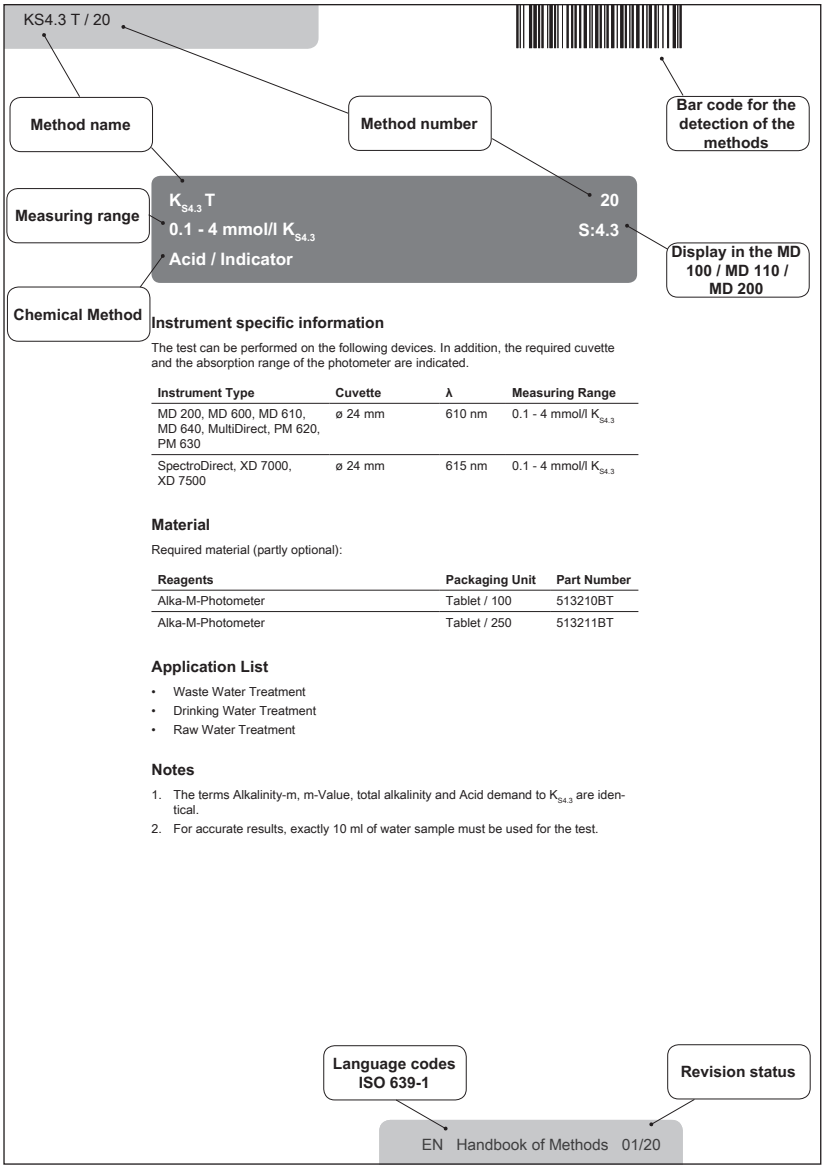
Lovibond® Water Testing

Tintometer® Group

Manual of Methods

MD50

Ozone



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

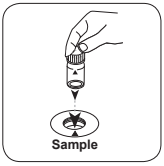
Implementation of the provision Acid capacity $K_{S4.3}$ with Tablet

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**.

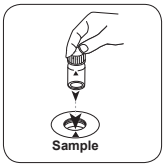
Close vial(s).



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.

Ozone T M300

0.02 - 2 mg/L O_3 O3

DPD / Glycine

EN

Material

Required material (partly optional):

Reagents	Packaging Unit	Part Number
DPD No.1	Tablet / 100	511050BT
DPD No. 1	Tablet / 250	511051BT
DPD No. 1	Tablet / 500	511052BT
DPD No. 3	Tablet / 100	511080BT
DPD No. 3	Tablet / 250	511081BT
DPD No. 3	Tablet / 500	511082BT
DPD No. 1 High Calcium [e)]	Tablet / 100	515740BT
DPD No. 1 High Calcium [e)]	Tablet / 250	515741BT
DPD No. 1 High Calcium [e)]	Tablet / 500	515742BT
DPD No. 3 High Calcium [e)]	Tablet / 100	515730BT
DPD No. 3 High Calcium [e)]	Tablet / 250	515731BT
DPD No. 3 High Calcium [e)]	Tablet / 500	515732BT
Glycine [f)]	Tablet / 100	512170BT
Glycine [f)]	Tablet / 250	512171BT
Set DPD No. 1/No. 3 100 Pc.[#]	100 each	517711BT
Set DPD No. 1/No. 3 250 Pc.[#]	250 each	517712BT
Set DPD No. 1/No. 3 High Calcium 100 Pc. [#]	100 each	517781BT
Set DPD No. 1/No. 3 High Calcium 250 Pc. [#]	250 each	517782BT
Set DPD No. 1/Glycine 100 Stck. [#]	100 each	517731BT
Set DPD No. 1/Glycine 250 Stck. [#]	250 each	517732BT

Preparation

1. Cleaning of vials:
   As many household cleaners (e.g. dishwasher detergent) contain reducing substances, the subsequent determination of oxidising agents (e.g. ozone and chlorine) may show lower results. To avoid measurement errors, the glassware used should be free of chlorine consumption. To achieve this, all glassware should be placed in a sodium hypochlorite solution (0.1 g/L) for one hour and then rinsed thoroughly with deionised water.
2. When preparing the sample, Ozone outgassing, e.g. through the pipette or shaking, must be avoided. The analysis must take place immediately after taking the sample.
3. Strong alkaline or acidic water samples must be adjusted between pH 6 and pH 7 before the analysis (use 0.5 mol/l Sulphuric acid or 1 mol/l Sodium hydroxide).

EN

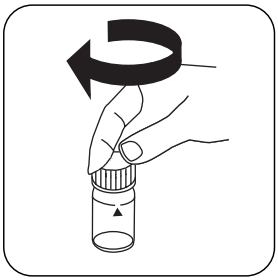
Determination of Ozone, in presence of Chlorine with tablet

Select the method on the device.

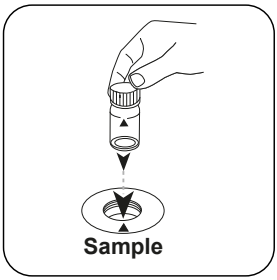
In addition, choose the test: in presence of Chlorine

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

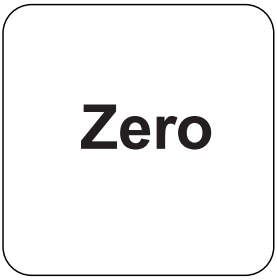
Fill 24 mm vial with **10 mL sample**.



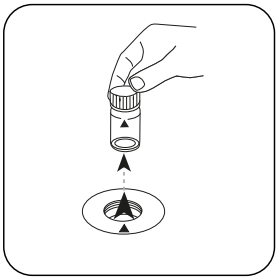
Close vial(s).



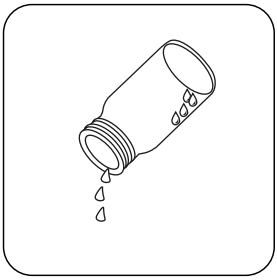
Place **sample vial** in the sample chamber. Pay attention to the positioning.



Press the **ZERO** button.

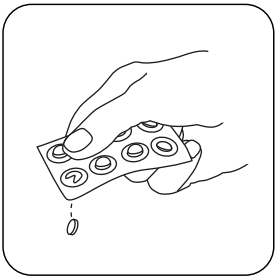


Remove the vial from the sample chamber.

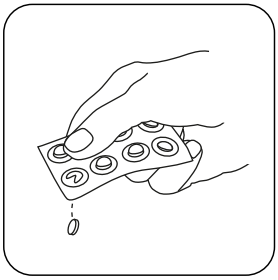


Empty vial except for a few drops.

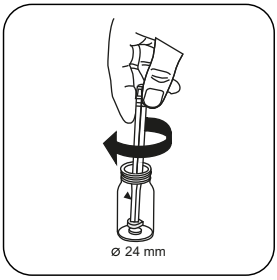
For devices that require **no ZERO measurement** , **start here**.



Add **DPD No. 1 tablet** .

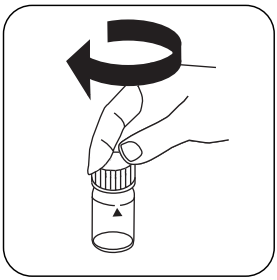


Add **DPD No. 3 tablet** .

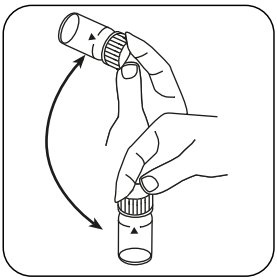


Crush tablet(s) by rotating slightly.

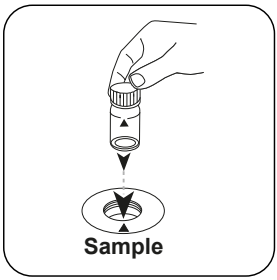
Fill up vial with **sample** to the **10 mL mark**.



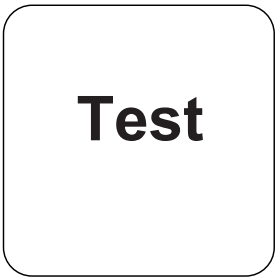
Close vial(s).



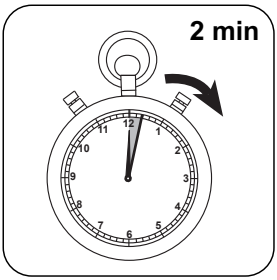
Dissolve tablet(s) by inverting.



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

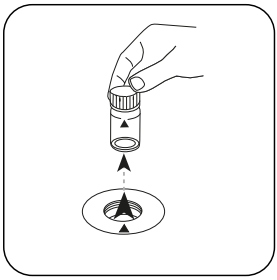


Press the **TEST** (XD: **START**)button.

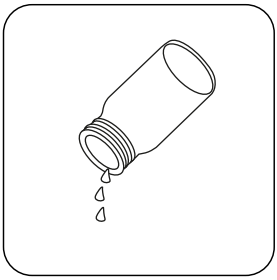


Wait for **2 minute(s) reaction time**.

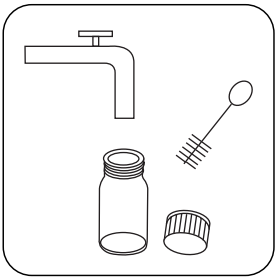
Once the reaction period is finished, the measurement takes place automatically.



Remove the vial from the sample chamber.



Empty vial.



Thoroughly clean the vial and vial cap.

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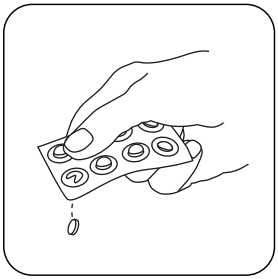
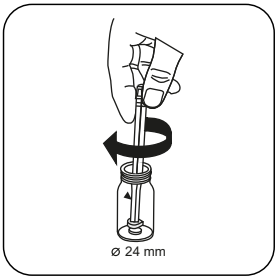
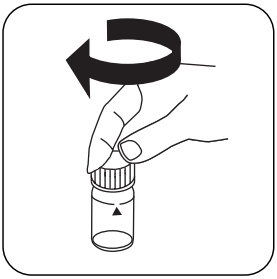
Fill a **second vial** with **10 mL sample** .



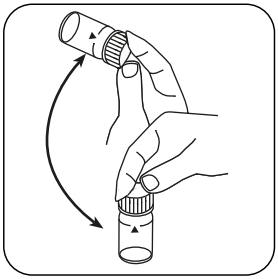
Add **GLYCINE tablet**.



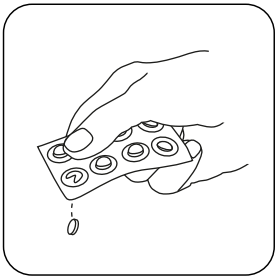
Crush tablet(s) by rotating slightly.



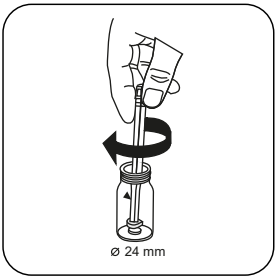
Close vial(s).



Dissolve tablet(s) by inverting.

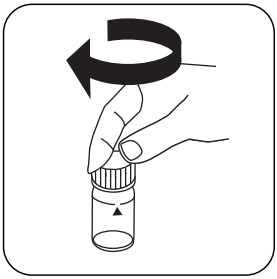


Add **one DPD No. 1 tablet** and **one DPD No. 3 tablet** straight from the foil into the first cleaned cuvette

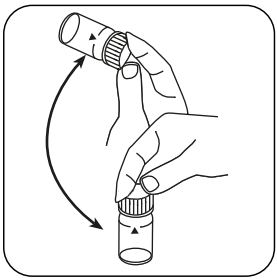


Crush tablet(s) by rotating slightly.

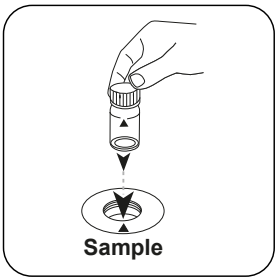
Fill prepared vial with prepared **glycine solution**.



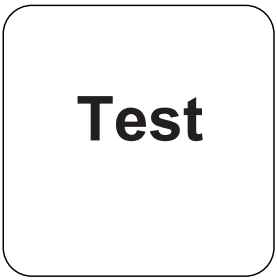
Close vial(s).



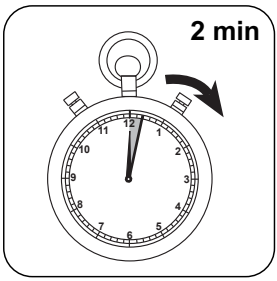
Dissolve tablet(s) by inverting.



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



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



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

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

The result in mg/L Ozone; mg/l total chlorine appears on the display.

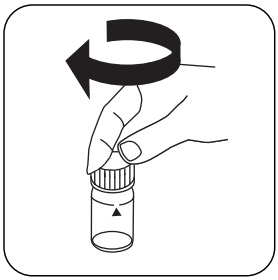
Determination of Ozone, in absence of chlorine with tablet

Select the method on the device.

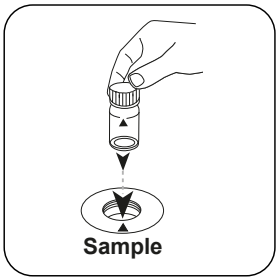
In addition, choose the test: without Chlorine

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

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



Close vial(s).



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

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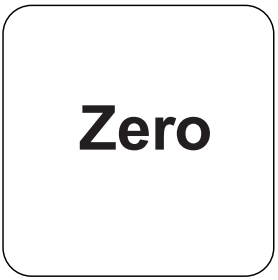
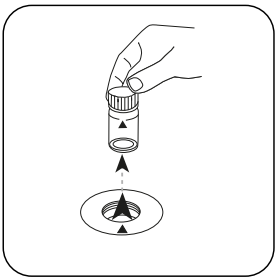


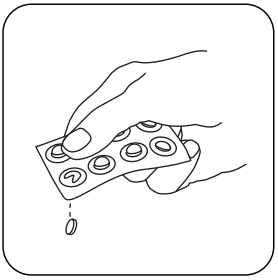
Press the **ZERO** button.



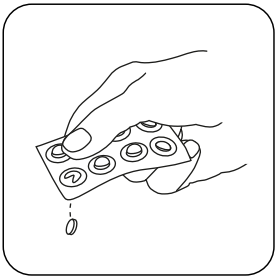
Remove the vial from the sample chamber.

Empty vial except for a few drops.

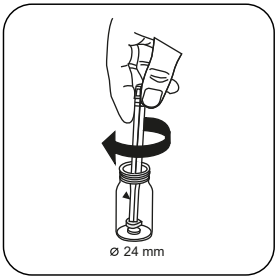
For devices that require **no ZERO measurement** , **start here**.



Add **DPD No. 1 tablet** .

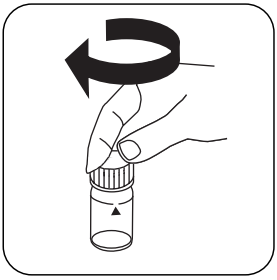


Add **DPD No. 3 tablet** .

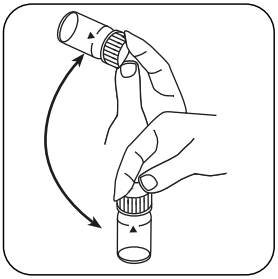


Crush tablet(s) by rotating slightly.

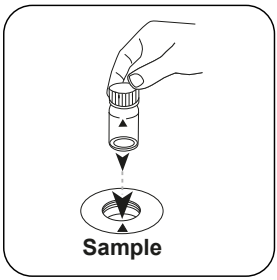
Fill up vial with **sample** to the **10 mL mark**.



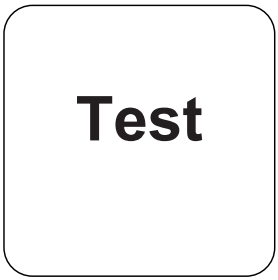
Close vial(s).



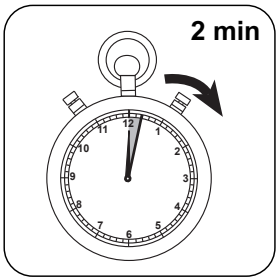
Dissolve tablet(s) by inverting.



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



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



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

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

The result in mg/L Ozone 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	O_3	1
mg/l	Cl_2	1.4771

Chemical Method

DPD / Glycine

Appendix

Interferences

Persistant Interferences

1. All oxidising agents in the samples react like chlorine, which leads to higher results.
2. Concentrations above 6 mg/L Ozone can lead to results within the measuring range of up to 0 mg/L. In this case, the water sample must be diluted. 10 ml of the diluted sample should be mixed with the reagent and the measurement taken again (plausibility test).

Bibliography

Colorimetric Chemical Analytical Methods, 9th Edition, Lovibond

Derived from

DIN 38408-3:2011-04

[e)] alternative reagent, used instead of DPD No.1/No.3 in case of turbidity in the water sample caused by high concentration of calcium and/or high conductivity | [f)] additionally required for determination of bromine, chlorine dioxide and ozone in the presence of chlorine | [#] including stirring rod, 10 cm

Ozone PP M301

0.015 - 1.2 mg/L O_3

DPD / Glycine

EN

Material

Required material (partly optional):

Reagents	Packaging Unit	Part Number
Chlorine Total DPD F10	Powder / 100 pc.	530120
Chlorine Total DPD F10	Powder / 1000 pc.	530123
Glycine [f)]	Tablet / 100	512170BT
Glycine [f)]	Tablet / 250	512171BT

Preparation

1. Cleaning of vials:
   As many household cleaners (e.g. dishwasher detergent) contain reducing substances, the subsequent determination of oxidising agents (e.g. ozone and chlorine) may show lower results. To avoid measurement errors, the glassware used should be free of chlorine consumption. To achieve this, all glassware should be placed in a sodium hypochlorite solution (0.1 g/L) for one hour and then rinsed thoroughly with deionised water.
2. When preparing the sample, Ozone outgassing, e.g. through the pipette or shaking, must be avoided. The analysis must take place immediately after taking the sample.
3. Strong alkaline or acidic water samples must be adjusted between pH 6 and pH 7 before the analysis (use 0.5 mol/l Sulphuric acid or 1 mol/l Sodium hydroxide).

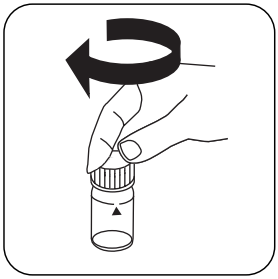
Determination of Ozone, in presence of chlorine with powder packs

Select the method on the device.

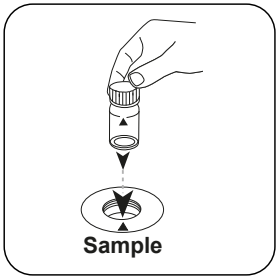
In addition, choose the test: in presence of Chlorine

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

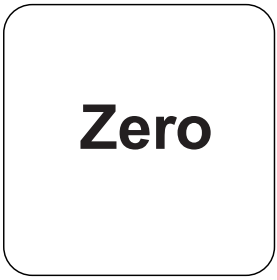
Fill 24 mm vial with **10 mL sample**.



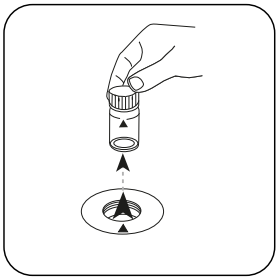
Close vial(s).



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

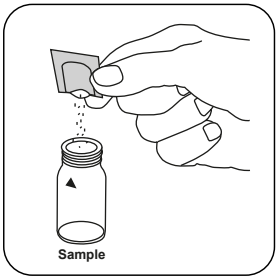


Press the **ZERO** button.

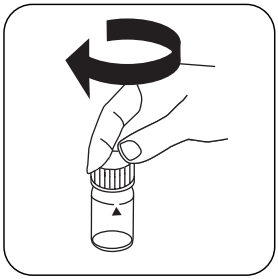


Remove the vial from the sample chamber.

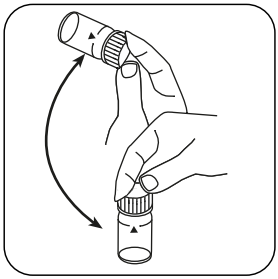
For devices that require **no ZERO measurement** , **start here**.



Add **Chlorine TOTAL-DPD/F 10 powder pack**.

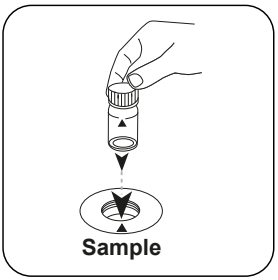


Close vial(s).

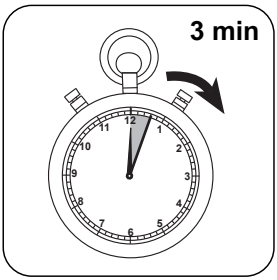


Invert several times to mix the contents (20 sec.).

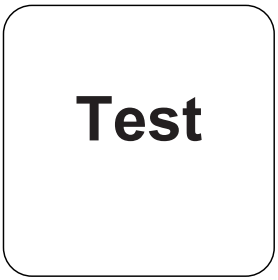
EN



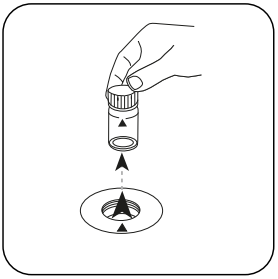
Place **sample vial** in the sample chamber. Pay attention to the positioning.



Wait for **3 minute(s) reaction time**.

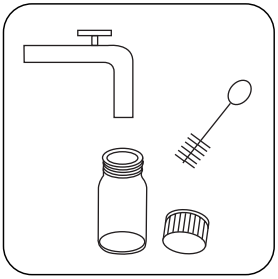


Press the **TEST** (XD: **START**)button.



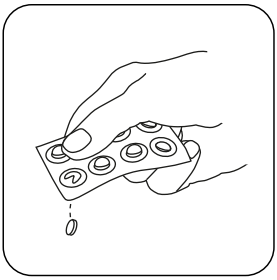
Remove the vial from the sample chamber.

Empty vial.

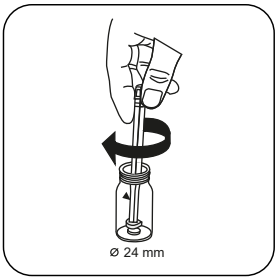


Thoroughly clean the vial and vial cap.

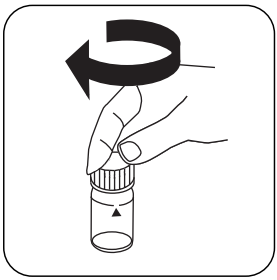
Fill 24 mm vial with **10 mL sample**.



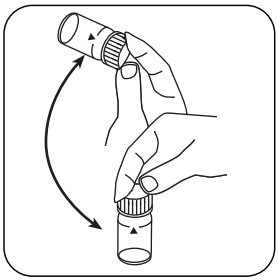
Add **GLYCINE tablet**.



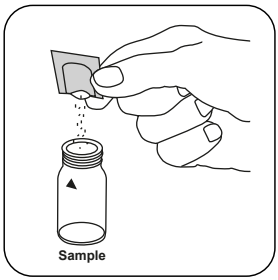
Crush tablet(s) by rotating slightly.



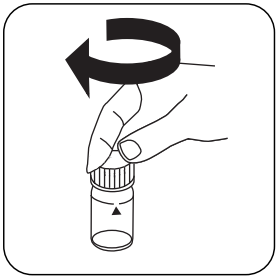
Close vial(s).



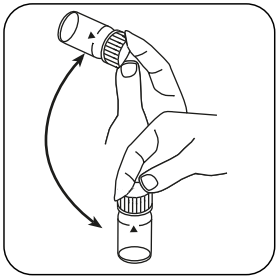
Dissolve tablet(s) by inverting.



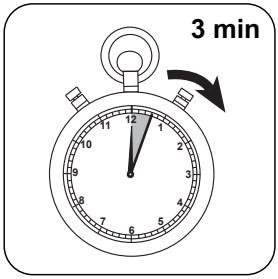
Add **Chlorine TOTAL-DPD/F 10 powder pack**.



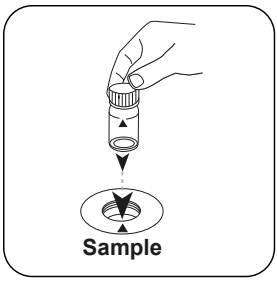
Close vial(s).



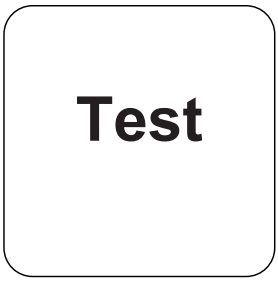
Invert several times to mix the contents (20 sec.).



Wait for **3 minute(s) 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 Ozone, mg/l total chlorine appears on the display.

Determination of Ozone, in absence of chlorine with powder packs

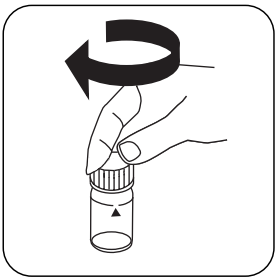
Select the method on the device.

In addition, choose the test: without Chlorine

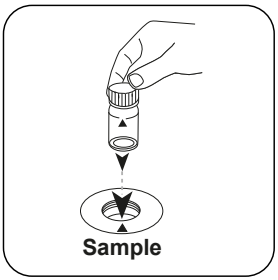
For this method, a ZERO measurement does not have to be carried out every time on the following devices: XD 7000, XD 7500

EN

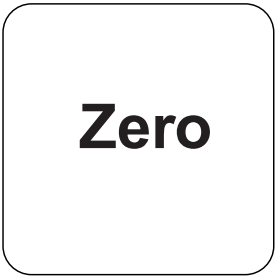
Fill 24 mm vial with **10 mL sample**.



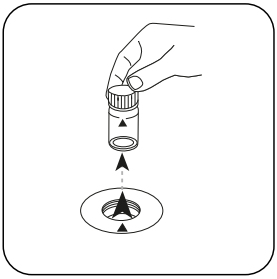
Close vial(s).



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

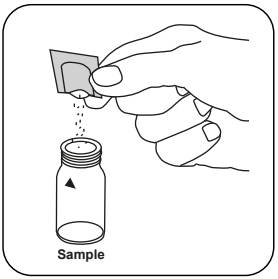


Press the **ZERO** button.

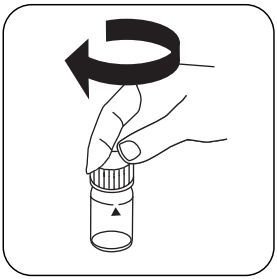


Remove the vial from the sample chamber.

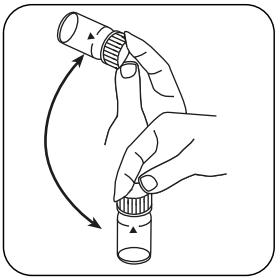
For devices that require **no ZERO measurement** , **start here**.



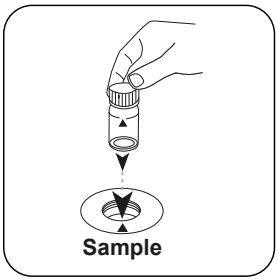
Add **Chlorine TOTAL-DPD/F 10 powder pack**.



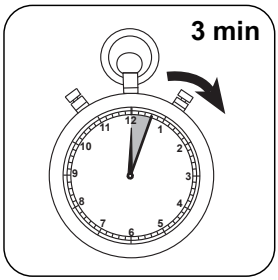
Close vial(s).



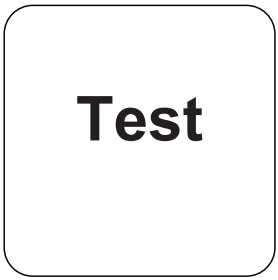
Invert several times to mix the contents (20 sec.).



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



Wait for **3 minute(s) reaction time**.



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

The result in mg/L Ozone 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	O_3	1
mg/l	Cl_2	1.4771

Chemical Method

DPD / Glycine

Interferences

Persistant Interferences

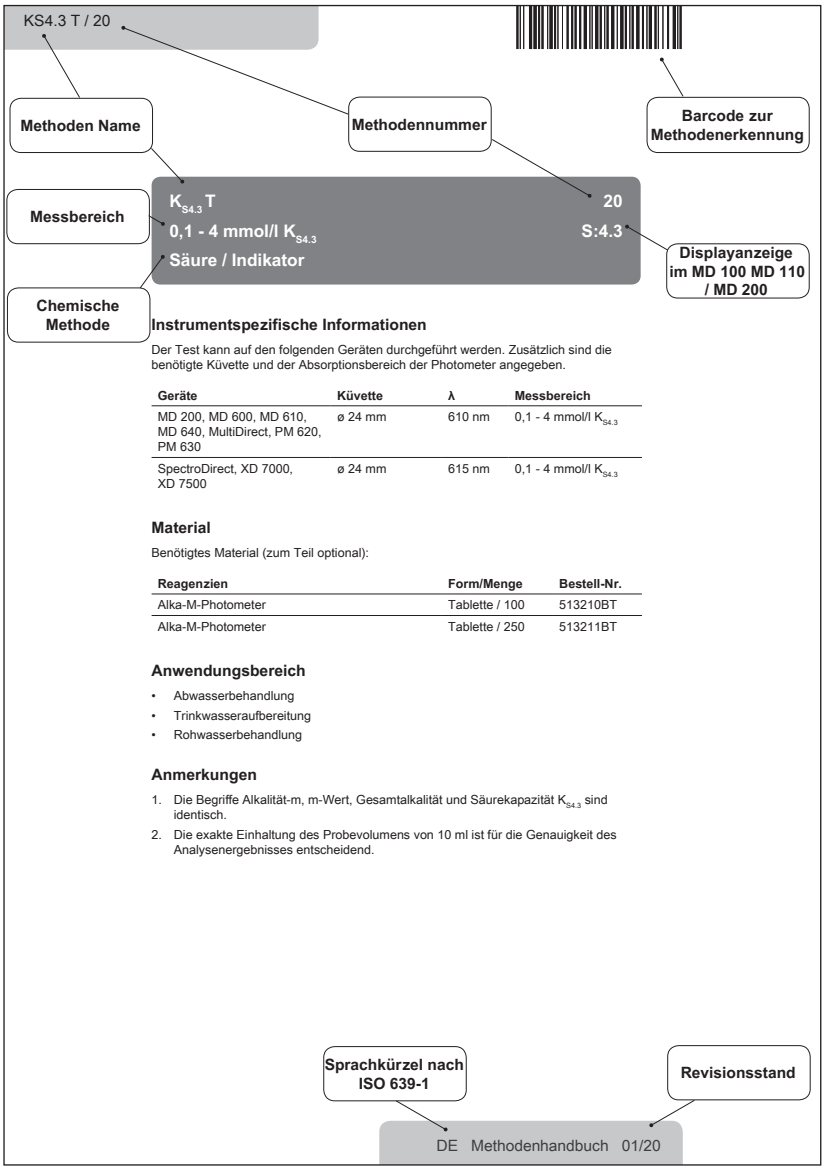
1. All oxidising agents in the samples react like chlorine, which leads to higher results.
2. Concentrations above 6 mg/L Ozone can lead to results within the measuring range of up to 0 mg/L. In this case, the water sample must be diluted. 10 ml of the diluted sample should be mixed with the reagent and the measurement taken again (plausibility test).

Method Validation

Limit of Detection	0.01 mg/L
Limit of Quantification	0.03 mg/L
End of Measuring Range	2 mg/L
Sensitivity	1.68 mg/L / Abs
Confidence Intervall	0.033 mg/L
Standard Deviation	0.014 mg/L
Variation Coefficient	1.34 %

[f] additionally required for determination of bromine, chlorine dioxide and ozone in the presence of chlorine

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

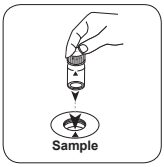
Durchführung der Bestimmung Säurekapazität $K_{S4.3}$ mit Tablette

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.

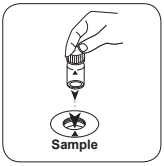
Küvette(n) verschließen.



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 $K_{S4.3}$.

Ozon T M300

0,02 - 2 mg/L O_3 O3

DPD / Glycin

DE

Material

Benötigtes Material (zum Teil optional):

Reagenzien	Form/Menge	Bestell-Nr.
DPD No.1	Tablette / 100	511050BT
DPD No. 1	Tablette / 250	511051BT
DPD No. 1	Tablette / 500	511052BT
DPD No. 3	Tablette / 100	511080BT
DPD No. 3	Tablette / 250	511081BT
DPD No. 3	Tablette / 500	511082BT
DPD No. 1 High Calcium [e)]	Tablette / 100	515740BT
DPD No. 1 High Calcium [e)]	Tablette / 250	515741BT
DPD No. 1 High Calcium [e)]	Tablette / 500	515742BT
DPD No. 3 High Calcium [e)]	Tablette / 100	515730BT
DPD No. 3 High Calcium [e)]	Tablette / 250	515731BT
DPD No. 3 High Calcium [e)]	Tablette / 500	515732BT
Glycine [f)]	Tablette / 100	512170BT
Glycine [f)]	Tablette / 250	512171BT
Set DPD No. 1/No. 3#	je 100	517711BT
Set DPD No. 1/No. 3#	je 250	517712BT
Set DPD No. 1/No. 3 High Calcium#	je 100	517781BT
Set DPD No. 1/No. 3 High Calcium#	je 250	517782BT
Set DPD No. 1/Glycine #	je 100	517731BT
Set DPD No. 1/Glycine #	je 250	517732BT

Vorbereitung

1. Reinigung der Küvetten:
   Da viele Haushaltsreiniger (z.B. Geschirrspülmittel) reduzierende Stoffe enthalten, kann es bei der nachfolgenden Bestimmung von Oxidationsmitteln (z.B. Ozon, Chlor) zu Minderbefunden kommen. Um diesen Messfehler auszuschließen, sollten die Glasgeräte chlorzehrungsfrei sein. Dazu weden die Glasgeräte für eine Stunde unter Natriumhypochloritlösung (0,1 g/L) aufbewahrt und danach gründlich mit VE-Wasser gespült.
2. Bei der Probenvorbereitung muss das Ausgasen von Ozon, z.B. durch Pipettieren und Schütteln vermieden werden. Die Analyse muss unmittelbar nach der Probennahme erfolgen.
3. Stark alkalische oder saure Wässer müssen vor der Analyse in einen pH-Bereich zwischen 6 und 7 gebracht werden (mit 0,5 mol/l Schwefelsäure bzw. 1 mol/l Natronlauge).

Durchführung der Bestimmung Ozon, neben Chlor mit Tablette

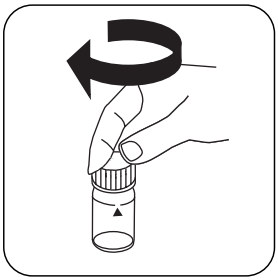
Die Methode im Gerät auswählen.

Wählen Sie zudem die Bestimmung: neben Chlor

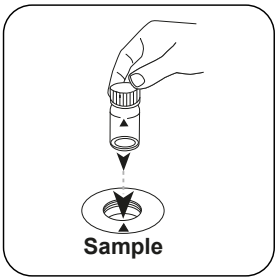
Für diese Methode muss bei folgenden Geräten nicht jedes mal eine ZERO-Messung durchgeführt werden: XD 7000, XD 7500

DE

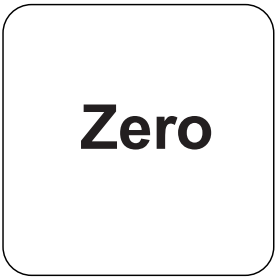
24-mm-Küvette mit **10 mL Probe** füllen.



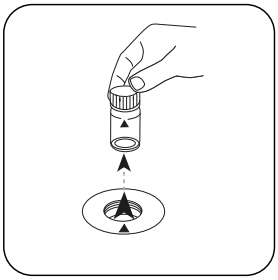
Küvette(n) verschließen.



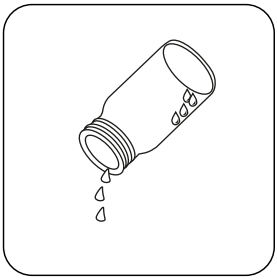
Die **Probenküvette** in den Messschacht stellen. Positionierung beachten.



Taste **ZERO** drücken.

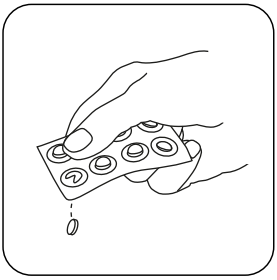


Küvette aus dem Messschacht nehmen.

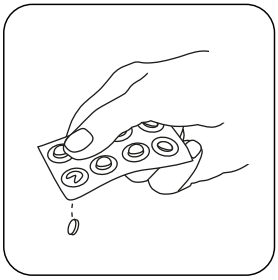


Die Küvette bis auf einige Tropfen entleeren.

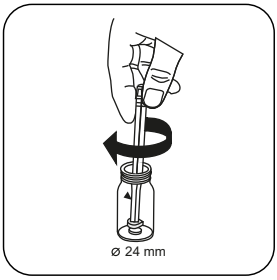
Bei Geräten, die **keine ZERO-Messung** erfordern, **hier beginnen**.



Eine **DPD No. 1 Tablette** zugeben.

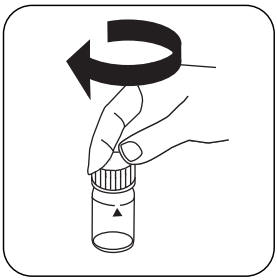


Eine **DPD No. 3 Tablette** zugeben.

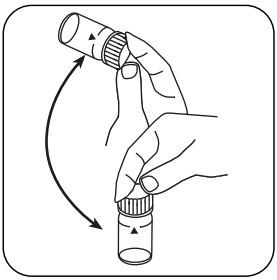


Tablette(n) unter leichter Drehung zerdrücken.

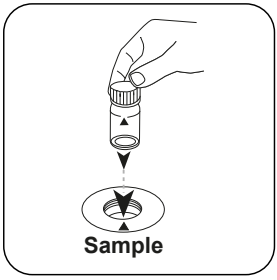
Küvette bis zur **10-mL-Marke** mit der **Probe** auffüllen.



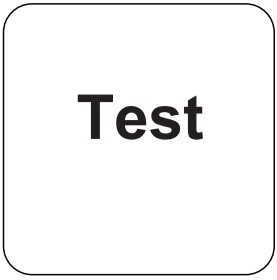
Küvette(n) verschließen.



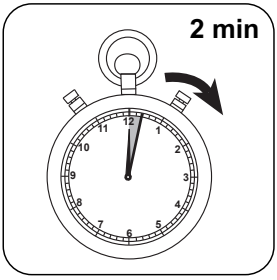
Tablette(n) durch Umschwenken lösen.



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

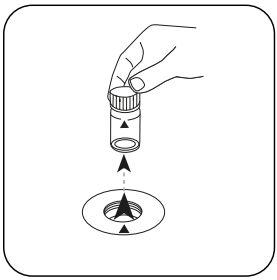


Taste **TEST** (XD: **START**) drücken.

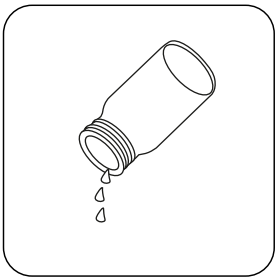


2 Minute(n) Reaktionszeit abwarten.

Nach Ablauf der Reaktionszeit erfolgt automatisch die Messung.



Küvette aus dem Messschacht nehmen.

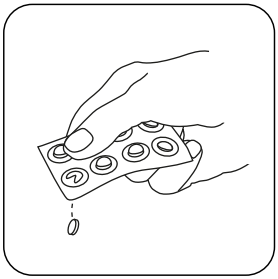


Küvette entleeren.

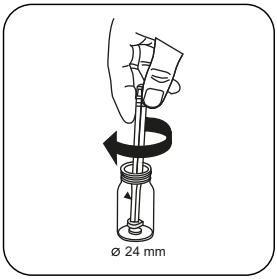
Die Küvette und den Küvettendeckel gründlich reinigen.

DE

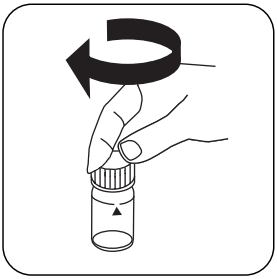
Eine **zweite Küvette** mit **10 mL Probe** füllen.



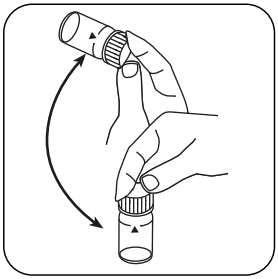
Eine **GLYCINE Tablette** zugeben.



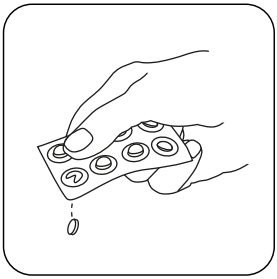
Tablette(n) unter leichter Drehung zerdrücken.



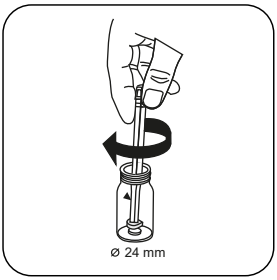
Küvette(n) verschließen.



Tablette(n) durch Umschwenken lösen.

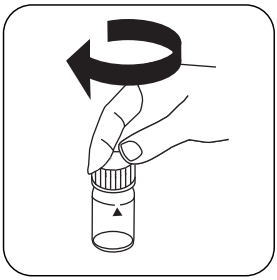


Eine DPD No. 1 Tablette und **eine DPD No. 3 Tablette** direkt aus der Folie in die erste Küvette geben.

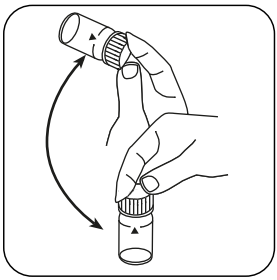


Tablette(n) unter leichter Drehung zerdrücken.

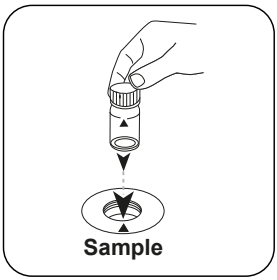
Die vorbereitete **Glycinlösung** in die vorbereitete Küvette füllen.



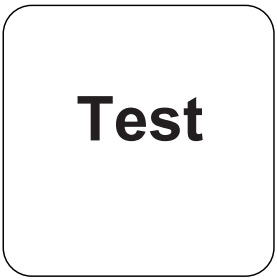
Küvette(n) verschließen.



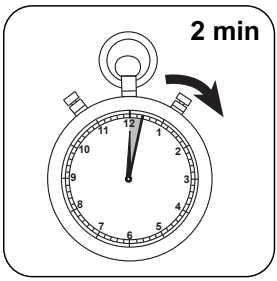
Tablette(n) durch Umschwenken lösen.



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



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



2 Minute(n) Reaktionszeit abwarten.

Nach Ablauf der Reaktionszeit erfolgt automatisch die Messung.

In der Anzeige erscheint das Ergebnis in mg/L Ozon; mg/l Gesamtchlor.

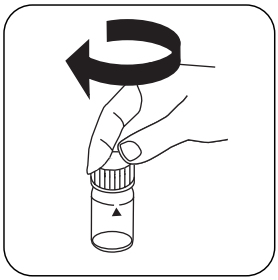
Durchführung der Bestimmung Ozon, in Abwesenheit von Chlor mit Tablette

Die Methode im Gerät auswählen.

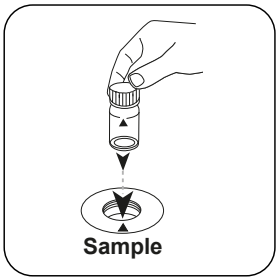
Wählen Sie zudem die Bestimmung: ohne Chlor

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

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

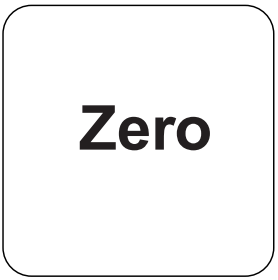


Küvette(n) verschließen.

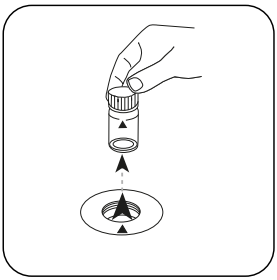


Die **Probenküvette** in den Messschacht stellen. Positionierung beachten.

DE



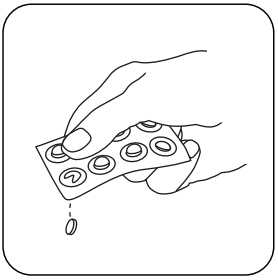
Taste **ZERO** drücken.



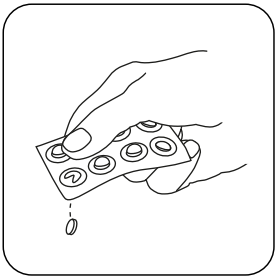
Küvette aus dem Messschacht nehmen.

Die Küvette bis auf einige Tropfen entleeren.

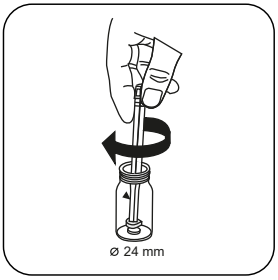
Bei Geräten, die **keine ZERO-Messung** erfordern, **hier beginnen**.



Eine **DPD No. 1 Tablette** zugeben.

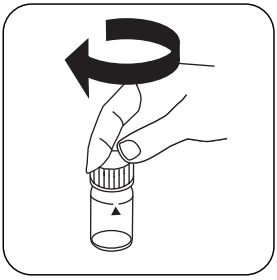


Eine **DPD No. 3 Tablette** zugeben.

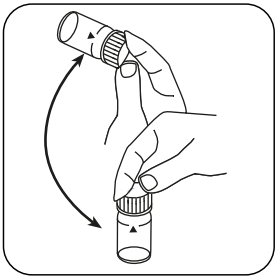


Tablette(n) unter leichter Drehung zerdrücken.

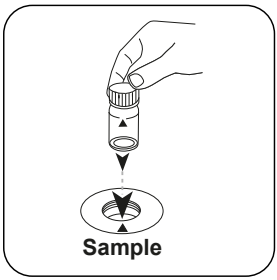
Küvette bis zur **10-mL-Marke** mit der **Probe** auffüllen.



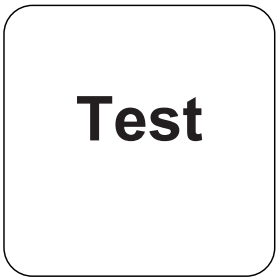
Küvette(n) verschließen.



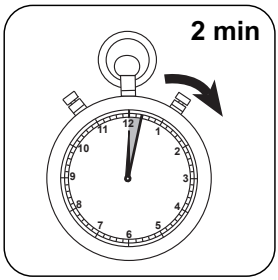
Tablette(n) durch Umschwenken lösen.



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



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



2 Minute(n) Reaktionszeit abwarten.

Nach Ablauf der Reaktionszeit erfolgt automatisch die Messung.

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

Auswertung

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

Einheit	Zitierform	Umrechnungsfaktor
mg/l	O_3	1
mg/l	Cl_2	1.4771

Chemische Methode

DPD / Glycin

Appendix

Störungen

Permanente Störungen

1. Alle in den Proben vorhandenen Oxidationsmittel reagieren wie Chlor, was zu Mehrbefunden führt.
2. Konzentrationen über 6 mg/L Ozon können zu Ergebnissen innerhalb des Messbereiches bis hin zu 0 mg/L führen. In diesem Fall ist die Wasserprobe zu verdünnen. 10 ml der verdünnten Probe werden mit Reagenz versetzt und die Messung wiederholt (Plausibilitätstest).

Literaturverweise

Colorimetric Chemical Analytical Methods, 9th Edition, Lovibond

Abgeleitet von

DIN 38408-3:2011-04

[e)] Hilfsreagenz, alternativ zur DPD No. 1 / No. 3 bei Eintrübungen der Probe durch hohen Calciumionengehalt und/ oder hohe Leitfähigkeit | [f)] Hilfsreagenz, wird zusätzlich für die Bestimmung Brom, Chlordioxid bzw. Ozon benötigt bei Anwesenheit von Chlor | [#] inklusive Rührstab

Ozon PP M301

0,015 - 1,2 mg/L O_3

DPD / Glycin

DE

Material

Benötigtes Material (zum Teil optional):

Reagenzien	Form/Menge	Bestell-Nr.
Chlorine Total DPD F10	Pulver / 100 St.	530120
Chlorine Total DPD F10	Pulver / 1000 St.	530123
Glycine [f)]	Tablette / 100	512170BT
Glycine [f)]	Tablette / 250	512171BT

Vorbereitung

1. Reinigung der Küvetten:
   Da viele Haushaltsreiniger (z.B. Geschirrspülmittel) reduzierende Stoffe enthalten, kann es bei der nachfolgenden Bestimmung von Oxidationsmitteln (z.B. Ozon, Chlor) zu Minderbefunden kommen. Um diesen Messfehler auszuschließen, sollten die Glasgeräte chlorzehrungsfrei sein. Dazu weden die Glasgeräte für eine Stunde unter Natriumhypochloritlösung (0,1 g/L) aufbewahrt und danach gründlich mit VE-Wasser gespült.
2. Bei der Probenvorbereitung muss das Ausgasen von Ozon, z.B. durch Pipettieren und Schütteln vermieden werden. Die Analyse muss unmittelbar nach der Probennahme erfolgen.
3. Stark alkalische oder saure Wässer müssen vor der Analyse in einen pH-Bereich zwischen 6 und 7 gebracht werden (mit 0,5 mol/l Schwefelsäure bzw. 1 mol/l Natronlauge).

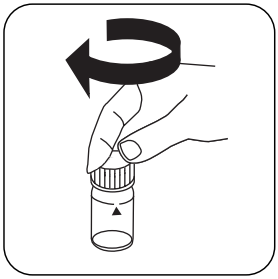
Durchführung der Bestimmung Ozon, in Anwesenheit von Chlor, mit Pulverpäckchen

Die Methode im Gerät auswählen.

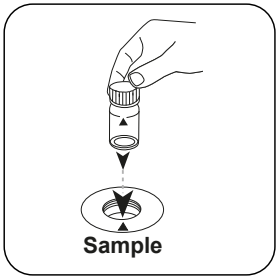
Wählen Sie zudem die Bestimmung: neben Chlor

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

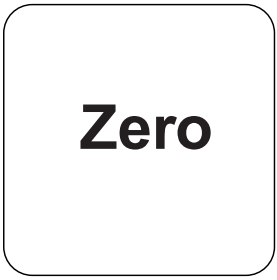
24-mm-Küvette mit **10 mL Probe** füllen.



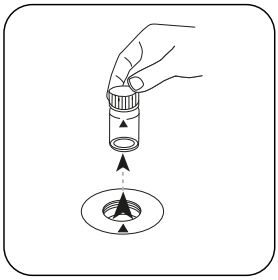
Küvette(n) verschließen.



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

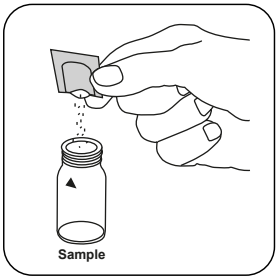


Taste **ZERO** drücken.

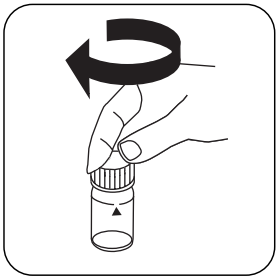


Küvette aus dem Messschacht nehmen.

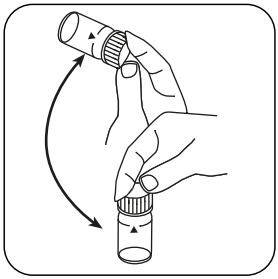
Bei Geräten, die **keine ZERO-Messung** erfordern, **hier beginnen**.



Ein **Chlorine TOTAL-DPD/F 10 Pulverpäckchen** zugeben.

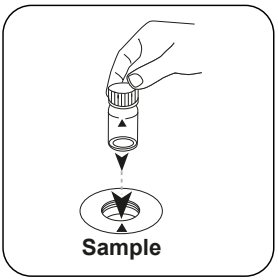


Küvette(n) verschließen.

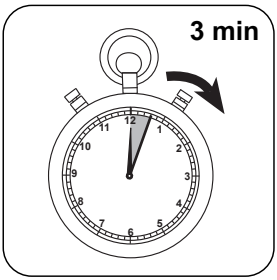


Inhalt durch Umschwenken mischen (20 Sek.).

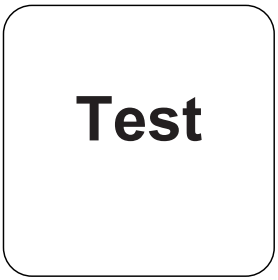
DE



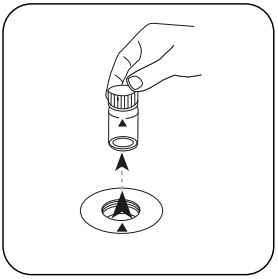
Die **Probenküvette** in den Messschacht stellen. Positionierung beachten.



3 Minute(n) Reaktionszeit abwarten.

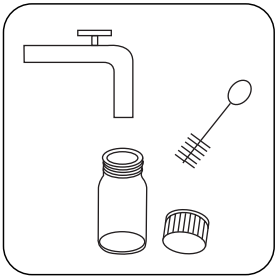


Taste **TEST** (XD: **START**) drücken.



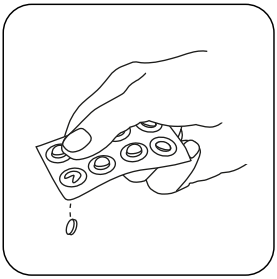
Küvette aus dem Messschacht nehmen.

Küvette entleeren.

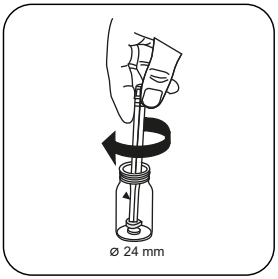


Die Küvette und den Küvettendeckel gründlich reinigen.

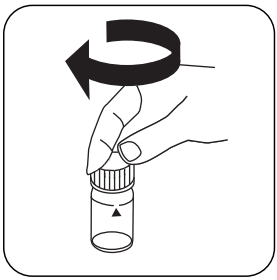
24-mm-Küvette mit **10 mL Probe** füllen.



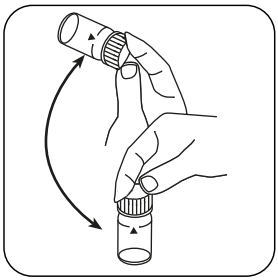
Eine **GLYCINE Tablette** zugeben.



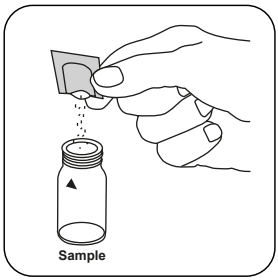
Tablette(n) unter leichter Drehung zerdrücken.



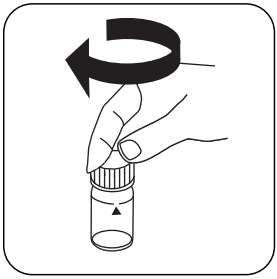
Küvette(n) verschließen.



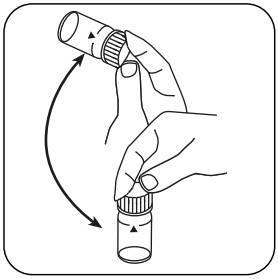
Tablette(n) durch Umschwenken lösen.



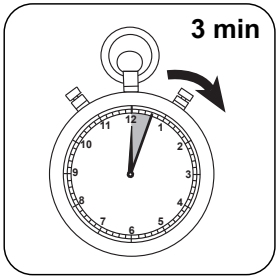
Ein **Chlorine TOTAL-DPD/F 10 Pulverpäckchen** zugeben.



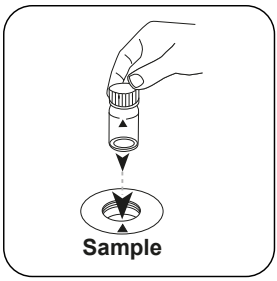
Küvette(n) verschließen.



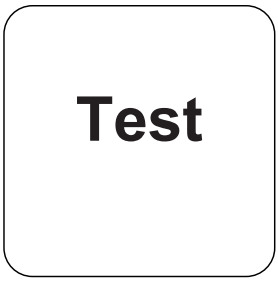
Inhalt durch Umschwenken mischen (20 Sek.).



3 Minute(n) Reaktionszeit abwarten.



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



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

In der Anzeige erscheint das Ergebnis in mg/L Ozon, mg/l Gesamtchlor.

Durchführung der Bestimmung Ozon, in Abwesenheit von Chlor, mit Pulverpäckchen

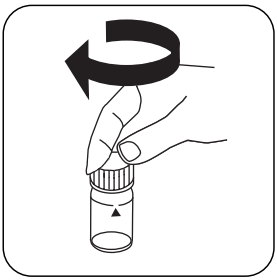
Die Methode im Gerät auswählen.

Wählen Sie zudem die Bestimmung: ohne Chlor

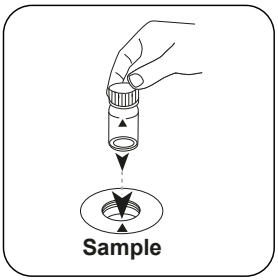
Für diese Methode muss bei folgenden Geräten nicht jedes mal eine ZERO-Messung durchgeführt werden: XD 7000, XD 7500

DE

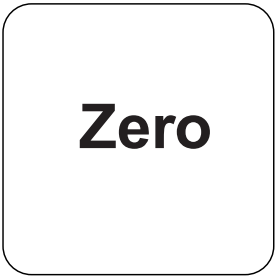
24-mm-Küvette mit **10 mL Probe** füllen.



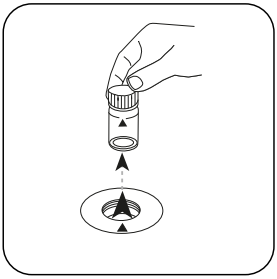
Küvette(n) verschließen.



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

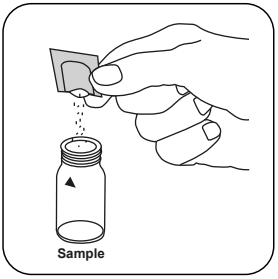


Taste **ZERO** drücken.



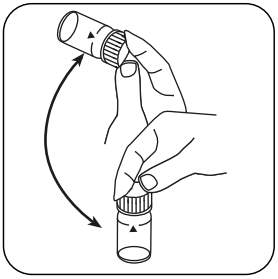
Küvette aus dem Messschacht nehmen.

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

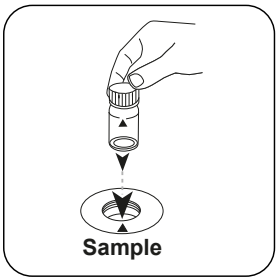


Ein **Chlorine TOTAL-DPD/F 10 Pulverpäckchen** zugeben.

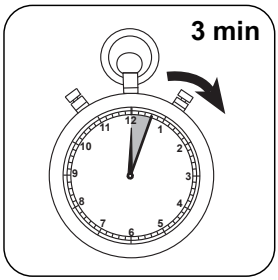
Küvette(n) verschließen.



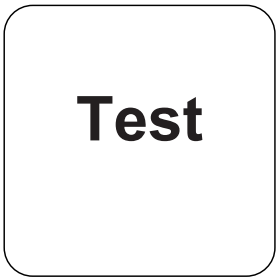
Inhalt durch Umschwenken mischen (20 Sek.).



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



3 Minute(n) Reaktionszeit abwarten.



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

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

Auswertung

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

Einheit	Zitierform	Umrechnungsfaktor
mg/l	O_3	1
mg/l	Cl_2	1.4771

Chemische Methode

DPD / Glycin

Störungen

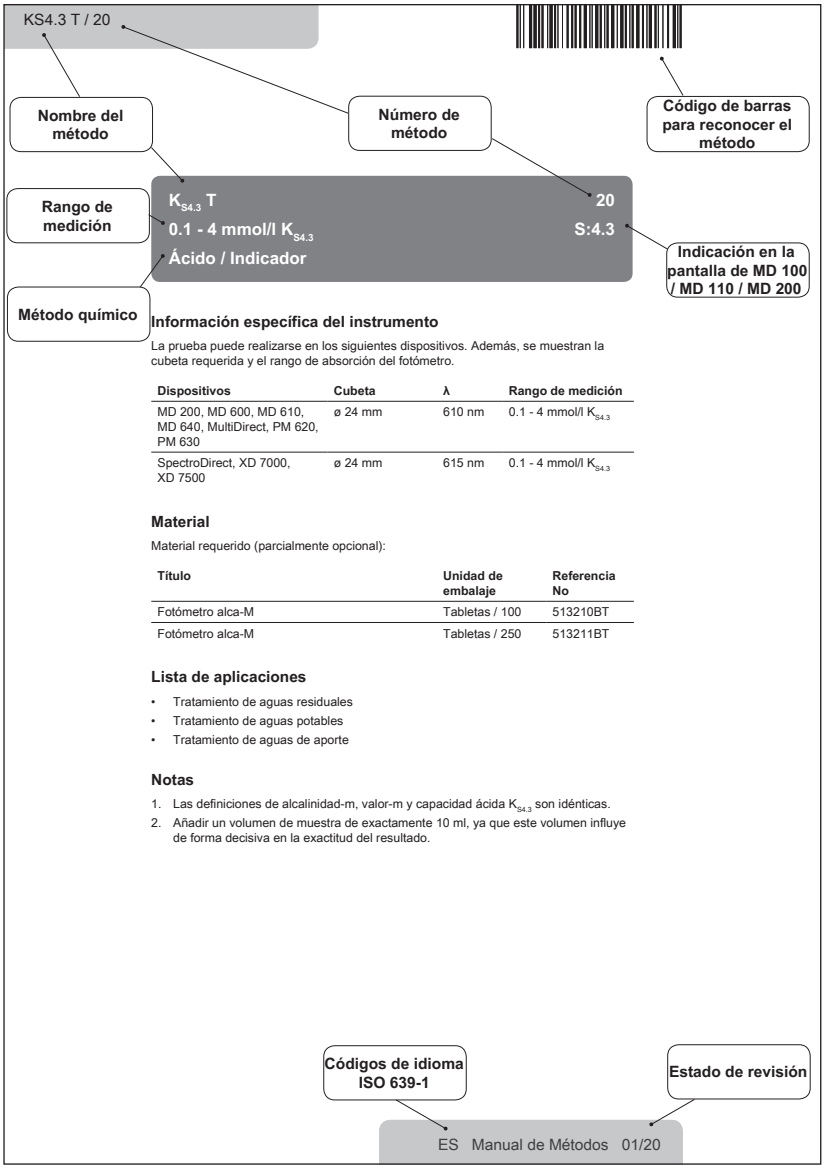
Permanente Störungen

1. Alle in den Proben vorhandenen Oxidationsmittel reagieren wie Chlor, was zu Mehrbefunden führt.
2. Konzentrationen über 6 mg/L Ozon können zu Ergebnissen innerhalb des Messbereiches bis hin zu 0 mg/L führen. In diesem Fall ist die Wasserprobe zu verdünnen. 10 ml der verdünnten Probe werden mit Reagenz versetzt und die Messung wiederholt (Plausibilitätstest).

Methodenvalidierung

Nachweisgrenze	0.01 mg/L
Bestimmungsgrenze	0.03 mg/L
Messbereichsende	2 mg/L
Empfindlichkeit	1.68 mg/L / Abs
Vertrauensbereich	0.033 mg/L
Verfahrensstandardabweichung	0.014 mg/L
Verfahrensvariationskoeffizient	1.34 %

[f] Hilfsreagenz, wird zusätzlich für die Bestimmung Brom, Chlordioxid bzw. Ozon benötigt bei Anwesenheit von Chlor


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

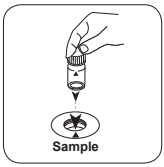
Ejecución de la determinación Capacidad ácida $K_{S4.3}$ con tableta

Seleccionar el método en el aparato.

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

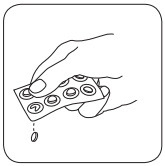
Llenar la cubeta de 24 mm con **10 ml de muestra** .

Cerrar la(s) cubeta(s).

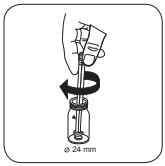


Poner la **cubeta de muestra** en el compartimiento de medición. ¡Debe tenerse en cuenta el posicionamiento!

• • •



Añadir **tableta ALKA-M-PHOTOMETER**.



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

Cerrar la(s) cubeta(s).

Ozono T M300

0.02 - 2 mg/L O_3 O3

DPD / Glicina

ES

Material

Material requerido (parcialmente opcional):

Reactivos	Unidad de embalaje	No. de referencia
DPD nº1	Tabletas / 100	511050BT
DPD nº 1	Tabletas / 250	511051BT
DPD nº 1	Tabletas / 500	511052BT
DPD nº 3	Tabletas / 100	511080BT
DPD nº 3	Tabletas / 250	511081BT
DPD nº 3	Tabletas / 500	511082BT
DPD nº 1 High Calcium [e)]	Tabletas / 100	515740BT
DPD nº 1 High Calcium [e)]	Tabletas / 250	515741BT
DPD nº 1 High Calcium [e)]	Tabletas / 500	515742BT
DPD nº 3 High Calcium [e)]	Tabletas / 100	515730BT
DPD nº 3 High Calcium [e)]	Tabletas / 250	515731BT
DPD nº 3 High Calcium [e)]	Tabletas / 500	515732BT
Glicina [f)]	Tabletas / 100	512170BT
Glicina [f)]	Tabletas / 250	512171BT
Juego DPD nº 1/nº 3#	100 cada	517711BT
Juego DPD nº 1/nº 3#	250 cada	517712BT
Juego DPD nº 1/nº 3 High Calcium#	100 cada	517781BT
Juego DPD nº 1/nº 3 High Calcium#	250 cada	517782BT
Juego DPD nº 1/glicina #	100 cada	517731BT
Juego DPD nº 1/glicina #	250 cada	517732BT

Preparación

1. Limpieza de las cubetas:
   Muchos productos de limpieza (p. ej., detergentes de lavavajillas) poseen componentes reductores, que pueden reducir los resultados en la determinación siguiente de oxidantes (p. ej., ozono, cloro). Para evitar estas alteraciones, los aparatos de vidrio deben estar exentos de componentes corrosivos al cloro. Para ello, deberá sumergir los aparatos de vidrio durante una hora en una solución de hipoclorito sódico (0,1 g/L), enjuagándolos minuciosamente a continuación con agua desionizada.
2. Evitar durante la preparación de la muestra la desgasificación de ozono, p. ej., al pipetar o agitar. La determinación se ha de realizar inmediatamente después de la toma de la muestra.
3. Las muestras acuosas muy ácidas o muy básicas se deberán neutralizar a un valor de pH entre 6 y 7 antes de realizar el análisis (con 0,5 mol/l de ácido sulfúrico o 1 mol/l de hidróxido sódico).

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

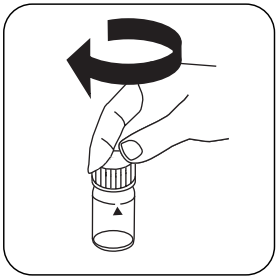
Seleccionar el método en el aparato.

Seleccione además la determinación: en presencia de Cloro

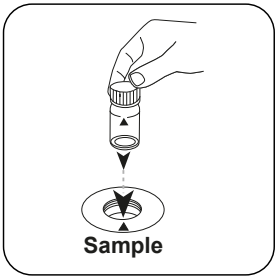
Para este método, no es necesario realizar una medición CERO cada vez en los siguientes dispositivos: XD 7000, XD 7500

ES

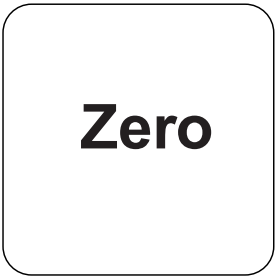
Llenar la cubeta de 24 mm con **10 mL de muestra** .



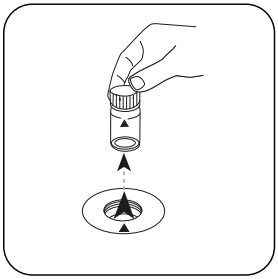
Cerrar la(s) cubeta(s).



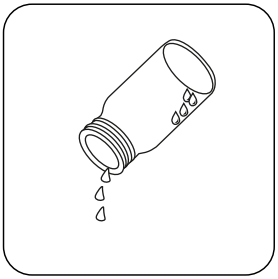
Poner la **cubeta de muestra** en el compartimiento de medición. ¡Debe tenerse en cuenta el posicionamiento!



Pulsar la tecla **ZERO**.

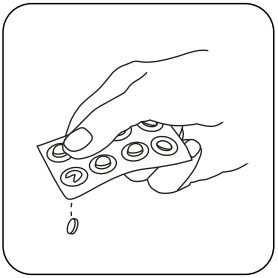


Extraer la cubeta del compartimiento de medición.

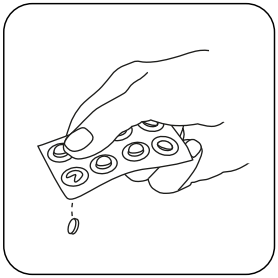


Vaciar la cubeta excepto algunas gotas.

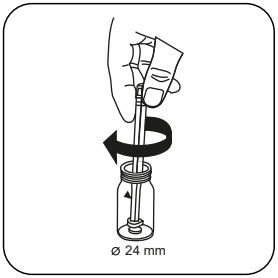
Para los aparatos que **no requieran medición CERO** , **empezar aquí**.



Añadir **tableta DPD No. 1**.

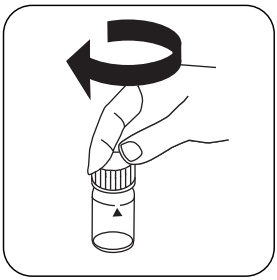


Añadir **tableta DPD No. 3**.

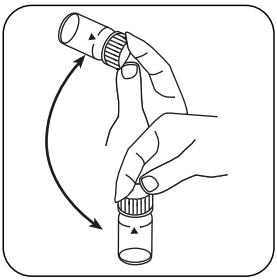


Triturar la(s) tableta(s) girando ligeramente.

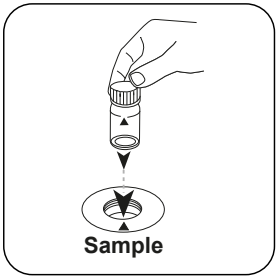
Llenar la cubeta con la **muestra** hasta la **marca de 10 mL** .



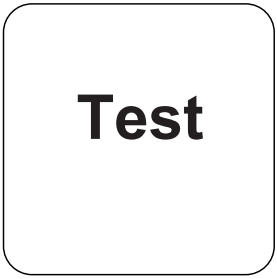
Cerrar la(s) cubeta(s).



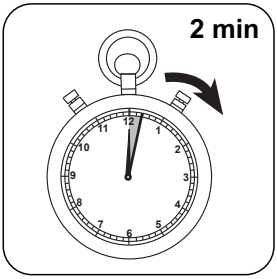
Disolver la(s) tableta(s) girando.



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

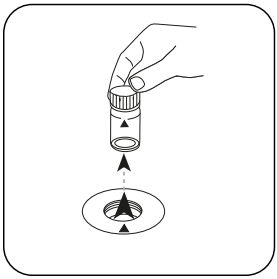


Pulsar la tecla **TEST** (XD: **START**).



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

Finalizado el periodo de reacción se realizará la determinación automáticamente.



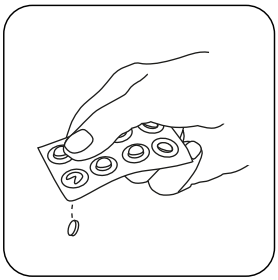
Extraer la cubeta del compartimiento de medición.

Vaciar la cubeta.

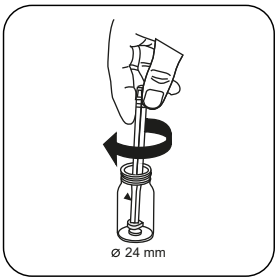
Limpiar a fondo la cubeta y la tapa.

ES

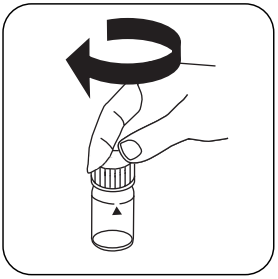
Llenar una **segunda cubeta** con **10 mL de muestra**.



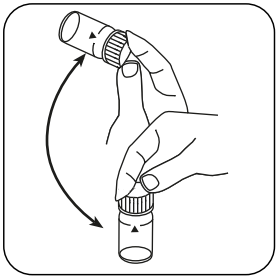
Añadir **tableta GLYCINE**.



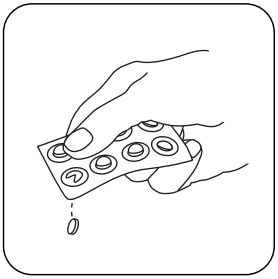
Triturar la(s) tableta(s) girando ligeramente.



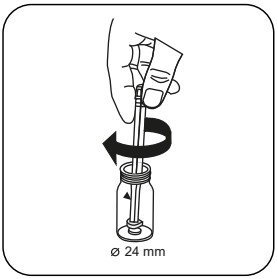
Cerrar la(s) cubeta(s).



Disolver la(s) tableta(s) girando.

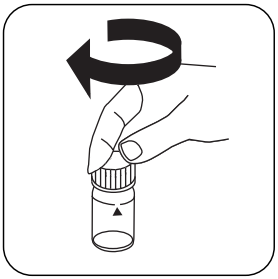


Añadir **una tableta DPD No. 1** y **una tableta DPD No. 3** directamente de su envoltura, en la primera cubeta.

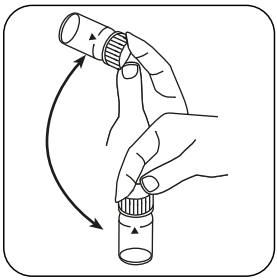


Triturar la(s) tableta(s) girando ligeramente.

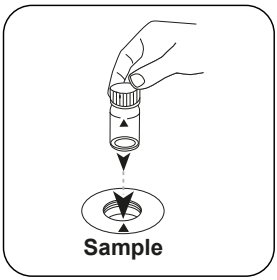
Llenar la **solución de glicina** preparada en la cubeta preparada.



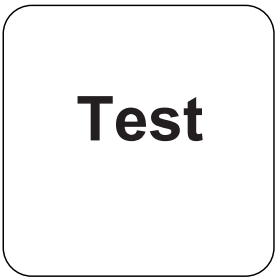
Cerrar la(s) cubeta(s).



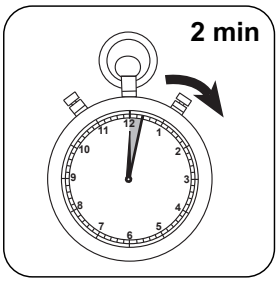
Disolver la(s) tableta(s) girando.



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



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



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

Finalizado el periodo de reacción se realizará la determinación automáticamente.

A continuación se visualizará el resultado en mg/L Ozono; mg/l cloro total.

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

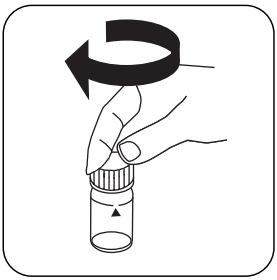
Seleccionar el método en el aparato.

Seleccione además la determinación: sin cloro

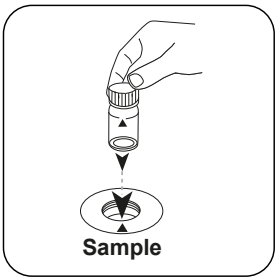
Para este método, no es necesario realizar una medición CERO cada vez en los siguientes dispositivos: XD 7000, XD 7500

ES

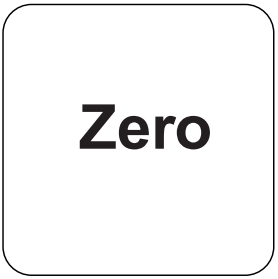
Llenar la cubeta de 24 mm con **10 mL de muestra** .



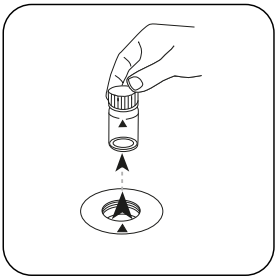
Cerrar la(s) cubeta(s).



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



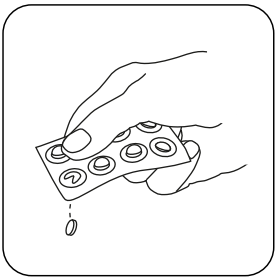
Pulsar la tecla **ZERO**.



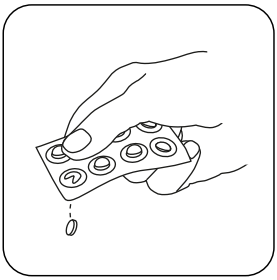
Extraer la cubeta del compartimiento de medición.

Vaciar la cubeta excepto algunas gotas.

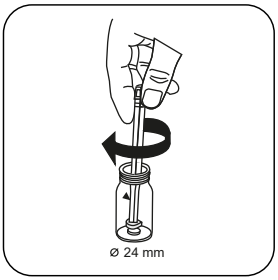
Para los aparatos que **no requieran medición CERO** , **empezar aquí**.



Añadir **tableta DPD No. 1**.

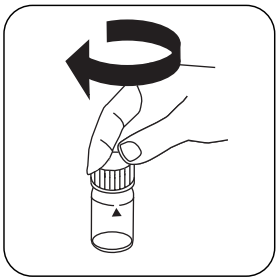


Añadir **tableta DPD No. 3**.

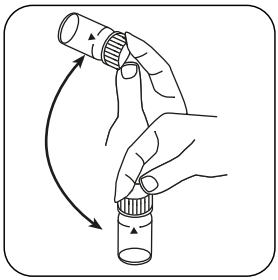


Triturar la(s) tableta(s) girando ligeramente.

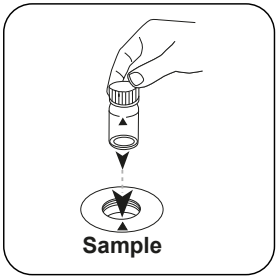
Llenar la cubeta con la **muestra** hasta la **marca de 10 mL** .



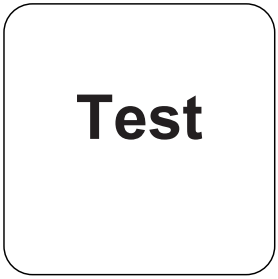
Cerrar la(s) cubeta(s).



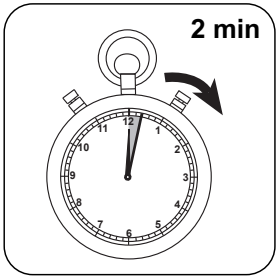
Disolver la(s) tableta(s) girando.



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



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



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

Finalizado el periodo de reacción se realizará la determinación automáticamente.

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

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	O_3	1
mg/l	Cl_2	1.4771

Método químico

DPD / Glicina

Apéndice

Interferencia

Interferencias persistentes

1. Todos los elementos oxidantes existentes en la muestra reaccionan como el cloro, lo que produce un resultado más elevado.
2. Las concentraciones de peróxido de ozono mayores a 6 mg/L pueden conducir a resultados de dentro del campo de medición hasta 0 mg/L. En este caso, se deberá diluir la muestra acuosa. Se mezclan 10 ml de muestra diluida con reactivo y se repite la medición (prueba de plausibilidad).

Bibliografía

Colorimetric Chemical Analytical Methods, 9th Edition, Lovibond

Derivado de

DIN 38408-3:2011-04

[e)] Reactivo auxiliar, alternativo a DPD No.1/3 en enturbiamientos de la prueba debido a concentraciones elevadas de calcio y/o elevada conductividad | [f)] Reactivo auxiliar, necesario adicionalmente para la determinación de bromo, dióxido de cloro y ozono en presencia de cloro

Ozono PP M301

0.015 - 1.2 mg/L O_3

DPD / Glicina

ES

Material

Material requerido (parcialmente opcional):

Reactivos	Unidad de embalaje	No. de referencia
Cloro total DPD F10	Polvos / 100 Cantidad	530120
Cloro total DPD F10	Polvos / 1000 Cantidad	530123
Glicina [f)]	Tabletas / 100	512170BT
Glicina [f)]	Tabletas / 250	512171BT

Preparación

1. Limpieza de las cubetas:
   Muchos productos de limpieza (p. ej., detergentes de lavavajillas) poseen componentes reductores, que pueden reducir los resultados en la determinación siguiente de oxidantes (p. ej., ozono, cloro). Para evitar estas alteraciones, los aparatos de vidrio deben estar exentos de componentes corrosivos al cloro. Para ello, deberá sumergir los aparatos de vidrio durante una hora en una solución de hipoclorito sódico (0,1 g/L), enjuagándolos minuciosamente a continuación con agua desionizada.
2. Evitar durante la preparación de la muestra la desgasificación de ozono, p. ej., al pipetar o agitar. La determinación se ha de realizar inmediatamente después de la toma de la muestra.
3. Las muestras acuosas muy ácidas o muy básicas se deberán neutralizar a un valor de pH entre 6 y 7 antes de realizar el análisis (con 0,5 mol/l de ácido sulfúrico o 1 mol/l de hidróxido sódico).

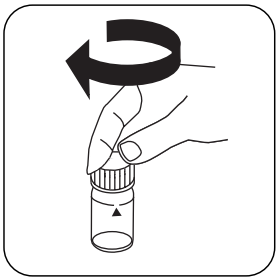
Ejecución de la determinación Ozono con reactivo Powder Pack, en presencia de cloro

Seleccionar el método en el aparato.

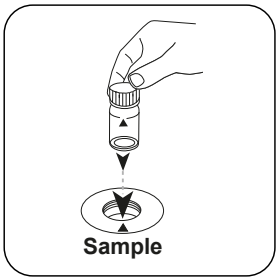
Seleccione además la determinación: en presencia de Cloro

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

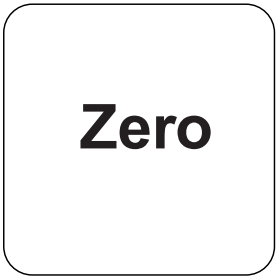
Llenar la cubeta de 24 mm con **10 mL de muestra** .



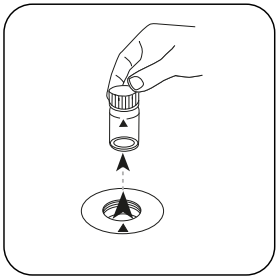
Cerrar la(s) cubeta(s).



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

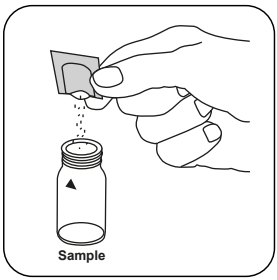


Pulsar la tecla **ZERO**.



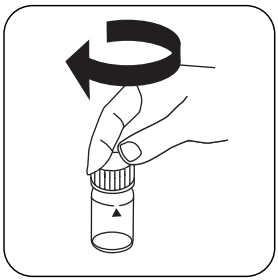
Extraer la cubeta del compartimiento de medición.

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

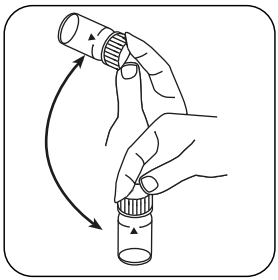


Añadir un **sobre de polvos Chlorine TOTAL-DPD/F10**

.

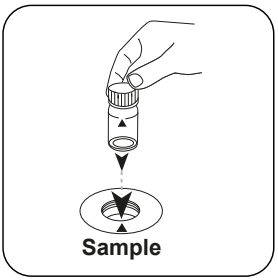


Cerrar la(s) cubeta(s).

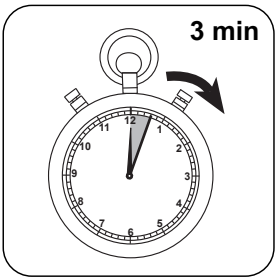


Mezclar el contenido girando (20 sec.).

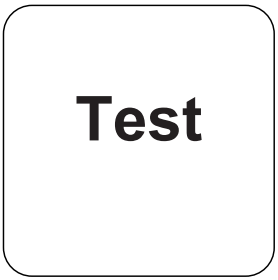
ES



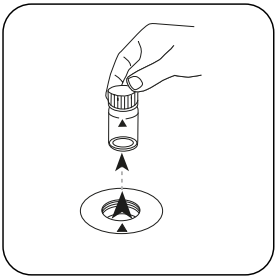
Poner la **cubeta de muestra** en el compartimiento de medición. ¡Debe tenerse en cuenta el posicionamiento!



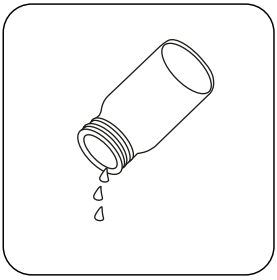
Esperar **3 minutos como periodo de reacción**.



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



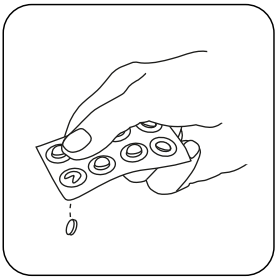
Extraer la cubeta del compartimiento de medición.



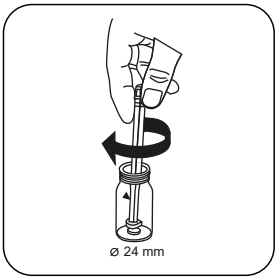
Vaciar la cubeta.

Limpiar a fondo la cubeta y la tapa.

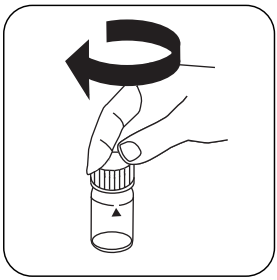
Llenar la cubeta de 24 mm con **10 mL de muestra** .



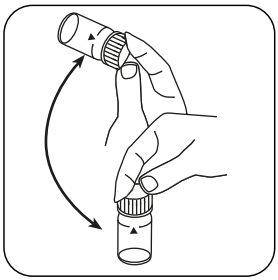
Añadir **tableta GLYCINE**.



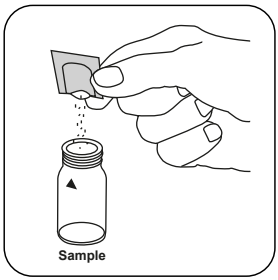
Triturar la(s) tableta(s) girando ligeramente.



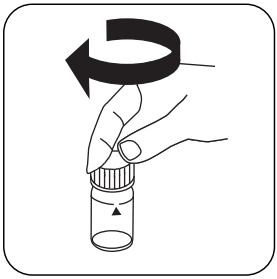
Cerrar la(s) cubeta(s).



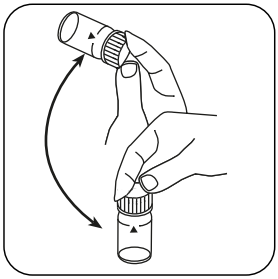
Disolver la(s) tableta(s) girando.



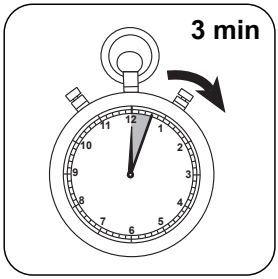
Añadir un **sobre de polvos Chlorine TOTAL-DPD/F10** .



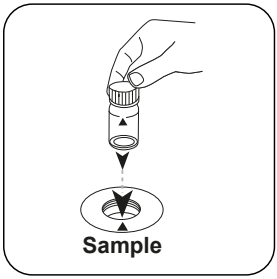
Cerrar la(s) cubeta(s).



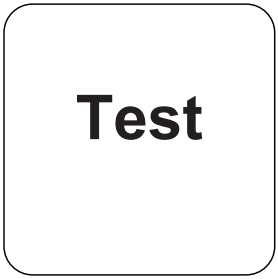
Mezclar el contenido girando (20 sec.).



Esperar **3 minutos como 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 Ozono, mg/l cloro total.

Ejecución de la determinación Ozono con reactivo Powder Pack, en ausencia de cloro

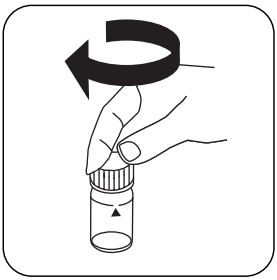
Seleccionar el método en el aparato.

Seleccione además la determinación: sin cloro

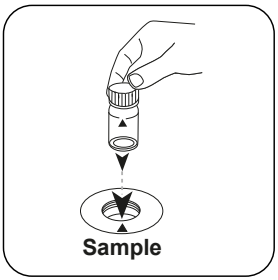
Para este método, no es necesario realizar una medición CERO cada vez en los siguientes dispositivos: XD 7000, XD 7500

ES

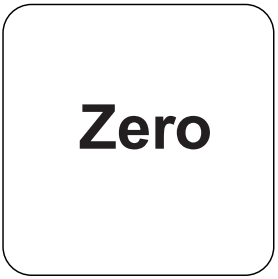
Llenar la cubeta de 24 mm con **10 mL de muestra** .



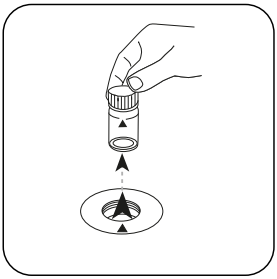
Cerrar la(s) cubeta(s).



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

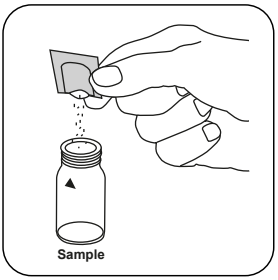


Pulsar la tecla **ZERO**.

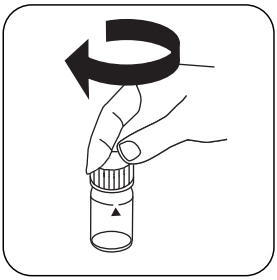


Extraer la cubeta del compartimiento de medición.

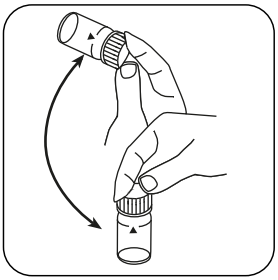
Para los aparatos que **no requieran medición CERO** , **empezar aquí**.



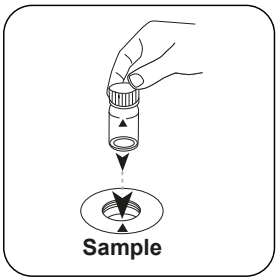
Añadir un **sobre de polvos Chlorine TOTAL-DPD/F10** .



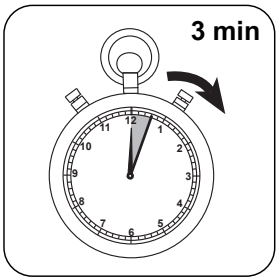
Cerrar la(s) cubeta(s).



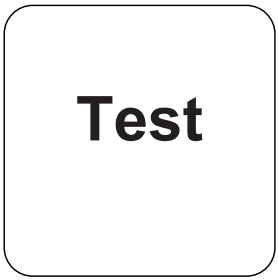
Mezclar el contenido girando (20 sec.).



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



Esperar **3 minutos como periodo de reacción**.



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

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

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	O_3	1
mg/l	Cl_2	1.4771

ES

Método químico

DPD / Glicina

Interferencia

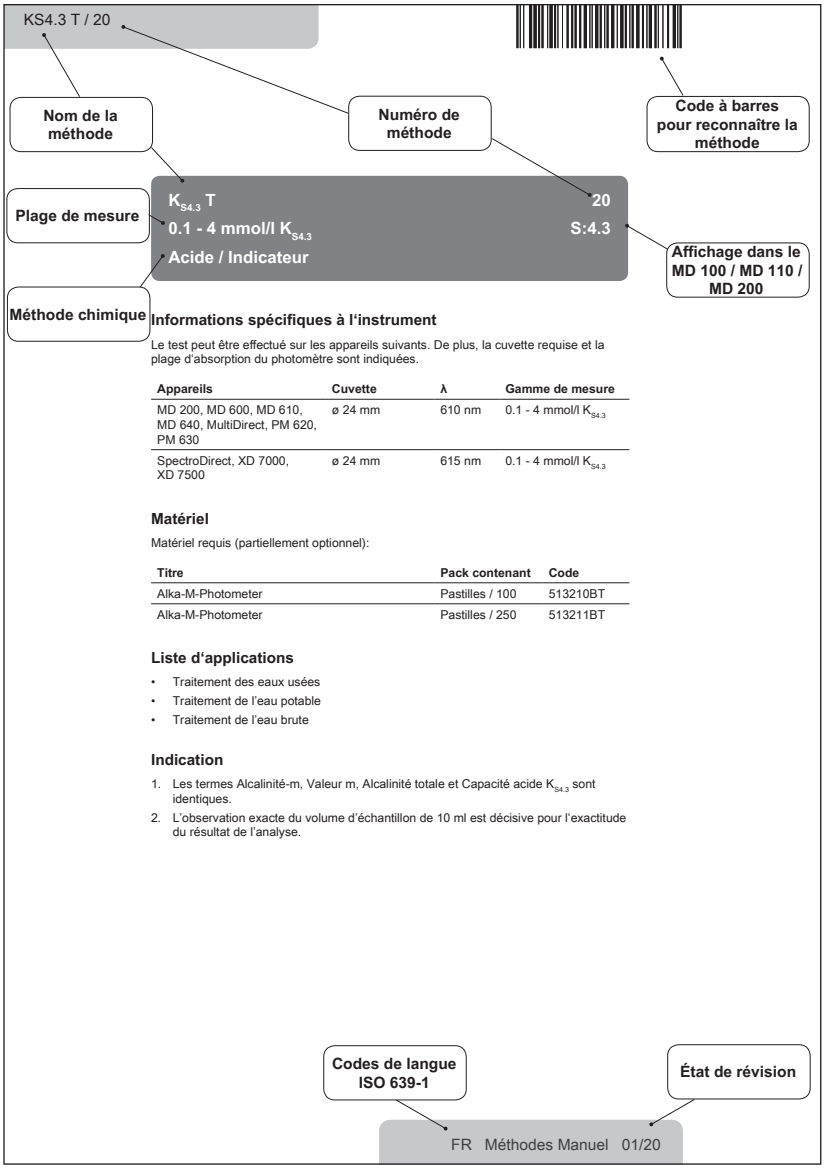
Interferencias persistentes

1. Todos los elementos oxidantes existentes en la muestra reaccionan como el cloro, lo que produce un resultado más elevado.
2. Las concentraciones de peróxido de ozono mayores a 6 mg/L pueden conducir a resultados de dentro del campo de medición hasta 0 mg/L. En este caso, se deberá diluir la muestra acuosa. Se mezclan 10 ml de muestra diluida con reactivo y se repite la medición (prueba de plausibilidad).

Validación del método

Límite de detección	0.01 mg/L
Límite de determinación	0.03 mg/L
Límite del rango de medición	2 mg/L
Sensibilidad	1.68 mg/L / Abs
Intervalo de confianza	0.033 mg/L
Desviación estándar	0.014 mg/L
Coeficiente de variación	1.34 %

[1] Reactivo auxiliar, necesario adicionalmente para la determinación de bromo, dióxido de cloro y ozono en presencia de cloro


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

Procédure du test

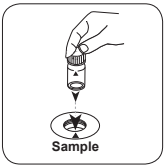
Réalisation de la quantification Capacité acide $K_{S4.3}$ avec pastille

Sélectionnez la méthode sur l'appareil.

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

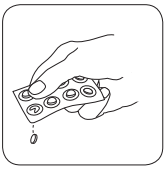
Remplissez une cuvette de 24 mm de **10 ml d'échantillon**.

Fermez la(les) cuvette(s).

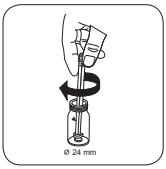


Placez la **cuvette réservée à l'échantillon** dans la chambre de mesure. Attention à la positionner correctement.

• • •



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



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

Fermez la(les) cuvette(s).

Ozone T **M300**

0.02 - 2 mg/L O_3 **O3**

DPD / Glycine

FR

Matériel

Matériel requis (partiellement optionnel):

Réactifs	Pack contenant	Code
DPD N°1	Pastilles / 100	511050BT
DPD N° 1	Pastilles / 250	511051BT
DPD N° 1	Pastilles / 500	511052BT
DPD N° 3	Pastilles / 100	511080BT
DPD N° 3	Pastilles / 250	511081BT
DPD N° 3	Pastilles / 500	511082BT
DPD N° 1 High Calcium [e)]	Pastilles / 100	515740BT
DPD N° 1 High Calcium [e)]	Pastilles / 250	515741BT
DPD N° 1 High Calcium [e)]	Pastilles / 500	515742BT
DPD N° 3 High Calcium [e)]	Pastilles / 100	515730BT
DPD N° 3 High Calcium [e)]	Pastilles / 250	515731BT
DPD N° 3 High Calcium [e)]	Pastilles / 500	515732BT
Glycine [f)]	Pastilles / 100	512170BT
Glycine [f)]	Pastilles / 250	512171BT
Kit DPD N° 1/N° 3#	100 chacun	517711BT
Kit DPD N° 1/N° 3#	250 chacun	517712BT
Kit DPD N° 1/N° 3 High Calcium#	100 chacun	517781BT
Kit DPD N° 1/N° 3 High Calcium#	250 chacun	517782BT
Kit DPD N° 1/Glycine #	100 chacun	517731BT
Kit DPD N° 1/Glycine #	250 chacun	517732BT

Préparation

1. Nettoyage des cuvettes :
   Beaucoup de produits de nettoyage domestiques (par ex. liquide vaisselle) contenant des agents réducteurs, il est possible que lors de la quantification suivante des agents oxydants (par ex. ozone, chlore), les résultats soient plus bas. Pour exclure ces erreurs, les instruments en verre utilisés devraient être insensibles aux effets du chlore. Il est recommandé de laisser les instruments en verre pendant une heure dans une solution d'hypochlorite de sodium (0,1 g/L) et de bien les rincer ensuite à l'eau déminéralisée.
2. Lors de la préparation de l'échantillon, il faudra éviter le dégazage de l'ozone, par ex. par pipetage ou agitation. L'analyse devra avoir lieu immédiatement après le prélèvement de l'échantillon.
3. Avant l'analyse, les eaux fortement alcalines ou acides doivent être ajustées sur un pH compris entre 6 et 7 (avec 0,5 mol/l d'acide sulfurique ou 1 mol/l de soude caustique).

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

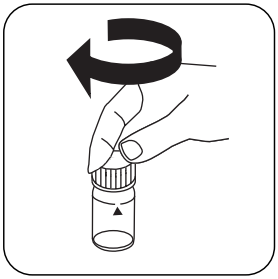
Sélectionnez la méthode sur l'appareil.

Sélectionnez également la quantification : en présence de chlore

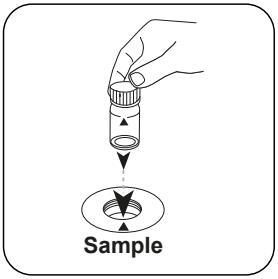
Pour cette méthode, il n'est pas nécessaire d'effectuer une mesure ZERO à chaque fois sur les appareils suivants : XD 7000, XD 7500

FR

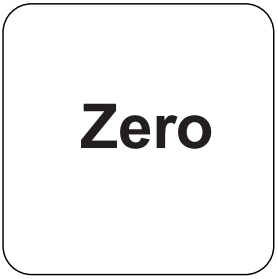
Remplissez une cuvette de 24 mm de **10 mL d'échantillon**.



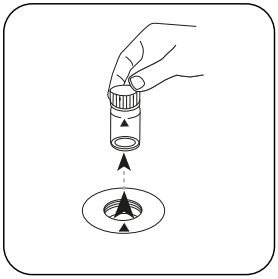
Fermez la(les) cuvette(s).



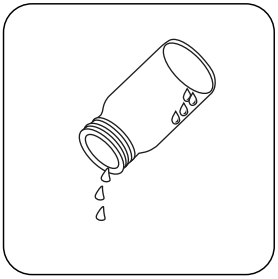
Placez la **cuvette réservée à l'échantillon** dans la chambre de mesure. Attention à la positionner correctement.



Appuyez sur la touche **ZERO**.

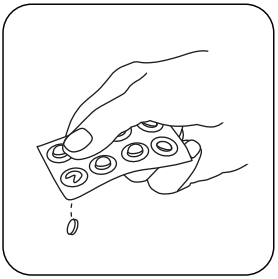


Retirez la cuvette de la chambre de mesure.

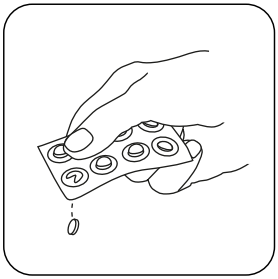


Videz pratiquement la cuvette en y laissant quelques gouttes.

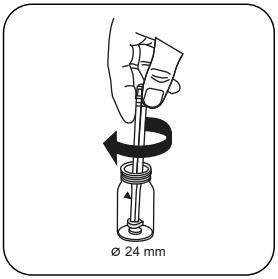
Sur les appareils ne nécessitant **aucune mesure ZÉRO** , **commencez ici**.



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

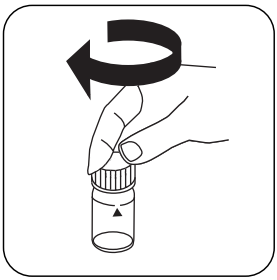


Ajoutez une **pastille de DPD No. 3**.

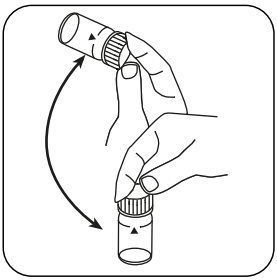


Écrasez la(les) pastille(s) en la(les) tournant un peu.

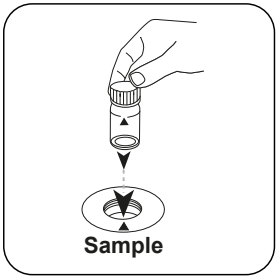
Remplissez la cuvette jusqu'au **repère de 10 mL** en y versant l'**échantillon**.



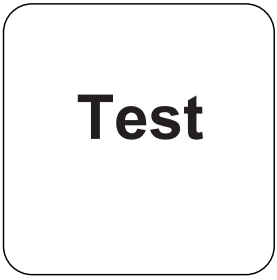
Fermez la(les) cuvette(s).



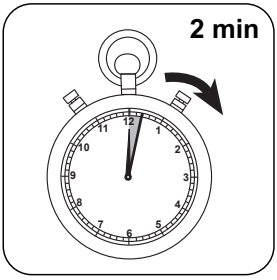
Dissolvez la(les) pastille(s) en mettant le tube plusieurs fois à l'envers.



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

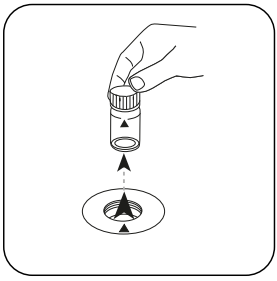


Appuyez sur la touche **TEST** (XD: **START**).

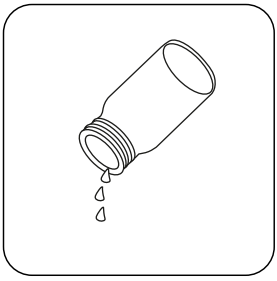


Attendez la fin du **temps de réaction de 2 minute(s)** .

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



Retirez la cuvette de la chambre de mesure.

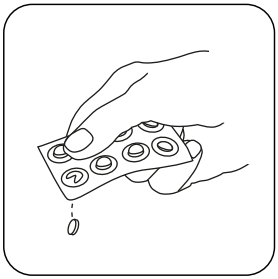


Videz la cuvette.

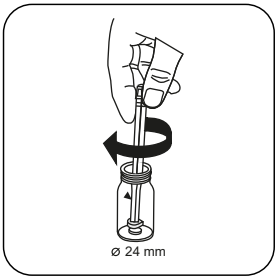
Nettoyez à fond la cuvette et le couvercle de la cuvette.

FR

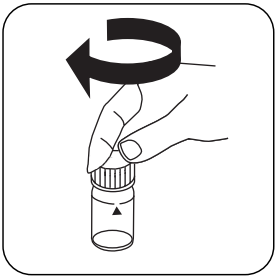
Remplissez une **deuxième cuvette** de **10 mL d'échantillon**.



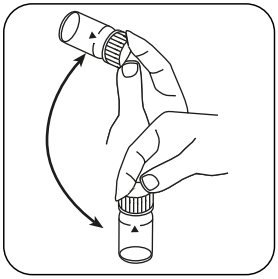
Ajoutez une **pastille de GLYCINE**.



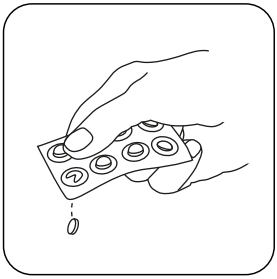
Écrasez la(les) pastille(s) en la(les) tournant un peu.



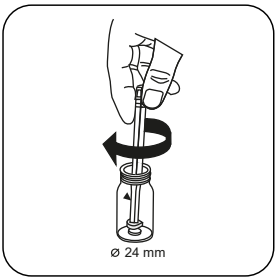
Fermez la(les) cuvette(s).



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

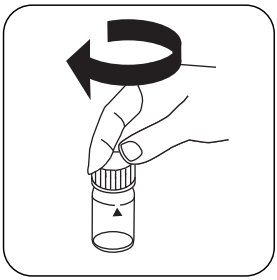


Déposez une pastille de DPD No. 1 et **une pastille de DPD No. 3** immédiatement après l'avoir déballée, dans la première cuvette.

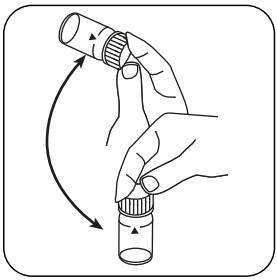


Écrasez la(les) pastille(s) en la(les) tournant un peu.

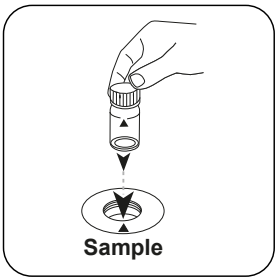
Versez la **solution de Glycine** préparée dans la cuvette préparée.



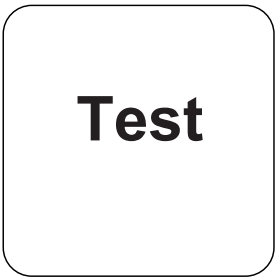
Fermez la(les) cuvette(s).



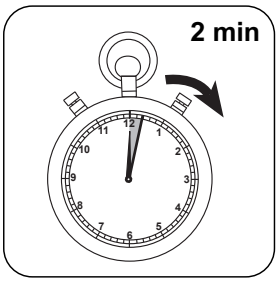
Dissolvez la(les) pastille(s) en mettant le tube plusieurs fois à l'envers.



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



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



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

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

Le résultat s'affiche à l'écran en mg/L Ozone; chlore total mg/l.

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

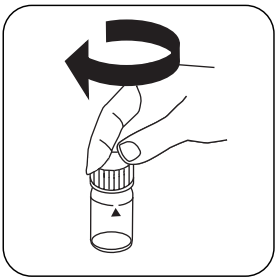
Sélectionnez la méthode sur l'appareil.

Sélectionnez également la quantification : sans chlore

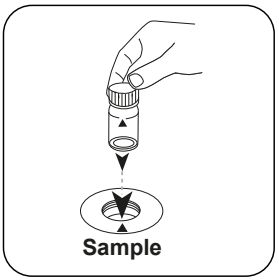
Pour cette méthode, il n'est pas nécessaire d'effectuer une mesure ZERO à chaque fois sur les appareils suivants : XD 7000, XD 7500

FR

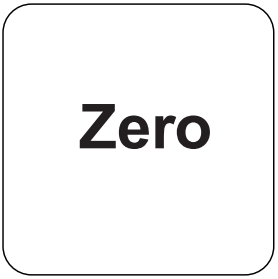
Remplissez une cuvette de 24 mm de **10 mL d'échantillon**.



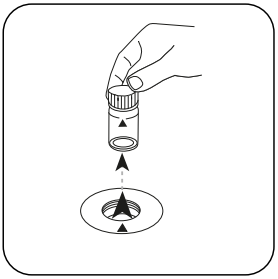
Fermez la(les) cuvette(s).



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



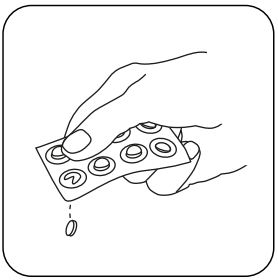
Appuyez sur la touche **ZERO**.



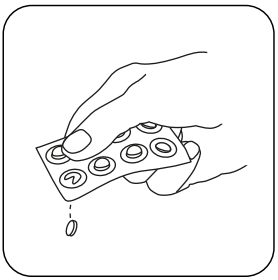
Retirez la cuvette de la chambre de mesure.

Videz pratiquement la cuvette en y laissant quelques gouttes.

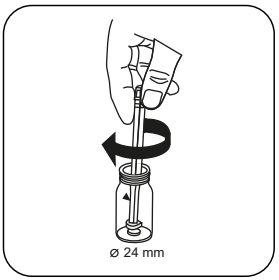
Sur les appareils ne nécessitant **aucune mesure ZÉRO** , **commencez ici**.



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

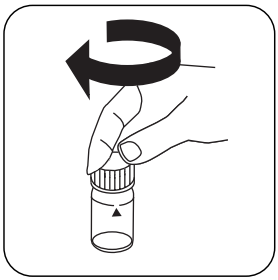


Ajoutez une **pastille de DPD No. 3**.

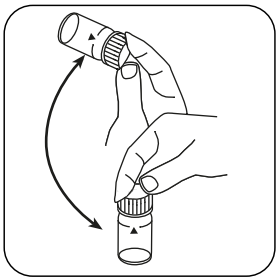


Écrasez la(les) pastille(s) en la(les) tournant un peu.

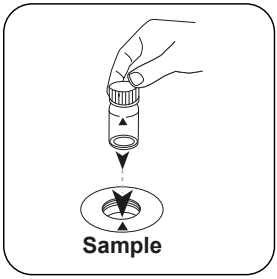
Remplissez la cuvette jusqu'au **repère de 10 mL** en y versant l'**échantillon**.



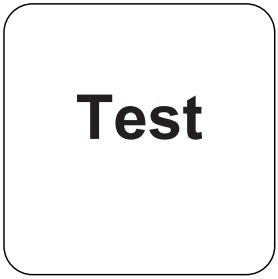
Fermez la(les) cuvette(s).



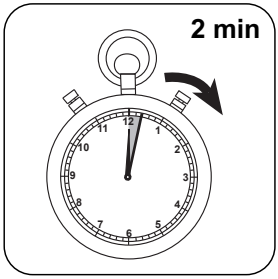
Dissolvez la(les) pastille(s) en mettant le tube plusieurs fois à l'envers.



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



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



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

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

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

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	O_3	1
mg/l	Cl_2	1.4771

FR

Méthode chimique

DPD / Glycine

Appendice

Interférences

Interférences persistantes

1. Les agents oxydants contenus dans les échantillons réagissent tous comme le chlore, ce qui entraîne des résultats plus élevés.
2. Les concentrations d'ozone supérieures à 6 mg/L peuvent provoquer des résultats dans la plage de mesure allant jusqu'à 0 mg/L. Dans ce cas, diluez l'échantillon d'eau. Le réactif est ajouté à 10 ml d'échantillon dilué. Ensuite, la mesure est répétée (test de plausibilité).

Bibliographie

Colorimetric Chemical Analytical Methods, 9th Edition, Lovibond

Dérivé de

DIN 38408-3:2011-04

[b]autre réactif, utilisé à la place de DPD No.1/3 en cas de turbidité dans l'échantillon d'eau due à une concentration élevée de calcium et/ou une conductivité élevée | [f]nécessaire pour la détermination de brome, dioxyde de chlore et ozone en présence de chlore | [j]* agitateur inclus

Ozone PP M301

0.015 - 1.2 mg/L O_3

DPD / Glycine

FR

Matériel

Matériel requis (partiellement optionnel):

Réactifs	Pack contenant	Code
Chlore total DPD F10	Poudre / 100 Pièces	530120
Chlore total DPD F10	Poudre / 1000 Pièces	530123
Glycine [f)]	Pastilles / 100	512170BT
Glycine [f)]	Pastilles / 250	512171BT

Préparation

1. Nettoyage des cuvettes :
   Beaucoup de produits de nettoyage domestiques (par ex. liquide vaisselle) contenant des agents réducteurs, il est possible que lors de la quantification suivante des agents oxydants (par ex. ozone, chlore), les résultats soient plus bas. Pour exclure ces erreurs, les instruments en verre utilisés devraient être insensibles aux effets du chlore. Il est recommandé de laisser les instruments en verre pendant une heure dans une solution d'hypochlorite de sodium (0,1 g/L) et de bien les rincer ensuite à l'eau déminéralisée.
2. Lors de la préparation de l'échantillon, il faudra éviter le dégazage de l'ozone, par ex. par pipetage ou agitation. L'analyse devra avoir lieu immédiatement après le prélèvement de l'échantillon.
3. Avant l'analyse, les eaux fortement alcalines ou acides doivent être ajustées sur un pH compris entre 6 et 7 (avec 0,5 mol/l d'acide sulfurique ou 1 mol/l de soude caustique).

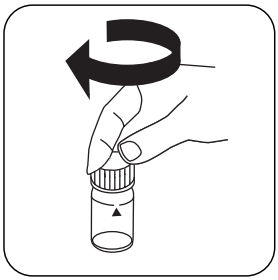
Réalisation de la quantification Ozone, en présence de chlore avec sachets de poudre

Sélectionnez la méthode sur l'appareil.

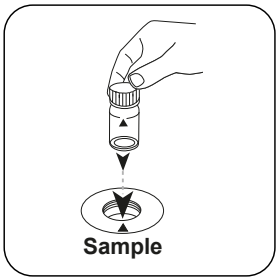
Sélectionnez également la quantification : en présence de chlore

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

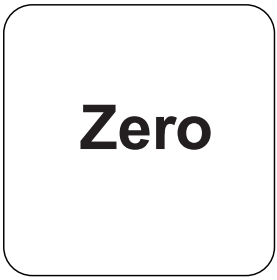
Remplissez une cuvette de 24 mm de **10 mL d'échantillon**.



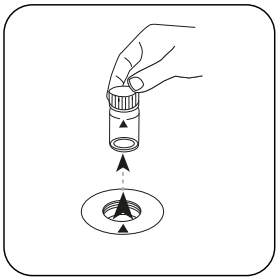
Fermez la(les) cuvette(s).



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

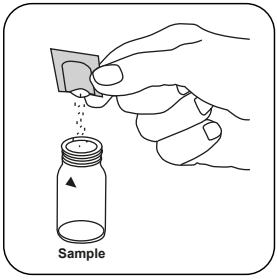


Appuyez sur la touche **ZERO**.

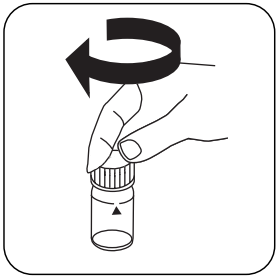


Retirez la cuvette de la chambre de mesure.

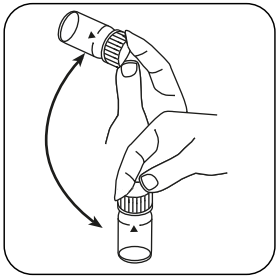
Sur les appareils ne nécessitant **aucune mesure ZÉRO** , **commencez ici**.



Ajoutez un **sachet de poudre Chlorine TOTAL-DPD/F10** .



Fermez la(les) cuvette(s).



Retourner plusieurs fois pour mélanger le contenu (20 sec.) .

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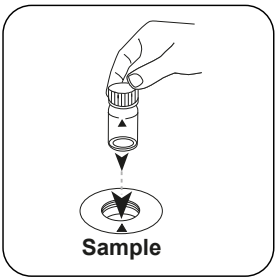
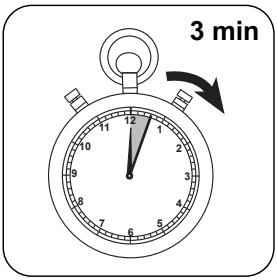
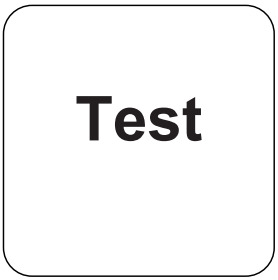


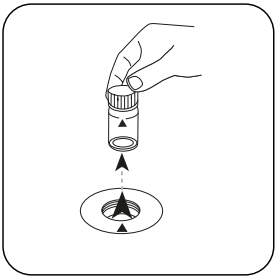
Placez la **cuvette réservée à l'échantillon** dans la chambre de mesure. Attention à la positionner correctement.



Attendez la fin du **temps de réaction de 3 minute(s)** .



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

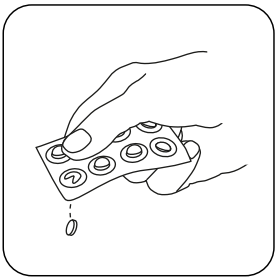


Retirez la cuvette de la chambre de mesure.

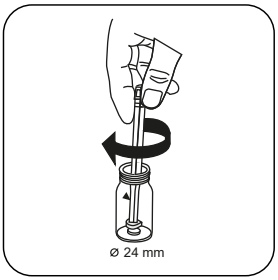
Videz la cuvette.

Nettoyez à fond la cuvette et le couvercle de la cuvette.

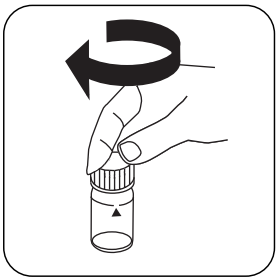
Remplissez une cuvette de 24 mm de **10 mL d'échantillon**.



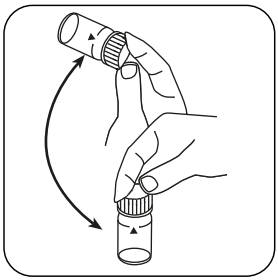
Ajoutez une **pastille de GLYCINE**.



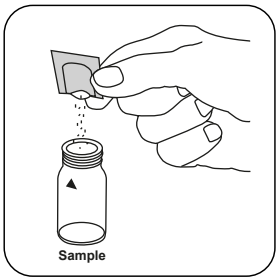
Écrasez la(les) pastille(s) en la(les) tournant un peu.



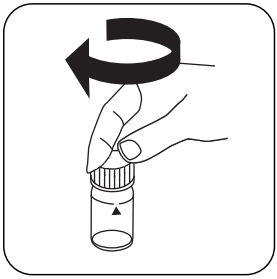
Fermez la(les) cuvette(s).



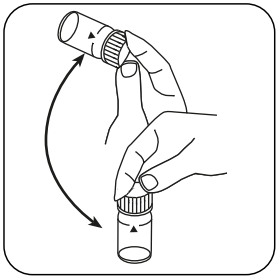
Dissolvez la(les) pastille(s) en mettant le tube plusieurs fois à l'envers.



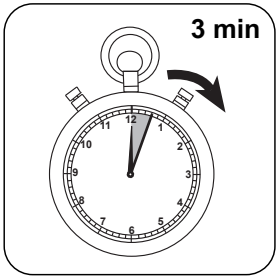
Ajoutez un **sachet de poudre Chlorine TOTAL-DPD/F10** .



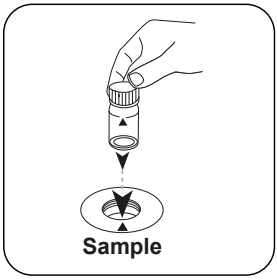
Fermez la(les) cuvette(s).



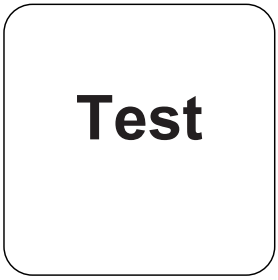
Retourner plusieurs fois pour mélanger le contenu (20 sec.) .



Attendez la fin du **temps de réaction de 3 minute(s)** .



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



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

Le résultat s'affiche à l'écran en mg/L Ozone; mg/l chlore total.

Réalisation de la quantification Ozone, en l'absence de chlore avec sachets de poudre

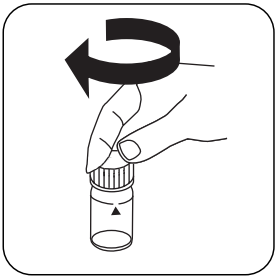
Sélectionnez la méthode sur l'appareil.

Sélectionnez également la quantification : sans chlore

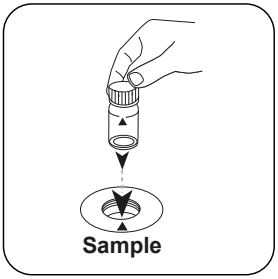
FR

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

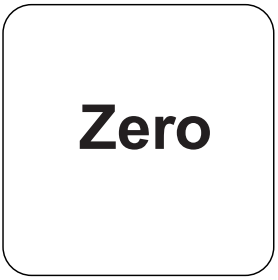
Remplissez une cuvette de 24 mm de **10 mL d'échantillon**.



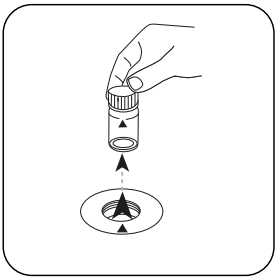
Fermez la(les) cuvette(s).



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

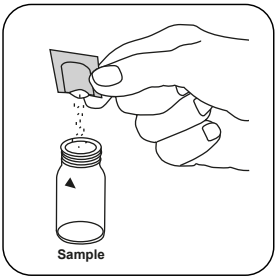


Appuyez sur la touche **ZERO**.

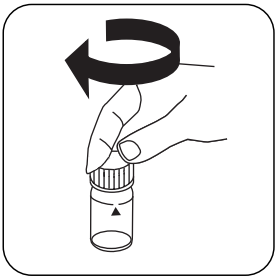


Retirez la cuvette de la chambre de mesure.

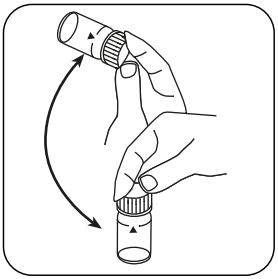
Sur les appareils ne nécessitant **aucune mesure ZÉRO** , **commencez ici**.



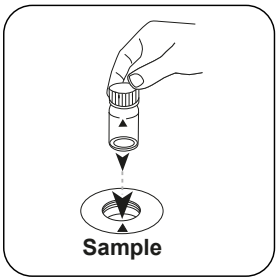
Ajoutez un **sachet de poudre Chlorine TOTAL-DPD/F10** .



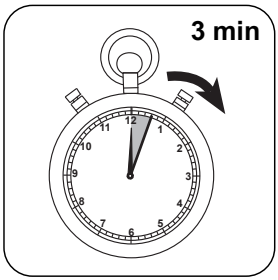
Fermez la(les) cuvette(s).



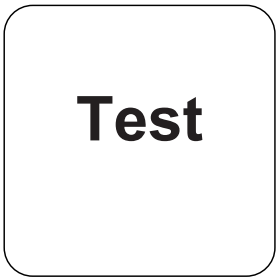
Retourner plusieurs fois pour mélanger le contenu (20 sec.) .



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



Attendez la fin du **temps de réaction de 3 minute(s)** .



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

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

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	O_3	1
mg/l	Cl_2	1.4771

Méthode chimique

DPD / Glycine

Interférences

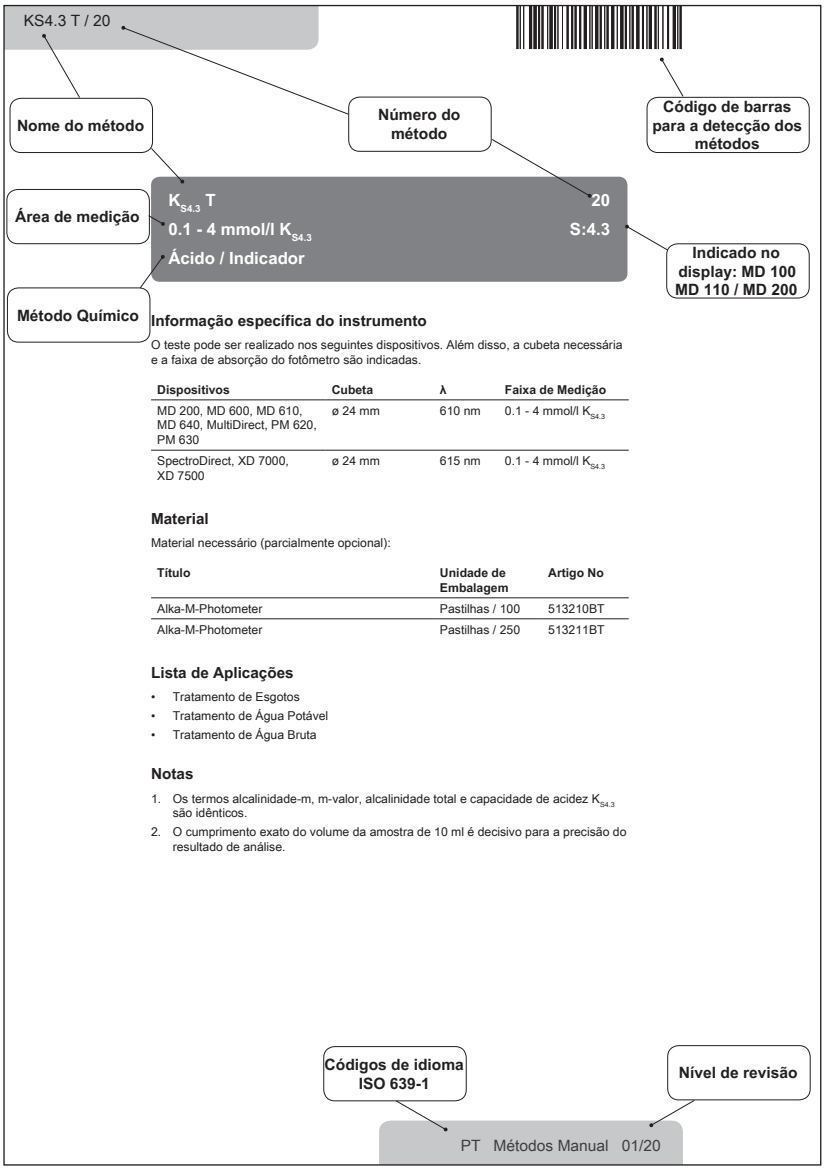
Interférences persistantes

1. Les agents oxydants contenus dans les échantillons réagissent tous comme le chlore, ce qui entraîne des résultats plus élevés.
2. Les concentrations d'ozone supérieures à 6 mg/L peuvent provoquer des résultats dans la plage de mesure allant jusqu'à 0 mg/L. Dans ce cas, diluez l'échantillon d'eau. Le réactif est ajouté à 10 ml d'échantillon dilué. Ensuite, la mesure est répétée (test de plausibilité).

Méthode Validation

Limite de détection	0.01 mg/L
Limite de détermination	0.03 mg/L
Fin de la gamme de mesure	2 mg/L
Sensibilité	1.68 mg/L / Abs
Intervalle de confiance	0.033 mg/L
Déviation standard	0.014 mg/L
Coefficient de variation	1.34 %

[f]nécessaire pour la détermination de brome, dioxyde de chlore et ozone en présence de chlore


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

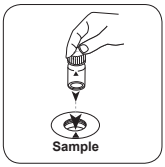
Realização da determinação Capacidade de acidez $K_{S4.3}$ com pastilha

Escolher o método no equipamento.

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

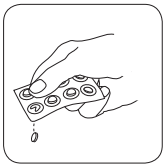
Encher a célula de 24 mm com **10 ml de amostra** .

Fechar a(s) célula(s).

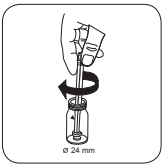


Colocar a **célula de amostra** no compartimento de medição. Observar o posicionamento.

• • •



Pastilha ALKA-M-PHOTOMETER.



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

Fechar a(s) célula(s).

Ozono T M300

0.02 - 2 mg/L O_3 O3

DPD / Glicina

PT

Material

Material necessário (parcialmente opcional):

Reagentes	Unidade de Embalagem	Código do Produto
DPD Nº.1	Pastilhas / 100	511050BT
DPD Nº. 1	Pastilhas / 250	511051BT
DPD Nº. 1	Pastilhas / 500	511052BT
DPD Nº. 3	Pastilhas / 100	511080BT
DPD Nº. 3	Pastilhas / 250	511081BT
DPD Nº. 3	Pastilhas / 500	511082BT
DPD Nº. 1 Alto Cálcio [e)]	Pastilhas / 100	515740BT
DPD Nº. 1 Alto Cálcio [e)]	Pastilhas / 250	515741BT
DPD Nº. 1 Alto Cálcio [e)]	Pastilhas / 500	515742BT
DPD Nº. 3 Alto Cálcio [e)]	Pastilhas / 100	515730BT
DPD Nº. 3 Alto Cálcio [e)]	Pastilhas / 250	515731BT
DPD Nº. 3 Alto Cálcio [e)]	Pastilhas / 500	515732BT
Glicina [f)]	Pastilhas / 100	512170BT
Glicina [f)]	Pastilhas / 250	512171BT
Definir N.º DPD 1/Não. 3#	cada 100	517711BT
Definir N.º DPD 1/Não. 3#	cada 250	517712BT
Definir N.º DPD 1/Não. 3 Alto Cálcio#	cada 100	517781BT
Definir N.º DPD 1/Não. 3 Alto Cálcio#	cada 250	517782BT
Definir N.º DPD 1/Glicina #	cada 100	517731BT
Definir N.º DPD 1/Glicina #	cada 250	517732BT

Preparação

1. Limpeza das células:
   Uma vez que muitos produtos de limpeza domésticos (p. ex. lava-louça) contêm substâncias redutoras, na determinação que se segue de oxidantes (p. ex. ozono, cloro) pode haver demasiadas reduções. Para excluir este erro de medição, os equipamentos de vidro não deviam ter a capacidade de absorção de cloro. Para esse efeito, os equipamentos de vidro são guardados por uma hora sob solução de hipoclorito de sódio (0,1 g/L) e depois devem ser bem enxaguados com água desmineralizada.
2. Na preparação da amostra é preciso evitar a libertação de gases de ozono, p. ex. através da pipetagem e agitação. A análise tem de ser efetuada logo após a recolha da amostra.
3. As águas fortemente alcalinas ou ácidas devem, antes da análise, ser ajustadas para um valor pH entre 6 e 7 (com 0,5 mol/l de ácido sulfúrico ou 1 mol/l soda cáustica).

Realização da determinação Ozono na presença de cloro com pastilha

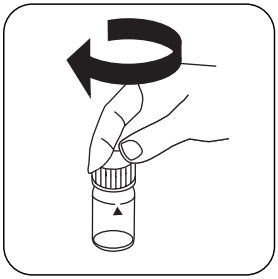
Escolher o método no equipamento.

Escolha ainda a determinação: na presença de Cloro

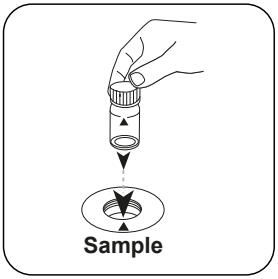
Para este método, uma medição ZERO não precisa ser realizada todas as vezes nos seguintes dispositivos: XD 7000, XD 7500

PT

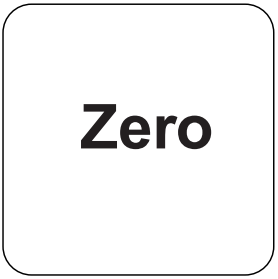
Encher a célula de 24 mm com **10 mL de amostra** .



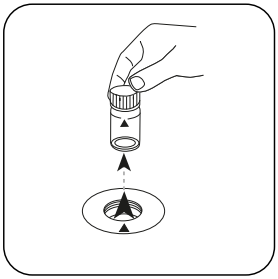
Fechar a(s) célula(s).



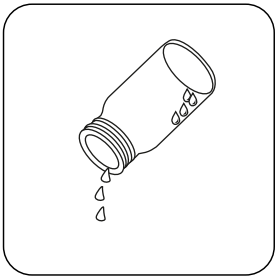
Colocar a **célula de amostra** no compartimento de medição. Observar o posicionamento.



Premir a tecla **ZERO**.

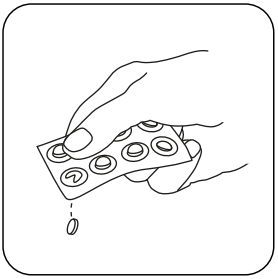


Retirar a célula do compartimento de medição.

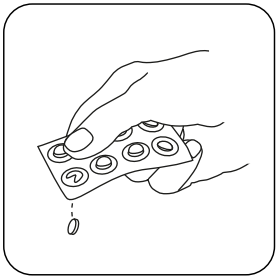


Esvaziar a célula até ficarem apenas algumas gotas.

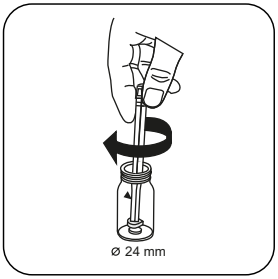
Nos equipamentos que **não requerem uma medição ZERO** , **deve começar aqui**.



Pastilha DPD No. 1.

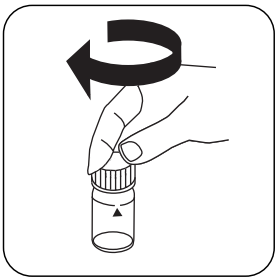


Pastilha DPD No. 3.

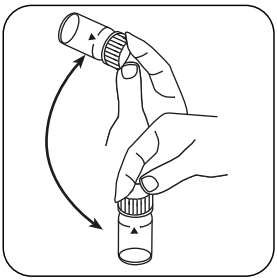


Esmagar a(s) pastilha(s) rodando ligeiramente.

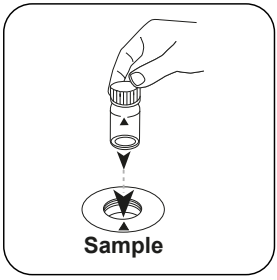
Encher a célula até à **marca de 10 mL** com a **amostra** .



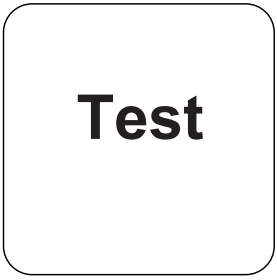
Fechar a(s) célula(s).



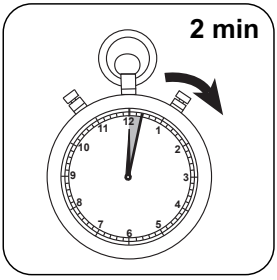
Dissolver a(s) pastilha(s) girando.



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

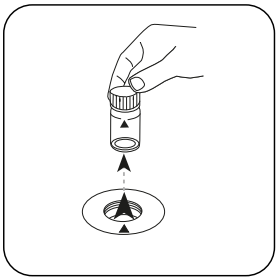


Premir a tecla **TEST** (XD: **START**).

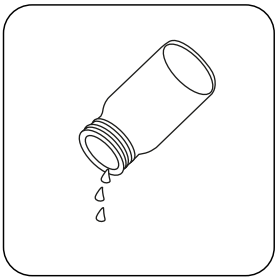


Aguardar **2 minuto(s) de tempo de reação**.

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



Retirar a célula do compartimento de medição.

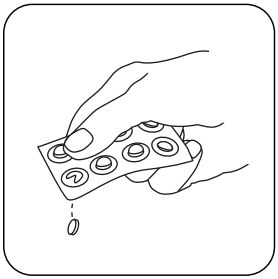


Esvaziar a célula.

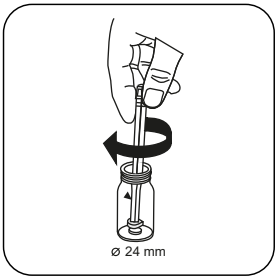
Limpar bem a célula e a tampa da mesma.

PT

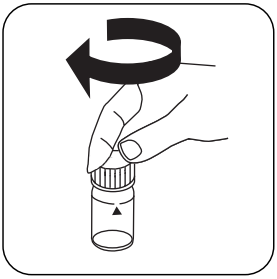
Encher uma **segunda célula** com **10 mL de amostra** .



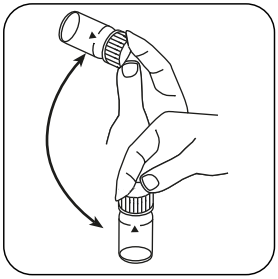
Pastilha GLYCINE.



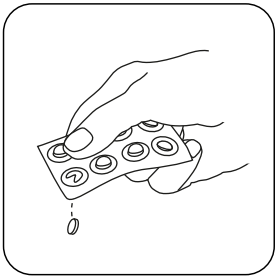
Esmagar a(s) pastilha(s) rodando ligeiramente.



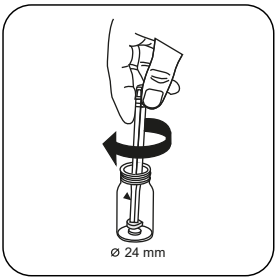
Fechar a(s) célula(s).



Dissolver a(s) pastilha(s) girando.

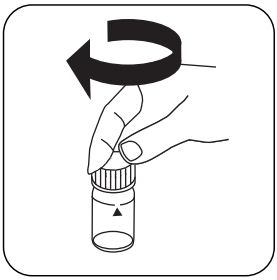


Adicionar **uma pastilha DPD No. 1** e **uma pastilha DPD No. 3** diretamente da película à primeira célula.

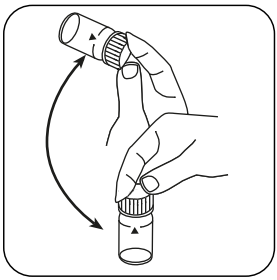


Esmagar a(s) pastilha(s) rodando ligeiramente.

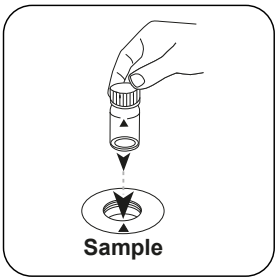
Introduzir a **solução de glicina** preparada na célula preparada.



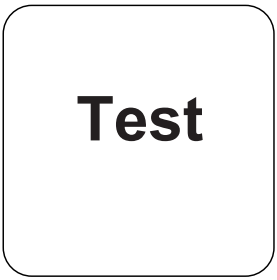
Fechar a(s) célula(s).



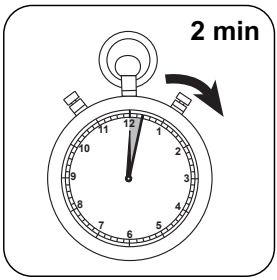
Dissolver a(s) pastilha(s) girando.



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



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



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

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

No visor aparece o resultado em mg/L Ozono; mg/l cloro total.

Realização da determinação Ozono, na ausência de cloro com pastilha

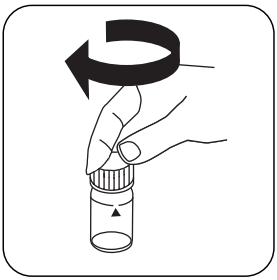
Escolher o método no equipamento.

Escolha ainda a determinação: sem Cloro

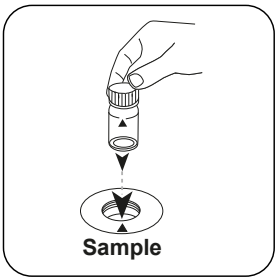
Para este método, uma medição ZERO não precisa ser realizada todas as vezes nos seguintes dispositivos: XD 7000, XD 7500

PT

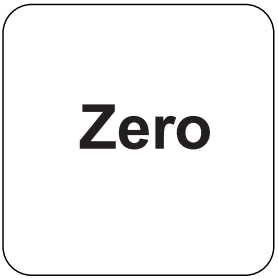
Encher a célula de 24 mm com **10 mL de amostra** .



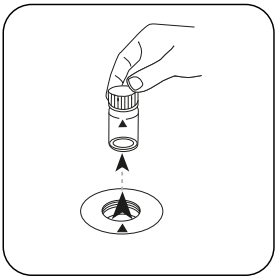
Fechar a(s) célula(s).



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



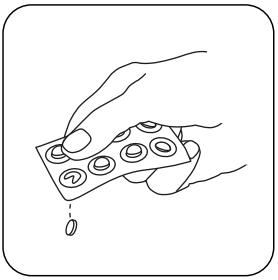
Premir a tecla **ZERO**.



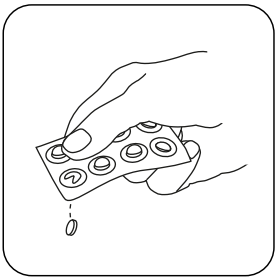
Retirar a célula do compartimento de medição.

Esvaziar a célula até ficarem apenas algumas gotas.

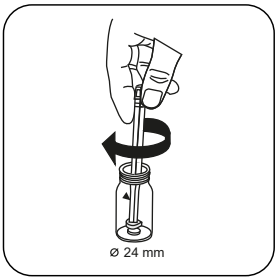
Nos equipamentos que **não requerem uma medição ZERO** , **deve começar aqui**.



Pastilha DPD No. 1.

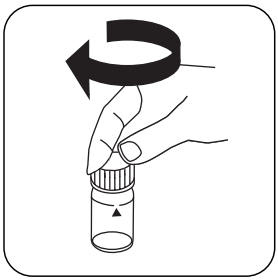


Pastilha DPD No. 3.

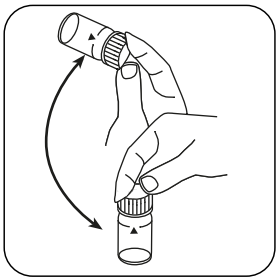


Esmagar a(s) pastilha(s) rodando ligeiramente.

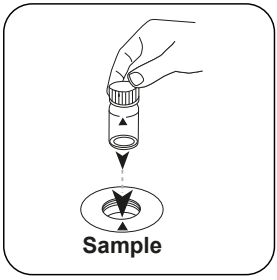
Encher a célula até à **marca de 10 mL** com a **amostra** .



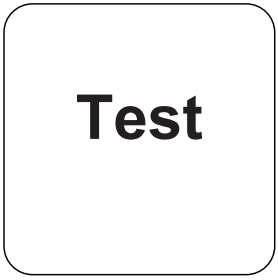
Fechar a(s) célula(s).



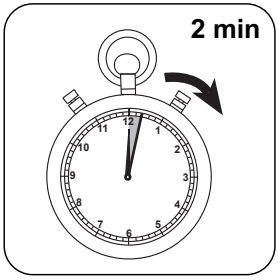
Dissolver a(s) pastilha(s) girando.



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



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



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

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

No visor aparece o resultado em mg/L Ozono.

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	O_3	1
mg/l	Cl_2	1.4771

Método Químico

DPD / Glicina

Apêndice

Texto de Interferências

Interferências Pesistentes

1. Todos os oxidantes presentes nas amostras reagem como o cloro, o que leva a resultados demasiado altos.
2. Concentrações de ozono superiores a 6 mg/L de podem causar resultados dentro da área de medição até 0 mg/L. Neste caso, deve diluir a amostra de água. 10 ml da amostra diluída é colocada em reagente e a medição é repetida (teste de plausibilidade).

Bibliografia

Colorimetric Chemical Analytical Methods, 9th Edition, Lovibond

Derivado de

DIN 38408-3:2011-04

[e)]Reagente auxiliar, alternativamente ao DPD no. 1 / não 3 quando a amostra é nublada devido ao alto teor de íons de cálcio e / ou alta condutividade | [f)]Reagente auxiliar, é adicionalmente necessário para a determinação de bromo, dióxido de cloro ou ozônio na presença de cloro | [#]incluindo vareta de agitação

Ozono PP M301

0.015 - 1.2 mg/L O_3

DPD / Glicina

PT

Material

Material necessário (parcialmente opcional):

Reagentes	Unidade de Embalagem	Código do Produto
Cloro Total DPD F10	Pó / 100 pc.	530120
Cloro Total DPD F10	Pó / 1000 pc.	530123
Glicina [f)]	Pastilhas / 100	512170BT
Glicina [f)]	Pastilhas / 250	512171BT

Preparação

1. Limpeza das células:
   Uma vez que muitos produtos de limpeza domésticos (p. ex. lava-louça) contêm substâncias redutoras, na determinação que se segue de oxidantes (p. ex. ozono, cloro) pode haver demasiadas reduções. Para excluir este erro de medição, os equipamentos de vidro não deviam ter a capacidade de absorção de cloro. Para esse efeito, os equipamentos de vidro são guardados por uma hora sob solução de hipoclorito de sódio (0,1 g/L) e depois devem ser bem enxaguados com água desmineralizada.
2. Na preparação da amostra é preciso evitar a libertação de gases de ozono, p. ex. através da pipetagem e agitação. A análise tem de ser efetuada logo após a recolha da amostra.
3. As águas fortemente alcalinas ou ácidas devem, antes da análise, ser ajustadas para um valor pH entre 6 e 7 (com 0,5 mol/l de ácido sulfúrico ou 1 mol/l soda cáustica).

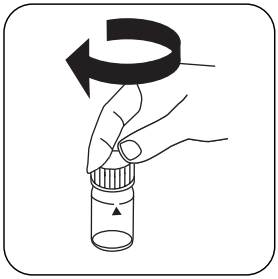
Realização da determinação Ozono, na presença de cloro com pacotes de pó

Escolher o método no equipamento.

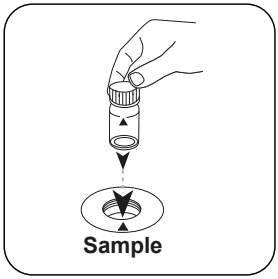
Escolha ainda a determinação: na presença de Cloro

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

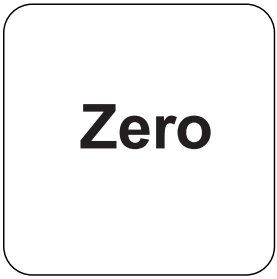
Encher a célula de 24 mm com **10 mL de amostra** .



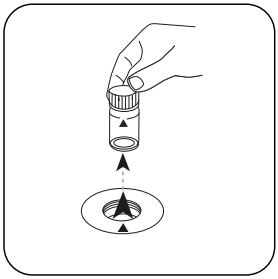
Fechar a(s) célula(s).



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

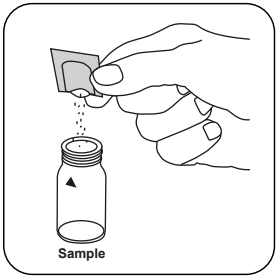


Premir a tecla **ZERO**.

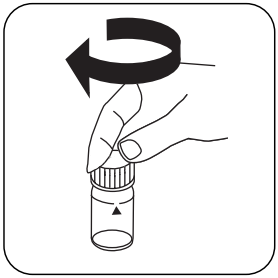


Retirar a célula do compartimento de medição.

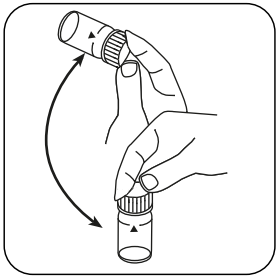
Nos equipamentos que **não requerem uma medição ZERO** , **deve começar aqui**.



Adicionar um **pacote de pó Chlorine TOTAL-DPD/F10** .

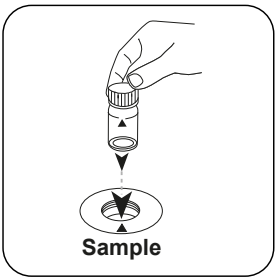


Fechar a(s) célula(s).

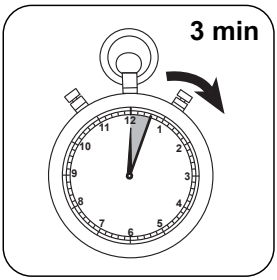


Misturar o conteúdo girando (20 sec.).

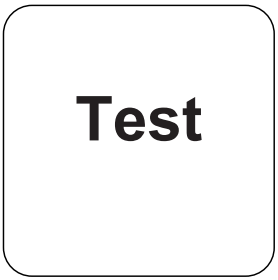
PT



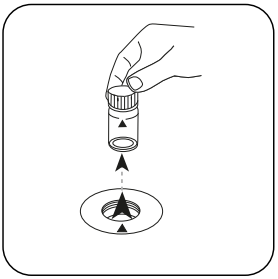
Colocar a **célula de amostra** no compartimento de medição. Observar o posicionamento.



Aguardar **3 minuto(s) de tempo de reação**.



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

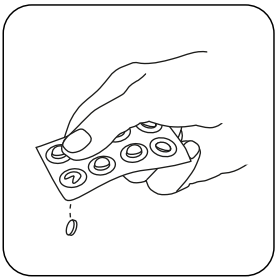


Retirar a célula do compartimento de medição.

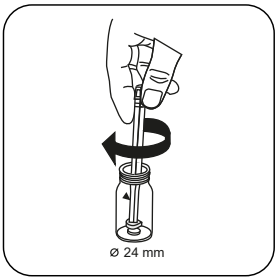
Esvaziar a célula.

Limpar bem a célula e a tampa da mesma.

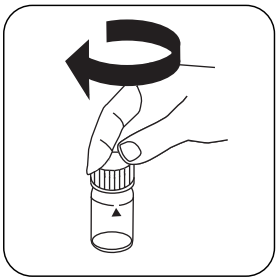
Encher a célula de 24 mm com **10 mL de amostra** .



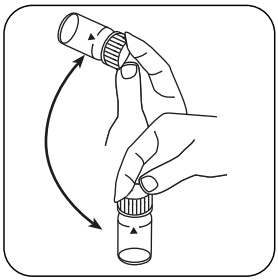
Pastilha GLYCINE.



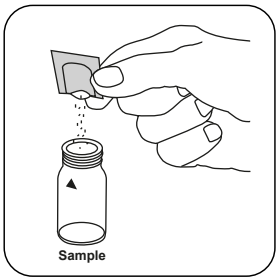
Esmagar a(s) pastilha(s) rodando ligeiramente.



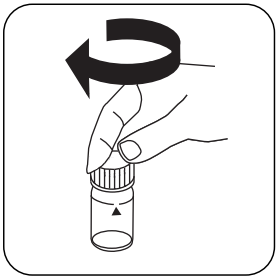
Fechar a(s) célula(s).



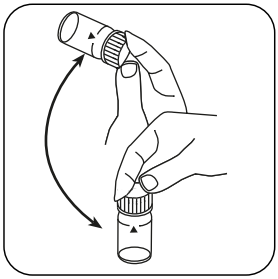
Dissolver a(s) pastilha(s) girando.



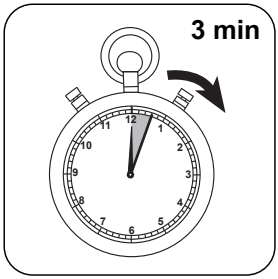
Adicionar um **pacote de pó Chlorine TOTAL-DPD/F10** .



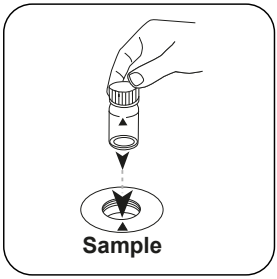
Fechar a(s) célula(s).



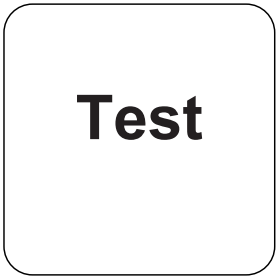
Misturar o conteúdo girando (20 sec.).



Aguardar **3 minuto(s) de tempo de reação**.



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 Ozono; mg/l cloro total.

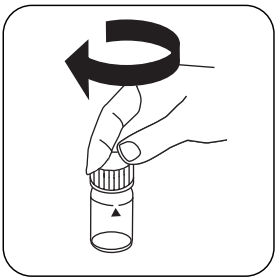
Realização da determinação Ozono, na ausência de cloro com pacotes de pó

Escolher o método no equipamento.

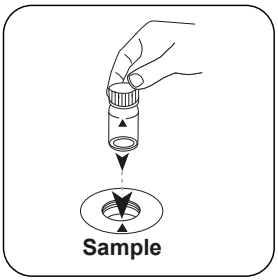
Escolha ainda a determinação: sem Cloro

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

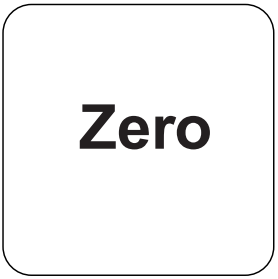
Encher a célula de 24 mm com **10 mL de amostra** .



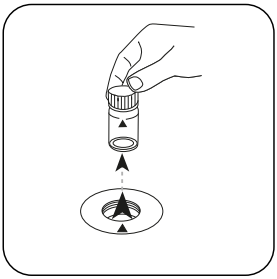
Fechar a(s) célula(s).



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

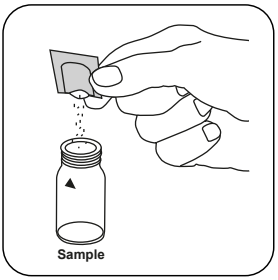


Premir a tecla **ZERO**.

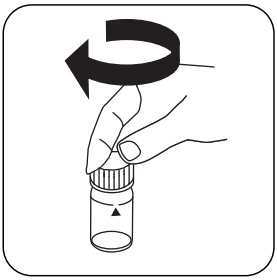


Retirar a célula do compartimento de medição.

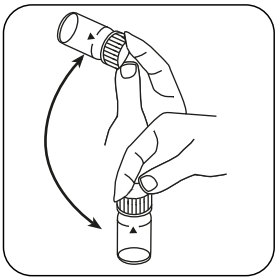
Nos equipamentos que **não requerem uma medição ZERO** , **deve começar aqui**.



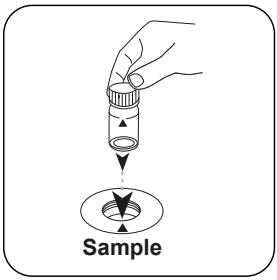
Adicionar um **pacote de pó Chlorine TOTAL-DPD/F10** .



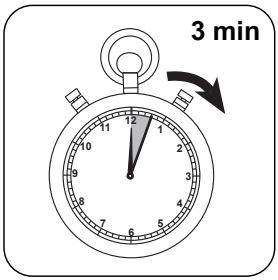
Fechar a(s) célula(s).



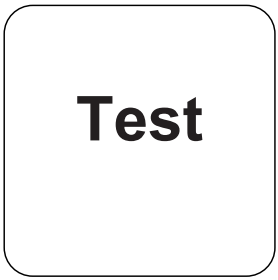
Misturar o conteúdo girando (20 sec.).



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



Aguardar **3 minuto(s) de tempo de reação**.



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

No visor aparece o resultado em mg/L Ozono.

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	O_3	1
mg/l	Cl_2	1.4771

Método Químico

DPD / Glicina

Texto de Interferências

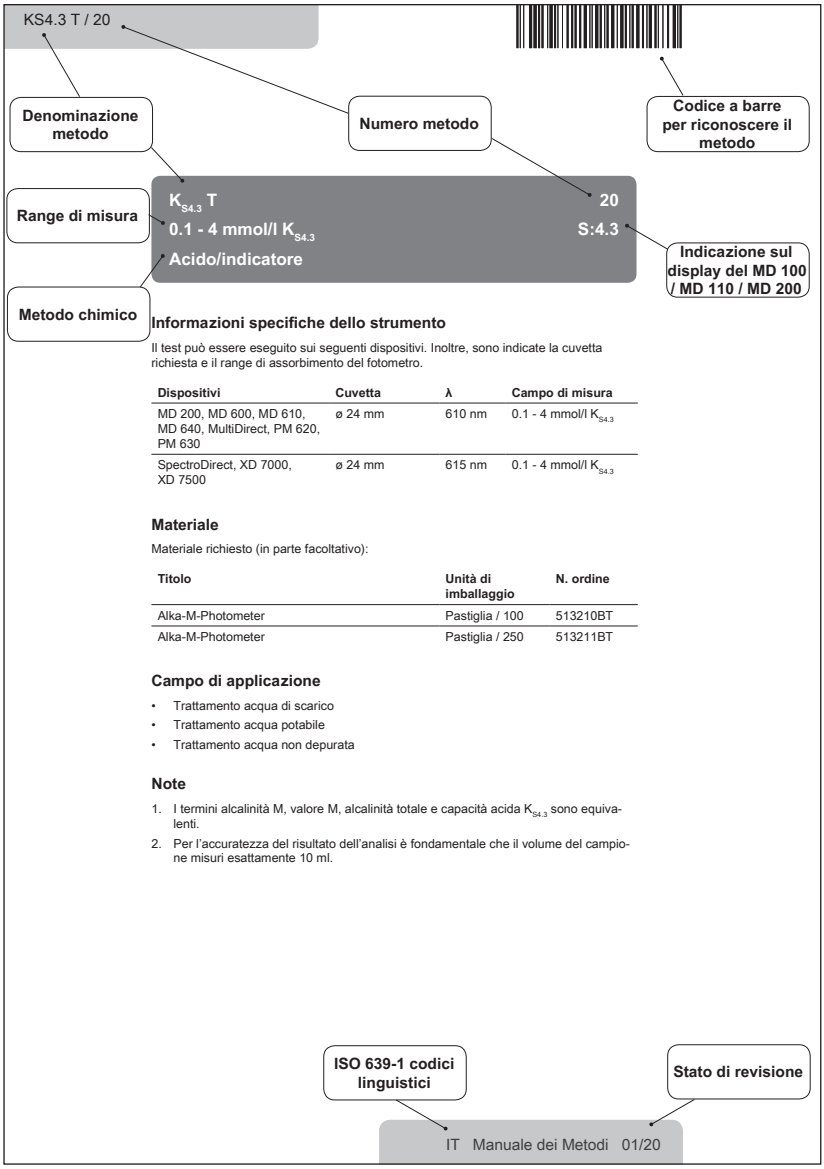
Interferências Pesistentes

1. Todos os oxidantes presentes nas amostras reagem como o cloro, o que leva a resultados demasiado altos.
2. Concentrações de ozono superiores a 6 mg/L de podem causar resultados dentro da área de medição até 0 mg/L. Neste caso, deve diluir a amostra de água. 10 ml da amostra diluída é colocada em reagente e a medição é repetida (teste de plausibilidade).

Validação de método

Limite de Detecção	0.01 mg/L
Limite de Determinação	0.03 mg/L
Fim da Faixa de Medição	2 mg/L
Sensibilidade	1.68 mg/L / Abs
Faixa de Confiança	0.033 mg/L
Desvio Padrão	0.014 mg/L
Coeficiente de Variação	1.34 %

[0]Reagente auxiliar, é adicionalmente necessário para a determinação de bromo, dióxido de cloro ou ozônio na presença de cloro



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.

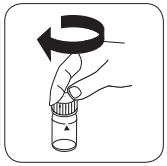
Svolgimento della misurazione

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

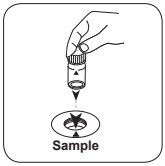
Selezionare il metodo nel dispositivo.

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**.



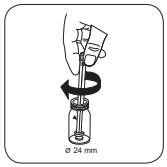
Chiudere la/e cuvetta/e.



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.

Ozono T M300

0.02 - 2 mg/L O_3 O3

DPD/glicina

IT

Materiale

Materiale richiesto (in parte facoltativo):

Reagenti	Unità di imballaggio	N. ordine
DPD No.1	Pastiglia / 100	511050BT
DPD No. 1	Pastiglia / 250	511051BT
DPD No. 1	Pastiglia / 500	511052BT
DPD No. 3	Pastiglia / 100	511080BT
DPD No. 3	Pastiglia / 250	511081BT
DPD No. 3	Pastiglia / 500	511082BT
DPD No. 1 Alto Calcio [e)]	Pastiglia / 100	515740BT
DPD No. 1 Alto Calcio [e)]	Pastiglia / 250	515741BT
DPD No. 1 Alto Calcio [e)]	Pastiglia / 500	515742BT
DPD No. 3 High Calcium [e)]	Pastiglia / 100	515730BT
DPD No. 3 High Calcium [e)]	Pastiglia / 250	515731BT
DPD No. 3 High Calcium [e)]	Pastiglia / 500	515732BT
Glicina [f)]	Pastiglia / 100	512170BT
Glicina [f)]	Pastiglia / 250	512171BT
Set DPD No. 1/no. 3#	ciascuna 100	517711BT
Set DPD No. 1/no. 3#	ciascuna 250	517712BT
Set DPD No. 1/no. 3 High Calcium#	ciascuna 100	517781BT
Set DPD No. 1/no. 3 High Calcium#	ciascuna 250	517782BT
Set DPD No. 1/glicina #	ciascuna 100	517731BT
Set DPD No. 1/glicina #	ciascuna 250	517732BT

Preparazione

1. Pulizia delle cuvette:
   Poiché molti detergenti ad uso domestico (ad es. detersivo per piatti) contengono sostanze riducenti, nella successiva rilevazione di ossidanti (ad es. ozono, cloro) si potrebbero ottenere risultati troppo bassi. Per escludere tali errori di misura è necessario che i dispositivi in vetro siano esenti dal consumo di cloro. I dispositivi in vetro inoltre vengono conservati in una soluzione di ipoclorito di sodio (0,1 g/L) per un'ora e successivamente vengono risciacquati abbondantemente con acqua demineralizzata.
2. Nella preparazione del campione occorre evitare la degassificazione dell'ozono, ad es. utilizzando pipette e agitando. L'analisi deve essere eseguita subito dopo il prelievo del campione.
3. Le acque fortemente alcaline o acide devono essere portate prima dell'analisi entro un range di pH compreso tra 6 e 7 (con 0,5 mol/l di acido solforico o 1 mol/l di liscivia).

Esecuzione della rilevazione Ozono, in presenza di cloro con pastiglia

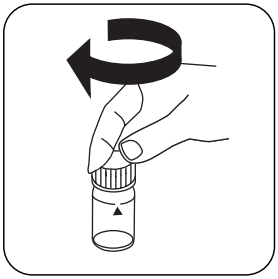
Selezionare il metodo nel dispositivo.

Selezionare inoltre la determinazione: in presenza di Cloro

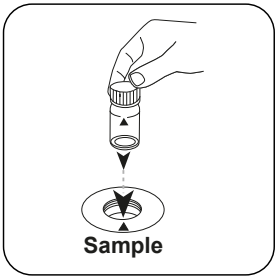
Per questo metodo, non è necessario eseguire una misurazione ZERO ogni volta sui seguenti dispositivi: XD 7000, XD 7500

IT

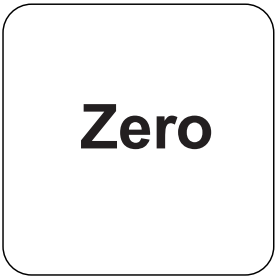
Riempire una cuvetta da 24 mm con **10 mL di campione**.



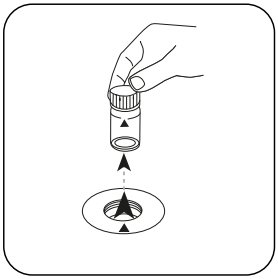
Chiudere la/e cuvetta/e.



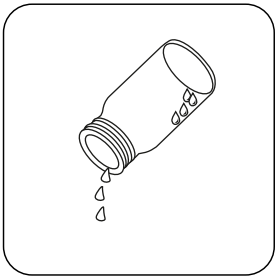
Posizionare la **cuvetta del campione** nel vano di misurazione. Fare attenzione al posizionamento.



Premere il tasto **ZERO**.

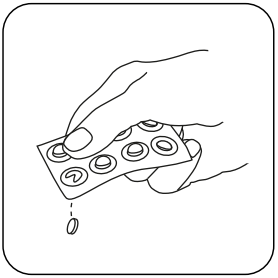


Prelevare la cuvetta dal vano di misurazione.

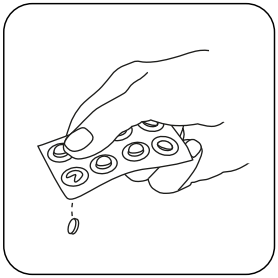


Svuotare la cuvetta finché non rimangono alcune gocce.

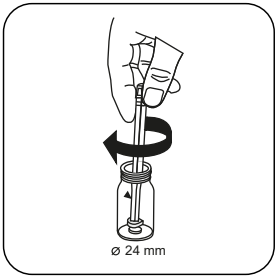
In caso di dispositivi che **non richiedono una misurazione ZERO**, **iniziare da qui**.



Aggiungere **una pastiglia DPD No. 1**.

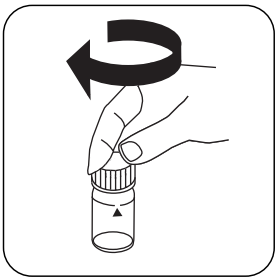


Aggiungere **una pastiglia DPD No. 3**.

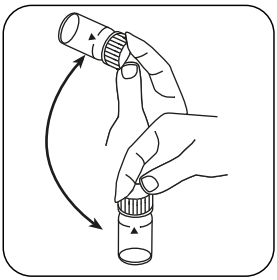


Frantumare la/e pastiglia/e con una leggera rotazione.

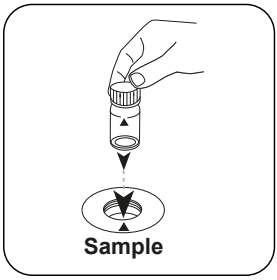
Immettere il **campione** nella cuvetta fino a raggiungere **la tacca dei 10 mL** .



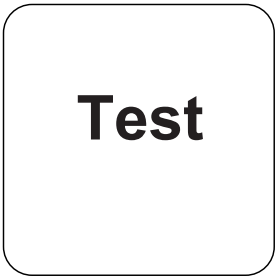
Chiudere la/e cuvetta/e.



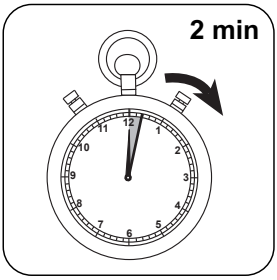
Far sciogliere la/e pastiglia/e agitando.



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

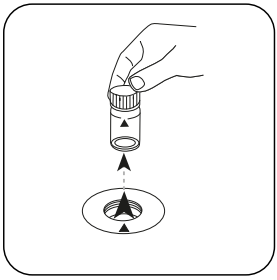


Premere il tasto **TEST** (XD: **START**).

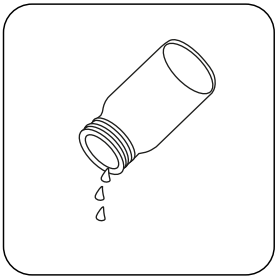


Attendere un **tempo di reazione di 2 minuto/i** .

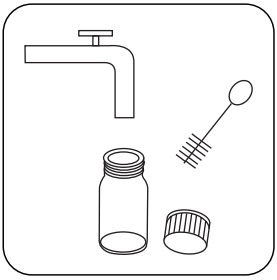
Allo scadere del tempo di reazione viene effettuata automaticamente la misurazione.



Prelevare la cuvetta dal vano di misurazione.



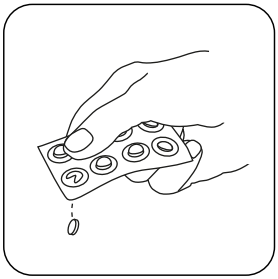
Svuotare la cuvetta.



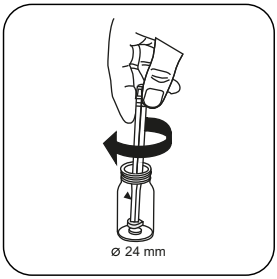
Pulire a fondo la cuvetta e il coperchio della cuvetta.

IT

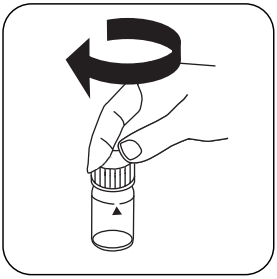
Riempire una **seconda cuvetta** con **10 mL di campione**.



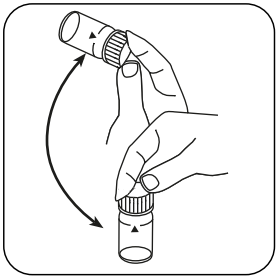
Aggiungere **una pastiglia GLYCINE**.



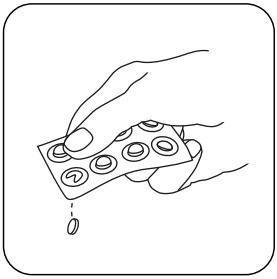
Frantumare la/e pastiglia/e con una leggera rotazione.



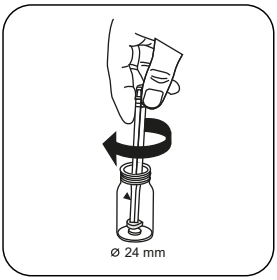
Chiudere la/e cuvetta/e.



Far sciogliere la/e pastiglia/e agitando.

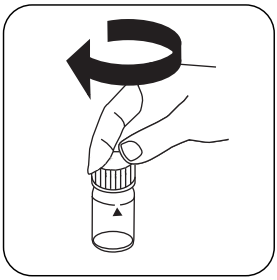


Immettere direttamente dalla pellicola nella prima cuvetta **una pastiglia DPD No. 1** e **una pastiglia DPD No. 3**.

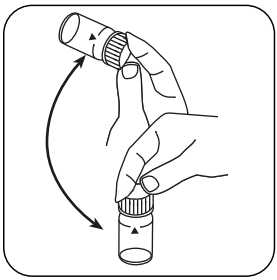


Frantumare la/e pastiglia/e con una leggera rotazione.

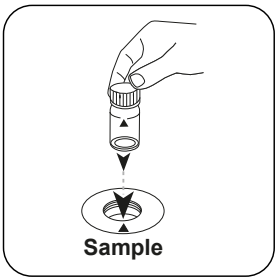
Immettere la **soluzione di glicina** preparata nella cuvetta preparata.



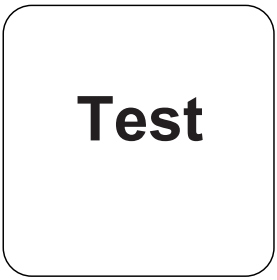
Chiudere la/e cuvetta/e.



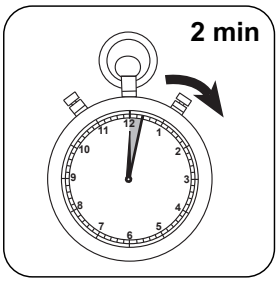
Far sciogliere la/e pastiglia/e agitando.



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



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



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

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

Sul display compare il risultato in mg/L di Ozono; Cloro totale mg/l.

Esecuzione della rilevazione Ozono, in assenza di cloro con pastiglia

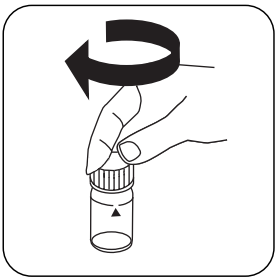
Selezionare il metodo nel dispositivo.

Selezionare inoltre la determinazione: senza Cloro

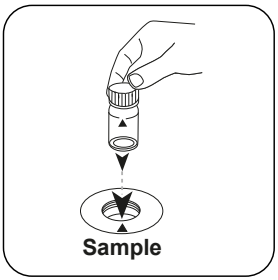
Per questo metodo, non è necessario eseguire una misurazione ZERO ogni volta sui seguenti dispositivi: XD 7000, XD 7500

IT

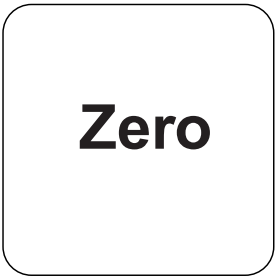
Riempire una cuvetta da 24 mm con **10 mL di campione**.



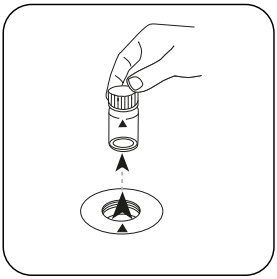
Chiudere la/e cuvetta/e.



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



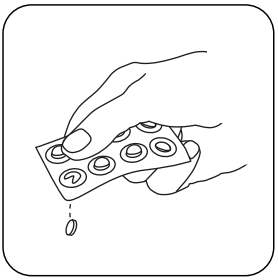
Premere il tasto **ZERO**.



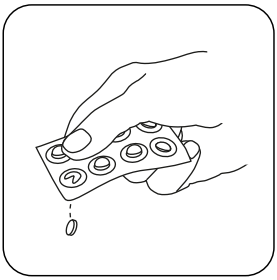
Prelevare la cuvetta dal vano di misurazione.

Svuotare la cuvetta finché non rimangono alcune gocce.

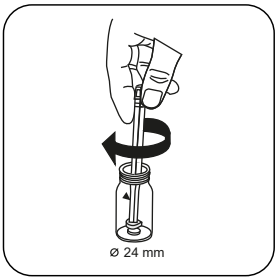
In caso di dispositivi che **non richiedono una misurazione ZERO**, **iniziare da qui**.



Aggiungere **una pastiglia DPD No. 1**.

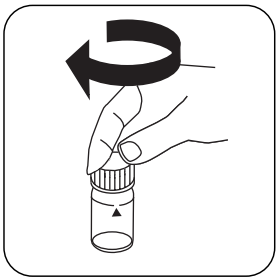


Aggiungere **una pastiglia DPD No. 3**.

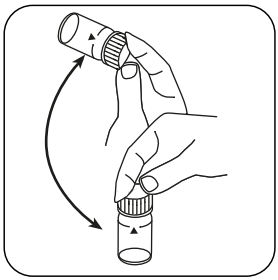


Frantumare la/e pastiglia/e con una leggera rotazione.

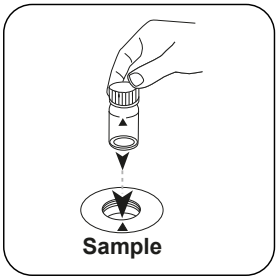
Immettere il **campione** nella cuvetta fino a raggiungere **la tacca dei 10 mL** .



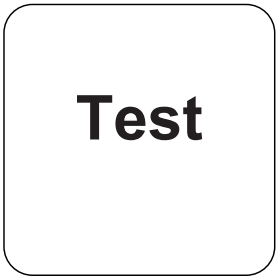
Chiudere la/e cuvetta/e.



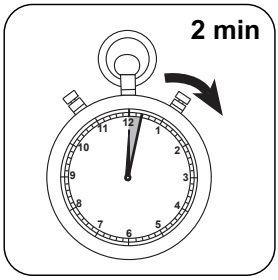
Far sciogliere la/e pastiglia/e agitando.



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



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



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

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

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

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	O_3	1
mg/l	Cl_2	1.4771

Metodo chimico

DPD/glicina

Appendice

Interferenze

Interferenze permanenti

1. Tutti gli ossidanti presenti nei campioni reagiscono come il cloro dando risultati troppo elevati.
2. Le concentrazioni di ozono maggiori di 6 mg/L possono dare risultati entro il range di misura fino a 0 mg/L. In questo caso il campione di acqua deve essere diluito. 10 ml del campione diluito vengono addizionati con il reagente e la misurazione viene ripetuta (test di plausibilità).

Riferimenti bibliografici

Colorimetric Chemical Analytical Methods, 9th Edition, Lovibond

Derivato di

DIN 38408-3:2011-04

[e)]Reagente ausiliario, in alternativa a DPD n. 1 / no 3 in caso di torbidità del campione a causa di alto contenuto di ioni di calcio e / o alta conduttività | [f)]Reagente ausiliario, è inoltre necessario per la determinazione di bromo, biossido di cloro o ozono in presenza di cloro | [j)] #Bacchetta compresa

Ozono PP M301

0.015 - 1.2 mg/L O_3

DPD/glicina

IT

Materiale

Materiale richiesto (in parte facoltativo):

Reagenti	Unità di imballaggio	N. ordine
Cloro totale DPD F10	Polvere / 100 pz.	530120
Cloro totale DPD F10	Polvere / 1000 pz.	530123
Glicina [f)]	Pastiglia / 100	512170BT
Glicina [f)]	Pastiglia / 250	512171BT

Preparazione

1. Pulizia delle cuvette:
   Poiché molti detergenti ad uso domestico (ad es. detersivo per piatti) contengono sostanze riducenti, nella successiva rilevazione di ossidanti (ad es. ozono, cloro) si potrebbero ottenere risultati troppo bassi. Per escludere tali errori di misura è necessario che i dispositivi in vetro siano esenti dal consumo di cloro. I dispositivi in vetro inoltre vengono conservati in una soluzione di ipoclorito di sodio (0,1 g/L) per un'ora e successivamente vengono risciacquati abbondantemente con acqua demineralizzata.
2. Nella preparazione del campione occorre evitare la degassificazione dell'ozono, ad es. utilizzando pipette e agitando. L'analisi deve essere eseguita subito dopo il prelievo del campione.
3. Le acque fortemente alcaline o acide devono essere portate prima dell'analisi entro un range di pH compreso tra 6 e 7 (con 0,5 mol/l di acido solforico o 1 mol/l di liscivia).

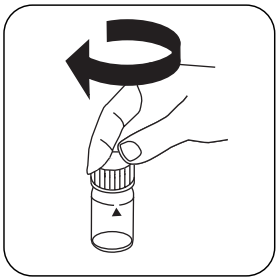
Esecuzione della rilevazione Ozono, in presenza di cloro con confezioni in polvere

Selezionare il metodo nel dispositivo.

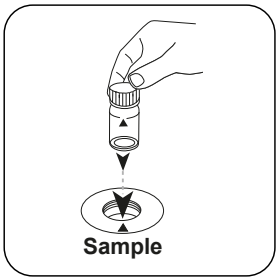
Selezionare inoltre la determinazione: in presenza di Cloro

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

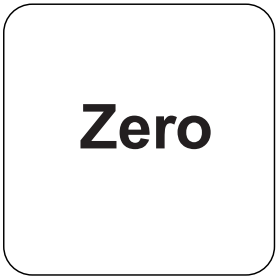
Riempire una cuvetta da 24 mm con **10 mL di campione**.



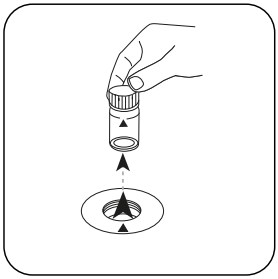
Chiudere la/e cuvetta/e.



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

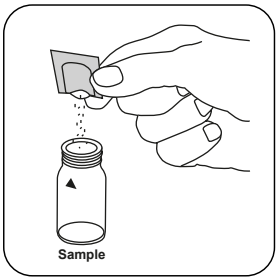


Premere il tasto **ZERO**.

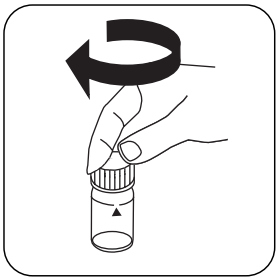


Prelevare la cuvetta dal vano di misurazione.

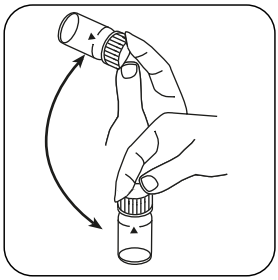
In caso di dispositivi che **non richiedono una misurazione ZERO**, **iniziare da qui**.



Aggiungere **una bustina di polvere Chlorine TOTAL-DPD/F10** .

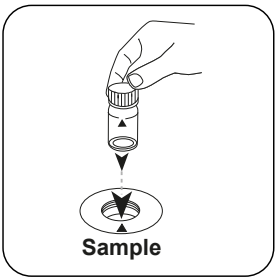


Chiudere la/e cuvetta/e.

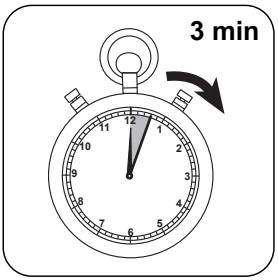


Miscelare il contenuto capovolgendo (20 sec.).

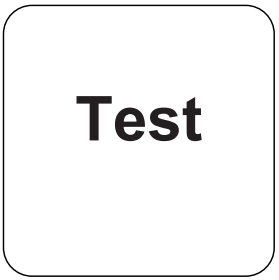
IT



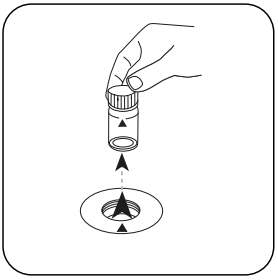
Posizionare la **cuvetta del campione** nel vano di misurazione. Fare attenzione al posizionamento.



Attendere un **tempo di reazione di 3 minuto/i** .



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

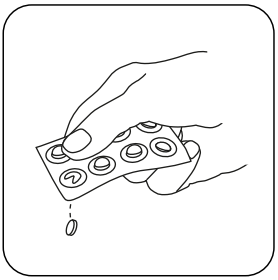


Prelevare la cuvetta dal vano di misurazione.

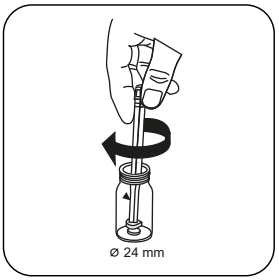
Svuotare la cuvetta.

Pulire a fondo la cuvetta e il coperchio della cuvetta.

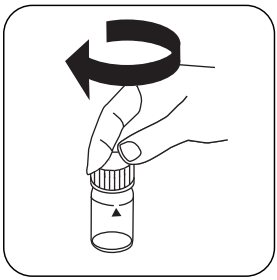
Riempire una cuvetta da 24 mm con **10 mL di campione**.



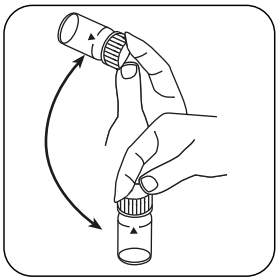
Aggiungere **una pastiglia GLYCINE**.



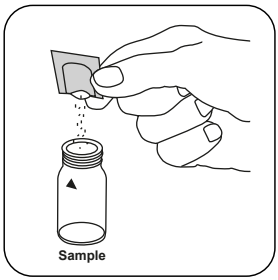
Frantumare la/e pastiglia/e con una leggera rotazione.



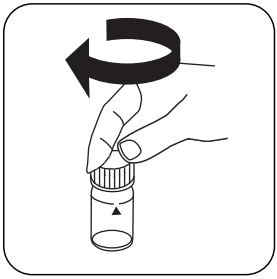
Chiudere la/e cuvetta/e.



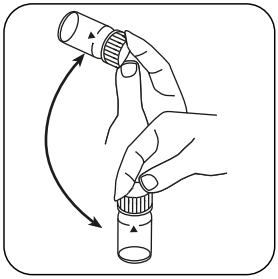
Far sciogliere la/e pastiglia/e agitando.



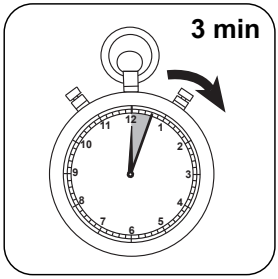
Aggiungere **una bustina di polvere Chlorine TOTAL-DPD/F10** .



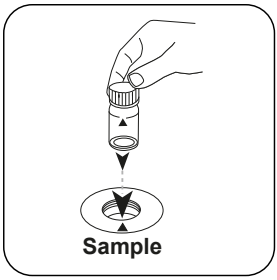
Chiudere la/e cuvetta/e.



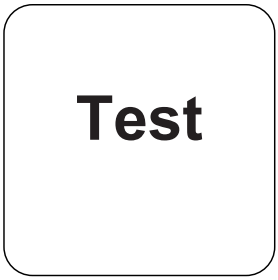
Miscelare il contenuto capovolgendo (20 sec.).



Attendere un **tempo di reazione di 3 minuto/i** .



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



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

Sul display compare il risultato in mg/L di Ozone, mg/l total chlorine.

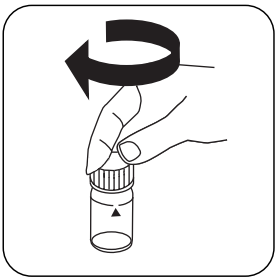
Esecuzione della rilevazione Ozono, in assenza di cloro con confezioni in polvere

Selezionare il metodo nel dispositivo.

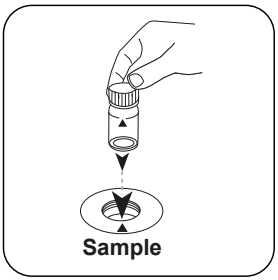
Selezionare inoltre la determinazione: senza Cloro

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

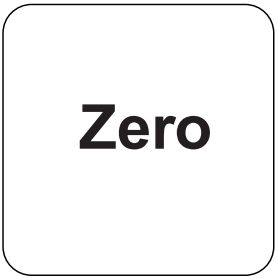
Riempire una cuvetta da 24 mm con **10 mL di campione**.



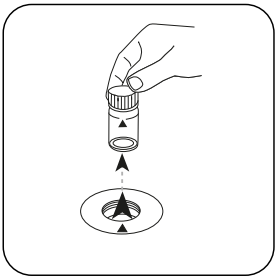
Chiudere la/e cuvetta/e.



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

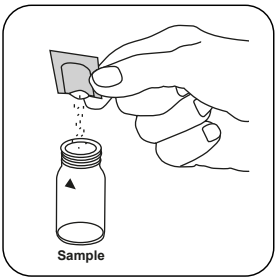


Premere il tasto **ZERO**.

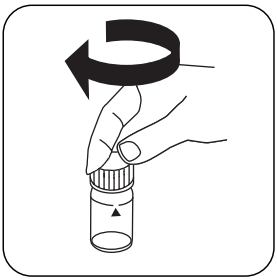


Prelevare la cuvetta dal vano di misurazione.

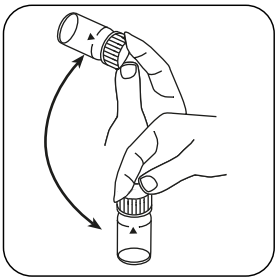
In caso di dispositivi che **non richiedono una misurazione ZERO**, **iniziare da qui**.



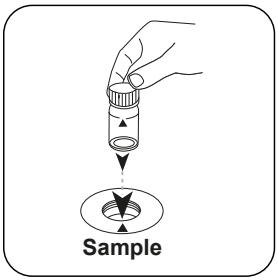
Aggiungere **una bustina di polvere Chlorine TOTAL-DPD/F10** .



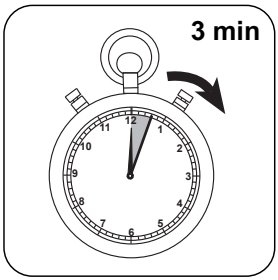
Chiudere la/e cuvetta/e.



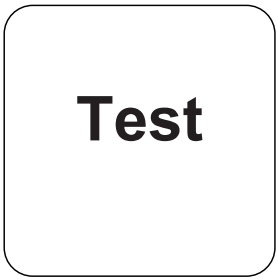
Miscelare il contenuto capovolgendo (20 sec.).



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



Attendere un **tempo di reazione di 3 minuto/i** .



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

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

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	O_3	1
mg/l	Cl_2	1.4771

Metodo chimico

DPD/glicina

Interferenze

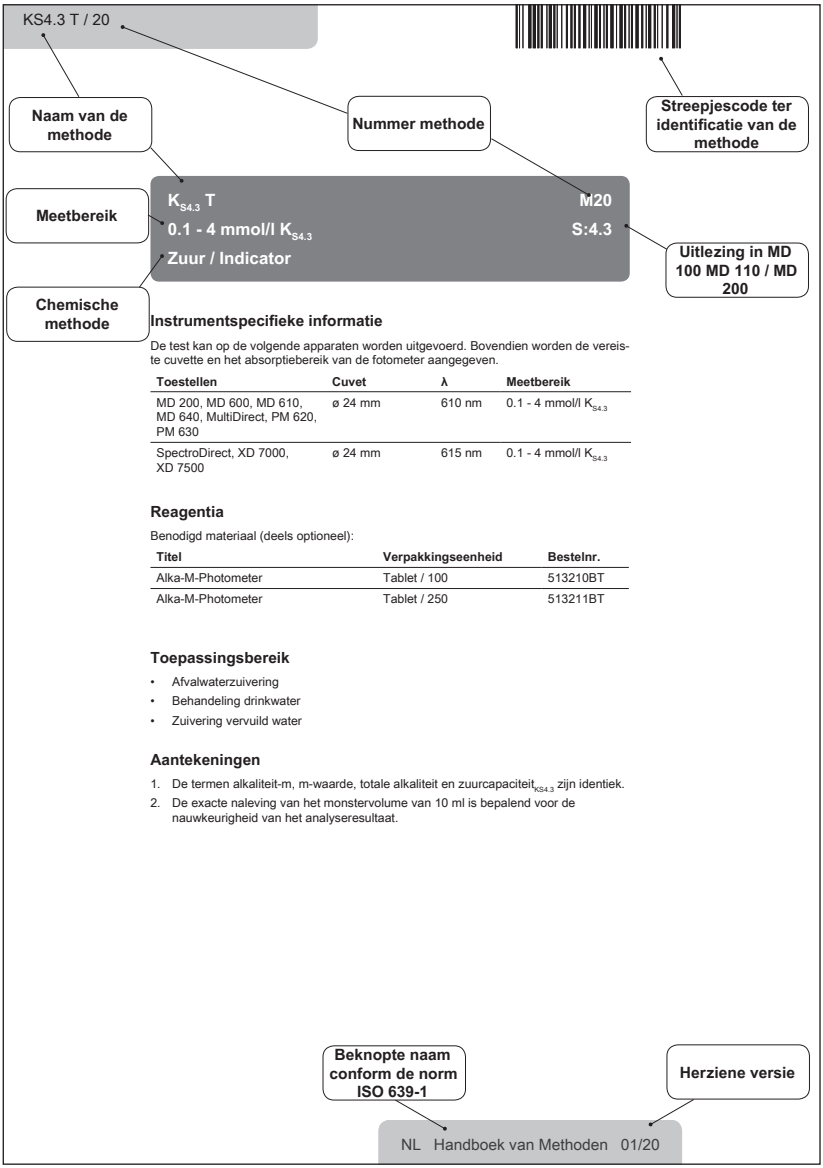
Interferenze permanenti

1. Tutti gli ossidanti presenti nei campioni reagiscono come il cloro dando risultati troppo elevati.
2. Le concentrazioni di ozono maggiori di 6 mg/L possono dare risultati entro il range di misura fino a 0 mg/L. In questo caso il campione di acqua deve essere diluito. 10 ml del campione diluito vengono addizionati con il reagente e la misurazione viene ripetuta (test di plausibilità).

Validazione metodo

Limite di rilevabilità	0.01 mg/L
Limite di quantificazione	0.03 mg/L
Estremità campo di misura	2 mg/L
Sensibilità	1.68 mg/L / Abs
Intervallo di confidenza	0.033 mg/L
Deviazione standard della procedura	0.014 mg/L
Coefficiente di variazione della procedura	1.34 %

[i]Reagente ausiliario, è inoltre necessario per la determinazione di bromo, biossido di cloro o ozono in presenza di cloro



Instrumentspecifieke informatie

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

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

Reagentia

Benodigd materiaal (deels optioneel):

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

Toepassingsbereik

- Afvalwaterzuivering
- Behandeling drinkwater
- Zuivering vervuild water

Aantekeningen

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

Uitvoering van de meting

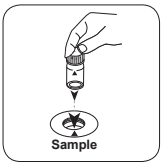
Uitvoering van de bepaling Zuurcapaciteit $K_{S4.3}$ met tablet

De methode in het apparaat selecteren.

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

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

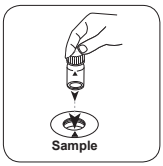
De spoelbakjes afsluiten.



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

• • •

Tabletten oplossen door om te draaien



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

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

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

Ozon T **M300**

0.02 - 2 mg/L O_3 **O3**

DPD/Glycine

NL

Reagentia

Benodigd materiaal (deels optioneel):

Reagentia	Verpakkingseenheid	Bestelnr.
DPD Nr.1	Tablet / 100	511050BT
DPD Nr. 1	Tablet / 250	511051BT
DPD Nr. 1	Tablet / 500	511052BT
DPD Nr. 3	Tablet / 100	511080BT
DPD Nr. 3	Tablet / 250	511081BT
DPD Nr. 3	Tablet / 500	511082BT
DPD Nr. 1 hoog calcium [e)]	Tablet / 100	515740BT
DPD Nr. 1 hoog calcium [e)]	Tablet / 250	515741BT
DPD Nr. 1 hoog calcium [e)]	Tablet / 500	515742BT
DPD Nr. 3 hoog calcium [e)]	Tablet / 100	515730BT
DPD Nr. 3 hoog calcium [e)]	Tablet / 250	515731BT
DPD Nr. 3 hoog calcium [e)]	Tablet / 500	515732BT
Glycine [f)]	Tablet / 100	512170BT
Glycine [f)]	Tablet / 250	512171BT
Set DPD nr. 1/Nr. 3#	per 100	517711BT
Set DPD nr. 1/Nr. 3#	per 250	517712BT
Set DPD nr. 1/Nr. 3 hoog calcium#	per 100	517781BT
Set DPD nr. 1/Nr. 3 hoog calcium#	per 250	517782BT
Set DPD nr. 1/glycine #	per 100	517731BT
Set DPD nr. 1/glycine #	per 250	517732BT

Voorbereiding

1. Het schoonmaken van de spoelbakjes:
   Aangezien veel huishoudelijke reinigingsmiddelen (bijv. afwasmiddelen) reducerende stoffen bevatten, kan de latere bepaling van oxidatiemiddelen (bijv. ozon, chloor) tot verminderde resultaten leiden. Om deze meetfout uit te sluiten, moeten de glasapparaten chloorvrij zijn. Hiertoe wordt het glaswerk gedurende één uur onder natriumhypochlorietoplossing (0,1 g/L) bewaard en vervolgens grondig gespoeld met gedeïoniseerd water.
2. Tijdens de monstervoorbereiding moet worden vermeden dat er ozon wordt uitgestoten, bijvoorbeeld door pipetteren en schudden. De analyse moet onmiddellijk na de bemonstering worden uitgevoerd.
3. Sterk alkalisch of zuur water moet vóór de analyse in een pH-gebied tussen 6 en 7 (met 0,5 mol/l zwavelzuur of 1 mol/l-natriumhydroxideoplossing) worden gebracht.

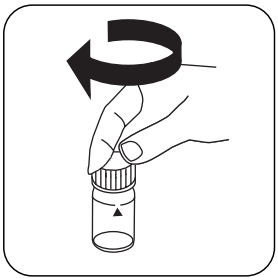
Uitvoering van de bepaling Ozon, naast chloor met tablet

De methode in het apparaat selecteren.

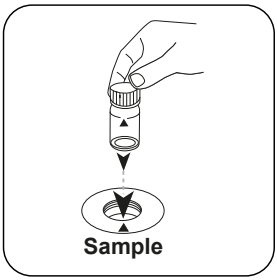
Selecteer bovendien de bepaling: naast chloor

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

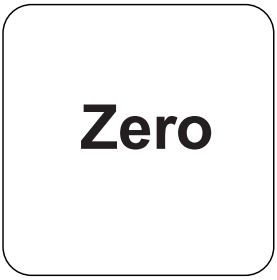
Spoelbakje van 24 mm met **10 mL staal** vullen.



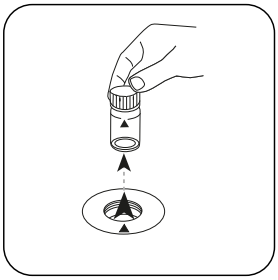
De spoelbakjes afsluiten.



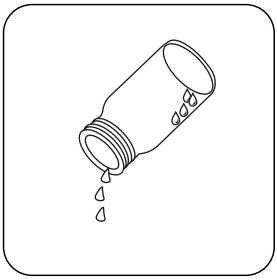
Het **staalspoelbakje** in de meetschacht plaatsen. Op de positionering letten.



De toets **NUL** indrukken.

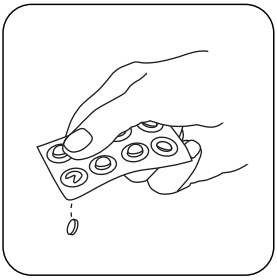


Het spoelbakje uit de meetschacht nemen.

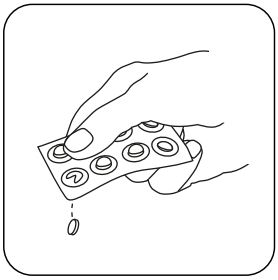


Het spoelbakje tot op enkele druppels ledigen.

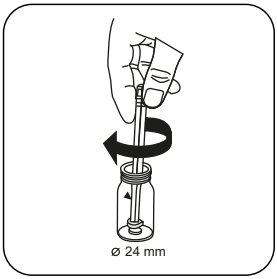
Bij apparaten die **geen nulmeting** vereisen, **hier beginnen**.



Een DPD Nr. 1 tablet toevoegen.

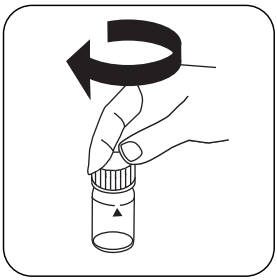


Een DPD Nr. 3 tablet toevoegen.

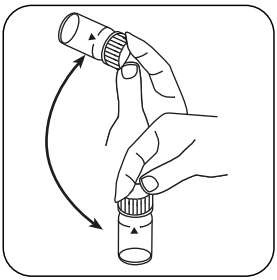


De tabletten onder lichte rotatie verpletteren.

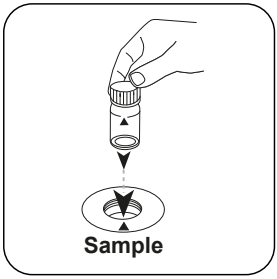
Het spoelbakje tot aan de **markering van 10 mL** met het **staal** vullen.



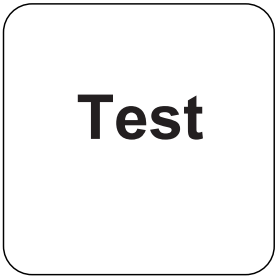
De spoelbakjes afsluiten.



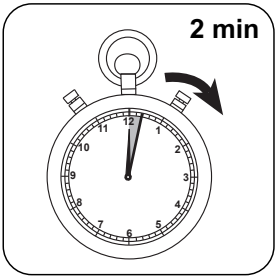
Tabletten oplossen door om te draaien



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

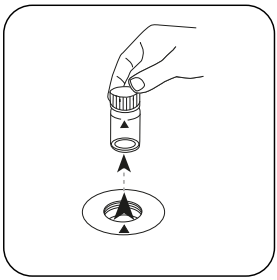


De toets **TEST** (XD: **START**) indrukken.

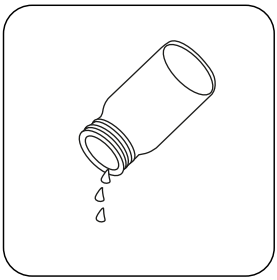


De reactietijd van 2 minuten afwachten.

Na afloop van de reactietijd wordt de meting automatisch uitgevoerd.



Het spoelbakje uit de meetschacht nemen.

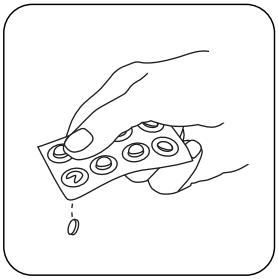


Het spoelbakje ledigen.

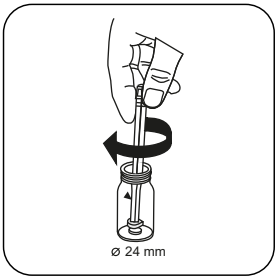
Het spoelbakje en het deksel van het spoelbakje grondig reinigen.

NL

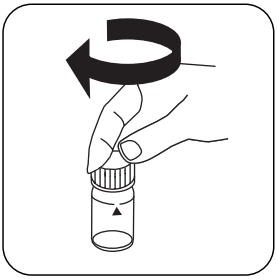
Een **tweede spoelbakje** met **10 mL staal** vullen.



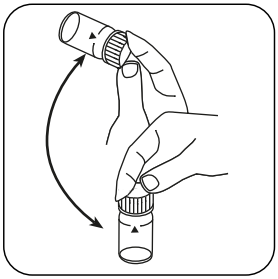
Een GLYCINE tablet toevoegen.



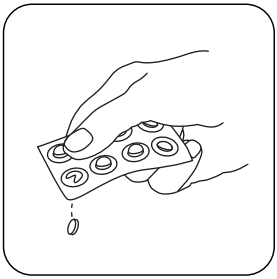
De tabletten onder lichte rotatie verpletteren.



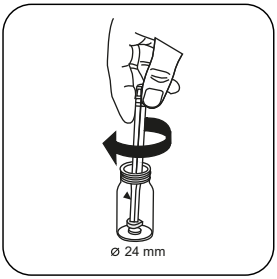
De spoelbakjes afsluiten.



Tabletten oplossen door om te draaien

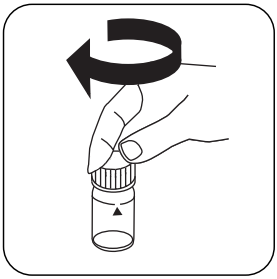


Een DPD Nr. 1 tablet en **een DPD Nr. 3 tablet** rechtstreeks uit de folie in het eerste spoelbakje doen.

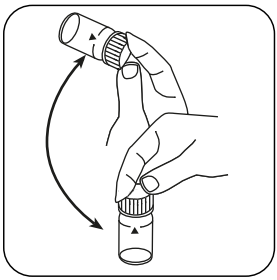


De tabletten onder lichte rotatie verpletteren.

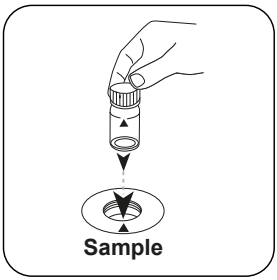
De voorbereide **glycineoplossing** in het voorbereide spoelbakje doen.



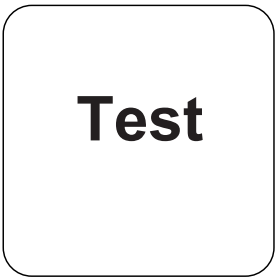
De spoelbakjes afsluiten.



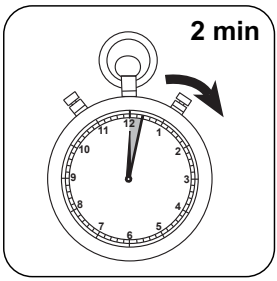
Tabletten oplossen door om te draaien



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



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



De reactietijd van 2 minuten afwachten.

Na afloop van de reactietijd wordt de meting automatisch uitgevoerd.

De display toont het resultaat in mg/L Ozon; mg/l totaal chloor.

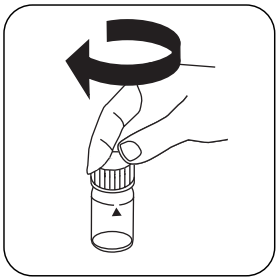
Uitvoering van de bepaling Ozon, in afwezigheid van chloor met tablet

De methode in het apparaat selecteren.

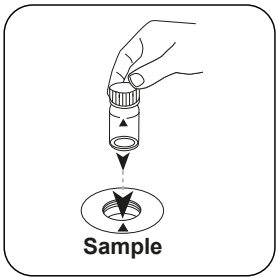
Selecteer bovendien de bepaling: zonder chloor

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

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

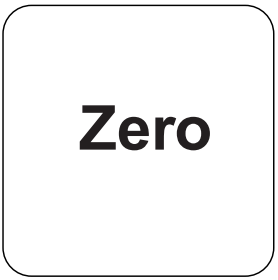


De spoelbakjes afsluiten.

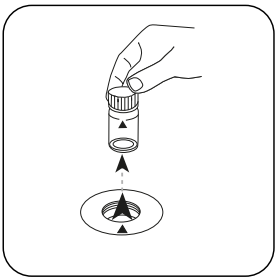


Het **staalspoelbakje** in de meetschacht plaatsen. Op de positionering letten.

NL



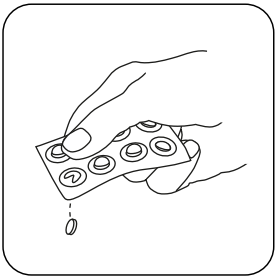
De toets **NUL** indrukken.



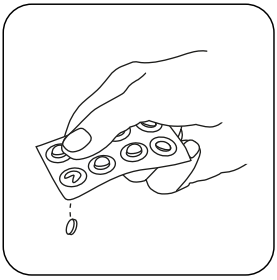
Het spoelbakje uit de meetschacht nemen.

Het spoelbakje tot op enkele druppels ledigen.

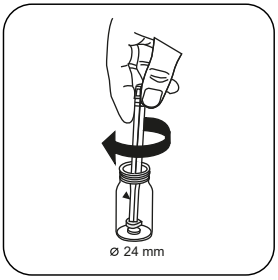
Bij apparaten die **geen nulmeting** vereisen, **hier beginnen**.



Een DPD Nr. 1 tablet toevoegen.

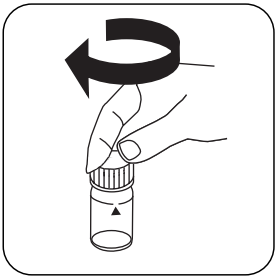


Een DPD Nr. 3 tablet toevoegen.

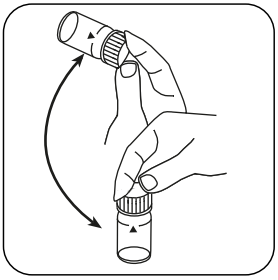


De tabletten onder lichte rotatie verpletteren.

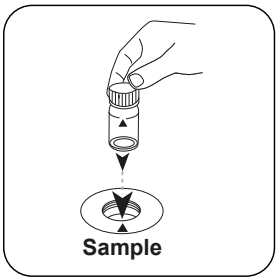
Het spoelbakje tot aan de **markering van 10 mL** met het **staal** vullen.

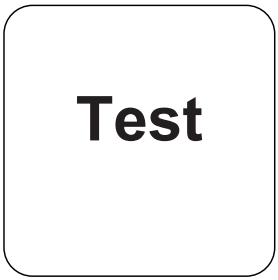


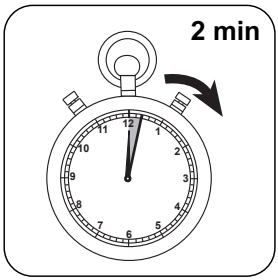
De spoelbakjes afsluiten.



Tabletten oplossen door om te draaien







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

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

De reactietijd van 2 minuten afwachten.

Na afloop van de reactietijd wordt de meting automatisch uitgevoerd.

De display toont het resultaat in mg/L Ozon.

Evaluatie

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

Eenheid	Dagvaardingsformulier	Omrekeningsfactor
mg/l	O_3	1
mg/l	Cl_2	1.4771

Chemische methode

DPD/Glycine

Aanhangsel

Verstoringen

Permanente verstoringen

1. Alle oxidatiemiddelen in de monsters reageren als chloor, wat tot extra resultaten leidt.
2. Concentraties boven de 6 mg/L ozon kunnen leiden tot resultaten binnen het meetbereik tot 0 mg/L. In dit geval moet het watermonster worden verdund. Voeg reagens toe aan 10 ml van het verdunde monster en herhaal de meting (plausibiliteitstest).

Literatuurverwijzing

Colorimetric Chemical Analytical Methods, 9th Edition, Lovibond

Afgeleid van

DIN 38408-3:2011-04

[e)] hulpreagens, alternatief voor DPD-nr. 1 / nr. 3 in geval van troebelheid van het monster als gevolg van een hoog calciumionengehalte en/of een hoge geleidbaarheid | [f)] hulpreagens, extra nodig voor de bepaling van broom, chloordioxide of ozon in aanwezigheid van chloor | [#] met inbegrip van de mengstaaf

Ozon PP M301

0.015 - 1.2 mg/L O_3

DPD/Glycine

NL

Reagentia

Benodigd materiaal (deels optioneel):

Reagentia	Verpakkingseenheid	Bestelnr.
Chloor totaal DPD F10	Poeder / 100 St.	530120
Chloor totaal DPD F10	Poeder / 1000 St.	530123
Glycine [f)]	Tablet / 100	512170BT
Glycine [f)]	Tablet / 250	512171BT

Voorbereiding

1. Het schoonmaken van de spoelbakjes:
   Aangezien veel huishoudelijke reinigingsmiddelen (bijv. afwasmiddelen) reducerende stoffen bevatten, kan de latere bepaling van oxidatiemiddelen (bijv. ozon, chloor) tot verminderde resultaten leiden. Om deze meetfout uit te sluiten, moeten de glasapparaten chloorvrij zijn. Hiertoe wordt het glaswerk gedurende één uur onder natriumhypochlorietoplossing (0,1 g/L) bewaard en vervolgens grondig gespoeld met gedeïoniseerd water.
2. Tijdens de monstervoorbereiding moet worden vermeden dat er ozon wordt uitgestoten, bijvoorbeeld door pipetteren en schudden. De analyse moet onmiddellijk na de bemonstering worden uitgevoerd.
3. Sterk alkalisch of zuur water moet vóór de analyse in een pH-gebied tussen 6 en 7 (met 0,5 mol/l zwavelzuur of 1 mol/l-natriumhydroxideoplossing) worden gebracht.

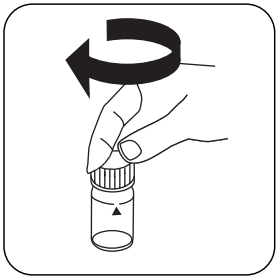
Uitvoering van de bepaling Ozon, in aanwezigheid van chloor, met poederpakjes

De methode in het apparaat selecteren.

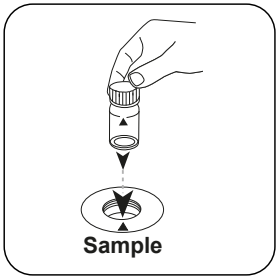
Selecteer bovendien de bepaling: naast chloor

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

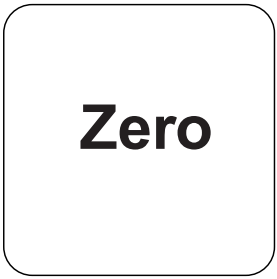
Spoelbakje van 24 mm met **10 mL staal** vullen.



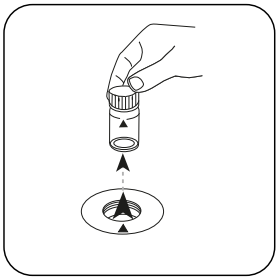
De spoelbakjes afsluiten.



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

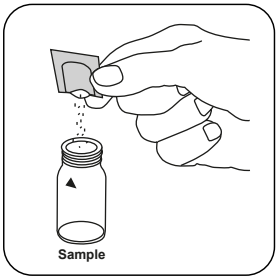


De toets **NUL** indrukken.

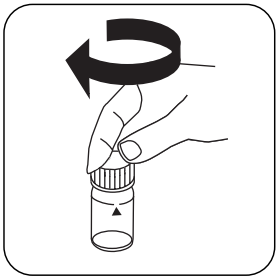


Het spoelbakje uit de meetschacht nemen.

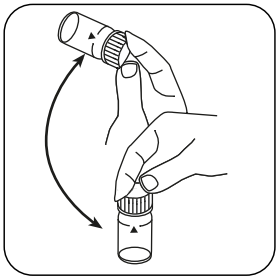
Bij apparaten die **geen nulmeting** vereisen, **hier beginnen**.



Een **Chlorine TOTAL-DPD/F 10 poederpakje** toevoegen.

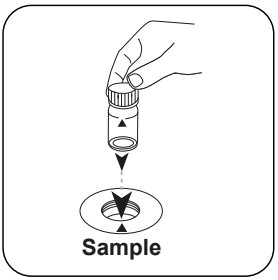


De spoelbakjes afsluiten.

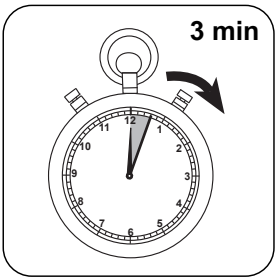


De inhoud mengen door om te draaien (20 sec.).

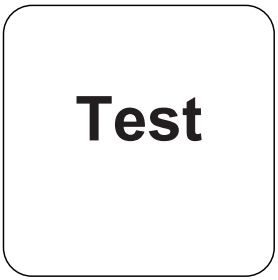
NL



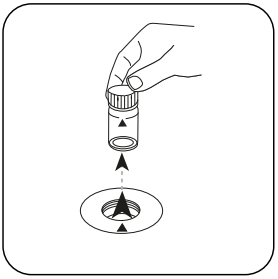
Het **staalspoelbakje** in de meetschacht plaatsen. Op de positionering letten.



De reactietijd van 3 minuten afwachten.

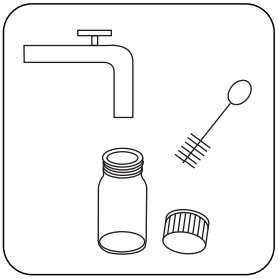


De toets **TEST** (XD: **START**) indrukken.



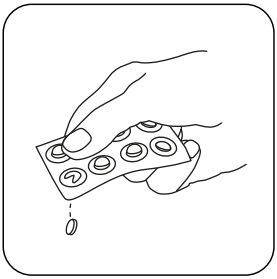
Het spoelbakje uit de meetschacht nemen.

Het spoelbakje ledigen.

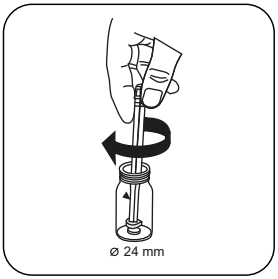


Het spoelbakje en het deksel van het spoelbakje grondig reinigen.

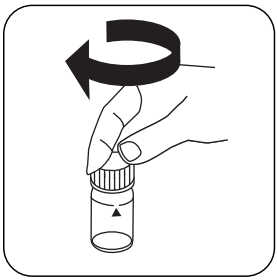
Spoelbakje van 24 mm met **10 mL staal** vullen.



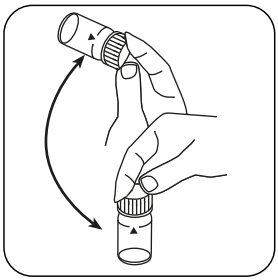
Een GLYCINE tablet toevoegen.



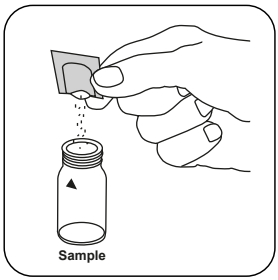
De tabletten onder lichte rotatie verpletteren.



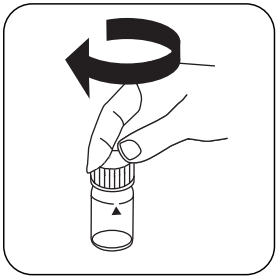
De spoelbakjes afsluiten.



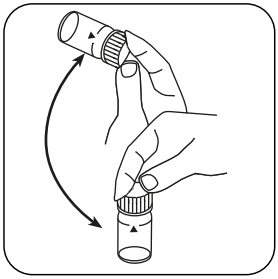
Tabletten oplossen door om te draaien



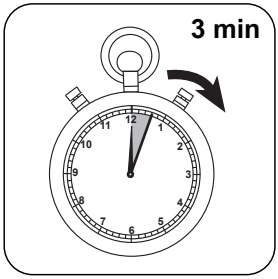
Een **Chlorine TOTAL-DPD/F 10 poederpakje** toevoegen.



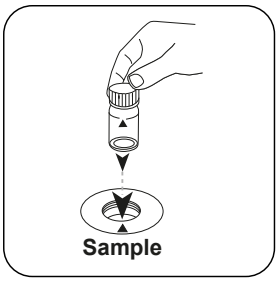
De spoelbakjes afsluiten.



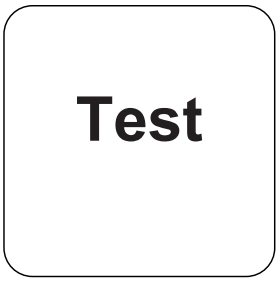
De inhoud mengen door om te draaien (20 sec.).



De reactietijd van 3 minuten afwachten.



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



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

De display toont het resultaat in mg/L Ozon, mg/l totaal chloor.

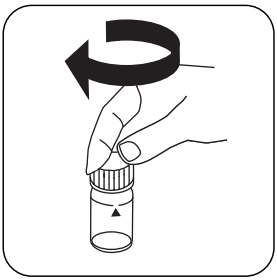
Uitvoering van de bepaling Ozon, in afwezigheid van chloor , met poederpakjes

De methode in het apparaat selecteren.

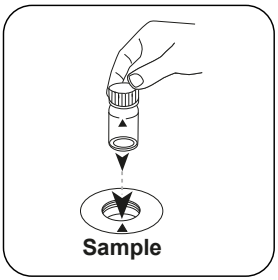
Selecteer bovendien de bepaling: zonder chloor

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

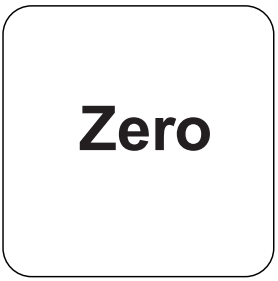
Spoelbakje van 24 mm met **10 mL staal** vullen.



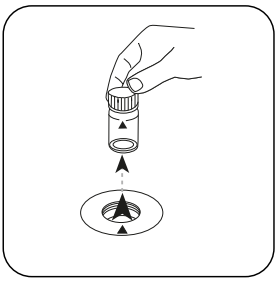
De spoelbakjes afsluiten.



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

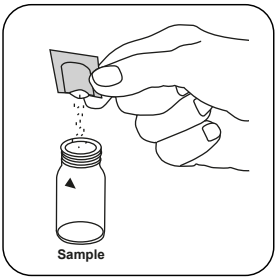


De toets **NUL** indrukken.



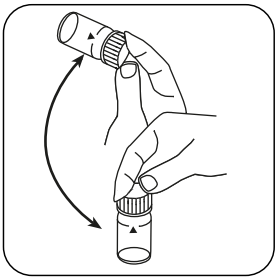
Het spoelbakje uit de meetschacht nemen.

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

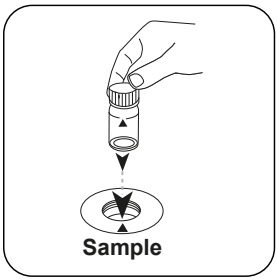


Een **Chlorine TOTAL-DPD/F 10 poederpakje** toevoegen.

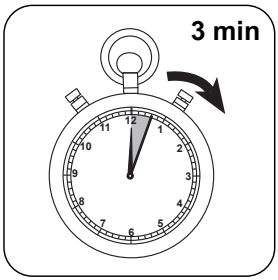
De spoelbakjes afsluiten.



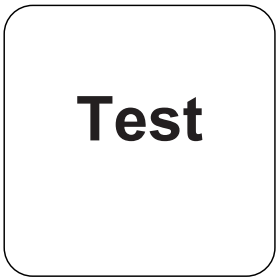
De inhoud mengen door om te draaien (20 sec.).



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



De reactietijd van 3 minuten afwachten.



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

De display toont het resultaat in mg/L Ozon.

Evaluatie

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

Eenheid	Dagvaardingsformulier	Omrekeningsfactor
mg/l	O_3	1
mg/l	Cl_2	1.4771

Chemische methode

DPD/Glycine

Verstoringen

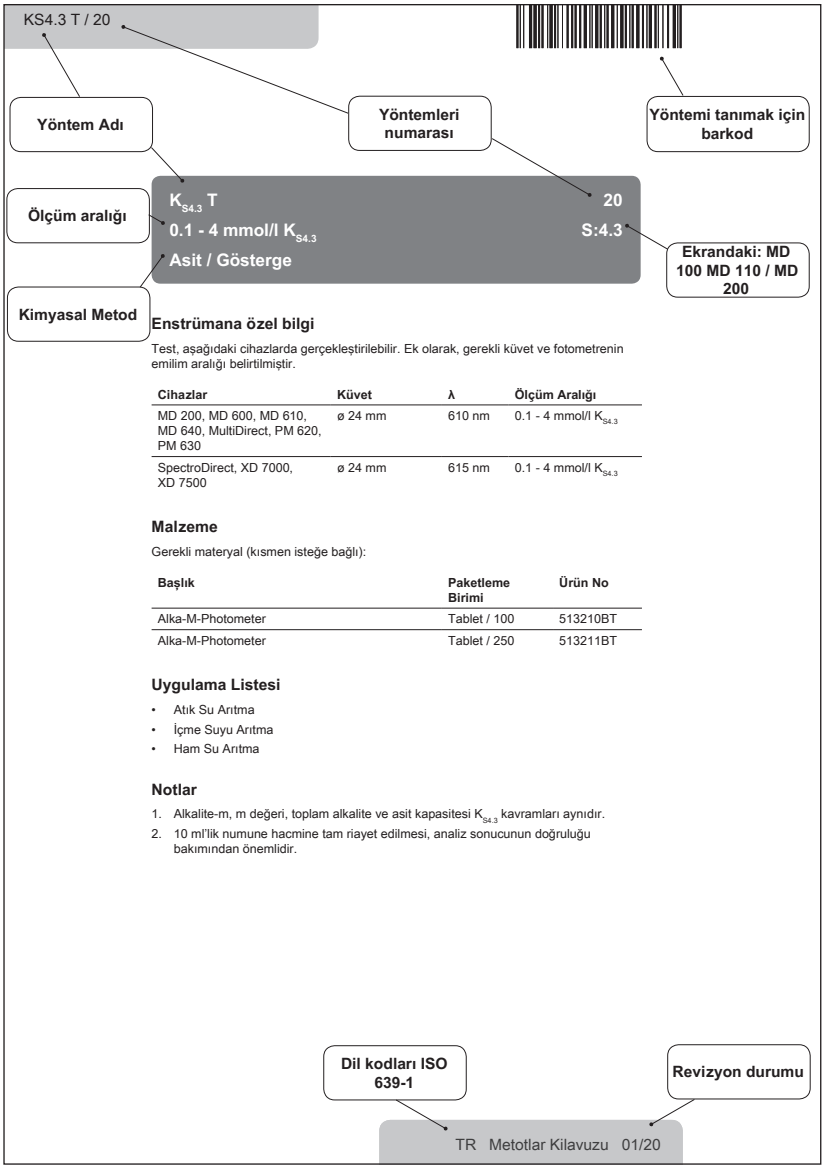
Permanente verstoringen

1. Alle oxidatiemiddelen in de monsters reageren als chloor, wat tot extra resultaten leidt.
2. Concentraties boven de 6 mg/L ozon kunnen leiden tot resultaten binnen het meetbereik tot 0 mg/L. In dit geval moet het watermonster worden verdund. Voeg reagens toe aan 10 ml van het verdunde monster en herhaal de meting (plausibiliteitstest).

Validatie van de methodes

Aantoonbaarheidsgrens	0.01 mg/L
Bepaalbaarheidsgrens	0.03 mg/L
Einde meetbereik	2 mg/L
Gevoeligheid	1.68 mg/L / Abs
Betrouwbaarheidsgrenzen	0.033 mg/L
Standaardafwijking procedure	0.014 mg/L
Variatiecoefficient procedure	1.34 %

[f] hulpreagens, extra nodig voor de bepaling van broom, chloordioxide of ozon in aanwezigheid van chloor



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

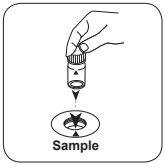
Tespitin uygulanması Tabletli asit kapasitesi $K_{S4.3}$

Cihazda metot seçin.

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

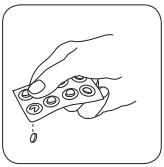
24 mm'lik küveti **10 ml numune** ile doldurun.

Küveti(küvetleri) kapatın.

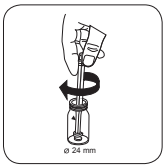


Numune küvetini ölçüm haznesine koyun. Doğru konumlandırılmasına dikkat edin.

• • •



ALKA-M-PHOTOMETER tablet ilave edin.



Tableti(tabletleri) hafifçe döndürerek ezin.

Küveti(küvetleri) kapatın.

TR Metotlar Kilavuzu 01/20

Ozon T M300

0.02 - 2 mg/L O_3 O3

DPD / Glisin

TR

Malzeme

Gerekli materyal (kısmen isteğe bağlı):

Ayıraçlar	Paketleme Birimi	Ürün No
DPD No.1	Tablet / 100	511050BT
DPD No. 1	Tablet / 250	511051BT
DPD No. 1	Tablet / 500	511052BT
DPD No. 3	Tablet / 100	511080BT
DPD No. 3	Tablet / 250	511081BT
DPD No. 3	Tablet / 500	511082BT
DPD No. 1 High Calcium [e)]	Tablet / 100	515740BT
DPD No. 1 High Calcium [e)]	Tablet / 250	515741BT
DPD No. 1 High Calcium [e)]	Tablet / 500	515742BT
DPD No. 3 High Calcium [e)]	Tablet / 100	515730BT
DPD No. 3 High Calcium [e)]	Tablet / 250	515731BT
DPD No. 3 High Calcium [e)]	Tablet / 500	515732BT
Glycine [f)]	Tablet / 100	512170BT
Glycine [f)]	Tablet / 250	512171BT
Set DPD No. 1/No. 3#	her bir 100	517711BT
Set DPD No. 1/No. 3#	her bir 250	517712BT
Set DPD No. 1/No. 3 High Calcium#	her bir 100	517781BT
Set DPD No. 1/No. 3 High Calcium#	her bir 250	517782BT
Set DPD No. 1/glisin #	her bir 100	517731BT
Set DPD No. 1/glisin #	her bir 250	517732BT

Hazırlık

1. Küvetlerin temizlenmesi:
   Birçok ev tipi temizlik malzemesi (ör. bulaşık deterjanı) azaltıcı maddeler içerdiğinden bir sonraki oksidasyon malzemeleri (ör. ozon, klor) tespitinde ehemmiyetsiz miktarda bulgulara ulaşılabilir. Bu ölçüm hatasına ihtimal vermemek için cam aletler klordan etkilenmeyecek şekilde olmalıdır. Bunun için cam gereçler bir saatliğine sodyum hipoklorit çözeltisinde (0,1 g/L) muhafaza edilir ve sonrasında demineralize su ile yıkanır.
2. Numune ön hazırlığı esnasında ör. pipetleme ve çalkalama ile ozonun gazlaşması önlenmelidir. Analiz numune alımından hemen sonra yapılmalıdır.
3. Analizden önce aşırı alkali veya asitli suların pH değeri 6 ile 7 arasına getirilmelidir (0,5 mol/l sülfürik asit veya 1 mol/l sodyum hidroksitin su ile çözünmüş hali ile).

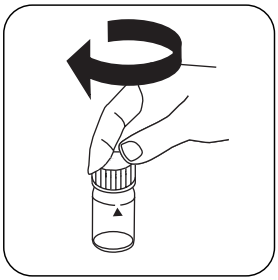
Tespitin uygulanması Ozon, tabletle birlikte klor mevcutken

Cihazda metot seçin.

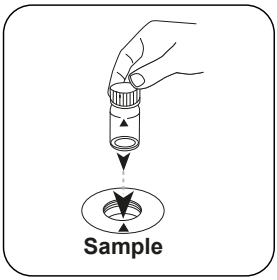
Buna ek olarak tespiti seçin: klor mevcutken

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

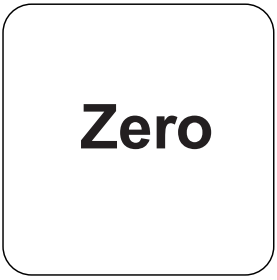
24 mm'lik küveti **10 mL numune** ile doldurun.



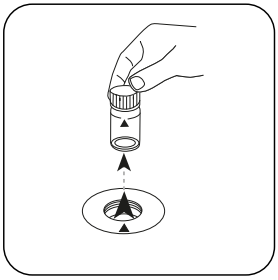
Küveti(küvetleri) kapatın.



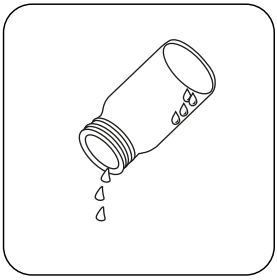
Numune küvetini ölçüm haznesine koyun. Doğru konumlandırılmasına dikkat edin.



ZERO tuşuna basın.

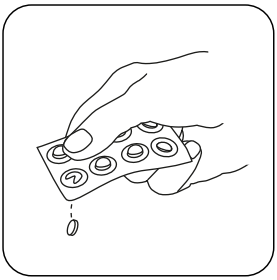


Küveti ölçüm haznesinden alın.

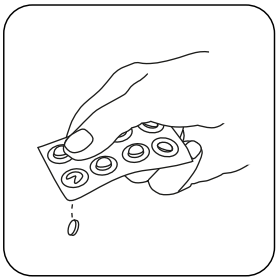


Küveti birkaç damla kalacak kadar boşaltın.

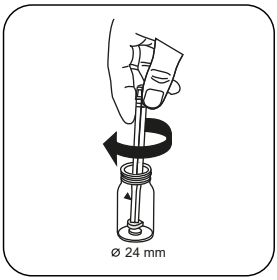
ZERO ölçümü gerektirmeyen cihazlarda **buradan başlayın**.



DPD No. 1 tablet ilave edin.

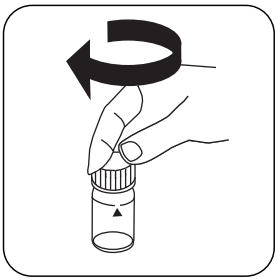


DPD No. 3 tablet ilave edin.

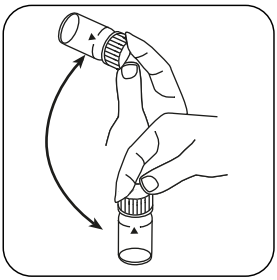


Tableti(tabletleri) hafifçe döndürerek ezin.

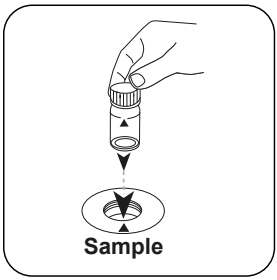
Küveti **10 mL işaretine** kadar **numune** ile doldurun.



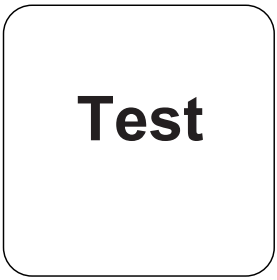
Küveti(küvetleri) kapatın.



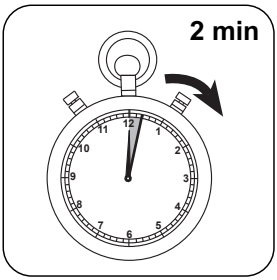
Tableti(tabletleri) sallayarak çözdürün.



Numune küvetini ölçüm haznesine koyun. Doğru konumlandırılmasına dikkat edin.

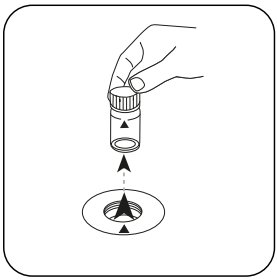


TEST (XD: **START**) tuşuna basın.

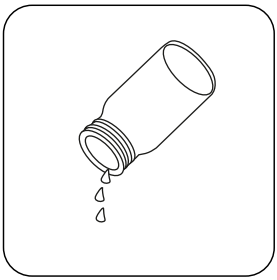


2 dakika tepkime süresi bekleyin.

Tepkime süresinin sona ermesinden sonra ölçüm otomatik gerçekleşir.



Küveti ölçüm haznesinden alın.

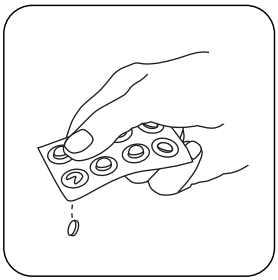


Küveti boşaltın.

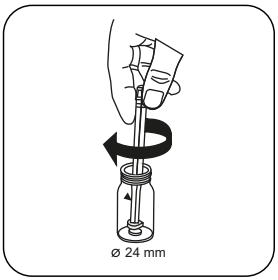
Küveti ve küvet kapağını iyice temizleyin.

TR

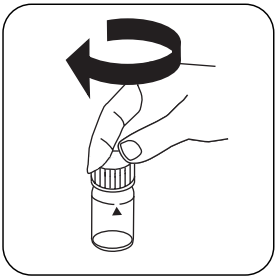
İkinci bir küveti 10 mL numune ile doldurun.



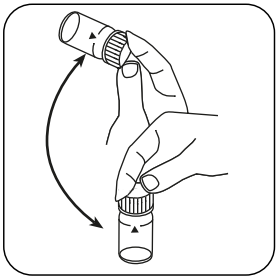
GLYCINE tablet ilave edin.



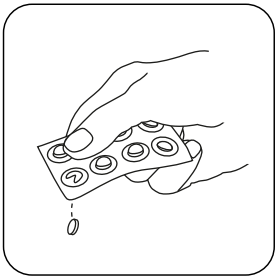
Tableti(tabletleri) hafifçe döndürerek ezin.



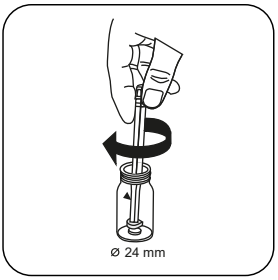
Küveti(küvetleri) kapatın.



Tableti(tabletleri) sallayarak çözdürün.

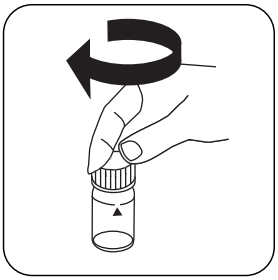


DPD No. 1 tableti ve**bir DPD No. 3 tableti** doğrudan folyodan ilk küvete ekleyin.

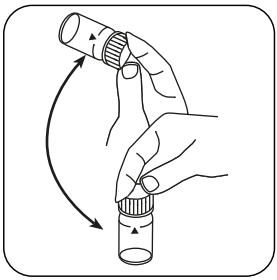


Tableti(tabletleri) hafifçe döndürerek ezin.

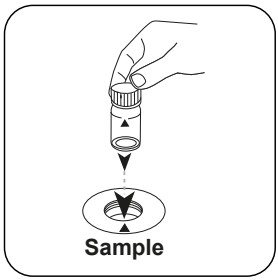
Önceden hazırlanmış küvete önceden hazırlanmış **glisin çözeltisi** ekleyin.



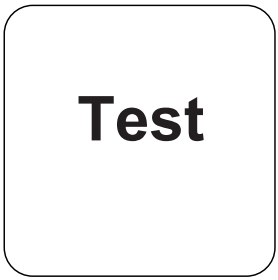
Küveti(küvetleri) kapatın.



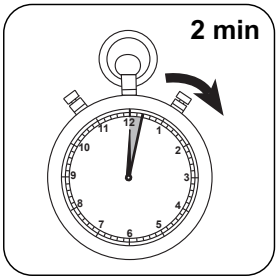
Tableti(tabletleri) sallayarak çözdürün.



Numune küvetini ölçüm haznesine koyun. Doğru konumlandırılmasına dikkat edin.



TEST (XD: **START**) tuşuna basın.



2 dakika tepkime süresi bekleyin.

Tepkime süresinin sona ermesinden sonra ölçüm otomatik gerçekleşir.

Ekranda sonuç mg/L Ozon; mg/l toplam klor cinsinden belirir.

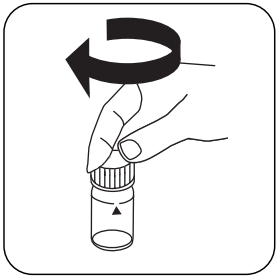
Tespitin uygulanması Ozon, tabletle birlikte klor mevcut değilken

Cihazda metot seçin.

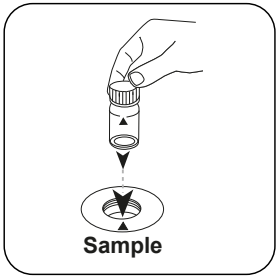
Buna ek olarak tespiti seçin: klor olmadan

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

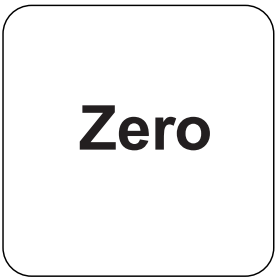
24 mm'lik küveti **10 mL numune** ile doldurun.



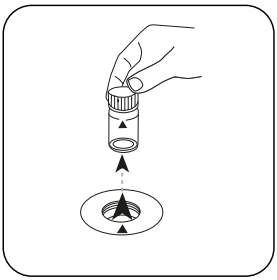
Küveti(küvetleri) kapatın.



Numune küvetini ölçüm haznesine koyun. Doğru konumlandırılmasına dikkat edin.



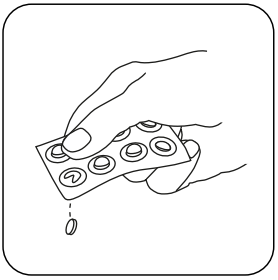
ZERO tuşuna basın.



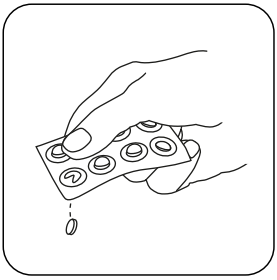
Küveti ölçüm haznesinden alın.

Küveti birkaç damla kalacak kadar boşaltın.

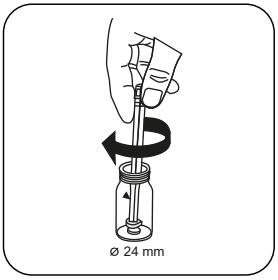
ZERO ölçümü gerektirmeyen cihazlarda **buradan başlayın**.



DPD No. 1 tablet ilave edin.

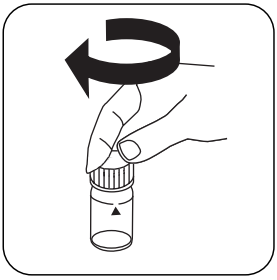


DPD No. 3 tablet ilave edin.

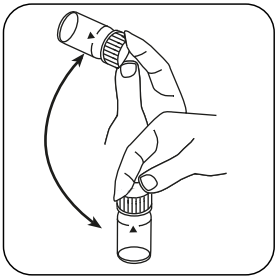


Tableti(tabletleri) hafifçe döndürerek ezin.

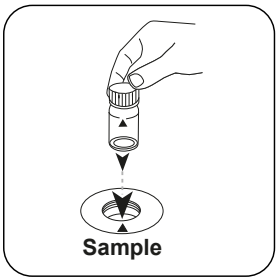
Küveti **10 mL işaretine** kadar **numune** ile doldurun.

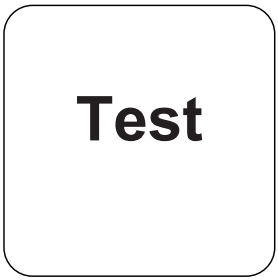


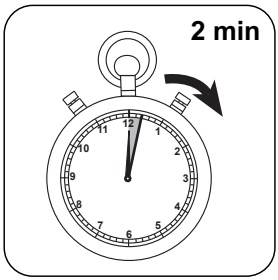
Küveti(küvetleri) kapatın.



Tableti(tabletleri) sallayarak çözdürün.







Numune küvetini ölçüm haznesine koyun. Doğru konumlandırılmasına dikkat edin.

TEST (XD: **START**) tuşuna basın.

2 dakika tepkime süresi bekleyin.

Tepkime süresinin sona ermesinden sonra ölçüm otomatik gerçekleşir.

Ekranda sonuç mg/L Ozon cinsinden belirir.

Analizler

Aşağıdaki tablo, çıkış değerlerini diğer alıntı formlarına dönüştürülebileceğini tanımlar.

Birim	Kısa formül	Ölçek katsayısı
mg/l	O_3	1
mg/l	Cl_2	1.4771

Kimyasal Metod

DPD / Glisin

Apandis

Girişim Metni

Kalıcı Girişimler

1. Numunelerde bulunan tüm oksidasyon malzemeleri tıpkı klor gibi tepkime verir ve bu da fazla miktarda bulguya sebep olur.
2. 6 mg/L ozon üzerindeki konsantrasyonlar, ölçüm aralığı içinde 0 mg/L'ye varan sonuçlara neden olabilir. Bu durumda su numunesi seyreltilmelidir. Seyreltilen numunenin 10 ml'sine ayıraç katılır ve ölçüm tekrarlanır (uygunluk testi).

Bibliyografi

Colorimetric Chemical Analytical Methods, 9th Edition, Lovibond

Elde edilen

DIN 38408-3:2011-04

[e)] alternatif reaktif, yüksek kalsiyum konsantrasyonu ve/veya yüksek iletkenlik nedeniyle su numunesinde bulanıklık oluşması durumunda DPD No.1/No.3 yerine kullanılır | [f)] klorun mevcut olması durumunda bromür, klor dioksit ve ozonu belirlemek için gerekir | [#] karıştırma çubuğu dahil

Ozon PP M301

0.015 - 1.2 mg/L O_3

DPD / Glisin

TR

Malzeme

Gerekli materyal (kısmen isteğe bağlı):

Ayıraçlar	Paketleme Birimi	Ürün No
Toplam klor DPD F10	Toz / 100 adetler	530120
Toplam klor DPD F10	Toz / 1000 adetler	530123
Glycine [f)]	Tablet / 100	512170BT
Glycine [f)]	Tablet / 250	512171BT

Hazırlık

1. Küvetlerin temizlenmesi:
   Birçok ev tipi temizlik malzemesi (ör. bulaşık deterjanı) azaltıcı maddeler içerdiğinden bir sonraki oksidasyon malzemeleri (ör. ozon, klor) tespitinde ehemmiyetsiz miktarda bulgulara ulaşılabilir. Bu ölçüm hatasına ihtimal vermemek için cam aletler klordan etkilenmeyecek şekilde olmalıdır. Bunun için cam gereçler bir saatliğine sodyum hipoklorit çözeltisinde (0,1 g/L) muhafaza edilir ve sonrasında demineralize su ile yıkanır.
2. Numune ön hazırlığı esnasında ör. pipetleme ve çalkalama ile ozonun gazlaşması önlenmelidir. Analiz numune alımından hemen sonra yapılmalıdır.
3. Analizden önce aşırı alkali veya asitli suların pH değeri 6 ile 7 arasına getirilmelidir (0,5 mol/l sülfürik asit veya 1 mol/l sodyum hidroksitin su ile çözünmüş hali ile).

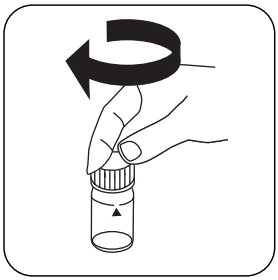
Tespitin uygulanması Ozon, toz poşetleriyle birlikte klor mevcutken

Cihazda metot seçin.

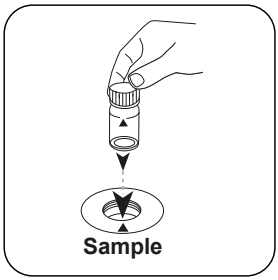
Buna ek olarak tespiti seçin: klor mevcutken

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

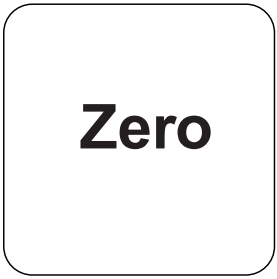
24 mm'lik küveti **10 mL numune** ile doldurun.



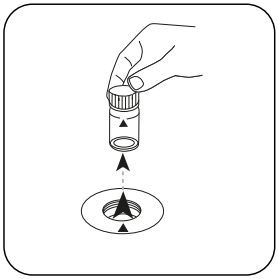
Küveti(küvetleri) kapatın.



Numune küvetini ölçüm haznesine koyun. Doğru konumlandırılmasına dikkat edin.

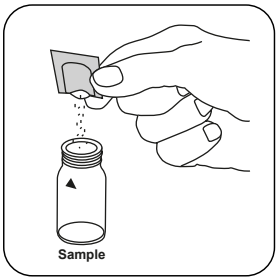


ZERO tuşuna basın.

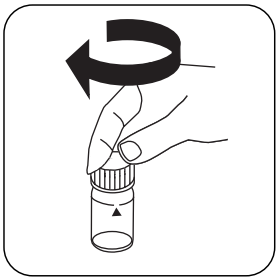


Küveti ölçüm haznesinden alın.

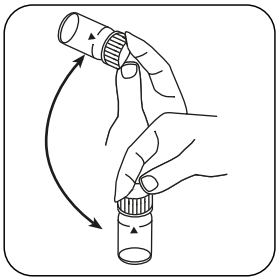
ZERO ölçümü gerektirmeyen cihazlarda **buradan başlayın**.



Chlorine TOTAL-DPD/F 10 toz paketi ilave edin.

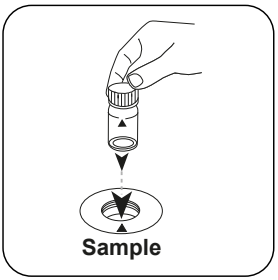


Küveti(küvetleri) kapatın.

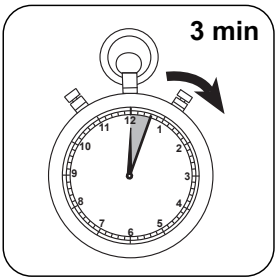


Sallayarak içeriği karıştırın (20 sec.).

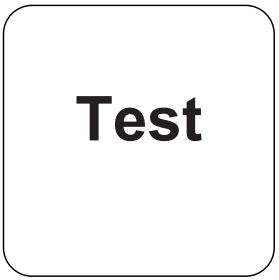
TR



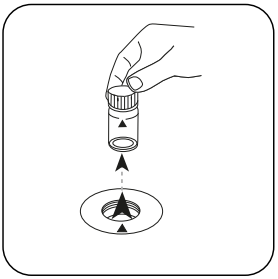
Numune küvetini ölçüm haznesine koyun. Doğru konumlandırılmasına dikkat edin.



3 dakika tepkime süresi bekleyin.



TEST (XD: **START**) tuşuna basın.

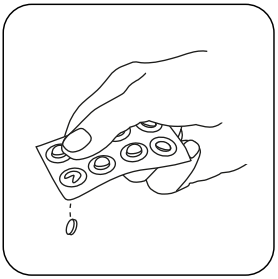


Küveti ölçüm haznesinden alın.

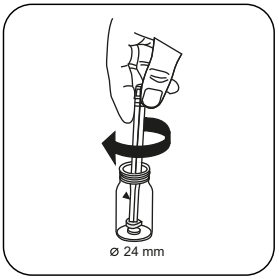
Küveti boşaltın.

Küveti ve küvet kapağını iyice temizleyin.

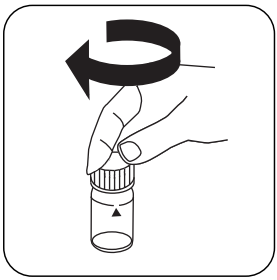
24 mm'lik küveti **10 mL numune** ile doldurun.



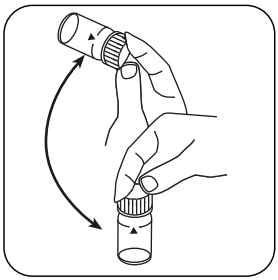
GLYCINE tablet ilave edin.



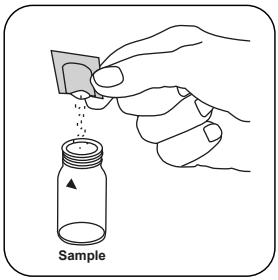
Tableti(tabletleri) hafifçe döndürerek ezin.



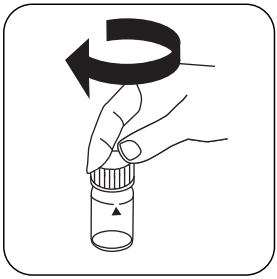
Küveti(küvetleri) kapatın.



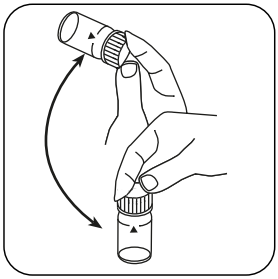
Tableti(tabletleri) sallayarak çözdürün.



Chlorine TOTAL-DPD/F 10 toz paketi ilave edin.



Küveti(küvetleri) kapatın.



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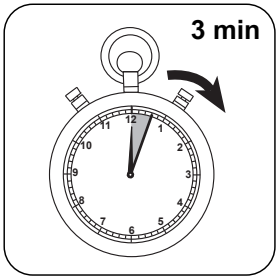
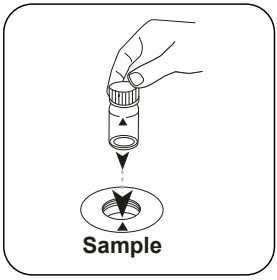
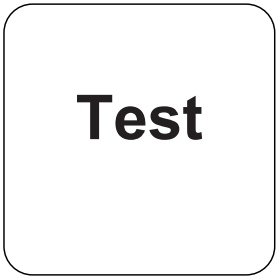


3 dakika tepkime süresi bekleyin.



Numune küvetini ölçüm haznesine koyun. Doğru konumlandırılmasına dikkat edin.



TEST (XD: **START**) tuşuna basın.

Ekranda sonuç mg/L Ozone, mg/l total chlorine cinsinden belirir.

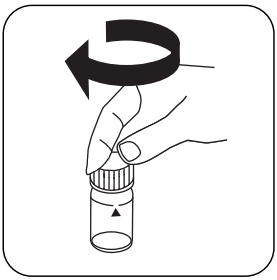
Tespitin uygulanması Ozon , toz poşetleriyle birlikte klor mevcut değilken

Cihazda metot seçin.

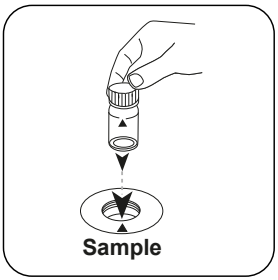
Buna ek olarak tespiti seçin: klor olmadan

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

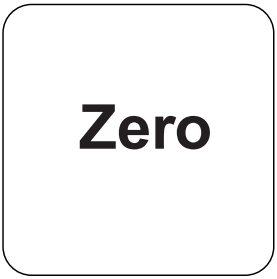
24 mm'lik küveti **10 mL numune** ile doldurun.



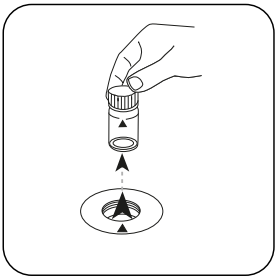
Küveti(küvetleri) kapatın.



Numune küvetini ölçüm haznesine koyun. Doğru konumlandırılmasına dikkat edin.

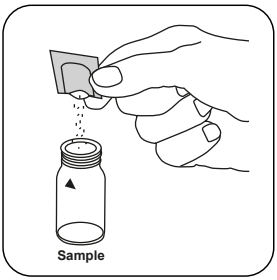


ZERO tuşuna basın.

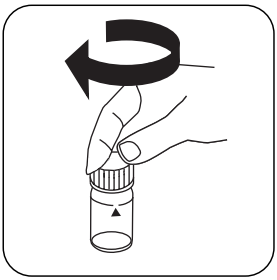


Küveti ölçüm haznesinden alın.

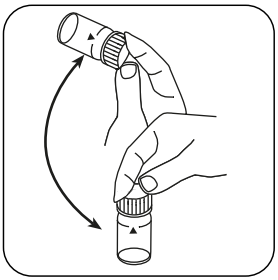
ZERO ölçümü gerektirmeyen cihazlarda **buradan başlayın**.



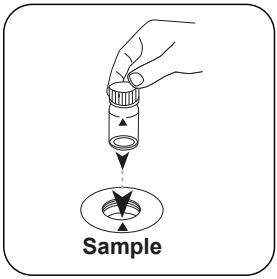
Chlorine TOTAL-DPD/F 10 toz paketi ilave edin.



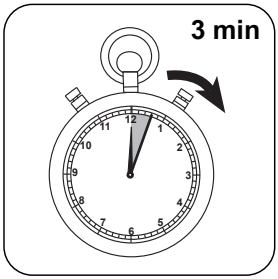
Küveti(küvetleri) kapatın.



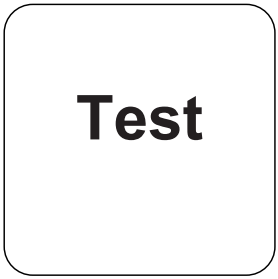
Sallayarak içeriği karıştırın (20 sec.).



Numune küvetini ölçüm haznesine koyun. Doğru konumlandırılmasına dikkat edin.



3 dakika tepkime süresi bekleyin.



TEST (XD: **START**) tuşuna basın.

Ekranda sonuç mg/L Ozone cinsinden belirir.

Analizler

Aşağıdaki tablo, çıkış değerlerini diğer alıntı formlarına dönüştürülebileceğini tanımlar.

Birim	Kısa formül	Ölçek katsayısı
mg/l	O_3	1
mg/l	Cl_2	1.4771

Kimyasal Metod

DPD / Glisin

Girişim Metni

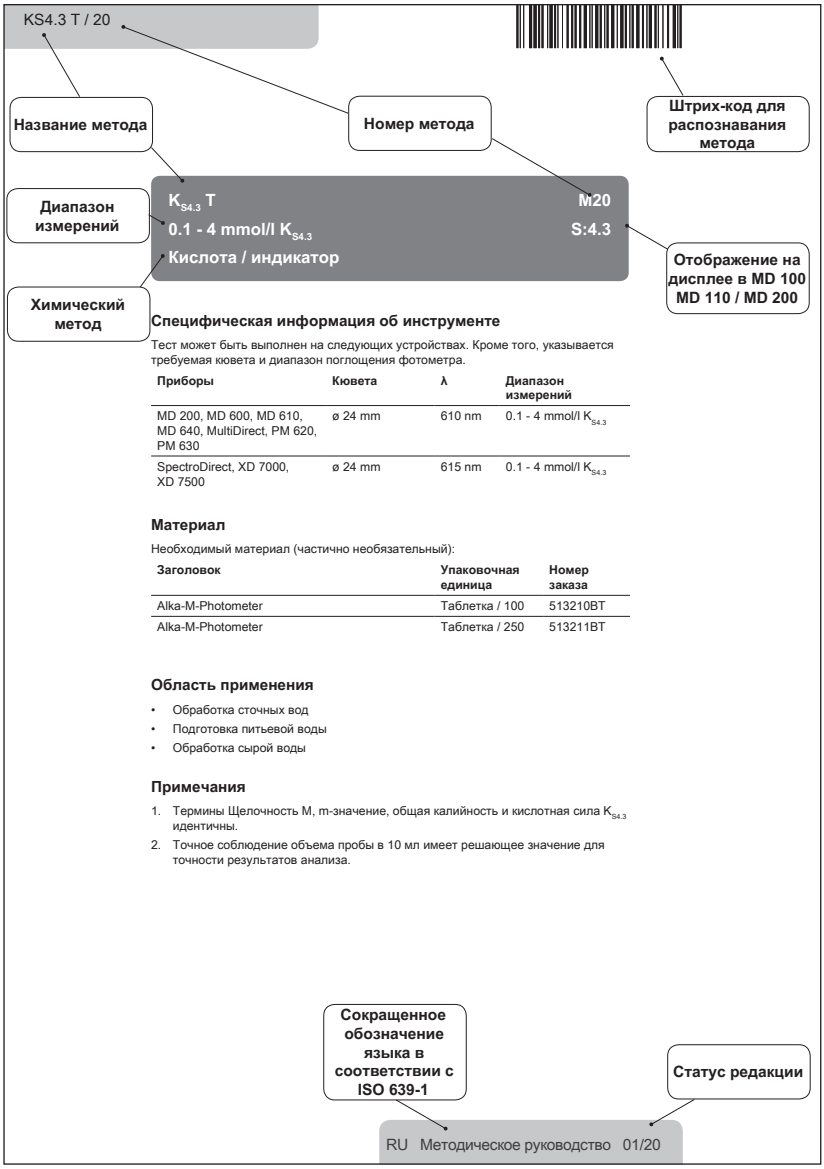
Kalıcı Girişimler

1. Numunelerde bulunan tüm oksidasyon malzemeleri tıpkı klor gibi tepkime verir ve bu da fazla miktarda bulguya sebep olur.
2. 6 mg/L ozon üzerindeki konsantrasyonlar, ölçüm aralığı içinde 0 mg/L'ye varan sonuçlara neden olabilir. Bu durumda su numunesi seyreltilmelidir. Seyreltilen numunenin 10 ml'sine ayıraç katılır ve ölçüm tekrarlanır (uygunluk testi).

Yöntem Doğrulama

Algılama Limiti	0.01 mg/L
Belirleme Limiti	0.03 mg/L
Ölçüm Aralığı Sonu	2 mg/L
Hassasiyet	1.68 mg/L / Abs
Güven Aralığı	0.033 mg/L
Standart Sapma	0.014 mg/L
Varyasyon Katsayısı	1.34 %

[f] klorun mevcut olması durumunda bromür, klor dioksit ve ozonu belirlemek için gerekir



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.

Выполнение измерения

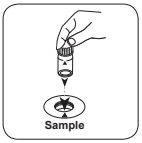
Выполнение определения Кислотная сила $K_{S4.3}$ с таблеткой

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.

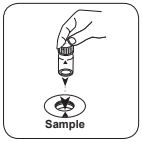
Закройте кювету(ы).



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 $K_{S4.3}$.

Озон T **M300**

0.02 - 2 mg/L O_3 **O3**

DPD / глицин

RU

Материал

Необходимый материал (частично необязательный):

Реактивы	Упаковочная единица	Номер заказа
DPD №1	Таблетка / 100	511050BT
DPD № 1	Таблетка / 250	511051BT
DPD № 1	Таблетка / 500	511052BT
DPD № 3	Таблетка / 100	511080BT
DPD № 3	Таблетка / 250	511081BT
DPD № 3	Таблетка / 500	511082BT
DPD № 1 Кальций высокий [e)]	Таблетка / 100	515740BT
DPD № 1 Кальций высокий [e)]	Таблетка / 250	515741BT
DPD № 1 Кальций высокий [e)]	Таблетка / 500	515742BT
DPD № 3 Кальций высокий [e)]	Таблетка / 100	515730BT
DPD № 3 Кальций высокий [e)]	Таблетка / 250	515731BT
DPD № 3 Кальций высокий [e)]	Таблетка / 500	515732BT
Глицин [f)]	Таблетка / 100	512170BT
Глицин [f)]	Таблетка / 250	512171BT
Набор DPD № 1/№ 3#	100 каждая	517711BT
Набор DPD № 1/№ 3#	250 каждая	517712BT
Набор DPD № 1/№ 3 Кальций высокий#	100 каждая	517781BT
Набор DPD № 1/№ 3 Кальций высокий#	250 каждая	517782BT
Набор DPD № 1/глицин #	100 каждая	517731BT
Набор DPD № 1/глицин #	250 каждая	517732BT

Подготовка

1. Чистка кювет:
   Поскольку многие бытовые чистящие средства (например, средства для мытья посуды) содержат восстановительные вещества, при последующем определении оксидационных средств (например, озона, хлора) возможно получение пониженных результатов. Чтобы исключить эту погрешность измерения, стеклянные приборы не должны потреблять хлор. Поэтому стеклотара хранится в течение часа под раствором гипохлорита натрия (0,1 г/л), а затем тщательно промывается полностью деминерализованной водой.
2. Во время подготовки пробы необходимо избегать выделения озона в атмосферу, например, из-за пипетирования и встряхивания. Анализ должен проводиться сразу же после отбора проб.
3. Сильно щелочные или кислые воды должны быть приведены в диапазон pH от 6 до 7 (с 0,5 моль/л серной кислоты или 1 моль/л раствора гидроксида натрия) перед анализом.

Выполнение определения Озон в присутствии хлора с использованием таблетки

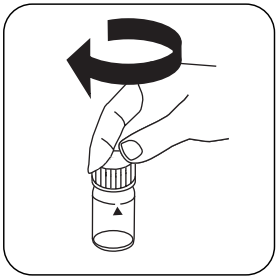
Выберите метод в устройстве.

Также выберите определение: в присутствии хлора.

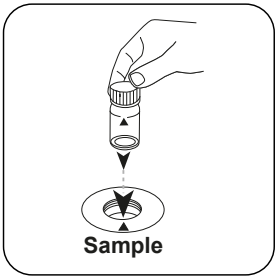
Для этого метода необязательно проводить измерение НУЛЯ каждый раз на следующих устройствах: XD 7000, XD 7500

RU

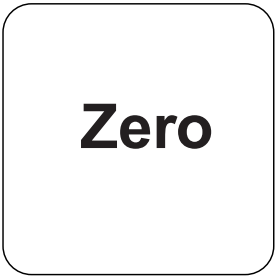
24-Наполните кювету -мм **10 пробой мл**.



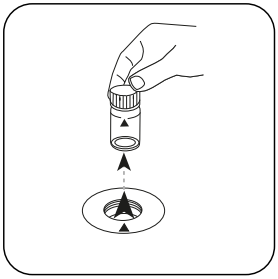
Закройте кювету(ы).



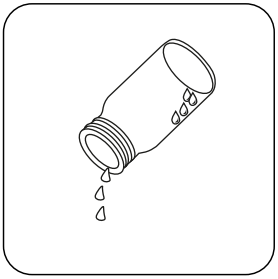
Поместите **кювету для проб** в измерительную шахту. Обращайте внимание на позиционирование.



Нажмите клавишу **НОЛЬ** .

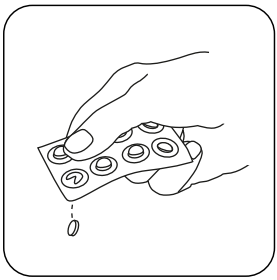


Извлеките кювету из измерительной шахты.

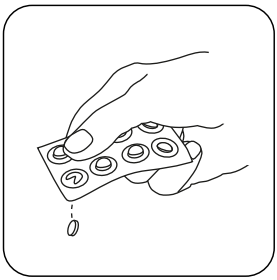


Опорожните кювету до нескольких капель.

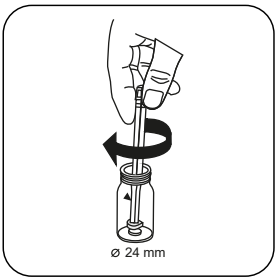
Для приборов, для которых не требуется **измерение нулевого значения** , **начните отсюда**.



Добавить **таблетку DPD No. 1**.

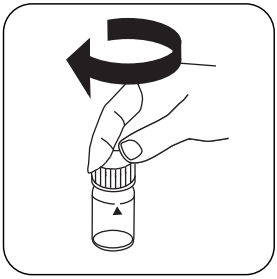


Добавить **таблетку DPD No. 3**.

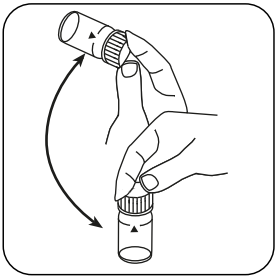


Раздавите таблетку (таблетки) легким вращением.

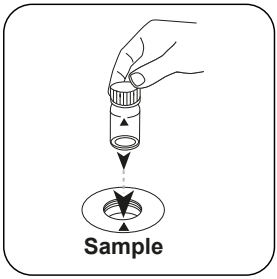
Наполните кювету **пробой** до **отметки 10 мл**.



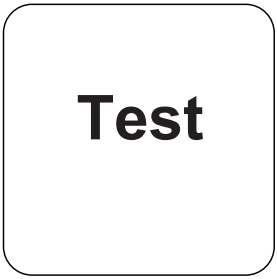
Закройте кювету(ы).



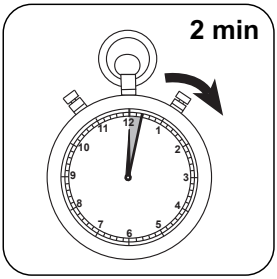
Растворите таблетку (таблетки) покачиванием.



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



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



Выдержите **2 минут(ы) времени реакции**.

По истечении времени реакции измерение выполняется автоматически.

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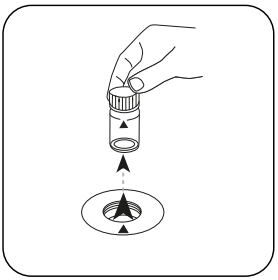
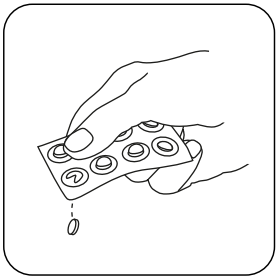


Извлеките кювету из измерительной шахты.

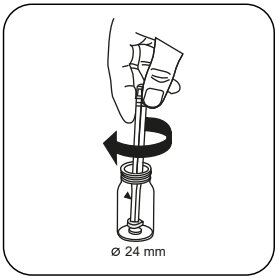
Опорожните кювету.

Тщательно очистите кювету и крышку для кювет.

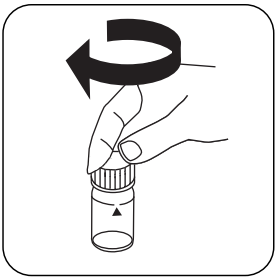
Наполните **вторую кювету мл пробы 10**.



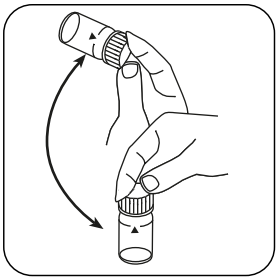
Добавить **таблетку GLYCINE**.



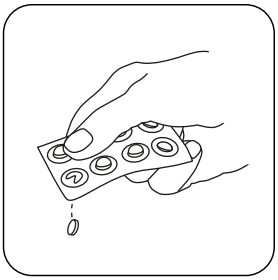
Раздавите таблетку (таблетки) легким вращением.



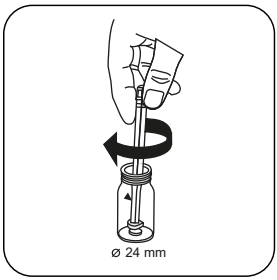
Закройте кювету(ы).



Растворите таблетку (таблетки) покачиванием.

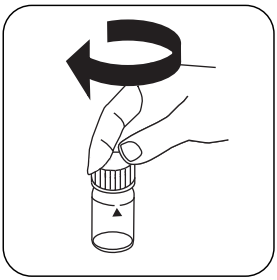


Добавьте **одну таблетку DPD No. 1** и **одну DPD No. 3 таблетку** прямо из пленки в первую кювету.

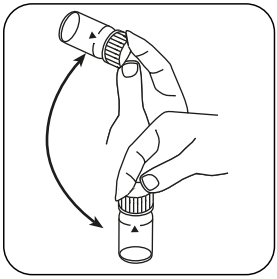


Раздавите таблетку (таблетки) легким вращением.

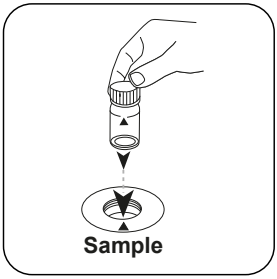
Добавьте подготовленный **раствор глицина** в подготовленную кювету.



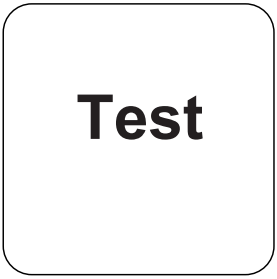
Закройте кювету(ы).



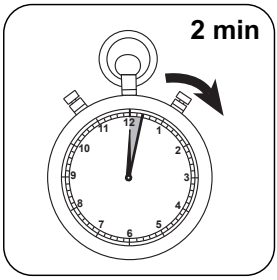
Растворите таблетку (таблетки) покачиванием.



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



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



Выдержите **2 минут(ы) времени реакции**.

По истечении времени реакции измерение выполняется автоматически.

На дисплее отображается результат в мг/л Озон; мг / л общий хлор.

Выполнение определения Озон в отсутствие хлора, с использованием таблетки

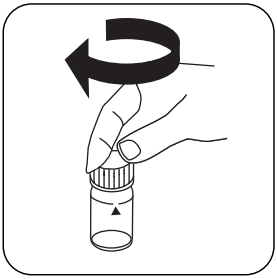
Выберите метод в устройстве.

Также выберите определение: без хлора.

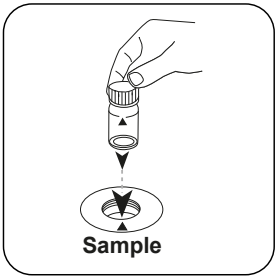
RU

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

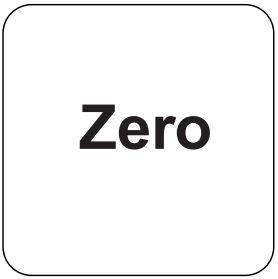
24-Наполните кювету -мм **10 пробой мл**.



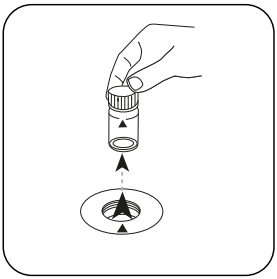
Закройте кювету(ы).



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



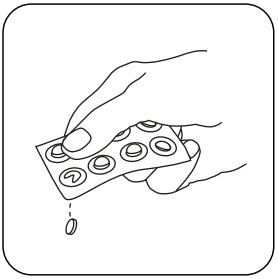
Нажмите клавишу **НОЛЬ** .



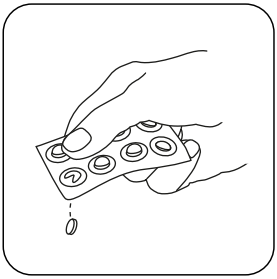
Извлеките кювету из измерительной шахты.

Опорожните кювету до нескольких капель.

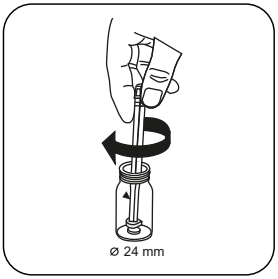
Для приборов, для которых не требуется **измерение нулевого значения** , **начните отсюда**.



Добавить **таблетку DPD No. 1**.

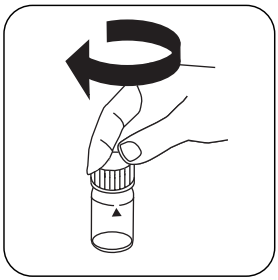


Добавить **таблетку DPD No. 3**.

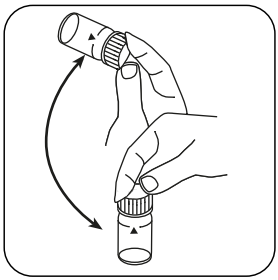


Раздавите таблетку (таблетки) легким вращением.

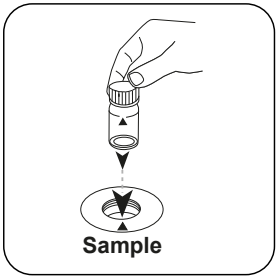
Наполните кювету **пробой** до **отметки 10 мл** .



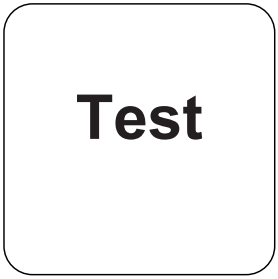
Закройте кювету(ы).



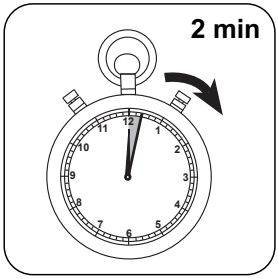
Растворите таблетку (таблетки) покачиванием.



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



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



Выдержите **2 минут(ы) времени реакции**.

По истечении времени реакции измерение выполняется автоматически.

На дисплее отображается результат в мг/л Озон.

Оценка

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

единицах	Форма цитирования	коэффициент преобразования
mg/l	O_3	1
mg/l	Cl_2	1.4771

RU

Химический метод

DPD / глицин

Приложение

Нарушения

Постоянные нарушения

1. Все оксидационные средства, присутствующие в пробах, реагируют как хлор, что приводит к повышенным результатам.
2. Концентрации свыше 6 мг/л озона могут привести к результатам в диапазоне измерения до 0 мг/л. В этом случае проба воды должна быть разбавлена. Добавьте реагент в 10 мл разбавленной пробы и повторите измерение (испытание на достоверность).

Ссылки на литературу

Colorimetric Chemical Analytical Methods, 9th Edition, Lovibond

Выведено из

DIN 38408-3:2011-04

[e)] альтернативный реагент, используемый вместо DPD №1/№3 в случае мутности в пробе воды, вызванной высокой концентрацией кальция и/или высокой проводимостью | [f)] требуется дополнительно для определения содержания брома, диоксида хлора и озона в присутствии хлора | [#] в комплект входит палочка для перемешивания

Озон PP M301

0.015 - 1.2 mg/L O_3

DPD / глицин

RU

Материал

Необходимый материал (частично необязательный):

Реактивы	Упаковочная единица	Номер заказа
хлорины общий DPD F10	Порошок / 100 Шт.	530120
хлорины общий DPD F10	Порошок / 1000 Шт.	530123
Глицин [1]	Таблетка / 100	512170BT
Глицин [1]	Таблетка / 250	512171BT

Подготовка

1. Чистка кювет:
   Поскольку многие бытовые чистящие средства (например, средства для мытья посуды) содержат восстановительные вещества, при последующем определении оксидационных средств (например, озона, хлора) возможно получение пониженных результатов. Чтобы исключить эту погрешность измерения, стеклянные приборы не должны потреблять хлор. Поэтому стеклотара хранится в течение часа под раствором гипохлорита натрия (0,1 г/л), а затем тщательно промывается полностью деминерализованной водой.
2. Во время подготовки пробы необходимо избегать выделения озона в атмосферу, например, из-за пипетирования и встряхивания. Анализ должен проводиться сразу же после отбора проб.
3. Сильно щелочные или кислые воды должны быть приведены в диапазон pH от 6 до 7 (с 0,5 моль/л серной кислоты или 1 моль/л раствора гидроксида натрия) перед анализом.

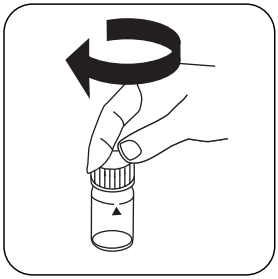
Выполнение определения Озон в присутствии хлора с использованием порошкообразного реагентах

Выберите метод в устройстве.

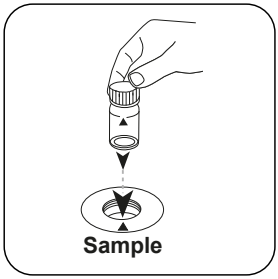
Также выберите определение: в присутствии хлора.

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

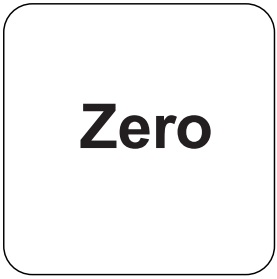
24-Наполните кювету -мм **10 пробой мл**.



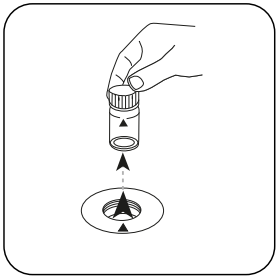
Закройте кювету(ы).



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



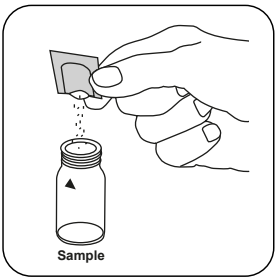
Нажмите клавишу **НОЛЬ** .



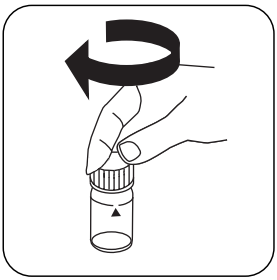
Извлеките кювету из измерительной шахты.

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

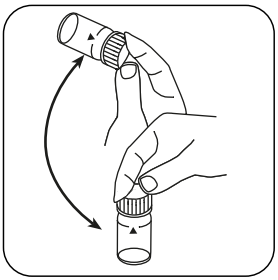
RU



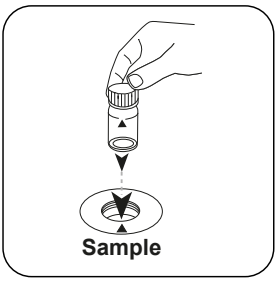
Добавьте **упаковку порошка Chlorine TOTAL-DPD/F10** .



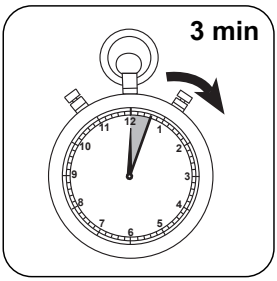
Закройте кювету(ы).



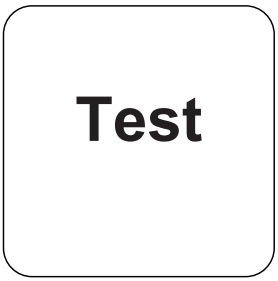
Перемешайте содержимое покачиванием (20 sec.).



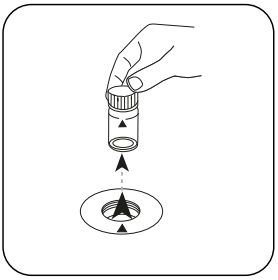
Поместите **кювету для проб** в измерительную шахту. Обращайте внимание на позиционирование.



Выдержите **3 минут(ы) времени реакции**.



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

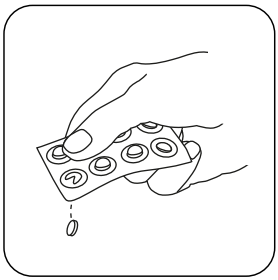


Извлеките кювету из измерительной шахты.

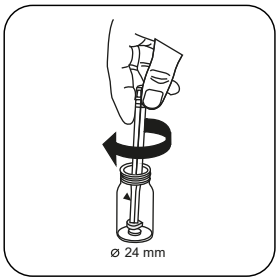
Опорожните кювету.

Тщательно очистите кювету и крышку для кювет.

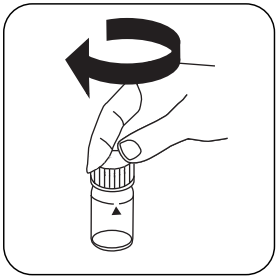
24-Наполните кювету -мм **10 пробой мл**.



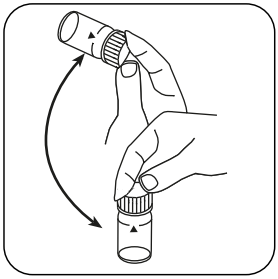
Добавить **таблетку GLYCINE**.



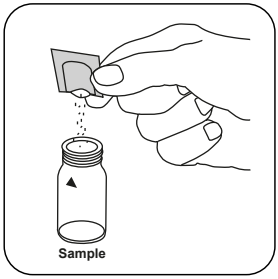
Раздавите таблетку (таблетки) легким вращением.



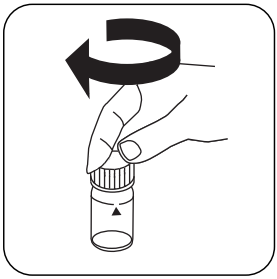
Закройте кювету(ы).



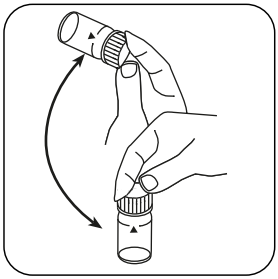
Растворите таблетку (таблетки) покачиванием.



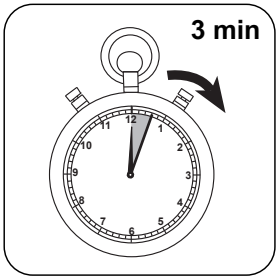
Добавьте **упаковку порошка Chlorine TOTAL-DPD/F10** .



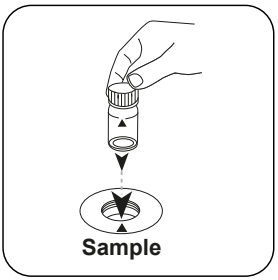
Закройте кювету(ы).



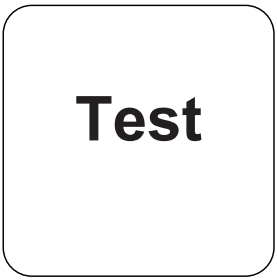
Перемешайте содержимое покачиванием (20 sec.).



Выдержите **3 минут(ы) времени реакции**.



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



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

RU

На дисплее отображается результат в мг/л Озон; мг / л общий хлор.

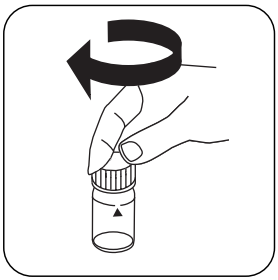
Выполнение определения Озон в отсутствие хлора, с использованием порошкообразного реагентах

Выберите метод в устройстве.

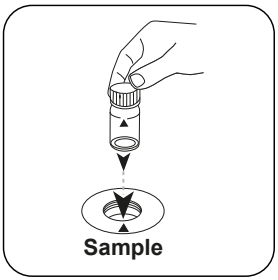
Также выберите определение: без хлора.

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

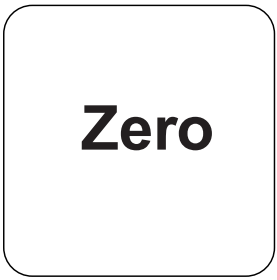
24-Наполните кювету -мм **10 пробой мл**.



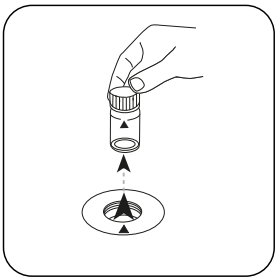
Закройте кювету(ы).



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

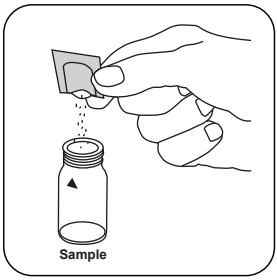


Нажмите клавишу **НОЛЬ** .

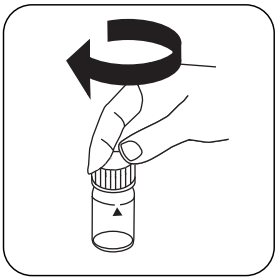


Извлеките кювету из измерительной шахты.

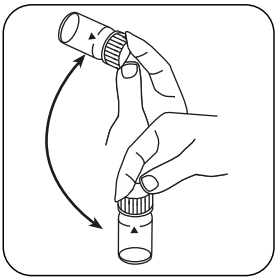
Для приборов, для которых не требуется **измерение нулевого значения** , **начните отсюда**.



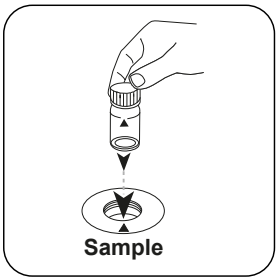
Добавьте **упаковку порошка Chlorine TOTAL-DPD/F10** .



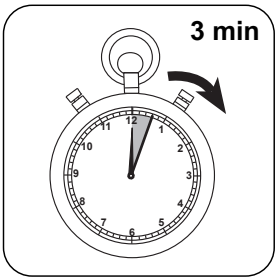
Закройте кювету(ы).



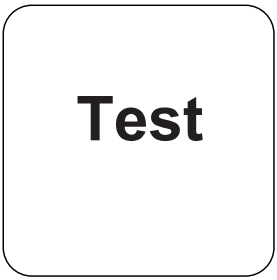
Перемешайте содержимое покачиванием (20 sec.).



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



Выдержите **3 минут(ы) времени реакции**.



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

На дисплее отображается результат в мг/л Озон.

Оценка

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

единицах	Форма цитирования	коэффициент преобразования
mg/l	O_3	1
mg/l	Cl_2	1.4771

RU

Химический метод

DPD / глицин

Нарушения

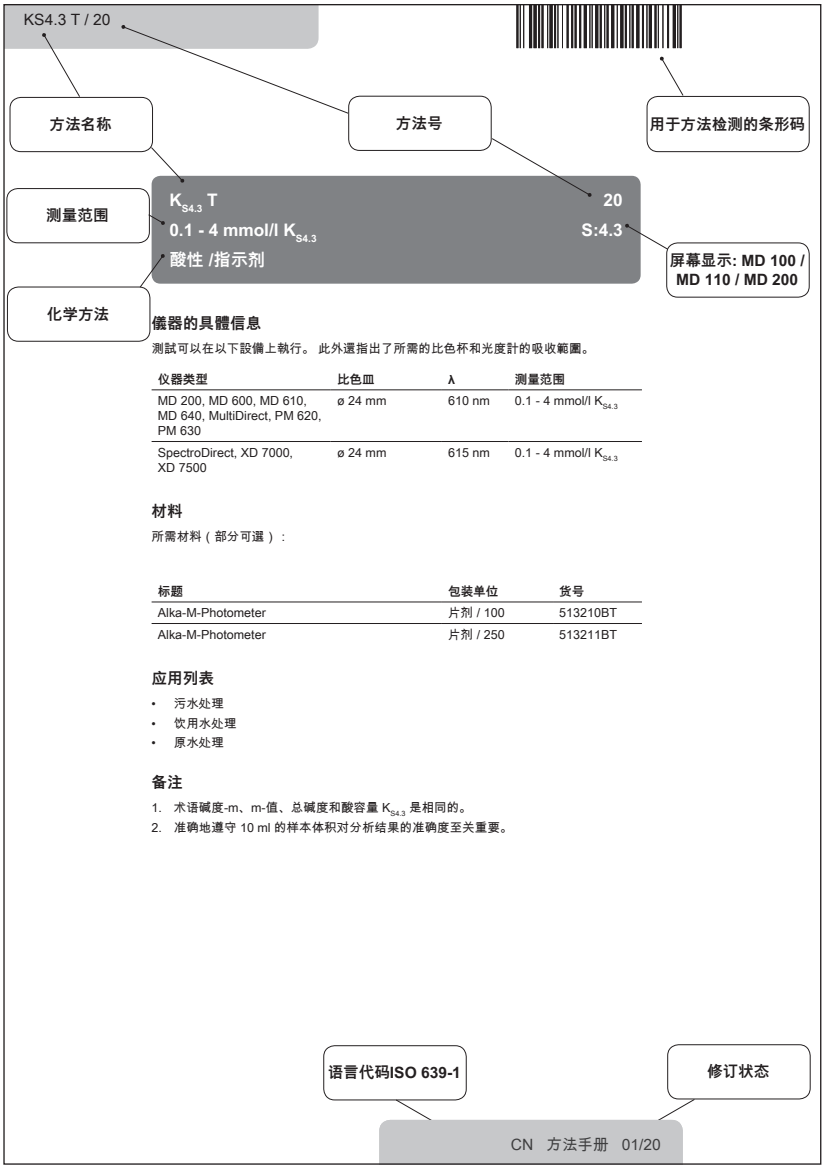
Постоянные нарушения

1. Все оксидационные средства, присутствующие в пробах, реагируют как хлор, что приводит к повышенным результатам.
2. Концентрации свыше 6 мг/л озона могут привести к результатам в диапазоне измерения до 0 мг/л. В этом случае проба воды должна быть разбавлена. Добавьте реагент в 10 мл разбавленной пробы и повторите измерение (испытание на достоверность).

Проверка метода

Предел обнаружения	0.01 mg/L
Предел детерминации	0.03 mg/L
Конечное значение диапазона измерений	2 mg/L
Восприимчивость	1.68 mg/L / Abs
Доверительная область	0.033 mg/L
Среднеквадратическое отклонение процесса	0.014 mg/L
Коэффициент вариации метода	1.34 %

[1] требуется дополнительно для определения содержания брома, диоксида хлора и озона в присутствии хлора



儀器的具體信息

測試可以在以下設備上執行。 此外還指出了所需的比色杯和光度計的吸收範圍。

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

材料

所需材料（部分可選）：

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

应用列表

- 污水处理
- 饮用水处理
- 原水处理

备注

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

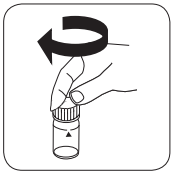
开始测量

进行测定 $K_{S4.3}$ 片剂酸容量

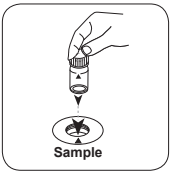
选择设备中的方法。

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

用 **10 ml** 样本填充 24 mm 比色杯。

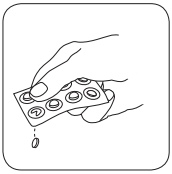


密封比色杯。

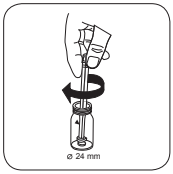


将样本比色杯放入测量轴中。注意定位。

• • •



加入 **ALKA-M-PHOTOMETER** 片剂。



用轻微的扭转压碎片剂。

密封比色杯。

CN 方法手册 01/20

T 臭氧 M300

0.02 - 2 mg/L O_3 O3

DPD / 甘氨酸

材料
所需材料（部分可選）：

ZH

试剂	包装单位	货号
DPD No.1	片剂 / 100	511050BT
DPD No.1	片剂 / 250	511051BT
DPD No.1	片剂 / 500	511052BT
DPD No.3	片剂 / 100	511080BT
DPD No.3	片剂 / 250	511081BT
DPD No.3	片剂 / 500	511082BT
DPD No.1 高钙 e)	片剂 / 100	515740BT
DPD No.1 高钙 e)	片剂 / 250	515741BT
DPD No.1 高钙 e)	片剂 / 500	515742BT
DPD No.3 高钙 e)	片剂 / 100	515730BT
DPD No.3 高钙 e)	片剂 / 250	515731BT
DPD No.3 高钙 e)	片剂 / 500	515732BT
甘氨酸 f)	片剂 / 100	512170BT
甘氨酸 f)	片剂 / 250	512171BT
套件 DPD No.1/No.3#	各100次	517711BT
套件 DPD No.1/No.3#	各250次	517712BT
套件 DPD No.1/No .3 高钙 #	各100次	517781BT
套件 DPD No.1/No .3 高钙 #	各250次	517782BT
套件 DPD No.1/甘氨酸 #	各100次	517731BT
套件 DPD No.1/甘氨酸 #	各250次	517732BT

准备

1. 清洗比色杯：
   由于许多家用清洁剂（例如洗碗用洗涤剂）含有还原剂，所以随后测定的氧化剂（例如臭氧、氯）结果可能会不足。为了排除这种测量误差，玻璃器皿应无氯。为此，将玻璃器皿在次氯酸钠溶液（0.1 g/L）下存放 1 小时，然后用去离子水彻底冲洗。
2. 在样本制备中，通过移液和摇动来避免臭氧的排气。取样后必须立即进行分析。
3. 在分析前（用 0.5 mol/l 硫酸或 1 mol/l 氢氧化钠溶液）必须将强碱性或酸性水的 pH 范围调节到 6 和 7 之间。

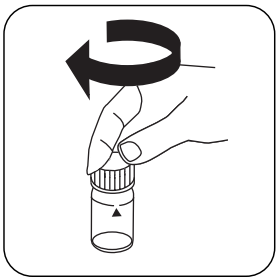
进行测定 臭氧，样品中含氯，片剂

选择设备中的方法。

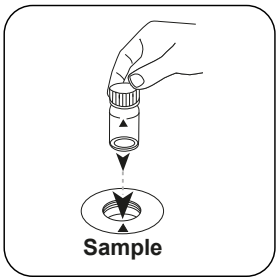
另外选择测定：有氯存在

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

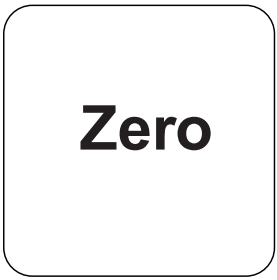
用 **10 mL 样本**填充 24 mm 比色杯。



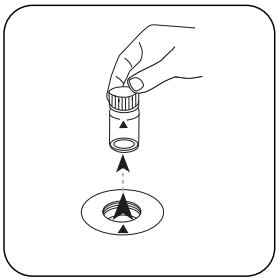
密封比色杯。



将**样本比色杯**放入测量轴中。注意定位。



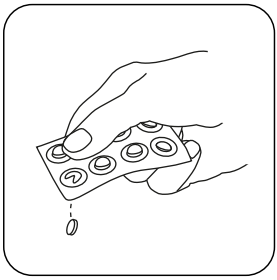
按下 **ZERO** 按钮。



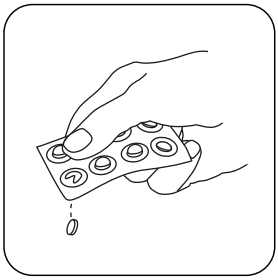
从测量轴上取下比色杯。

将比色杯倒空。

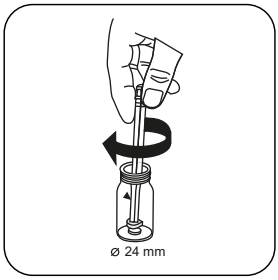
对于**不需要 ZERO 测量**的设备，**从这里开始。**



加入 **DPD No. 1 片剂** 。



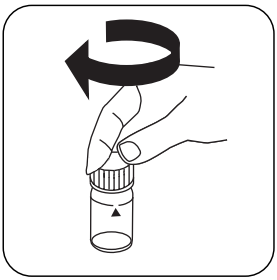
加入 **DPD No. 3 片剂** 。



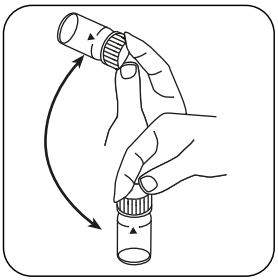
用轻微的扭转压碎片剂。

ZH

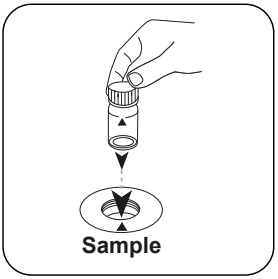
用**样本**将比色杯填充至**10 mL 刻度**处。



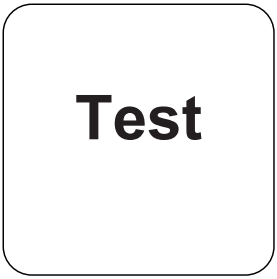
密封比色杯。



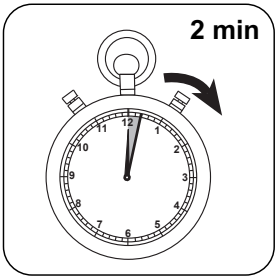
通过旋转溶解片剂。



将**样本比色杯**放入测量轴中。注意定位。

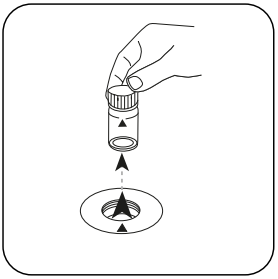


按下 **TEST** (XD: **START**) 按钮。



等待 **2 分钟反应时间** 。

反应时间结束后，自动进行测量。

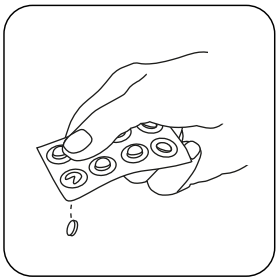


从测量轴上取下比色杯。

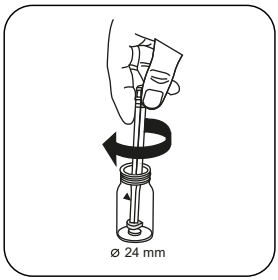
倒空比色杯。

彻底清洗比色杯和比色杯杯盖。

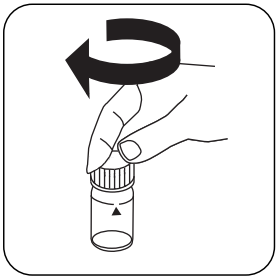
用 **10 mL** 样本填充第二个比色杯。



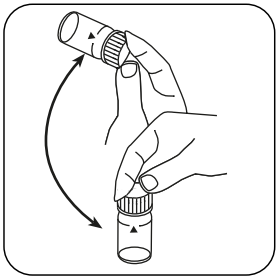
加入 **GLYCINE** 片剂。



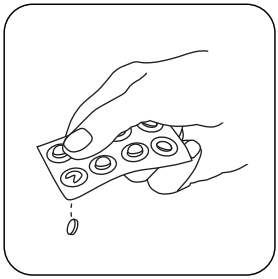
用轻微的扭转压碎片剂。



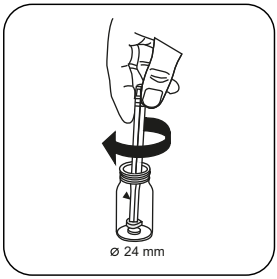
密封比色杯。



通过旋转溶解片剂。

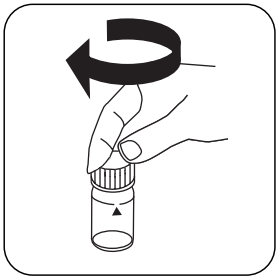


将一片 **DPD No. 1** 片剂 和一片 **DPD No. 3** 片剂 直接从铝箔中取出加入到第一个比色杯中。

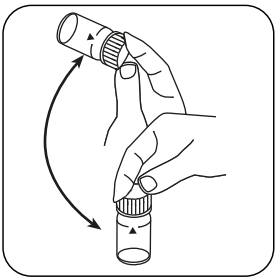


用轻微的扭转压碎片剂。

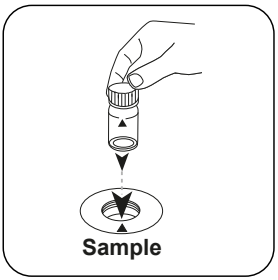
将准备好的甘氨酸加入到准备好的比色杯中。



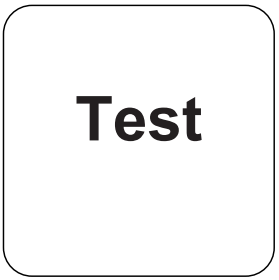
密封比色杯。



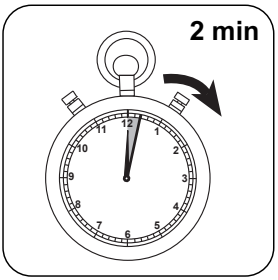
通过旋转溶解片剂。



将**样本比色杯**放入测量轴中。注意定位。



按下 **TEST** (XD: **START**) 按钮。



等待 **2 分钟反应时间** 。

反应时间结束后，自动进行测量。

结果在显示屏上显示为 mg / l 臭氧； mg/l 总氯。

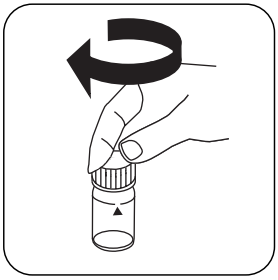
进行测定 臭氧，样品中不含氯，片剂

选择设备中的方法。

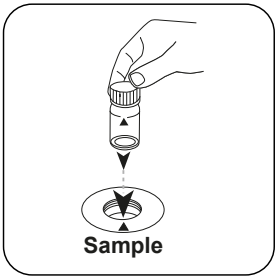
另外选择测定：不含氯

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

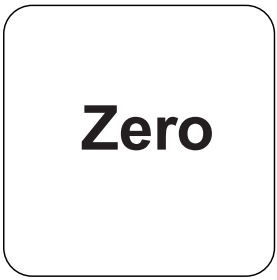
用 **10 mL 样本**填充 24 mm 比色杯。



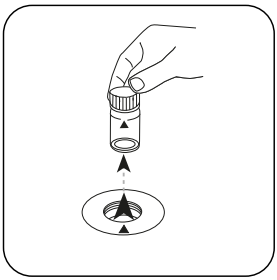
密封比色杯。



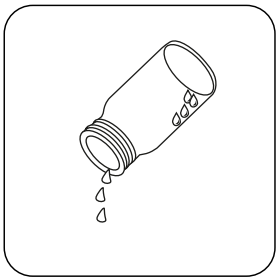
将**样本比色杯**放入测量轴中。注意定位。



按下 **ZERO** 按钮。

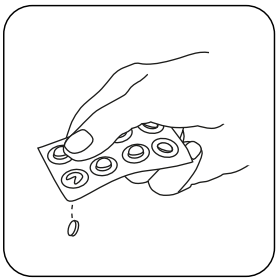


从测量轴上取下比色杯。

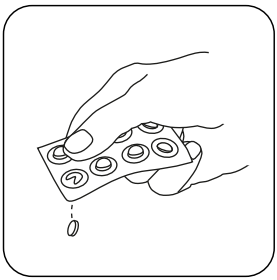


将比色杯倒空。

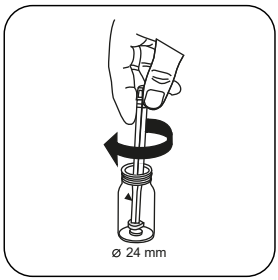
对于**不需要 ZERO 测量**的设备，**从这里开始。**



加入 **DPD No. 1 片剂** 。

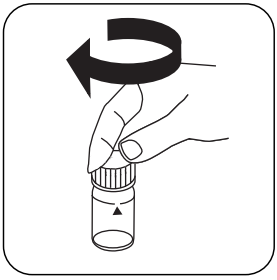


加入 **DPD No. 3 片剂** 。

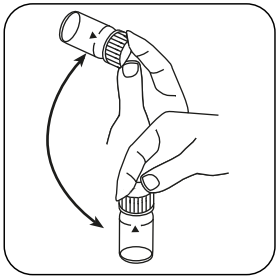


用轻微的扭转压碎片剂。

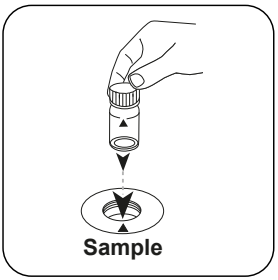
用**样本**将比色杯填充至 **10 mL 刻度**处。

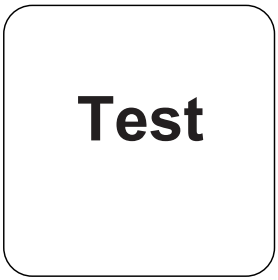


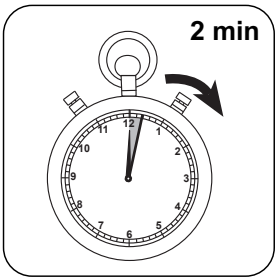
密封比色杯。



通过旋转溶解片剂。







ZH

将**样本比色杯**放入测量轴中。注意定位。

按下 **TEST** (XD: **START**) 按钮。

等待 **2 分钟反应时间** 。

反应时间结束后，自动进行测量。

结果在显示屏上显示为 mg / l 臭氧。

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	O_3	1
mg/l	Cl_2	1.4771

化学方法

DPD / 甘氨酸

附錄

干扰说明

持续干扰

1. 存在于样本中的所有氧化剂都像氯一样反应，导致多重结果。
2. 高于 6 mg/L 臭氧的浓度可导致测量范围内的结果高达 0 mg/L。在这种情况下应稀释水样。将 10 ml 稀释的样本与试剂混合并重复测量（可信度测试）。

参考文献

Colorimetric Chemical Analytical Methods, 9th Edition, Lovibond

源于

DIN 38408-3:2011-04

[e] 替代试剂，取代DPD No.1/No.3试剂，用于由高浓度钙离子和/或高电导率引起的浑浊水样分析 | [f] 附加试剂，用于含氯水样，进行溴，二氧化氯和臭氧的测定分析 | [#] i含搅拌棒, 10cm

PP 臭氧 M301

0.015 - 1.2 mg/L O_3

DPD / 甘氨酸

材料
所需材料（部分可選）：

ZH

试剂	包装单位	货号
氯总量 DPD F10	粉剂 / 100 片	530120
氯总量 DPD F10	粉剂 / 1000 片	530123
甘氨酸 [1)]	片剂 / 100	512170BT
甘氨酸 [1)]	片剂 / 250	512171BT

准备

1. 清洗比色杯：
   由于许多家用清洁剂（例如洗碗用洗涤剂）含有还原剂，所以随后测定的氧化剂（例如臭氧、氯）结果可能会不足。为了排除这种测量误差，玻璃器皿应无氯。为此，将玻璃器皿在次氯酸钠溶液（0.1 g/L）下存放 1 小时，然后用去离子水彻底冲洗。
2. 在样本制备中，通过移液和摇动来避免臭氧的排气。取样后必须立即进行分析。
3. 在分析前（用 0.5 mol/l 硫酸或 1 mol/l 氢氧化钠溶液）必须将强碱性或酸性水的 pH 范围调节到 6 和 7 之间。

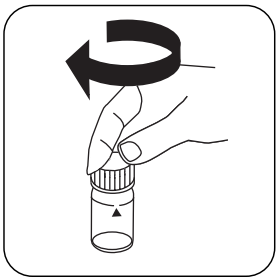
进行测定 臭氧，样品中含氯，粉剂法

选择设备中的方法。

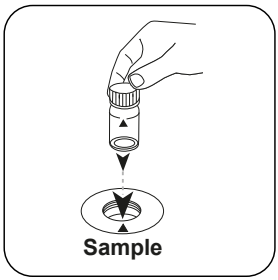
另外选择测定：有氯存在

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

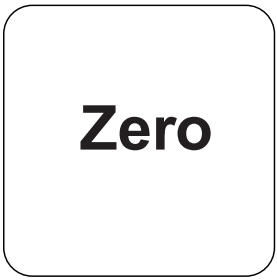
用 **10 mL 样本**填充 24 mm 比色杯。



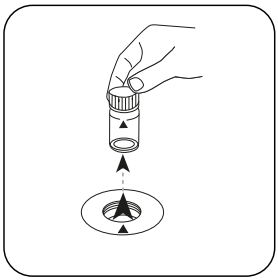
密封比色杯。



将**样本比色杯**放入测量轴中。注意定位。

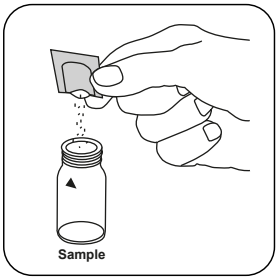


按下 **ZERO** 按钮。

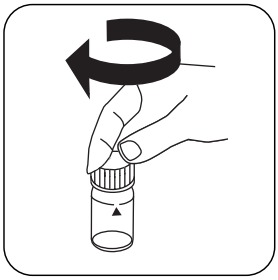


从测量轴上取下比色杯。

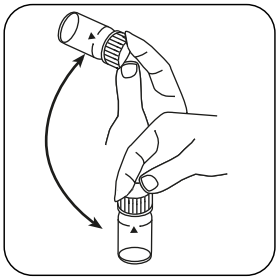
对于**不需要 ZERO 测量**的设备，**从这里开始。**



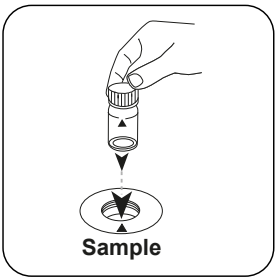
加入 **Chlorine TOTAL-DPD/F 10 粉包**。



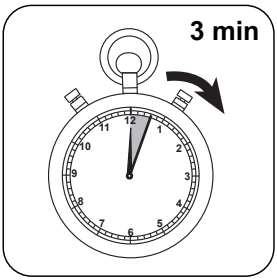
密封比色杯。



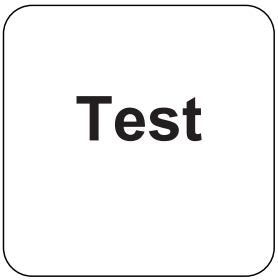
通过旋转混合内容物（20 sec.）。



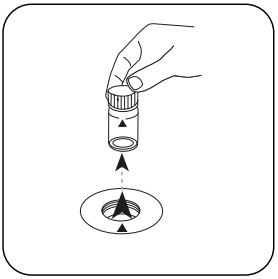
将**样本比色杯**放入测量轴中。注意定位。



等待 **3 分钟反应时间** 。



按下 **TEST** (XD: **START**) 按钮。

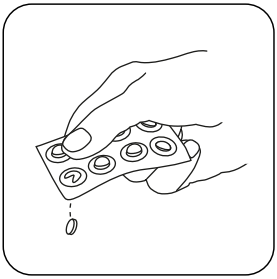


从测量轴上取下比色杯。

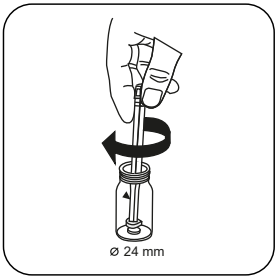
倒空比色杯。

彻底清洗比色杯和比色杯杯盖。

用 **10 mL 样本**填充 24 mm 比色杯。

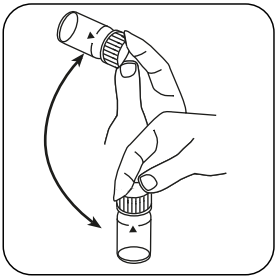


加入 **GLYCINE 片剂**。

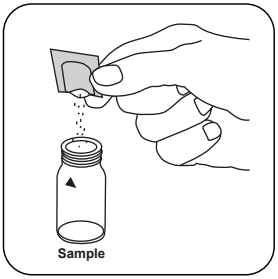


用轻微的扭转压碎片剂。

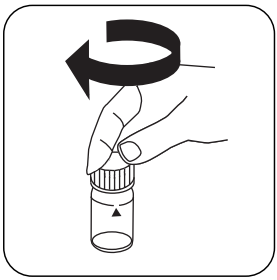
密封比色杯。



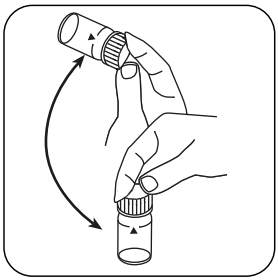
通过旋转溶解片剂。



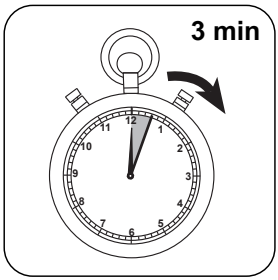
加入 **Chlorine TOTAL-DPD/F 10 粉包** 。



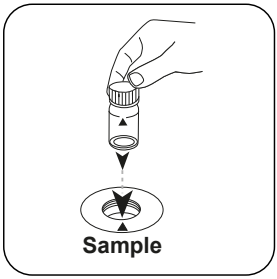
密封比色杯。



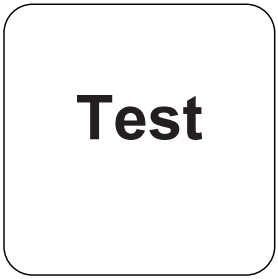
通过旋转混合内容物（20 sec.）。



等待 **3 分钟反应时间** 。



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 臭氧； mg/l，总氯。

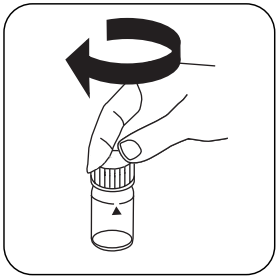
进行测定 臭氧 ， 无氯存在, 粉剂法

选择设备中的方法。

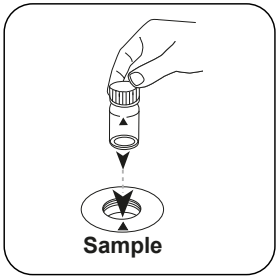
另外选择测定：不含氯

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

用 **10 mL 样本**填充 24 mm 比色杯。

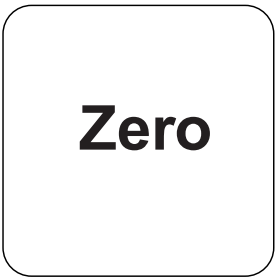


密封比色杯。

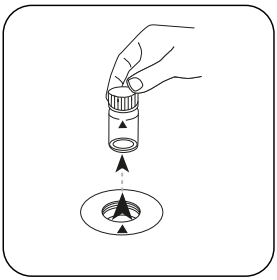


将**样本比色杯**放入测量轴中。注意定位。

ZH

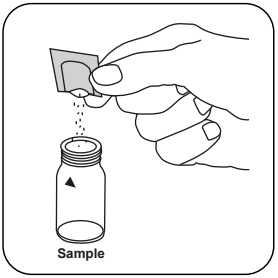


按下 **ZERO** 按钮。



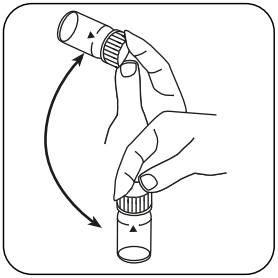
从测量轴上取下比色杯。

对于**不需要 ZERO 测量**的设备，**从这里开始**。

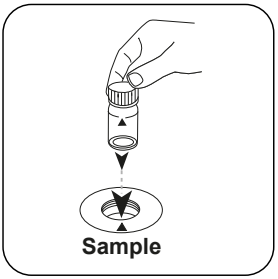


加入 **Chlorine TOTAL-DPD/F 10 粉包** 。

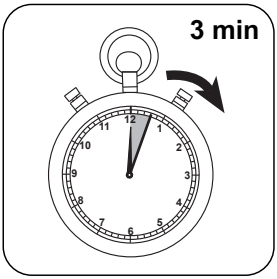
密封比色杯。



通过旋转混合内容物（20 sec.）。



将**样本比色杯**放入测量轴中。注意定位。



等待 **3 分钟反应时间** 。

按下 **TEST** (XD: **START**) 按钮。

结果在显示屏上显示为 mg / l 臭氧。

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	O_3	1
mg/l	Cl_2	1.4771

化学方法

DPD / 甘氨酸

干扰说明

持续干扰

1. 存在于样本中的所有氧化剂都像氯一样反应，导致多重结果。
2. 高于 6 mg/L 臭氧的浓度可导致测量范围内的结果高达 0 mg/L。在这种情况下应稀释水样。将 10 ml 稀释的样本与试剂混合并重复测量（可信度测试）。

方法验证

检出限	0.01 mg/L
测定下限	0.03 mg/L
测量上限	2 mg/L
灵敏度	1.68 mg/L / Abs
置信范围	0.033 mg/L
标准偏差	0.014 mg/L
变异系数	1.34 %

[9] 附加试剂，用于含氯水样，进行溴，二氧化氯和臭氧的测定分析

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Fax: +44 (0)1980 625412
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Tel.: +86 10 85251111 Ext. 330
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