdat

DE

Material

Benötigtes Material (zum Teil optional):

Reagenzien	Form/Menge	Bestell-Nr.
VARIO Silica HR Reagenz, Set F10	1 Satz	535700

Vorbereitung

1. Die Probentemperatur muss zwischen 15 °C und 25 °C liegen.

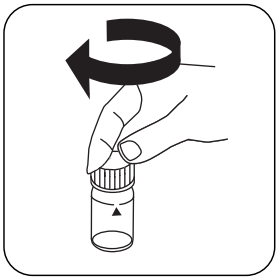
Anmerkungen

1. Die Methode misst in der Flanke der Absorptionskurve der entstehenden Färbung. Bei Filterphotometern kann daher bei Bedarf die Genauigkeit der Methode durch eine Anwenderjustierung mittels eines Silikat-Standards (ca. 70 mg/L SiO_2) verbessert werden.

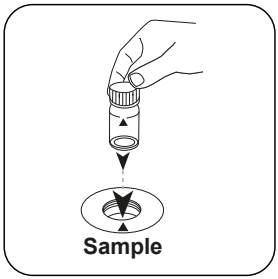
Durchführung der Bestimmung Siliciumdioxid HR mit Vario Pulverpäckchen

Die Methode im Gerät auswählen.

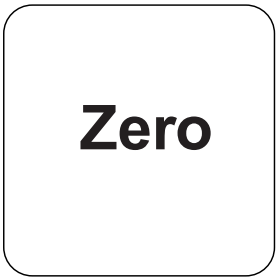
24-mm-Küvette mit **10 mL Probe** füllen.



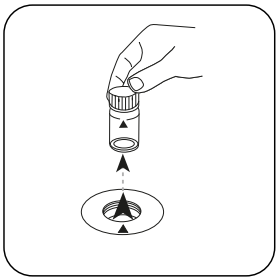
Küvette(n) verschließen.



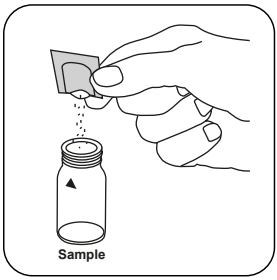
Die **Probenküvette** in den Messschacht stellen. Positionierung beachten.



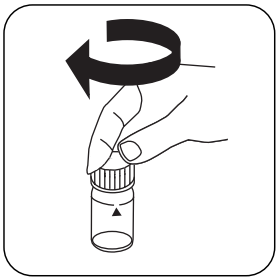
Taste **ZERO** drücken.



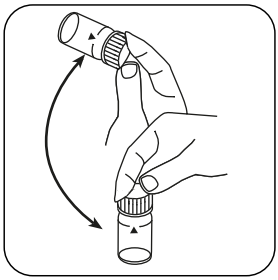
Küvette aus dem Messschacht nehmen.



Ein **Vario Silica HR Molybdate F10 Pulverpäckchen** zugeben.

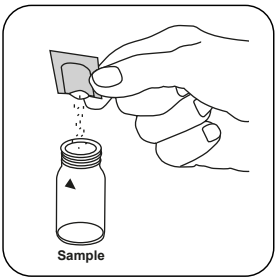


Küvette(n) verschließen.

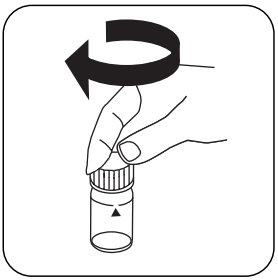


Das Pulver durch Umschwenken lösen.

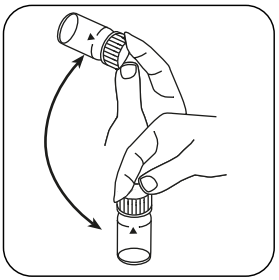
DE



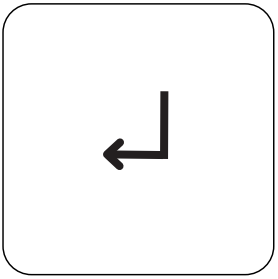
Ein **Vario Silica HR Acid Rgt. F10 Pulverpäckchen** zugeben.



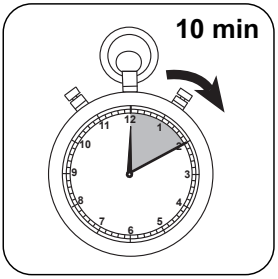
Küvette(n) verschließen.



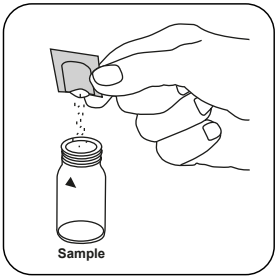
Inhalt durch Umschwenken mischen.



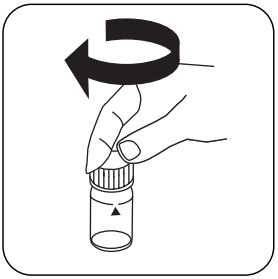
Taste **ENTER** drücken.



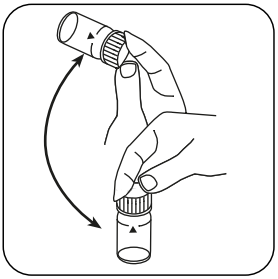
10 Minute(n) Reaktionszeit abwarten.



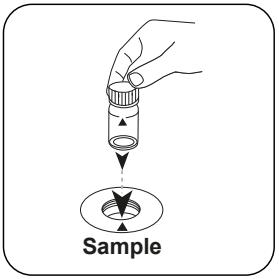
Ein **Vario Silica Citric Acid F10 Pulverpäckchen** zugeben.



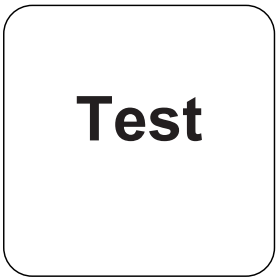
Küvette(n) verschließen.

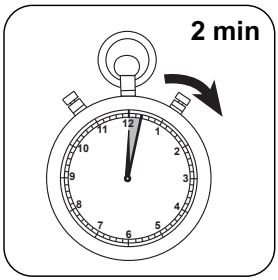


Das Pulver durch Umschwenken lösen.



Die **Probenküvette** in den Messschacht stellen. Positionierung beachten.





Taste **TEST** (XD: **START**) drücken.

2 Minute(n) Reaktionszeit abwarten.

Nach Ablauf der Reaktionszeit erfolgt automatisch die Messung.

In der Anzeige erscheint das Ergebnis in mg/L Siliciumdioxid.

Auswertung

Die folgende Tabelle gibt an wie die ausgegebenen Werte in andere Zitierformen umgewandelt werden können.

Einheit	Zitierform	Umrechnungsfaktor
mg/l	SiO_2	1
mg/l	Si	0.47

Chemische Methode

Silicomolybdat

Appendix

Störungen

Ausschließbare Störungen

- Gelegentlich enthalten Wasserproben Formen von Kieselsäuren, die sehr langsam mit Molybdat reagieren. Die genaue Art dieser Formen ist derzeit nicht bekannt. Durch eine Vorbehandlung mit Natriumhydrogencarbonat und anschließend mit Schwefelsäure können diese in reaktionsfreudige Formen umgewandelt werden (Beschreibung in "Standard Methods for the Examination of Water and Wastewater" unter "Silica-Digenstion with Sodium Bicarbonate").
- Sind Siliciumdioxid oder Phosphat vorhanden, entwickelt sich eine gelbe Farbe. Durch die Zugabe des Silica Citric Acid F10 Pulverpäckchens wird die durch Phosphat entstandene gelbe Farbe beseitigt.

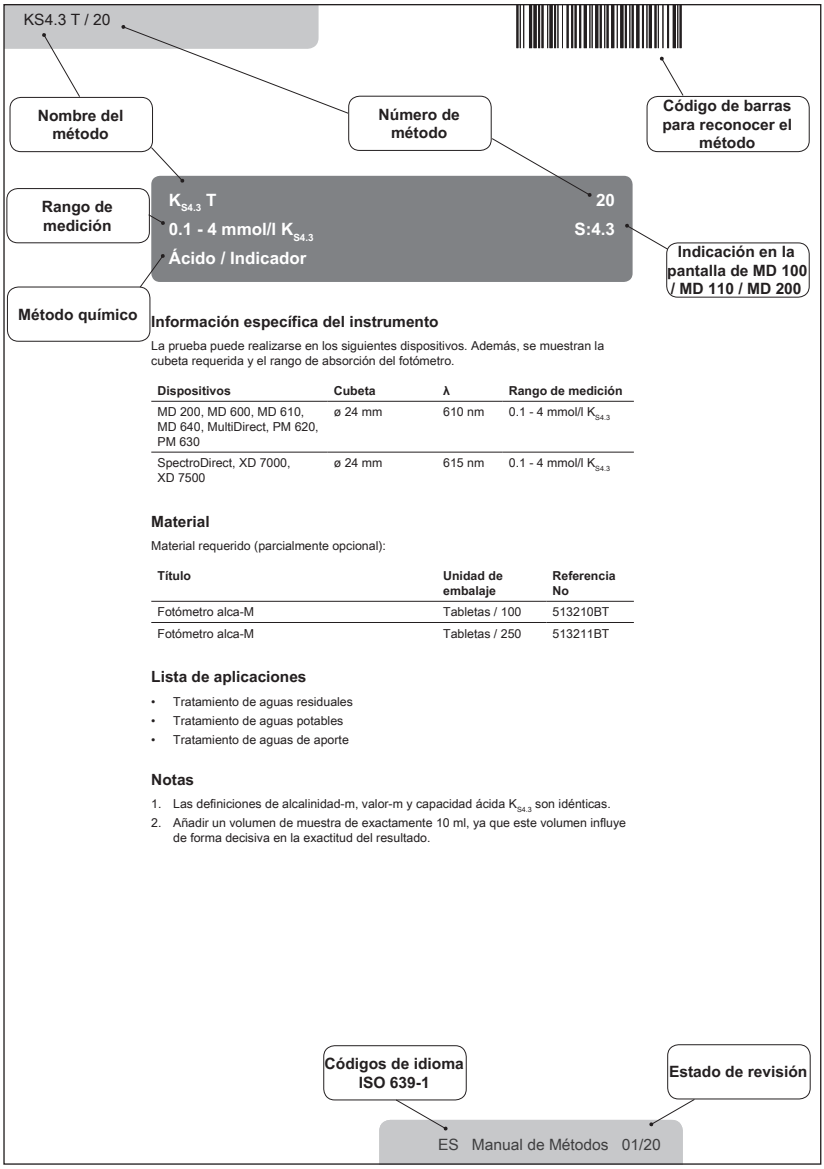
Störung	Stört ab / [mg/L]	Einfluss
Fe	große Mengen	
PO_4^{3-}	50	
PO_4^{3-}	60	Die Störung beträgt etwa -2 %
PO_4^{3-}	75	Die Störung beträgt etwa -11 %
S^{2-}	in allen Mengen	

Methodenvalidierung

Nachweisgrenze	0.38 mg/L
Bestimmungsgrenze	1.14 mg/L
Messbereichsende	100 mg/L
Empfindlichkeit	120 mg/L / Abs
Vertrauensbereich	1.69 mg/L
Verfahrensstandardabweichung	0.70 mg/L
Verfahrensvariationskoeffizient	1.38 %

Abgeleitet von

Standard Method 4500-SiO2 C


KS4.3 T / 20
Nombre del método
Número de método
Código de barras para reconocer el método
Rango de medición
$K_{S4.3}$ T
20
0.1 - 4 mmol/l $K_{S4.3}$
S:4.3
Ácido / Indicador
Indicación en la pantalla de MD 100 / MD 110 / MD 200
Método químico
Información específica del instrumento
La prueba puede realizarse en los siguientes dispositivos. Además, se muestran la cubeta requerida y el rango de absorción del fotómetro.
Dispositivos | Cubeta | λ | Rango de medición
MD 200, MD 600, MD 610, MD 640, MultiDirect, PM 620, PM 630 | ø 24 mm | 610 nm | 0.1 - 4 mmol/l $K_{S4.3}$
SpectroDirect, XD 7000, XD 7500 | ø 24 mm | 615 nm | 0.1 - 4 mmol/l $K_{S4.3}$
Material
Material requerido (parcialmente opcional):
Título | Unidad de embalaje | Referencia No
Fotómetro alca-M | Tabletas / 100 | 513210BT
Fotómetro alca-M | Tabletas / 250 | 513211BT
Lista de aplicaciones
• Tratamiento de aguas residuales
• Tratamiento de aguas potables
• Tratamiento de aguas de aporte
Notas
1. Las definiciones de alcalinidad-m, valor-m y capacidad ácida $K_{S4.3}$ son idénticas.
2. Añadir un volumen de muestra de exactamente 10 ml, ya que este volumen influye de forma decisiva en la exactitud del resultado.
Códigos de idioma ISO 639-1
Estado de revisión
ES Manual de Métodos 01/20

Realización de la determinación

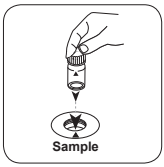
Ejecución de la determinación Capacidad ácida $K_{S4.3}$ con tableta

Seleccionar el método en el aparato.

Para este método no es necesario realizar medición CERO en los aparatos siguientes:
XD 7000, XD 7500

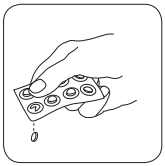
Llenar la cubeta de 24 mm con **10 ml de muestra** .

Cerrar la(s) cubeta(s).

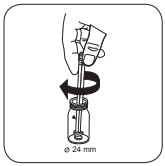


Poner la **cubeta de muestra** en el compartimiento de medición. ¡Debe tenerse en cuenta el posicionamiento!

• • •



Añadir **tableta ALKA-M-PHOTOMETER**.



Triturar la(s) tableta(s) girando ligeramente.

Cerrar la(s) cubeta(s).

Silicato T **M350**

0.05 - 4 mg/L SiO_2 **Si**

Silicomolibdeno azul

ES

Material

Material requerido (parcialmente opcional):

Reactivos	Unidad de embalaje	No. de referencia
Sílice nº 1	Tabletas / 100	513130BT
Sílice nº 1	Tabletas / 250	513131BT
Sílice nº 2	Tabletas / 100	513140BT
Sílice nº 2	Tabletas / 250	513141BT
Sílice PR	Tabletas / 100	513150BT
Sílice PR	Tabletas / 250	513151BT
Juego sílice nº 1/nº 2#	100 cada	517671BT
Juego sílice nº 1/nº 2#	250 cada	517672BT

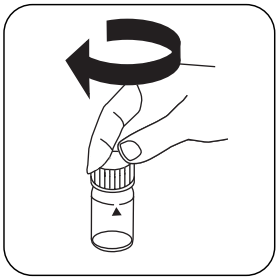
Notas

1. Debe seguirse estrictamente el orden de adición de las tabletas.

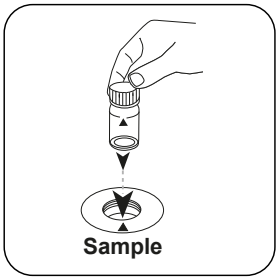
Ejecución de la determinación Dióxido de silicio con tableta

Seleccionar el método en el aparato.

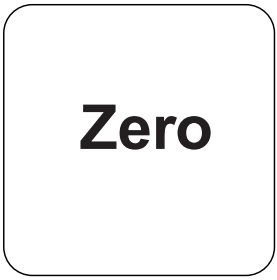
Llenar la cubeta de 24 mm con **10 mL de muestra** .



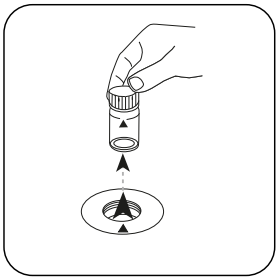
Cerrar la(s) cubeta(s).



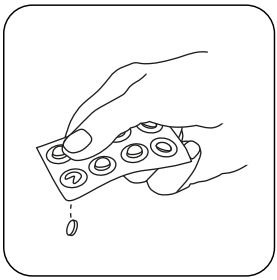
Poner la **cubeta de muestra** en el compartimiento de medición. ¡Debe tenerse en cuenta el posicionamiento!



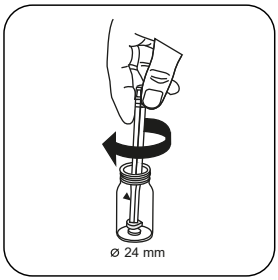
Pulsar la tecla **ZERO**.



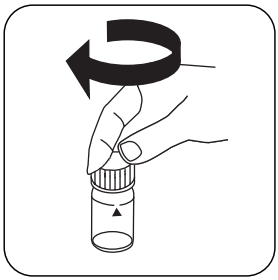
Extraer la cubeta del compartimiento de medición.



Añadir **tableta SILICA No. 1**.

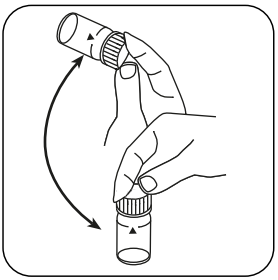


Triturar la(s) tableta(s) girando ligeramente.

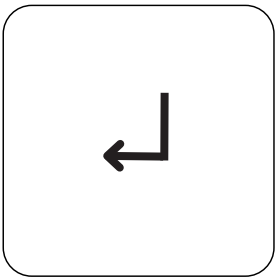


Cerrar la(s) cubeta(s).

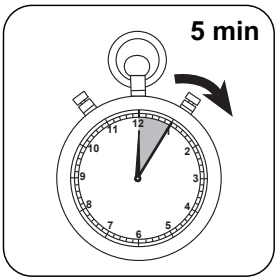
ES



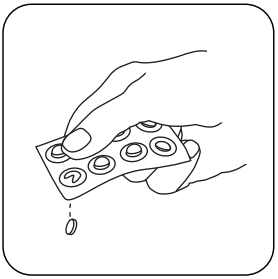
Disolver la(s) tableta(s) girando.



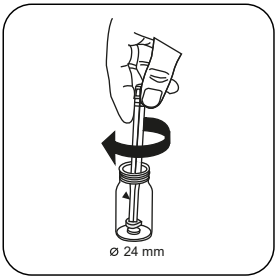
Pulsar la tecla **ENTER**.



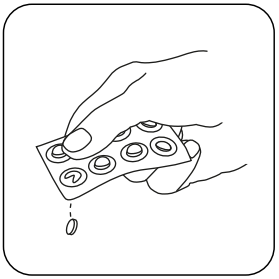
Esperar **5 minutos como periodo de reacción**.



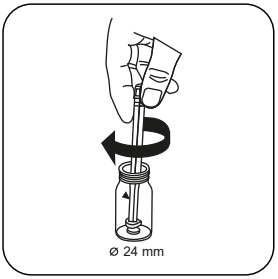
Añadir **tableta SILICA PR**.



Triturar la(s) tableta(s) girando ligeramente.

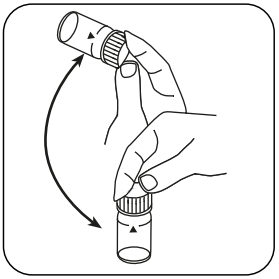


Añadir **tableta SILICA No. 2**.

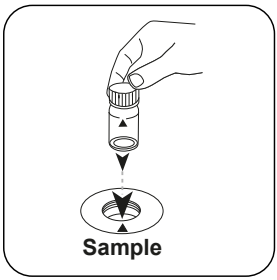


Triturar la(s) tableta(s) girando ligeramente.

Cerrar la(s) cubeta(s).



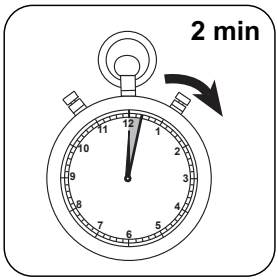
Disolver la(s) tableta(s) girando.



Poner la **cubeta de muestra** en el compartimiento de medición. ¡Debe tenerse en cuenta el posicionamiento!

Test

Pulsar la tecla **TEST** (XD: **START**).



Esperar **2 minutos como periodo de reacción**.

Finalizado el periodo de reacción se realizará la determinación automáticamente.

A continuación se visualizará el resultado en mg/L dióxido de silicio.

Evaluación

La siguiente tabla muestra cómo los valores de salida se pueden convertir a otros formularios de citas.

Unidad	Conversión	Factor de conversión
mg/l	SiO_2	1
mg/l	Si	0.47

Método químico

Silicomolibdeno azul

Apéndice

Interferencia

Interferencias extraibles

- Los fosfatos no producen perturbaciones bajo estas condiciones de reacción.

Derivado de

Método estándar 4500-SiO2 C

Silicato LR PP **M351**

0.1 - 1.6 mg/L SiO_2 **SiLr**

Heteropoliazul

ES

Material

Material requerido (parcialmente opcional):

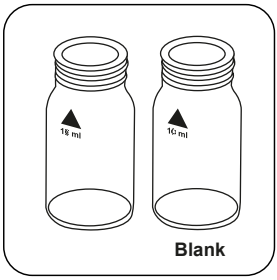
Reactivos	Unidad de embalaje	No. de referencia
Sílice LR, juego F10 VARIO	1 Set	535690

Notas

1. El tiempo de reacción indicado de 4 minutos se refiere a una temperatura de muestra de 20 °C. Para 30 °C se deberá mantener un tiempo de reacción de 2 minutos, para 10 °C 8 minutos.

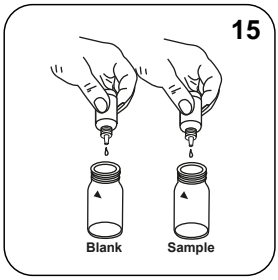
Ejecución de la determinación Dióxido de silicio LR con sobres de polvos Vario y reactivo líquido

Seleccionar el método en el aparato.

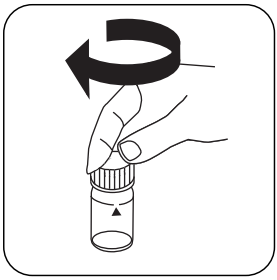


Preparar dos cubetas limpias de 24 mm. Identificar una como cubeta en blanco.

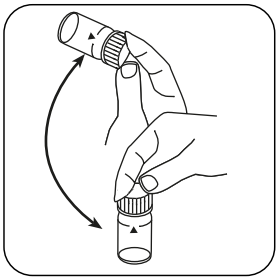
Añadir en cada cubeta **10 mL de muestra**.



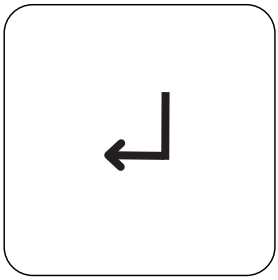
Añadir en cada cubeta **15 gotas de solución Vario Molybdate 3 Reagenz-** .



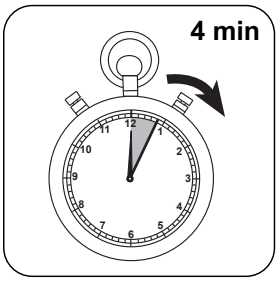
Cerrar la(s) cubeta(s).



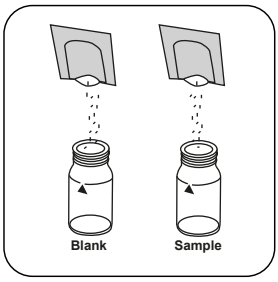
Mezclar el contenido girando.



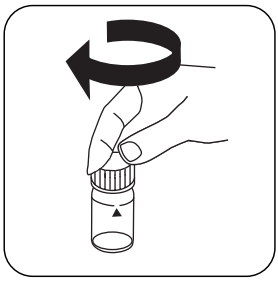
Pulsar la tecla **ENTER**.



Esperar **4 minutos como periodo de reacción**.

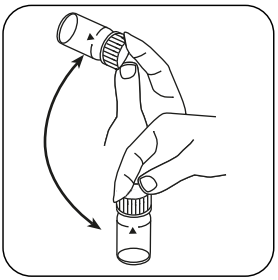


Añadir **un sobre de polvos de Vario Silica Citric Acid F10** en cada cubeta.

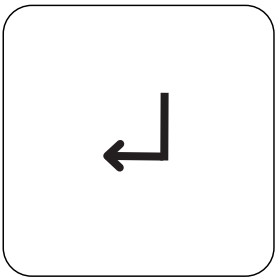


Cerrar la(s) cubeta(s).

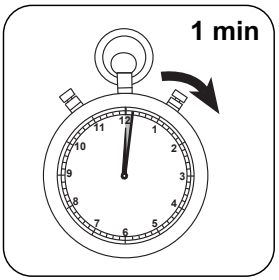
ES



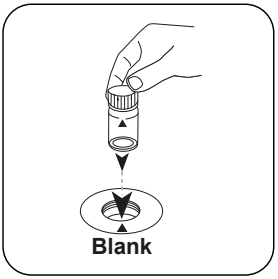
Disolver los polvos girando.



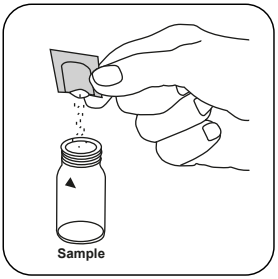
Pulsar la tecla **ENTER**.



Esperar **1 minutos como periodo de reacción**.

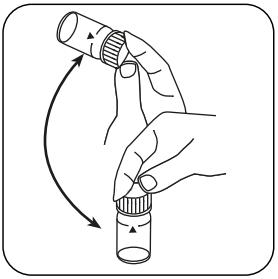


Poner la **cubeta en blanco** en el compartimiento de medición. ¡Debe tenerse en cuenta el posicionamiento!

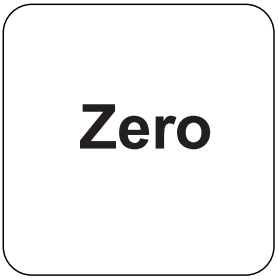


Añadir un **sobre de polvos Vario Silica Amino Acid F10** en la cubeta de muestra.

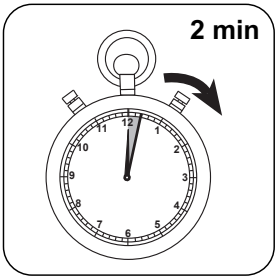
Cerrar la(s) cubeta(s).



Disolver los polvos girando.

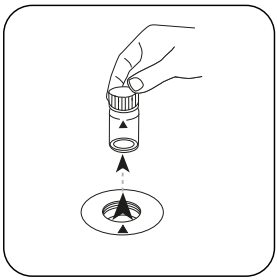


Pulsar la tecla **ZERO**.

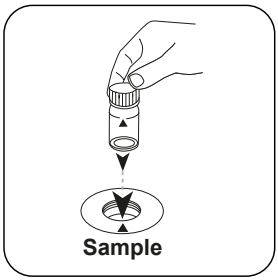


Esperar **2 minutos como periodo de reacción**.

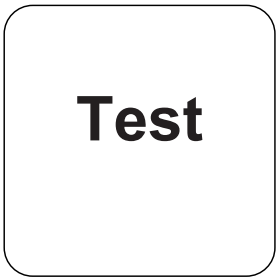
Finalizado el periodo de reacción se realizará la determinación automáticamente.



Extraer la cubeta del compartimiento de medición.



Poner la **cubeta de muestra** en el compartimiento de medición. ¡Debe tenerse en cuenta el posicionamiento!



Pulsar la tecla **TEST** (XD: **START**).

A continuación se visualizará el resultado en mg/L dióxido de silicio.

Evaluación

La siguiente tabla muestra cómo los valores de salida se pueden convertir a otros formularios de citas.

Unidad	Conversión	Factor de conversión
mg/l	SiO_2	1
mg/l	Si	0.47

Método químico

Heteropoliazul

Apéndice

Interferencia

Interferencias extraibles

1. Cierre las cubetas inmediatamente después de añadir la solución reactiva Vario Molybdate 3, de lo contrario se producirán resultados más bajos.
2. Ocasionalmente, las muestras acuosas contienen formas de ácido silícico que reaccionan muy lentamente con molibdato. La clase exacta de estas formas se desconoce por el momento. Mediante un pretratamiento con bicarbonato sódico y seguidamente con ácido sulfúrico se pueden transformar estas formas en sustancias más reactivas (instrucciones en "Standard Methods for the Examination of Water and Wastewater" en "Silica-Digenstion with Sodium Bicarbonate").

Interferencia	de / [mg/L]
Fe	grandes cantidades
PO_4^{3-}	50
S^{2-}	en todas las cantidades

Validación del método

Límite de detección	0.01 mg/L
Límite de determinación	0.03 mg/L
Límite del rango de medición	1.6 mg/L
Sensibilidad	1.35 mg/L / Abs
Intervalo de confianza	0.01 mg/L
Desviación estándar	0.004 mg/L
Coeficiente de variación	0.46 %

Derivado de
Método estándar 4500-SiO2 D

Silicato HR PP M352

1 - 90 mg/L SiO_2 SiHr

Silicomolibdato

ES

Material

Material requerido (parcialmente opcional):

Reactivos	Unidad de embalaje	No. de referencia
Reactivo para sílice HR VARIO, juego F10	1 Set	535700

Preparación

1. La temperatura de la muestra deberá encontrarse entre 15 °C y 25 °C.

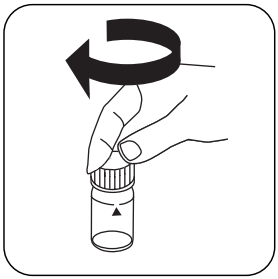
Notas

1. El método realiza la medición en el flanco de la curva de absorción de la coloración resultante. Por consiguiente, en los fotómetros de filtro, el usuario puede mejorar la precisión del método, si es necesario, utilizando un silicato estándar (aprox. 70 mg/L SiO_2).

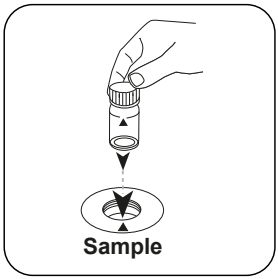
Ejecución de la determinación Dióxido de silicio HR con sobres de polvos Vario

Seleccionar el método en el aparato.

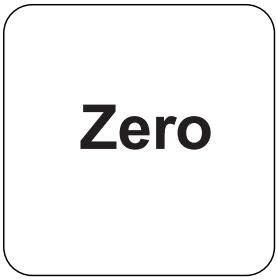
Llenar la cubeta de 24 mm con **10 mL de muestra** .



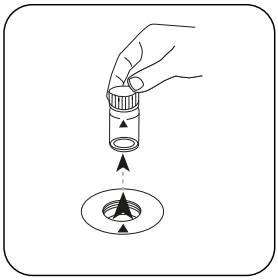
Cerrar la(s) cubeta(s).



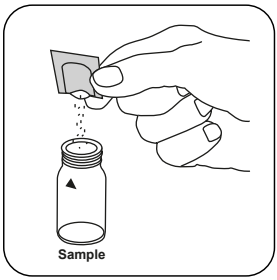
Poner la **cubeta de muestra** en el compartimiento de medición. ¡Debe tenerse en cuenta el posicionamiento!



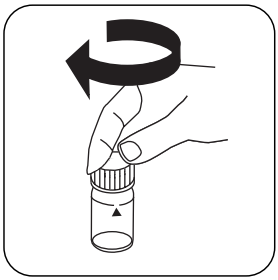
Pulsar la tecla **ZERO**.



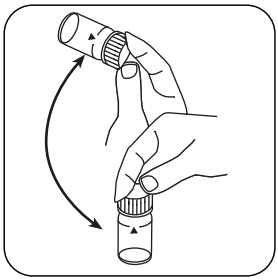
Extraer la cubeta del compartimiento de medición.



Añadir un **sobre de polvos Vario Silica HR Molybdate F10** .

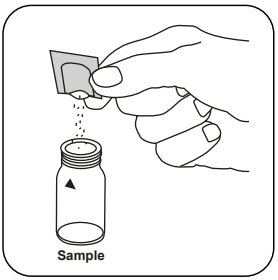


Cerrar la(s) cubeta(s).

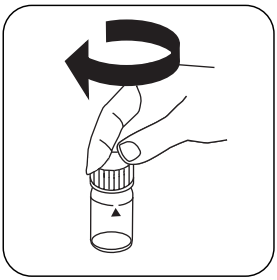


Disolver los polvos girando.

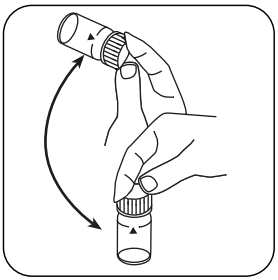
ES



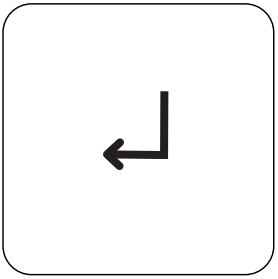
Añadir un **sobre de polvos Vario Silica HR Acid Rgt. F10** .



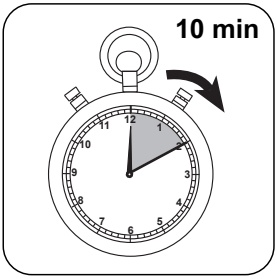
Cerrar la(s) cubeta(s).



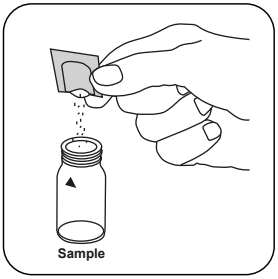
Mezclar el contenido girando.



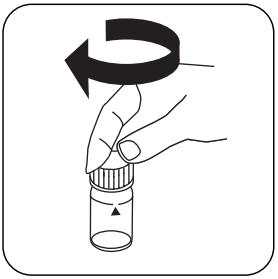
Pulsar la tecla **ENTER**.



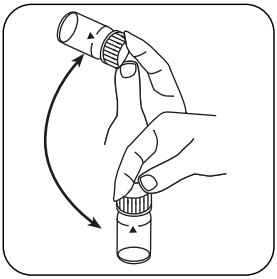
Esperar **10 minutos como periodo de reacción**.



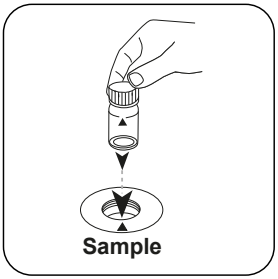
Añadir un **sobre de polvos Vario Silica Citric Acid F10** .



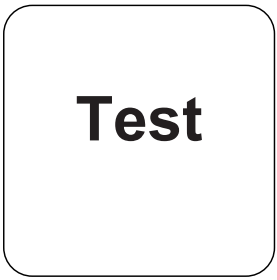
Cerrar la(s) cubeta(s).

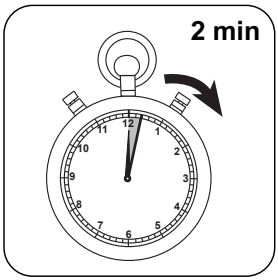


Disolver los polvos girando.



Poner la **cubeta de muestra** en el compartimiento de medición. ¡Debe tenerse en cuenta el posicionamiento!





Pulsar la tecla **TEST** (XD: **START**).

Esperar **2 minutos como periodo de reacción**.

Finalizado el periodo de reacción se realizará la determinación automáticamente.

A continuación se visualizará el resultado en mg/L Silica.

Evaluación

La siguiente tabla muestra cómo los valores de salida se pueden convertir a otros formularios de citas.

Unidad	Conversión	Factor de conversión
mg/l	SiO_2	1
mg/l	Si	0.47

Método químico

Silicomolibdato

Apéndice

Interferencia

Interferencias extraibles

- Ocasionalmente, las muestras acuosas contienen formas de ácido silícico que reaccionan muy lentamente con molibdato. La clase exacta de estas formas se desconoce por el momento. Mediante un pretratamiento con bicarbonato sódico y seguidamente con ácido sulfúrico se pueden transformar estas formas en sustancias más reactivas (instrucciones en "Standard Methods for the Examination of Water and Wastewater" en "Silica-Digenstion with Sodium Bicarbonate").
- La presencia de dióxido de silicio o fosfato producirá un color amarillo.
  El color amarillo producido por el fosfato se eliminará añadiendo el sobre de polvos Silica Citric Acid F10.

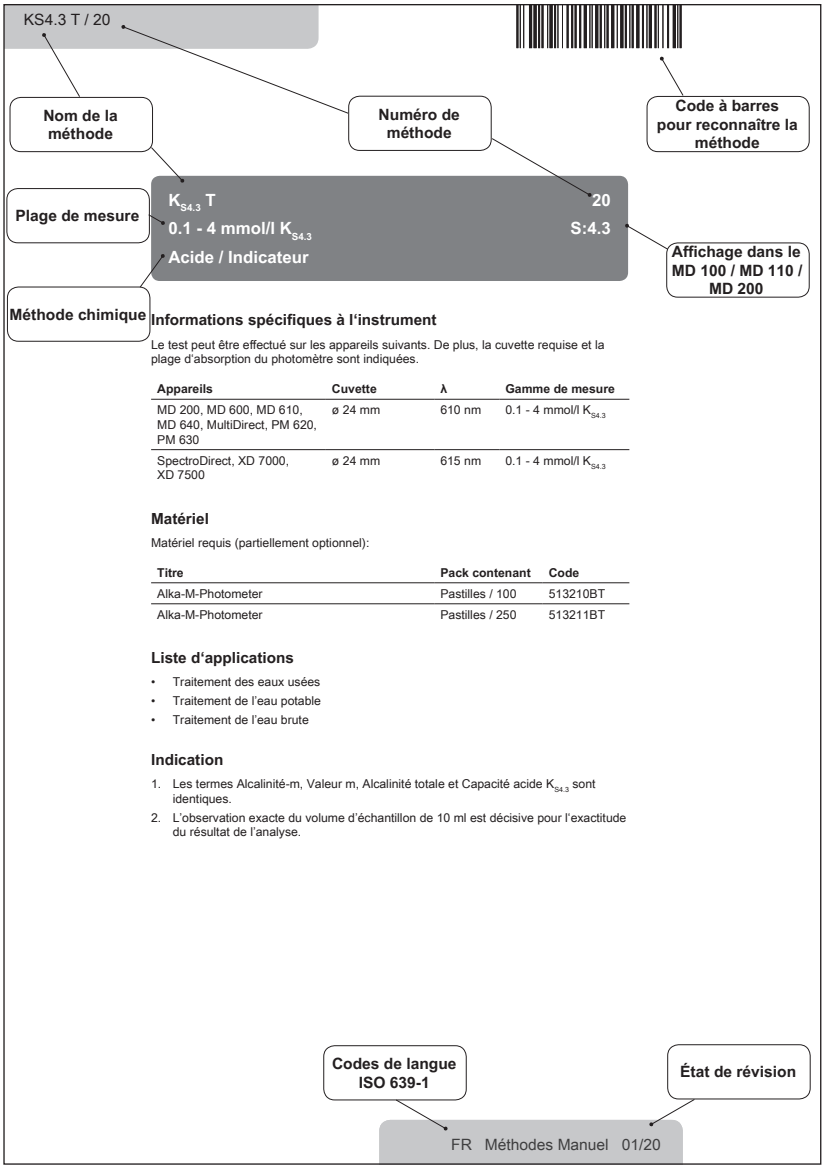
Interferencia	de / [mg/L]	Influencia
Fe	grandes cantidades	
PO_4^{3-}	50	
PO_4^{3-}	60	La perturbación es del aproximadamente -2 %
PO_4^{3-}	75	La perturbación es del aproximadamente -11 %
S^{2-}	en todas las cantidades	

Validación del método

Límite de detección	0.38 mg/L
Límite de determinación	1.14 mg/L
Límite del rango de medición	100 mg/L
Sensibilidad	120 mg/L / Abs
Intervalo de confianza	1.69 mg/L
Desviación estándar	0.70 mg/L
Coeficiente de variación	1.38 %

Derivado de

Método estándar 4500-SiO2 C


KS4.3 T / 20
Nom de la méthode
Numéro de méthode
Code à barres pour reconnaître la méthode
Plage de mesure
$K_{S4.3}$ T
20
0.1 - 4 mmol/l $K_{S4.3}$
S:4.3
Acide / Indicateur
Affichage dans le MD 100 / MD 110 / MD 200
Méthode chimique
Informations spécifiques à l'instrument
Le test peut être effectué sur les appareils suivants. De plus, la cuvette requise et la plage d'absorption du photomètre sont indiquées.
Appareils | Cuvette | λ | Gamme de mesure
MD 200, MD 600, MD 610, MD 640, MultiDirect, PM 620, PM 630 | ø 24 mm | 610 nm | 0.1 - 4 mmol/l $K_{S4.3}$
SpectroDirect, XD 7000, XD 7500 | ø 24 mm | 615 nm | 0.1 - 4 mmol/l $K_{S4.3}$
Matériel
Matériel requis (partiellement optionnel):
Titre | Pack contenant | Code
Alka-M-Photometer | Pastilles / 100 | 513210BT
Alka-M-Photometer | Pastilles / 250 | 513211BT
Liste d'applications
• Traitement des eaux usées
• Traitement de l'eau potable
• Traitement de l'eau brute
Indication
1. Les termes Alcalinité-m, Valeur m, Alcalinité totale et Capacité acide $K_{S4.3}$ sont identiques.
2. L'observation exacte du volume d'échantillon de 10 ml est décisive pour l'exactitude du résultat de l'analyse.
Codes de langue ISO 639-1
État de révision
FR Méthodes Manuel 01/20

Procédure du test

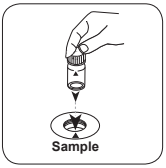
Réalisation de la quantification Capacité acide $K_{S4.3}$ avec pastille

Sélectionnez la méthode sur l'appareil.

Cette méthode ne nécessite aucune mesure du zéro sur les appareils suivants : XD 7000, XD 7500

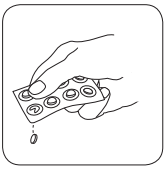
Remplissez une cuvette de 24 mm de **10 ml d'échantillon**.

Fermez la(les) cuvette(s).

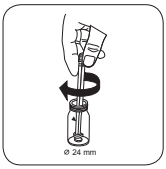


Placez la **cuvette réservée à l'échantillon** dans la chambre de mesure. Attention à la positionner correctement.

• • •



Ajoutez une **pastille de ALKA-M-PHOTOMETER**.



Écrasez la(les) pastille(s) en la(les) tournant un peu.

Fermez la(les) cuvette(s).

Silicate T **M350**

0.05 - 4 mg/L SiO_2 **Si**

Bleu de silico-molybdénum

FR

Matériel

Matériel requis (partiellement optionnel):

Réactifs	Pack contenant	Code
Silice N° 1	Pastilles / 100	513130BT
Silice N° 1	Pastilles / 250	513131BT
Silice N° 2	Pastilles / 100	513140BT
Silice N° 2	Pastilles / 250	513141BT
Silice PR	Pastilles / 100	513150BT
Silice PR	Pastilles / 250	513151BT
Kit silice N° 1/N° 2#	100 chacun	517671BT
Kit silice N° 1/N° 2#	250 chacun	517672BT

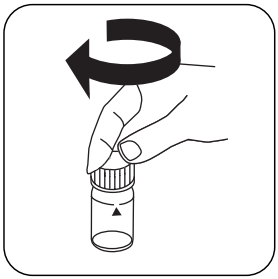
Indication

1. Respectez obligatoirement l'ordre d'apport de la pastille indiqué.

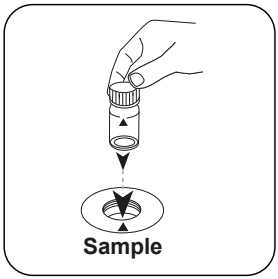
Réalisation de la quantification Dioxyde de silicium avec pastille

Sélectionnez la méthode sur l'appareil.

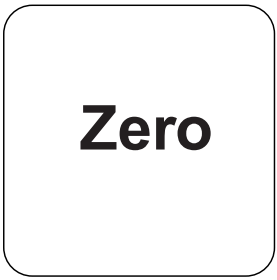
Remplissez une cuvette de 24 mm de **10 mL d'échantillon**.



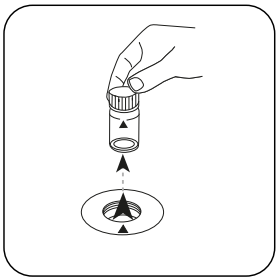
Fermez la(les) cuvette(s).



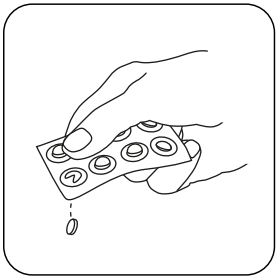
Placez la **cuvette réservée à l'échantillon** dans la chambre de mesure. Attention à la positionner correctement.



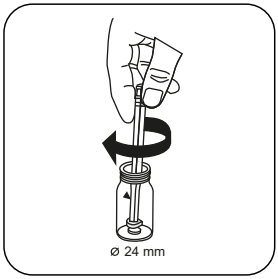
Appuyez sur la touche **ZERO**.



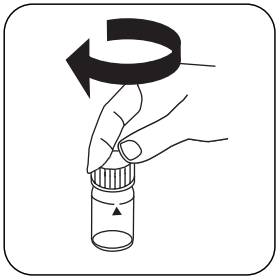
Retirez la cuvette de la chambre de mesure.



Ajoutez une **pastille de SILICA No. 1**.

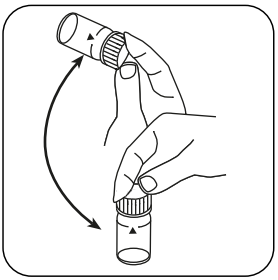


Écrasez la(les) pastille(s) en la(les) tournant un peu.

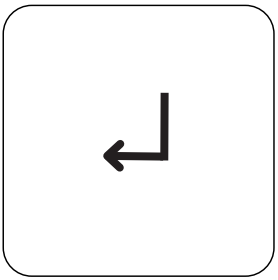


Fermez la(les) cuvette(s).

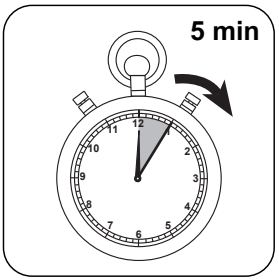
FR



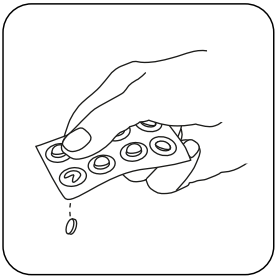
Dissolvez la(les) pastille(s) en mettant le tube plusieurs fois à l'envers.



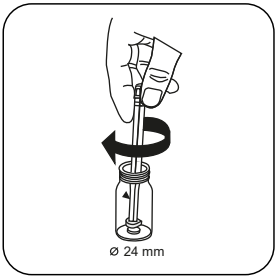
Appuyez sur la touche **ENTER**.



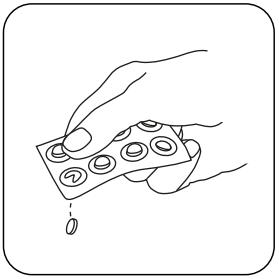
Attendez la fin du **temps de réaction de 5 minute(s)** .



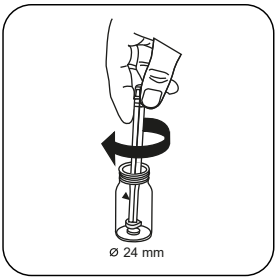
Ajoutez une **pastille de SILICA PR**.



Écrasez la(les) pastille(s) en la(les) tournant un peu.

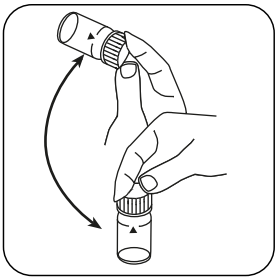


Ajoutez une **pastille de SILICA No. 2**.

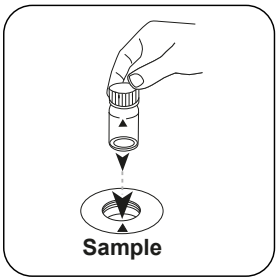


Écrasez la(les) pastille(s) en la(les) tournant un peu.

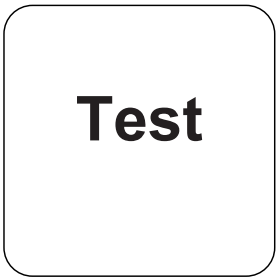
Fermez la(les) cuvette(s).



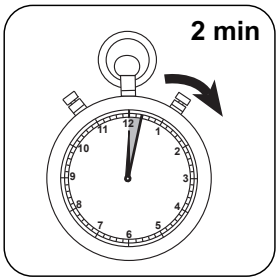
Dissolvez la(les) pastille(s) en mettant le tube plusieurs fois à l'envers.



Placez la **cuvette réservée à l'échantillon** dans la chambre de mesure. Attention à la positionner correctement.



Appuyez sur la touche **TEST** (XD: **START**).



Attendez la fin du **temps de réaction de 2 minute(s)** .

À l'issue du temps de réaction, la mesure est effectuée automatiquement.

Le résultat s'affiche à l'écran en mg/L Dioxyde de silicium.

Analyses

Le tableau suivant identifie les valeurs de sortie qui peuvent être converties en d'autres formes de citation.

Unité	Formes de citation	Facteur de conversion
mg/l	SiO_2	1
mg/l	Si	0.47

FR

Méthode chimique

Bleu de silico-molybdénum

Appendice

Interférences

Interférences exclues

- Dans les conditions de réaction indiquées, les phosphates n'ont pas d'effet perturbateur.

Dérivé de

Standard Method 4500-SiO2 C

[1] # agitateur inclus

Silicate LR PP M351

0.1 - 1.6 mg/L SiO_2 SiLr

Bleu hétéropoly

FR

Matériel

Matériel requis (partiellement optionnel):

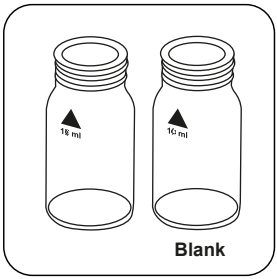
Réactifs	Pack contenant	Code
VARIO silice LR, kit F10	1 Kit	535690

Indication

1. Le temps de réaction de 4 minutes se rapporte à une température de l'échantillon égale à 20 °C. À une température de 30 °C, respectez un temps de réaction de 2 minutes et à une température de 10 °C, un temps de réaction de 8 minutes.

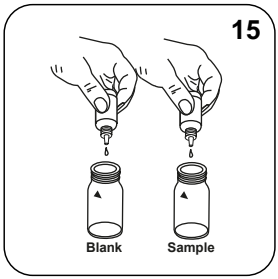
Réalisation de la quantification Dioxyde de silicium LR avec sachet de poudre Vario et réactif liquide

Sélectionnez la méthode sur l'appareil.

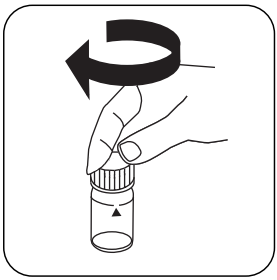


Préparez deux cuvettes propres de 24 mm. L'une des deux cuvettes sera la cuvette du blanc. Étiquetez-la.

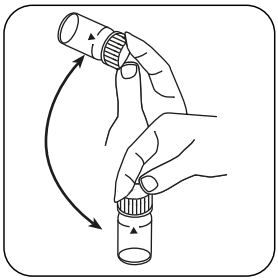
Dans chaque cuvette, versez **10 mL d'échantillon**.



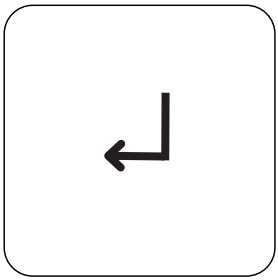
Dans chaque cuvette, versez **15 gouttes de solution Vario Molybdate 3 Reagenz-** .



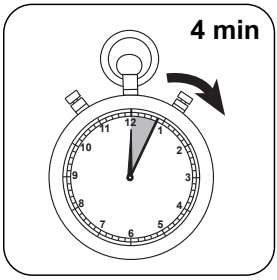
Fermez la(les) cuvette(s).



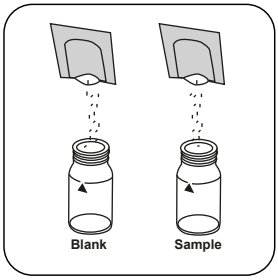
Mélangez le contenu en mettant le tube plusieurs fois à l'envers puis à l'endroit.



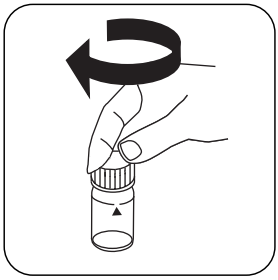
Appuyez sur la touche **ENTER**.



Attendez la fin du **temps de réaction de 4 minute(s)** .

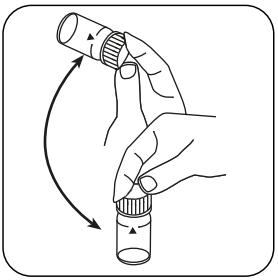


Dans chaque cuvette, versez **un sachet de poudre Vario Silica Citric Acid F10**.

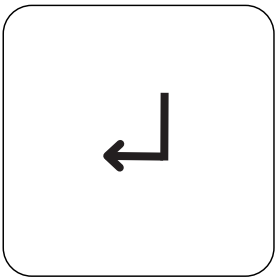


Fermez la(les) cuvette(s).

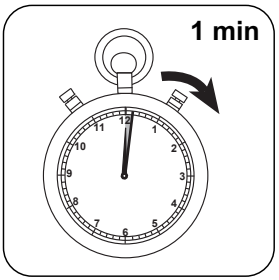
FR



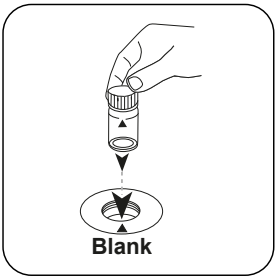
Dissolvez la poudre en mettant plusieurs fois le tube à l'envers puis à l'endroit.



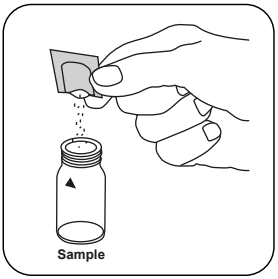
Appuyez sur la touche **ENTER**.



Attendez la fin du **temps de réaction de 1 minute(s)** .

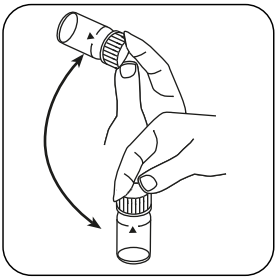


Placez la **cuvette du blanc** dans la chambre de mesure. Attention à la positionner correctement.

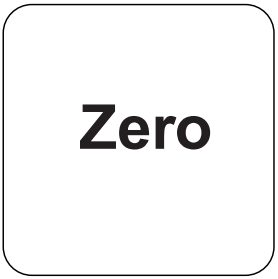


Ajoutez à la cuvette de l'échantillon un **sachet de poudre Vario Silica Amino Acid F10**.

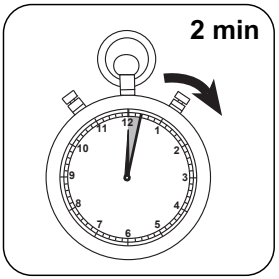
Fermez la(les) cuvette(s).



Dissolvez la poudre en mettant plusieurs fois le tube à l'envers puis à l'endroit.

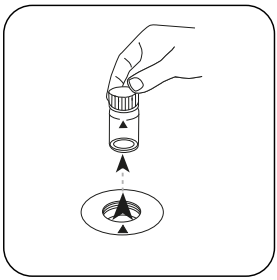


Appuyez sur la touche **ZERO**.

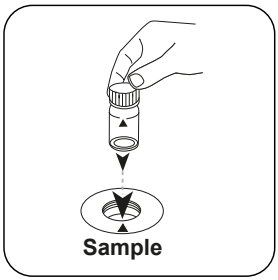


Attendez la fin du **temps de réaction de 2 minute(s)** .

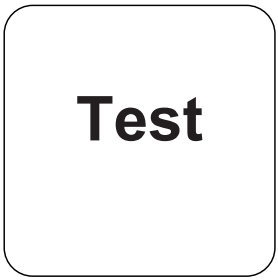
À l'issue du temps de réaction, la mesure est effectuée automatiquement.



Retirez la cuvette de la chambre de mesure.



Placez la **cuvette réservée à l'échantillon** dans la chambre de mesure. Attention à la positionner correctement.



Appuyez sur la touche **TEST** (XD: **START**).

Le résultat s'affiche à l'écran en mg/L Dioxyde de silicium.

Analyses

Le tableau suivant identifie les valeurs de sortie qui peuvent être converties en d'autres formes de citation.

Unité	Formes de citation	Facteur de conversion
mg/l	SiO_2	1
mg/l	Si	0.47

Méthode chimique

Bleu hétéropoly

Appendice

Interférences

Interférences exclues

1. Les cuvettes doivent être refermées à l'aide du couvercle immédiatement après l'apport de la solution de réactif Vario Molybdate 3 pour empêcher une éventuelle baisse des résultats.
2. Les échantillons d'eau contiennent parfois certaines formes d'acides siliciques qui réagissent très lentement avec le molybdate. Actuellement, le type exact de ces formes n'est pas connu. En procédant à un prétraitement au bicarbonate de sodium puis à l'acide sulfurique, il est possible de les transformer en des formes plus aptes à réagir (description dans « Standard Methods for the Examination of Water and Wastewater » dans la section « Silica-Digenstion with Sodium Bicarbonate »).

Interférences	de / [mg/L]
Fe	grandes quantités
PO_4^{3-}	50
S^{2-}	en toutes les quantités

Méthode Validation

Limite de détection	0.01 mg/L
Limite de détermination	0.03 mg/L
Fin de la gamme de mesure	1.6 mg/L
Sensibilité	1.35 mg/L / Abs
Intervalle de confiance	0.01 mg/L
Déviation standard	0.004 mg/L
Coefficient de variation	0.46 %

Dérivé de

Standard Method 4500-SiO2 D

Silicate HR PP **M352**

1 - 90 mg/L SiO_2 **SiHr**

Silico-molybdate

FR

Matériel

Matériel requis (partiellement optionnel):

Réactifs	Pack contenant	Code
VARIO réactif Silice HR, kit F10	1 Kit	535700

Préparation

1. La température de l'échantillon doit être comprise entre 15 °C et 25 °C.

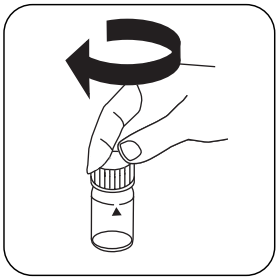
Indication

1. La méthode consiste à mesurer dans le flanc de la courbe d'absorption de la coloration résultante. Sur les photomètres à filtre, la précision de la méthode peut donc être améliorée, si nécessaire, en ajustant à l'aide d'un étalon de silicate (env. 70 mg/L SiO_2).

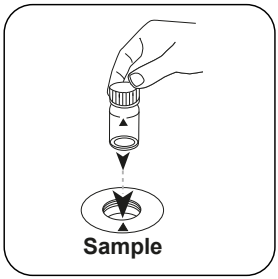
Réalisation de la quantification Dioxyde de silicium HR avec sachet de poudre Vario

Sélectionnez la méthode sur l'appareil.

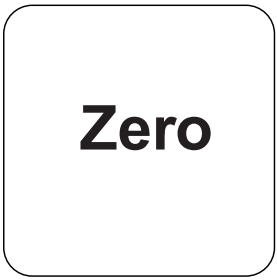
Remplissez une cuvette de 24 mm de **10 mL d'échantillon**.



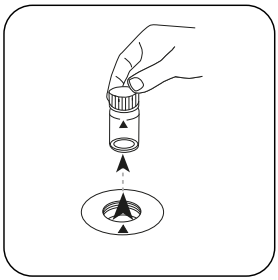
Fermez la(les) cuvette(s).



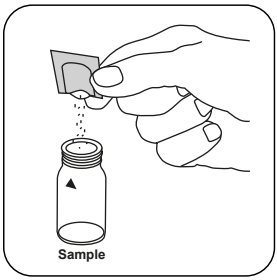
Placez la **cuvette réservée à l'échantillon** dans la chambre de mesure. Attention à la positionner correctement.



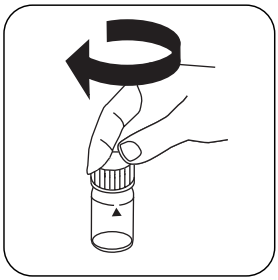
Appuyez sur la touche **ZERO**.



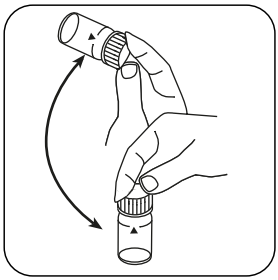
Retirez la cuvette de la chambre de mesure.



Ajoutez un **sachet de poudre Vario Silica HR Molybdate F10**.

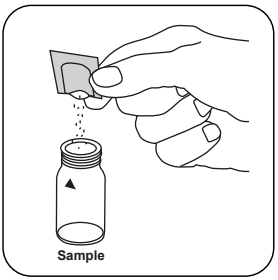


Fermez la(les) cuvette(s).

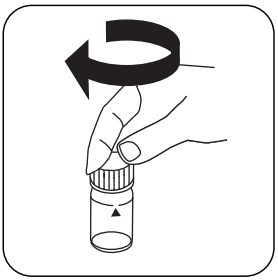


Dissolvez la poudre en mettant plusieurs fois le tube à l'envers puis à l'endroit.

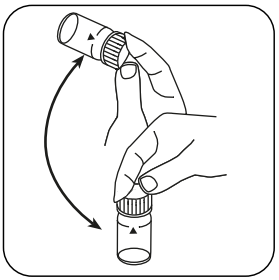
FR



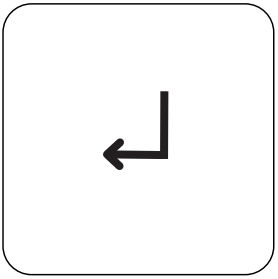
Ajoutez un **sachet de poudre Vario Silica HR Acid Rgt. F10**.



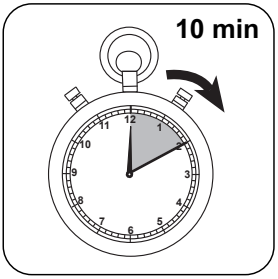
Fermez la(les) cuvette(s).



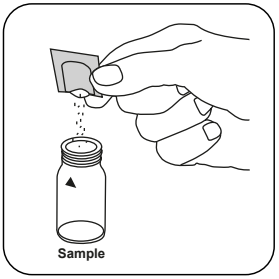
Mélangez le contenu en mettant le tube plusieurs fois à l'envers puis à l'endroit.



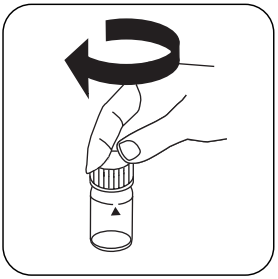
Appuyez sur la touche **ENTER**.



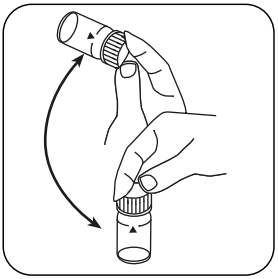
Attendez la fin du **temps de réaction de 10 minute(s)** .



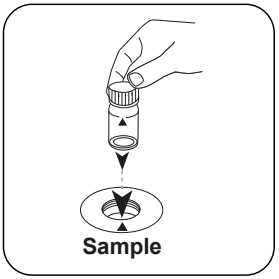
Ajoutez un **sachet de poudre Vario Silica Citric Acid F10**.



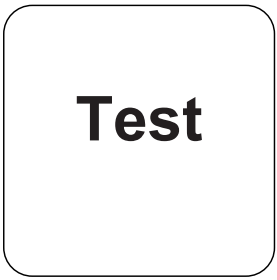
Fermez la(les) cuvette(s).

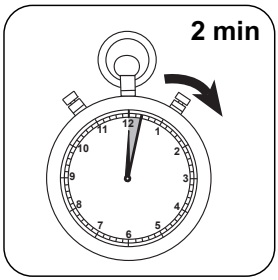


Dissolvez la poudre en mettant plusieurs fois le tube à l'envers puis à l'endroit.



Placez la **cuvette réservée à l'échantillon** dans la chambre de mesure. Attention à la positionner correctement.





Appuyez sur la touche **TEST** (XD: **START**).

Attendez la fin du **temps de réaction de 2 minute(s)** .

À l'issue du temps de réaction, la mesure est effectuée automatiquement.

Le résultat s'affiche à l'écran en mg/L Dioxyde de silicium.

Analyses

Le tableau suivant identifie les valeurs de sortie qui peuvent être converties en d'autres formes de citation.

Unité	Formes de citation	Facteur de conversion
mg/l	SiO_2	1
mg/l	Si	0.47

Méthode chimique

Silico-molybdate

Appendice

Interférences

Interférences exclues

- Les échantillons d'eau contiennent parfois certaines formes d'acides siliciques qui réagissent très lentement avec le molybdate. Actuellement, le type exact de ces formes n'est pas connu. En procédant à un prétraitement au bicarbonate de sodium puis à l'acide sulfurique, il est possible de les transformer en des formes plus aptes à réagir (description dans « Standard Methods for the Examination of Water and Wastewater » dans la section « Silica-Digenstion with Sodium Bicarbonate »).
- En présence de dioxyde de silicium ou de phosphate, il se forme une couleur jaune. En ajoutant le sachet de poudre Silica Citric Acid F10, la couleur jaune due au phosphate est éliminée.

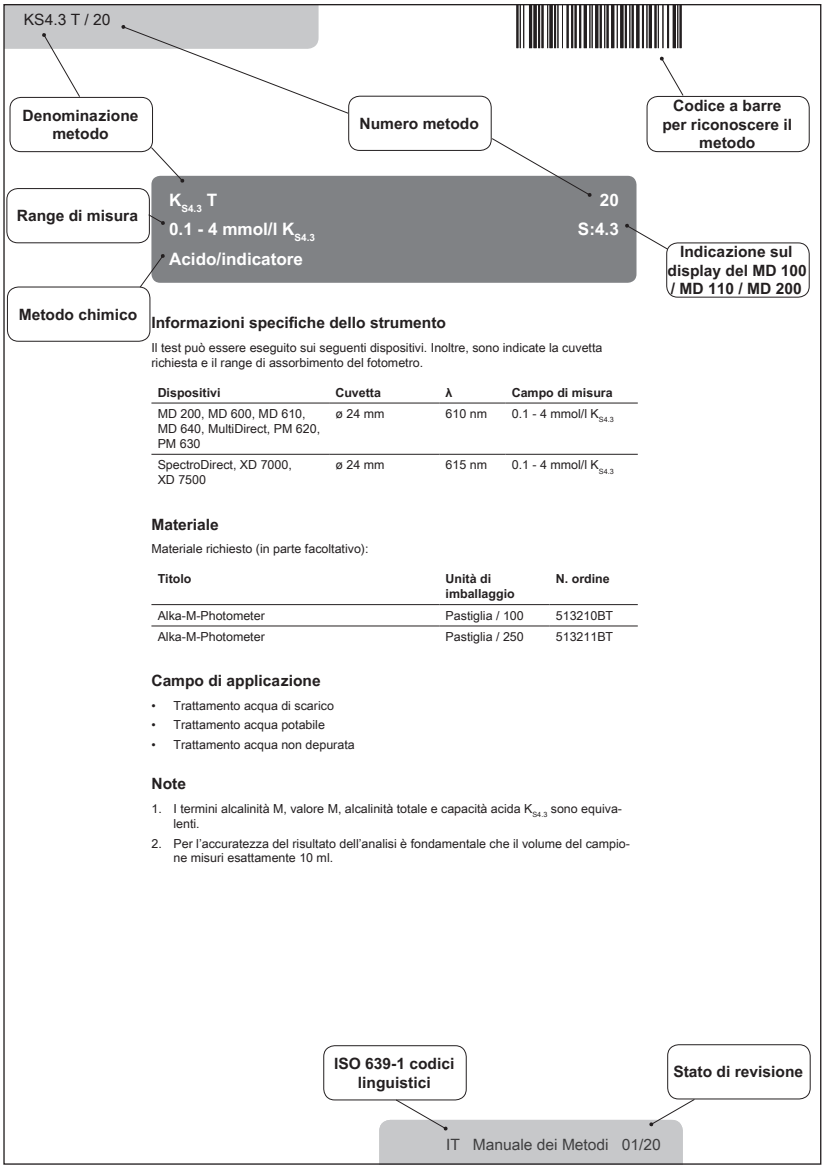
Interférences	de / [mg/L]	Influence
Fe	grandes quantités	
PO_4^{3-}	50	
PO_4^{3-}	60	La perturbation est d'env. -2 %
PO_4^{3-}	75	La perturbation est d'env. -11 %
S^{2-}	en toutes les quantités	

Méthode Validation

Limite de détection	0.38 mg/L
Limite de détermination	1.14 mg/L
Fin de la gamme de mesure	100 mg/L
Sensibilité	120 mg/L / Abs
Intervalle de confiance	1.69 mg/L
Déviation standard	0.70 mg/L
Coefficient de variation	1.38 %

Dérivé de

Standard Method 4500-SiO2 C



Informazioni specifiche dello strumento

Il test può essere eseguito sui seguenti dispositivi. Inoltre, sono indicate la cuvetta richiesta e il range di assorbimento del fotometro.

Dispositivi	Cuvetta	λ	Campo di misura
MD 200, MD 600, MD 610, MD 640, MultiDirect, PM 620, PM 630	ø 24 mm	610 nm	0.1 - 4 mmol/l $K_{S4.3}$
SpectroDirect, XD 7000, XD 7500	ø 24 mm	615 nm	0.1 - 4 mmol/l $K_{S4.3}$

Materiale

Materiale richiesto (in parte facoltativo):

Titolo	Unità di imballaggio	N. ordine
Alka-M-Photometer	Pastiglia / 100	513210BT
Alka-M-Photometer	Pastiglia / 250	513211BT

Campo di applicazione

- Trattamento acqua di scarico
- Trattamento acqua potabile
- Trattamento acqua non depurata

Note

1. I termini alcalinità M, valore M, alcalinità totale e capacità acida $K_{S4.3}$ sono equivalenti.
2. Per l'accuratezza del risultato dell'analisi è fondamentale che il volume del campione misuri esattamente 10 ml.

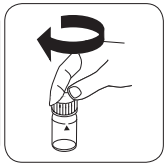
Svolgimento della misurazione

Esecuzione della rilevazione Capacità acida $K_{S4.3}$ con pastiglia

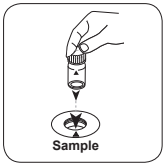
Selezionare il metodo nel dispositivo.

Con i seguenti dispositivi, per questo metodo non è necessario eseguire una misurazione ZERO: XD 7000, XD 7500

Riempire una cuvetta da 24 mm con **10 ml di campione**.



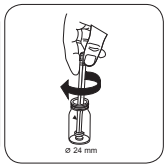
Chiudere la/e cuvetta/e.



Posizionare la **cuvetta del campione** nel vano di misurazione. Fare attenzione al posizionamento.

• • •

Aggiungere **una pastiglia ALKA-M-PHOTOMETER**.



Frantumare la/e pastiglia/e con una leggera rotazione.

Chiudere la/e cuvetta/e.

Silicato T M350

0.05 - 4 mg/L SiO_2 Si

Blu di silicomolibdeno

IT

Materiale

Materiale richiesto (in parte facoltativo):

Reagenti	Unità di imballaggio	N. ordine
Silice No. 1	Pastiglia / 100	513130BT
Silice No. 1	Pastiglia / 250	513131BT
Silice No. 2	Pastiglia / 100	513140BT
Silice No. 2	Pastiglia / 250	513141BT
Silice PR	Pastiglia / 100	513150BT
Silice PR	Pastiglia / 250	513151BT
Set Silice No. 1/no. 2#	ciascuna 100	517671BT
Set Silice No. 1/no. 2#	ciascuna 250	517672BT

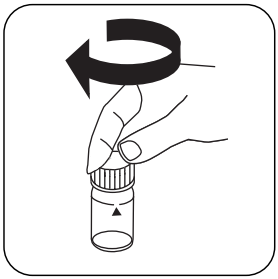
Note

1. Attenersi scrupolosamente all'ordine con cui aggiungere le pastiglie.

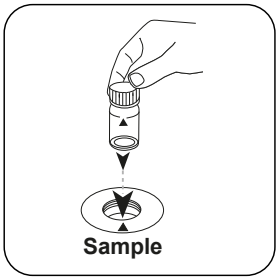
Esecuzione della rilevazione Biossido di silicio con pastiglia

Selezionare il metodo nel dispositivo.

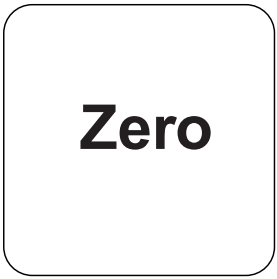
Riempire una cuvetta da 24 mm con **10 mL di campione**.



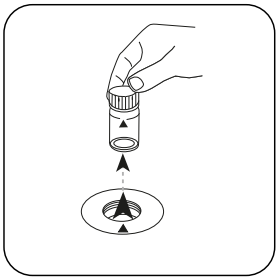
Chiudere la/e cuvetta/e.



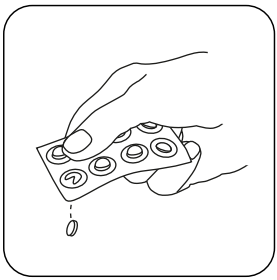
Posizionare la **cuvetta del campione** nel vano di misurazione. Fare attenzione al posizionamento.



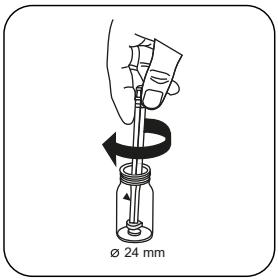
Premere il tasto **ZERO**.



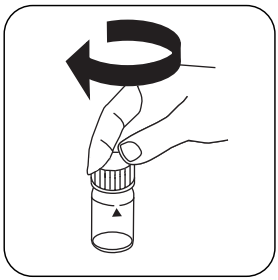
Prelevare la cuvetta dal vano di misurazione.



Aggiungere **una pastiglia SILICA No. 1**.

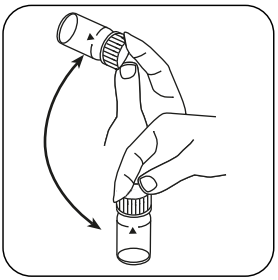


Frantumare la/e pastiglia/e con una leggera rotazione.

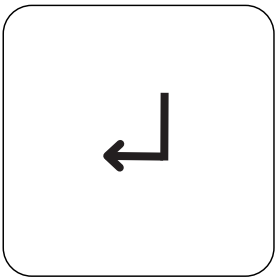


Chiudere la/e cuvetta/e.

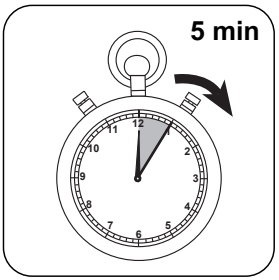
IT



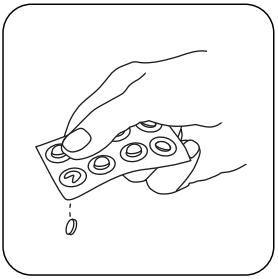
Far sciogliere la/e pastiglia/e agitando.



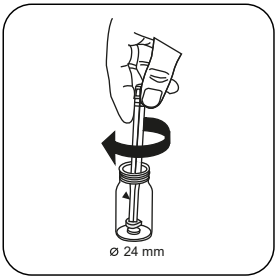
Premere il tasto **ENTER**.



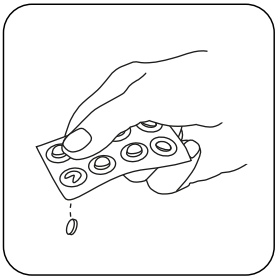
Attendere un **tempo di reazione di 5 minuto/i** .



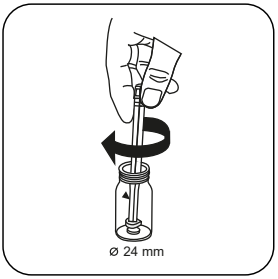
Aggiungere **una pastiglia SILICA PR**.



Frantumare la/e pastiglia/e con una leggera rotazione.

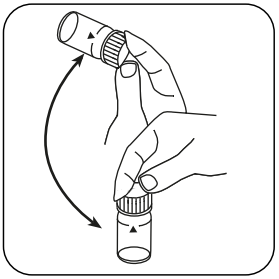


Aggiungere **una pastiglia SILICA No. 2**.

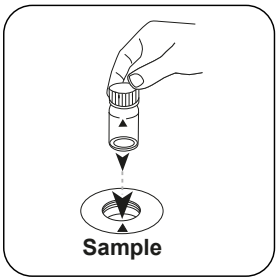


Frantumare la/e pastiglia/e con una leggera rotazione.

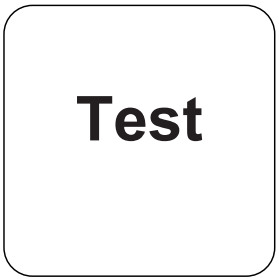
Chiudere la/e cuvetta/e.



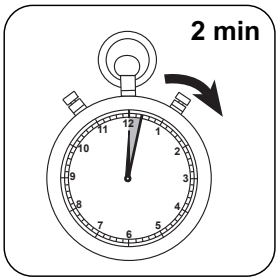
Far sciogliere la/e pastiglia/e agitando.



Posizionare la **cuvetta del campione** nel vano di misurazione. Fare attenzione al posizionamento.



Premere il tasto **TEST** (XD: **START**).



Attendere un **tempo di reazione di 2 minuto/i** .

Allo scadere del tempo di reazione viene effettuata automaticamente la misurazione.

Sul display compare il risultato in mg/L di Silicato.

Valutazione

La seguente tabella identifica i valori di output che possono essere convertiti in altre forme di citazione.

Unità di misura	Forma di citazione	Fattore di conversione
mg/l	SiO_2	1
mg/l	Si	0.47

Metodo chimico

Blu di silicomolibdeno

Appendice

Interferenze

Interferenze escludibili

- I fosfati non provocano interferenze nelle condizioni di reazione specificate.

Derivato di

Standard Method 4500-SiO2 C

[1] #Bacchetta compresa

Silicato LR PP M351

0.1 - 1.6 mg/L SiO_2 SiLr

Blu di eteropolo

IT

Materiale

Materiale richiesto (in parte facoltativo):

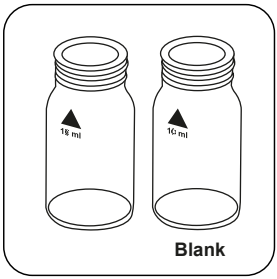
Reagenti	Unità di imballaggio	N. ordine
VARIO Silica LR, F10 Set	1 set	535690

Note

1. Il tempo di reazione di 4 minuti specificato si riferisce a campioni con una temperatura di 20 °C. Con una temperatura di 30 °C si deve osservare un tempo di reazione di 2 minuti, con 10 °C di 8 minuti.

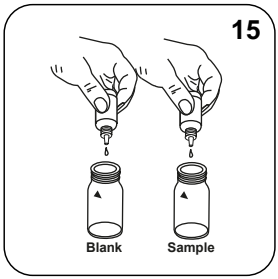
Esecuzione della rilevazione Biossido di silicio LR con polvere in bustine Vario e reagente liquido

Selezionare il metodo nel dispositivo.

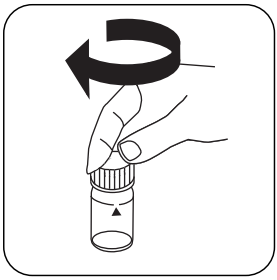


Preparare due cuvette pulite da 24 mm. Contrassegnare una cuvetta come cuvetta zero.

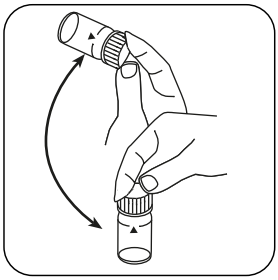
Immettere **10 mL di campione** in ogni cuvetta.



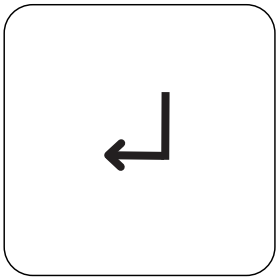
Immettere **15 gocce di soluzione Vario Molybdate 3 Reagenz-** in ogni cuvetta.



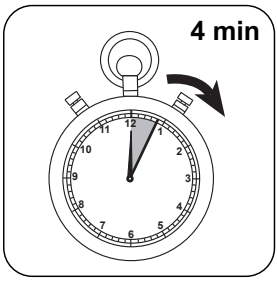
Chiudere la/e cuvetta/e.



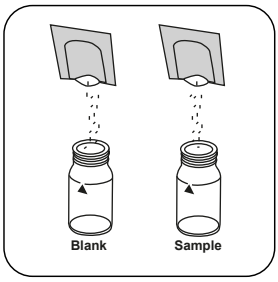
Miscelare il contenuto capovolgendo.



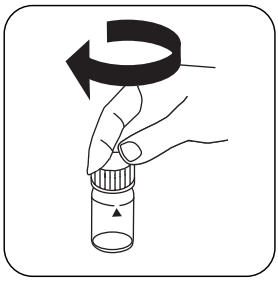
Premere il tasto **ENTER**.



Attendere un **tempo di reazione di 4 minuto/i** .

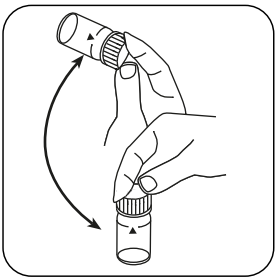


Immettere **una bustina di polvere Vario Silica Citric Acid F10** in ogni cuvetta.

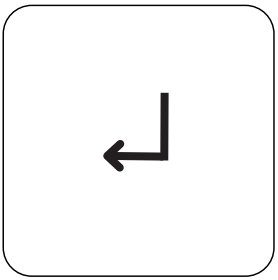


Chiudere la/e cuvetta/e.

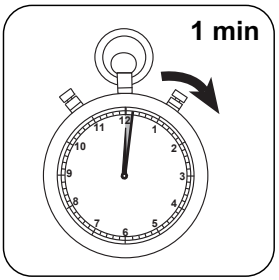
IT



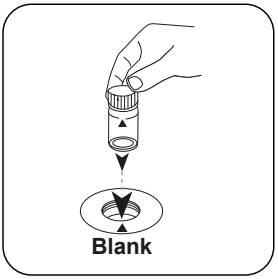
Far sciogliere la polvere capovolgendo.



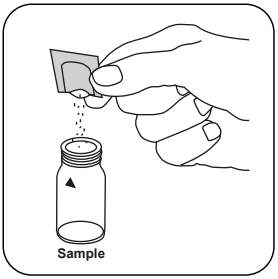
Premere il tasto **ENTER**.



Attendere un **tempo di reazione di 1 minuto/i** .

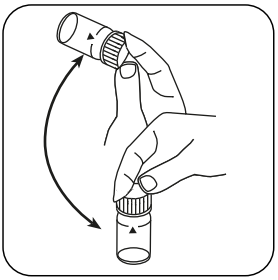


Posizionare la **cuvetta zero** nel vano di misurazione. Fare attenzione al posizionamento.

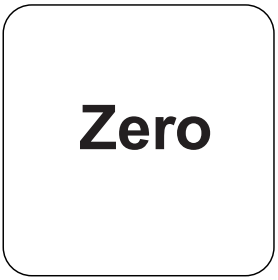


Immettere **una bustina di polvere Silica Amino Acid F10** nella cuvetta del campione.

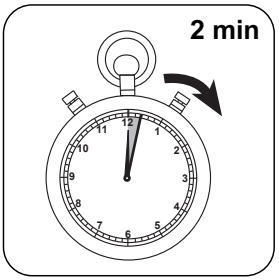
Chiudere la/e cuvetta/e.



Far sciogliere la polvere capovolgendo.

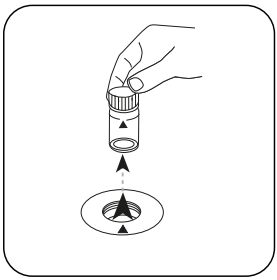


Premere il tasto **ZERO**.

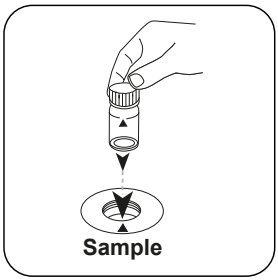


Attendere un **tempo di reazione di 2 minuto/i** .

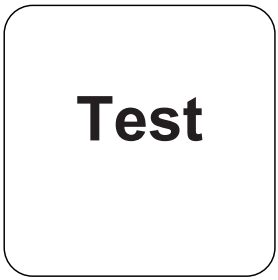
Allo scadere del tempo di reazione viene effettuata automaticamente la misurazione.



Prelevare la cuvetta dal vano di misurazione.



Posizionare la **cuvetta del campione** nel vano di misurazione. Fare attenzione al posizionamento.



Premere il tasto **TEST** (XD: **START**).

Sul display compare il risultato in mg/L di Silicato.

Valutazione

La seguente tabella identifica i valori di output che possono essere convertiti in altre forme di citazione.

Unità di misura	Forma di citazione	Fattore di conversione
mg/l	SiO_2	1
mg/l	Si	0.47

Metodo chimico

Blu di eteropolo

Appendice

Interferenze

Interferenze escludibili

1. Le cuvette devono essere richiuse con il coperchio subito dopo l'aggiunta della soluzione reagente Vario Molybdate 3, altrimenti si otterranno risultati troppo bassi.
2. Talvolta i campioni di acqua contengono forme di acido silicico che reagiscono molto lentamente con il molibdato. Il tipo esatto di tali forme non è attualmente noto. Attraverso un pretrattamento con bicarbonato di sodio e successivamente con acido solforico è possibile trasformarle in forme più reattive (descrizione in "Standard Methods for the Examination of Water and Wastewater" alla sezione "Silica-Digestion with Sodium Bicarbonate").

Interferenze	da / [mg/L]
Fe	grandi quantità
PO_4^{3-}	50
S^{2-}	in tutte le quantità

Validazione metodo

Limite di rilevabilità	0.01 mg/L
Limite di quantificazione	0.03 mg/L
Estremità campo di misura	1.6 mg/L
Sensibilità	1.35 mg/L / Abs
Intervallo di confidenza	0.01 mg/L
Deviazione standard della procedura	0.004 mg/L
Coefficiente di variazione della procedura	0.46 %

Derivato di

Standard Method 4500-SiO2 D

Silicato HR PP M352

1 - 90 mg/L SiO_2 SiHr

Molibdato di silicio

IT

Materiale

Materiale richiesto (in parte facoltativo):

Reagenti	Unità di imballaggio	N. ordine
VARIO Reagente per silice HR, set F10	1 set	535700

Preparazione

1. La temperatura del campione deve essere compresa tra 15 °C e 25 °C.

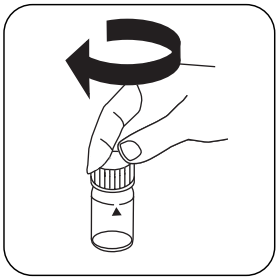
Note

1. Il metodo effettua la misurazione sul lato della curva di assorbimento della colorazione risultante. Nei fotometri con filtro l'accuratezza del metodo può quindi essere migliorata, se necessario, tramite regolazione con un silicato standard (circa 70 mg/L SiO_2).

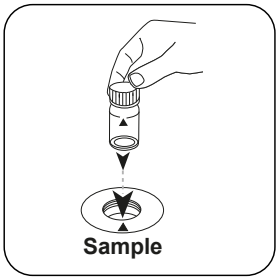
Esecuzione della rilevazione Biossido di silicio HR con polvere in bustine Vario

Selezionare il metodo nel dispositivo.

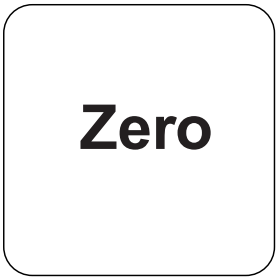
Riempire una cuvetta da 24 mm con **10 mL di campione**.



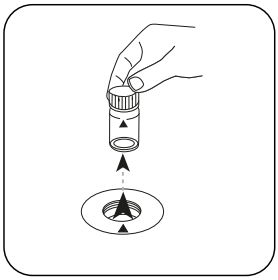
Chiudere la/e cuvetta/e.



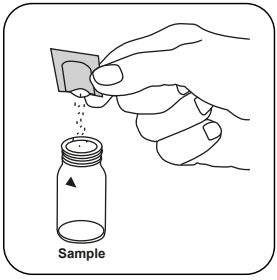
Posizionare la **cuvetta del campione** nel vano di misurazione. Fare attenzione al posizionamento.



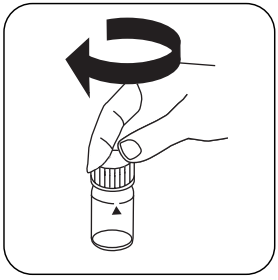
Premere il tasto **ZERO**.



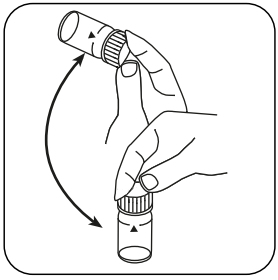
Prelevare la cuvetta dal vano di misurazione.



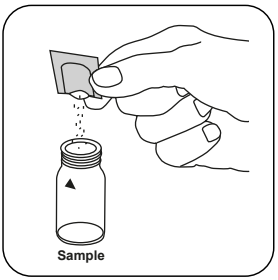
Aggiungere **una bustina di polvere Vario Silica HR Molybdate F10**.



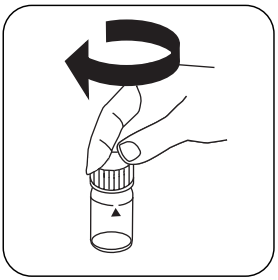
Chiudere la/e cuvetta/e.



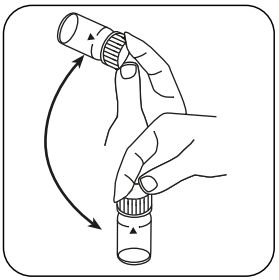
Far sciogliere la polvere capovolgendo.



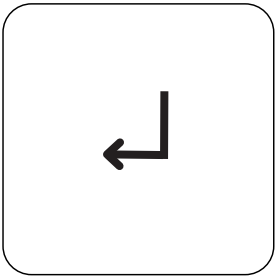
Aggiungere **una bustina di polvere Vario Silica HR Acid Rgt. F10**.



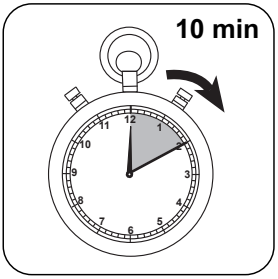
Chiudere la/e cuvetta/e.



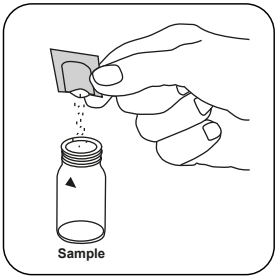
Miscelare il contenuto capovolgendo.



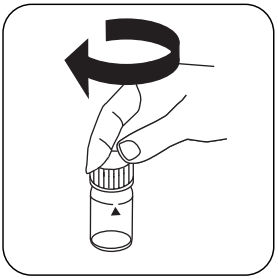
Premere il tasto **ENTER**.



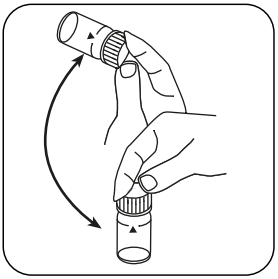
Attendere un **tempo di reazione di 10 minuto/i** .



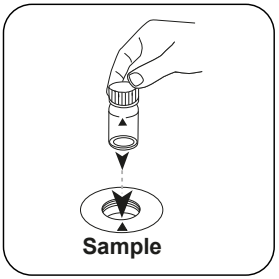
Aggiungere **una bustina di polvere Vario Silica Citric Acid F10**.



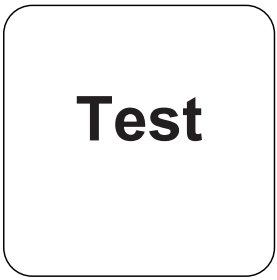
Chiudere la/e cuvetta/e.

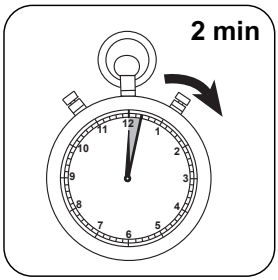


Far sciogliere la polvere capovolgendo.



Posizionare la **cuvetta del campione** nel vano di misurazione. Fare attenzione al posizionamento.





Premere il tasto **TEST** (XD: **START**).

Attendere un **tempo di reazione di 2 minuto/i** .

Allo scadere del tempo di reazione viene effettuata automaticamente la misurazione.

Sul display compare il risultato in mg/L di Silicato.

Valutazione

La seguente tabella identifica i valori di output che possono essere convertiti in altre forme di citazione.

Unità di misura	Forma di citazione	Fattore di conversione
mg/l	SiO_2	1
mg/l	Si	0.47

Metodo chimico

Molibdato di silicio

Appendice

Interferenze

Interferenze escludibili

- Talvolta i campioni di acqua contengono forme di acido silicico che reagiscono molto lentamente con il molibdato. Il tipo esatto di tali forme non è attualmente noto. Attraverso un pretrattamento con bicarbonato di sodio e successivamente con acido solforico è possibile trasformarle in forme più reattive (descrizione in "Standard Methods for the Examination of Water and Wastewater" alla sezione "Silica-Digestion with Sodium Bicarbonate").
- Se sono presenti biossido di silicio o fosfato si sviluppa una colorazione gialla. Aggiungendo la polvere in bustine Silica Citric Acid F10 si elimina il colore giallo prodotto dal fosfato.

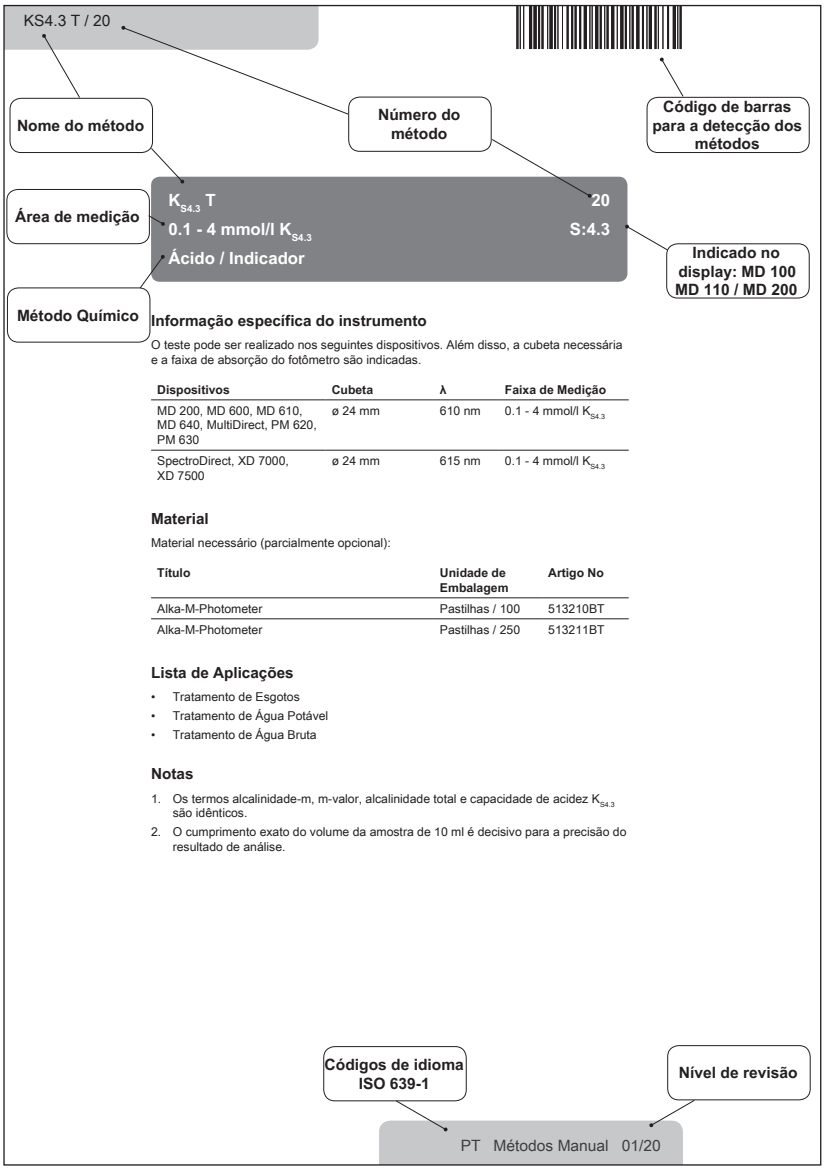
Interferenze	da / [mg/L]	Influenza
Fe	grandi quantità	
PO_4^{3-}	50	
PO_4^{3-}	60	Il disturbo è di circa -2 %
PO_4^{3-}	75	Il disturbo è di circa-11 %
S^{2-}	in tutte le quantità	

Validazione metodo

Limite di rilevabilità	0.38 mg/L
Limite di quantificazione	1.14 mg/L
Estremità campo di misura	100 mg/L
Sensibilità	120 mg/L / Abs
Intervallo di confidenza	1.69 mg/L
Deviazione standard della procedura	0.70 mg/L
Coefficiente di variazione della procedura	1.38 %

Derivato di

Standard Method 4500-SiO2 C


KS4.3 T / 20
Nome do método
Número do método
Código de barras para a detecção dos métodos
Área de medição
$K_{S4.3}$ T
20
0.1 - 4 mmol/l $K_{S4.3}$
S:4.3
Ácido / Indicador
Indicado no display: MD 100 MD 110 / MD 200
Método Químico
Informação específica do instrumento
O teste pode ser realizado nos seguintes dispositivos. Além disso, a cubeta necessária e a faixa de absorção do fotômetro são indicadas.
Dispositivos | Cubeta | λ | Faixa de Medição
MD 200, MD 600, MD 610, MD 640, MultiDirect, PM 620, PM 630 | ø 24 mm | 610 nm | 0.1 - 4 mmol/l $K_{S4.3}$
SpectroDirect, XD 7000, XD 7500 | ø 24 mm | 615 nm | 0.1 - 4 mmol/l $K_{S4.3}$
Material
Material necessário (parcialmente opcional):
Título | Unidade de Embalagem | Artigo No
Alka-M-Photometer | Pastilhas / 100 | 513210BT
Alka-M-Photometer | Pastilhas / 250 | 513211BT
Lista de Aplicações
• Tratamento de Esgotos
• Tratamento de Água Potável
• Tratamento de Água Bruta
Notas
1. Os termos alcalinidade-m, m-valor, alcalinidade total e capacidade de acidez $K_{S4.3}$ são idênticos.
2. O cumprimento exato do volume da amostra de 10 ml é decisivo para a precisão do resultado de análise.
Códigos de idioma ISO 639-1
Nível de revisão
PT Métodos Manual 01/20

Efetuar a medição

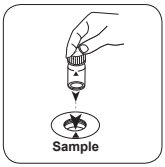
Realização da determinação Capacidade de acidez $K_{S4.3}$ com pastilha

Escolher o método no equipamento.

Para este método não tem de ser efetuada uma medição ZERO nos seguintes equipamentos: XD 7000, XD 7500

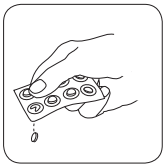
Encher a célula de 24 mm com **10 ml de amostra** .

Fechar a(s) célula(s).

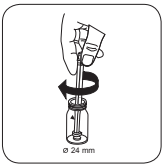


Colocar a **célula de amostra** no compartimento de medição. Observar o posicionamento.

• • •



Pastilha ALKA-M-PHOTOMETER.



Esmagar a(s) pastilha(s) rodando ligeiramente.

Fechar a(s) célula(s).

PT Métodos Manual 01/20

Silicato T **M350**

0.05 - 4 mg/L SiO_2 **Si**

Silicomolybdenum Blue

PT

Material

Material necessário (parcialmente opcional):

Reagentes	Unidade de Embalagem	Código do Produto
Sílica Não. 1	Pastilhas / 100	513130BT
Sílica Não. 1	Pastilhas / 250	513131BT
Sílica Não. 2	Pastilhas / 100	513140BT
Sílica Não. 2	Pastilhas / 250	513141BT
Sílica PR	Pastilhas / 100	513150BT
Sílica PR	Pastilhas / 250	513151BT
Set Sílica No. 1/Não. 2#	cada 100	517671BT
Set Sílica No. 1/Não. 2#	cada 250	517672BT

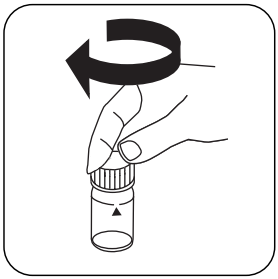
Notas

1. A sequência da adição de pastilhas tem de ser cumprida.

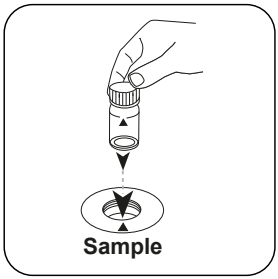
Realização da determinação Dióxido de silício com pastilha

Escolher o método no equipamento.

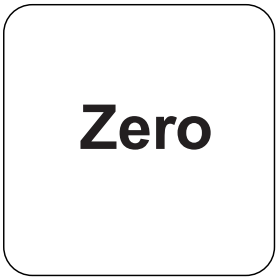
Encher a célula de 24 mm com **10 mL de amostra** .



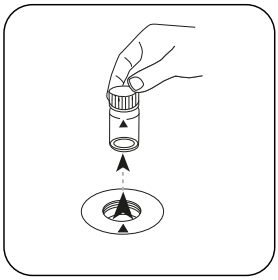
Fechar a(s) célula(s).



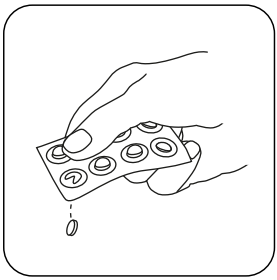
Colocar a **célula de amostra** no compartimento de medição. Observar o posicionamento.



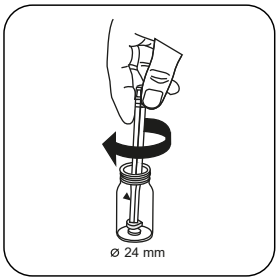
Premir a tecla **ZERO**.



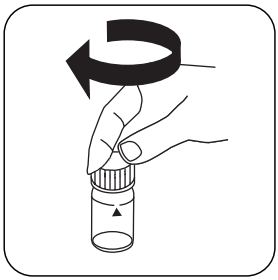
Retirar a célula do compartimento de medição.



Pastilha SILICA No. 1.

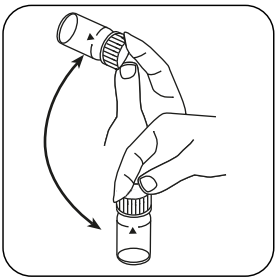


Esmagar a(s) pastilha(s) rodando ligeiramente.

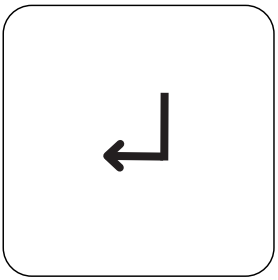


Fechar a(s) célula(s).

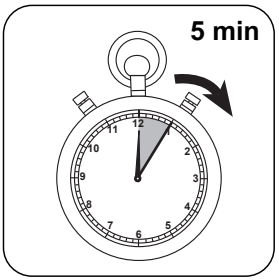
PT



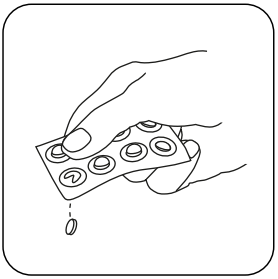
Dissolver a(s) pastilha(s) girando.



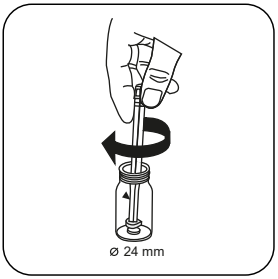
Premir a tecla **ENTER**.



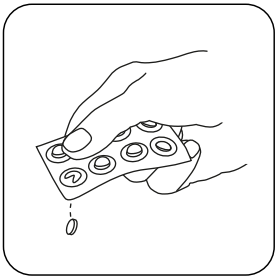
Aguardar **5 minuto(s) de tempo de reação**.



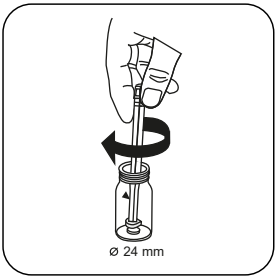
Pastilha SILICA PR.



Esmagar a(s) pastilha(s) rodando ligeiramente.

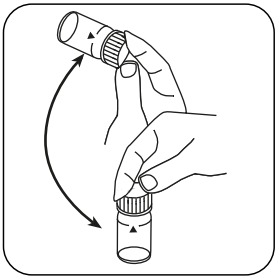


Pastilha SILICA No. 2.

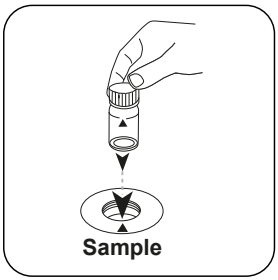


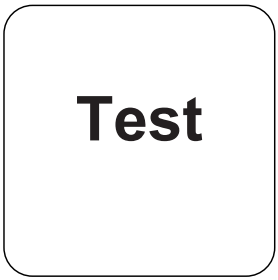
Esmagar a(s) pastilha(s) rodando ligeiramente.

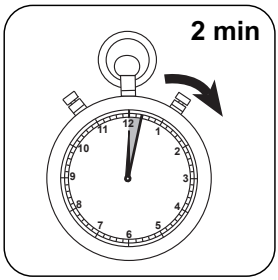
Fechar a(s) célula(s).



Dissolver a(s) pastilha(s) girando.







Colocar a **célula de amostra** no compartimento de medição. Observar o posicionamento.

Premir a tecla **TEST** (XD: **START**).

Aguardar **2 minuto(s) de tempo de reação**.

Decorrido o tempo de reação, a medição é efetuada automaticamente.

No visor aparece o resultado em mg/L Silicato.

Análises

A tabela a seguir identifica os valores de saída que podem ser convertidos em outras formas de citação.

Unidade	Forma de citação	Fator de conversão
mg/l	SiO_2	1
mg/l	Si	0.47

Método Químico

Silicomolybdenum Blue

Apêndice

Texto de Interferências

Interferências Removíveis

- Os fosfatos não interferem sob as condições de reação indicadas.

Derivado de

Standard Method 4500-SiO2 C

[a]incluindo vareta de agitação

Silicato LR PP **M351**

0.1 - 1.6 mg/L SiO_2 **SiLr**

Heteropolyblue

PT

Material

Material necessário (parcialmente opcional):

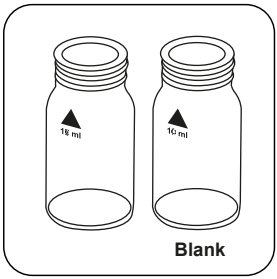
Reagentes	Unidade de Embalagem	Código do Produto
VARIO Sílica LR, Conjunto F10	1 Conjunto	535690

Notas

1. O tempo de reação indicado de 4 minutos refere-se a uma temperatura de amostra de 20 °C. Para 30 °C deve manter um tempo de reação de 2 minutos, e para 10 °C deve manter um tempo de reação de 8 minutos.

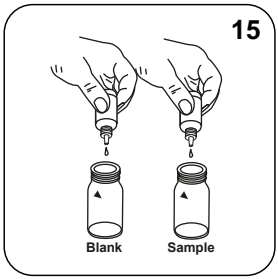
Realização da determinação Dióxido de silício LR com pacote de pó Vario e reagente líquido

Escolher o método no equipamento.

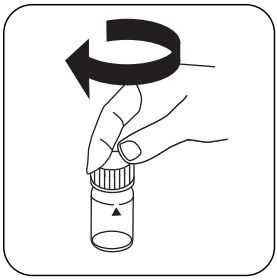


Preparar duas células de 24 mm limpas. Identificar uma célula como célula zero.

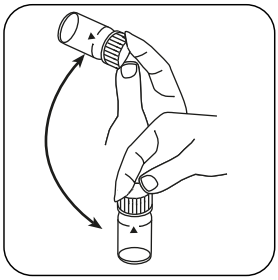
Introduzir em cada célula **10 mL de amostra** .



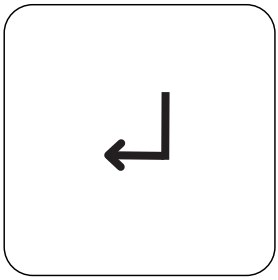
Introduzir em cada célula **15 gotas Vario Molybdate 3 Reagenz- de solução** .



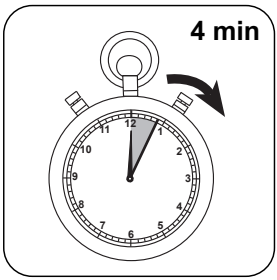
Fechar a(s) célula(s).



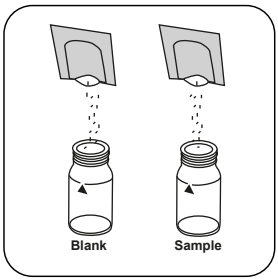
Misturar o conteúdo girando.



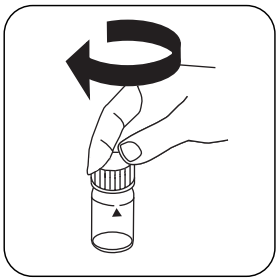
Premir a tecla **ENTER**.



Aguardar **4 minuto(s) de tempo de reação**.

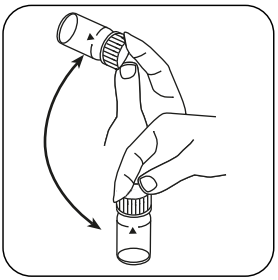


Introduzir em cada célula **um pacote de pó Vario Silica Citric Acid F10**.

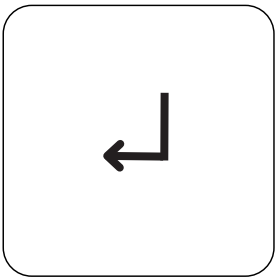


Fechar a(s) célula(s).

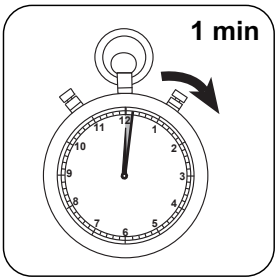
PT



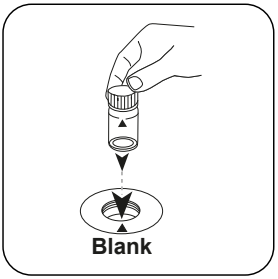
Dissolver o pó girando.



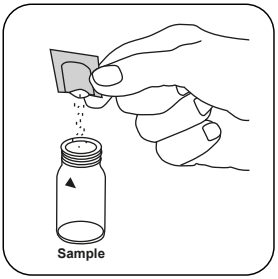
Premir a tecla **ENTER**.



Aguardar **1 minuto(s) de tempo de reação**.

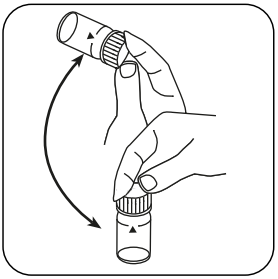


Colocar a **célula zero** no compartimento de medição. Observar o posicionamento.

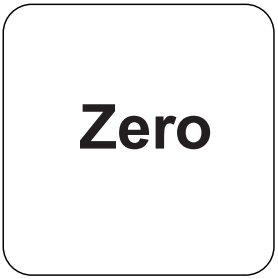


Adicionar à célula de amostra um **pacote de pó Vario Silica Amino Acid F10** .

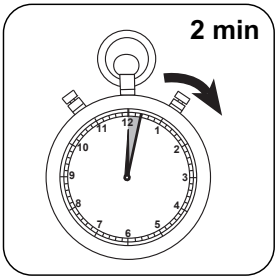
Fechar a(s) célula(s).



Dissolver o pó girando.

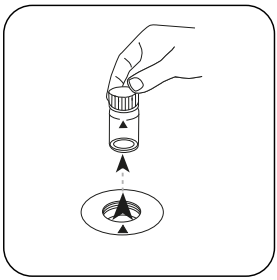


Premir a tecla **ZERO**.

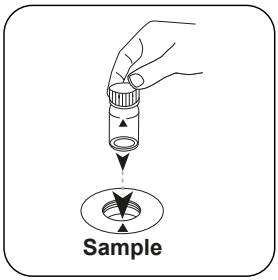


Aguardar **2 minuto(s) de tempo de reação**.

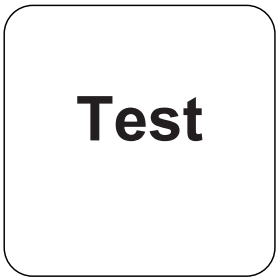
Decorrido o tempo de reação, a medição é efetuada automaticamente.



Retirar a célula do compartimento de medição.



Colocar a **célula de amostra** no compartimento de medição. Observar o posicionamento.



Premir a tecla **TEST** (XD: **START**).

No visor aparece o resultado em mg/L Silicato.

Análises

A tabela a seguir identifica os valores de saída que podem ser convertidos em outras formas de citação.

Unidade	Forma de citação	Fator de conversão
mg/l	SiO_2	1
mg/l	Si	0.47

Método Químico

Heteropolyblue

Apêndice

Texto de Interferências

Interferências Removíveis

1. As células têm de ser fechadas com a tampa logo após a adição da solução de reagente molibdénio 3 Vario, senão podem correr resultados demasiado baixos.
2. As amostras de água podem conter formas de ácido silícico que reagem muito lentamente com molibdénio. O tipo exato destas formas não é conhecido hoje em dia. Através de um pré-tratamento com hidrogenocarbonato de sódio e depois com ácido sulfúrico, estas podem ser convertidas em formas com capacidade de resposta (descrição em "Standard Methods for the Examination of Water and Wastewater" em "Silica-Digenstion with Sodium Bicarbonate").

Interferências	a partir de / [mg/L]
Fe	grandes quantidades
PO_4^{3-}	50
S^{2-}	em todas as quantidades

Validação de método

Limite de Detecção	0.01 mg/L
Limite de Determinação	0.03 mg/L
Fim da Faixa de Medição	1.6 mg/L
Sensibilidade	1.35 mg/L / Abs
Faixa de Confiança	0.01 mg/L
Desvio Padrão	0.004 mg/L
Coeficiente de Variação	0.46 %

Derivado de
Standard Method 4500-SiO2 D

Silicato HR PP **M352**

1 - 90 mg/L SiO_2 **SiHr**

Silicomolybdate

PT

Material

Material necessário (parcialmente opcional):

Reagentes	Unidade de Embalagem	Código do Produto
VARIO Sílica HR Reagente, Conjunto F10	1 Conjunto	535700

Preparação

1. A temperatura da amostra deve situar-se entre 15 °C e 25 °C.

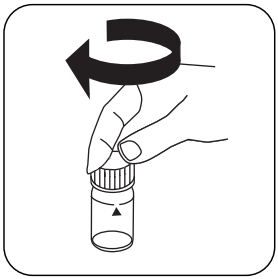
Notas

1. O método mede no flanco da curva de absorção da coloração resultante. Para fotómetros de filtro, a precisão do método pode, portanto, ser melhorada, se necessário, pelo ajuste do utilizador com um padrão de silicato (aprox. 70 mg/L SiO_2).

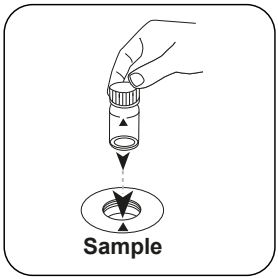
Realização da determinação Dióxido de silício HR com pacote de pó Vario

Escolher o método no equipamento.

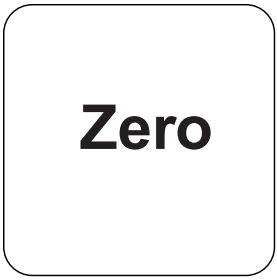
Encher a célula de 24 mm com **10 mL de amostra** .



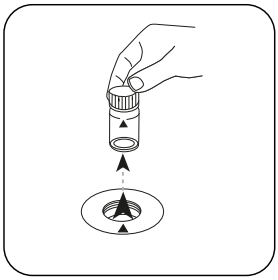
Fechar a(s) célula(s).



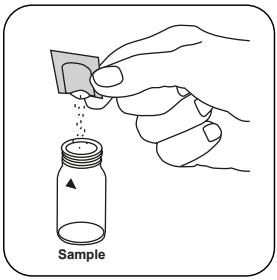
Colocar a **célula de amostra** no compartimento de medição. Observar o posicionamento.



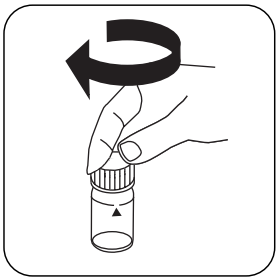
Premir a tecla **ZERO**.



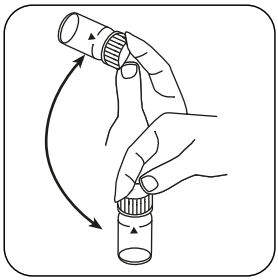
Retirar a célula do compartimento de medição.



Adicionar um **pacote de pó Vario Silica HR Molybdate F10** .

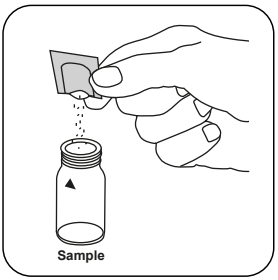


Fechar a(s) célula(s).

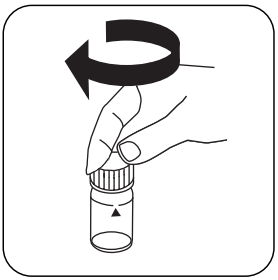


Dissolver o pó girando.

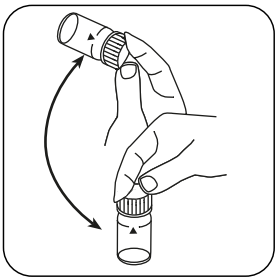
PT



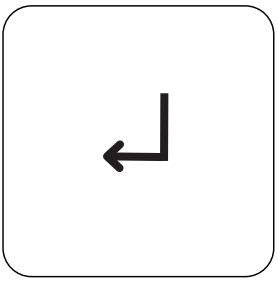
Adicionar um **pacote de pó Vario Silica HR Acid Rgt. F10** .



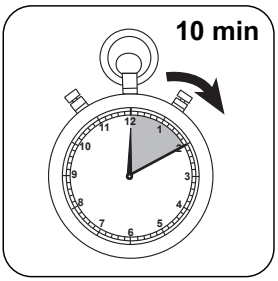
Fechar a(s) célula(s).



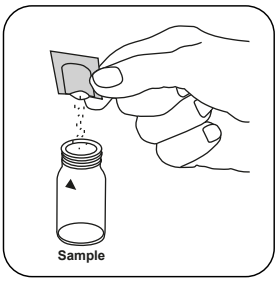
Misturar o conteúdo girando.



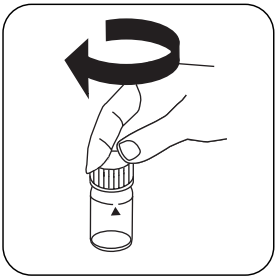
Premir a tecla **ENTER**.



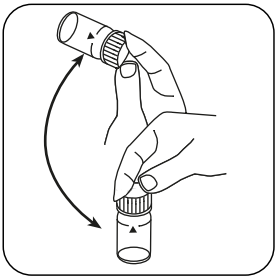
Aguardar **10 minuto(s) de tempo de reação**.



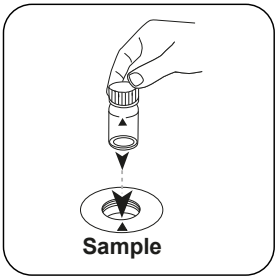
Adicionar um **pacote de pó Vario Silica Citric Acid F10** .



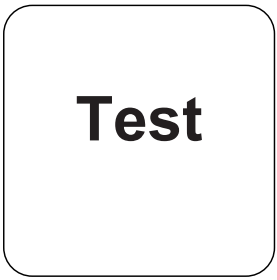
Fechar a(s) célula(s).

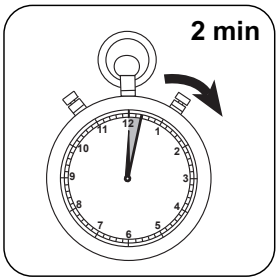


Dissolver o pó girando.



Colocar a **célula de amostra** no compartimento de medição. Observar o posicionamento.





Premir a tecla **TEST** (XD: **START**).

Aguardar **2 minuto(s) de tempo de reação**.

Decorrido o tempo de reação, a medição é efetuada automaticamente.

No visor aparece o resultado em mg/L Silicato.

Análises

A tabela a seguir identifica os valores de saída que podem ser convertidos em outras formas de citação.

Unidade	Forma de citação	Fator de conversão
mg/l	SiO_2	1
mg/l	Si	0.47

Método Químico

Silicomolybdate

Apêndice

Texto de Interferências

Interferências Removíveis

- As amostras de água podem conter formas de ácido silícico que reagem muito lentamente com molibdénio. O tipo exato destas formas não é conhecido hoje em dia. Através de um pré-tratamento com hidrogenocarbonato de sódio e depois com ácido sulfúrico, estas podem ser convertidas em formas com capacidade de resposta (descrição em "Standard Methods for the Examination of Water and Wastewater" em "Silica-Digenstion with Sodium Bicarbonate").
- Na presença de dióxido de silício ou de fosfato, forma-se uma cor amarela.
  A adição do pacote de pó Silica Citric Acid F10 permite eliminar a cor amarela que se formou com o fosfato.

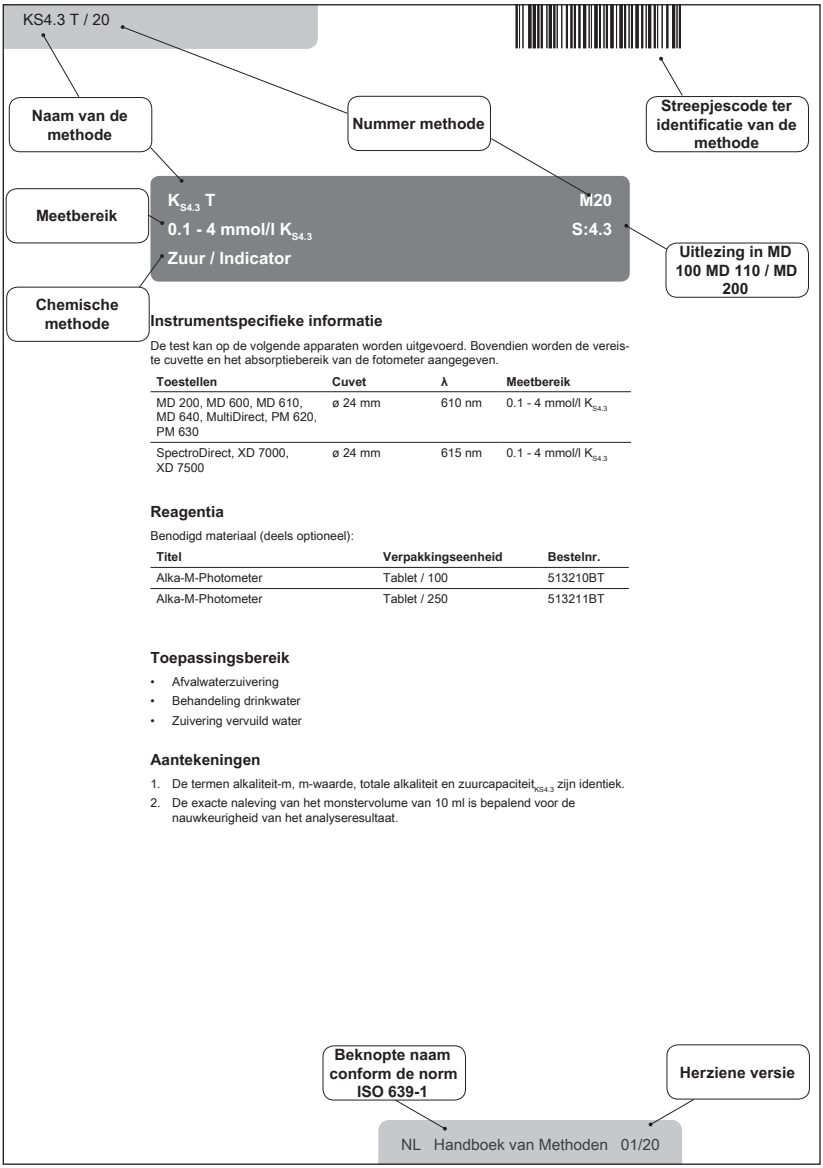
Interferências	a partir de / [mg/L]	Influência
Fe	grandes quantidades	
PO_4^{3-}	50	
PO_4^{3-}	60	A perturbação é de cerca de -2 %
PO_4^{3-}	75	A perturbação é de cerca de -11 %
S^{2-}	em todas as quantidades	

Validação de método

Limite de Detecção	0.38 mg/L
Limite de Determinação	1.14 mg/L
Fim da Faixa de Medição	100 mg/L
Sensibilidade	120 mg/L / Abs
Faixa de Confiança	1.69 mg/L
Desvio Padrão	0.70 mg/L
Coeficiente de Variação	1.38 %

Derivado de

Standard Method 4500-SiO2 C



Instrumentspecifieke informatie

De test kan op de volgende apparaten worden uitgevoerd. Bovendien worden de vereiste cuvette en het absorptiebereik van de fotometer aangegeven.

Toestellen	Cuvet	λ	Meetbereik
MD 200, MD 600, MD 610, MD 640, MultiDirect, PM 620, PM 630	ø 24 mm	610 nm	0.1 - 4 mmol/l $K_{S4.3}$
SpectroDirect, XD 7000, XD 7500	ø 24 mm	615 nm	0.1 - 4 mmol/l $K_{S4.3}$

Reagentia

Benodigd materiaal (deels optioneel):

Titel	Verpakkingseenheid	Bestelnr.
Alka-M-Photometer	Tablet / 100	513210BT
Alka-M-Photometer	Tablet / 250	513211BT

Toepassingsbereik

- Afvalwaterzuivering
- Behandeling drinkwater
- Zuivering vervuild water

Aantekeningen

1. De termen alkaliteit-m, m-waarde, totale alkaliteit en zuurcapaciteit$_{KS4.3}$ zijn identiek.
2. De exacte naleving van het monstervolume van 10 ml is bepalend voor de nauwkeurigheid van het analyseresultaat.

Uitvoering van de meting

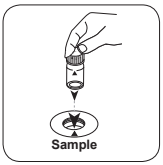
Uitvoering van de bepaling Zuurcapaciteit $K_{S4.3}$ met tablet

De methode in het apparaat selecteren.

Voor deze methode moet bij de volgende apparaten geen nulmeting worden uitgevoerd: XD 7000, XD 7500

Spoelbakje van 24 mm met **10 ml staal** vullen.

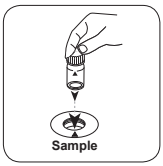
De spoelbakjes afsluiten.



Het **staalspoelbakje** in de meetschacht plaatsen. Op de positionering letten.

• • •

Tabletten oplossen door om te draaien



Het **staalspoelbakje** in de meetschacht plaatsen. Op de positionering letten.

De toets **TEST** (XD: **START**) indrukken.

De display toont het resultaat als Zuurcapaciteit $K_{S4.3}$.

Silicaat T **M350**

0.05 - 4 mg/L SiO_2 **Si**

Siliciummolybdeenblauw

NL

Reagentia

Benodigd materiaal (deels optioneel):

Reagentia	Verpakkingseenheid	Bestelnr.
Silica Nr. 1	Tablet / 100	513130BT
Silica Nr. 1	Tablet / 250	513131BT
Silica Nr. 2	Tablet / 100	513140BT
Silica Nr. 2	Tablet / 250	513141BT
Silica PR	Tablet / 100	513150BT
Silica PR	Tablet / 250	513151BT
Set silica nr. 1/Nr. 2#	per 100	517671BT
Set silica nr. 1/Nr. 2#	per 250	517672BT

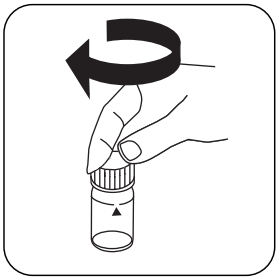
Aantekeningen

1. De volgorde waarin de tabletten worden toegevoegd, moet strikt in acht worden genomen.

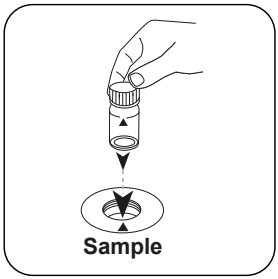
Uitvoering van de bepaling Siliciumdioxide met tablet

De methode in het apparaat selecteren.

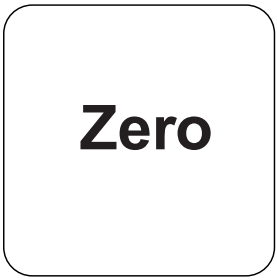
Spoelbakje van 24 mm met **10 mL staal** vullen.



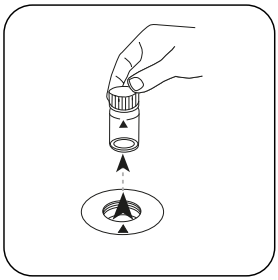
De spoelbakjes afsluiten.



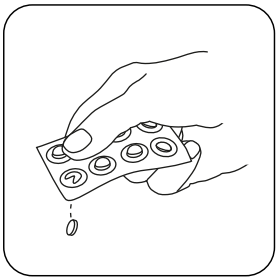
Het **staalspoelbakje** in de meetschacht plaatsen. Op de positionering letten.



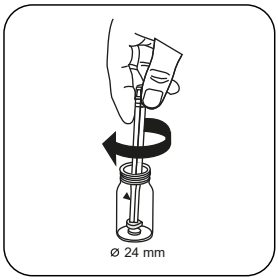
De toets **NUL** indrukken.



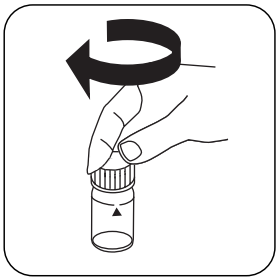
Het spoelbakje uit de meetschacht nemen.



Een SILICA Nr. 1 tablet toevoegen.

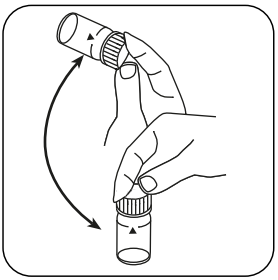


De tabletten onder lichte rotatie verpletteren.

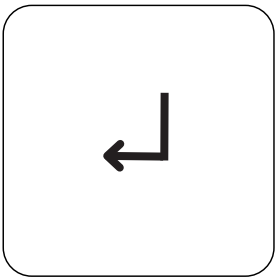


De spoelbakjes afsluiten.

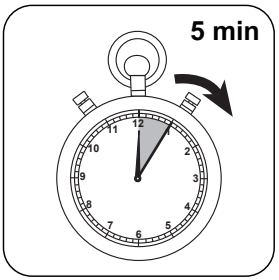
NL



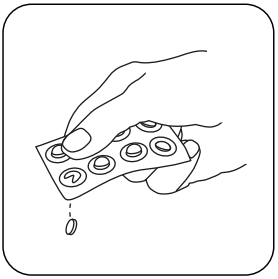
Tabletten oplossen door om te draaien



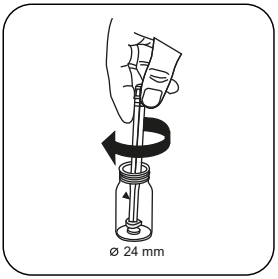
De toets **ENTER** indrukken.



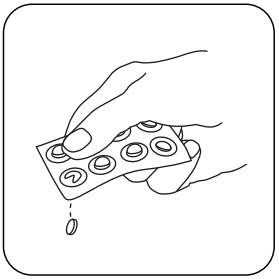
De reactietijd van 5 minuten afwachten.



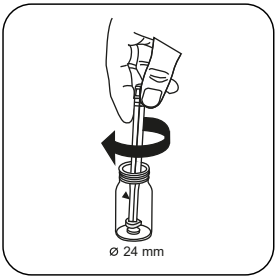
Een SILICA PR tablet toevoegen.



De tabletten onder lichte rotatie verpletteren.

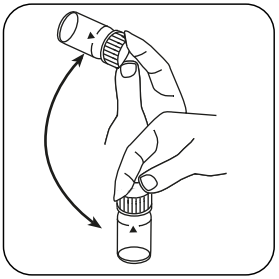


Een SILICA Nr. 2 tablet toevoegen.

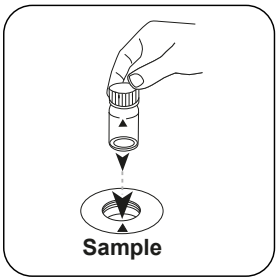


De tabletten onder lichte rotatie verpletteren.

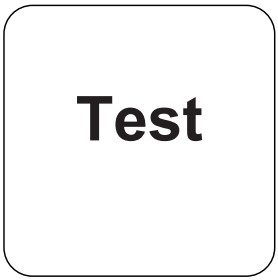
De spoelbakjes afsluiten.



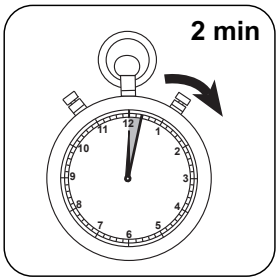
Tabletten oplossen door om te draaien



Het **staalspoelbakje** in de meetschacht plaatsen. Op de positionering letten.



De toets **TEST** (XD: **START**) indrukken.



De reactietijd van 2 minuten afwachten.

Na afloop van de reactietijd wordt de meting automatisch uitgevoerd.

De display toont het resultaat in mg/L Siliciumdioxide.

Evaluatie

De volgende tabel geeft aan dat de uitvoerwaarden kunnen worden geconverteerd naar andere citatievormen.

Eenheid	Dagvaardingsformulier	Omrekeningsfactor
mg/l	SiO_2	1
mg/l	Si	0.47

Chemische methode

Siliciummolybdeenblauw

Aanhangsel

Verstoringen

Uit te sluiten verstoringen

- Onder de gegeven reactieomstandigheden storen fosfaten niet.

Afgeleid van

Standaardmethode 4500-SiO2 C

[#] met inbegrip van de mengstaaf

Silicaat LR PP **M351**

0.1 - 1.6 mg/L SiO_2 **SiLr**

Heteropolyblauw

NL

Reagentia

Benodigd materiaal (deels optioneel):

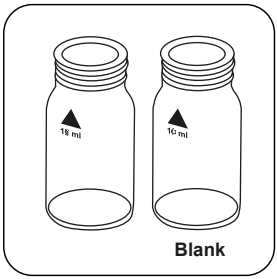
Reagentia	Verpakkingseenheid	Bestelnr.
VARIO silica LR, F10 set	1 Zin	535690

Aantekeningen

1. De aangegeven reactietijd van 4 minuten is van toepassing op een bemonsteringstemperatuur van 20 °C. Een reactietijd van 2 minuten gedurende 30 °C en 8 minuten gedurende 10 °C moet in acht worden genomen.

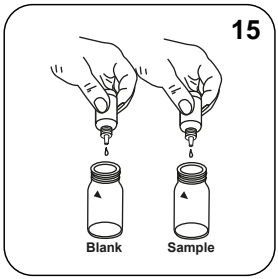
Uitvoering van de bepaling Siliciumdioxide LR met Vario-poederpakje en vloeibaar reagens

De methode in het apparaat selecteren.

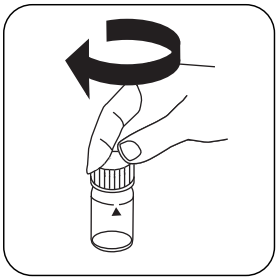


Twee propere spoelbakjes van 24 mm klaarzetten. Een als nulspoelbakje kenmerken.

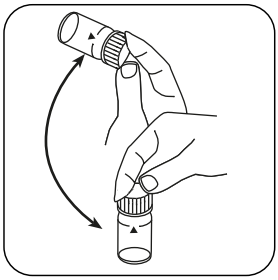
In elk spoelbakje **10 mL staal** doen.



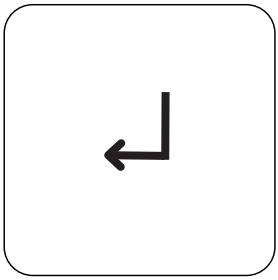
In elk spoelbakje **15 druppels Vario molybdaat 3 reagens oplossing** doen.



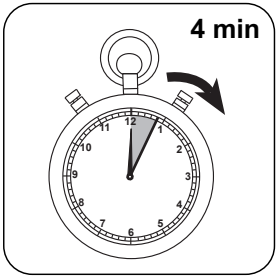
De spoelbakjes afsluiten.



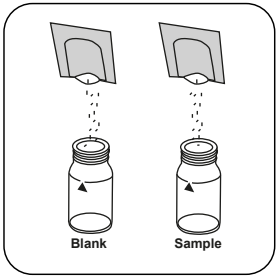
De inhoud mengen door om te draaien.



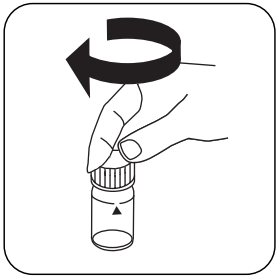
De toets **ENTER** indrukken.



De reactietijd van 4 minuten afwachten.

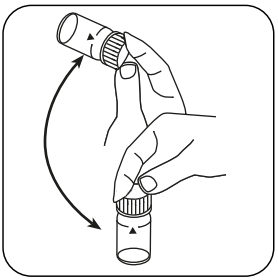


In elk spoelbakje **een Vario Silica citroenzuur F10 poederpakje** doen.

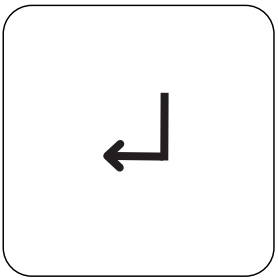


De spoelbakjes afsluiten.

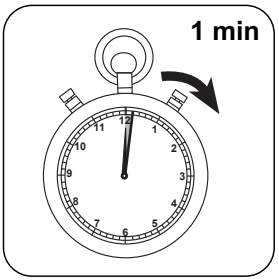
NL



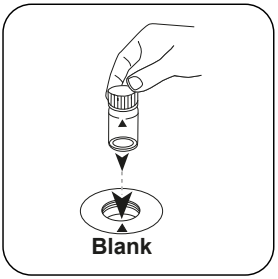
Het poeder oplossen door om te draaien.



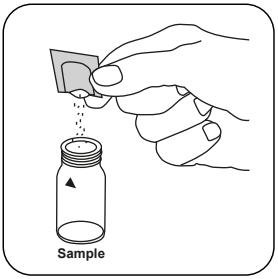
De toets **ENTER** indrukken.



De reactietijd van 1 minuten afwachten.

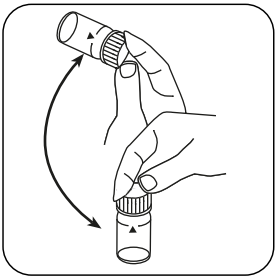


Het **nulspoelbakje** in de meetschacht plaatsen. Op de positionering letten.

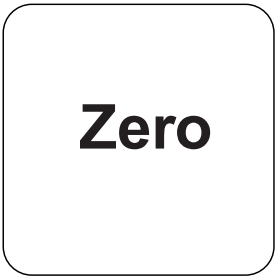


Een **Vario Silica Amino Acid F10-poederpakje** aan het staalspoelbakje toevoegen.

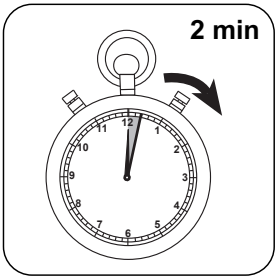
De spoelbakjes afsluiten.



Het poeder oplossen door om te draaien.

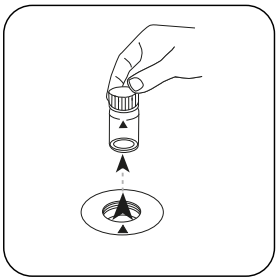


De toets **NUL** indrukken.

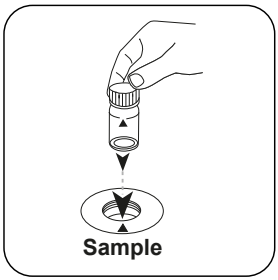


De reactietijd van 2 minuten afwachten.

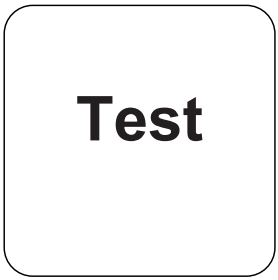
Na afloop van de reactietijd wordt de meting automatisch uitgevoerd.



Het spoelbakje uit de meetschacht nemen.



Het **staalspoelbakje** in de meetschacht plaatsen. Op de positionering letten.



De toets **TEST** (XD: **START**) indrukken.

De display toont het resultaat in mg/L Siliciumdioxide.

Evaluatie

De volgende tabel geeft aan dat de uitvoerwaarden kunnen worden geconverteerd naar andere citatievormen.

Eenheid	Dagvaardingsformulier	Omrekeningsfactor
mg/l	SiO_2	1
mg/l	Si	0.47

Chemische methode

Heteropolyblauw

Aanhangsel

Verstoringen

Uit te sluiten verstoringen

1. De spoelbakjes moeten onmiddellijk na toevoeging van de reagensoplossing Vario Molybdate 3 met het deksel worden gesloten, anders kunnen de resultaten verminderen.
2. Af en toe bevatten watermonsters vormen van siliciumdioxide die zeer langzaam reageren met molybdaat. De precieze aard van deze vormen is momenteel onbekend. Door voorbehandeling met natriumwaterstofcarbonaat en vervolgens met zwavelzuur kunnen deze worden omgezet in vormen met een hoge reactiviteit (beschrijving in "Standard Methods for the Examination of Water and Wastewater" onder "Silica-Digenstion with Sodium Bicarbonate").

Verstoringen	verstoort vanaf
Fe	grote aantallen
PO_4^{3-}	50
S^{2-}	in alle hoeveelheden

Validatie van de methodes

Aantoonbaarheidsgrens	0.01 mg/L
Bepaalbaarheidsgrens	0.03 mg/L
Einde meetbereik	1.6 mg/L
Gevoeligheid	1.35 mg/L / Abs
Betrouwbaarheidsgrenzen	0.01 mg/L
Standaardafwijking procedure	0.004 mg/L
Variatiecoefficient procedure	0.46 %

Afgeleid van

Standaardmethode 4500-SiO2 D

Silicaat HR PP M352

1 - 90 mg/L SiO_2 SiHr

Silicomolybdaat

NL

Reagentia

Benodigd materiaal (deels optioneel):

Reagentia	Verpakkingseenheid	Bestelnr.
VARIO Silica HR Reagens, set F10	1 Zin	535700

Voorbereiding

1. De bemonsteringstemperatuur moet tussen 15 en 25 °C liggen.

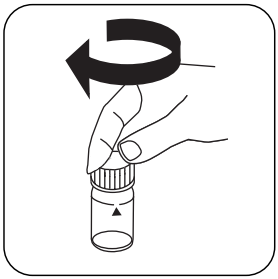
Aantekeningen

1. De methode meet de resulterende kleuring in de flank van de absorptiecurve. Voor filterfotometers kan de nauwkeurigheid van de methode daarom met behulp van een silicaatstandaard (ca. 70 mg/L SiO_2), indien nodig, worden verbeterd door de gebruikersaanpassing.

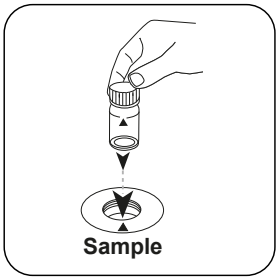
Uitvoering van de bepaling Siliciumdioxide HR met Vario-poederpakje

De methode in het apparaat selecteren.

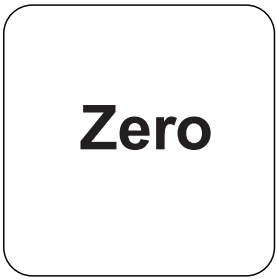
Spoelbakje van 24 mm met **10 mL staal** vullen.



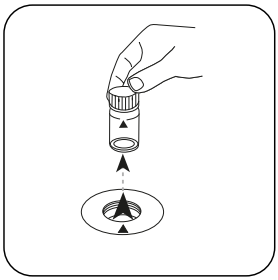
De spoelbakjes afsluiten.



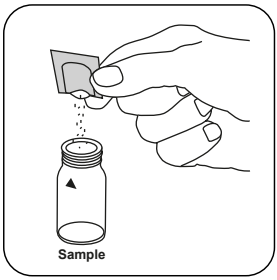
Het **staalspoelbakje** in de meetschacht plaatsen. Op de positionering letten.



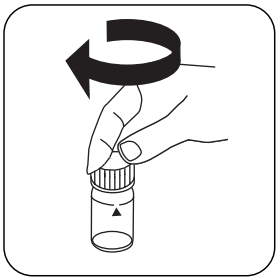
De toets **NUL** indrukken.



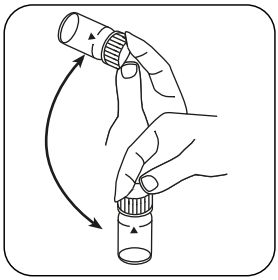
Het spoelbakje uit de meetschacht nemen.



Een **Vario Silica HR molybdaat F10 poederpakje** toevoegen.

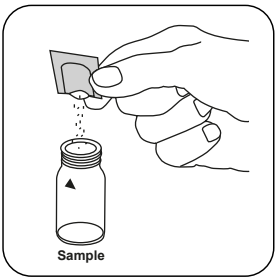


De spoelbakjes afsluiten.

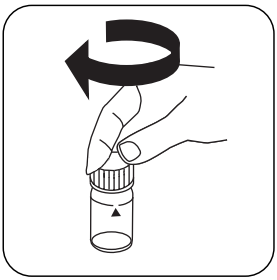


Het poeder oplossen door om te draaien.

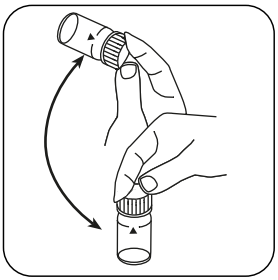
NL



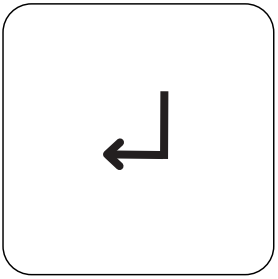
Een **Vario Silica HR zuur Rgt. F10 poederpakje** toevoegen.



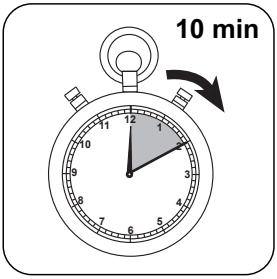
De spoelbakjes afsluiten.



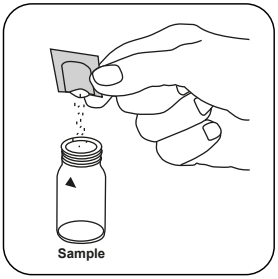
De inhoud mengen door om te draaien.



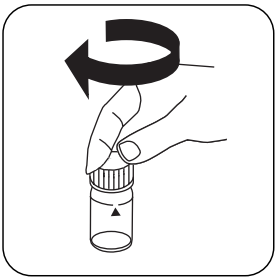
De toets **ENTER** indrukken.



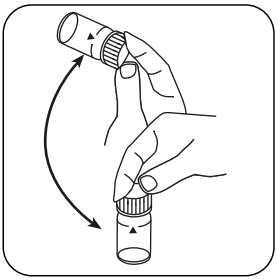
De reactietijd van 10 minuten afwachten.



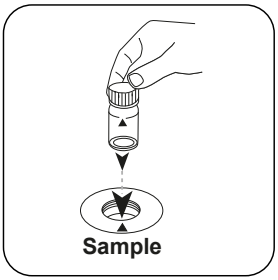
Een **Vario Silica citroenzuur F10 poederpakje** toevoegen.



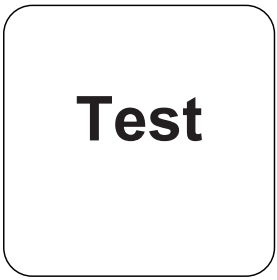
De spoelbakjes afsluiten.

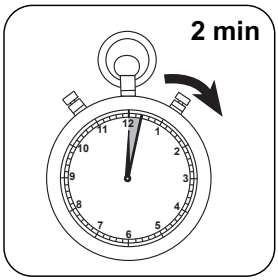


Het poeder oplossen door om te draaien.



Het **staalspoelbakje** in de meetschacht plaatsen. Op de positionering letten.





De toets **TEST** (XD: **START**) indrukken.

De reactietijd van 2 minuten afwachten.

Na afloop van de reactietijd wordt de meting automatisch uitgevoerd.

De display toont het resultaat in mg/L Siliciumdioxide.

Evaluatie

De volgende tabel geeft aan dat de uitvoerwaarden kunnen worden geconverteerd naar andere citatievormen.

Eenheid	Dagvaardingsformulier	Omrekeningsfactor
mg/l	SiO_2	1
mg/l	Si	0.47

Chemische methode

Silicomolybdaat

Aanhangsel

Verstoringen

Uit te sluiten verstoringen

- Af en toe bevatten watermonsters vormen van siliciumdioxide die zeer langzaam reageren met molybdaat. De precieze aard van deze vormen is momenteel onbekend. Door voorbehandeling met natriumwaterstofcarbonaat en vervolgens met zwavelzuur kunnen deze worden omgezet in vormen met een hoge reactiviteit (beschrijving in "Standard Methods for the Examination of Water and Wastewater" onder "Silica-Digenstion with Sodium Bicarbonate").
- Als er siliciumdioxide of fosfaat aanwezig is, ontstaat er een gele kleur.
  Door de toevoeging van de Silica Citroenzuur F10 poederverpakking wordt de gele kleur veroorzaakt door fosfaat geëlimineerd.

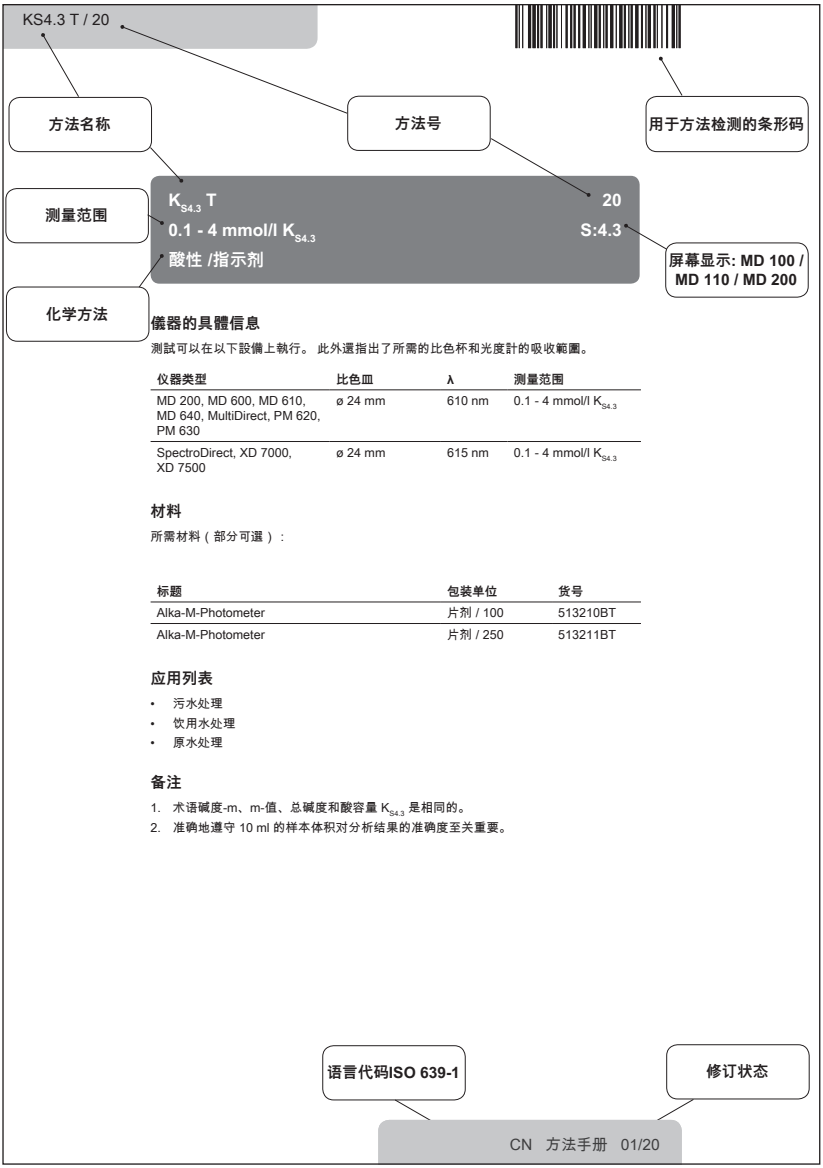
Verstoringen	verstoort vanaf	Invloed
Fe	grote aantallen	
PO_4^{3-}	50	
PO_4^{3-}	60	De verstoring is ongeveer -2%
PO_4^{3-}	75	De verstoring is ongeveer -11 %
S^{2-}	in alle hoeveelheden	

Validatie van de methodes

Aantoonbaarheidsgrens	0.38 mg/L
Bepaalbaarheidsgrens	1.14 mg/L
Einde meetbereik	100 mg/L
Gevoeligheid	120 mg/L / Abs
Betrouwbaarheidsgrenzen	1.69 mg/L
Standaardafwijking procedure	0.70 mg/L
Variatiecoefficient procedure	1.38 %

Afgeleid van

Standaardmethode 4500-SiO2 C



儀器的具體信息

測試可以在以下設備上執行。 此外還指出了所需的比色杯和光度計的吸收範圍。

仪器类型	比色皿	λ	测量范围
MD 200, MD 600, MD 610, MD 640, MultiDirect, PM 620, PM 630	ø 24 mm	610 nm	0.1 - 4 mmol/l $K_{S4.3}$
SpectroDirect, XD 7000, XD 7500	ø 24 mm	615 nm	0.1 - 4 mmol/l $K_{S4.3}$

材料

所需材料（部分可選）：

标题	包装单位	货号
Alka-M-Photometer	片剂 / 100	513210BT
Alka-M-Photometer	片剂 / 250	513211BT

应用列表

- 污水处理
- 饮用水处理
- 原水处理

备注

1. 术语碱度-m、m-值、总碱度和酸容量 $K_{S4.3}$ 是相同的。
2. 准确地遵守 10 ml 的样本体积对分析结果的准确度至关重要。

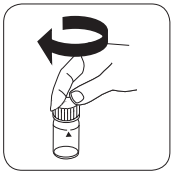
开始测量

进行测定 $K_{S4.3}$ 片剂酸容量

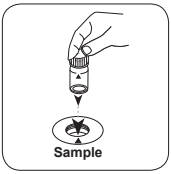
选择设备中的方法。

对于这种方法，在以下设备上不能进行 ZERO 测量：XD 7000, XD 7500

用 **10 ml** 样本填充 24 mm 比色杯。

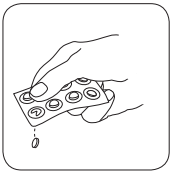


密封比色杯。

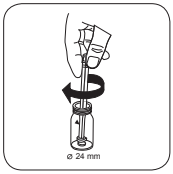


将样本比色杯放入测量轴中。注意定位。

• • •



加入 **ALKA-M-PHOTOMETER** 片剂。



用轻微的扭转压碎片剂。

密封比色杯。

CN 方法手册 01/20

T 硅酸盐 M350

0.05 - 4 mg/L SiO_2 Si

硅钼蓝

材料
所需材料（部分可選）：

ZH

试剂	包装单位	货号
二氧化硅 No.1	片剂 / 100	513130BT
二氧化硅 No.1	片剂 / 250	513131BT
二氧化硅 No.2	片剂 / 100	513140BT
二氧化硅 No.2	片剂 / 250	513141BT
二氧化硅 PR	片剂 / 100	513150BT
二氧化硅 PR	片剂 / 250	513151BT
套件二氧化硅 No.1/No.2#	各100次	517671BT
套件二氧化硅 No.1/No.2#	各250次	517672BT

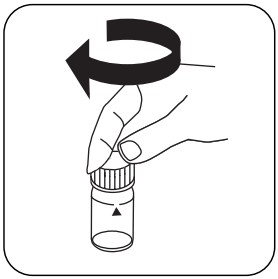
备注

1. 必须严格遵守添加片剂的顺序。

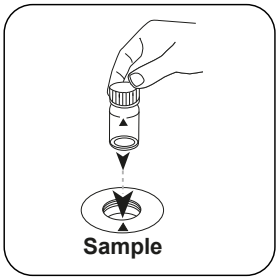
进行测定 二氧化硅片剂

选择设备中的方法。

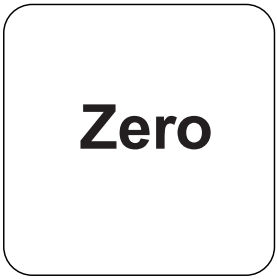
用 **10 mL 样本**填充 24 mm 比色杯。



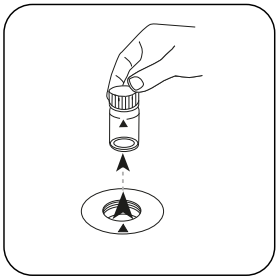
密封比色杯。



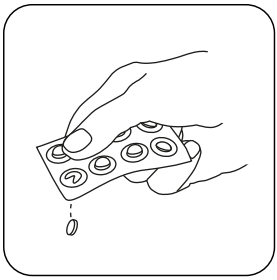
将**样本比色杯**放入测量轴中。注意定位。



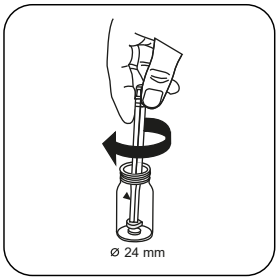
按下 **ZERO** 按钮。



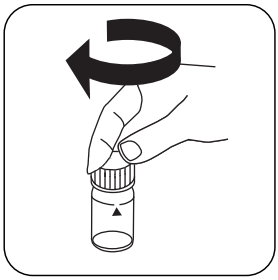
从测量轴上取下比色杯。



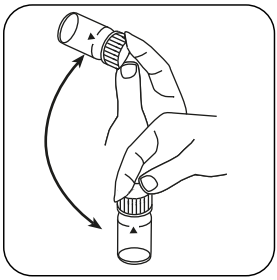
加入 **SILICA No. 1 片剂** 。



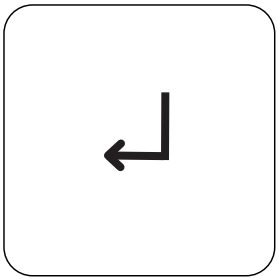
用轻微的扭转压碎片剂。



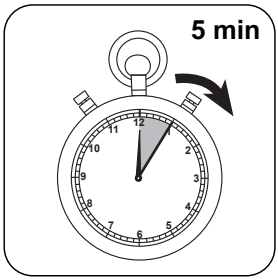
密封比色杯。



通过旋转溶解片剂。

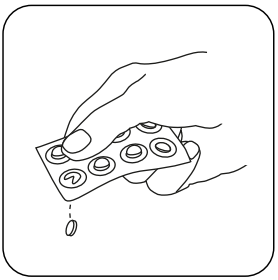


按下 **ENTER** 按钮。

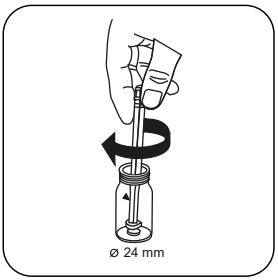


等待 **5 分钟反应时间** 。

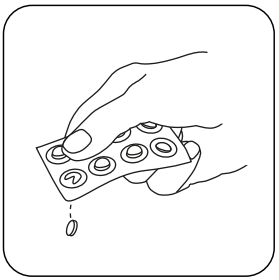
ZH



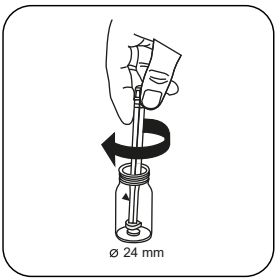
加入 **SILICA PR 片剂**。



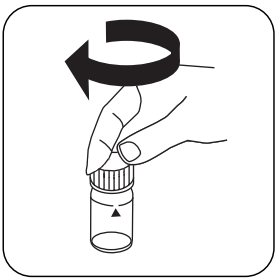
用轻微的扭转压碎片剂。



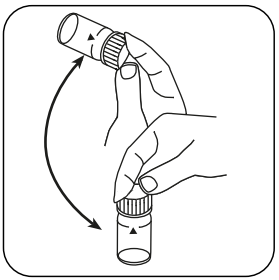
加入 **SILICA No. 2 片剂** 。



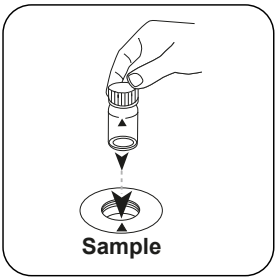
用轻微的扭转压碎片剂。



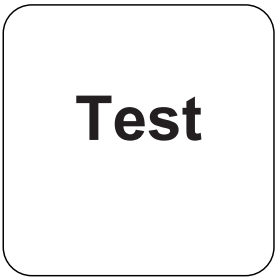
密封比色杯。



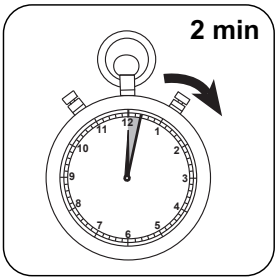
通过旋转溶解片剂。



将**样本比色杯**放入测量轴中。注意定位。



按下 **TEST** (XD: **START**) 按钮。



等待 **2 分钟反应时间** 。

反应时间结束后，自动进行测量。

结果在显示屏上显示为 mg / l 硅酸盐。

分析

下表中输出数据也可转换为其他格式表示.

单位	参考表格	因素
mg/l	SiO_2	1
mg/l	Si	0.47

化学方法

硅钼蓝

附錄

干扰说明

可消除干扰

- 在给定的反应条件下，磷酸盐不会产生干扰。

源于

标准方法 4500-SiO2 C

i含搅拌棒, 10cm

LR PP 硅酸盐 M351

0.1 - 1.6 mg/L SiO_2 SiLr

杂多酸

材料
所需材料（部分可選）：

ZH

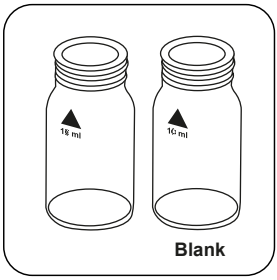
试剂	包装单位	货号
VARIO 二氧化硅 LR，F10 套件	1 组	535690

备注

1. 4 分钟的规定反应时间针对样本温度为 20 °C 的样本。对于样本温度为 30 °C 的样本，必须保持 2 分钟的反应时间；对于样本温度为 10 °C 的样本，必须保持 8 分钟的反应时间。

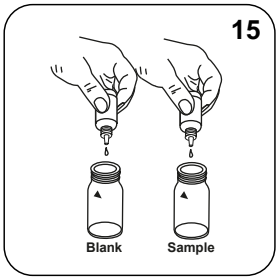
进行测定 LR 二氧化硅 Vario 粉包和液剂

选择设备中的方法。

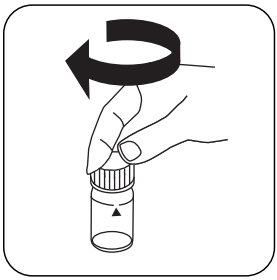


准备两个干净的 24 mm 比色杯。将一个比色杯标记为空白比色杯。

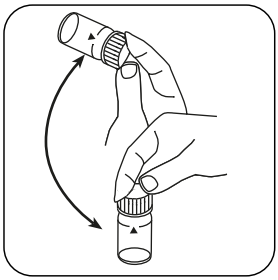
在每个比色杯中加入 **10 mL 样本**。



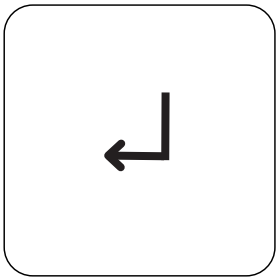
在每个比色杯中加入 **15 滴 Vario Molybdate 3 Reagenz- 溶液**。



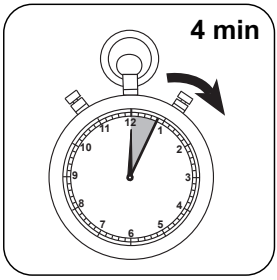
密封比色杯。



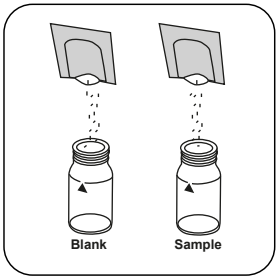
通过旋转混合内容物。



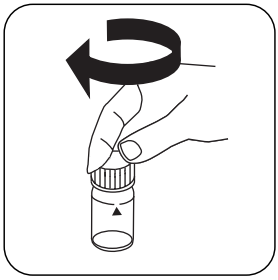
按下 **ENTER** 按钮。



等待 **4 分钟反应时间** 。

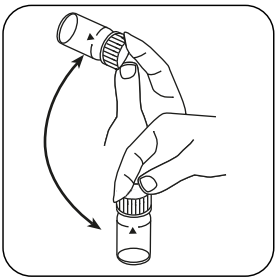


在每个比色杯中加入**一个 Vario Silica Citric Acid F10 粉包** 。

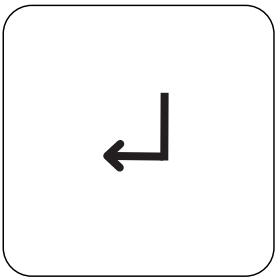


密封比色杯。

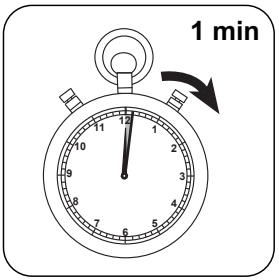
ZH



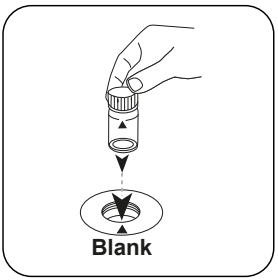
通过旋转溶解粉末。



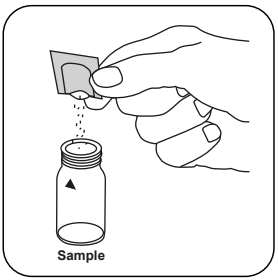
按下 **ENTER** 按钮。



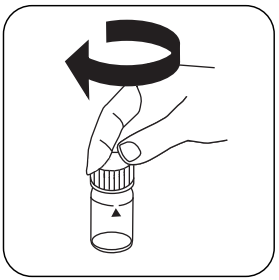
等待 **1 分钟反应时间** 。



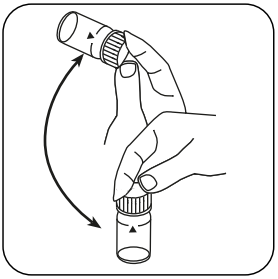
将**空白比色杯**放入测量轴中。注意定位。



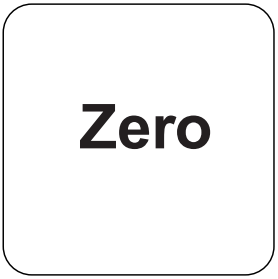
将一个 **Vario Silica Amino Acid F10 粉包** 加入到样本比色杯中。



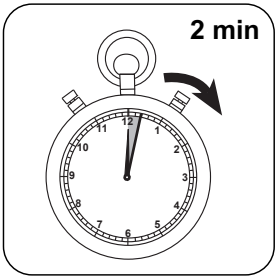
密封比色杯。



通过旋转溶解粉末。

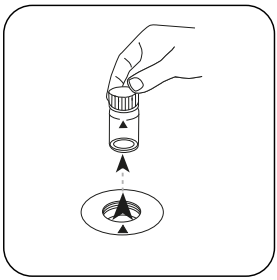


按下 **ZERO** 按钮。

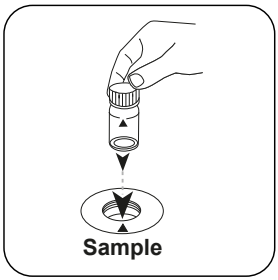


等待 **2 分钟反应时间** 。

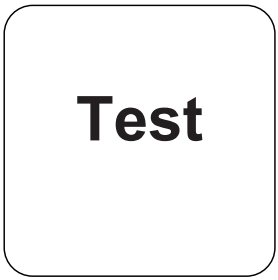
反应时间结束后，自动进行测量。



从测量轴上取下比色杯。



将**样本比色杯**放入测量轴中。注意定位。



按下 **TEST** (XD: **START**) 按钮。

结果在显示屏上显示为 mg / l 硅酸盐。

分析

下表中输出数据也可转换为其他格式表示.

单位	参考表格	因素
mg/l	SiO_2	1
mg/l	Si	0.47

化学方法

杂多酸

附錄

干扰说明

可消除干扰

1. 加入 Vario 钼酸盐 3 试剂溶液后，必须立即用比色杯杯盖密封比色杯，因为这可能会导致较低的结果。
2. 偶尔水样含有与钼酸盐反应非常缓慢的硅酸形式。这些形式的确切性质目前是未知的。通过用碳酸氢钠，然后用硫酸预处理，可以将它们转化成反应性形式（参见“水和废水检测的标准方法”中“用碳酸氢钠进行二氧化硅分离”的描述）。

干擾	從/ [mg/l]
Fe	大量
PO_4^{3-}	50
S^{2-}	所有的量

方法验证

检出限	0.01 mg/L
测定下限	0.03 mg/L
测量上限	1.6 mg/L
灵敏度	1.35 mg/L / Abs
置信范围	0.01 mg/L
标准偏差	0.004 mg/L
变异系数	0.46 %

源于

标准方法 4500-SiO2 D

HR PP 硅酸盐 M352

1 - 90 mg/L SiO_2 SiHr

硅钼

材料
所需材料（部分可選）：

ZH

试剂	包装单位	货号
VARIO 二氧化硅 HR 试剂，套件 F10	1 组	535700

准备

1. 样本温度必须在 15 °C 至 25 °C 之间。

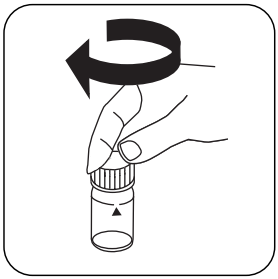
备注

1. 该方法根据所得着色液的吸收曲线的吸收边进行测量。对于滤色光度计，如果需要，可以使用硅酸盐标准液（约 70 mg/L SiO_2）通过用户调节来改善该方法的精度。

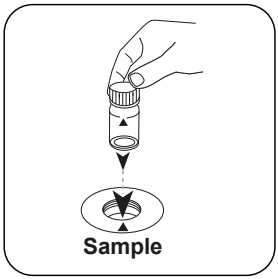
进行测定 HR 二氧化硅 Vario 粉包

选择设备中的方法。

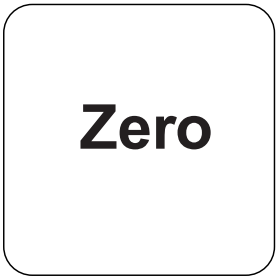
用 **10 mL 样本**填充 24 mm 比色杯。



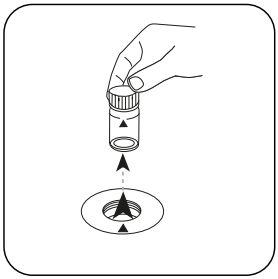
密封比色杯。



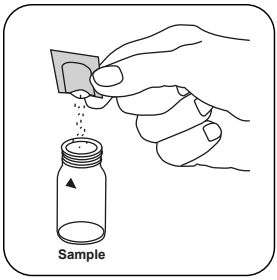
将**样本比色杯**放入测量轴中。注意定位。



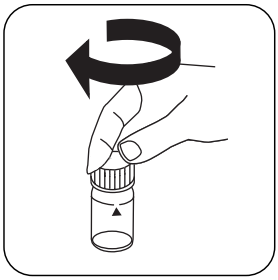
按下 **ZERO** 按钮。



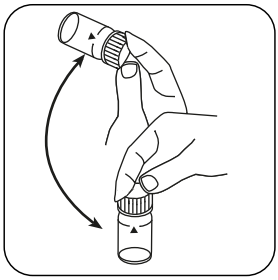
从测量轴上取下比色杯。



加入 **Vario Silica HR Molybdate F10 粉包** 。

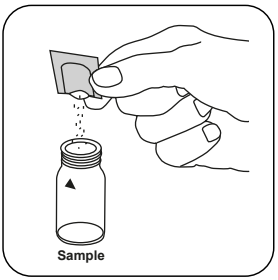


密封比色杯。

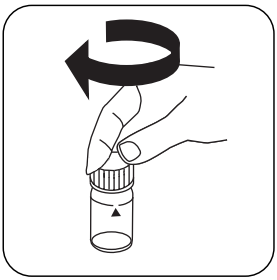


通过旋转溶解粉末。

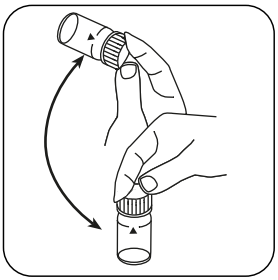
ZH



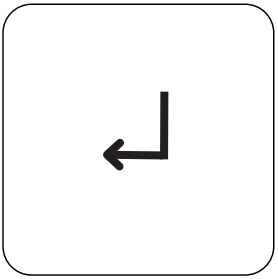
加入 **Vario Silica HR Acid Rgt. F10 粉包** 。



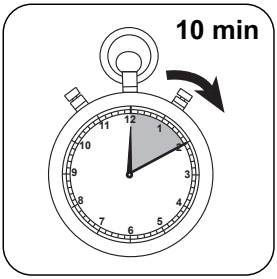
密封比色杯。



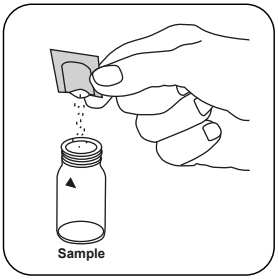
通过旋转混合内容物。



按下 **ENTER** 按钮。

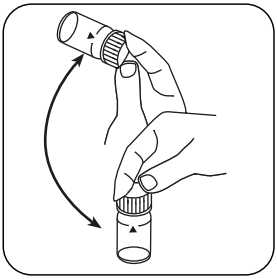


等待 **10 分钟反应时间** 。

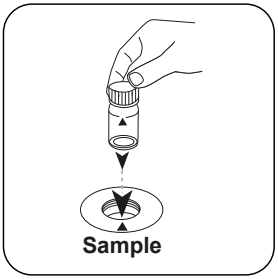


加入 **Vario Silica Citric Acid F10 粉包** 。

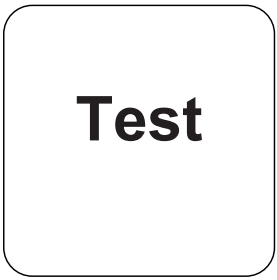
密封比色杯。

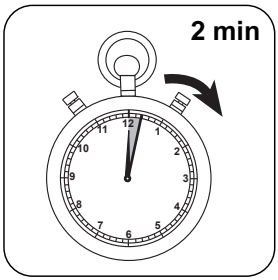


通过旋转溶解粉末。



将**样本比色杯**放入测量轴中。注意定位。





按下 **TEST** (XD: **START**) 按钮。

等待 **2 分钟反应时间** 。

反应时间结束后，自动进行测量。

结果在显示屏上显示为 mg / l 硅酸盐。

分析

下表中输出数据也可转换为其他格式表示.

单位	参考表格	因素
mg/l	SiO_2	1
mg/l	Si	0.47

化学方法

硅钼

附錄

干扰说明

可消除干扰

- 偶尔水样含有与钼酸盐反应非常缓慢的硅酸形式。这些形式的确切性质目前是未知的。通过用碳酸氢钠，然后用硫酸预处理，可以将它们转化成反应性形式（参见“水和废水检测的标准方法”中“用碳酸氢钠进行二氧化硅分离”的描述）。
- 如果存在二氧化硅或磷酸盐，则会出现黄色。
  添加二氧化硅柠檬酸 F10 粉包可去除磷酸盐引起的黄色。

干擾	從/ [mg/l]	影響
Fe	大量	
PO_4^{3-}	50	
PO_4^{3-}	60	干扰约为 -2 %
PO_4^{3-}	75	干扰约为 -11 %
S^{2-}	所有的量	

方法验证

检出限	0.38 mg/L
测定下限	1.14 mg/L
测量上限	100 mg/L
灵敏度	120 mg/L / Abs
置信范围	1.69 mg/L
标准偏差	0.70 mg/L
变异系数	1.38 %

源于
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