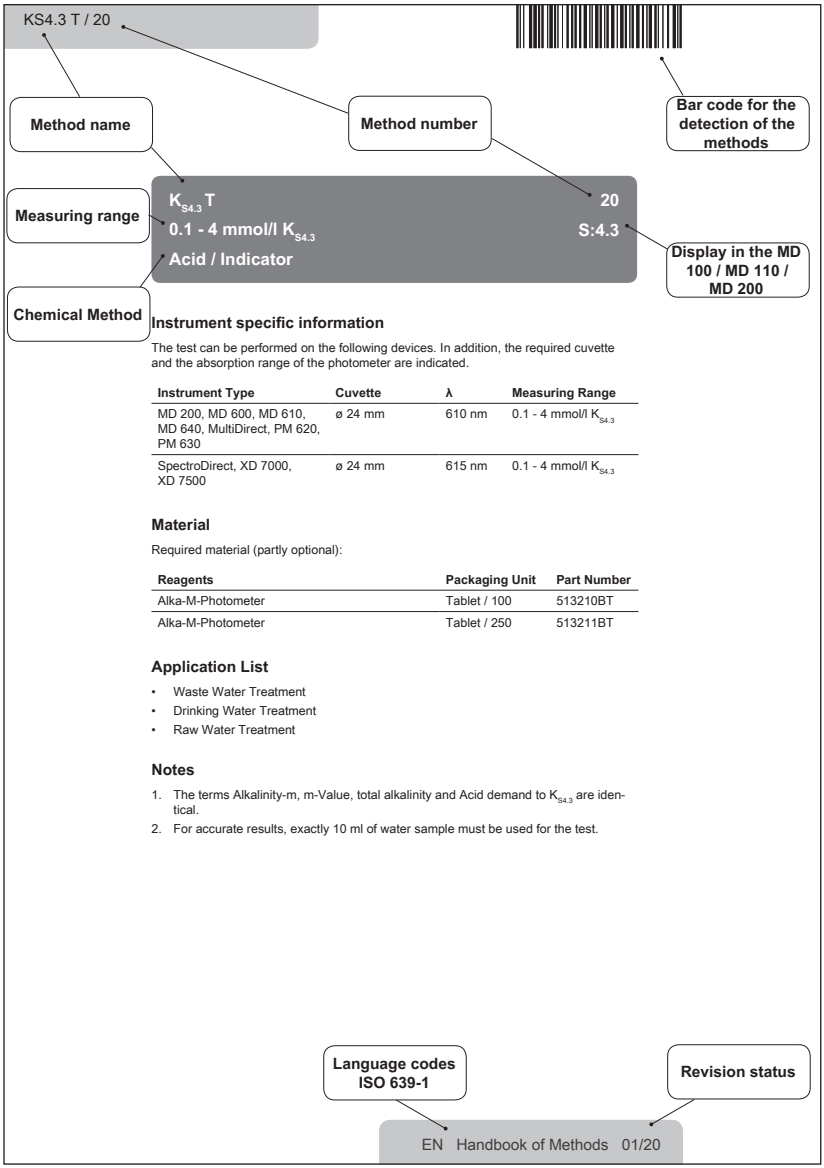
Lovibond® Water Testing

Tintometer® Group

Manual of Methods

MD50

Chloramine | Chlorine (free) and Monochloramine



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

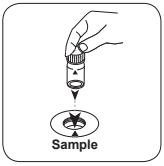
Implementation of the provision Acid capacity $K_{S4.3}$ with Tablet

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**.

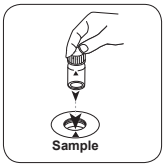
Close vial(s).



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.

Chloramine (M) PP M63

0.02 - 4.5 mg/L NH_2Cl as Cl_2

Indophenole method

EN

Material

Required material (partly optional):

Reagents	Packaging Unit	Part Number
VARIO Monochloramine Set	1 Set	535800
VARIO Monochlor F Rgt - 100	Powder / 100 pc.	531810
VARIO Free Ammonia Reagent Solution - 5 ml	5 mL	531800
Vario Rochelle Salt Solution, 30 ml [h)]	30 mL	530640

Notes

1. Full colour development – temperature
   The reaction periods indicated in the manual refer to a sample temperature between 12 °C and 14 °C. Due to the fact that the reaction period is strongly influenced by sample temperature, you have to adjust both reaction periods according to the following table:

Sample temperature		Reaction period in **X** min
°C	°F	
5	41	10
7	45	9
9	47	8
10	50	8
12	54	7
14	57	7
16	61	6
18	64	5
20	68	5
23	73	2.5
25	77	2
> 25	> 77	2

2. Press [Enter] key to to cancel a reaction period.
3. Hold the bottle vertically and squeeze slowly.
4. To determine the ammonia concentration the difference between mono chloramine (T1) and the sum of mono chloramine and ammonia (T2) is calculated. If T2 exceeds the range limit the following message is displayed:
   $N[NH_2Cl] + N[NH_3] > 0.9$ mg/L
   In this case the sample has to be diluted and the measurement repeated.

Determination of Monochloramine, without Free Ammonia

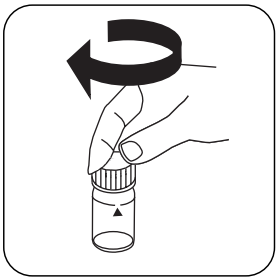
Select the method on the device.

In addition, choose the test: without Ammonia

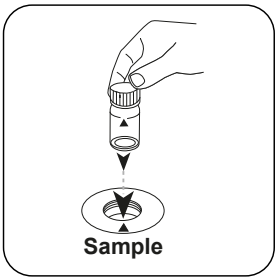
For this method, a ZERO measurement does not have to be carried out every time on the following devices: XD 7000, XD 7500

EN

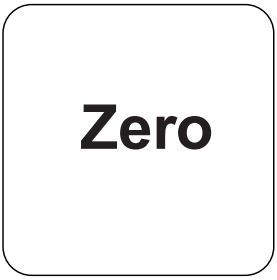
Fill 24 mm vial with **10 mL sample**.



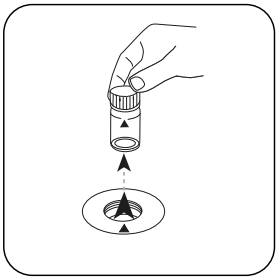
Close vial(s).



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

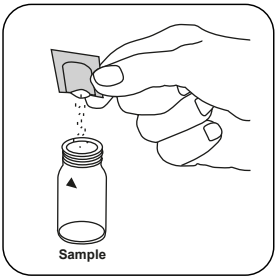


Press the **ZERO** button.

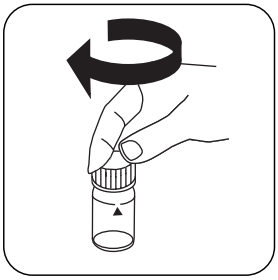


Remove the vial from the sample chamber.

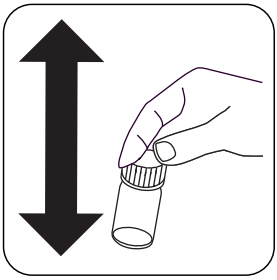
For devices that require **no ZERO measurement** , **start here**.



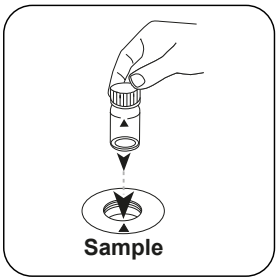
Add **Monochlor FRGT powder pack**.



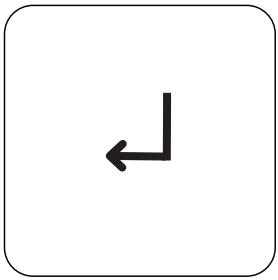
Close vial(s).



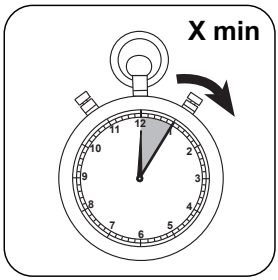
Dissolve the contents by shaking. (20 sec.)



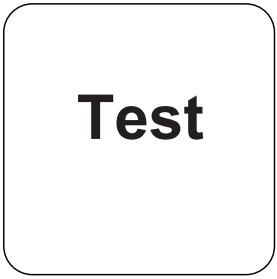
Place **sample vial** in the sample chamber. Pay attention to the positioning.



Press the **ENTER** button for countdown.
(XD: start timer)



Reaction time **X minute(s)** according to table. **Wait for reaction time**.



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

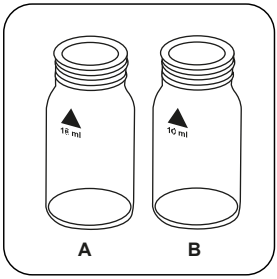
The result in mg/L Monochloramine - Chlorine Cl [NH_2Cl] appears on the display.

Determination of Monochloramine, in presence of free ammonia with powder pack

Select the method on the device.

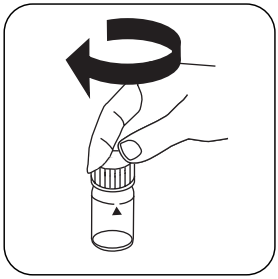
In addition, choose the test: with Free Ammonia

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



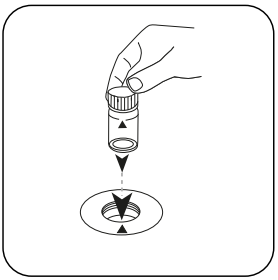
Prepare two clean 24 mm vials. Mark one as Ammonia and the other as Chloramine vial.

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

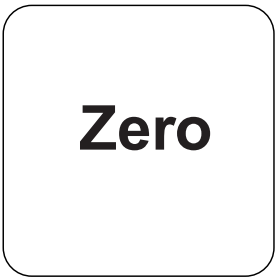


Close vial(s).

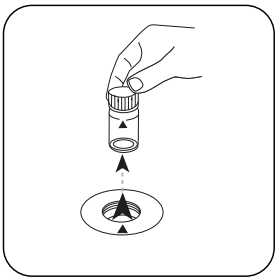
EN



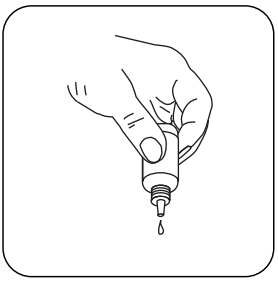
Place Ammonia **vial** in the sample chamber. • Pay attention to the positioning.



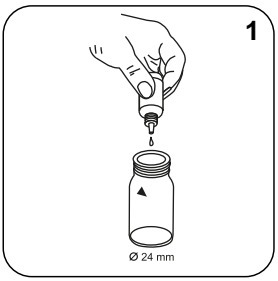
Press the **ZERO** button.



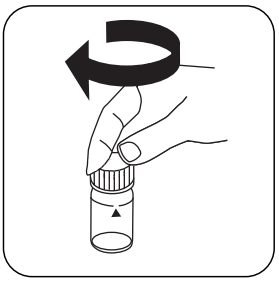
Remove the vial from the sample chamber.



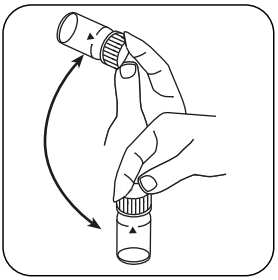
Hold cuvettes vertically and add equal drops by pressing slowly.



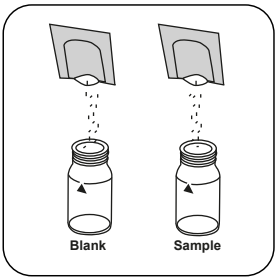
Add **1 drops Free Ammonia Reagent Solution** to the **Ammonia vial**.



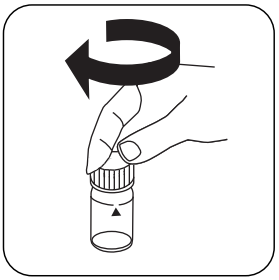
Close vial(s).



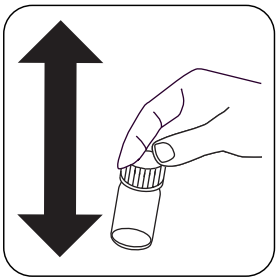
Invert several times to mix the contents (approx. 15 sec).



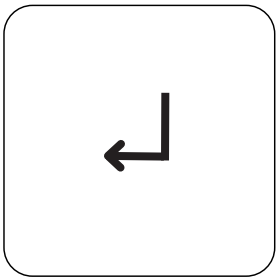
Add **a Monochlor FRGT powder pack** simultaneously in each vial.



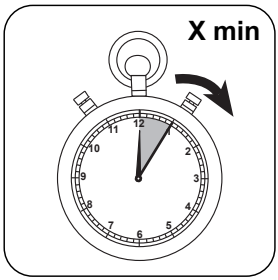
Close vial(s).



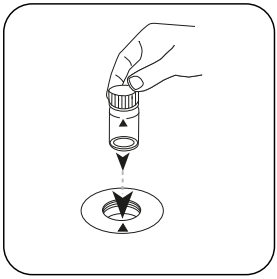
Dissolve the contents by shaking. (20 sec.)



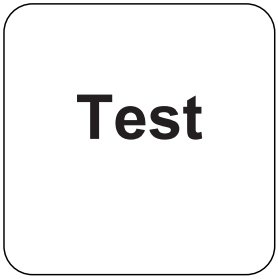
Press the **ENTER** button for countdown.
(XD: start timer)



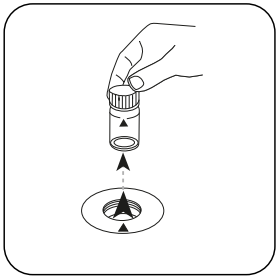
Reaction time **X minute(s)** according to table. **Wait for reaction time**.



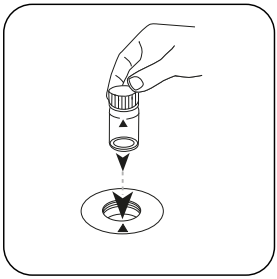
Place Chloramine **vial** in the sample chamber. • Pay attention to the positioning.



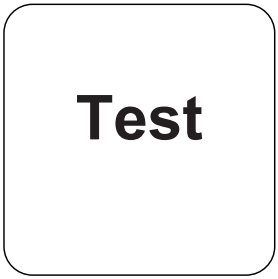
Press the **TEST** (XD: **START**)button.



Remove the vial from the sample chamber.



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



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

The result in mg/L Monochloramine - Chlorine Cl [NH_2Cl] and mg/l free Ammonia - Nitrogen N [NH_3] 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	Cl_2	1
mg/l	NH_2Cl	0.72598
mg/l	$N[NH_2Cl]$	0.19754
mg/l	NH_3	0.24019

Chemical Method

Indophenole method

Interferences

Removeable Interferences

Disturbances caused by precipitation caused by magnesium hardness of more than 400 mg / l $CaCO_3$ can be eliminated by adding 5 drops of Rochelle salt solution.

Interference	from / [mg/L]
Alanine (N)	1
Aluminium (Al)	10
Bromide (Br^-)	100
Bromine (Br_2)	15
Calcium ($CaCO_3$)	1000
Chloride (Cl^-)	18.000
Chlorine Dioxide (ClO_2)	5
Copper (Cu)	10
Dichloramine (Cl_2)	10
Fluoride (F^-)	5
Free Chloride (Cl_2)	10
Glycine (N)	1
Iron (II) (Fe^{2+})	10
Iro (III) (Fe^{3+})	10
Lead (Pb)	10
Permanganate	3
Nitrate (N)	100
Nitrite (N)	50

Interference	from / [mg/L]
Sulfide	0.5
Phosphate (PO_4)	100
Silica (SiO_2)	100
Sulfate (SO_4^{2+})	2600
Sulfite (SO_3^{2-})	50
Ozone	1
Tyrosine (N)	1
Urea (N)	10
Zinc (Zn)	5

Method Validation

Limit of Detection	0.010 mg/L
Limit of Quantification	0.03 mg/L
End of Measuring Range	4.5 mg/L
Sensitivity	1.78 mg/L / Abs
Confidence Intervall	0.044 mg/L
Standard Deviation	0.018 mg/L
Variation Coefficient	0.78 %

Chlorine (free) and Monochloramine M64

0.02 - 4.50 mg/L Cl_2 CL2

Indophenole method

EN

Material

Required material (partly optional):

Reagents	Packaging Unit	Part Number
VARIO Free Chlorine Reagent Solution - 30 ml	30 mL	531820
VARIO Monochlor F Rgt - 100	Powder / 100 pc.	531810
Vario Rochelle Salt Solution, 30 ml [h)]	30 mL	530640

Notes

1. Full colour development – temperature
   The reaction periods indicated in the manual refer to a sample temperature between 12 °C and 14 °C. Due to the fact that the reaction period is strongly influenced by sample temperature, you have to adjust both reaction periods according to the following table:

Sample temperature		Reaction period in **X** min
°C	°F	
5	41	10
7	45	9
9	47	8
10	50	8
12	54	7
14	57	7
16	61	6
18	64	5
20	68	5
23	73	2.5
25	77	2
> 25	> 77	2

2. Press [Enter] key to to cancel a reaction period.
3. Hold the bottle vertically and squeeze slowly.
4. To determine the chlorine concentration the difference between the monochloramine and the sum of monochloramine and chlorine is calculated. If one measured value exceeds the range limit the following message is displayed:
   $Cl_2[NH_2Cl] + Cl_2 > 4.5$ mg/L
   In this case the sample has to be diluted and the measurement repeated.

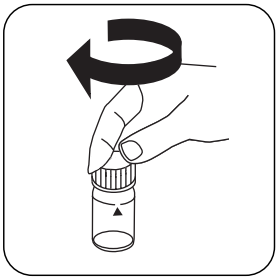
EN

Determination of Free Chlorine in absence of Monochloramine

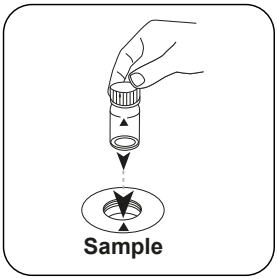
Select the method on the device.

In addition, choose the test: free Chlorine in absence of Monochloramine

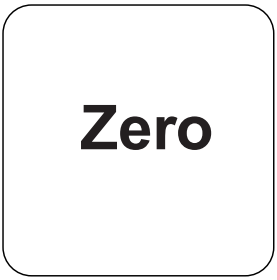
Fill 24 mm vial with **10 mL sample**.



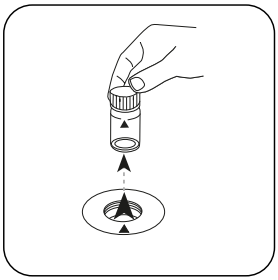
Close vial(s).



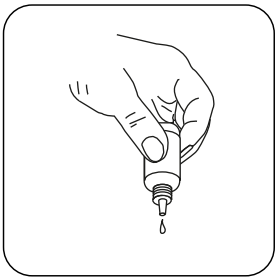
Place **sample vial** in the sample chamber. Pay attention to the positioning.



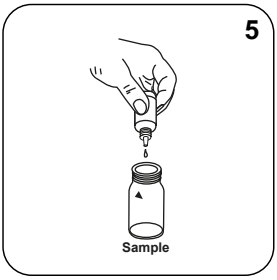
Press the **ZERO** button.



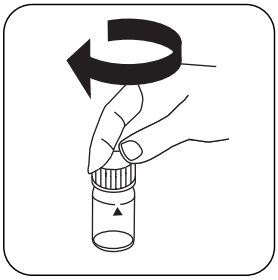
Remove the vial from the sample chamber.



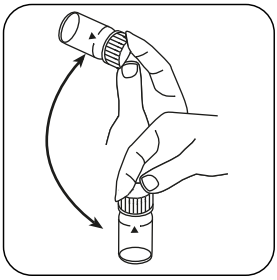
Hold cuvettes vertically and add equal drops by pressing slowly.



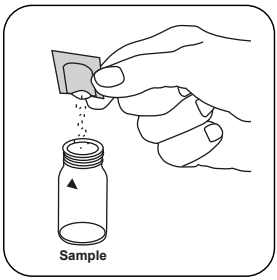
Add **5 drops Free Chlorine Reagent Solution** to the **sample vial**.



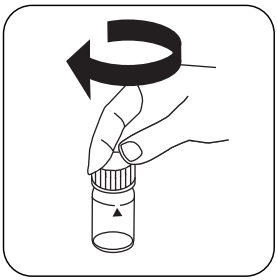
Close vial(s).



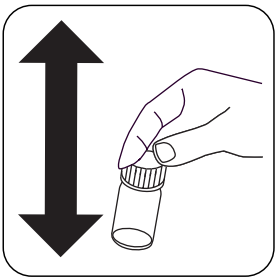
Invert several times to mix the contents (15 sec.).



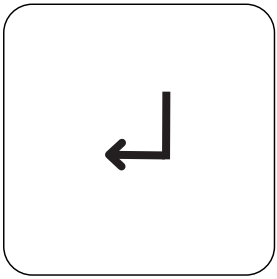
Add **Monochlor FRGT powder pack**.



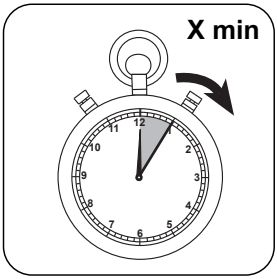
Close vial(s).



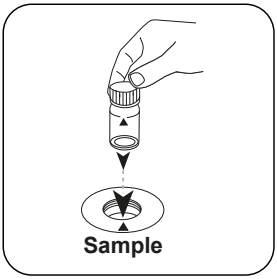
Dissolve the contents by shaking. (20 sec.)



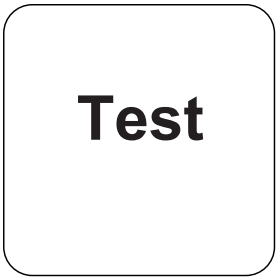
Press the **ENTER** button for countdown.
(XD: start timer)



Reaction time **X minute(s)** according to table. **Wait for reaction time**.



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



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

The result in mg/L free Chlorine appears on the display.

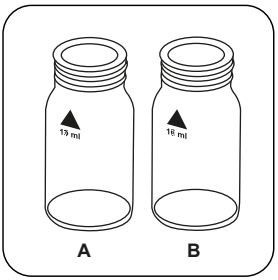
Determination of free Chlorine and Monochloramine

Select the method on the device.

In addition, choose the test: Free Chlorine

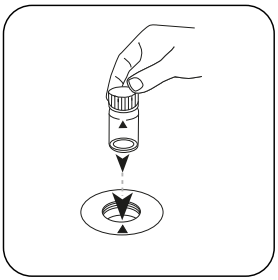
For this method, a ZERO measurement does not have to be carried out every time on the following devices: XD 7000, XD 7500

EN

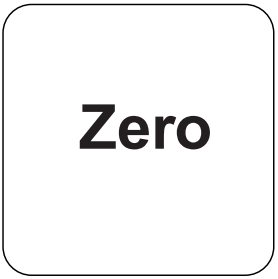


Prepare two clean 24 mm vials. Mark one as Chloramine and the other as Chlorine vial.

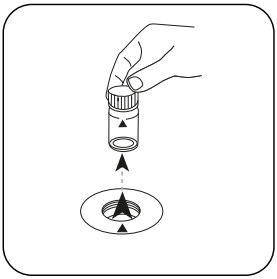
Place **10 mL sample** in each vial.



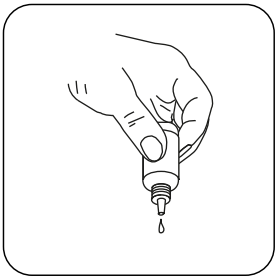
Place Chlorine **vial** in the sample chamber. • Pay attention to the positioning.



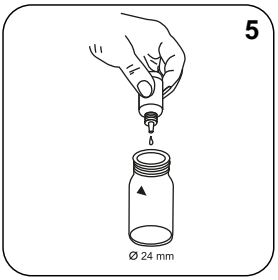
Press the **ZERO** button.



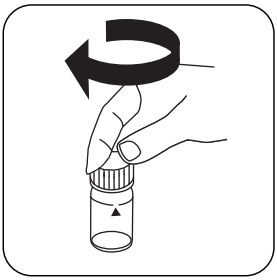
Remove the vial from the sample chamber.



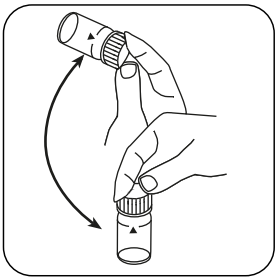
Hold cuvettes vertically and add equal drops by pressing slowly.



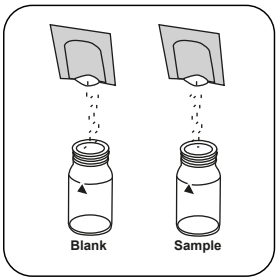
Add **5 drops Free Chlorine Reagent Solution** to the **Chlorine vial**.



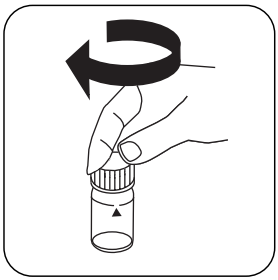
Close vial(s).



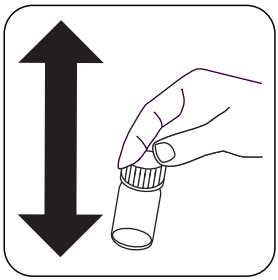
Invert several times to mix the contents (approx. 15 sec).



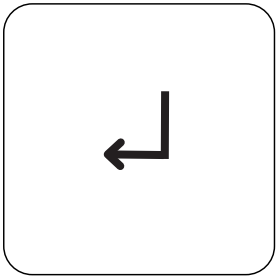
Add **a Monochlor FRGT powder pack** simultaneously in each vial.



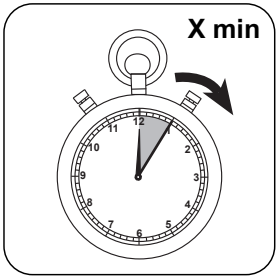
Close vial(s).



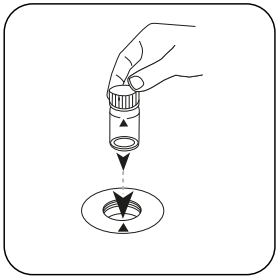
Dissolve the contents by shaking. (20 sec.)



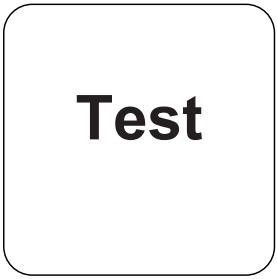
Press the **ENTER** button for countdown.
(XD: start timer)



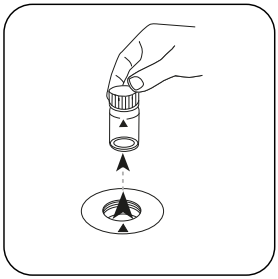
Reaction time **X minute(s)** according to table. **Wait for reaction time**.



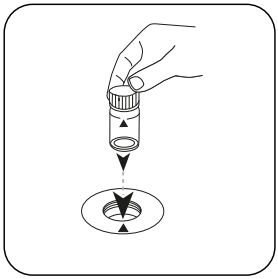
Place Chloramine **vial** in the sample chamber. • Pay attention to the positioning.



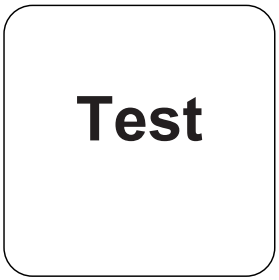
Press the **TEST** (XD: **START**)button.



Remove the vial from the sample chamber.



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



EN

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

The result in mg/L Chlorine and mg/l Monochloramine - Chlorine Cl [NH_2Cl] 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	Cl_2	1
mg/l	NH_2Cl	0.72598
mg/l	$N[NH_2Cl]$	0.19754
mg/l	NH_3	0.24019

Chemical Method

Indophenole method

Interferences

Removeable Interferences

Disturbances caused by precipitation caused by magnesium hardness of more than 400 mg / l $CaCO_3$ can be eliminated by adding 5 drops of Rochelle salt solution.

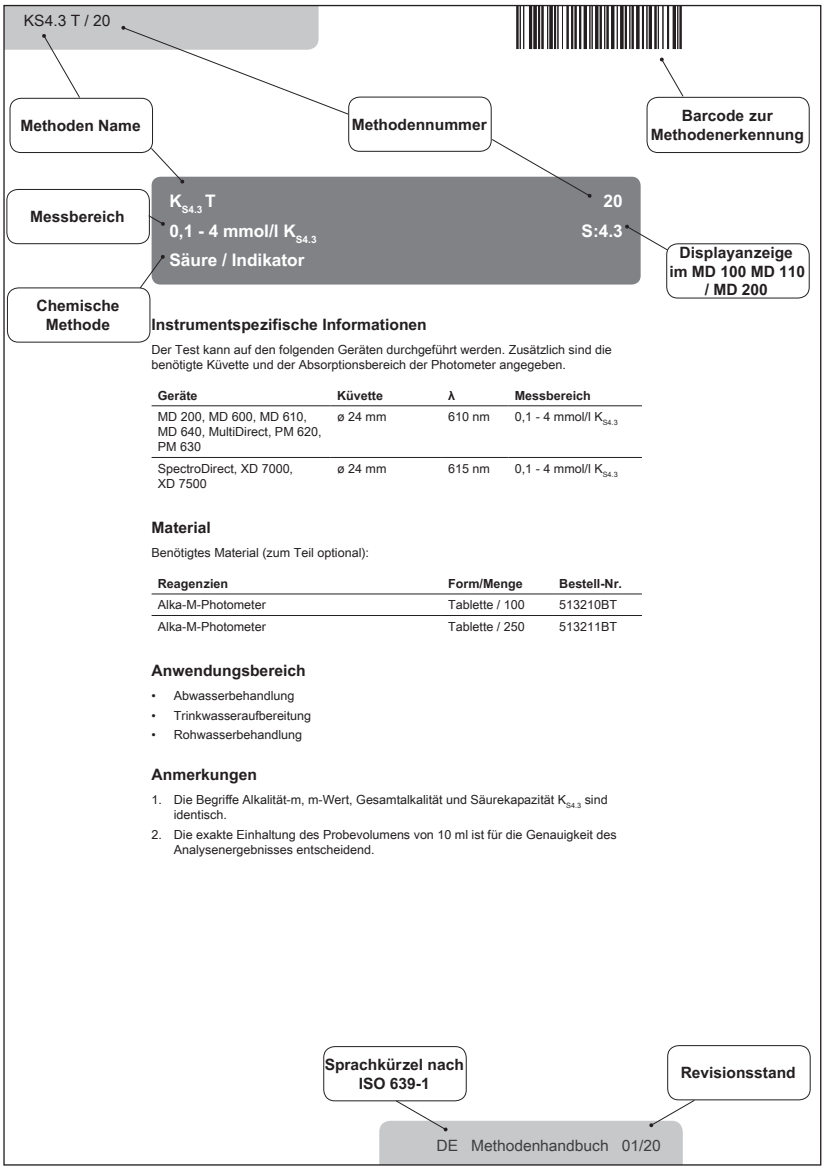
Interference	from / [mg/L]
Alanine (N)	1
Aluminium (Al)	10
Bromide (Br^-)	100
Bromine (Br_2)	15
Calcium ($CaCO_3$)	1000
Chloride (Cl^-)	18.000
Chlorine Dioxide (ClO_2)	5
Copper (Cu)	10
Dichloramine (Cl_2)	10
Fluoride (F^-)	5
Glycine (N)	1
Iron (II) (Fe^{2+})	10
Iron (III) (Fe^{3+})	10
Lead (Pb)	10
Permanganate	3
Nitrate (N)	100
Nitrite (N)	50

Interference	from / [mg/L]
Sulfide	0.5
Phosphate (PO_4)	100
Silica (SiO_2)	100
Sulfate (SO_4^{2+})	2600
Sulfite (SO_3^{2-})	50
Ozone	1
Tyrosine (N)	1
Urea (N)	10
Zinc (Zn)	5

Method Validation

Limit of Detection	0.010 mg/L
Limit of Quantification	0.03 mg/L
End of Measuring Range	4.5 mg/L
Sensitivity	1.78 mg/L / Abs
Confidence Intervall	0.044 mg/L
Standard Deviation	0.018 mg/L
Variation Coefficient	0.78 %

DE



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

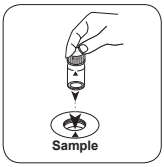
Durchführung der Bestimmung Säurekapazität $K_{S4.3}$ mit Tablette

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.

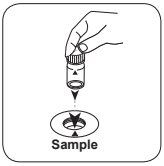
Küvette(n) verschließen.



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 $K_{S4.3}$.

Chloramin (M) PP M63

0,02 - 4,5 mg/L NH_2Cl as Cl_2

Indophenole method

DE

Material

Benötigtes Material (zum Teil optional):

Reagenzien	Form/Menge	Bestell-Nr.
VARIO Monochloramine Set	1 Satz	535800
VARIO Monochlor F Rgt - 100	Pulver / 100 St.	531810
VARIO Free Ammonia Reagent Solution - 5 ml	5 mL	531800
VARIO Rochelle Salzlösung, 30 ml [h)]	30 mL	530640

Anmerkungen

1. Vollständige Farbentwicklung – Temperatur
   Die im Handbuch angegebenen Reaktionszeiten beziehen sich auf eine Probentemperatur zwischen 12 °C und 14 °C. Aufgrund der Tatsache, dass die Reaktionszeit stark von der Probentemperatur beeinflusst wird, müssen Sie beide Reaktionszeiten gemäß der folgenden Tabelle wählen:

Probentemperatur		Reaktionszeiten in **X** min
°C	°F	
5	41	10
7	45	9
9	47	8
10	50	8
12	54	7
14	57	7
16	61	6
18	64	5
20	68	5
23	73	2.5
25	77	2
> 25	> 77	2

2. Die Taste [Enter] drücken, um eine Reaktionszeit abzubrechen.
3. Die Tropfflaschen senkrecht halten und durch langsames Drücken gleich große Tropfen zugeben.
4. Zur Bestimmung der Ammoniakkonzentration wird die Differenz zwischen Monochloramin (T1) und der Summe von Monochloramin und Ammoniak (T2) berechnet. Wenn T2 die Messbereichsgrenze überschreitet, wird die folgende Meldung angezeigt:
   $N[NH_2Cl] + N[NH_3] > 0.9$ mg/L
   In diesem Fall muss die Probe verdünnt und die Messung wiederholt werden.

Durchführung der Bestimmung Monochloramine, ohne freies Ammoniak

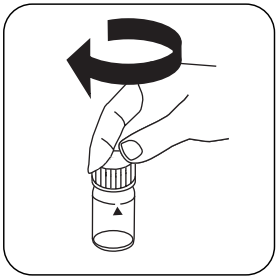
Die Methode im Gerät auswählen.

Wählen Sie zudem die Bestimmung: ohne Ammoniak

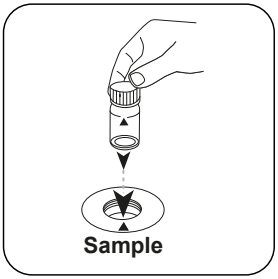
Für diese Methode muss bei folgenden Geräten nicht jedes mal eine ZERO-Messung durchgeführt werden: XD 7000, XD 7500

DE

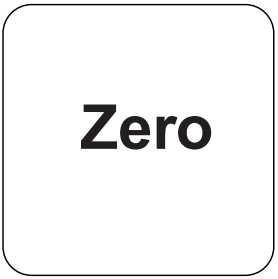
24-mm-Küvette mit **10 mL Probe** füllen.



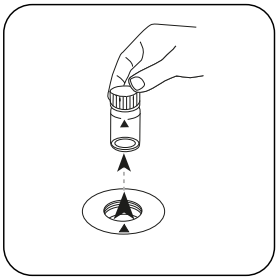
Küvette(n) verschließen.



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

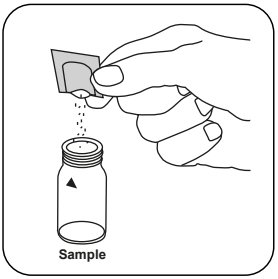


Taste **ZERO** drücken.

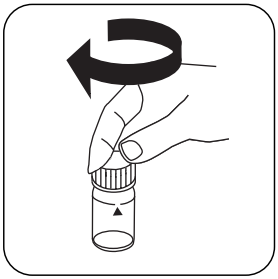


Küvette aus dem Messschacht nehmen.

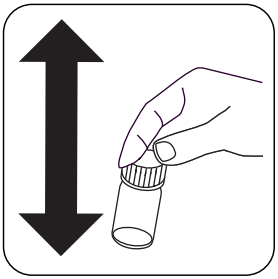
Bei Geräten, die **keine ZERO-Messung** erfordern, **hier beginnen**.



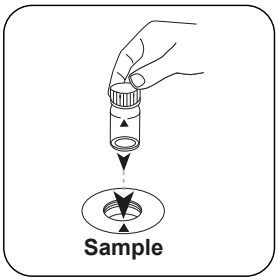
Ein **Monochlor FRGT Pulverpäckchen** zugeben.



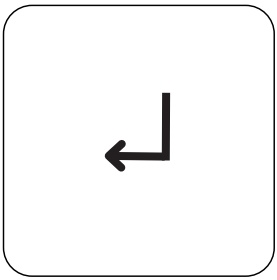
Küvette(n) verschließen.



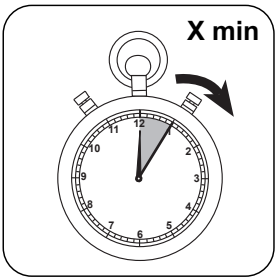
Inhalt durch Schütteln lösen. (20 sec.)



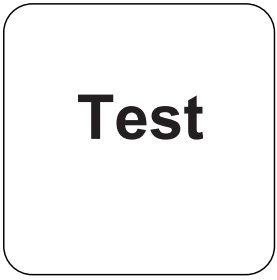
Die **Probenküvette** in den Messschacht stellen. Positionierung beachten.



Für Countdown **ENTER** Taste drücken. (XD: Timer starten)



Reaktionszeit **X min** siehe Tabelle. **Reaktionszeit abwarten.**



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

In der Anzeige erscheint das Ergebnis in mg/L Monochloramin - Chlor Cl [NH_2Cl].

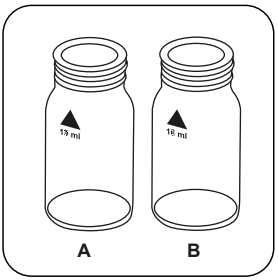
Durchführung der Bestimmung Monochloramine, in Anwesenheit von freiem Ammoniak, mit Powder Pack

Die Methode im Gerät auswählen.

Wählen Sie zudem die Bestimmung: mit freiem Ammoniak

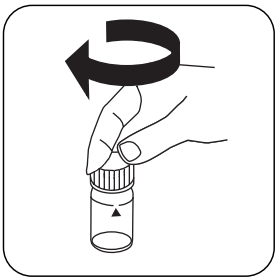
Für diese Methode muss bei folgenden Geräten nicht jedes mal eine ZERO-Messung durchgeführt werden: XD 7000, XD 7500

DE

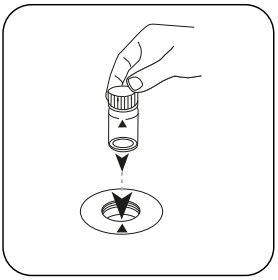


Zwei saubere 24-mm-Küvetten bereitstellen. Eine als Ammoniakküvette, die andere als Chloraminküvette kennzeichnen.

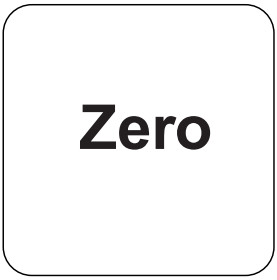
In jede Küvette **10 mL Probe** geben.



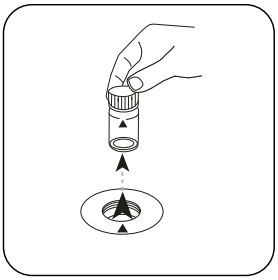
Küvette(n) verschließen.



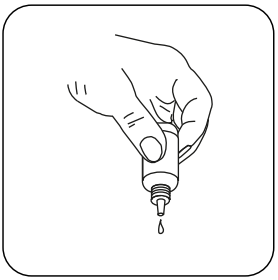
Die Ammoniak **Küvette** in den Messschacht stellen. Positionierung beachten.



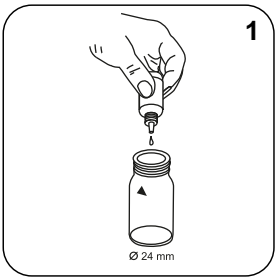
Taste **ZERO** drücken.



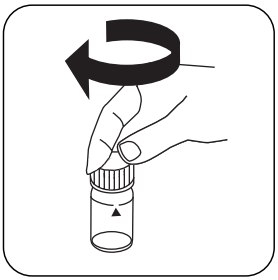
Küvette aus dem Messschacht nehmen.



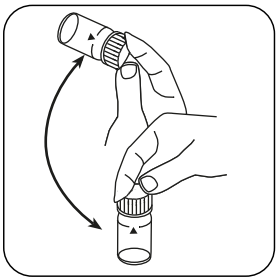
Die Tropfflaschen senkrecht halten und durch langsames Drücken gleich große Tropfen zugeben.



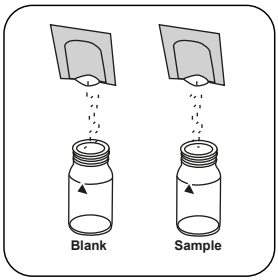
1 Tropfen Free Ammonia Reagent Solution in die **Ammoniak Küvette** geben.



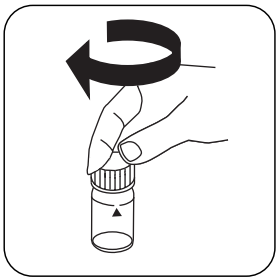
Küvette(n) verschließen.



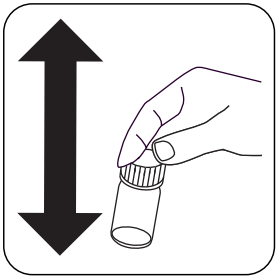
Inhalt durch Umschwenken mischen (ca. 15 sec).



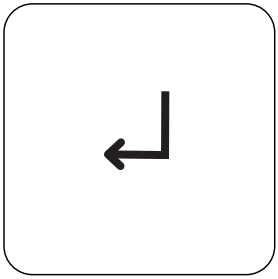
Zeitgleich in jede Küvette **ein Monochlor FRGT Pulverpäckchen** geben.



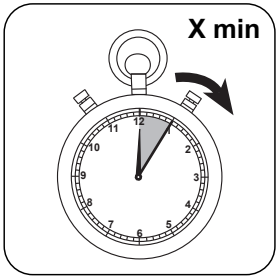
Küvette(n) verschließen.



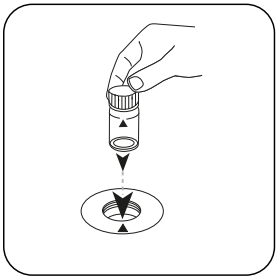
Inhalt durch Schütteln lösen. (20 sec.)



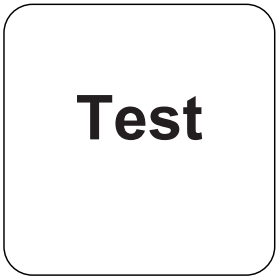
Für Countdown **ENTER** Taste drücken.
(XD: Timer starten)



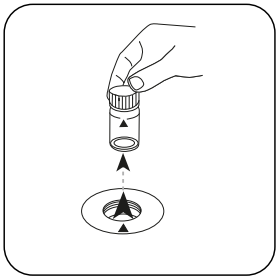
Reaktionszeit **X min** siehe Tabelle. **Reaktionszeit abwarten.**



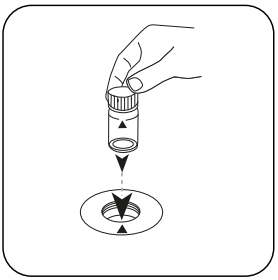
Die Chloramine **Küvette** in den Messschacht stellen. Positionierung beachten.

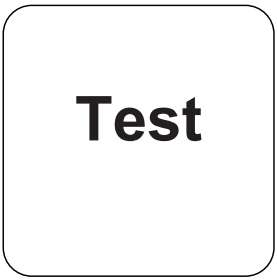


Taste **TEST** (XD: **START**) drücken.



Küvette aus dem Messschacht nehmen.





DE

Die Ammoniak **Küvette** in den Messschacht stellen. Positionierung beachten.

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

In der Anzeige erscheint das Ergebnis in mg/L Monochloramin - Chlor Cl [NH_2Cl] und mg/l freies Ammonium - Stickstoff N [NH_3].

Auswertung

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

Einheit	Zitierform	Umrechnungsfaktor
mg/l	Cl_2	1
mg/l	NH_2Cl	0.72598
mg/l	$N[NH_2Cl]$	0.19754
mg/l	NH_3	0.24019

Chemische Methode

Indophenole method

Störungen

Ausschließbare Störungen

Störungen durch Ausfällungen, die durch Magnesiumhärte von mehr als 400 mg/L $CaCO_3$ auftreten, können durch Zugabe von 5 Tropfen Rochelle Salzlösung beseitigt werden.

Störung	Stört ab / [mg/L]
Alanine (N)	1
Aluminium (Al)	10
Bromide (Br^-)	100
Bromine (Br_2)	15
Calcium ($CaCO_3$)	1000
Chloride (Cl^-)	18.000
Chlorine Dioxide (ClO_2)	5
Copper (Cu)	10
Dichloramine (Cl_2)	10
Fluoride (F^-)	5
Free Chloride (Cl_2)	10
Glycine (N)	1
Iron (II) (Fe^{2+})	10
Iro (III) (Fe^{3+})	10
Lead (Pb)	10
Permanganate	3
Nitrate (N)	100

Störung	Stört ab / [mg/L]
Nitrite (N)	50
Sulfide	0.5
Phosphate (PO_4)	100
Silica (SiO_2)	100
Sulfate (SO_4^{2+})	2600
Sulfite (SO_3^{2-})	50
Ozone	1
Tyrosine (N)	1
Urea (N)	10
Zinc (Zn)	5

Methodenvalidierung

Nachweisgrenze	0.010 mg/L
Bestimmungsgrenze	0.03 mg/L
Messbereichsende	4.5 mg/L
Empfindlichkeit	1.78 mg/L / Abs
Vertrauensbereich	0.044 mg/L
Verfahrensstandardabweichung	0.018 mg/L
Verfahrensvariationskoeffizient	0.78 %

freies Chlor u. Monochloramin M64

0,02 - 4,50 mg/L Cl_2 CL2

Indophenole method

DE

Material

Benötigtes Material (zum Teil optional):

Reagenzien	Form/Menge	Bestell-Nr.
VARIO Free Chlorine Reagent Solution - 30 ml	30 mL	531820
VARIO Monochlor F Rgt - 100	Pulver / 100 St.	531810
VARIO Rochelle Salzlösung, 30 ml [h)]	30 mL	530640

Anmerkungen

1. Vollständige Farbentwicklung – Temperatur
   Die im Handbuch angegebenen Reaktionszeiten beziehen sich auf eine Probentemperatur zwischen 12 °C und 14 °C. Aufgrund der Tatsache, dass die Reaktionszeit stark von der Probentemperatur beeinflusst wird, müssen Sie beide Reaktionszeiten gemäß der folgenden Tabelle wählen:

Probentemperature		Reaktionszeit in **X** min
°C	°F	
5	41	10
7	45	9
9	47	8
10	50	8
12	54	7
14	57	7
16	61	6
18	64	5
20	68	5
23	73	2.5
25	77	2
> 25	> 77	2

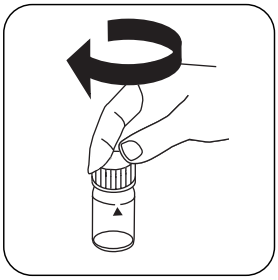
2. Die Taste [Enter] drücken, um eine Reaktionszeit abzubrechen.
3. Die Tropfflaschen senkrecht halten und durch langsames Drücken gleich große Tropfen zugeben.
4. Zur Bestimmung der Chlorkonzentration wird die Differenz zwischen Monochloramin und der Summe von Monochloramin und Chlor berechnet. Wenn ein Messwert die Messbereichsgrenze überschreitet, wird die folgende Meldung angezeigt:
   $Cl_2[NH_2Cl] + Cl_2 > 4.5$ mg/L
   In diesem Fall muss die Probe verdünnt und die Messung wiederholt werden.

Durchführung der Bestimmung freies Chlor in Abwesenheit von Monochloramin

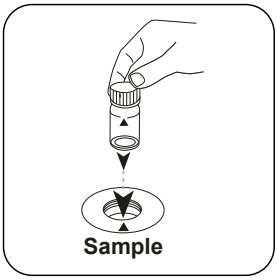
Die Methode im Gerät auswählen.

Wählen Sie zudem die Bestimmung: freies Chlor in Abwesenheit von Monochloramin

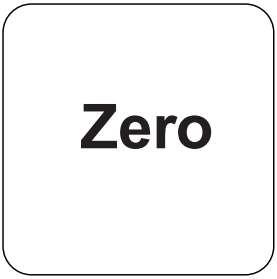
24-mm-Küvette mit **10 mL Probe** füllen.



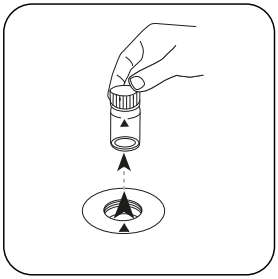
Küvette(n) verschließen.



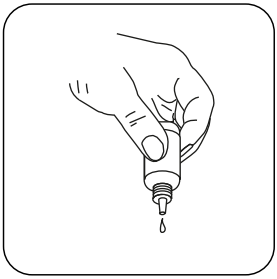
Die **Probenküvette** in den Messschacht stellen. Positionierung beachten.



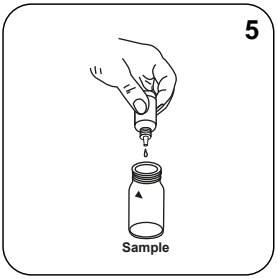
Taste **ZERO** drücken.



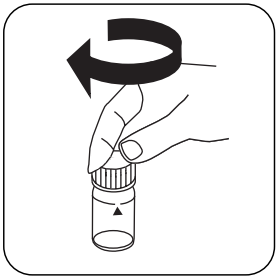
Küvette aus dem Messschacht nehmen.



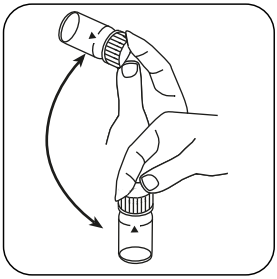
Die Tropfflaschen senkrecht halten und durch langsames Drücken gleich große Tropfen zugeben.



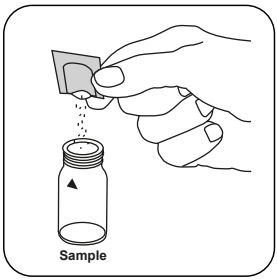
5 Tropfen Free Chlorine Reagent Solution in die **Probenküvette** geben.



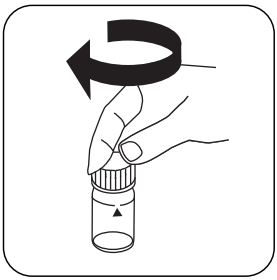
Küvette(n) verschließen.



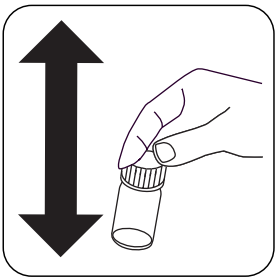
Inhalt durch Umschwenken mischen (15 sec.).



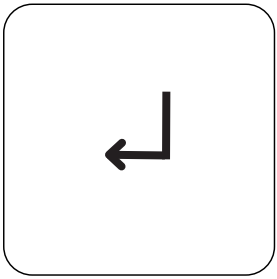
Ein **Monochlor FRGT Pulverpäckchen** zugeben.



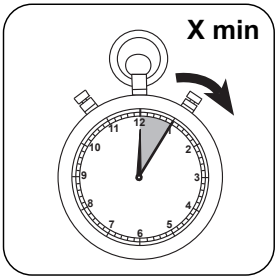
Küvette(n) verschließen.



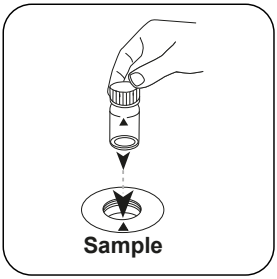
Inhalt durch Schütteln lösen. (20 sec.)



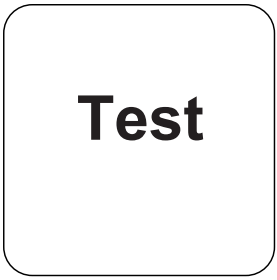
Für Countdown **ENTER** Taste drücken.
(XD: Timer starten)



Reaktionszeit **X min** siehe Tabelle. **Reaktionszeit abwarten.**



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



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

In der Anzeige erscheint das Ergebnis in mg/L freies Chlor.

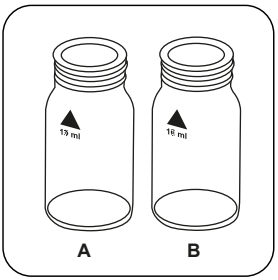
Durchführung der Bestimmung freies Chlor und Monochloramin

Die Methode im Gerät auswählen.

Wählen Sie zudem die Bestimmung: freies Chlor

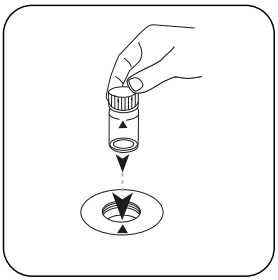
Für diese Methode muss bei folgenden Geräten nicht jedes mal eine ZERO-Messung durchgeführt werden: XD 7000, XD 7500

DE

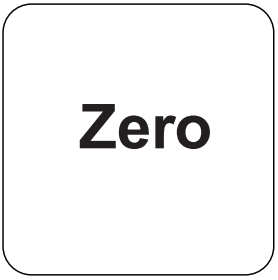


Zwei saubere 24-mm-Küvetten bereitstellen. Eine als Chloraminküvette, die andere als Chlorküvette kennzeichnen.

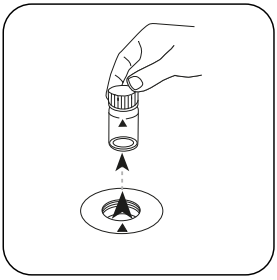
In jede Küvette **10 mL Probe** geben.



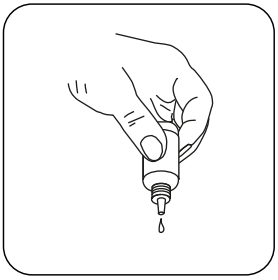
Die Chlor **Küvette** in den Messschacht stellen. Positionierung beachten.



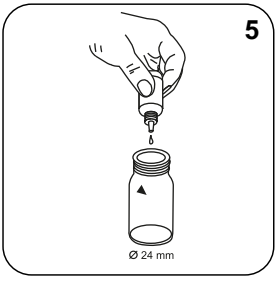
Taste **ZERO** drücken.



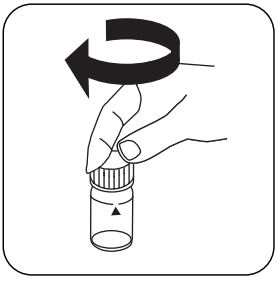
Küvette aus dem Messschacht nehmen.



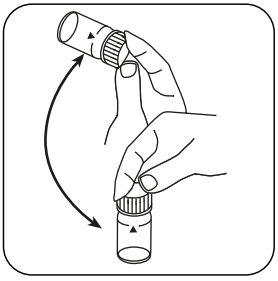
Die Tropfflaschen senkrecht halten und durch langsames Drücken gleich große Tropfen zugeben.



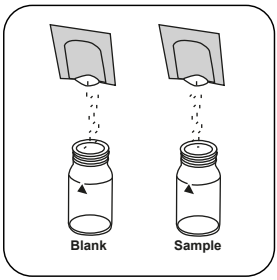
5 Tropfen Free Chlorine Reagent Solution in die **Chlor Küvette** geben.



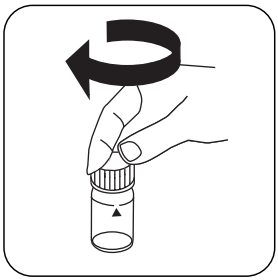
Küvette(n) verschließen.



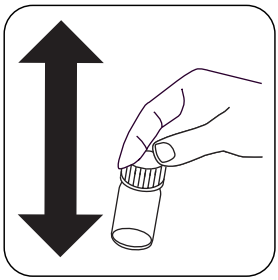
Inhalt durch Umschwenken mischen (ca. 15 sec).



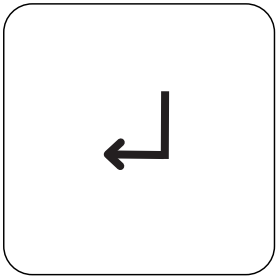
Zeitgleich in jede Küvette **ein Monochlor FRGT Pulverpäckchen** geben.



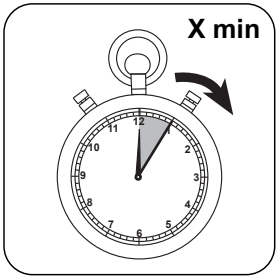
Küvette(n) verschließen.



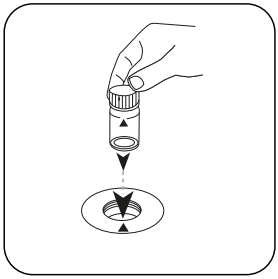
Inhalt durch Schütteln lösen. (20 sec.)



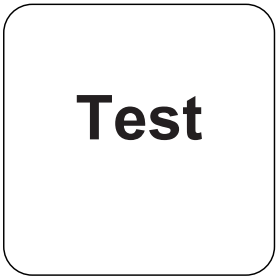
Für Countdown **ENTER** Taste drücken.
(XD: Timer starten)



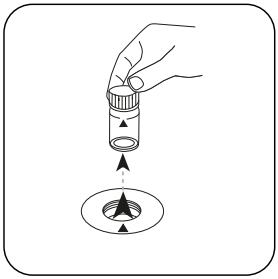
Reaktionszeit **X min** siehe Tabelle. **Reaktionszeit abwarten.**



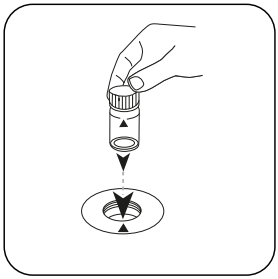
Die Chloramin **Küvette** in den Messschacht stellen. Positionierung beachten.



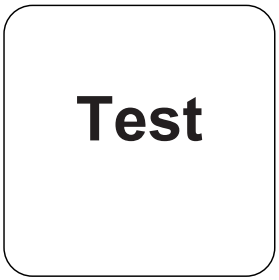
Taste **TEST** (XD: **START**) drücken.



Küvette aus dem Messschacht nehmen.



Die Chlor **Küvette** in den Messschacht stellen. Positionierung beachten.



DE

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

In der Anzeige erscheint das Ergebnis in mg/L Chlor und mg/l Monochloramin - Chlor Cl [NH_2Cl].

Auswertung

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

Einheit	Zitierform	Umrechnungsfaktor
mg/l	Cl_2	1
mg/l	NH_2Cl	0.72598
mg/l	$N[NH_2Cl]$	0.19754
mg/l	NH_3	0.24019

Chemische Methode

Indophenole method

Störungen

Ausschließbare Störungen

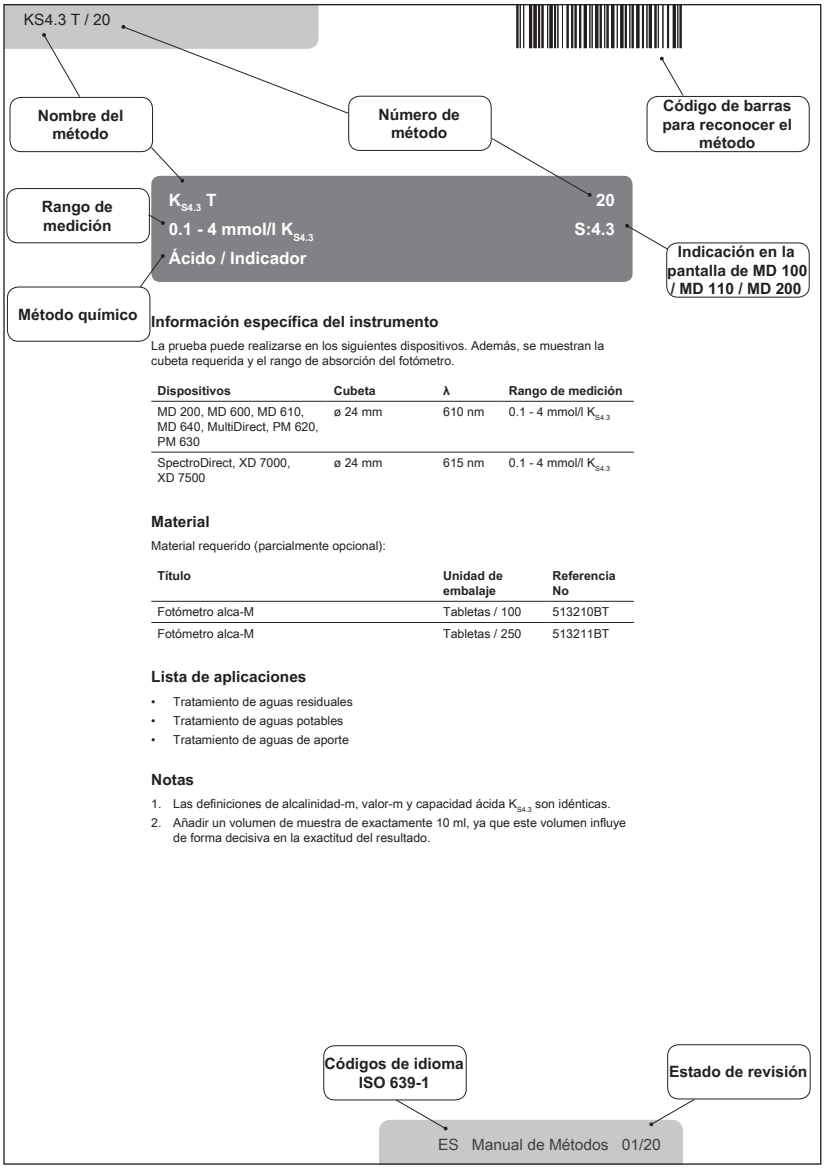
Störungen durch Ausfällungen, die durch Magnesiumhärte von mehr als 400 mg/L $CaCO_3$ auftreten, können durch Zugabe von 5 Tropfen Rochelle Salzlösung beseitigt werden.

Störung	Stört ab / [mg/L]
Alanine (N)	1
Aluminium (Al)	10
Bromide (Br^-)	100
Bromine (Br_2)	15
Calcium ($CaCO_3$)	1000
Chloride (Cl^-)	18.000
Chlorine Dioxide (ClO_2)	5
Copper (Cu)	10
Dichloramine (Cl_2)	10
Fluoride (F^-)	5
Glycine (N)	1
Iron (II) (Fe^{2+})	10
Iron (III) (Fe^{3+})	10
Lead (Pb)	10
Permanganate	3
Nitrate (N)	100
Nitrite (N)	50

Störung	Stört ab / [mg/L]
Sulfide	0.5
Phosphate (PO_4)	100
Silica (SiO_2)	100
Sulfate (SO_4^{2+})	2600
Sulfite (SO_3^{2-})	50
Ozone	1
Tyrosine (N)	1
Urea (N)	10
Zinc (Zn)	5

Methodenvalidierung

Nachweisgrenze	0.010 mg/L
Bestimmungsgrenze	0.03 mg/L
Messbereichsende	4.5 mg/L
Empfindlichkeit	1.78 mg/L / Abs
Vertrauensbereich	0.044 mg/L
Verfahrensstandardabweichung	0.018 mg/L
Verfahrensvariationskoeffizient	0.78 %


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

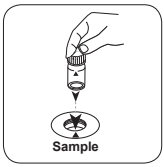
Ejecución de la determinación Capacidad ácida $K_{S4.3}$ con tableta

Seleccionar el método en el aparato.

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

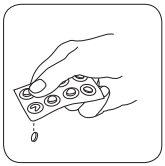
Llenar la cubeta de 24 mm con **10 ml de muestra** .

Cerrar la(s) cubeta(s).

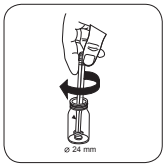


Poner la **cubeta de muestra** en el compartimiento de medición. ¡Debe tenerse en cuenta el posicionamiento!

• • •



Añadir **tableta ALKA-M-PHOTOMETER**.



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

Cerrar la(s) cubeta(s).

Cloramina (M) PP M63

0.02 - 4.5 mg/L NH_2Cl as Cl_2

Indophenole method

ES

Material

Material requerido (parcialmente opcional):

Reactivos	Unidad de embalaje	No. de referencia
VARIO Monochloramine Set	1 Set	535800
VARIO Monochlor F Rgt - 100	Polvos / 100 Cantidad	531810
VARIO Free Ammonia Reagent Solution - 5 ml	5 mL	531800
Solución salina Rochelle VARIO, 30 ml [h)]	30 mL	530640

Notas

1. Desarrollo completo del color - temperatura
   Los períodos de reacción indicados en el manual se refieren a una temperatura de la muestra entre 12° y 14°C. Debido a que el período de reacción está fuertemente influenciado por la temperatura de la muestra, hay que ajustar ambos períodos de reacción de acuerdo con la siguiente tabla:

La temperatura de la muestra		Período de reacción en x min
°C	°F	
5	41	10
7	45	9
9	47	8
10	50	8
12	54	7
14	57	7
16	61	6
18	64	5
20	68	5
23	73	2.5
25	77	2
> 25	> 77	2

2. Pulse la tecla [Intro] para cancelar un período de reacción.
3. Sostenga la botella en posición vertical y apriete lentamente.
4. Para determinar la concentración de amoníaco se calcula la diferencia entre la monocloramina (T1) y la suma de la monocloramina y el amoníaco (T2). Si T2 excede el límite del rango, se muestra el siguiente mensaje:
   $N[NH_2Cl] + N[NH_3] > 0{,}9$ mg/L
   En este caso, la muestra debe ser diluida y la medición debe ser repetida.

Ejecución de la determinación Dióxido de cloro con tableta, en presencia de cloro

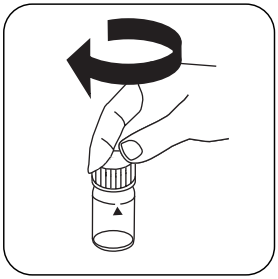
Seleccionar el método en el aparato.

Seleccione además la determinación: junto a cloro

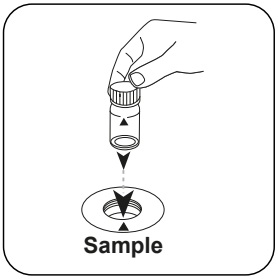
Para este método, no es necesario realizar una medición CERO cada vez en los siguientes dispositivos: junto a cloro

ES

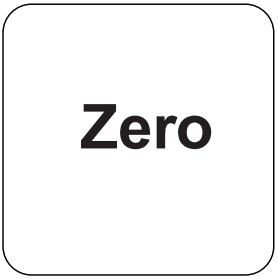
Llenar la cubeta de 24 mm con **10 mL de muestra** .



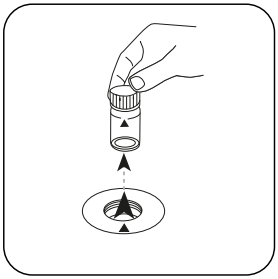
Cerrar la(s) cubeta(s).



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

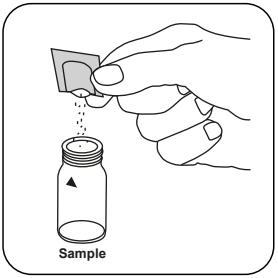


Pulsar la tecla **ZERO**.

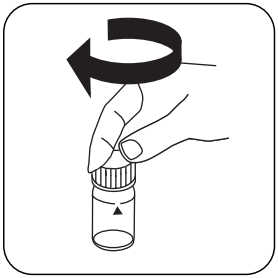


Extraer la cubeta del compartimiento de medición.

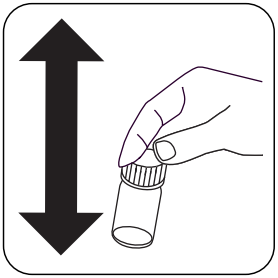
Para los aparatos que **no requieran medición CERO** , **empezar aquí**.



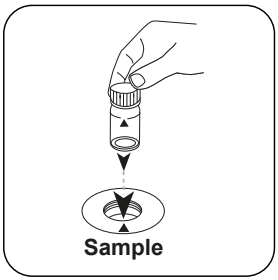
Añadir un **sobre de polvos Monochlor FRGT** .



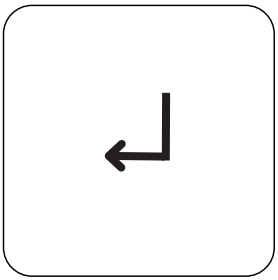
Cerrar la(s) cubeta(s).



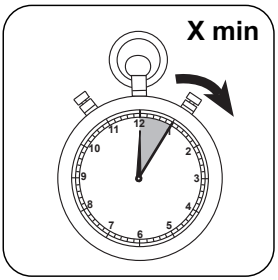
Disolver el contenido agitando. (20 sec.)



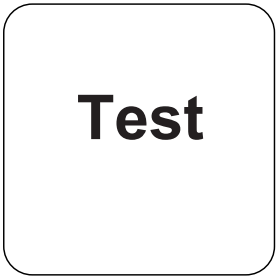
Poner la **cubeta de muestra** en el compartimiento de medición. ¡Debe tenerse en cuenta el posicionamiento!



Pulsar la tecla **ENTER**.(XD: Iniciar temporizador)



Tiempo de reacción **X min** según tabla. **Esperar el periodo de reacción.**



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

A continuación se visualizará el resultado en mg/L Monocloramina - Cloro Cl [NH_2Cl].

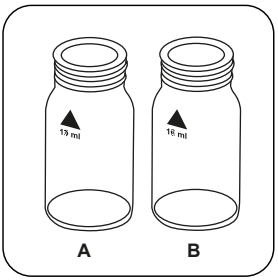
Ejecución de la determinación Dióxido de cloro con tableta, en ausencia de cloro

Seleccionar el método en el aparato.

Seleccione además la determinación: con amoníaco libre

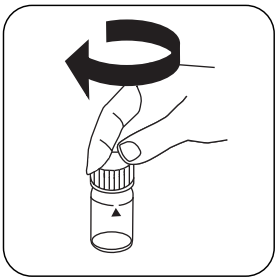
Para este método, no es necesario realizar una medición CERO cada vez en los siguientes dispositivos: XD 7000, XD 7500

ES

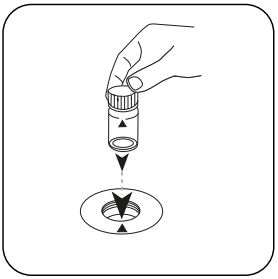


Preparar dos cubetas limpias de Amoníaco mm. Identificar una como cubeta en blanco.

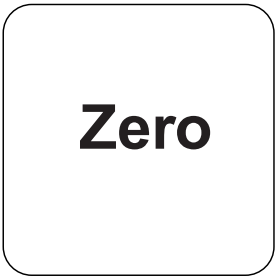
Añadir en cada cubeta **10 mL de muestra**.



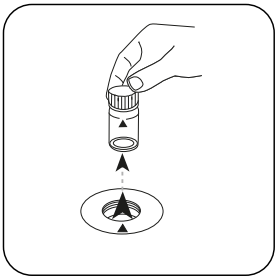
Cerrar la(s) cubeta(s).



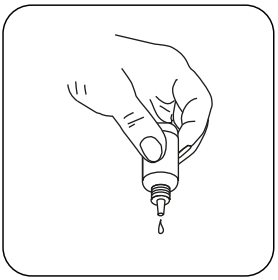
Poner la **cubeta** Amoníacoen el compartimiento de medición. ¡Debe tenerse en cuenta el posicionamiento!



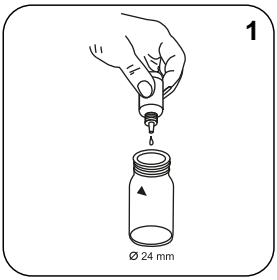
Pulsar la tecla **ZERO**.



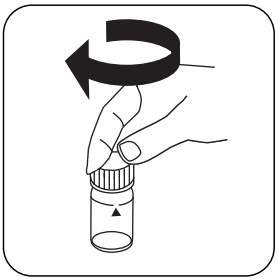
Extraer la cubeta del compartimiento de medición.



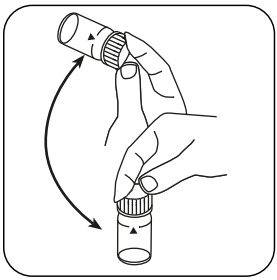
Mantener la botella cuentagotas vertical y añadir gotas del mismo tamaño presionando lentamente.



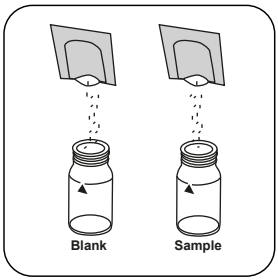
Añadir **1 gotas de Free Ammonia Reagent Solution** en la cubeta **Amoníaco**.



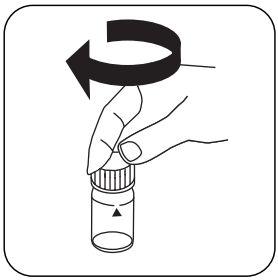
Cerrar la(s) cubeta(s).



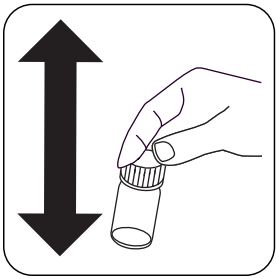
Mezclar el contenido girando (approx. 15 sec).



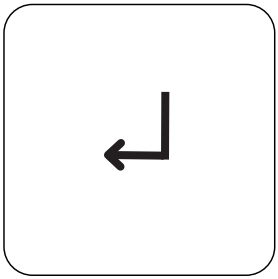
Añadir simultáneamente **un sobre de polvos de Monochlor FRGT** en cada cubeta.



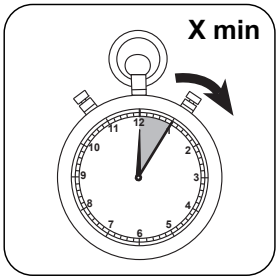
Cerrar la(s) cubeta(s).



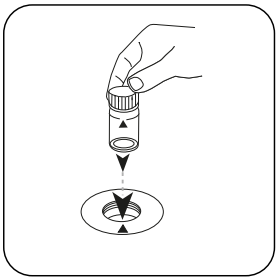
Disolver el contenido agitando. (20 sec.)



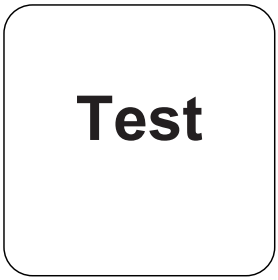
Pulsar la tecla **ENTER**.(XD: Iniciar temporizador)



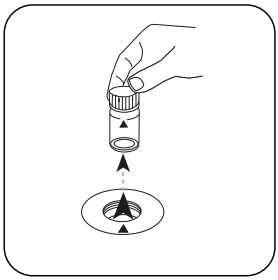
Tiempo de reacción **X min** según tabla. **Esperar el periodo de reacción.**



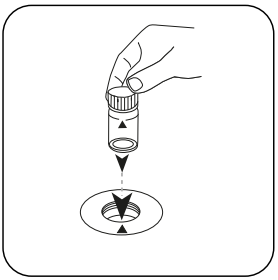
Poner la **cubeta** Cloraminaen el compartimiento de medición. ¡Debe tenerse en cuenta el posicionamiento!

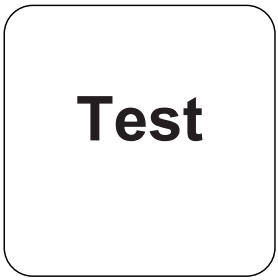


Pulsar la tecla **TEST** (XD: **START**).



Extraer la cubeta del compartimiento de medición.





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Poner la **cubeta** Ammoniaen 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 Monocloramina - Cloro Cl [NH_2Cl] y mg/l de Amoníaco - Nitrógeno N [NH_3] libre.

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	Cl_2	1
mg/l	NH_2Cl	0.72598
mg/l	$N[NH_2Cl]$	0.19754
mg/l	NH_3	0.24019

Método químico

Indophenole method

Interferencia

Interferencias extraibles

Las alteraciones provocadas por la precipitación provocada por una dureza del magnesio superior a 400 mg / l de $CaCO_3$ pueden eliminarse añadiendo 5 gotas de solución salina de Rochelle.

Interferencia	de / [mg/L]
Alanine (N)	1
Aluminium (Al)	10
Bromide (Br^-)	100
Bromine (Br_2)	15
Calcium ($CaCO_3$)	1000
Chloride (Cl^-)	18.000
Chlorine Dioxide (ClO_2)	5
Copper (Cu)	10
Dichloramine (Cl_2)	10
Fluoride (F^-)	5
Free Chloride (Cl_2)	10
Glycine (N)	1
Iron (II) (Fe^{2+})	10
Iro (III) (Fe^{3+})	10
Lead (Pb)	10
Permanganate	3
Nitrate (N)	100

Interferencia	de / [mg/L]
Nitrite (N)	50
Sulfide	0.5
Phosphate (PO_4)	100
Silica (SiO_2)	100
Sulfate (SO_4^{2+})	2600
Sulfite (SO_3^{2-})	50
Ozone	1
Tyrosine (N)	1
Urea (N)	10
Zinc (Zn)	5

Validación del método

Límite de detección	0.010 mg/L
Límite de determinación	0.03 mg/L
Límite del rango de medición	4.5 mg/L
Sensibilidad	1.78 mg/L / Abs
Intervalo de confianza	0.044 mg/L
Desviación estándar	0.018 mg/L
Coeficiente de variación	0.78 %

Cloro (libre) y monocloramina M64

0.02 - 4.50 mg/L Cl_2 CL2

Indophenole method

ES

Material

Material requerido (parcialmente opcional):

Reactivos	Unidad de embalaje	No. de referencia
VARIO Free Chlorine Reagent Solution - 30 ml	30 mL	531820
VARIO Monochlor F Rgt - 100	Polvos / 100 Cantidad	531810
Solución salina Rochelle VARIO, 30 ml [h)]	30 mL	530640

Notas

1. Desarrollo completo del color - temperatura
   Los períodos de reacción indicados en el manual se refieren a una temperatura de la muestra entre 12° y 14°C. Debido a que el período de reacción está fuertemente influenciado por la temperatura de la muestra, hay que ajustar ambos períodos de reacción de acuerdo con la siguiente tabla:

La temperatura de la muestra		Período de reacción en x min
in °C	in °F	
5	41	10
7	45	9
9	47	8
10	50	8
12	54	7
14	57	7
16	61	6
18	64	5
20	68	5
23	73	2.5
25	77	2
> 25	> 77	2

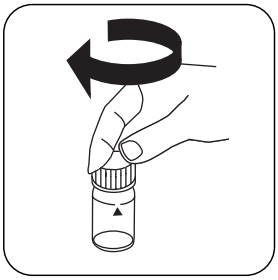
2. Pulse la tecla [Intro] para cancelar un período de reacción.
3. Sostenga la botella en posición vertical y apriete lentamente.
4. Para determinar la concentración de cloro se calcula la diferencia entre la monocloramina y la suma de monocloramina y cloro. Si un valor medido excede el límite del rango, se muestra el siguiente mensaje:
   $Cl_2[NH_2Cl] + Cl_2 > 4{,}5$ mg/L
   En este caso, la muestra debe ser diluida y la medición debe ser repetida.

Ejecución de la determinación Dióxido de cloro con tableta, en presencia de cloro

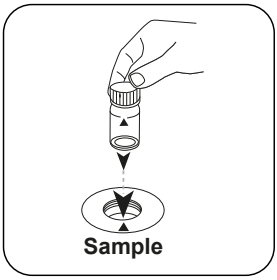
Seleccionar el método en el aparato.

Seleccione además la determinación: junto a cloro

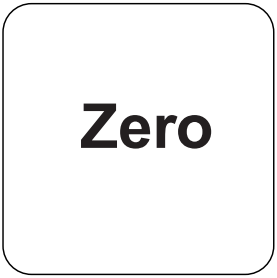
Llenar la cubeta de 24 mm con **10 mL de muestra** .



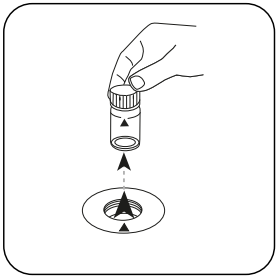
Cerrar la(s) cubeta(s).



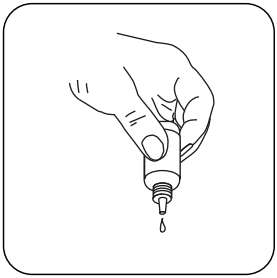
Poner la **cubeta de muestra** en el compartimiento de medición. ¡Debe tenerse en cuenta el posicionamiento!



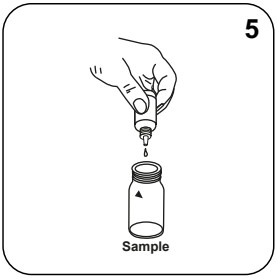
Pulsar la tecla **ZERO**.



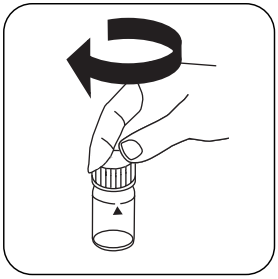
Extraer la cubeta del compartimiento de medición.



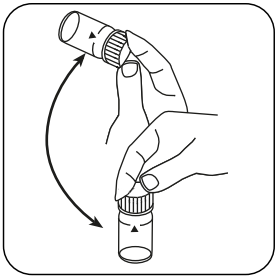
Mantener la botella cuentagotas vertical y añadir gotas del mismo tamaño presionando lentamente.



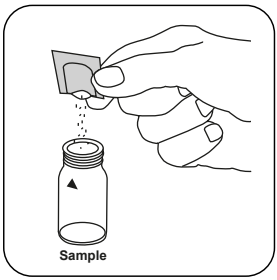
Añadir **5 gotas de Free Chlorine Reagent Solution** en la cubeta con la muestra.



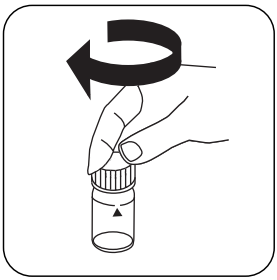
Cerrar la(s) cubeta(s).



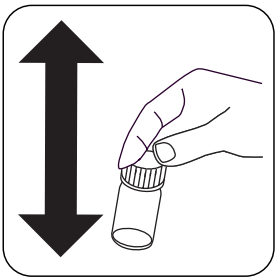
Mezclar el contenido girando (15 sec.).



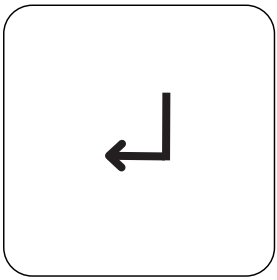
Añadir un **sobre de polvos Monochlor FRGT** .



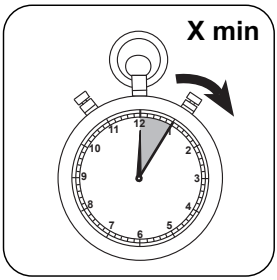
Cerrar la(s) cubeta(s).



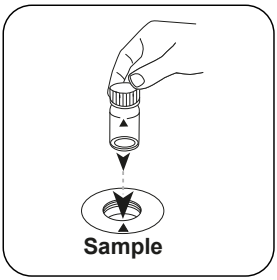
Disolver el contenido agitando. (20 sec.)



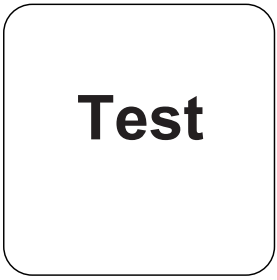
Pulsar la tecla **ENTER**.(XD: Iniciar temporizador)



Tiempo de reacción **X min** según tabla. **Esperar el periodo de reacción.**



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 cloro libre.

Ejecución de la determinación cloro libre y monocloramina

Seleccionar el método en el aparato.

Seleccione además la determinación: Cloro libre

Para este método, no es necesario realizar una medición CERO cada vez en los siguientes dispositivos: en ausencia de cloro

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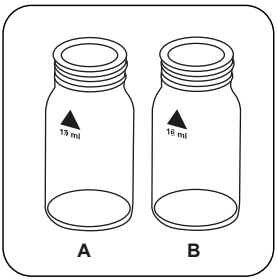
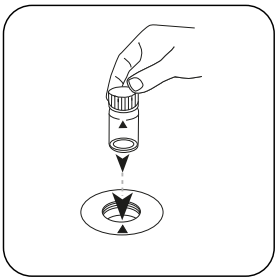
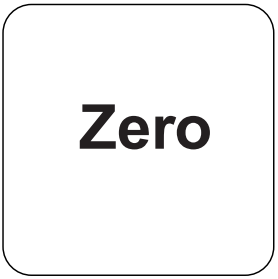


Preparar dos cubetas limpias de Cloramina mm. Identificar una como cubeta en blanco.

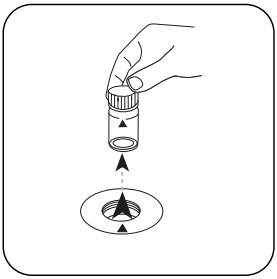
Añadir en cada cubeta **10 mL de muestra**.



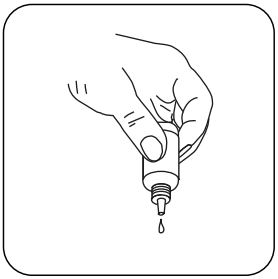
Poner la **cubeta** Cloroen el compartimiento de medición. ¡Debe tenerse en cuenta el posicionamiento!



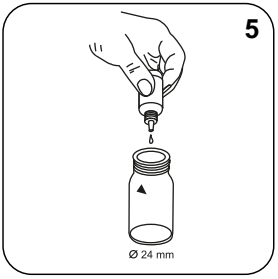
Pulsar la tecla **ZERO**.



Extraer la cubeta del compartimiento de medición.

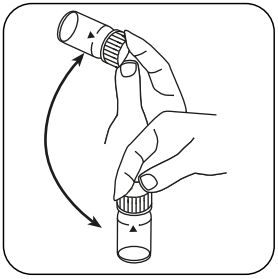


Mantener la botella cuentagotas vertical y añadir gotas del mismo tamaño presionando lentamente.

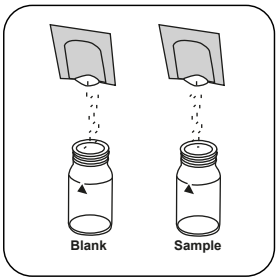


Añadir **5 gotas de Free Chlorine Reagent Solution** en la cubeta **Cloro**.

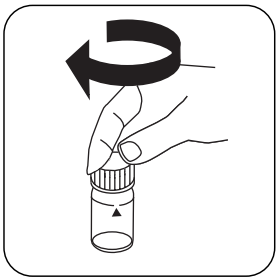
Cerrar la(s) cubeta(s).



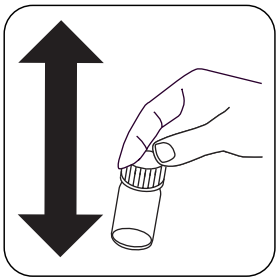
Mezclar el contenido girando (aprox. 15 segundos).



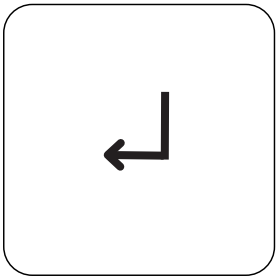
Añadir simultáneamente **un sobre de polvos de Monochlor FRGT** en cada cubeta.



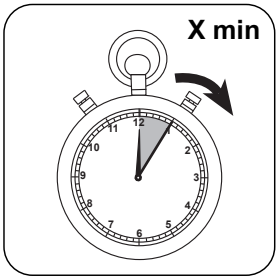
Cerrar la(s) cubeta(s).



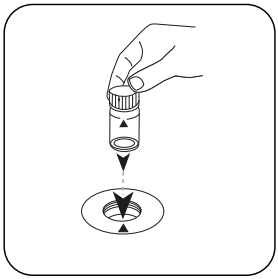
Disolver el contenido agitando. (20 seg.)



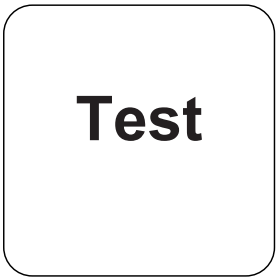
Pulsar la tecla **ENTER**.(XD: Iniciar temporizador)



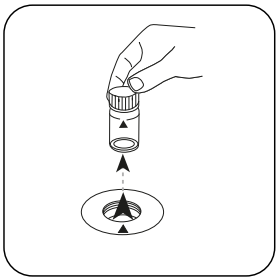
Tiempo de reacción **X min** según tabla. **Esperar el periodo de reacción.**



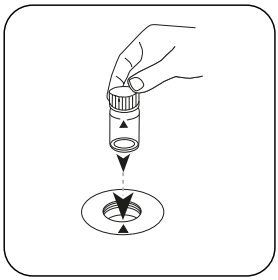
Poner la **cubeta** Cloraminaen el compartimiento de medición. ¡Debe tenerse en cuenta el posicionamiento!



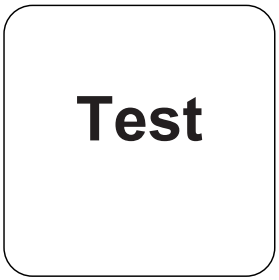
Pulsar la tecla **TEST** (XD: **START**).



Extraer la cubeta del compartimiento de medición.



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



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

A continuación se visualizará el resultado en mg/L Cloro y mg/l de monocloramina - Cloro [NH_2Cl].

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	Cl_2	1
mg/l	NH_2Cl	0.72598
mg/l	$N[NH_2Cl]$	0.19754
mg/l	NH_3	0.24019

Método químico

Indophenole method

Interferencia

Interferencias extraibles

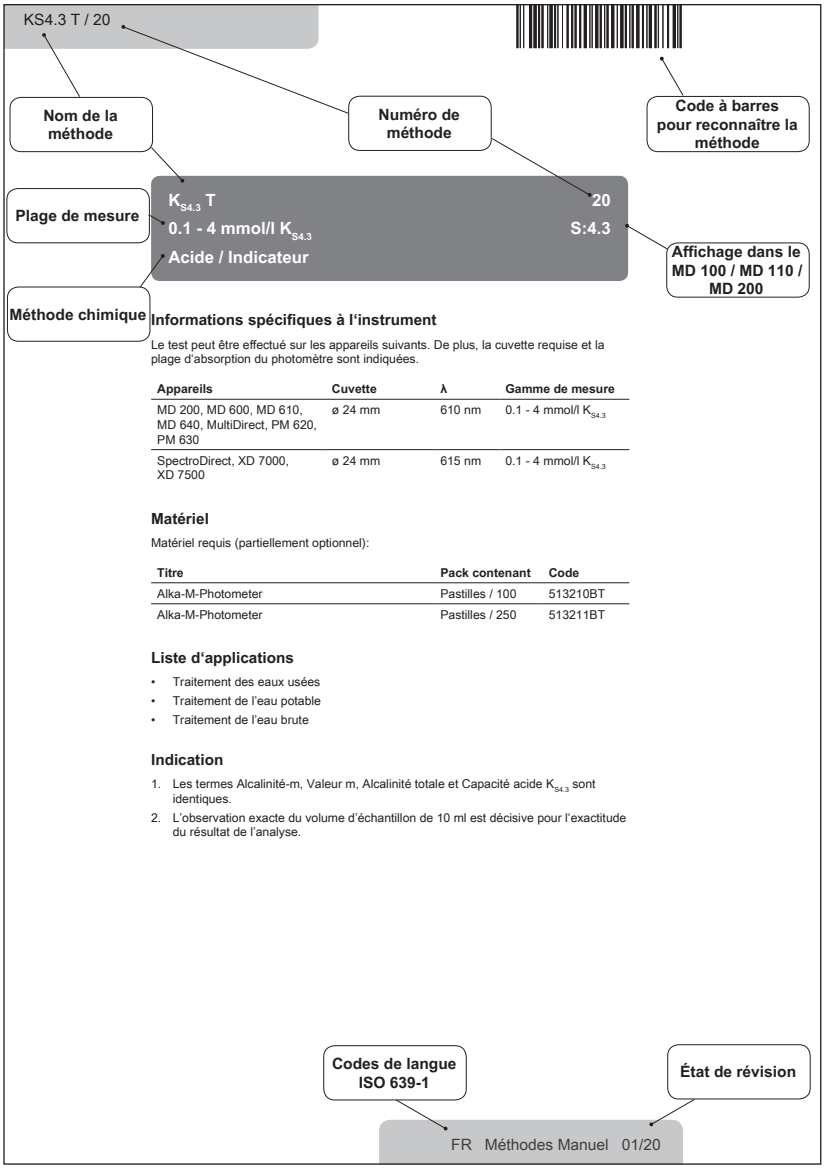
Las alteraciones provocadas por la precipitación provocada por una dureza del magnesio superior a 400 mg / l de $CaCO_3$ pueden eliminarse añadiendo 5 gotas de solución salina de Rochelle.

Interferencia	de / [mg/L]
Alanine (N)	1
Aluminium (Al)	10
Bromide (Br^-)	100
Bromine (Br_2)	15
Calcium ($CaCO_3$)	1000
Chloride (Cl^-)	18.000
Chlorine Dioxide (ClO_2)	5
Copper (Cu)	10
Dichloramine (Cl_2)	10
Fluoride (F^-)	5
Glycine (N)	1
Iron (II) (Fe^{2+})	10
Iron (III) (Fe^{3+})	10
Lead (Pb)	10
Permanganate	3
Nitrate (N)	100
Nitrite (N)	50

Interferencia	de / [mg/L]
Sulfide	0.5
Phosphate (PO_4)	100
Silica (SiO_2)	100
Sulfate (SO_4^{2+})	2600
Sulfite (SO_3^{2-})	50
Ozone	1
Tyrosine (N)	1
Urea (N)	10
Zinc (Zn)	5

Validación del método

Límite de detección	0.010 mg/L
Límite de determinación	0.03 mg/L
Límite del rango de medición	4.5 mg/L
Sensibilidad	1.78 mg/L / Abs
Intervalo de confianza	0.044 mg/L
Desviación estándar	0.018 mg/L
Coeficiente de variación	0.78 %



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.

Procédure du test

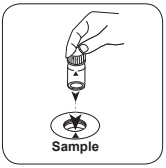
Réalisation de la quantification Capacité acide $K_{S4.3}$ avec pastille

Sélectionnez la méthode sur l'appareil.

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

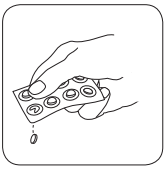
Remplissez une cuvette de 24 mm de **10 ml d'échantillon**.

Fermez la(les) cuvette(s).

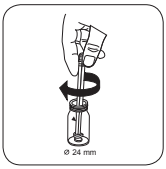


Placez la **cuvette réservée à l'échantillon** dans la chambre de mesure. Attention à la positionner correctement.

• • •



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



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

Fermez la(les) cuvette(s).

Chloramine (M) PP M63

0.02 - 4.5 mg/L NH_2Cl as Cl_2

Indophenole method

FR

Matériel

Matériel requis (partiellement optionnel):

Réactifs	Pack contenant	Code
VARIO Monochloramine Set	1 Kit	535800
VARIO Monochlor F Rgt - 100	Poudre / 100 Pièces	531810
VARIO Free Ammonia Reagent Solution - 5 ml	5 mL	531800
VARIO Solution saline Rochelle, 30 ml [h)]	30 mL	530640

Indication

1. Développement complet des couleurs - Température
   Les périodes de réaction indiquées dans le manuel se réfèrent à une température de l'échantillon comprise entre 12° et 14°C. Étant donné que la période de réaction est fortement influencée par la température de l'échantillon, vous devez ajuster les deux périodes de réaction selon le tableau suivant:

Température de l'échantillon		Période de réaction en x min
in °C	in °F	
5	41	10
7	45	9
9	47	8
10	50	8
12	54	7
14	57	7
16	61	6
18	64	5
20	68	5
23	73	2.5
25	77	2
> 25	> 77	2

2. Appuyez sur la touche [Entrée] pour annuler un délai de réaction.
3. Tenez la bouteille verticalement et pressez lentement.
4. Pour déterminer la concentration en ammoniac, on calcule la différence entre la mono chloramine (T1) et la somme de la mono chloramine et de l'ammoniac (T2). Si T2 dépasse la limite de la plage, le message suivant s'affiche:
   $N[NH_2Cl] + N[NH_3] > 0.9$ mg/L
   Dans ce cas, l'échantillon doit être dilué et la mesure doit être répétée.

Réalisation de la quantification Dioxyde de chlore, en présence de chlore avec pastille

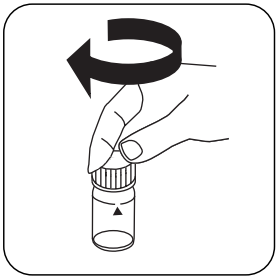
Sélectionnez la méthode sur l'appareil.

Sélectionnez également la quantification : en présence de chlore

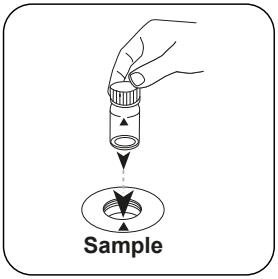
Pour cette méthode, il n'est pas nécessaire d'effectuer une mesure ZERO à chaque fois sur les appareils suivants : en présence de chlore

FR

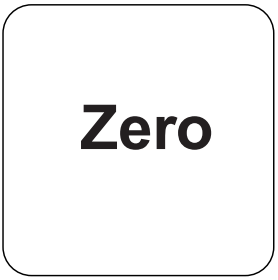
Remplissez une cuvette de 24 mm de **10 mL d'échantillon**.



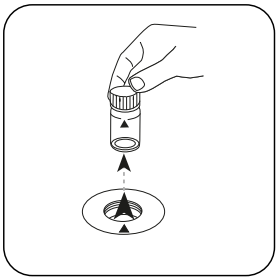
Fermez la(les) cuvette(s).



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

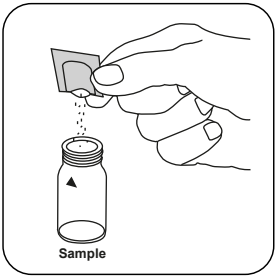


Appuyez sur la touche **ZERO**.

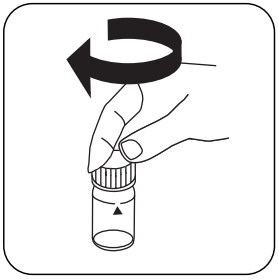


Retirez la cuvette de la chambre de mesure.

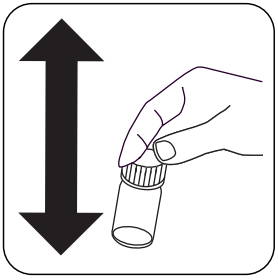
Sur les appareils ne nécessitant **aucune mesure ZÉRO** , **commencez ici**.



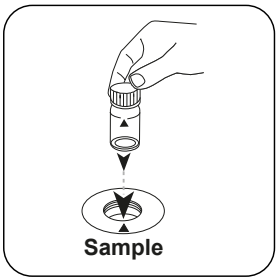
Ajoutez un **sachet de poudre Monochlor FRGT**.



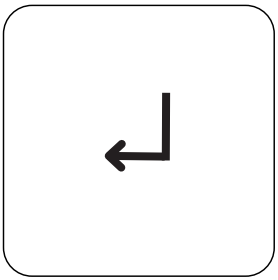
Fermez la(les) cuvette(s).



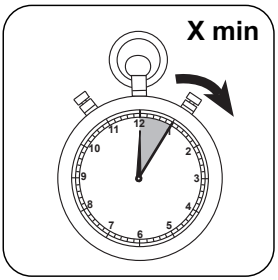
Dissolvez le contenu en agitant. (20 sec.)



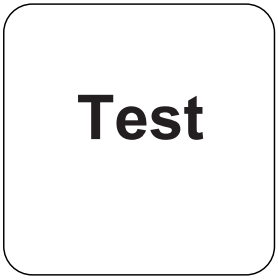
Placez la **cuvette réservée à l'échantillon** dans la chambre de mesure. Attention à la positionner correctement.



Appuyez sur la touche **ENTER**.(XD : Démarrer le minuteur)



Temps de réaction **X min** selon le tableau. **Attendez le temps de réaction.**



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

Le résultat s'affiche à l'écran en mg/L Monochloramine - Chlore Cl [NH_2Cl].

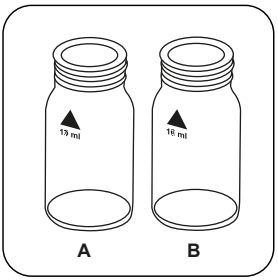
Réalisation de la quantification Dioxyde de chlore, en l'absence de chlore avec pastille

Sélectionnez la méthode sur l'appareil.

Sélectionnez également la quantification : avec de l'ammoniac libre

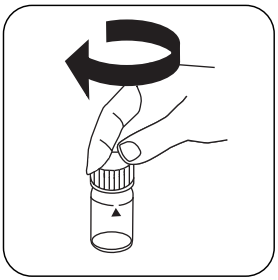
Pour cette méthode, il n'est pas nécessaire d'effectuer une mesure ZERO à chaque fois sur les appareils suivants : XD 7000, XD 7500

FR

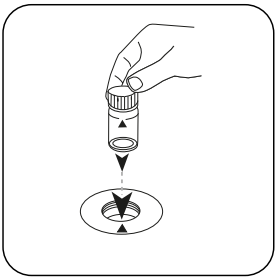


Préparer deux cuvettes propres de 24 mm. Marquer l'une comme étant la cuvette Ammoniac et l'autre comme étant la cuvette Chloramine.

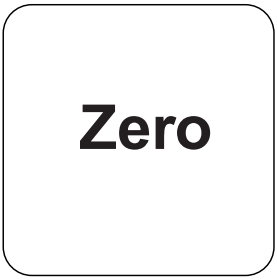
Dans chaque cuvette, versez **10 mL d'échantillon**.



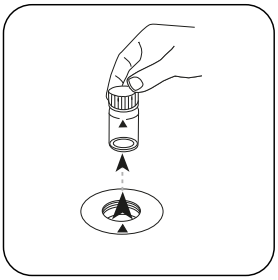
Fermez la(les) cuvette(s).



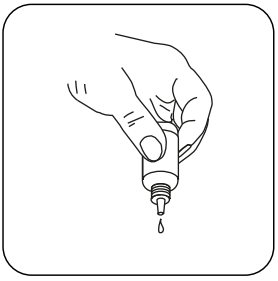
Placez la **cuvette** Ammoniac dans la chambre de mesure. Attention à la positionner correctement.



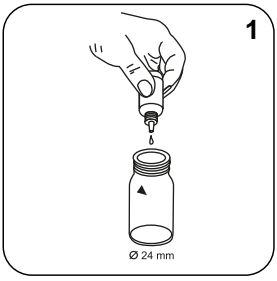
Appuyez sur la touche **ZERO**.



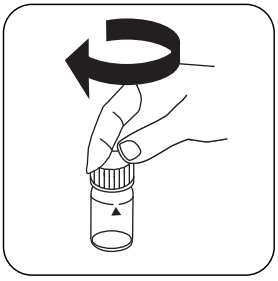
Retirez la cuvette de la chambre de mesure.



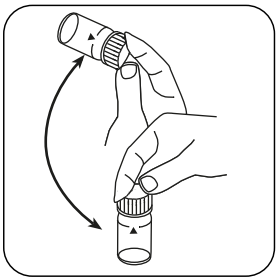
Tenez les flacons compte-goutte à la verticale et ajoutez des gouttes uniformes en appuyant lentement.



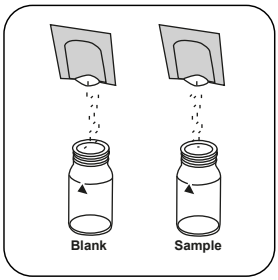
Ajoutez **1 gouttes de Free Ammonia Reagent Solution** dans la cuvette **Ammoniac**.



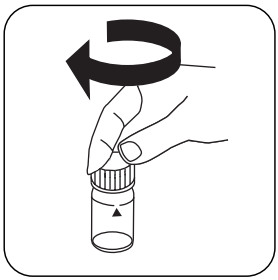
Fermez la(les) cuvette(s).



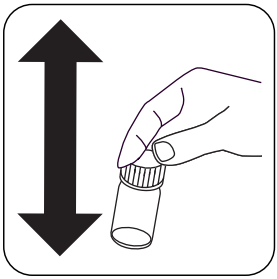
Retourner plusieurs fois pour mélanger le contenu (approx. 15 sec) .



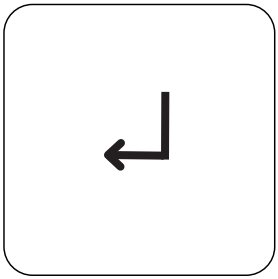
Dans chaque cuvette, versez **simultanément un sachet de poudre Monochlor FRGT**.



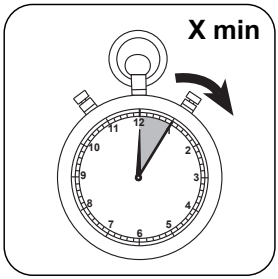
Fermez la(les) cuvette(s).



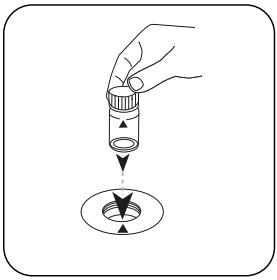
Dissolvez le contenu en agitant. (20 sec.)



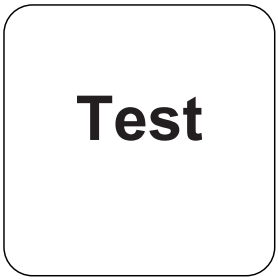
Appuyez sur la touche **ENTER**.(XD : Démarrer le minuteur)



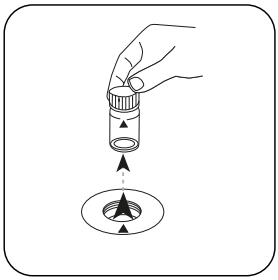
Temps de réaction **X min** selon le tableau. **Attendez le temps de réaction.**



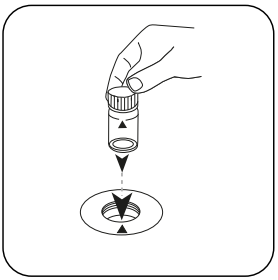
Placez la **cuvette** Chloramine dans la chambre de mesure. Attention à la positionner correctement.

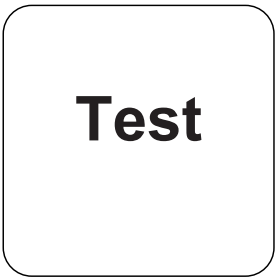


Appuyez sur la touche **TEST** (XD: **START**).



Retirez la cuvette de la chambre de mesure.





FR

Placez la **cuvette** Ammonia 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 Monochloramine - Chlore Cl [NH_2Cl] et Ammoniac - Azote N [NH_3] libre en mg/l.

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	Cl_2	1
mg/l	NH_2Cl	0.72598
mg/l	$N[NH_2Cl]$	0.19754
mg/l	NH_3	0.24019

Méthode chimique

Indophenole method

Interférences

Interférences exclues

Les perturbations causées par les précipitations causées par une dureté du magnésium supérieure à 400 mg / l de CaCO3 peuvent être éliminées en ajoutant 5 gouttes de solution de sel de Rochelle.

Interférences	de / [mg/L]
Alanine (N)	1
Aluminium (Al)	10
Bromide (Br^-)	100
Bromine (Br_2)	15
Calcium ($CaCO_3$)	1000
Chloride (Cl^-)	18.000
Chlorine Dioxide (ClO_2)	5
Copper (Cu)	10
Dichloramine (Cl_2)	10
Fluoride (F^-)	5
Free Chloride (Cl_2)	10
Glycine (N)	1
Iron (II) (Fe^{2+})	10
Iro (III) (Fe^{3+})	10
Lead (Pb)	10
Permanganate	3
Nitrate (N)	100

Interférences	de / [mg/L]
Nitrite (N)	50
Sulfide	0.5
Phosphate (PO_4)	100
Silica (SiO_2)	100
Sulfate (SO_4^{2+})	2600
Sulfite (SO_3^{2-})	50
Ozone	1
Tyrosine (N)	1
Urea (N)	10
Zinc (Zn)	5

Méthode Validation

Limite de détection	0.010 mg/L
Limite de détermination	0.03 mg/L
Fin de la gamme de mesure	4.5 mg/L
Sensibilité	1.78 mg/L / Abs
Intervalle de confiance	0.044 mg/L
Déviation standard	0.018 mg/L
Coefficient de variation	0.78 %

Chlore (libre) et Monochloramine M64

0.02 - 4.50 mg/L Cl_2 CL2

Indophenole method

FR

Matériel

Matériel requis (partiellement optionnel):

Réactifs	Pack contenant	Code
VARIO Free Chlorine Reagent Solution - 30 ml	30 mL	531820
VARIO Monochlor F Rgt - 100	Poudre / 100 Pièces	531810
VARIO Solution saline Rochelle, 30 ml [h)]	30 mL	530640

Indication

1. Développement complet des couleurs - Température
   Les périodes de réaction indiquées dans le manuel se réfèrent à une température de l'échantillon comprise entre 12° et 14°C. Étant donné que la période de réaction est fortement influencée par la température de l'échantillon, vous devez ajuster les deux périodes de réaction selon le tableau suivant:

Température de l'échantillon		Période de réaction en x min
°C	°F	
5	41	10
7	45	9
9	47	8
10	50	8
12	54	7
14	57	7
16	61	6
18	64	5
20	68	5
23	73	2.5
25	77	2
> 25	> 77	2

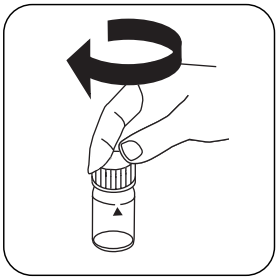
2. Appuyez sur la touche [Entrée] pour annuler un délai de réaction.
3. Tenez la bouteille verticalement et pressez lentement.
4. Pour déterminer la concentration de chlore, on calcule la différence entre la monochloramine et la somme de la monochloramine et du chlore. Si une valeur mesurée dépasse la limite de la plage, le message suivant s'affiche :
   $Cl_2[NH_2Cl] + Cl_2 > 4.5$ mg/L
   Dans ce cas, l'échantillon doit être dilué et la mesure doit être répétée.

Réalisation de la quantification Dioxyde de chlore, en présence de chlore avec pastille

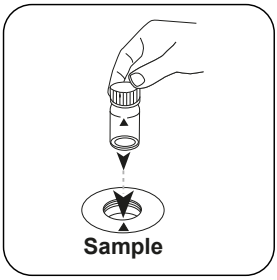
Sélectionnez la méthode sur l'appareil.

Sélectionnez également la quantification : en présence de chlore

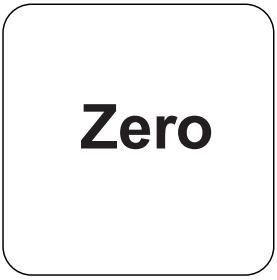
Remplissez une cuvette de 24 mm de **10 mL d'échantillon**.



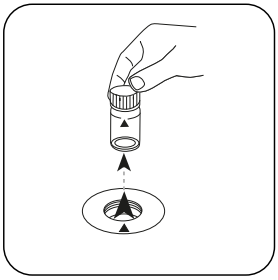
Fermez la(les) cuvette(s).



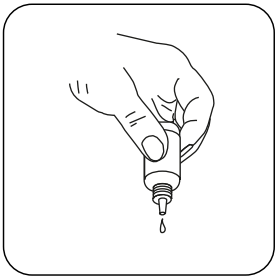
Placez la **cuvette réservée à l'échantillon** dans la chambre de mesure. Attention à la positionner correctement.



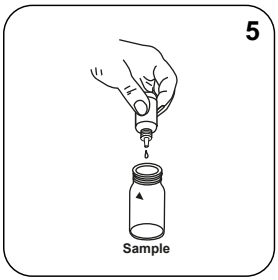
Appuyez sur la touche **ZERO**.



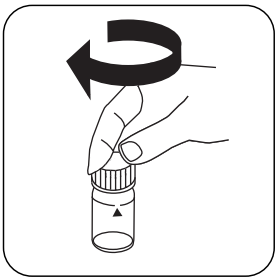
Retirez la cuvette de la chambre de mesure.



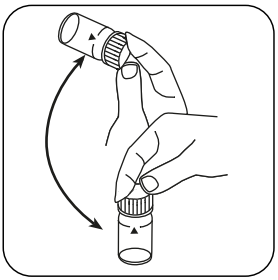
Tenez les flacons compte-goutte à la verticale et ajoutez des gouttes uniformes en appuyant lentement.



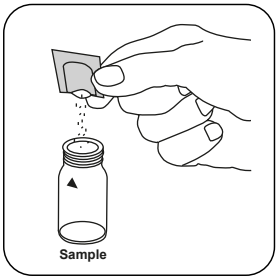
Ajoutez **5 gouttes de Free Chlorine Reagent Solution** dans la cuvette réservée à l'échantillon.



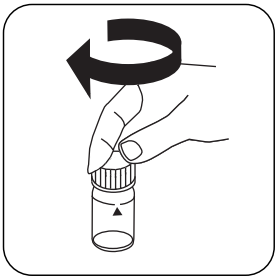
Fermez la(les) cuvette(s).



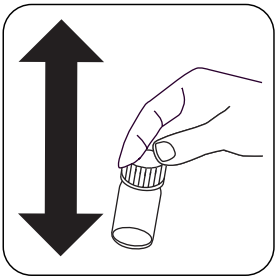
Retourner plusieurs fois pour mélanger le contenu (15 sec.) .



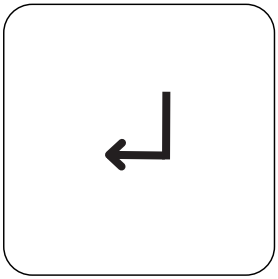
Ajoutez un **sachet de poudre Monochlor FRGT**.



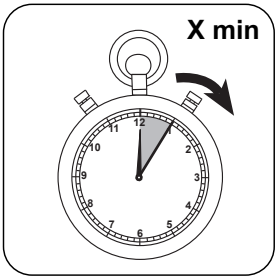
Fermez la(les) cuvette(s).



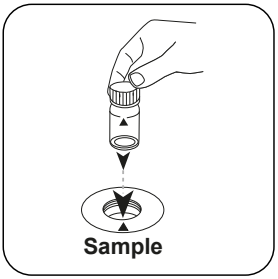
Dissolvez le contenu en agitant. (20 sec.)



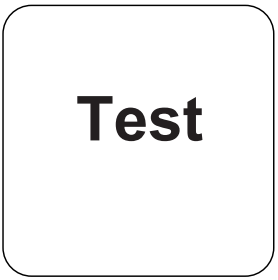
Appuyez sur la touche **ENTER**.(XD : Démarrer le minuteur)



Temps de réaction **X min** selon le tableau. **Attendez le temps de réaction.**



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



FR

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

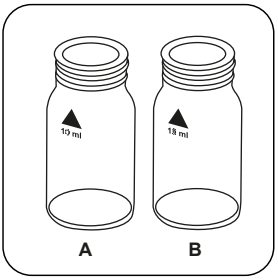
Le résultat s'affiche à l'écran en mg/L chlore libre.

Réalisation de la quantification Chlore libre et monochloramine

Sélectionnez la méthode sur l'appareil.

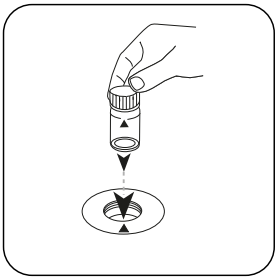
Sélectionnez également la quantification : Chlore libre

Pour cette méthode, il n'est pas nécessaire d'effectuer une mesure ZERO à chaque fois sur les appareils suivants : sans chlore

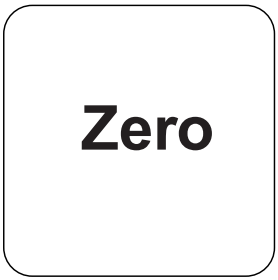


Préparer deux cuvettes propres de 24 mm. Marquer l'une comme étant la cuvette Chloramine et l'autre comme étant la cuvette Chlore.

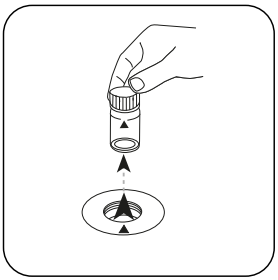
Dans chaque cuvette, versez **10 mL d'échantillon**.



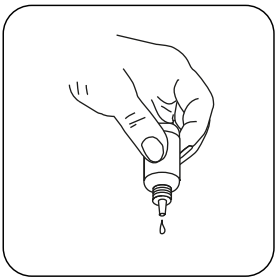
Placez la **cuvette** Chlore dans la chambre de mesure. Attention à la positionner correctement.



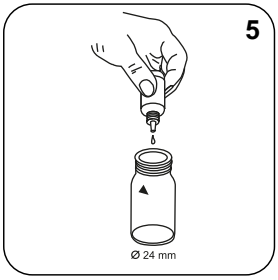
Appuyez sur la touche **ZERO**.



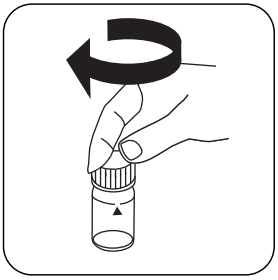
Retirez la cuvette de la chambre de mesure.



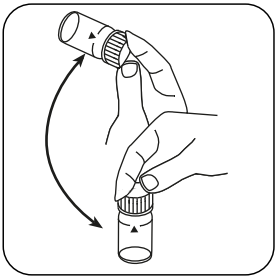
Tenez les flacons compte-goutte à la verticale et ajoutez des gouttes uniformes en appuyant lentement.



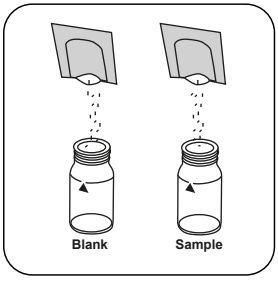
Ajoutez **5 gouttes de Free Chlorine Reagent Solution** dans la cuvette **Chlore**.



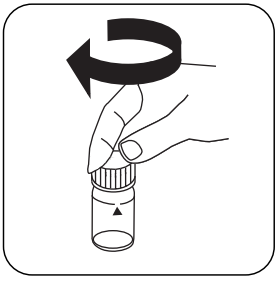
Fermez la(les) cuvette(s).



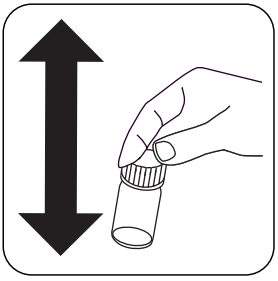
Retourner plusieurs fois pour mélanger le contenu (environ 15 secondes) .



Dans chaque cuvette, versez **simultanément un sachet de poudre Monochlor FRGT**.

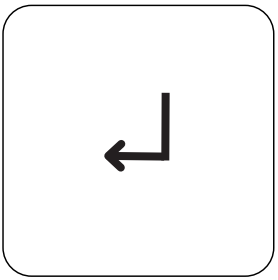


Fermez la(les) cuvette(s).

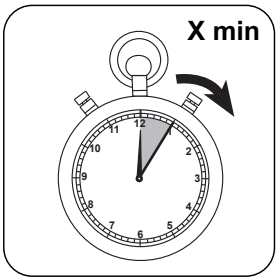


Dissolvez le contenu en agitant. (20 sec.)

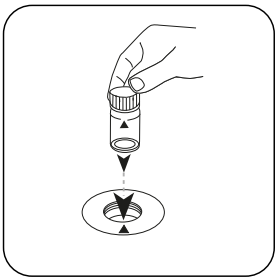
FR



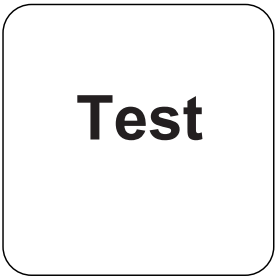
Appuyez sur la touche **ENTER**.(XD : Démarrer le minuteur)



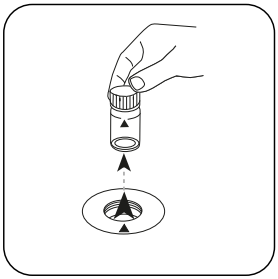
Temps de réaction **X min** selon le tableau. **Attendez le temps de réaction.**



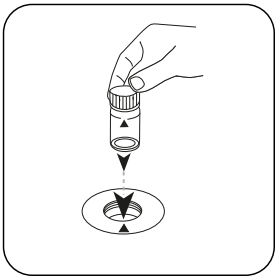
Placez la **cuvette** Chloramine dans la chambre de mesure. Attention à la positionner correctement.



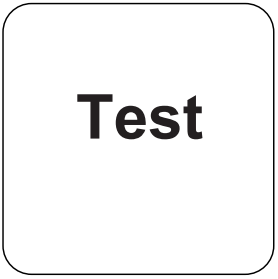
Appuyez sur la touche **TEST** (XD: **START**).



Retirez la cuvette de la chambre de mesure.



Placez la **cuvette** Chlore 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 Chlore et mg/l Monochloramine - Chlore Cl [NH_2Cl].

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	Cl_2	1
mg/l	NH_2Cl	0.72598
mg/l	$N[NH_2Cl]$	0.19754
mg/l	NH_3	0.24019

Méthode chimique

Indophenole method

Interférences

Interférences exclues

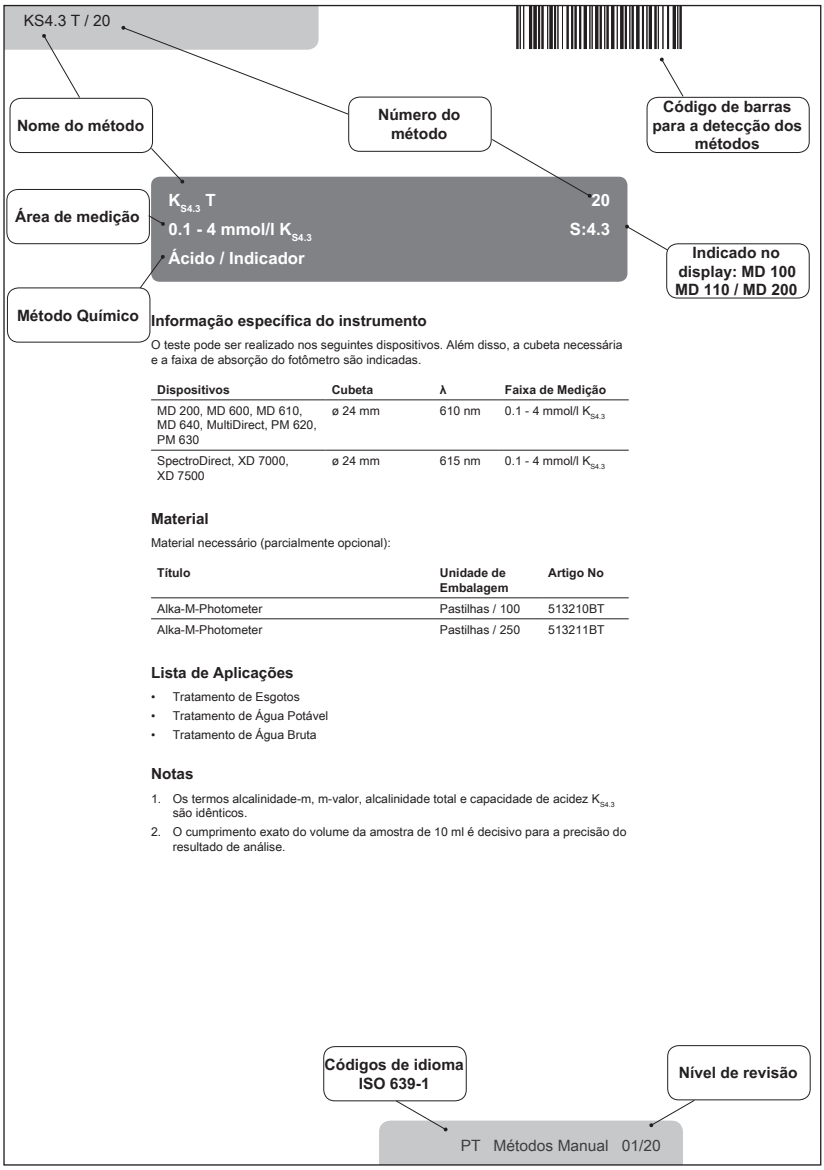
Les perturbations causées par les précipitations causées par une dureté du magnésium supérieure à 400 mg / l de $CaCO_3$ peuvent être éliminées en ajoutant 5 gouttes de solution de sel de Rochelle.

Interférences	de / [mg/L]
Alanine (N)	1
Aluminium (Al)	10
Bromide (Br^-)	100
Bromine (Br_2)	15
Calcium ($CaCO_3$)	1000
Chloride (Cl^-)	18.000
Chlorine Dioxide (ClO_2)	5
Copper (Cu)	10
Dichloramine (Cl_2)	10
Fluoride (F^-)	5
Glycine (N)	1
Iron (II) (Fe^{2+})	10
Iron (III) (Fe^{3+})	10
Lead (Pb)	10
Permanganate	3
Nitrate (N)	100
Nitrite (N)	50

Interférences	de / [mg/L]
Sulfide	0.5
Phosphate (PO_4)	100
Silica (SiO_2)	100
Sulfate (SO_4^{2+})	2600
Sulfite (SO_3^{2-})	50
Ozone	1
Tyrosine (N)	1
Urea (N)	10
Zinc (Zn)	5

Méthode Validation

Limite de détection	0.010 mg/L
Limite de détermination	0.03 mg/L
Fin de la gamme de mesure	4.5 mg/L
Sensibilité	1.78 mg/L / Abs
Intervalle de confiance	0.044 mg/L
Déviation standard	0.018 mg/L
Coefficient de variation	0.78 %


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

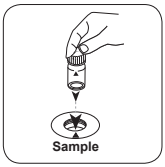
Realização da determinação Capacidade de acidez $K_{S4.3}$ com pastilha

Escolher o método no equipamento.

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

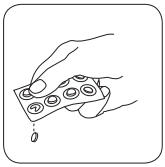
Encher a célula de 24 mm com **10 ml de amostra** .

Fechar a(s) célula(s).

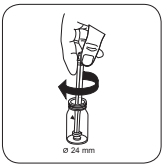


Colocar a **célula de amostra** no compartimento de medição. Observar o posicionamento.

• • •



Pastilha ALKA-M-PHOTOMETER.



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

Fechar a(s) célula(s).

Cloramina (M) PP M63

0.02 - 4.5 mg/L NH_2Cl as Cl_2

Indophenole method

PT

Material

Material necessário (parcialmente opcional):

Reagentes	Unidade de Embalagem	Código do Produto
VARIO Monochloramine Set	1 Conjunto	535800
VARIO Monochlor F Rgt - 100	Pó / 100 pc.	531810
VARIO Free Ammonia Reagent Solution - 5 ml	5 mL	531800
Solução de sal VARIO Rochelle, 30 ml [h)]	30 mL	530640

Notas

1. Desenvolvimento total da cor - temperatura
   Os períodos de reacção indicados no manual referem-se a uma temperatura da amostra entre 12° e 14°C. Devido ao facto de o período de reacção ser fortemente influenciado pela temperatura da amostra, é necessário ajustar ambos os períodos de reacção de acordo com a tabela seguinte:

Temperatura da amostra		Período de reacção em x min
°C	°F	
5	41	10
7	45	9
9	47	8
10	50	8
12	54	7
14	57	7
16	61	6
18	64	5
20	68	5
23	73	2.5
25	77	2
> 25	> 77	2

2. Prima a tecla [Enter] para cancelar um período de reacção.
3. Segurar a garrafa verticalmente e apertar lentamente.
4. Para determinar a concentração de amoníaco, calcula-se a diferença entre mono cloramina (T1) e a soma de mono cloramina e amoníaco (T2). Se T2 exceder o limite do intervalo, é exibida a seguinte mensagem:
   $N[NH_2Cl] + N[NH_3] > 0,9$ mg/L
   Neste caso, a amostra tem de ser diluída e a medição tem de ser repetida.

Realização da determinação Dióxido de Cloro, na presença de cloro com pastilha

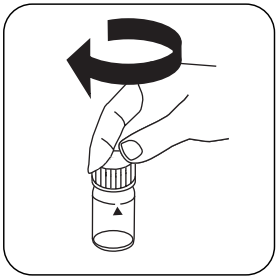
Escolher o método no equipamento.

Escolha ainda a determinação: na presença de Cloro

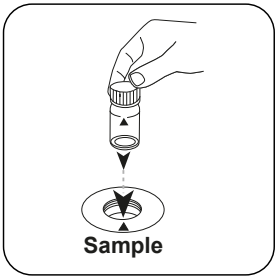
Para este método, uma medição ZERO não precisa ser realizada todas as vezes nos seguintes dispositivos: na presença de Cloro

PT

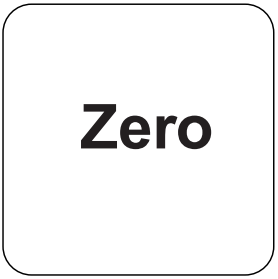
Encher a célula de 24 mm com **10 mL de amostra** .



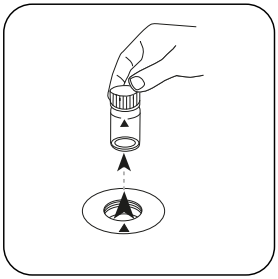
Fechar a(s) célula(s).



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

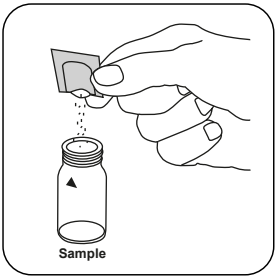


Premir a tecla **ZERO**.

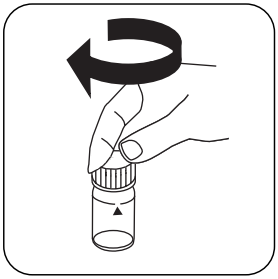


Retirar a célula do compartimento de medição.

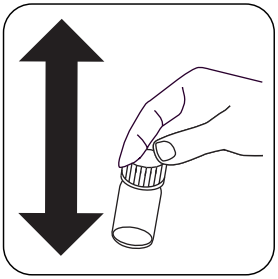
Nos equipamentos que **não requerem uma medição ZERO** , **deve começar aqui**.



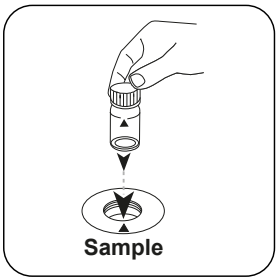
Adicionar um **pacote de pó Monochlor FRGT** .



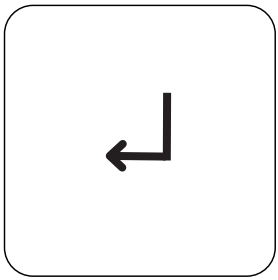
Fechar a(s) célula(s).



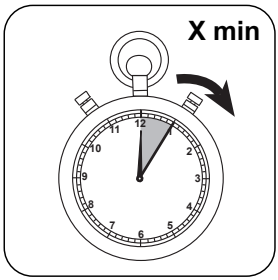
Dissolver o conteúdo agitando. (20 sec.)



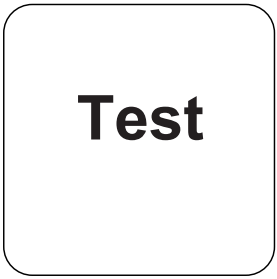
Colocar a **célula de amostra** no compartimento de medição. Observar o posicionamento.



Premir a tecla **ENTER**.(XD: Temporizador de início)



Tempo de reacção **X min**, de acordo com a tabela. **Aguardar o período de reacção.**



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

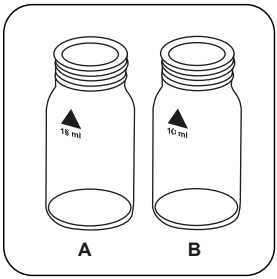
No visor aparece o resultado em mg/L Monocloramina - Cloro Cl [NH_2Cl].

Realização da determinação Dióxido de Cloro, na ausência de cloro com pastilha

Escolher o método no equipamento.

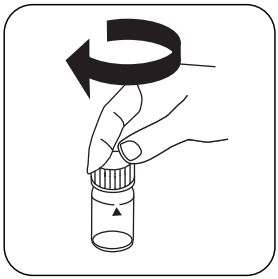
Escolha ainda a determinação: com amoníaco livre

Para este método, uma medição ZERO não precisa ser realizada todas as vezes nos seguintes dispositivos: XD 7000, XD 7500



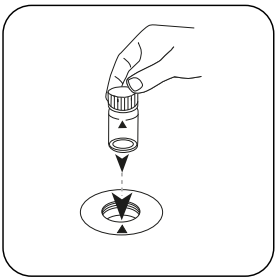
Preparar dois cuvetes de 24 mm limpos. Marcar um cubeta como Amoníaco e o outro como Cloramina.

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

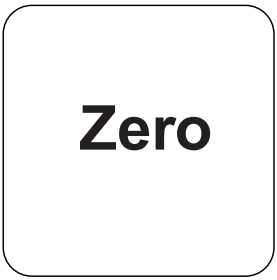


Fechar a(s) célula(s).

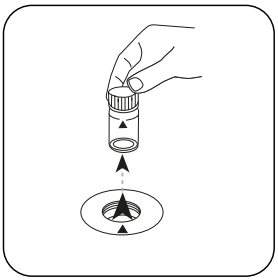
PT



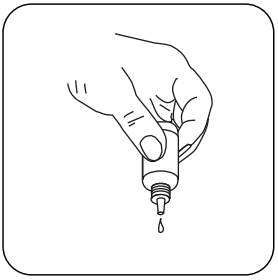
Colocar a **célula** Amoníacono compartimento de medição. Observar o posicionamento.



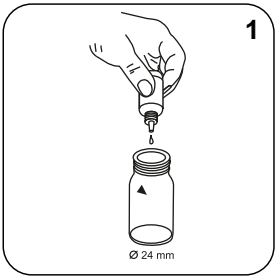
Premir a tecla **ZERO**.



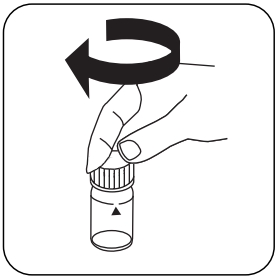
Retirar a célula do compartimento de medição.



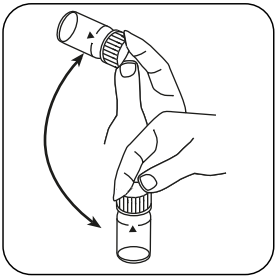
Manter os frascos conta gotas na vertical e pressionar lentamente para adicionar gotas de igual dimensão.



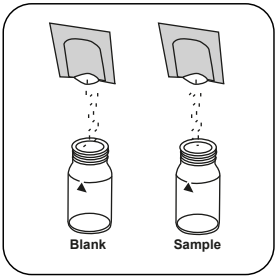
Adicionar **1 gotas Free Ammonia Reagent Solution** à célula **Amoníaco**.



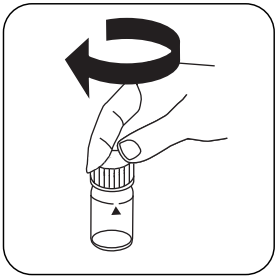
Fechar a(s) célula(s).



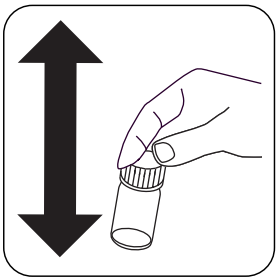
Misturar o conteúdo girando (approx. 15 sec).



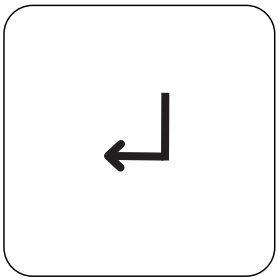
Introduzir simultaneamente em cada célula **um pacote de pó Monochlor FRGT**.



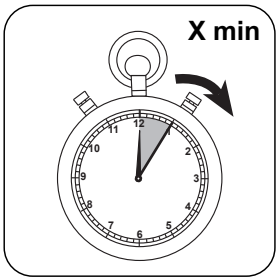
Fechar a(s) célula(s).



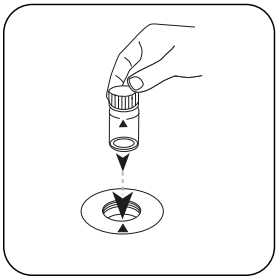
Dissolver o conteúdo agitando. (20 sec.)



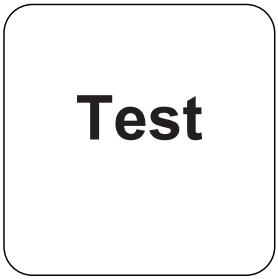
Premir a tecla **ENTER**.(XD: Temporizador de início)



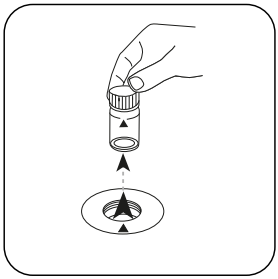
Tempo de reacção **X min**, de acordo com a tabela. **Aguardar o período de reacção.**



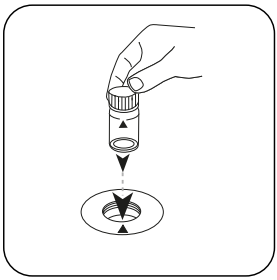
Colocar a **célula** Cloraminano compartimento de medição. Observar o posicionamento.



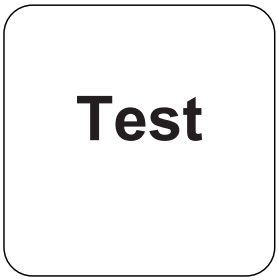
Premir a tecla **TEST** (XD: **START**).



Retirar a célula do compartimento de medição.



Colocar a **célula** Ammoniano compartimento de medição. Observar o posicionamento.



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

No visor aparece o resultado em mg/L Monocloramina - Cloro Cl [NH_2Cl] e mg/l de amónia livre - Nitrogénio N [NH_3].

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	Cl_2	1
mg/l	NH_2Cl	0.72598
mg/l	$N[NH_2Cl]$	0.19754
mg/l	NH_3	0.24019

Método Químico

Indophenole method

Texto de Interferências

Interferências Removíveis

Perturbações causadas por precipitação causadas por dureza de magnésio de mais de 400 mg / l $CaCO_3$ podem ser eliminadas adicionando 5 gotas de solução de sal de Rochelle.

Interferências	a partir de / [mg/L]
Alanine (N)	1
Aluminium (Al)	10
Bromide (Br^-)	100
Bromine (Br_2)	15
Calcium ($CaCO_3$)	1000
Chloride (Cl^-)	18.000
Chlorine Dioxide (ClO_2)	5
Copper (Cu)	10
Dichloramine (Cl_2)	10
Fluoride (F^-)	5
Free Chloride (Cl_2)	10
Glycine (N)	1
Iron (II) (Fe^{2+})	10
Iro (III) (Fe^{3+})	10
Lead (Pb)	10
Permanganate	3
Nitrate (N)	100

Interferências	a partir de / [mg/L]
Nitrite (N)	50
Sulfide	0.5
Phosphate (PO_4)	100
Silica (SiO_2)	100
Sulfate (SO_4^{2+})	2600
Sulfite (SO_3^{2-})	50
Ozone	1
Tyrosine (N)	1
Urea (N)	10
Zinc (Zn)	5

Validação de método

Limite de Detecção	0.010 mg/L
Limite de Determinação	0.03 mg/L
Fim da Faixa de Medição	4.5 mg/L
Sensibilidade	1.78 mg/L / Abs
Faixa de Confiança	0.044 mg/L
Desvio Padrão	0.018 mg/L
Coeficiente de Variação	0.78 %

Cloro (livre) e Monocloramina M64

0.02 - 4.50 mg/L Cl_2 CL2

Indophenole method

PT

Material

Material necessário (parcialmente opcional):

Reagentes	Unidade de Embalagem	Código do Produto
VARIO Free Chlorine Reagent Solution - 30 ml	30 mL	531820
VARIO Monochlor F Rgt - 100	Pó / 100 pc.	531810
Solução de sal VARIO Rochelle, 30 ml [h)]	30 mL	530640

Notas

1. Desenvolvimento total da cor - temperatura
   Os períodos de reacção indicados no manual referem-se a uma temperatura da amostra entre 12° e 14°C. Devido ao facto de o período de reacção ser fortemente influenciado pela temperatura da amostra, é necessário ajustar ambos os períodos de reacção de acordo com a tabela seguinte:

Temperatura da amostra		Período de reacção em x min
°C	°F	
5	41	10
7	45	9
9	47	8
10	50	8
12	54	7
14	57	7
16	61	6
18	64	5
20	68	5
23	73	2.5
25	77	2
> 25	> 77	2

2. Prima a tecla [Enter] para cancelar um período de reacção.
3. Segurar a garrafa verticalmente e apertar lentamente.
4. Para determinar a concentração de cloro é calculada a diferença entre a monocloramina e a soma da monocloramina e do cloro. Se um valor medido exceder o limite da gama, é exibida a seguinte mensagem:
   $Cl_2[NH_2Cl] + Cl_2 > 4,5$ mg/L
   Neste caso, a amostra tem de ser diluída e a medição tem de ser repetida.

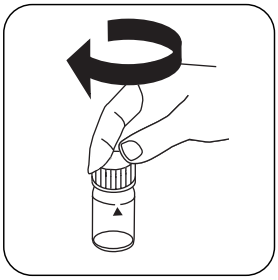
Realização da determinação Dióxido de Cloro, na presença de cloro com pastilha

Escolher o método no equipamento.

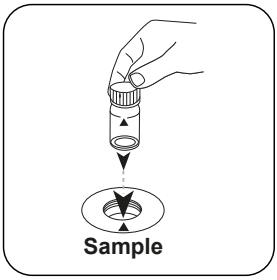
Escolha ainda a determinação: na presença de Cloro

PT

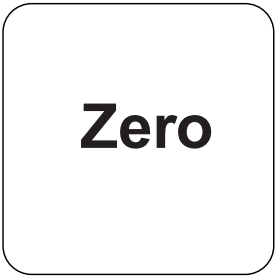
Encher a célula de 24 mm com **10 mL de amostra** .



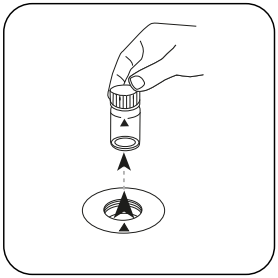
Fechar a(s) célula(s).



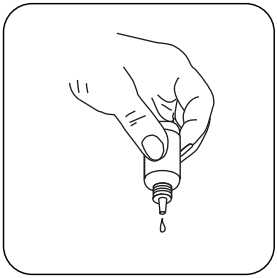
Colocar a **célula de amostra** no compartimento de medição. Observar o posicionamento.



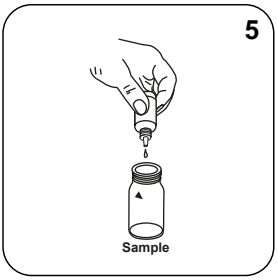
Premir a tecla **ZERO**.



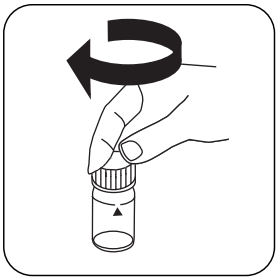
Retirar a célula do compartimento de medição.



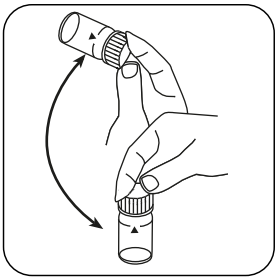
Manter os frascos conta gotas na vertical e pressionar lentamente para adicionar gotas de igual dimensão.



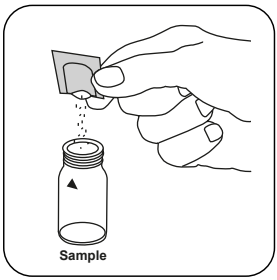
Adicionar **5 gotas Free Chlorine Reagent Solution** à célula de amostra.



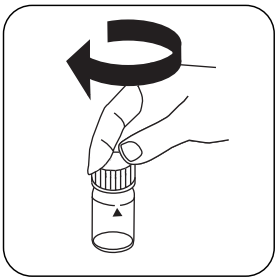
Fechar a(s) célula(s).



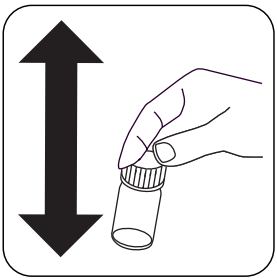
Misturar o conteúdo girando (15 sec.).



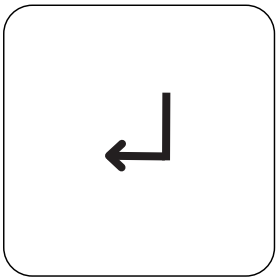
Adicionar um **pacote de pó Monochlor FRGT** .



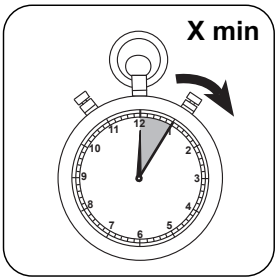
Fechar a(s) célula(s).



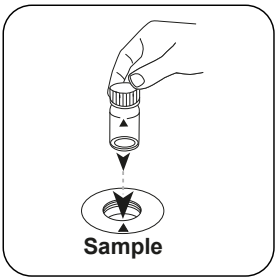
Dissolver o conteúdo agitando. (20 sec.)



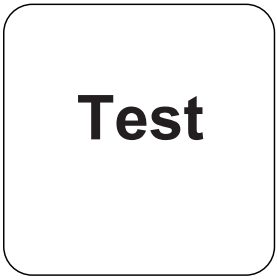
Premir a tecla **ENTER**.(XD: Temporizador de início)



Tempo de reacção **X min**, de acordo com a tabela. **Aguardar o período de reacção.**



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 Cloro livre.

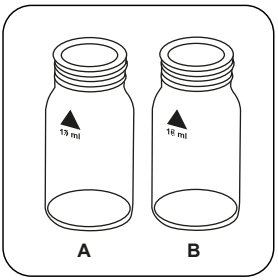
Realização da determinação Cloro e Monocloramina livres

Escolher o método no equipamento.

Escolha ainda a determinação: Cloro Livre

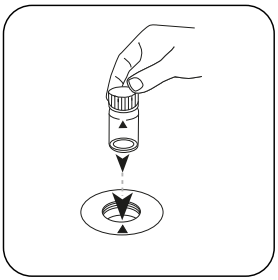
Para este método, uma medição ZERO não precisa ser realizada todas as vezes nos seguintes dispositivos: sem Cloro

PT

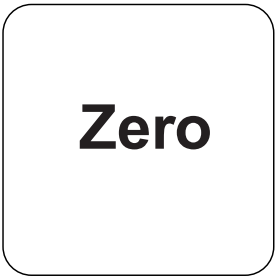


Preparar dois cuvetes de 24 mm limpos. Marcar um cubeta como Cloramina e o outro como Cloro.

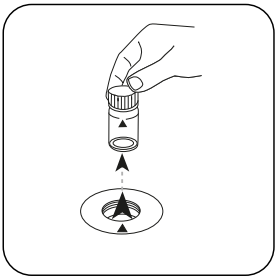
Introduzir em cada célula **10 mL de amostra** .



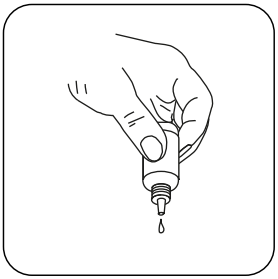
Colocar a **célula** Clorono compartimento de medição. Observar o posicionamento.



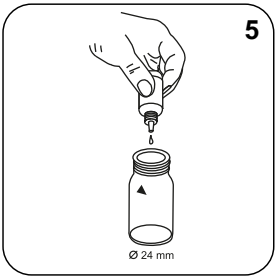
Premir a tecla **ZERO**.



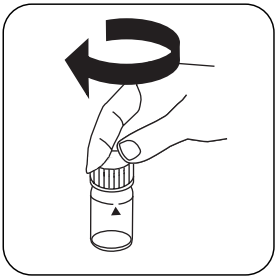
Retirar a célula do compartimento de medição.



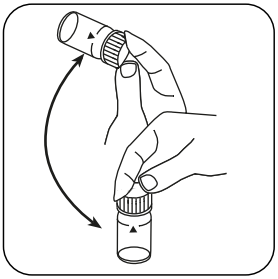
Manter os frascos conta gotas na vertical e pressionar lentamente para adicionar gotas de igual dimensão.



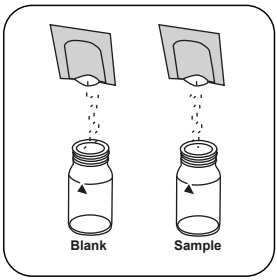
Adicionar **5 gotas Free Chlorine Reagent Solution** à célula **Cloro**.



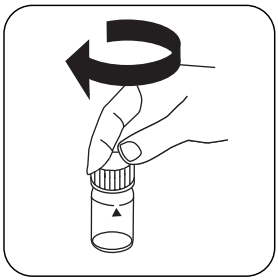
Fechar a(s) célula(s).



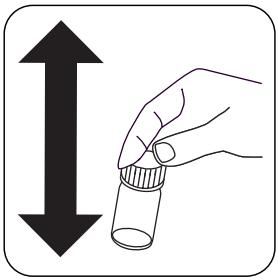
Misturar o conteúdo girando (aproximadamente 15 seg.).



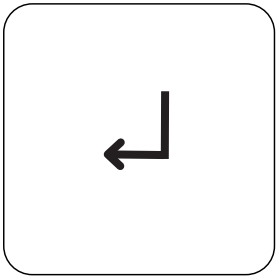
Introduzir simultaneamente em cada célula **um pacote de pó Monochlor FRGT**.



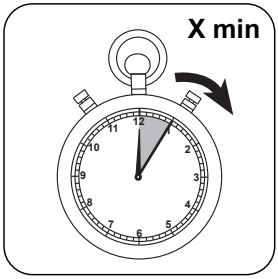
Fechar a(s) célula(s).



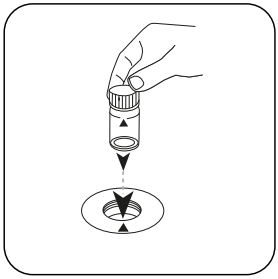
Dissolver o conteúdo agitando. (20 seg)



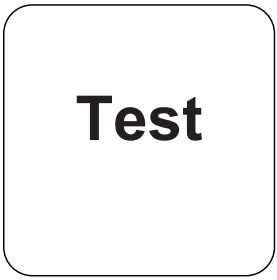
Premir a tecla **ENTER**.(XD: Temporizador de início)



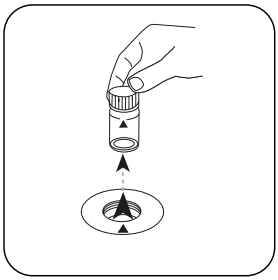
Tempo de reacção **X min**, de acordo com a tabela. **Aguardar o período de reacção.**



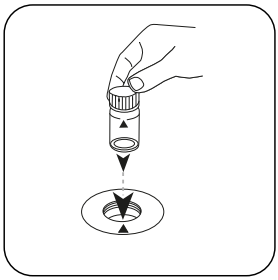
Colocar a **célula** Cloraminano compartimento de medição. Observar o posicionamento.



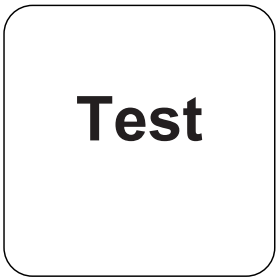
Premir a tecla **TEST** (XD: **START**).



Retirar a célula do compartimento de medição.



Colocar a **célula** Clorono compartimento de medição. Observar o posicionamento.



PT

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

No visor aparece o resultado em mg/L Cloro e mg/l Monocloramina - Cloro Cl [NH_2Cl].

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	Cl_2	1
mg/l	NH_2Cl	0.72598
mg/l	$N[NH_2Cl]$	0.19754
mg/l	NH_3	0.24019

Método Químico

Indophenole method

Texto de Interferências

Interferências Removíveis

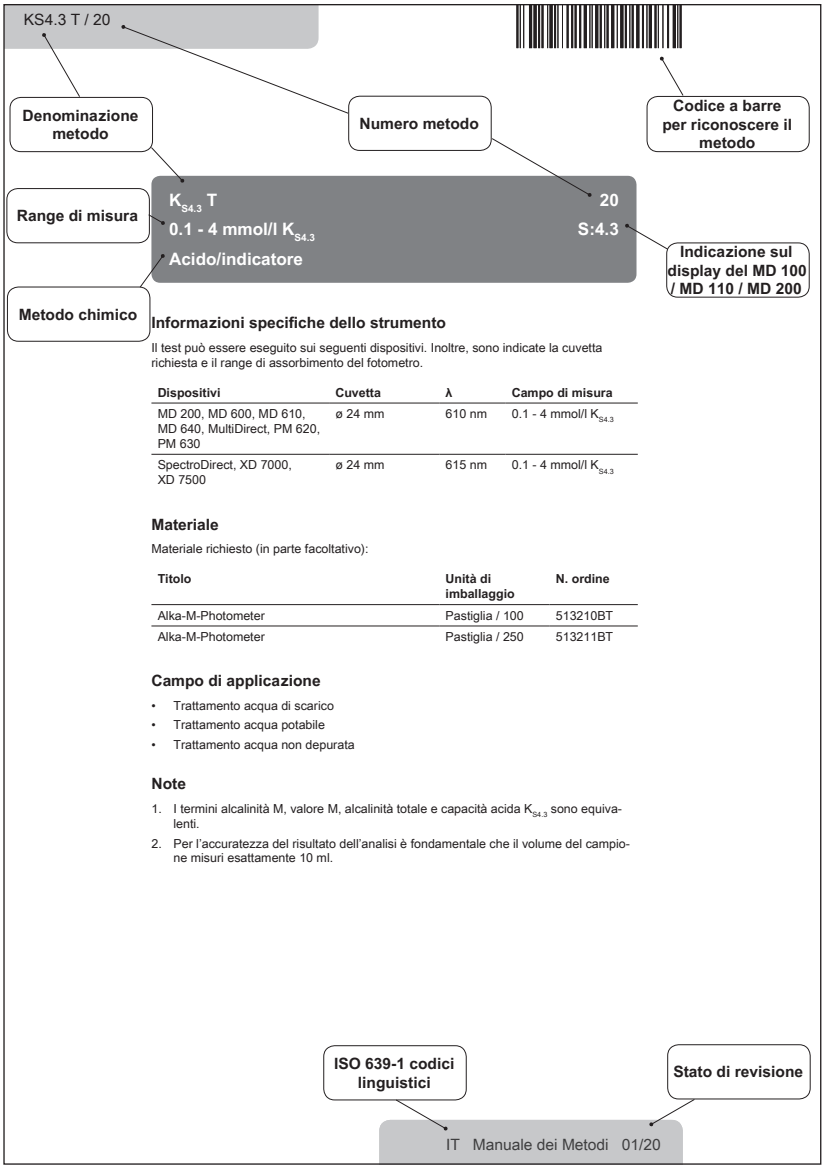
Perturbações causadas por precipitação causadas por dureza de magnésio de mais de 400 mg / l $CaCO_3$ podem ser eliminadas adicionando 5 gotas de solução de sal de Rochelle.

Interferências	a partir de / [mg/L]
Alanine (N)	1
Aluminium (Al)	10
Bromide (Br^-)	100
Bromine (Br_2)	15
Calcium ($CaCO_3$)	1000
Chloride (Cl^-)	18.000
Chlorine Dioxide (ClO_2)	5
Copper (Cu)	10
Dichloramine (Cl_2)	10
Fluoride (F^-)	5
Glycine (N)	1
Iron (II) (Fe^{2+})	10
Iron (III) (Fe^{3+})	10
Lead (Pb)	10
Permanganate	3
Nitrate (N)	100
Nitrite (N)	50

Interferências	a partir de / [mg/L]
Sulfide	0.5
Phosphate (PO_4)	100
Silica (SiO_2)	100
Sulfate (SO_4^{2+})	2600
Sulfite (SO_3^{2-})	50
Ozone	1
Tyrosine (N)	1
Urea (N)	10
Zinc (Zn)	5

Validação de método

Limite de Detecção	0.010 mg/L
Limite de Determinação	0.03 mg/L
Fim da Faixa de Medição	4.5 mg/L
Sensibilidade	1.78 mg/L / Abs
Faixa de Confiança	0.044 mg/L
Desvio Padrão	0.018 mg/L
Coeficiente de Variação	0.78 %



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.

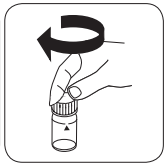
Svolgimento della misurazione

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

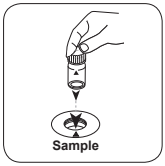
Selezionare il metodo nel dispositivo.

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**.



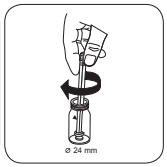
Chiudere la/e cuvetta/e.



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.

Cloramina (M) PP M63

0.02 - 4.5 mg/L NH_2Cl as Cl_2

Indophenole method

IT

Materiale

Materiale richiesto (in parte facoltativo):

Reagenti	Unità di imballaggio	N. ordine
VARIO Monochloramine Set	1 set	535800
VARIO Monochlor F Rgt - 100	Polvere / 100 pz.	531810
VARIO Free Ammonia Reagent Solution - 5 ml	5 mL	531800
VARIO Rochelle soluzione salina, 30 ml [h)]	30 mL	530640

Note

1. Sviluppo del colore completo - temperatura
   I periodi di reazione indicati nel manuale si riferiscono ad una temperatura del campione compresa tra 12° e 14°C. Poiché il periodo di reazione è fortemente influenzato dalla temperatura del campione, è necessario regolare entrambi i periodi di reazione secondo la seguente tabella:

Temperatura del campione		Periodo di reazione in x min
°C	°F	
5	41	10
7	45	9
9	47	8
10	50	8
12	54	7
14	57	7
16	61	6
18	64	5
20	68	5
23	73	2.5
25	77	2
> 25	> 77	2

2. Premere il tasto [Enter] per annullare un periodo di reazione.
3. Tenere il flacone in verticale e premere lentamente.
4. Per determinare la concentrazione di ammoniaca si calcola la differenza tra la mono cloramina (T1) e la somma di mono cloramina e ammoniaca (T2). Se T2 supera il limite dell'intervallo, viene visualizzato il seguente messaggio:
   $N[NH_2Cl] + N[NH_3] > 0.9$ mg/L
   In questo caso il campione deve essere diluito e la misurazione deve essere ripetuta.

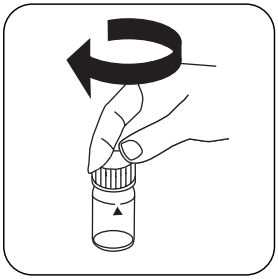
Esecuzione della rilevazione Biossido di cloro, in presenza di cloro con pastiglia

Selezionare il metodo nel dispositivo.

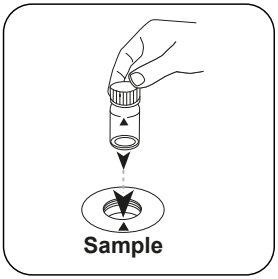
Selezionare inoltre la determinazione: in presenza di Cloro

Per questo metodo, non è necessario eseguire una misurazione ZERO ogni volta sui seguenti dispositivi: in presenza di Cloro

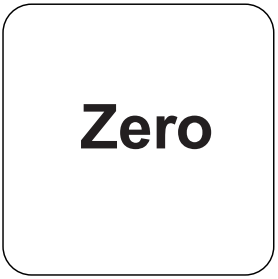
Riempire una cuvetta da 24 mm con **10 mL di campione**.



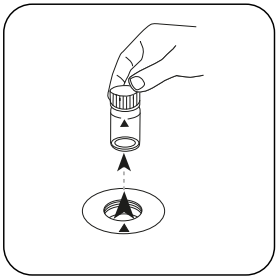
Chiudere la/e cuvetta/e.



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

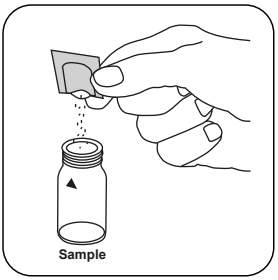


Premere il tasto **ZERO**.

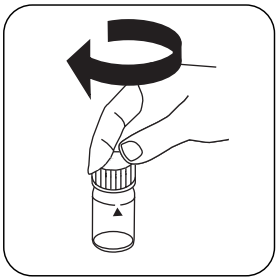


Prelevare la cuvetta dal vano di misurazione.

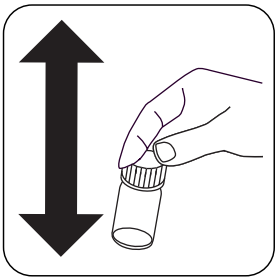
In caso di dispositivi che **non richiedono una misurazione ZERO**, **iniziare da qui**.



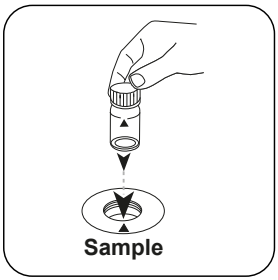
Aggiungere **una bustina di polvere Monochlor FRGT**.



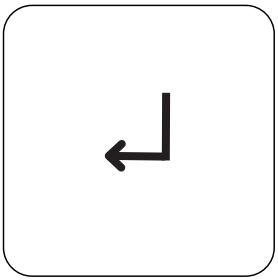
Chiudere la/e cuvetta/e.



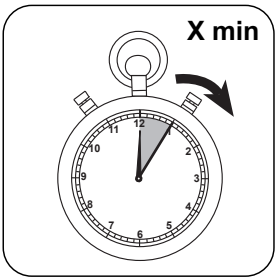
Far sciogliere il contenuto agitando. (20 sec.)



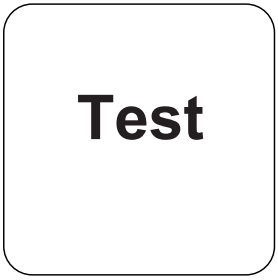
Posizionare la **cuvetta del campione** nel vano di misurazione. Fare attenzione al posizionamento.



Premere il tasto **ENTER**. (XD: avvio del timer)



Tempo di reazione **X min** secondo la tabella. **Attendere il periodo di reazione.**



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

Sul display compare il risultato in mg/L di Monocloramina - Cloro Cl [NH_2Cl].

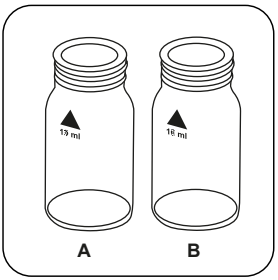
Esecuzione della rilevazione Biossido di cloro, in assenza di cloro con pastiglia

Selezionare il metodo nel dispositivo.

Selezionare inoltre la determinazione: con ammoniaca libera

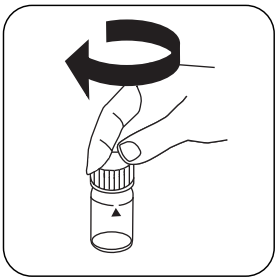
Per questo metodo, non è necessario eseguire una misurazione ZERO ogni volta sui seguenti dispositivi: XD 7000, XD 7500

IT

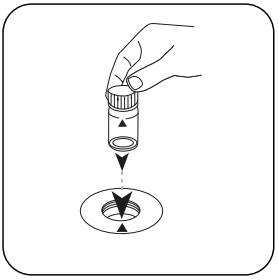


Preparare due cuvette pulite da 24 mm. Contrassegnare una cuvetta come Ammoniaca e l'altra come Cloramina.

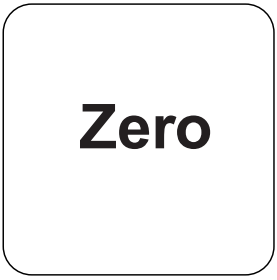
Immettere **10 mL di campione** in ogni cuvetta.



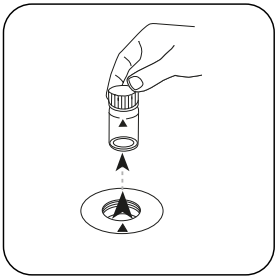
Chiudere la/e cuvetta/e.



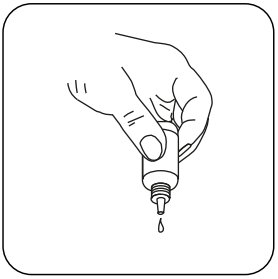
Posizionare la **cuvetta** Ammoniaca nel vano di misurazione. Fare attenzione al posizionamento.



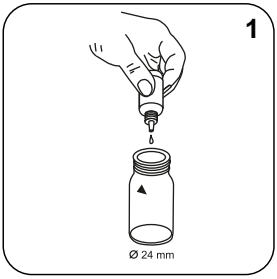
Premere il tasto **ZERO**.



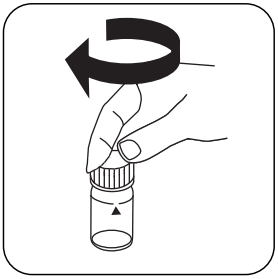
Prelevare la cuvetta dal vano di misurazione.



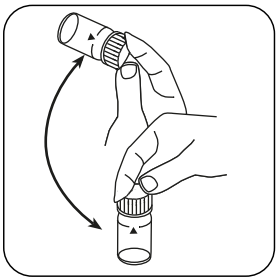
Tenere le boccette contagocce in posizione verticale e introdurre, premendo lentamente, gocce della stessa dimensione nella cuvetta.



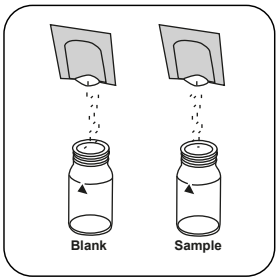
Introdurre **1 gocce di Free Ammonia Reagent Solution** nellacuvetta **Ammoniaca**.



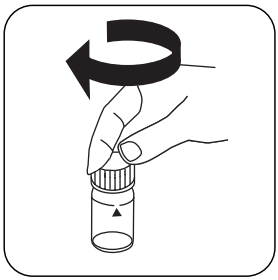
Chiudere la/e cuvetta/e.



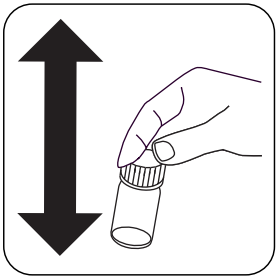
Miscelare il contenuto capovolgendo (approx. 15 sec).



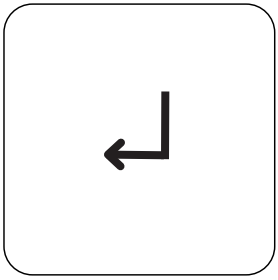
Immettere **contemporaneamente una bustina di polvere Monochlor FRGT** in ogni cuvetta.



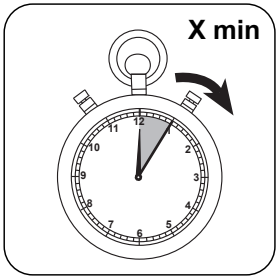
Chiudere la/e cuvetta/e.



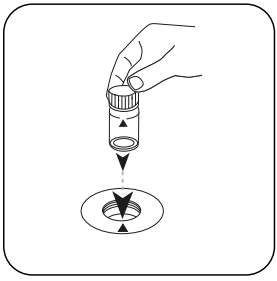
Far sciogliere il contenuto agitando. (20 sec.)



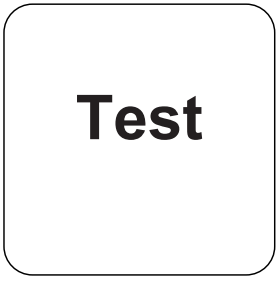
Premere il tasto **ENTER**. (XD: avvio del timer)



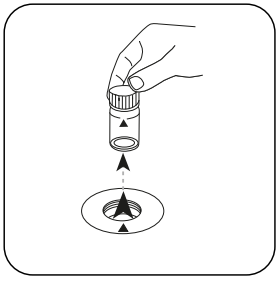
Tempo di reazione **X min** secondo la tabella. **Attendere il periodo di reazione.**



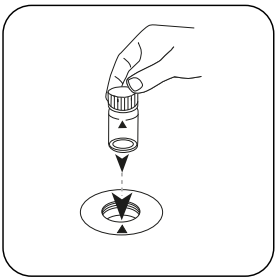
Posizionare la **cuvetta** Cloramina nel vano di misurazione. Fare attenzione al posizionamento.

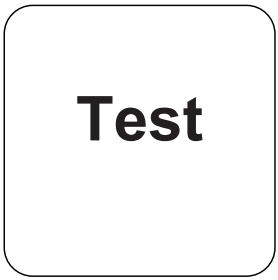


Premere il tasto **TEST** (XD: **START**).



Prelevare la cuvetta dal vano di misurazione.





IT

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

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

Sul display compare il risultato in mg/L di Monocloramina - Cloro Cl [NH_2Cl] e mg/l di Ammoniaca libera - Azoto N [NH_3].

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	Cl_2	1
mg/l	NH_2Cl	0.72598
mg/l	$N[NH_2Cl]$	0.19754
mg/l	NH_3	0.24019

Metodo chimico

Indophenole method

Interferenze

Interferenze escludibili

I disturbi causati dalle precipitazioni causate da una durezza del magnesio superiore a 400 mg / l $CaCO_3$ possono essere eliminati aggiungendo 5 gocce di soluzione di sale di Rochelle.

Interferenze	da / [mg/L]
Alanine (N)	1
Aluminium (Al)	10
Bromide (Br^-)	100
Bromine (Br_2)	15
Calcium ($CaCO_3$)	1000
Chloride (Cl^-)	18.000
Chlorine Dioxide (ClO_2)	5
Copper (Cu)	10
Dichloramine (Cl_2)	10
Fluoride (F^-)	5
Free Chloride (Cl_2)	10
Glycine (N)	1
Iron (II) (Fe^{2+})	10
Iro (III) (Fe^{3+})	10
Lead (Pb)	10
Permanganate	3
Nitrate (N)	100

Interferenze	da / [mg/L]
Nitrite (N)	50
Sulfide	0.5
Phosphate (PO_4)	100
Silica (SiO_2)	100
Sulfate (SO_4^{2+})	2600
Sulfite (SO_3^{2-})	50
Ozone	1
Tyrosine (N)	1
Urea (N)	10
Zinc (Zn)	5

Validazione metodo

Limite di rilevabilità	0.010 mg/L
Limite di quantificazione	0.03 mg/L
Estremità campo di misura	4.5 mg/L
Sensibilità	1.78 mg/L / Abs
Intervallo di confidenza	0.044 mg/L
Deviazione standard della procedura	0.018 mg/L
Coefficiente di variazione della procedura	0.78 %

Cloro (libero) e monocloramina M64

0.02 - 4.50 mg/L Cl_2 CL2

Indophenole method

IT

Materiale

Materiale richiesto (in parte facoltativo):

Reagenti	Unità di imballaggio	N. ordine
VARIO Free Chlorine Reagent Solution - 30 ml	30 mL	531820
VARIO Monochlor F Rgt - 100	Polvere / 100 pz.	531810
VARIO Rochelle soluzione salina, 30 ml [h)]	30 mL	530640

Note

1. Sviluppo del colore completo - temperatura
   I periodi di reazione indicati nel manuale si riferiscono ad una temperatura del campione compresa tra 12° e 14°C. Poiché il periodo di reazione è fortemente influenzato dalla temperatura del campione, è necessario regolare entrambi i periodi di reazione secondo la seguente tabella:

Temperatura del campione		Periodo di reazione in x min
°C	°F	
5	41	10
7	45	9
9	47	8
10	50	8
12	54	7
14	57	7
16	61	6
18	64	5
20	68	5
23	73	2.5
25	77	2
> 25	> 77	2

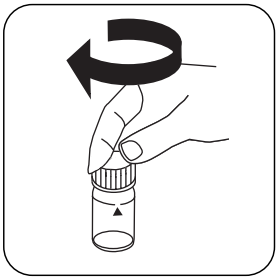
2. Premere il tasto [Enter] per annullare un periodo di reazione.
3. Tenere il flacone in verticale e premere lentamente.
4. Per determinare la concentrazione di cloro si calcola la differenza tra la monocloramina e la somma di monocloramina e cloro. Se un valore misurato supera il limite dell'intervallo, viene visualizzato il seguente messaggio:
   $Cl_2[NH_2Cl] + Cl_2 > 4.5$ mg/L
   In questo caso il campione deve essere diluito e la misurazione deve essere ripetuta.

Esecuzione della rilevazione Biossido di cloro, in presenza di cloro con pastiglia

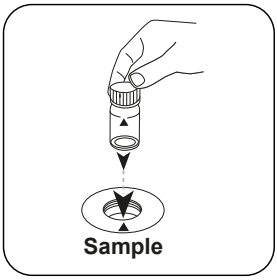
Selezionare il metodo nel dispositivo.

Selezionare inoltre la determinazione: in presenza di Cloro

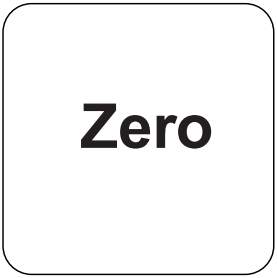
Riempire una cuvetta da 24 mm con **10 mL di campione**.



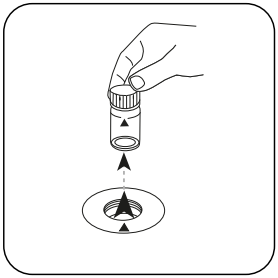
Chiudere la/e cuvetta/e.



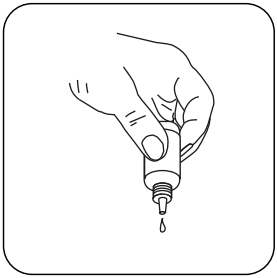
Posizionare la **cuvetta del campione** nel vano di misurazione. Fare attenzione al posizionamento.



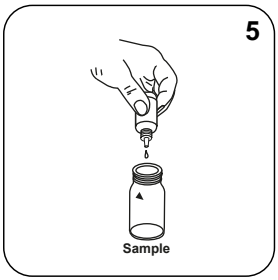
Premere il tasto **ZERO**.



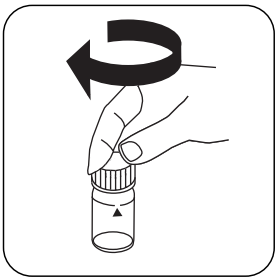
Prelevare la cuvetta dal vano di misurazione.



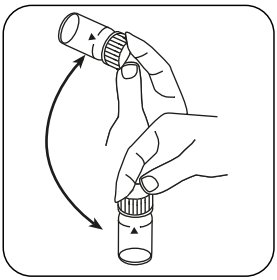
Tenere le boccette contagocce in posizione verticale e introdurre, premendo lentamente, gocce della stessa dimensione nella cuvetta.



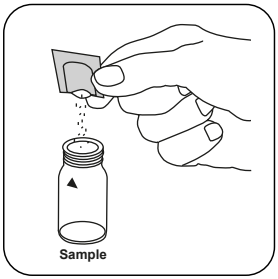
Introdurre **5 gocce di Free Chlorine Reagent Solution** nella cuvetta del campione.



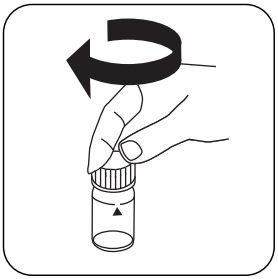
Chiudere la/e cuvetta/e.



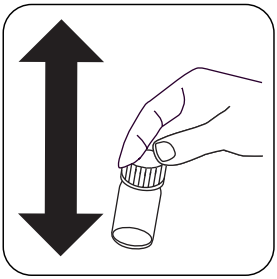
Miscelare il contenuto capovolgendo (15 sec.).



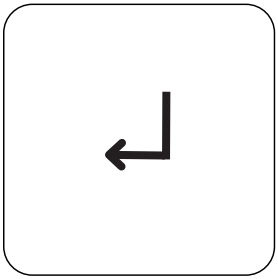
Aggiungere **una bustina di polvere Monochlor FRGT**.



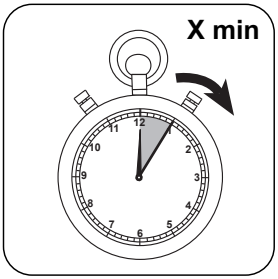
Chiudere la/e cuvetta/e.



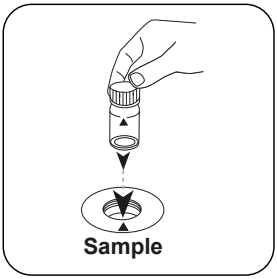
Far sciogliere il contenuto agitando. (20 sec.)



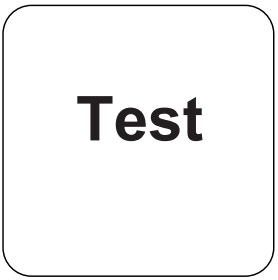
Premere il tasto **ENTER**. (XD: avvio del timer)



Tempo di reazione **X min** secondo la tabella. **Attendere il periodo di reazione.**



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



IT

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

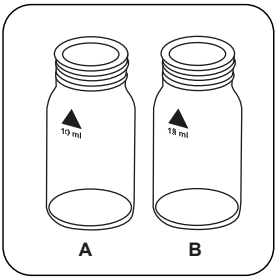
Sul display compare il risultato in mg/L di cloro libero.

Esecuzione della rilevazione cloro libero e monocloramina

Selezionare il metodo nel dispositivo.

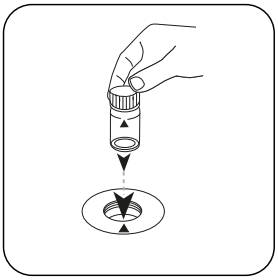
Selezionare inoltre la determinazione: Cloro libero

Per questo metodo, non è necessario eseguire una misurazione ZERO ogni volta sui seguenti dispositivi: senza Cloro

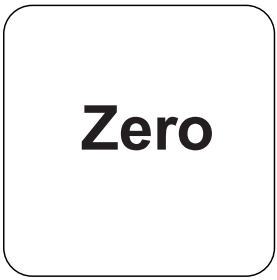


Preparare due cuvette pulite da 24 mm. Contrassegnare una cuvetta come Cloramina e l'altra come Cloro.

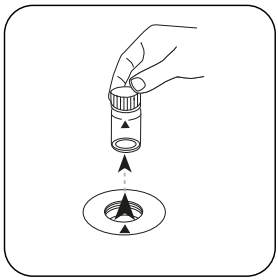
Immettere **10 mL di campione** in ogni cuvetta.



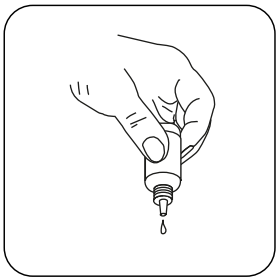
Posizionare la **cuvetta** Cloro nel vano di misurazione. Fare attenzione al posizionamento.



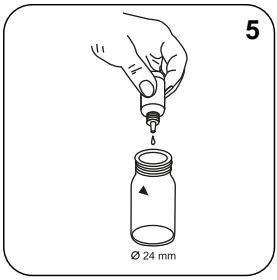
Premere il tasto **ZERO**.



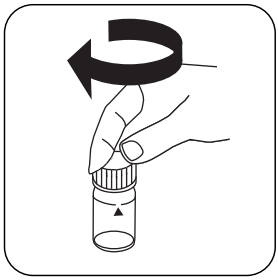
Prelevare la cuvetta dal vano di misurazione.



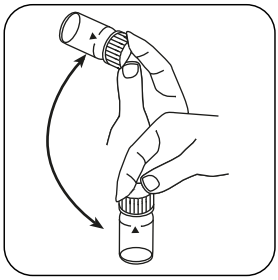
Tenere le boccette contagocce in posizione verticale e introdurre, premendo lentamente, gocce della stessa dimensione nella cuvetta.



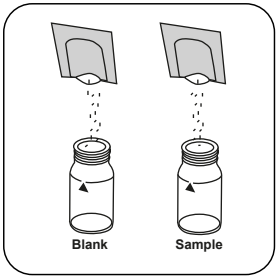
Introdurre **5 gocce di Free Chlorine Reagent Solution** nellacuvetta **Cloro**.



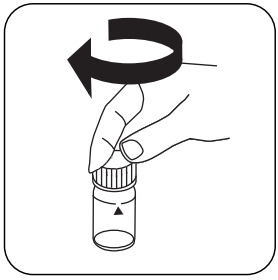
Chiudere la/e cuvetta/e.



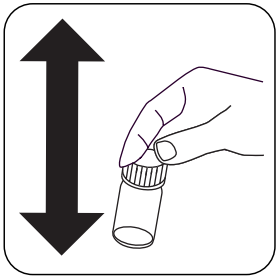
Miscelare il contenuto capovolgendo (ca. 15 sec).



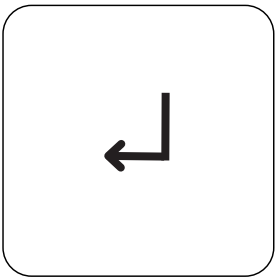
Immettere **contemporaneamente una bustina di polvere Monochlor FRGT** in ogni cuvetta.



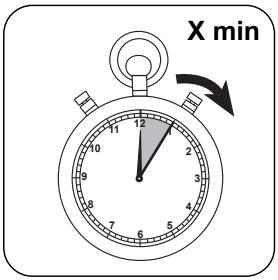
Chiudere la/e cuvetta/e.



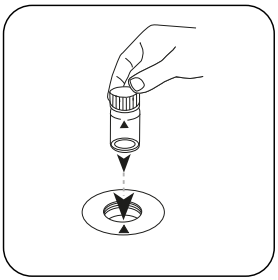
Far sciogliere il contenuto agitando. (20 sec.)



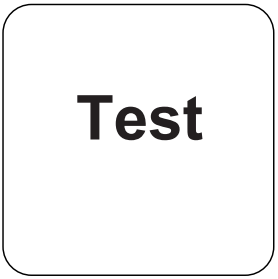
Premere il tasto **ENTER**. (XD: avvio del timer)



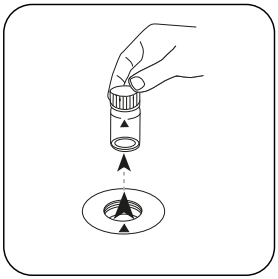
Tempo di reazione **X min** secondo la tabella. **Attendere il periodo di reazione.**



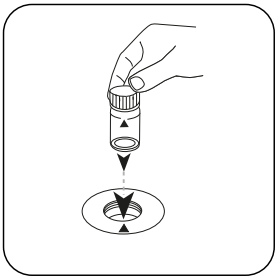
Posizionare la **cuvetta** Cloramina nel vano di misurazione. Fare attenzione al posizionamento.



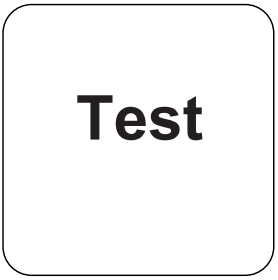
Premere il tasto **TEST** (XD: **START**).



Prelevare la cuvetta dal vano di misurazione.



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



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

Sul display compare il risultato in mg/L di Cloro e mg/l Monocloramina - Cloro Cl [NH_2Cl].

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	Cl_2	1
mg/l	NH_2Cl	0.72598
mg/l	$N[NH_2Cl]$	0.19754
mg/l	NH_3	0.24019

Metodo chimico

Indophenole method

Interferenze

Interferenze escludibili

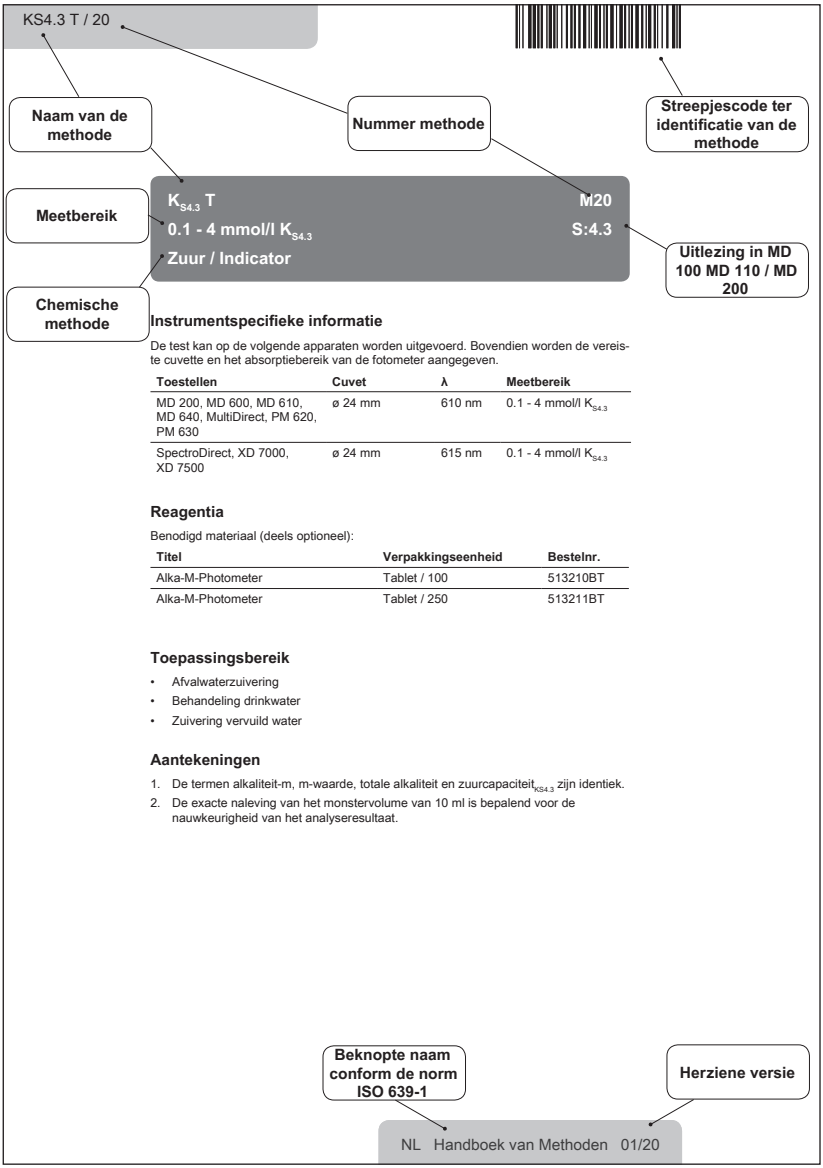
I disturbi causati dalle precipitazioni causate da una durezza del magnesio superiore a 400 mg / l $CaCO_3$ possono essere eliminati aggiungendo 5 gocce di soluzione di sale di Rochelle.

Interferenze	da / [mg/L]
Alanine (N)	1
Aluminium (Al)	10
Bromide (Br^-)	100
Bromine (Br_2)	15
Calcium ($CaCO_3$)	1000
Chloride (Cl^-)	18.000
Chlorine Dioxide (ClO_2)	5
Copper (Cu)	10
Dichloramine (Cl_2)	10
Fluoride (F^-)	5
Glycine (N)	1
Iron (II) (Fe^{2+})	10
Iron (III) (Fe^{3+})	10
Lead (Pb)	10
Permanganate	3
Nitrate (N)	100
Nitrite (N)	50

Interferenze	da / [mg/L]
Sulfide	0.5
Phosphate (PO_4)	100
Silica (SiO_2)	100
Sulfate (SO_4^{2+})	2600
Sulfite (SO_3^{2-})	50
Ozone	1
Tyrosine (N)	1
Urea (N)	10
Zinc (Zn)	5

Validazione metodo

Limite di rilevabilità	0.010 mg/L
Limite di quantificazione	0.03 mg/L
Estremità campo di misura	4.5 mg/L
Sensibilità	1.78 mg/L / Abs
Intervallo di confidenza	0.044 mg/L
Deviazione standard della procedura	0.018 mg/L
Coefficiente di variazione della procedura	0.78 %


KS4.3 T / 20
Naam van de methode
Nummer methode
Streepjescode ter identificatie van de methode
Meetbereik
Chemische methode
Uitlezing in MD 100 MD 110 / MD 200
$K_{S4.3}$ T
M20
0.1 - 4 mmol/l $K_{S4.3}$
S:4.3
Zuur / Indicator
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.
Beknopte naam conform de norm ISO 639-1
Herziene versie
NL Handboek van Methoden 01/20

Uitvoering van de meting

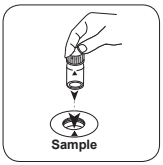
Uitvoering van de bepaling Zuurcapaciteit $K_{S4.3}$ met tablet

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.

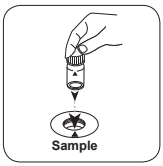
De spoelbakjes afsluiten.



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 $K_{S4.3}$.

Chloramine (M) PP M63

0.02 - 4.5 mg/L NH_2Cl as Cl_2

Indophenole method

NL

Reagentia

Benodigd materiaal (deels optioneel):

Reagentia	Verpakkingseenheid	Bestelnr.
VARIO Monochloramine Set	1 Zin	535800
VARIO Monochlor F Rgt - 100	Poeder / 100 St.	531810
VARIO Free Ammonia Reagent Solution - 5 ml	5 mL	531800
VARIO Rochelle zoutoplossing, 30 ml [h)]	30 mL	530640

Aantekeningen

1. Volledige kleurontwikkeling - temperatuur
   De in de handleiding aangegeven reactietijden hebben betrekking op een monstertemperatuur tussen 12° en 14°C. Omdat de reactietijd sterk wordt beïnvloed door de temperatuur van het monster, moet u beide reactietijden volgens de volgende tabel aanpassen:

Temperatuur van het monster		Reactietijd in x min
°C	°F	
5	41	10
7	45	9
9	47	8
10	50	8
12	54	7
14	57	7
16	61	6
18	64	5
20	68	5
23	73	2.5
25	77	2
> 25	> 77	2

2. Druk op [Enter] om een reactieperiode te annuleren.
3. Houd de fles verticaal en knijp langzaam.
4. Om de ammoniakconcentratie te bepalen wordt het verschil tussen monochlooramine (T1) en de som van monochlooramine en ammoniak (T2) berekend. Als T2 de grenswaarde van het bereik overschrijdt, wordt de volgende melding weergegeven:
   $N[NH_2Cl] + N[NH_3] > 0{,}9$ mg/L
   In dit geval moet het monster worden verdund en de meting worden herhaald.

Uitvoering van de bepaling Chloramine, zonder vrij ammonium

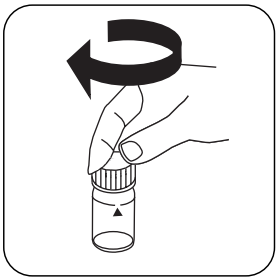
De methode in het apparaat selecteren.

Selecteer bovendien de bepaling: zonder ammonium

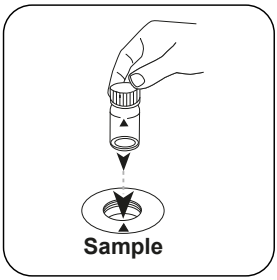
Voor deze methode hoeft niet elke keer een nulmeting uitgevoerd te worden op de volgende apparaten: zonder ammonium

NL

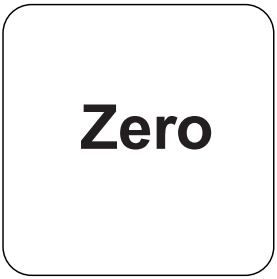
Spoelbakje van 24 mm met **10 mL staal** vullen.



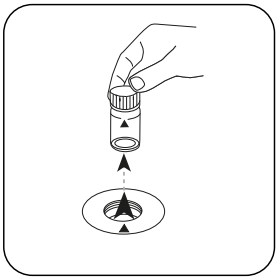
De spoelbakjes afsluiten.



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

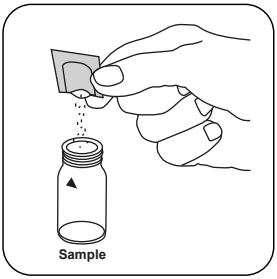


De toets **NUL** indrukken.

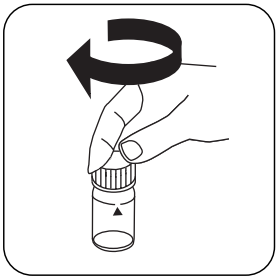


Het spoelbakje uit de meetschacht nemen.

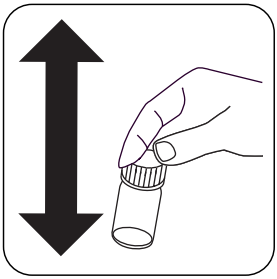
Bij apparaten die **geen nulmeting** vereisen, **hier beginnen**.



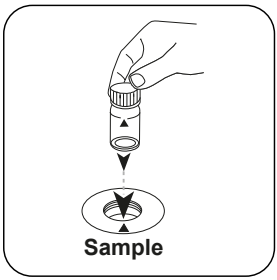
Een **Monochlor FRGT poederpakje** toevoegen.



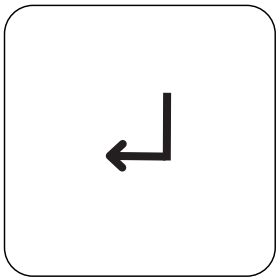
De spoelbakjes afsluiten.



De inhoud oplossen door te schudden. (20 sec.)

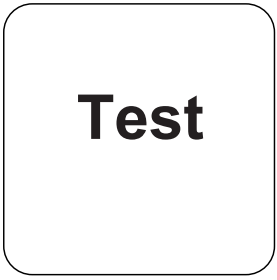


Het **staalspoelbakje** in de meetschacht plaatsen. Op de positionering letten.



De toets **ENTER** indrukken. (XD: Start timer)

Reactietijd **X min** volgens tabel. **Wacht de reactieperiode af.**



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

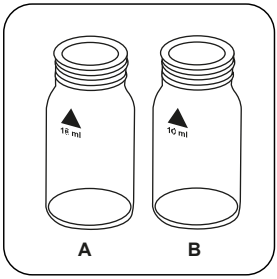
De display toont het resultaat in mg/L Monochlooramine - Chloor Cl [NH_2Cl].

Uitvoering van de bepaling Chloramine, in afwezigheid van vrij ammonium, met poederpakje

De methode in het apparaat selecteren.

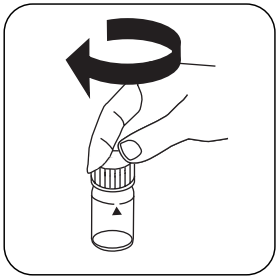
Selecteer bovendien de bepaling: met vrij ammonium

Voor deze methode hoeft niet elke keer een nulmeting uitgevoerd te worden op de volgende apparaten: XD 7000, XD 7500



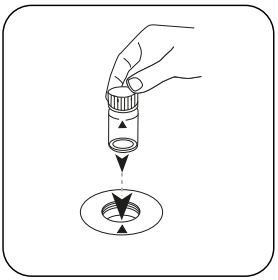
Twee propere spoelbakjes van 24 mm klaarzetten. Markeer één als Ammoniak en de andere als Chlooramine spoelbakje.

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

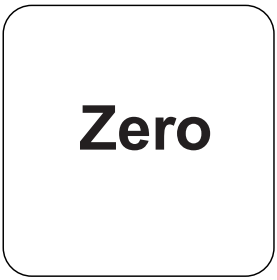


De spoelbakjes afsluiten.

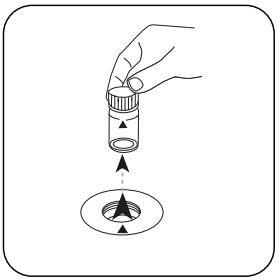
NL



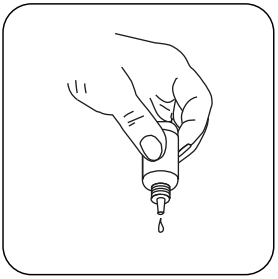
Het Ammoniak cuvetin de meetschacht plaatsen. Op de positionering letten.



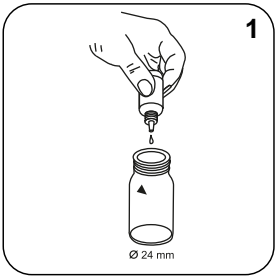
De toets **NUL** indrukken.



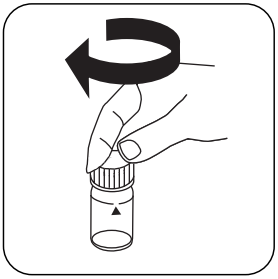
Het spoelbakje uit de meetschacht nemen.



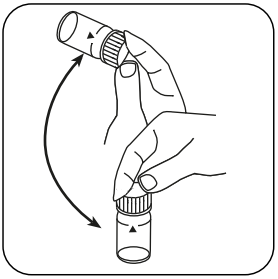
De druppelflessen verticaal houden en even grote druppels toevoegen door langzaam te drukken.



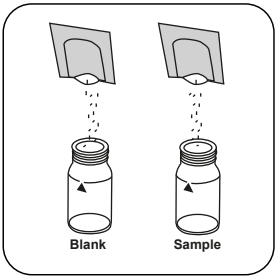
1 druppels Free Ammonia Reagent Solution in het **Ammoniak** staalspoelbakje doen.



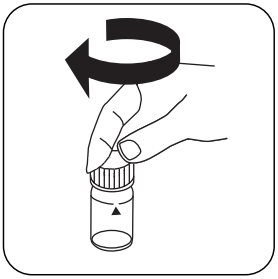
De spoelbakjes afsluiten.



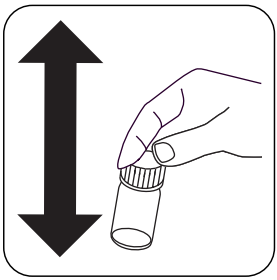
De inhoud mengen door om te draaien (approx. 15 sec).



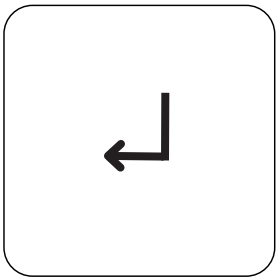
In elk spoelbakje **een Monochlor FRGT poederpakje** tezelfdertijd doen.



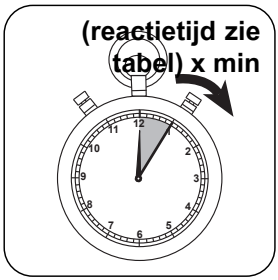
De spoelbakjes afsluiten.



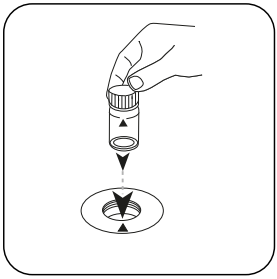
De inhoud oplossen door te schudden. (20 sec.)



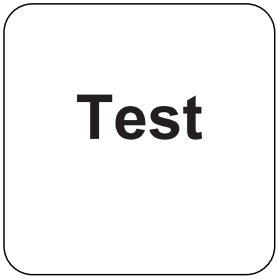
De toets **ENTER** indrukken. (XD: Start timer)



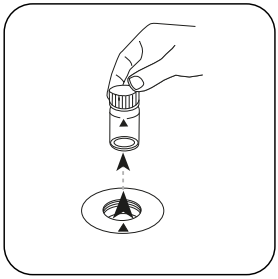
Reactietijd **X min** volgens tabel. **Wacht de reactieperiode af.**



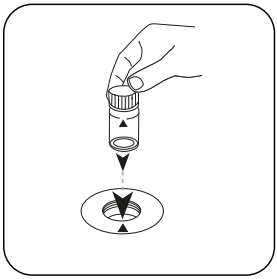
Het Chlooramine cuvetin de meetschacht plaatsen. Op de positionering letten.



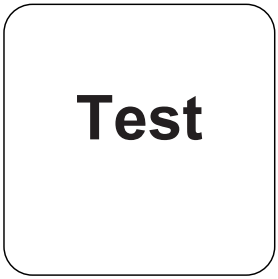
De toets **TEST** (XD: **START**) indrukken.



Het spoelbakje uit de meetschacht nemen.



Het Ammonia cuvetin de meetschacht plaatsen. Op de positionering letten.



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

De display toont het resultaat in mg/L Monochlooramine - Chloor Cl [NH_2Cl] en mg/l vrij Ammoniak - Stikstof N [NH_3].

Evaluatie

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

Eenheid	Dagvaardingsformulier	Omrekeningsfactor
mg/l	Cl_2	1
mg/l	NH_2Cl	0.72598
mg/l	$N[NH_2Cl]$	0.19754
mg/l	NH_3	0.24019

Chemische methode

Indophenole method

Verstoringen

Uit te sluiten verstoringen

Storingen veroorzaakt door neerslag veroorzaakt door magnesiumhardheid van meer dan 400 mg / l $CaCO_3$ kunnen worden geëlimineerd door 5 druppels Rochelle-zoutoplossing toe te voegen.

Verstoringen	verstoort vanaf
Alanine (N)	1
Aluminium (Al)	10
Bromide (Br^-)	100
Bromine (Br_2)	15
Calcium ($CaCO_3$)	1000
Chloride (Cl^-)	18.000
Chlorine Dioxide (ClO_2)	5
Copper (Cu)	10
Dichloramine (Cl_2)	10
Fluoride (F^-)	5
Free Chloride (Cl_2)	10
Glycine (N)	1
Iron (II) (Fe^{2+})	10
Iro (III) (Fe^{3+})	10
Lead (Pb)	10
Permanganate	3
Nitrate (N)	100

Verstoringen	verstoort vanaf
Nitrite (N)	50
Sulfide	0.5
Phosphate (PO_4)	100
Silica (SiO_2)	100
Sulfate (SO_4^{2+})	2600
Sulfite (SO_3^{2-})	50
Ozone	1
Tyrosine (N)	1
Urea (N)	10
Zinc (Zn)	5

Validatie van de methodes

Aantoonbaarheidsgrens	0.010 mg/L
Bepaalbaarheidsgrens	0.03 mg/L
Einde meetbereik	4.5 mg/L
Gevoeligheid	1.78 mg/L / Abs
Betrouwbaarheidsgrenzen	0.044 mg/L
Standaardafwijking procedure	0.018 mg/L
Variatiecoefficient procedure	0.78 %

Chloor (vrij) en monochlooramine M64

0.02 - 4.50 mg/L Cl_2 CL2

Indophenole method

NL

Reagentia

Benodigd materiaal (deels optioneel):

Reagentia	Verpakkingseenheid	Bestelnr.
VARIO Free Chlorine Reagent Solution - 30 ml	30 mL	531820
VARIO Monochlor F Rgt - 100	Poeder / 100 St.	531810
VARIO Rochelle zoutoplossing, 30 ml [h)]	30 mL	530640

Aantekeningen

1. Volledige kleurontwikkeling - temperatuur
   De in de handleiding aangegeven reactietijden hebben betrekking op een monstertemperatuur tussen 12° en 14°C. Omdat de reactietijd sterk wordt beïnvloed door de temperatuur van het monster, moet u beide reactietijden volgens de volgende tabel aanpassen:

Temperatuur van het monster		Reactietijd in x min
in °C	in °F	
5	41	10
7	45	9
9	47	8
10	50	8
12	54	7
14	57	7
16	61	6
18	64	5
20	68	5
23	73	2.5
25	77	2
> 25	> 77	2

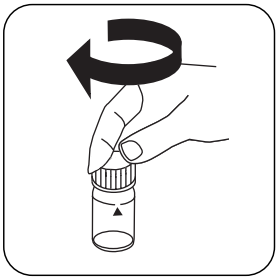
2. Druk op [Enter] om een reactieperiode te annuleren.
3. Houd de fles verticaal en knijp langzaam.
4. Om de chloorconcentratie te bepalen wordt het verschil tussen de monochlooramine en de som van monochlooramine en chloor berekend. Als een gemeten waarde de grenswaarde van het bereik overschrijdt, wordt de volgende melding weergegeven:
   $Cl_2[NH_2Cl] + Cl_2 > 4,5$ mg/L
   In dit geval moet het monster worden verdund en de meting worden herhaald.

Uitvoering van de bepaling Free Chlorine in absence of Monochloramine

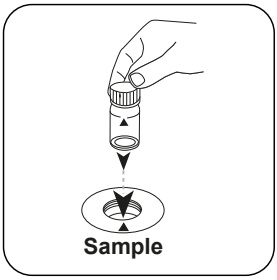
De methode in het apparaat selecteren.

Selecteer bovendien de bepaling: free Chlorine in absence of Monochloramine

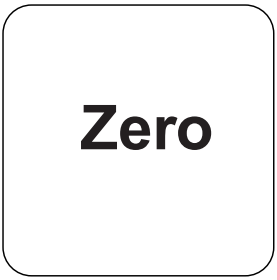
Spoelbakje van 24 mm met **10 mL staal** vullen.



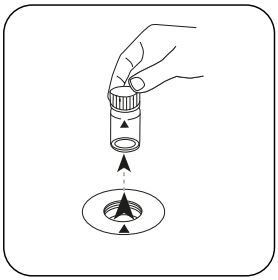
De spoelbakjes afsluiten.



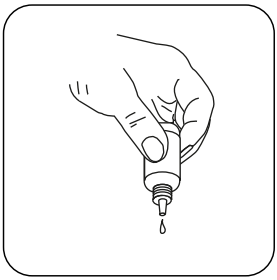
Het **staalspoelbakje** in de meetschacht plaatsen. Op de positionering letten.



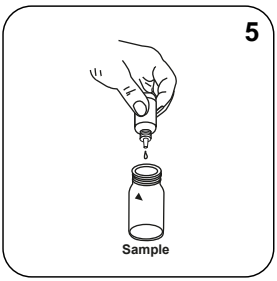
De toets **NUL** indrukken.



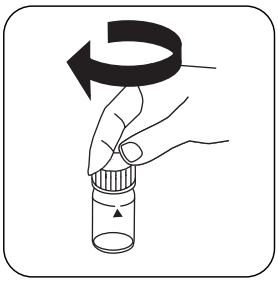
Het spoelbakje uit de meetschacht nemen.



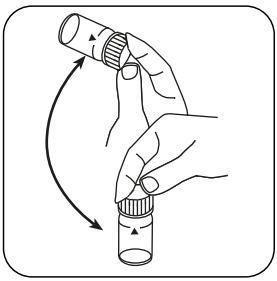
De druppelflessen verticaal houden en even grote druppels toevoegen door langzaam te drukken.



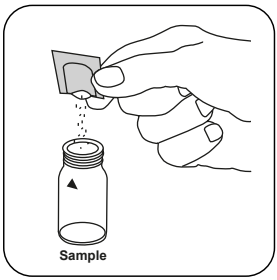
5 druppels Free Chlorine Reagent Solution in het staalspoelbakje doen.



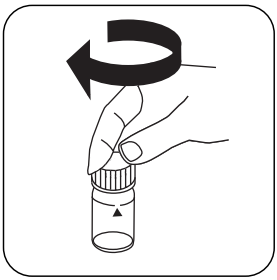
De spoelbakjes afsluiten.



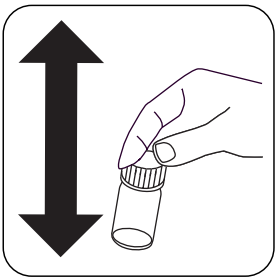
De inhoud mengen door om te draaien (15 sec.).



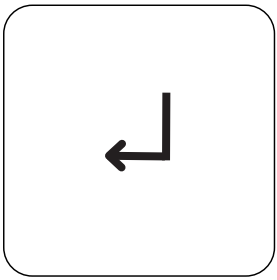
Een **Monochlor FRGT poederpakje** toevoegen.



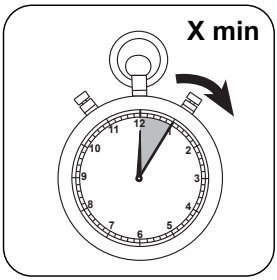
De spoelbakjes afsluiten.



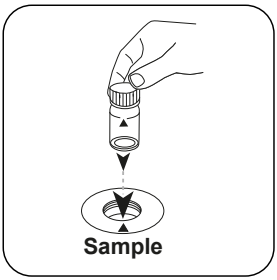
De inhoud oplossen door te schudden. (20 sec.)



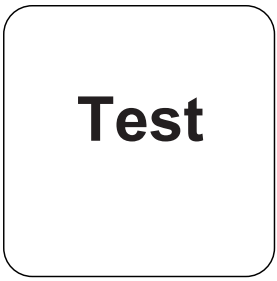
De toets **ENTER** indrukken. (XD: Start timer)



Reactietijd **X min** volgens tabel. **Wacht de reactieperiode af.**



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



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

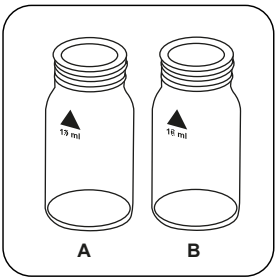
De display toont het resultaat in mg/L vrij chloor.

Uitvoering van de bepaling vrij chloor en monochlooramine

De methode in het apparaat selecteren.

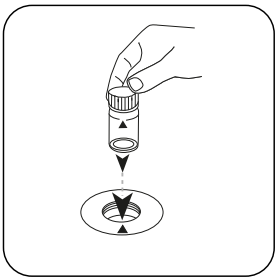
Selecteer bovendien de bepaling: Vrije chloor

Voor deze methode hoeft niet elke keer een nulmeting uitgevoerd te worden op de volgende apparaten: XD 7000, XD 7500

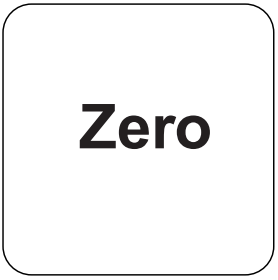


Twee propere spoelbakjes van 24 mm klaarzetten. Markeer één als Chlooramine en de andere als Chloor spoelbakje.

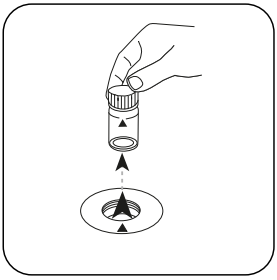
In elk spoelbakje **10 mL staal** doen.



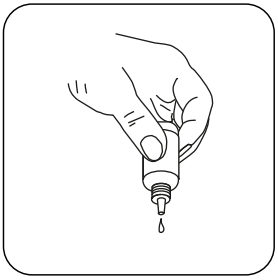
Het Chloor cuvetin de meetschacht plaatsen. Op de positionering letten.



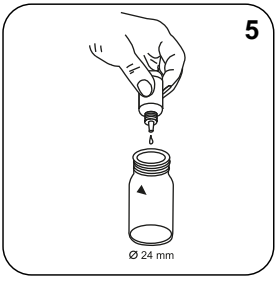
De toets **NUL** indrukken.



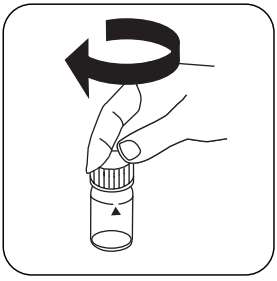
Het spoelbakje uit de meetschacht nemen.



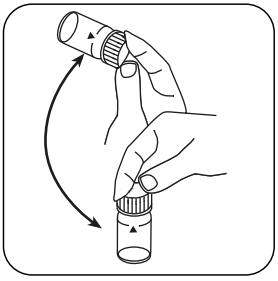
De druppelflessen verticaal houden en even grote druppels toevoegen door langzaam te drukken.



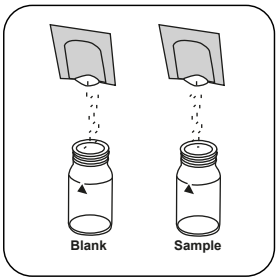
5 druppels Free Chlorine Reagent Solution in het **Chloor** staalspoelbakje doen.



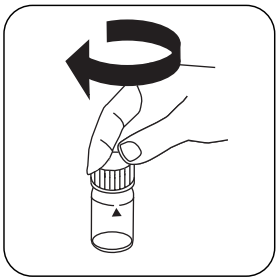
De spoelbakjes afsluiten.



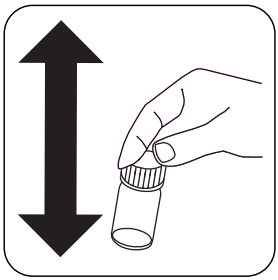
De inhoud mengen door om te draaien (ca. 15 sec).



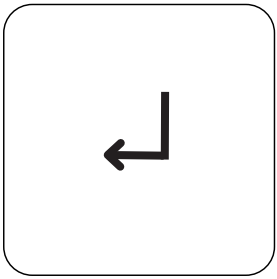
In elk spoelbakje **een Monochlor FRGT poederpakje** tezelfdertijd doen.



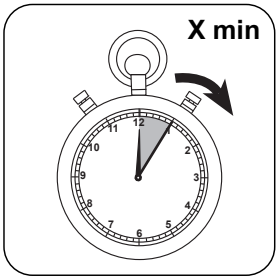
De spoelbakjes afsluiten.



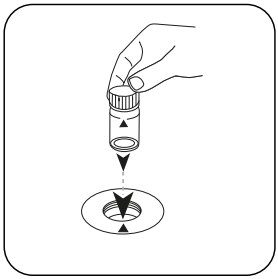
De inhoud oplossen door te schudden. (20 sec.)



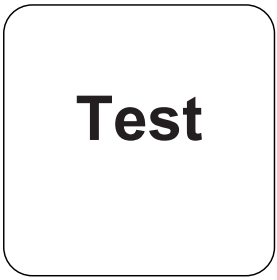
De toets **ENTER** indrukken. (XD: Start timer)



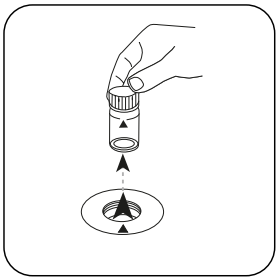
Reactietijd **X min** volgens tabel. **Wacht de reactieperiode af.**



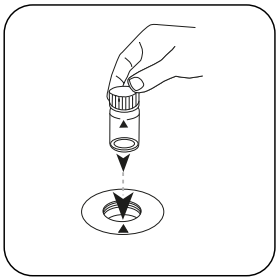
Het Chlooramine cuvetin de meetschacht plaatsen. Op de positionering letten.



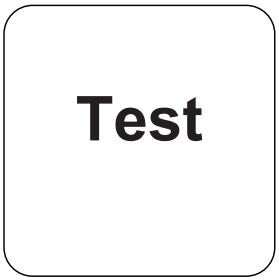
De toets **TEST** (XD: **START**) indrukken.



Het spoelbakje uit de meetschacht nemen.



Het Chloor cuvetin de meetschacht plaatsen. Op de positionering letten.



NL

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

De display toont het resultaat in mg/L Chloor en mg/l Monochlooramine - Chloor Cl [NH_2Cl].

Evaluatie

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

Eenheid	Dagvaardingsformulier	Omrekeningsfactor
mg/l	Cl_2	1
mg/l	NH_2Cl	0.72598
mg/l	$N[NH_2Cl]$	0.19754
mg/l	NH_3	0.24019

Chemische methode

Indophenole method

Verstoringen

Uit te sluiten verstoringen

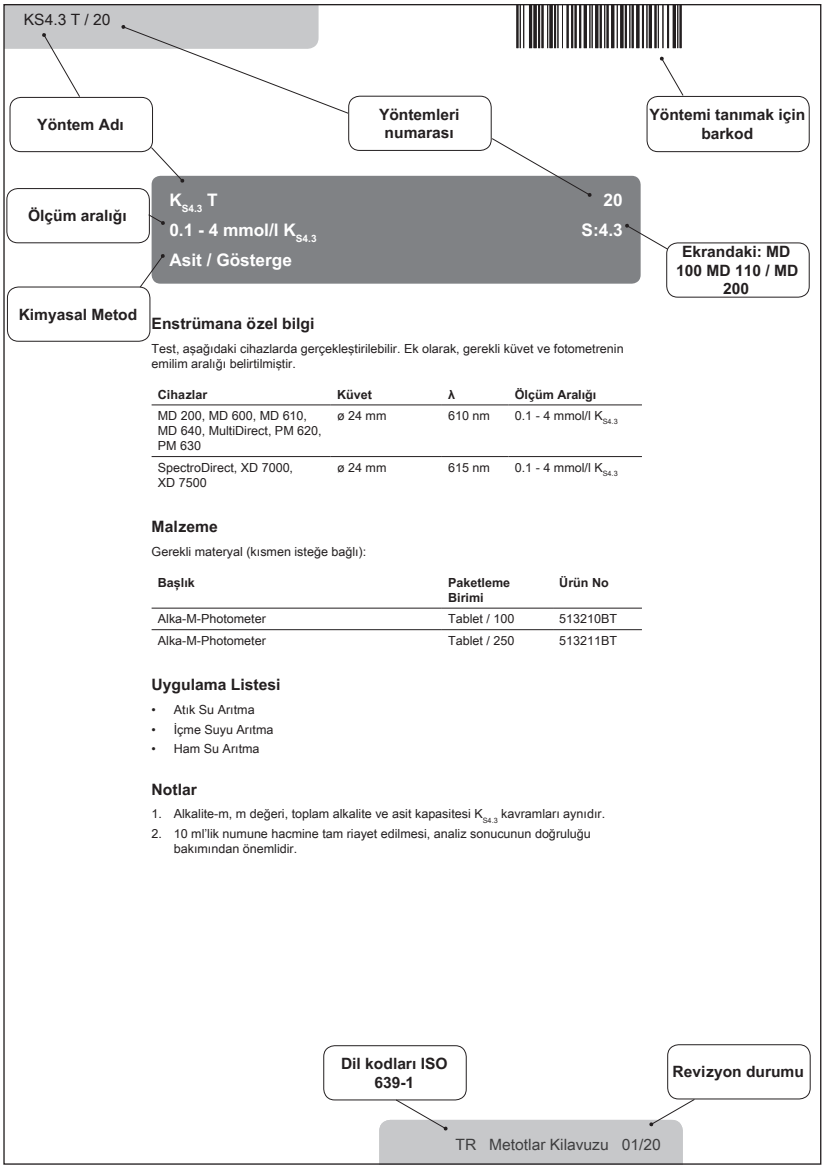
Storingen veroorzaakt door neerslag veroorzaakt door magnesiumhardheid van meer dan 400 mg / l CaCO3 kunnen worden geëlimineerd door 5 druppels Rochelle-zoutoplossing toe te voegen.

Verstoringen	verstoort vanaf
Alanine (N)	1
Aluminium (Al)	10
Bromide (Br^-)	100
Bromine (Br_2)	15
Calcium ($CaCO_3$)	1000
Chloride (Cl^-)	18.000
Chlorine Dioxide (ClO_2)	5
Copper (Cu)	10
Dichloramine (Cl_2)	10
Fluoride (F^-)	5
Glycine (N)	1
Iron (II) (Fe^{2+})	10
Iron (III) (Fe^{3+})	10
Lead (Pb)	10
Permanganate	3
Nitrate (N)	100
Nitrite (N)	50

Verstoringen	verstoort vanaf
Sulfide	0.5
Phosphate (PO_4)	100
Silica (SiO_2)	100
Sulfate (SO_4^{2+})	2600
Sulfite (SO_3^{2-})	50
Ozone	1
Tyrosine (N)	1
Urea (N)	10
Zinc (Zn)	5

Validatie van de methodes

Aantoonbaarheidsgrens	0.010 mg/L
Bepaalbaarheidsgrens	0.03 mg/L
Einde meetbereik	4.5 mg/L
Gevoeligheid	1.78 mg/L / Abs
Betrouwbaarheidsgrenzen	0.044 mg/L
Standaardafwijking procedure	0.018 mg/L
Variatiecoefficient procedure	0.78 %



Enstrümana özel bilgi

Test, aşağıdaki cihazlarda gerçekleştirilebilir. Ek olarak, gerekli küvet ve fotometrenin emilim aralığı belirtilmiştir.

Cihazlar	Küvet	λ	Ölçüm Aralığı
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 $K_{S4.3}$

Malzeme

Gerekli materyal (kısmen isteğe bağlı):

Başlık	Paketleme Birimi	Ürün No
Alka-M-Photometer	Tablet / 100	513210BT
Alka-M-Photometer	Tablet / 250	513211BT

Uygulama Listesi

- Atık Su Arıtma
- İçme Suyu Arıtma
- Ham Su Arıtma

Notlar

1. Alkalite-m, m değeri, toplam alkalite ve asit kapasitesi $K_{S4.3}$ kavramları aynıdır.
2. 10 ml'lik numune hacmine tam riayet edilmesi, analiz sonucunun doğruluğu bakımından önemlidir.

Testin uygulanması

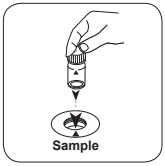
Tespitin uygulanması Tabletli asit kapasitesi $K_{S4.3}$

Cihazda metot seçin.

Bu metot için şu cihazlarda ZERO ölçümü yapılması gerekmez: XD 7000, XD 7500

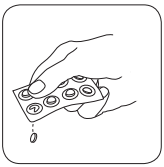
24 mm'lik küveti **10 ml numune** ile doldurun.

Küveti(küvetleri) kapatın.

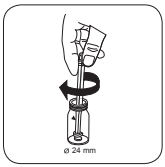


Numune küvetini ölçüm haznesine koyun. Doğru konumlandırılmasına dikkat edin.

• • •



ALKA-M-PHOTOMETER tablet ilave edin.



Tableti(tabletleri) hafifçe döndürerek ezin.

Küveti(küvetleri) kapatın.

TR Metotlar Kilavuzu 01/20

Kloramin (M) PP M63

0.02 - 4.5 mg/L NH_2Cl as Cl_2

Indophenole method

TR

Malzeme

Gerekli materyal (kısmen isteğe bağlı):

Ayıraçlar	Paketleme Birimi	Ürün No
VARIO Monochloramine Set	1 Set	535800
VARIO Monochlor F Rgt - 100	Toz / 100 adetler	531810
VARIO Free Ammonia Reagent Solution - 5 ml	5 mL	531800
VARIO Rochelle tuz çözeltisi, 30 ml [h)]	30 mL	530640

Notlar

1. Tam renk gelişimi - sıcaklık
   Kılavuzda belirtilen reaksiyon süreleri, 12 °C ile 14 °C arasındaki bir numune sıcaklığına karşılık gelir. Reaksiyon periyodunun numune sıcaklığından büyük ölçüde etkilenmesi nedeniyle, her iki reaksiyon periyodunu aşağıdaki tabloya göre ayarlamanız gerekir:

Numune sıcaklığı		X dakika cinsinden reaksiyon süresi
°C	°F	
5	41	10
7	45	9
9	47	8
10	50	8
12	54	7
14	57	7
16	61	6
18	64	5
20	68	5
23	73	2.5
25	77	2
> 25	> 77	2

2. Bir reaksiyon süresini iptal etmek için [Enter] tuşuna basın.
3. Şişeyi dik tutun ve yavaşça sıkın.
4. Amonyak konsantrasyonunu belirlemek için mono kloramin (T1) ile mono kloramin ve amonyak (T2) toplamı arasındaki fark hesaplanır. T2 aralık sınırını aşarsa aşağıdaki mesaj görüntülenir:
   N [NH_2Cl] + N [NH_3]> 0,9 mg / l
   Bu durumda numune seyreltilmeli ve ölçüm tekrarlanmalıdır.

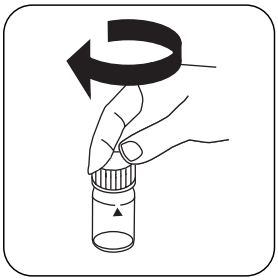
Tespitin uygulanması Klor dioksit, tabletle birlikte klor mevcutken

Cihazda metot seçin.

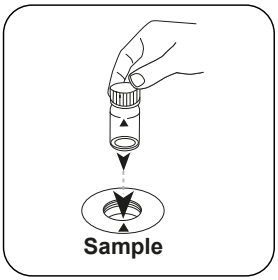
Buna ek olarak tespiti seçin: klor mevcutken

Bu yöntem için, aşağıdaki cihazlarda her seferinde SIFIR ölçümünün yapılması gerekmez: klor mevcutken

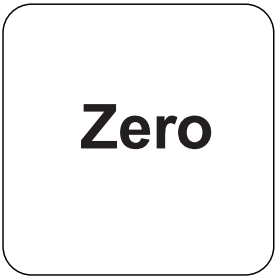
24 mm'lik küveti **10 mL numune** ile doldurun.



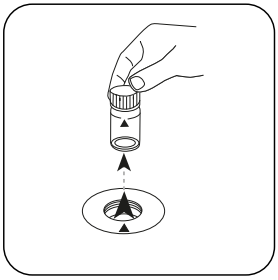
Küveti(küvetleri) kapatın.



Numune küvetini ölçüm haznesine koyun. Doğru konumlandırılmasına dikkat edin.

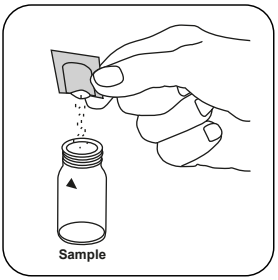


ZERO tuşuna basın.

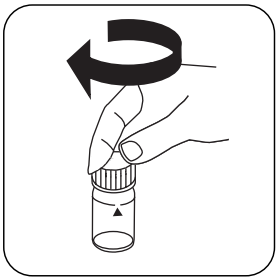


Küveti ölçüm haznesinden alın.

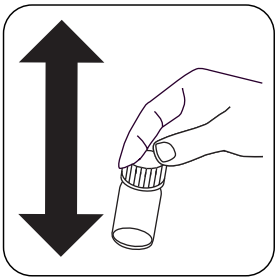
ZERO ölçümü gerektirmeyen cihazlarda **buradan başlayın**.



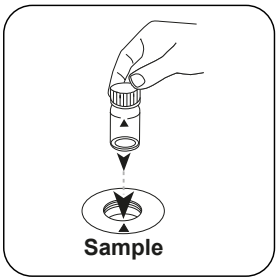
Monochlor FRGT toz paketi ilave edin.



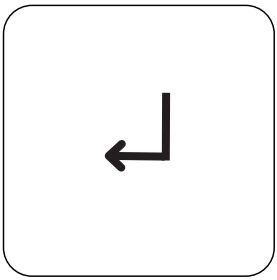
Küveti(küvetleri) kapatın.



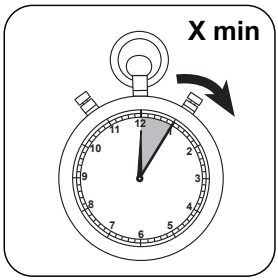
Çalkalayarak içeriği çözdürün. (20 sec.)



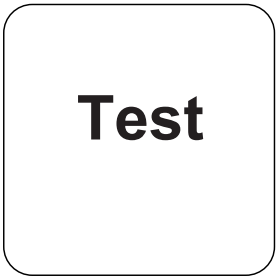
Numune küvetini ölçüm haznesine koyun. Doğru konumlandırılmasına dikkat edin.



ENTER tuşuna basın.(XD: zamanlayıcıyı başlat)



Tabloya göre reaksiyon süresi **X dak**. **Reaksiyon süresini bekleyin.**



TEST (XD: **START**) tuşuna basın.

Ekranda sonuç mg/L Monokloramin - Klor Cl [NH_2Cl] cinsinden belirir.

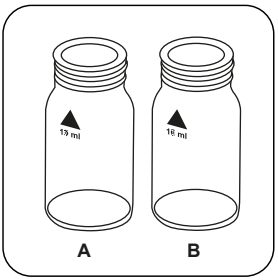
Tespitin uygulanması Klor dioksit, tabletle birlikte klor mevcut değilken

Cihazda metot seçin.

Buna ek olarak tespiti seçin: ücretsiz amonyak ile

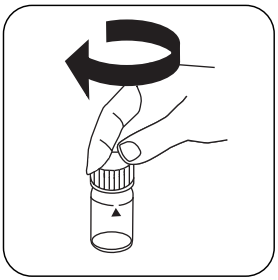
Bu yöntem için, aşağıdaki cihazlarda her seferinde SIFIR ölçümünün yapılması gerekmez: XD 7000, XD 7500

TR

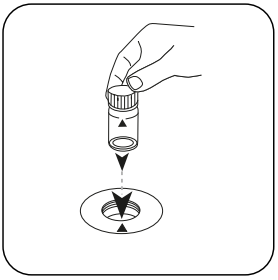


İki adet temiz 24 mm'lik flakon hazırlayın. Birini Amonyak ve diğerini kloramin flakon olarak işaretleyin.

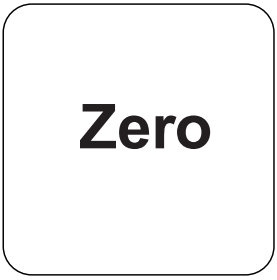
Her küvete **10 mL numune** ekleyin.



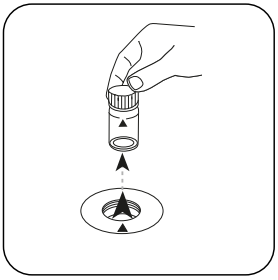
Küveti(küvetleri) kapatın.



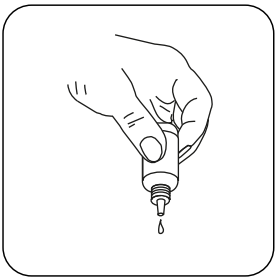
Amonyak **küvetini** ölçüm haznesine koyun. Doğru konumlandırılmasına dikkat edin.



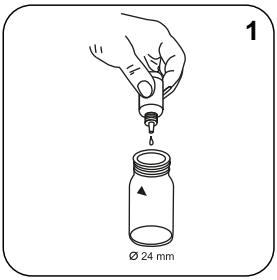
ZERO tuşuna basın.



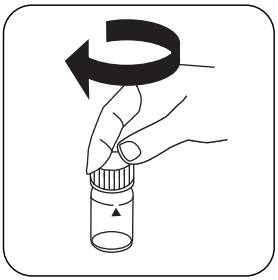
Küveti ölçüm haznesinden alın.



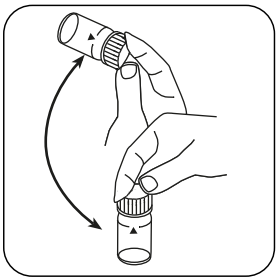
Damla şişelerini dik tutun ve yavaşça pompalayarak aynı büyüklükte damlalar ilave edin.



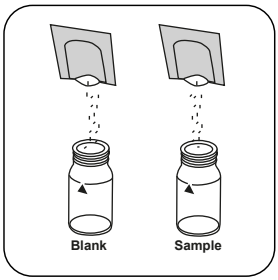
Amonyak küvetine 1 damla Free Ammonia Reagent Solution ilave edin.



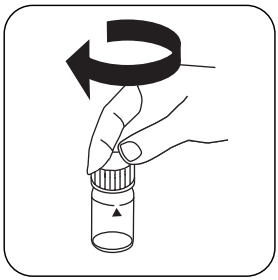
Küveti(küvetleri) kapatın.



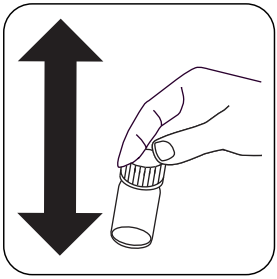
Sallayarak içeriği karıştırın (approx. 15 sec).



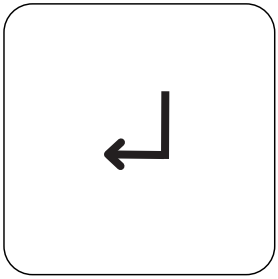
Her şişeye aynı anda bir **Monochlor FRGT** toz paketi ekleyin.



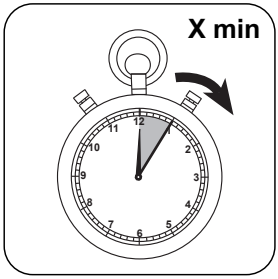
Küveti(küvetleri) kapatın.



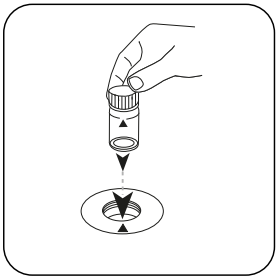
Çalkalayarak içeriği çözdürün. (20 sec.)



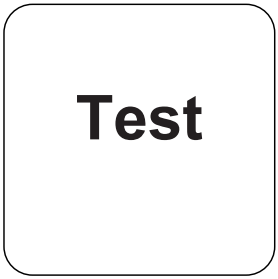
ENTER tuşuna basın.(XD: zamanlayıcıyı başlat)



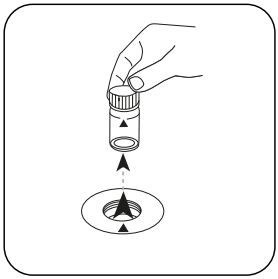
Tabloya göre reaksiyon süresi **X dak**. **Reaksiyon süresini bekleyin.**



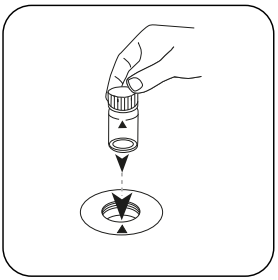
kloraminler **küvetini** ölçüm haznesine koyun. Doğru konumlandırılmasına dikkat edin.



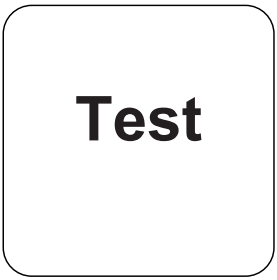
TEST (XD: **START**) tuşuna basın.



Küveti ölçüm haznesinden alın.



Ammonia **küvetini** ölçüm haznesine koyun. Doğru konumlandırılmasına dikkat edin.



TEST (XD: **START**) tuşuna basın.

Ekranda sonuç mg/L Monokloramin - Klor Cl [NH_2Cl] ve mg/l serbest Amonyak - Azot N [NH_3] cinsinden belirir.

Analizler

Aşağıdaki tablo, çıkış değerlerini diğer alıntı formlarına dönüştürülebileceğini tanımlar.

Birim	Kısa formül	Ölçek katsayısı
mg/l	Cl_2	1
mg/l	NH_2Cl	0.72598
mg/l	$N[NH_2Cl]$	0.19754
mg/l	NH_3	0.24019

Kimyasal Metod

Indophenole method

Girişim Metni

Giderilebilir Girişimler

400 mg / l $CaCO_3$'ün üzerindeki magnezyum sertliğinin neden olduğu çökelmenin neden olduğu rahatsızlıklar, 5 damla Rochelle tuzu çözeltisi eklenerek giderilebilir.

Karışmalar	itibaren / [mg/L]
Alanine (N)	1
Aluminium (Al)	10
Bromide (Br^-)	100
Bromine (Br_2)	15
Calcium ($CaCO_3$)	1000
Chloride (Cl^-)	18.000
Chlorine Dioxide (ClO_2)	5
Copper (Cu)	10
Dichloramine (Cl_2)	10
Fluoride (F^-)	5
Free Chloride (Cl_2)	10
Glycine (N)	1
Iron (II) (Fe^{2+})	10
Iro (III) (Fe^{3+})	10
Lead (Pb)	10
Permanganate	3
Nitrate (N)	100
Nitrite (N)	50

Karışmalar	itibaren / [mg/L]
Sulfide	0.5
Phosphate (PO_4)	100
Silica (SiO_2)	100
Sulfate (SO_4^{2+})	2600
Sulfite (SO_3^{2-})	50
Ozone	1
Tyrosine (N)	1
Urea (N)	10
Zinc (Zn)	5

Yöntem Doğrulama

Algılama Limiti	0.010 mg/L
Belirleme Limiti	0.03 mg/L
Ölçüm Aralığı Sonu	4.5 mg/L
Hassasiyet	1.78 mg/L / Abs
Güven Aralığı	0.044 mg/L
Standart Sapma	0.018 mg/L
Varyasyon Katsayısı	0.78 %

Klor (serbest) ve Monokloramin M64

0.02 - 4.50 mg/L Cl_2 CL2

Indophenole method

TR

Malzeme

Gerekli materyal (kısmen isteğe bağlı):

Ayıraçlar	Paketleme Birimi	Ürün No
VARIO Free Chlorine Reagent Solution - 30 ml	30 mL	531820
VARIO Monochlor F Rgt - 100	Toz / 100 adetler	531810
VARIO Rochelle tuz çözeltisi, 30 ml [h)]	30 mL	530640

Notlar

1. Tam renk gelişimi - sıcaklık
   Kılavuzda belirtilen reaksiyon süreleri, 12 °C ile 14 °C arasındaki bir numune sıcaklığına karşılık gelir. Reaksiyon periyodunun numune sıcaklığından büyük ölçüde etkilenmesi nedeniyle, her iki reaksiyon periyodunu aşağıdaki tabloya göre ayarlamanız gerekir:

Numune sıcaklığı		X dakika cinsinden reaksiyon süresi
°C	°F	
5	41	10
7	45	9
9	47	8
10	50	8
12	54	7
14	57	7
16	61	6
18	64	5
20	68	5
23	73	2.5
25	77	2
> 25	> 77	2

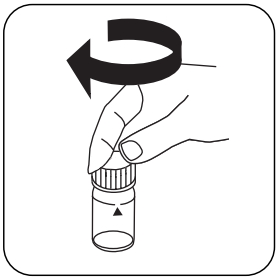
2. Bir reaksiyon süresini iptal etmek için [Enter] tuşuna basın.
3. Şişeyi dik tutun ve yavaşça sıkın.
4. Klor konsantrasyonunu belirlemek için monokloramin ile monokloramin ve klorin toplamı arasındaki fark hesaplanır. Ölçülen değerlerden biri aralık sınırını aşarsa aşağıdaki mesaj görüntülenir:
   Cl_2 [NH_2Cl] + Cl_2> 4,5 mg / l
   Bu durumda numune seyreltilmeli ve ölçüm tekrarlanmalıdır.

Tespitin uygulanması Klor dioksit, tabletle birlikte klor mevcutken

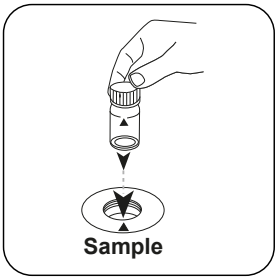
Cihazda metot seçin.

Buna ek olarak tespiti seçin: klor mevcutken

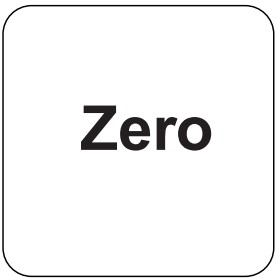
24 mm'lik küveti **10 mL numune** ile doldurun.



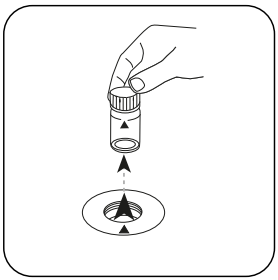
Küveti(küvetleri) kapatın.



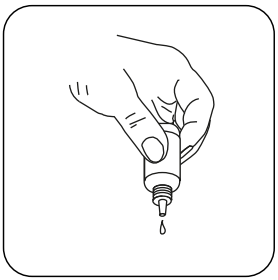
Numune küvetini ölçüm haznesine koyun. Doğru konumlandırılmasına dikkat edin.



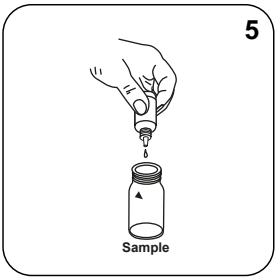
ZERO tuşuna basın.



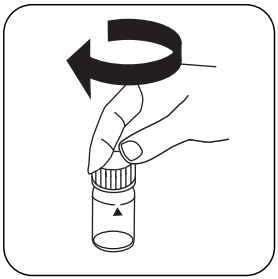
Küveti ölçüm haznesinden alın.



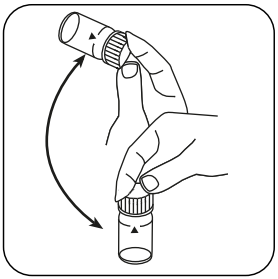
Damla şişelerini dik tutun ve yavaşça pompalayarak aynı büyüklükte damlalar ilave edin.



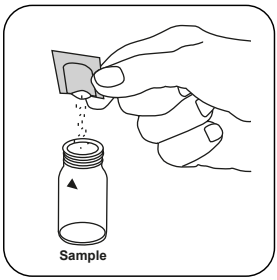
Numune küvetine 5 damla Free Chlorine Reagent Solution ilave edin.



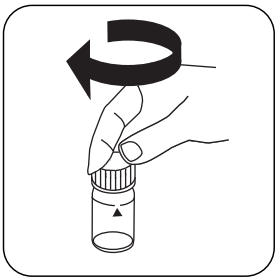
Küveti(küvetleri) kapatın.



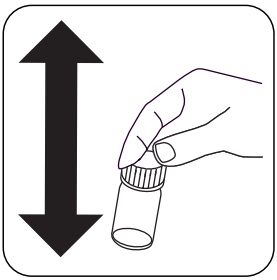
Sallayarak içeriği karıştırın (15 sec.).



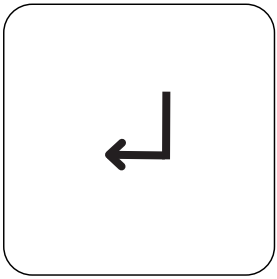
Monochlor FRGT toz paketi ilave edin.



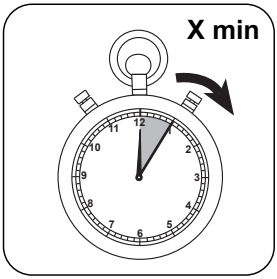
Küveti(küvetleri) kapatın.



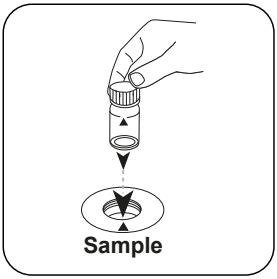
Çalkalayarak içeriği çözdürün. (20 sec.)



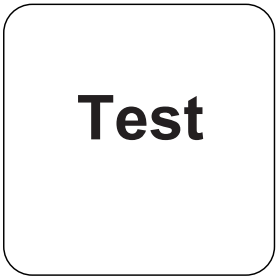
ENTER tuşuna basın.(XD: zamanlayıcıyı başlat)



Tabloya göre reaksiyon süresi **X dak**. **Reaksiyon süresini bekleyin.**



Numune küvetini ölçüm haznesine koyun. Doğru konumlandırılmasına dikkat edin.



TEST (XD: **START**) tuşuna basın.

Ekranda sonuç mg/L serbest klor cinsinden belirir.

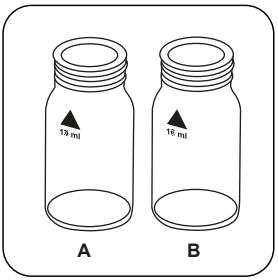
Tespitin uygulanması serbest Klor ve Monokloramin

Cihazda metot seçin.

Buna ek olarak tespiti seçin: Serbest Klor

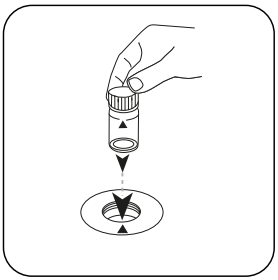
Bu yöntem için, aşağıdaki cihazlarda her seferinde SIFIR ölçümünün yapılması gerekmez: klor olmadan

TR

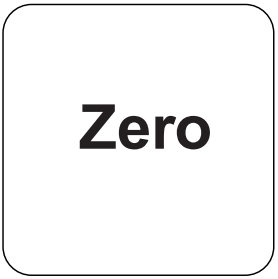


İki adet temiz 24 mm'lik flakon hazırlayın. Birini kloramin ve diğerini Klor flakon olarak işaretleyin.

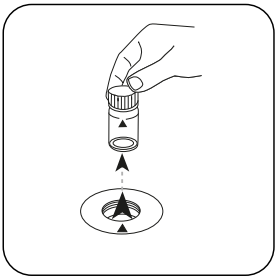
Her küvete **10 mL numune** ekleyin.



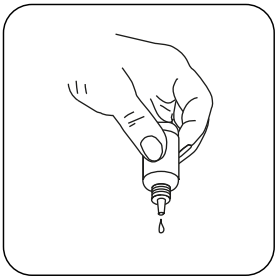
Klor **küvetini** ölçüm haznesine koyun. Doğru konumlandırılmasına dikkat edin.



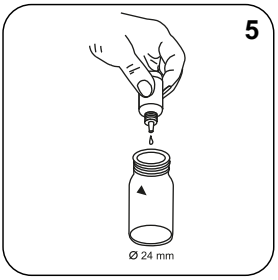
ZERO tuşuna basın.



Küveti ölçüm haznesinden alın.

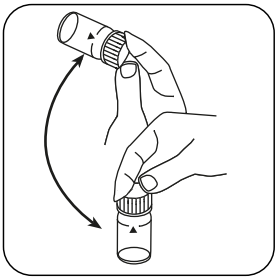


Damla şişelerini dik tutun ve yavaşça pompalayarak aynı büyüklükte damlalar ilave edin.

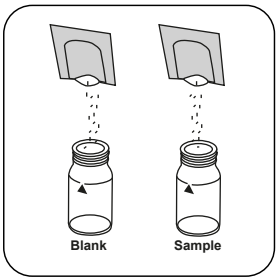


Klor küvetine 5 damla Free Chlorine Reagent Solution ilave edin.

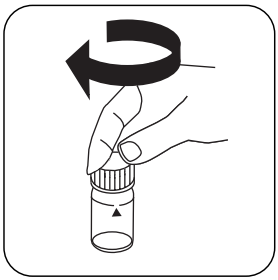
Küveti(küvetleri) kapatın.



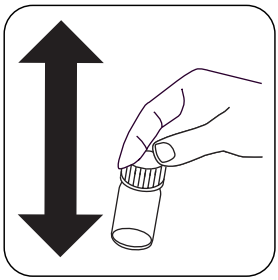
Sallayarak içeriği karıştırın (yaklaşık 15 saniye).



Her şişeye aynı anda bir **Monochlor FRGT** toz paketi ekleyin.

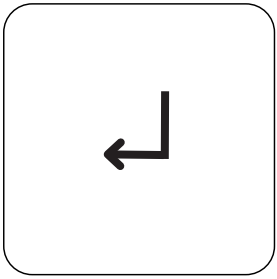


Küveti(küvetleri) kapatın.

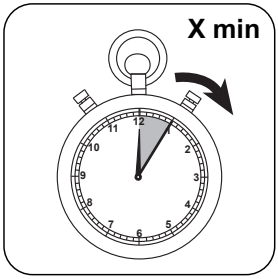


Çalkalayarak içeriği çözdürün. (20 saniye)

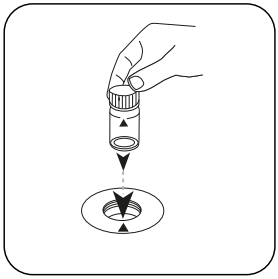
TR



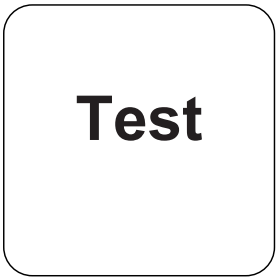
ENTER tuşuna basın.(XD: zamanlayıcıyı başlat)



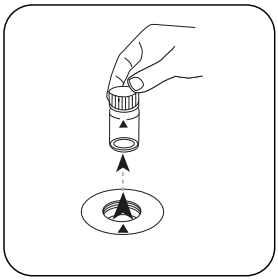
Tabloya göre reaksiyon süresi **X dak**. **Reaksiyon süresini bekleyin.**



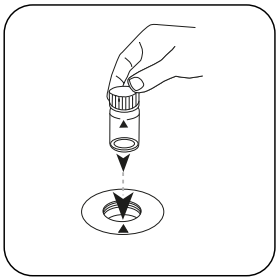
kloramin **küvetini** ölçüm haznesine koyun. Doğru konumlandırılmasına dikkat edin.



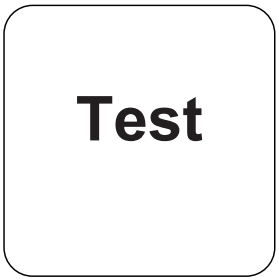
TEST (XD: **START**) tuşuna basın.



Küveti ölçüm haznesinden alın.



Klor **küvetini** ölçüm haznesine koyun. Doğru konumlandırılmasına dikkat edin.



TR

TEST (XD: **START**) tuşuna basın.

Ekranda sonuç mg/L Klor ve mg/l Monokloramin - Klor Cl [NH_2Cl] cinsinden belirir.

Analizler

Aşağıdaki tablo, çıkış değerlerini diğer alıntı formlarına dönüştürülebileceğini tanımlar.

Birim	Kısa formül	Ölçek katsayısı
mg/l	Cl_2	1
mg/l	NH_2Cl	0.72598
mg/l	$N[NH_2Cl]$	0.19754
mg/l	NH_3	0.24019

Kimyasal Metod

Indophenole method

Girişim Metni

Giderilebilir Girişimler

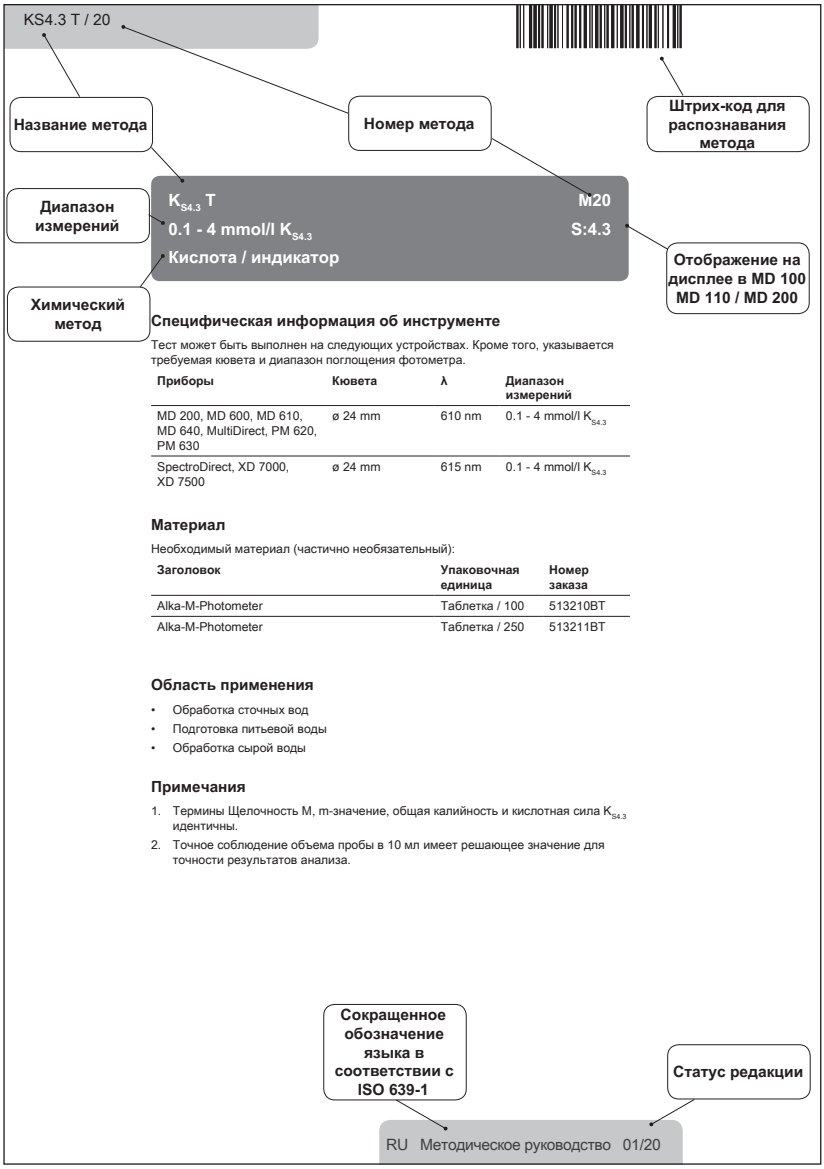
400 mg / l $CaCO_3$'ün üzerindeki magnezyum sertliğinin neden olduğu çökelmenin neden olduğu rahatsızlıklar, 5 damla Rochelle tuzu çözeltisi eklenerek giderilebilir.

Karışmalar	itibaren / [mg/L]
Alanine (N)	1
Aluminium (Al)	10
Bromide (Br^-)	100
Bromine (Br_2)	15
Calcium ($CaCO_3$)	1000
Chloride (Cl^-)	18.000
Chlorine Dioxide (ClO_2)	5
Copper (Cu)	10
Dichloramine (Cl_2)	10
Fluoride (F^-)	5
Glycine (N)	1
Iron (II) (Fe^{2+})	10
Iron (III) (Fe^{3+})	10
Lead (Pb)	10
Permanganate	3
Nitrate (N)	100
Nitrite (N)	50
Sulfide	0.5

Karışmalar	itibaren / [mg/L]
Phosphate (PO_4)	100
Silica (SiO_2)	100
Sulfate (SO_4^{2+})	2600
Sulfite (SO_3^{2-})	50
Ozone	1
Tyrosine (N)	1
Urea (N)	10
Zinc (Zn)	5

Yöntem Doğrulama

Algılama Limiti	0.010 mg/L
Belirleme Limiti	0.03 mg/L
Ölçüm Aralığı Sonu	4.5 mg/L
Hassasiyet	1.78 mg/L / Abs
Güven Aralığı	0.044 mg/L
Standart Sapma	0.018 mg/L
Varyasyon Katsayısı	0.78 %


KS4.3 T / 20
Название метода
Номер метода
Штрих-код для распознавания метода
Диапазон измерений
K S4.3 T
M20
0.1 - 4 mmol/l K S4.3
S:4.3
Кислота / индикатор
Отображение на дисплее в MD 100 MD 110 / MD 200
Химический метод
Специфическая информация об инструменте
Тест может быть выполнен на следующих устройствах. Кроме того, указывается требуемая кювета и диапазон поглощения фотометра.
Приборы | Кювета | λ | Диапазон измерений
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
Материал
Необходимый материал (частично необязательный):
Заголовок | Упаковочная единица | Номер заказа
Alka-M-Photometer | Таблетка / 100 | 513210BT
Alka-M-Photometer | Таблетка / 250 | 513211BT
Область применения
• Обработка сточных вод
• Подготовка питьевой воды
• Обработка сырой воды
Примечания
1. Термины Щелочность M, m-значение, общая калийность и кислотная сила K S4.3 идентичны.
2. Точное соблюдение объема пробы в 10 мл имеет решающее значение для точности результатов анализа.
Сокращенное обозначение языка в соответствии с ISO 639-1
Статус редакции
RU Методическое руководство 01/20

Выполнение измерения

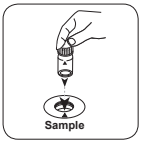
Выполнение определения Кислотная сила $K_{S4.3}$ с таблеткой

Выберите метод в устройстве.

Для этого метода измерения нуля не требуется для следующих устройств: XD 7000, XD 7500

24-Наполните кювету -мм **10** пробой мл.

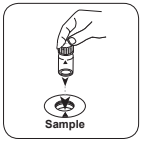
Закройте кювету(ы).



Поместите кювету для проб в измерительную шахту. Обращайте внимание на позиционирование.

■ ■ ■

Растворите таблетку (таблетки) покачиванием.



Поместите кювету для проб в измерительную шахту. Обращайте внимание на позиционирование.

Нажмите клавишу ТЕСТ (XD: СТАРТ).

На дисплее отображается результат в виде Кислотная сила $K_{S4.3}$.

Хлорамин (M) PP M63

0.02 - 4.5 mg/L NH_2Cl as Cl_2

Indophenole method

RU

Материал

Необходимый материал (частично необязательный):

Реактивы	Упаковочная единица	Номер заказа
VARIO Monochloramine Set	1 Набор	535800
VARIO Monochlor F Rgt - 100	Порошок / 100 Шт.	531810
VARIO Free Ammonia Reagent Solution - 5 ml	5 mL	531800
VARIO Раствор сегнетовой соли, 30 ml [h)]	30 mL	530640

Примечания

1. Полноцветное развитие - температура
   Периоды реакции, указанные в руководстве, относятся к температуре образца между 12 °C и 14 °C. В связи с тем, что период реакции сильно зависит от температуры образца, необходимо регулировать оба периода реакции в соответствии со следующей таблицей:

Температура образца		Период реакции x мин
°C	°F	
5	41	10
7	45	9
9	47	8
10	50	8
12	54	7
14	57	7
16	61	6
18	64	5
20	68	5
23	73	2.5
25	77	2
> 25	> 77	2

2. Нажмите клавишу [Enter], чтобы отменить период реакции.
3. Держите бутылку вертикально и медленно сжимайте.
4. Для определения концентрации аммиака рассчитывается разница между моно-хлорамином (T1) и суммой моно-хлорамина и аммиака (T2). Если T2 превышает предел диапазона, отображается следующее сообщение: $N[NH_2Cl] + N[NH_3] > 0{,}9$ мг/л.
   В этом случае пробу необходимо разбавить и повторить измерение.

Выполнение определения Диоксид хлора в присутствии хлора с использованием таблетки

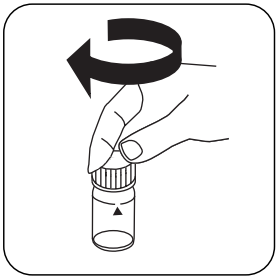
Выберите метод в устройстве.

Также выберите определение: в присутствии хлора.

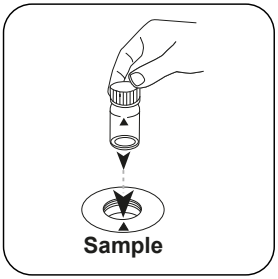
Для этого метода необязательно проводить измерение НУЛЯ каждый раз на следующих устройствах: в присутствии хлора

RU

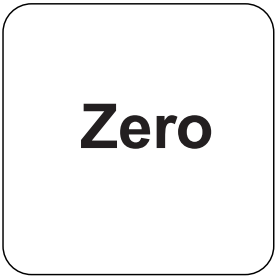
24-Наполните кювету -мм **10 пробой мл**.



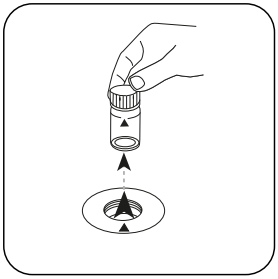
Закройте кювету(ы).



Поместите **кювету для проб** в измерительную шахту. Обращайте внимание на позиционирование.

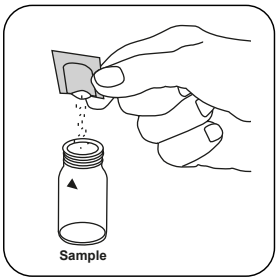


Нажмите клавишу **НОЛЬ** .

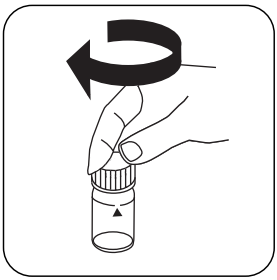


Извлеките кювету из измерительной шахты.

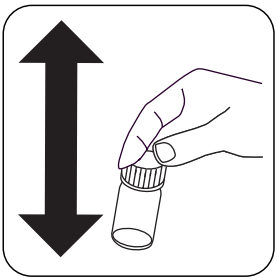
Для приборов, для которых не требуется **измерение нулевого значения** , **начните отсюда**.



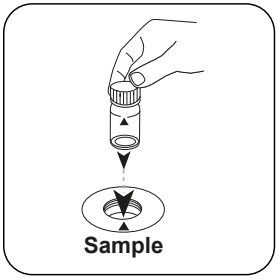
Добавьте **упаковку порошка Monochlor FRGT**.



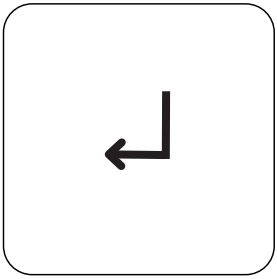
Закройте кювету(ы).



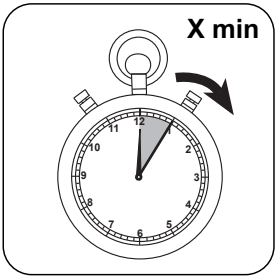
Растворите реагент взбалтыванием. (20 sec.)



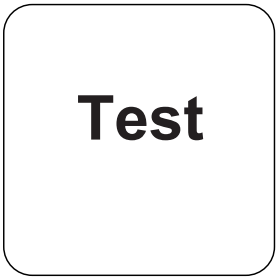
Поместите **кювету для проб** в измерительную шахту. Обращайте внимание на позиционирование.



Нажмите клавишу **ENTER** .(XD: Запуск таймера)



Время реакции **X мин** согласно таблице. **Дождитесь периода реакции.**



Нажмите клавишу **ТЕСТ** (XD: **СТАРТ**).

На дисплее отображается результат в мг/л Монохлорамин - Хлор Cl [NH_2Cl].

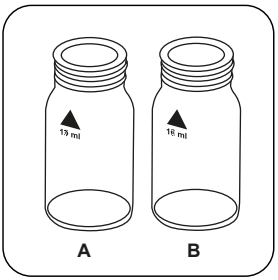
Выполнение определения Диоксид хлора в отсутствие хлора, с использованием таблетки

Выберите метод в устройстве.

Также выберите определение: со свободным аммиаком.

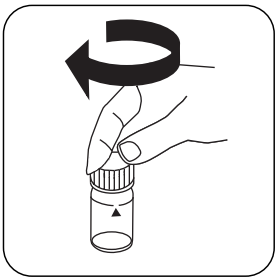
Для этого метода необязательно проводить измерение НУЛЯ каждый раз на следующих устройствах: XD 7000, XD 7500

RU

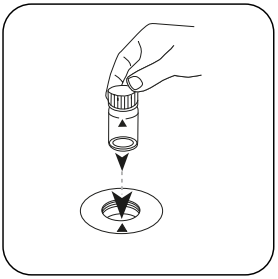


Подготовьте два чистых флакона диаметром 24 мм. Пометьте один флакон как Аммиак, а другой как Хлорамин.

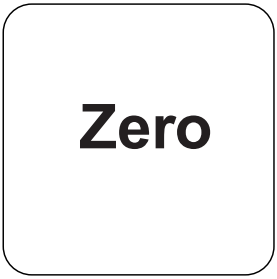
Добавьте **10 мл пробы** в каждую кювету.



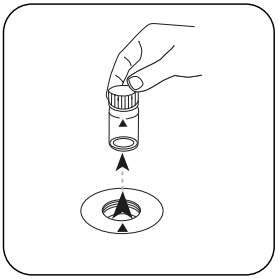
Закройте кювету(ы).



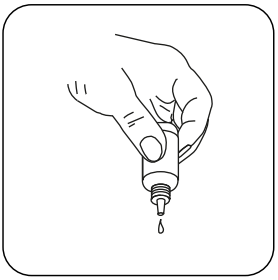
Поместите **кювету** Аммиакв измерительную шахту. Обращайте внимание на позиционирование.



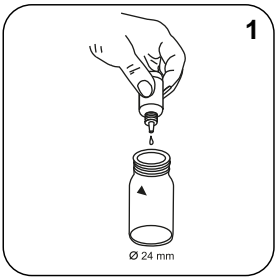
Нажмите клавишу **НОЛЬ** .



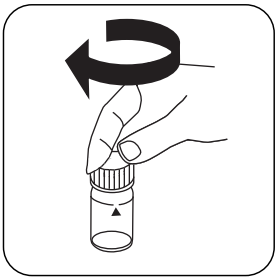
Извлеките кювету из измерительной шахты.



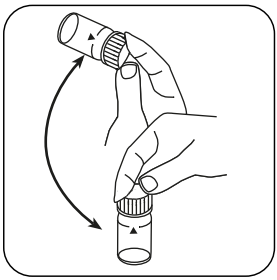
Держите капельницы вертикально и добавляйте капли того же размера, медленно нажимая на них.



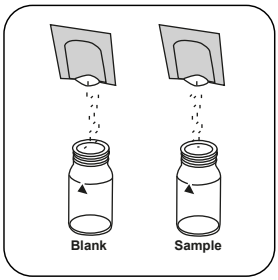
Добавьте **1 капли Free Ammonia Reagent Solution** в кювету **Аммиак**.



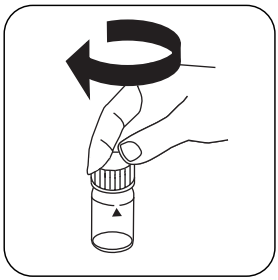
Закройте кювету(ы).



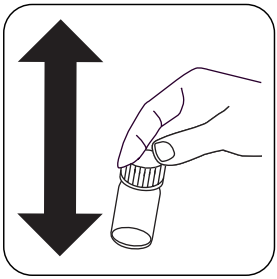
Перемешайте содержимое покачиванием (approx. 15 sec).



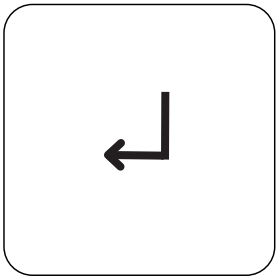
Добавьте одновременно в каждый флакон порошок **Monochlor FRGT.**



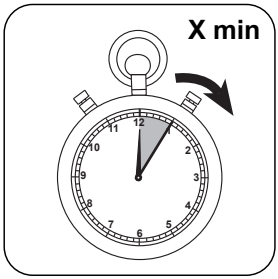
Закройте кювету(ы).



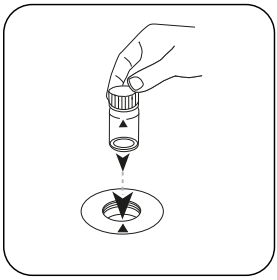
Растворите реагент взбалтыванием. (20 sec.)



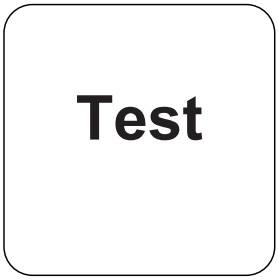
Нажмите клавишу **ENTER** .(XD: Запуск таймера)



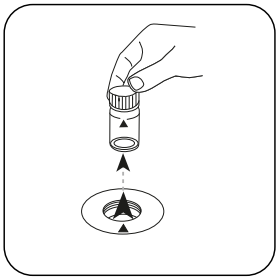
Время реакции **X мин** согласно таблице. **Дождитесь периода реакции.**



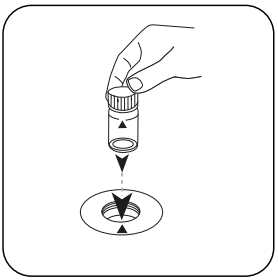
Поместите **кювету** Хлораминв измерительную шахту. Обращайте внимание на позиционирование.

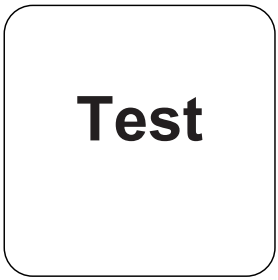


Нажмите клавишу **ТЕСТ** (XD: **СТАРТ**).



Извлеките кювету из измерительной шахты.





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Поместите **кювету** Ammoniав измерительную шахту. Обращайте внимание на позиционирование.

Нажмите клавишу **ТЕСТ** (XD: **СТАРТ**).

На дисплее отображается результат в мг/л Монохлорамин - хлор Cl [NH_2Cl] и мг/л свободного аммиака - азот N [NH_3].

Оценка

В следующей таблице указаны выходные значения, которые могут быть преобразованы в другие формы цитирования.

единицах	Форма цитирования	коэффициент преобразования
mg/l	Cl_2	1
mg/l	NH_2Cl	0.72598
mg/l	$N[NH_2Cl]$	0.19754
mg/l	NH_3	0.24019

Химический метод

Indophenole method

Нарушения

Исключаемые нарушения

Нарушения, вызванные осаждением из-за жесткости $CaCO_3$ по магнию более 400 мг / л, можно устранить, добавив 5 капель раствора соли Рошель.

Помехи	от / [мг/л]
Alanine (N)	1
Aluminium (Al)	10
Bromide (Br^-)	100
Bromine (Br_2)	15
Calcium ($CaCO_3$)	1000
Chloride (Cl^-)	18.000
Chlorine Dioxide (ClO_2)	5
Copper (Cu)	10
Dichloramine (Cl_2)	10
Fluoride (F^-)	5
Free Chloride (Cl_2)	10
Glycine (N)	1
Iron (II) (Fe^{2+})	10
Iro (III) (Fe^{3+})	10
Lead (Pb)	10
Permanganate	3
Nitrate (N)	100

Помехи	от / [мг/л]
Nitrite (N)	50
Sulfide	0.5
Phosphate (PO_4)	100
Silica (SiO_2)	100
Sulfate (SO_4^{2+})	2600
Sulfite (SO_3^{2-})	50
Ozone	1
Tyrosine (N)	1
Urea (N)	10
Zinc (Zn)	5

Проверка метода

Предел обнаружения	0.010 mg/L
Предел детерминации	0.03 mg/L
Конечное значение диапазона измерений	4.5 mg/L
Восприимчивость	1.78 mg/L / Abs
Доверительная область	0.044 mg/L
Среднеквадратическое отклонение процесса	0.018 mg/L
Коэффициент вариации метода	0.78 %

Хлор (свободный) и монохлорамин M64

0.02 - 4.50 mg/L Cl_2 CL2

Indophenole method

RU

Материал

Необходимый материал (частично необязательный):

Реактивы	Упаковочная единица	Номер заказа
VARIO Free Chlorine Reagent Solution - 30 ml	30 mL	531820
VARIO Monochlor F Rgt - 100	Порошок / 100 Шт.	531810
VARIO Раствор сегнетовой соли, 30 ml [h)]	30 mL	530640

Примечания

1. Полноцветное развитие - температура
   Периоды реакции, указанные в руководстве, относятся к температуре образца между 12 °C и 14 °C. В связи с тем, что период реакции сильно зависит от температуры образца, необходимо регулировать оба периода реакции в соответствии со следующей таблицей:

Температура образца		Период реакции x мин
°C	°F	
5	41	10
7	45	9
9	47	8
10	50	8
12	54	7
14	57	7
16	61	6
18	64	5
20	68	5
23	73	2.5
25	77	2
> 25	> 77	2

2. Нажмите клавишу [Enter], чтобы отменить период реакции.
3. Держите бутылку вертикально и медленно сжимайте.
4. Для определения концентрации хлора рассчитывается разность между монохлораминами и суммой монохлорамина и хлора. Если одно измеренное значение превышает предел диапазона, на дисплее появляется следующее сообщение:
   $Cl_2[NH_2Cl] + Cl_2 > 4{,}5$ мг/л.
   В этом случае пробу необходимо разбавить и повторить измерение.

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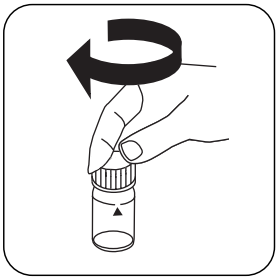
Выполнение определения Диоксид хлора в присутствии хлора с использованием таблетки

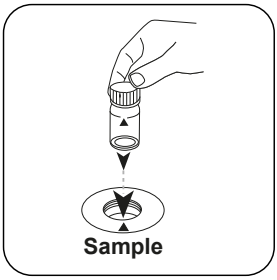
Выберите метод в устройстве.

Также выберите определение: в присутствии хлора.

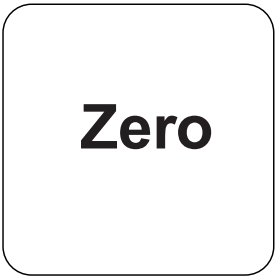
24-Наполните кювету -мм **10 пробой мл**.



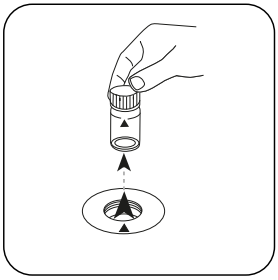
Закройте кювету(ы).



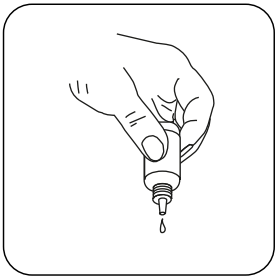
Поместите **кювету для проб** в измерительную шахту. Обращайте внимание на позиционирование.



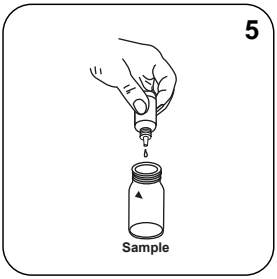
Нажмите клавишу **НОЛЬ** .



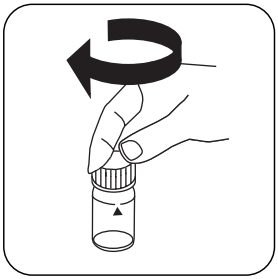
Извлеките кювету из измерительной шахты.



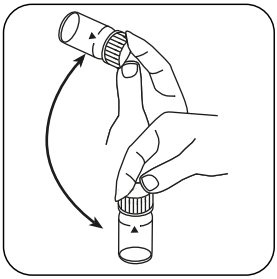
Держите капельницы вертикально и добавляйте капли того же размера, медленно нажимая на них.



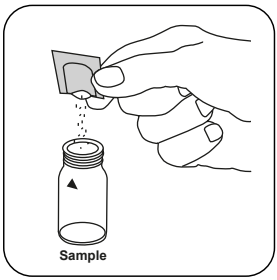
Добавьте **5 капли Free Chlorine Reagent Solution** в кювету для проб.



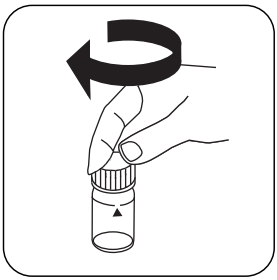
Закройте кювету(ы).



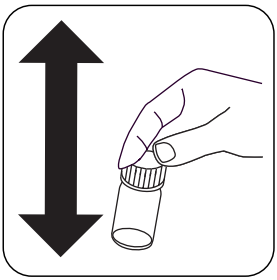
Перемешайте содержимое покачиванием (15 sec.).



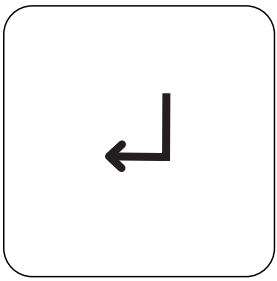
Добавьте **упаковку порошка Monochlor FRGT**.



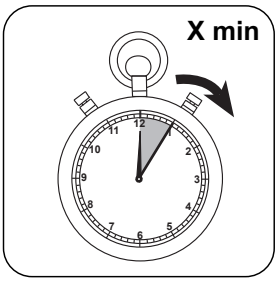
Закройте кювету(ы).



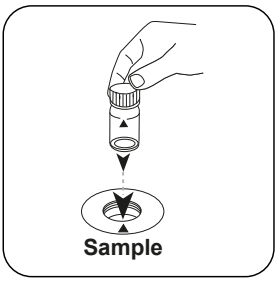
Растворите реагент взбалтыванием. (20 sec.)



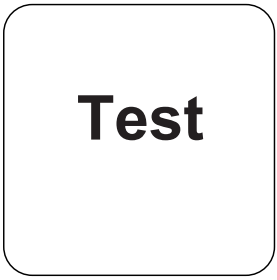
Нажмите клавишу **ENTER** .(XD: Запуск таймера)



Время реакции **X мин** согласно таблице. **Дождитесь периода реакции.**



Поместите **кювету для проб** в измерительную шахту. Обращайте внимание на позиционирование.



Нажмите клавишу **ТЕСТ** (XD: **СТАРТ**).

На дисплее отображается результат в мг/л Свободный хлор.

Выполнение определения свободный хлор и монохлорамин

Выберите метод в устройстве.

Также выберите определение: Свободный хлор.

Для этого метода необязательно проводить измерение НУЛЯ каждый раз на следующих устройствах: без хлора

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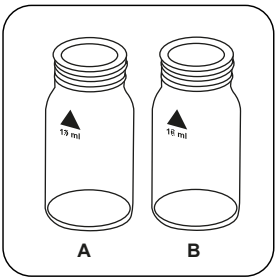
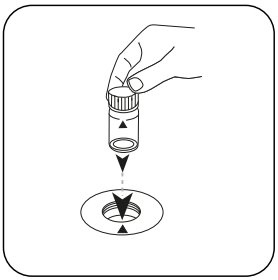
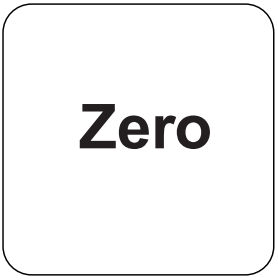


Подготовьте два чистых флакона диаметром 24 мм. Пометьте один флакон как Хлорамин, а другой как Хлор.

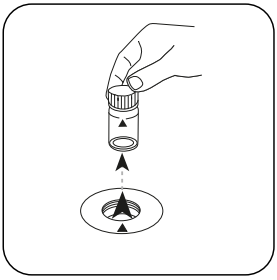
Добавьте **10 мл пробы** в каждую кювету.



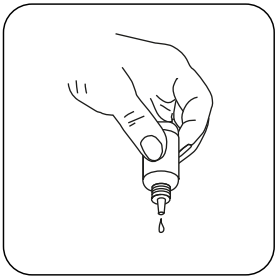
Поместите **кювету** Хлорв измерительную шахту. Обращайте внимание на позиционирование.



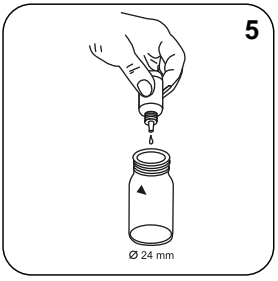
Нажмите клавишу **НОЛЬ** .



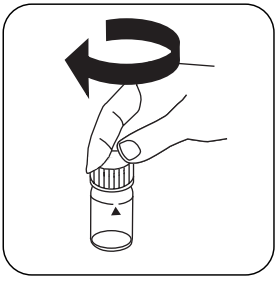
Извлеките кювету из измерительной шахты.



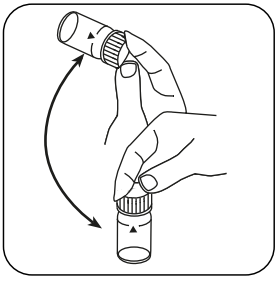
Держите капельницы вертикально и добавляйте капли того же размера, медленно нажимая на них.



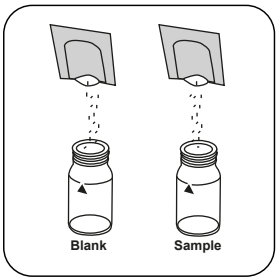
Добавьте **5 капли Free Chlorine Reagent Solution** в кювету **Хлор**.



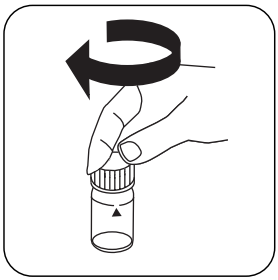
Закройте кювету(ы).



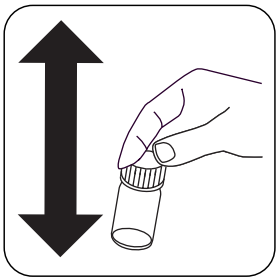
Перемешайте содержимое покачиванием (около 15 сек).



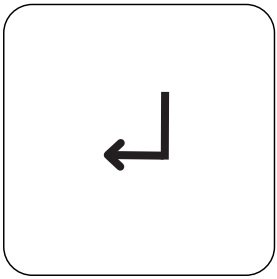
Добавьте одновременно в каждый флакон порошок **Monochlor FRGT.**



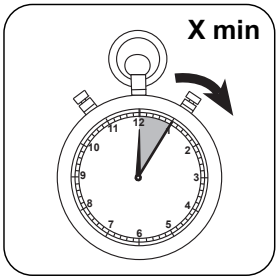
Закройте кювету(ы).



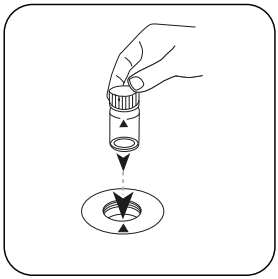
Растворите реагент взбалтыванием. (20 сек)



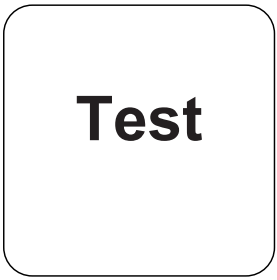
Нажмите клавишу **ENTER** .(XD: Запуск таймера)



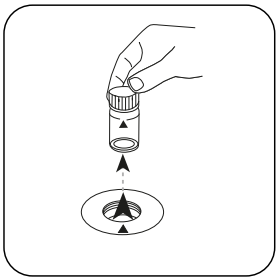
Время реакции **X мин** согласно таблице. **Дождитесь периода реакции.**



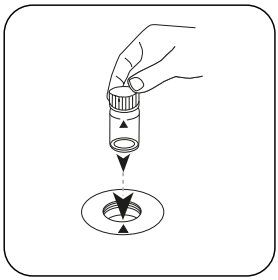
Поместите **кювету** Хлораминв измерительную шахту. Обращайте внимание на позиционирование.



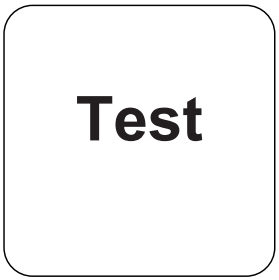
Нажмите клавишу **ТЕСТ** (XD: **СТАРТ**).



Извлеките кювету из измерительной шахты.



Поместите **кювету** Хлорв измерительную шахту. Обращайте внимание на позиционирование.



RU

Нажмите клавишу **ТЕСТ**
(XD: **СТАРТ**).

На дисплее отображается результат в мг/л Хлор и мг/л Монохлорамин - хлор Cl [NH_2Cl].

Оценка

В следующей таблице указаны выходные значения, которые могут быть преобразованы в другие формы цитирования.

единицах	Форма цитирования	коэффициент преобразования
mg/l	Cl_2	1
mg/l	NH_2Cl	0.72598
mg/l	$N[NH_2Cl]$	0.19754
mg/l	NH_3	0.24019

Химический метод

Indophenole method

Нарушения

Исключаемые нарушения

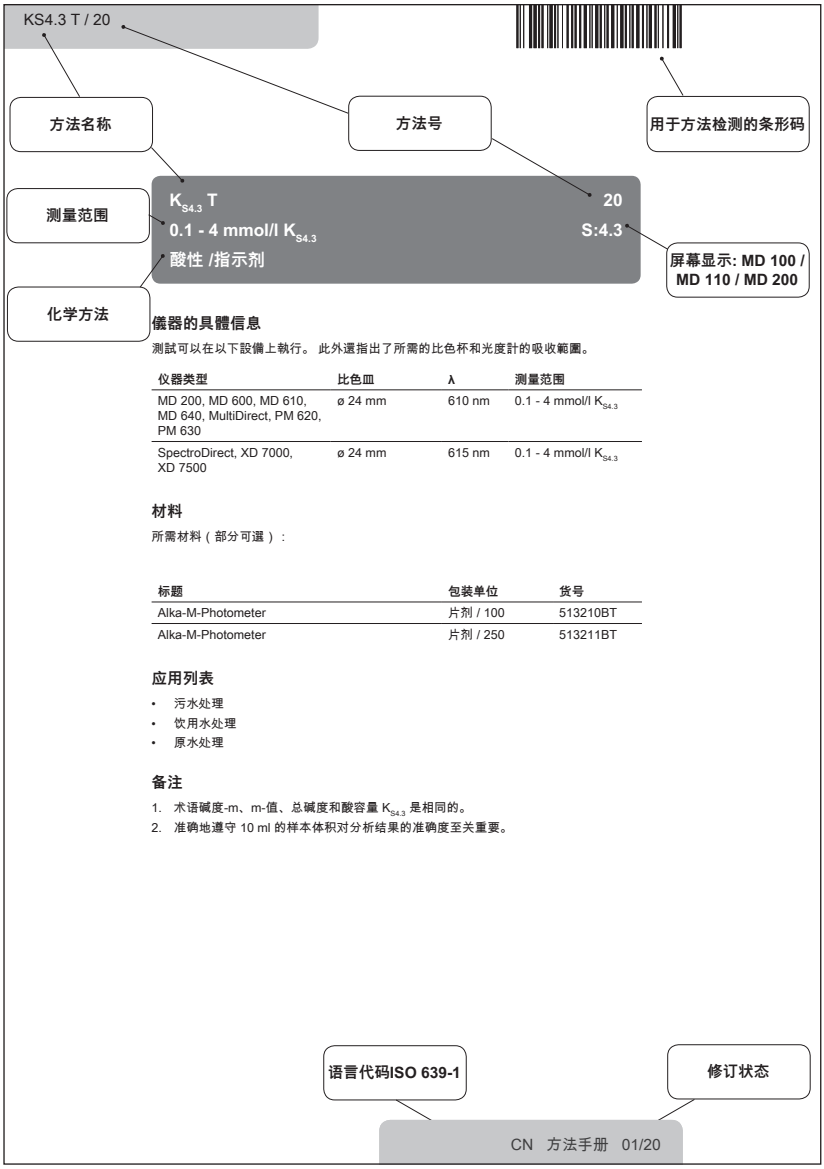
Нарушения, вызванные осаждением из-за жесткости $CaCO_3$ по магнию более 400 мг / л, можно устранить, добавив 5 капель раствора соли Рошель.

Помехи	от / [мг/л]
Alanine (N)	1
Aluminium (Al)	10
Bromide (Br^-)	100
Bromine (Br_2)	15
Calcium ($CaCO_3$)	1000
Chloride (Cl^-)	18.000
Chlorine Dioxide (ClO_2)	5
Copper (Cu)	10
Dichloramine (Cl_2)	10
Fluoride (F^-)	5
Glycine (N)	1
Iron (II) (Fe^{2+})	10
Iron (III) (Fe^{3+})	10
Lead (Pb)	10
Permanganate	3
Nitrate (N)	100
Nitrite (N)	50

Помехи	от / [мг/л]
Sulfide	0.5
Phosphate (PO_4)	100
Silica (SiO_2)	100
Sulfate (SO_4^{2+})	2600
Sulfite (SO_3^{2-})	50
Ozone	1
Tyrosine (N)	1
Urea (N)	10
Zinc (Zn)	5

Проверка метода

Предел обнаружения	0.010 mg/L
Предел детерминации	0.03 mg/L
Конечное значение диапазона измерений	4.5 mg/L
Восприимчивость	1.78 mg/L / Abs
Доверительная область	0.044 mg/L
Среднеквадратическое отклонение процесса	0.018 mg/L
Коэффициент вариации метода	0.78 %



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。

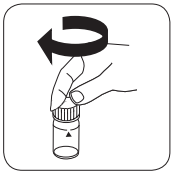
开始测量

进行测定 $K_{S4.3}$ 片剂酸容量

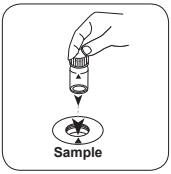
选择设备中的方法。

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。

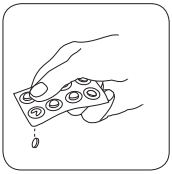


密封比色杯。

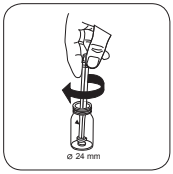


将样本比色杯放入测量轴中。注意定位。

• • •



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

氯胺 (M) PP M63

0.02 - 4.5 mg/L NH_2Cl as Cl_2

Indophenole method

材料
所需材料（部分可選）：

ZH

试剂	包装单位	货号
VARIO Monochloramine Set	1 组	535800
VARIO Monochlor F Rgt - 100	粉剂 / 100 片	531810
VARIO Free Ammonia Reagent Solution - 5 ml	5 mL	531800
VARIO Rochelle 盐溶液, 30 ml [h)]	30 mL	530640

备注

1. 全色发展--温度
   说明书中标明的反应周期是指样品温度在12° ~ 14°C之间。由于反应期受样品温度的影响很大，所以必须按照下表调整两个反应期。

样品温度		反应时间（x 分钟)
°C	°F	
5	41	10
7	45	9
9	47	8
10	50	8
12	54	7
14	57	7
16	61	6
18	64	5
20	68	5
23	73	2.5
25	77	2
> 25	> 77	2

2. 按[Enter]键取消反应期。
3. 垂直握住瓶子，慢慢挤压。
4. 计算一氯胺(T1)与一氯胺和氨气之和(T2)的差值，确定氨气浓度。如果T2超过范围限制，则显示以下信息。
   $N[NH_2Cl] + N[NH_3] > 0.9$ mg/L。
   在这种情况下，必须对样品进行稀释并重复测量。

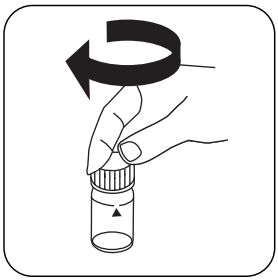
进行测定 二氧化氯, 有氯存在，片剂法

选择设备中的方法。

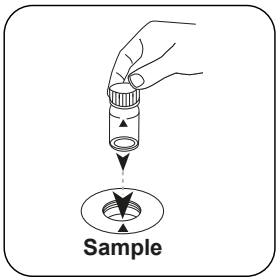
另外选择测定：含氯

对于此方法，不必每次都在以下设备上进行零测量：含氯

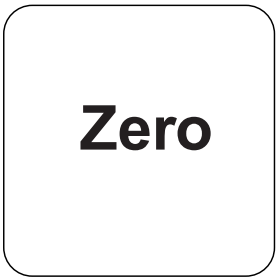
用 **10 mL 样本**填充 24 mm 比色杯。



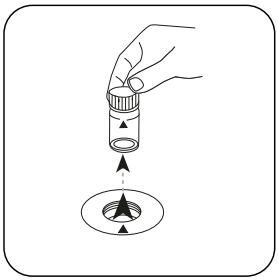
密封比色杯。



将**样本比色杯**放入测量轴中。注意定位。

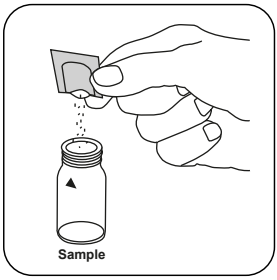


按下 **ZERO** 按钮。

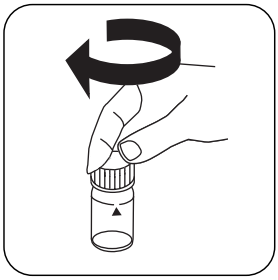


从测量轴上取下比色杯。

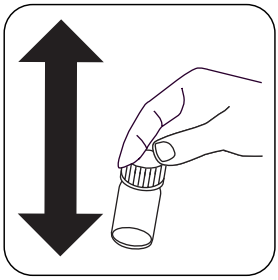
对于**不需要 ZERO 测量**的设备，**从这里开始。**



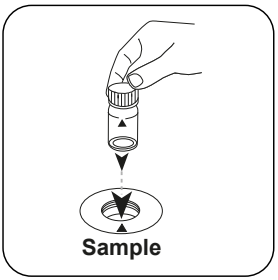
加入 **Monochlor FRGT 粉包。**



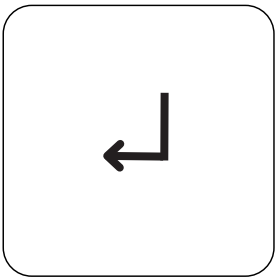
密封比色杯。



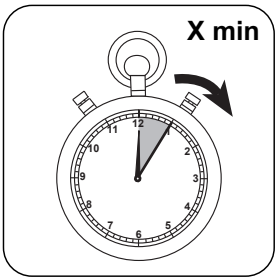
通过摇晃溶解内容物。(20 sec.)



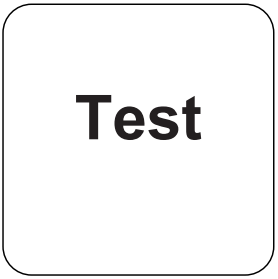
将**样本比色杯**放入测量轴中。注意定位。



按下 **ENTER** 按钮。(XD: 定时器开始)



按表反应时间 **X分钟**。 **等待反应期**。



按下 **TEST** (XD: **START**) 按钮。

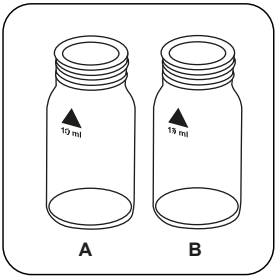
结果在显示屏上显示为 mg / l 单氯胺 - 氯 Cl [NH_2Cl]。

进行测定 二氧化氯, 无氯存在，片剂法

选择设备中的方法。

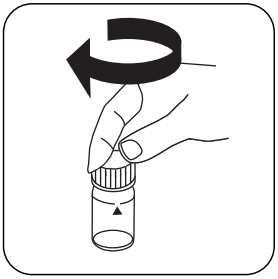
另外选择测定：赠与自由的阿莫尼克

对于此方法，不必每次都在以下设备上进行零测量：XD 7000, XD 7500

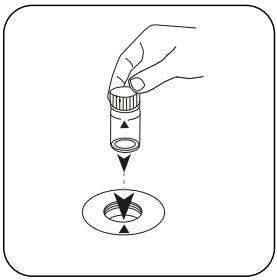


准备两个干净的 24 毫米小瓶。一个标记为氨水**10 毫升样本**，另一个标记为氯胺小瓶。

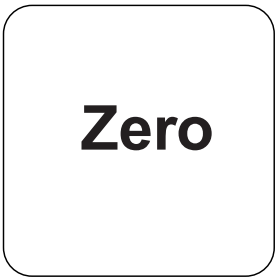
在每个比色杯中加入



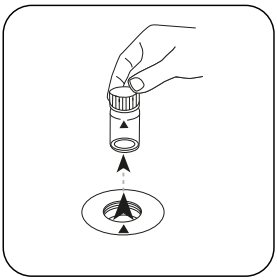
密封比色杯。



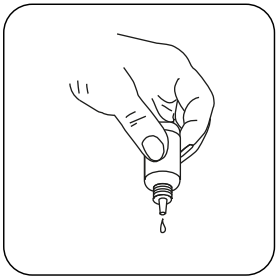
将 氨水 细胞置于样品室中。注意定位。



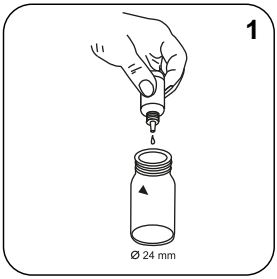
按下 **ZERO** 按钮。



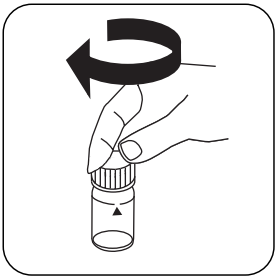
从测量轴上取下比色杯。



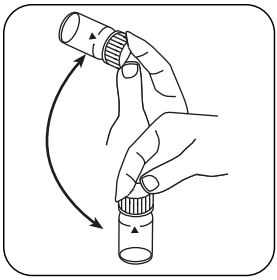
垂直握住滴瓶，慢慢加入相同大小的滴剂。



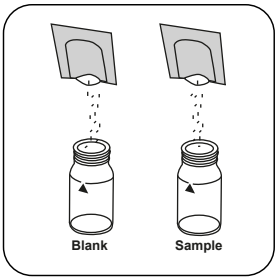
将 **1 滴 Free Ammonia Reagent Solution** 添加到 **氨水** 比色杯中。



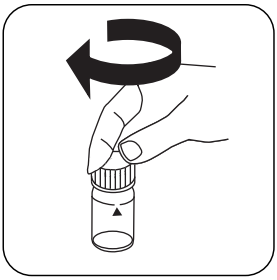
密封比色杯。



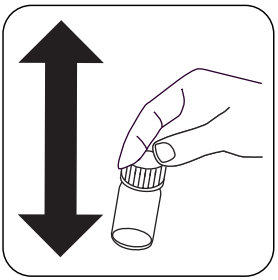
通过旋转混合内容物（approx. 15 sec）。



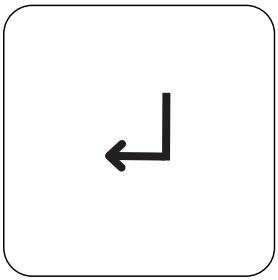
在每个比色杯中同时加入一个 **Monochlor FRGT** 粉包。



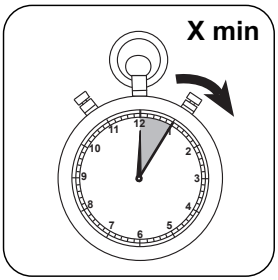
密封比色杯。



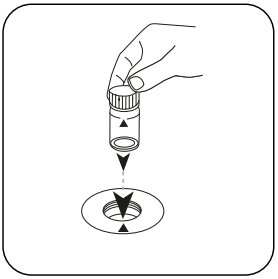
通过摇晃溶解内容物。
(20 sec.)



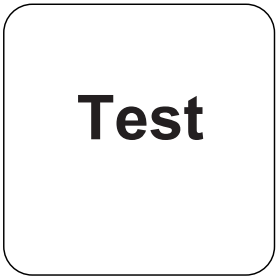
按下 **ENTER** 按钮。(XD: 定时器开始)



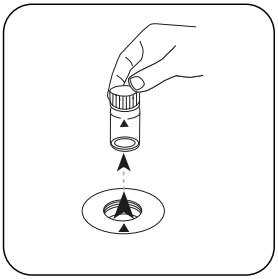
按表反应时间 **X分钟。 等待反应期。**



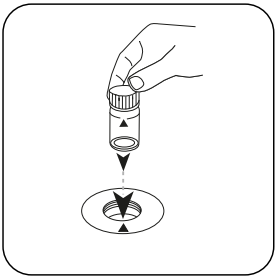
将 氯胺酮 细胞置于样品室中。注意定位。



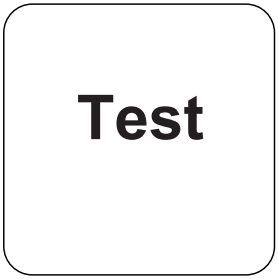
按下 **TEST** (XD: **START**) 按钮。



从测量轴上取下比色杯。



将 Ammonia 细胞置于样品室中。注意定位。



按下 **TEST** (XD: **START**) 按钮。

结果在显示屏上显示为 mg / l 单氯胺-氯[NH_2Cl]和毫克/升游离氨-氮[NH_3]。

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	Cl_2	1
mg/l	NH_2Cl	0.72598
mg/l	$N[NH_2Cl]$	0.19754
mg/l	NH_3	0.24019

化学方法

Indophenole method

干扰说明

可消除干扰

通过添加5滴罗谢尔盐溶液，可以消除由镁硬度超过400 mg / l $CaCO_3$引起的沉淀引起的干扰。

干擾	從/ [mg/l]
Alanine (N)	1
Aluminium (Al)	10
Bromide (Br^-)	100
Bromine (Br_2)	15
Calcium ($CaCO_3$)	1000
Chloride (Cl^-)	18.000
Chlorine Dioxide (ClO_2)	5
Copper (Cu)	10
Dichloramine (Cl_2)	10
Fluoride (F^-)	5
Free Chloride (Cl_2)	10
Glycine (N)	1
Iron (II) (Fe^{2+})	10
Iro (III) (Fe^{3+})	10
Lead (Pb)	10
Permanganate	3
Nitrate (N)	100
Nitrite (N)	50

干擾	從/ [mg/l]
Sulfide	0.5
Phosphate (PO_4)	100
Silica (SiO_2)	100
Sulfate (SO_4^{2+})	2600
Sulfite (SO_3^{2-})	50
Ozone	1
Tyrosine (N)	1
Urea (N)	10
Zinc (Zn)	5

方法验证

检出限	0.010 mg/L
测定下限	0.03 mg/L
测量上限	4.5 mg/L
灵敏度	1.78 mg/L / Abs
置信范围	0.044 mg/L
标准偏差	0.018 mg/L
变异系数	0.78 %

氯（游离）和单氯胺 M64

0.02 - 4.50 mg/L Cl_2 CL2

Indophenole method

材料
所需材料（部分可選）：

ZH

试剂	包装单位	货号
VARIO Free Chlorine Reagent Solution - 30 ml	30 mL	531820
VARIO Monochlor F Rgt - 100	粉剂 / 100 片	531810
VARIO Rochelle 盐溶液, 30 ml [h)]	30 mL	530640

备注

1. 全色发展--温度
   说明书中标明的反应周期是指样品温度在12° ~ 14°C之间。由于反应期受样品温度的影响很大，所以必须按照下表调整两个反应期。

样品温度		反应时间（x 分钟）
°C	°F	
5	41	10
7	45	9
9	47	8
10	50	8
12	54	7
14	57	7
16	61	6
18	64	5
20	68	5
23	73	2.5
25	77	2
> 25	> 77	2

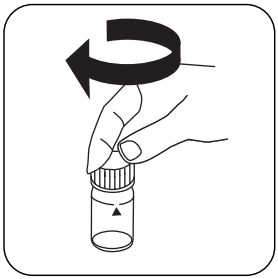
2. 按[Enter]键取消反应期。
3. 垂直握住瓶子，慢慢挤压。
4. 计算一氯胺和一氯胺与氯之和的差值来确定氯浓度。如果一个测量值超过了范围限制，将显示以下信息。
   $Cl_2[NH_2Cl]+Cl_2 > 4.5$ mg/L。
   在这种情况下，必须对样品进行稀释并重复测量。

进行测定 二氧化氯, 有氯存在，片剂法

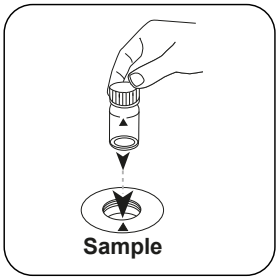
选择设备中的方法。

另外选择测定：**含氯**

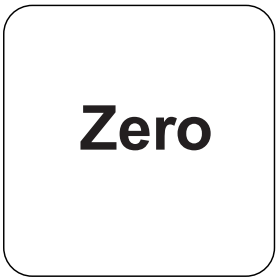
用 **10 mL 样本**填充 24 mm 比色杯。



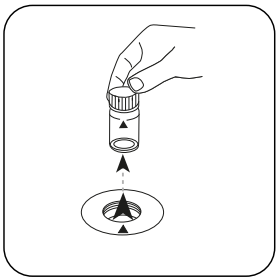
密封比色杯。



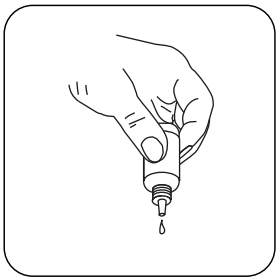
将**样本比色杯**放入测量轴中。注意定位。



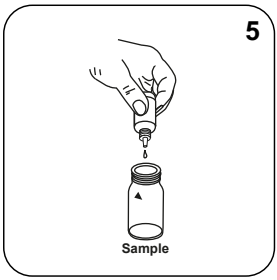
按下 **ZERO** 按钮。



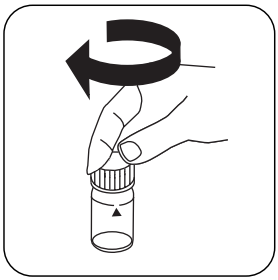
从测量轴上取下比色杯。



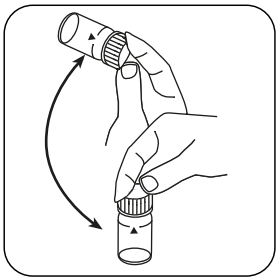
垂直握住滴瓶，慢慢加入相同大小的滴剂。



将 **5 滴 Free Chlorine Reagent Solution** 添加到样本比色杯中。

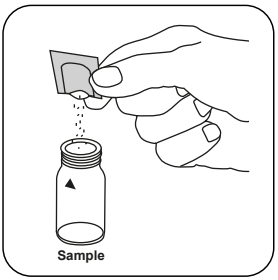


密封比色杯。

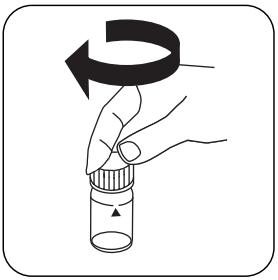


通过旋转混合内容物（15 sec.）。

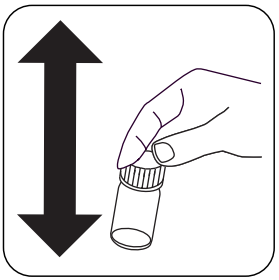
ZH



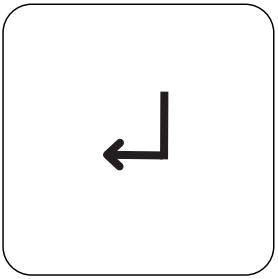
加入 **Monochlor FRGT 粉包**。



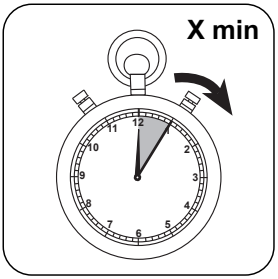
密封比色杯。



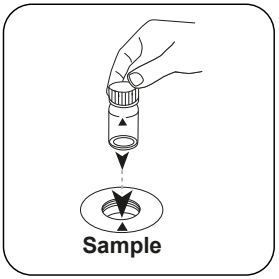
通过摇晃溶解内容物。
(20 sec.)



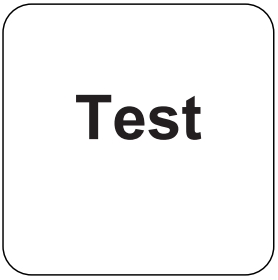
按下 **ENTER** 按钮。(XD: 定时器开始)



按表反应时间 **X分钟。 等待反应期。**



将**样本比色杯**放入测量轴中。注意定位。



按下 **TEST** (XD: **START**) 按钮。

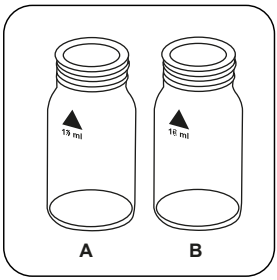
结果在显示屏上显示为 mg / l 余氯。

进行测定 游离氯和单氯胺

选择设备中的方法。

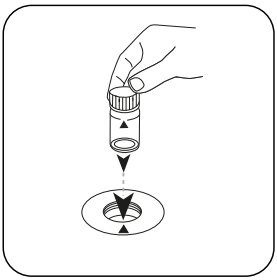
另外选择测定：游离氯

对于此方法，不必每次都在以下设备上进行零测量：不含氯

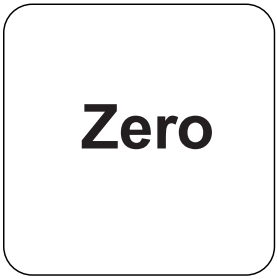


准备两个干净的 24 毫米小瓶。一个标记为**氯胺**样本，另一个标记为**氯气**样本。

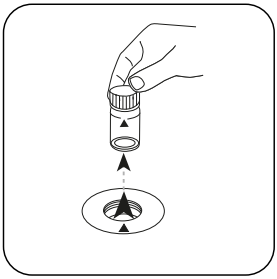
在每个比色杯中加入 **10 mL** 样本。



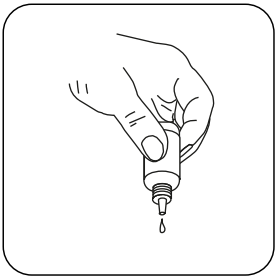
将 **氯气** 细胞置于样品室中。注意定位。



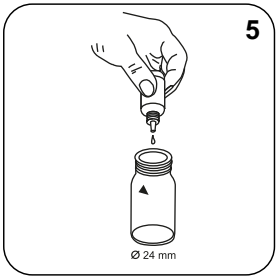
按下 **ZERO** 按钮。



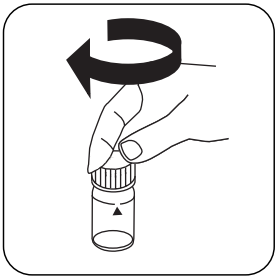
从测量轴上取下比色杯。



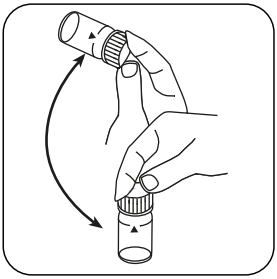
垂直握住滴瓶，慢慢加入相同大小的滴剂。



将 **5 滴 Free Chlorine Reagent Solution** 添加到**氯气**比色杯中。

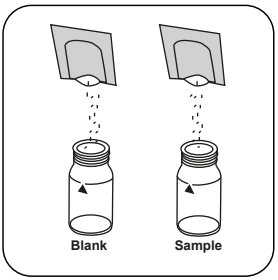


密封比色杯。

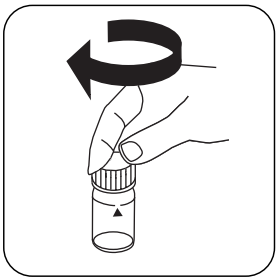


通过旋转混合内容物（约15秒）。

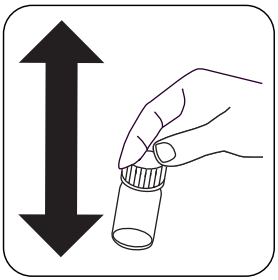
ZH



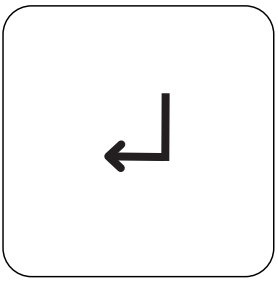
在每个比色杯中同时加入一个 **Monochlor FRGT** 粉包。



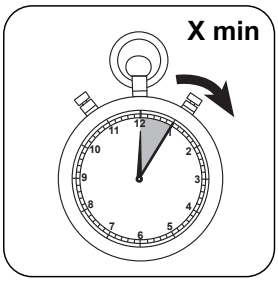
密封比色杯。



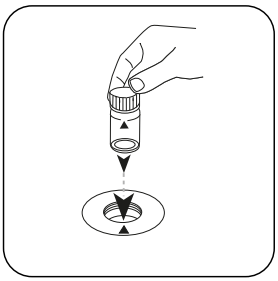
通过摇晃溶解内容物。(20秒)



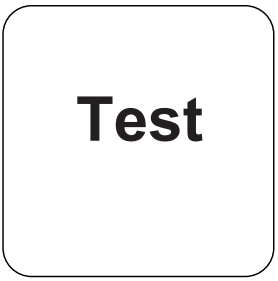
按下 **ENTER** 按钮。(XD: 定时器开始)



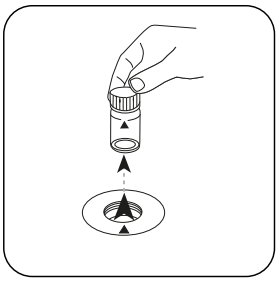
按表反应时间 **X分钟。 等待反应期。**



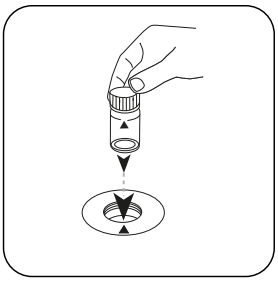
将 氯胺酮 细胞置于样品室中。注意定位。



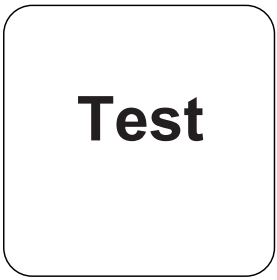
按下 **TEST** (XD: **START**) 按钮。



从测量轴上取下比色杯。



将 氯气 细胞置于样品室中。注意定位。



按下 **TEST** (XD: **START**) 按钮。

结果在显示屏上显示为 mg / l 氯和毫克/升单氯胺--氯Cl [NH_2Cl]。

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	Cl_2	1
mg/l	NH_2Cl	0.72598
mg/l	$N[NH_2Cl]$	0.19754
mg/l	NH_3	0.24019

ZH

化学方法

Indophenole method

干扰说明

可消除干扰

通过添加5滴罗谢尔盐溶液，可以消除由镁硬度超过400 mg / l $CaCO_3$引起的沉淀引起的干扰。

干擾	從/ [mg/l]
Alanine (N)	1
Aluminium (Al)	10
Bromide (Br^-)	100
Bromine (Br_2)	15
Calcium ($CaCO_3$)	1000
Chloride (Cl^-)	18.000
Chlorine Dioxide (ClO_2)	5
Copper (Cu)	10
Dichloramine (Cl_2)	10
Fluoride (F^-)	5
Glycine (N)	1
Iron (II) (Fe^{2+})	10
Iron (III) (Fe^{3+})	10
Lead (Pb)	10
Permanganate	3
Nitrate (N)	100
Nitrite (N)	50
Sulfide	0.5

干擾	從/ [mg/l]
Phosphate (PO_4)	100
Silica (SiO_2)	100
Sulfate (SO_4^{2+})	2600
Sulfite (SO_3^{2-})	50
Ozone	1
Tyrosine (N)	1
Urea (N)	10
Zinc (Zn)	5

方法验证

检出限	0.010 mg/L
测定下限	0.03 mg/L
测量上限	4.5 mg/L
灵敏度	1.78 mg/L / Abs
置信范围	0.044 mg/L
标准偏差	0.018 mg/L
变异系数	0.78 %

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