

# Lovibond® Water Testing

Tintometer® Group



## Manual of Methods

MD50 • MD150

### Urea

**EN MD50 Photometer**

Page 4

**ES Fotómetro MD50**

Página 32

**PT Fotómetro MD50**

Página 60

**NL MD50 Fotometer**

Zijde 88

**RU Фотометр MD50**

Страница 116

**DE MD50 Photometer**

Seite 18

**FR MD50 Photomètre**

Page 46

**IT Fotometro MD50**

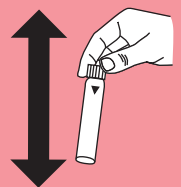
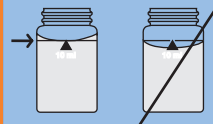
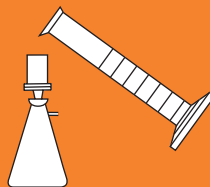
Pagina 74

**TR MD50 fotometre**

Sayfa 102

**ZH MD50 光度计**

Page 130





KS4.3 T / 20


Method name

Method number

Bar code for the detection of the methods

Measuring range

20

S:4.3

$K_{S4.3 T}$   
 0.1 - 4 mmol/l  $K_{S4.3}$   
 Acid / Indicator

Chemical Method

**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	$\lambda$	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.

Language codes  
ISO 639-1

Revision status

EN Handbook of Methods 01/20

Performing test procedure

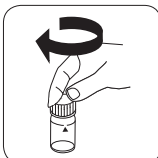
### Implementation of the provision Acid capacity $K_{S_{4.3}}$ with Tablet

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).

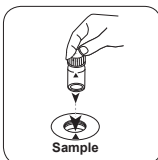


Place **sample vial** in the sample chamber. • Pay attention to the positioning.

• • •



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  $K_{S_{4.3}}$  appears on the display.



Urea T

M390

0.1 - 2.5 mg/L Urea

Ur1

Indophenol / Urease

## Material

EN

Required material (partly optional):

Reagents	Packaging Unit	Part Number
UREA Reagent 1	15 mL	459300
UREA Reagent 2	10 mL	459400
Ammonia No. 1	Tablet / 100	512580BT
Ammonia No. 1	Tablet / 250	512581BT
Ammonia No. 2	Tablet / 100	512590BT
Ammonia No. 2	Tablet / 250	512591BT
Set Ammonia No. 1/No. 2 100 Pc.#	100 each	517611BT
Set Ammonia No. 1/No. 2 250 Pc.#	250 each	517612BT
Ammonia Conditioning Powder	Powder / 26 g	460170
Urea Pretreat (compensates for the interference of free Chlorine up to 2 mg/l)	Tablet / 100	516110BT
UREA Reagent Set	1 Set	517800BT

## Preparation

1. The temperature of the sample should be between 20 °C and 30 °C.
2. The analysis must take place within one hour after taking the sample at the latest.
3. With the analysis of sea water samples, before the addition of Ammonia No. 1 Tablet, two scoops of ammonium conditioning powder must be added to the sample and dissolved by swirling.

## Notes

1. The AMMONIA No. 1 tablet will only dissolve completely after the AMMONIA No. 2 Tablet has been added.
2. Ammonium and chloramines are accounted for in the urea determination.

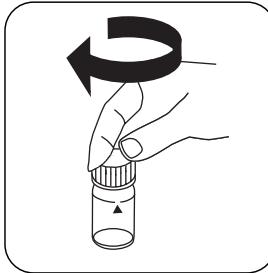
## Determination of Urea with Tablet and Liquid Reagent

Select the method on the device.

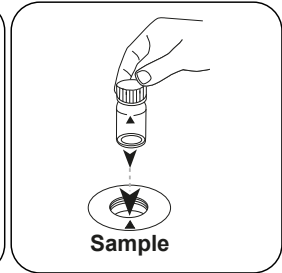
For this method, a ZERO measurement does not have to be carried out every time on the following devices: XD 7000, XD 7500



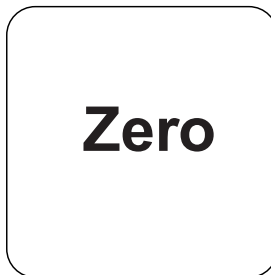
Fill 24 mm vial with **10 mL sample**.



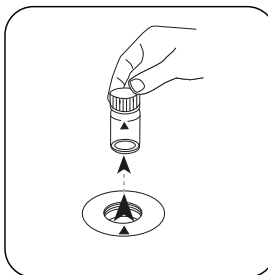
Close vial(s).



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

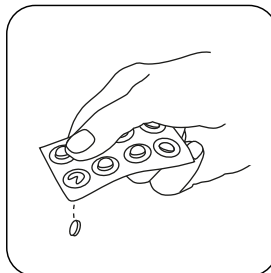


Press the **ZERO** button.

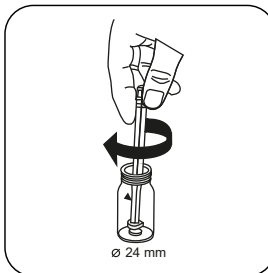


Remove the vial from the sample chamber.

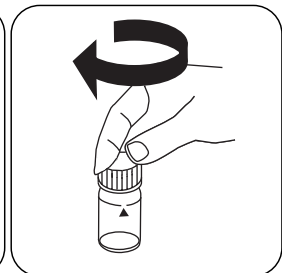
For devices that require **no ZERO measurement**, start here.



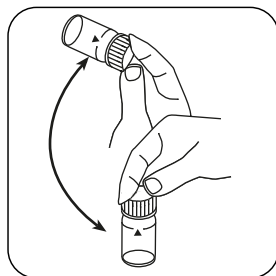
If free chlorine (HOCl) is present, add a **UREA PRETREAT** tablet.



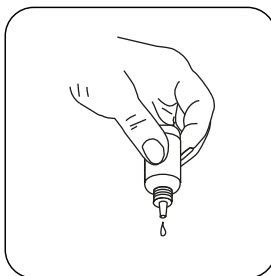
Crush tablet(s) by rotating slightly.



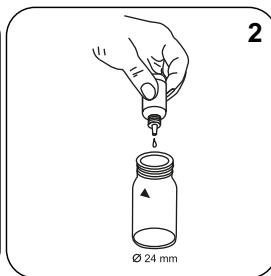
Close vial(s).



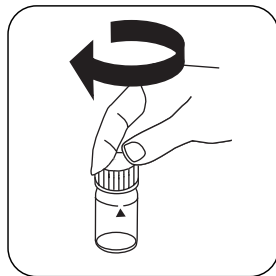
Dissolve tablet(s) by inverting.



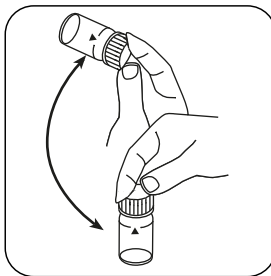
Hold cuvettes vertically and add equal drops by pressing slowly.



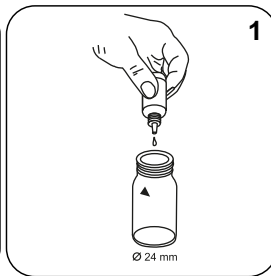
Add **2 drops Urea Reagent 1.**



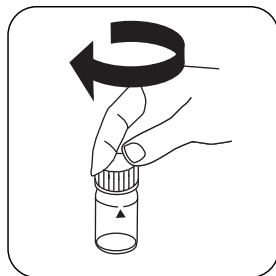
Close vial(s).



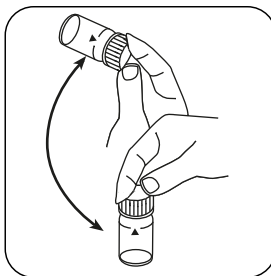
Invert several times to mix the contents.



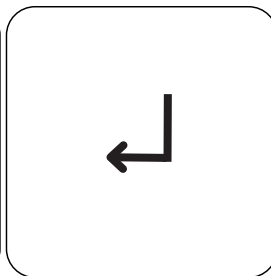
Add **1 drops Urea Reagent 2.**



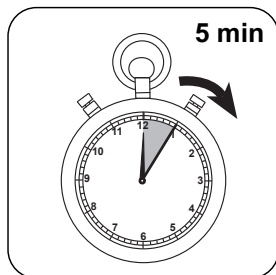
Close vial(s).



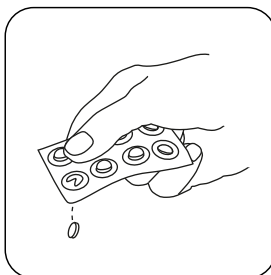
Invert several times to mix the contents.



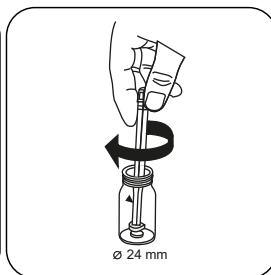
Press the **ENTER** button.



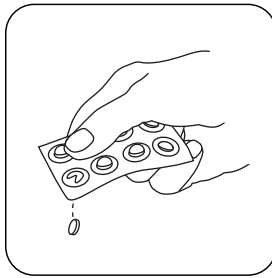
Wait for **5 minute(s) reaction time.**



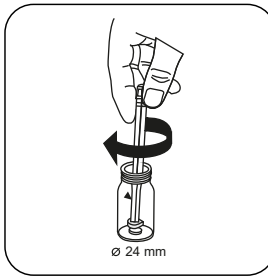
Add **AMMONIA No.1 tablet** .



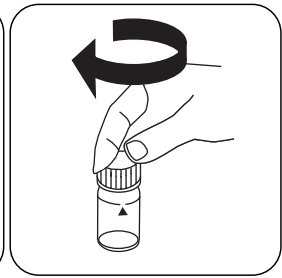
Crush tablet(s) by rotating slightly.



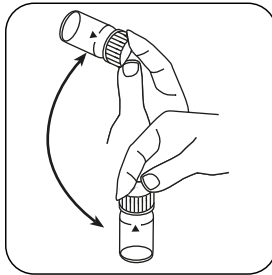
Add **AMMONIA No.2** tablet .



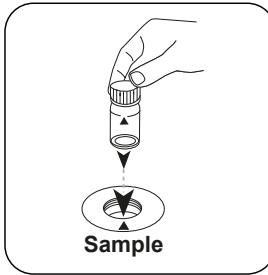
Crush tablet(s) by rotating slightly.



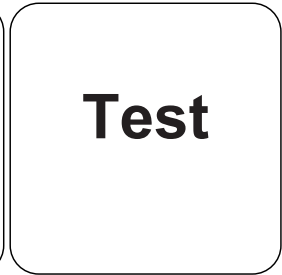
Close vial(s).



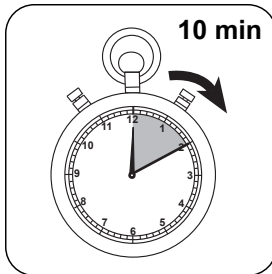
Dissolve tablet(s) by inverting.



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



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



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

Once the reaction period is finished, the measurement takes place automatically. The result in mg/L Urea appears on the display.





## Chemical Method

Indophenol / Urease

## Appendix

EN

### Interferences

#### Persistent Interferences

- Concentrations above 2 mg/L urea can lead to results within the measuring range. In this case, the water sample must be diluted with water that is free from urea and the measurement must be repeated (plausibility test).

#### Removeable Interferences

- A UREA PRETREAT Tablet eliminates the interference of free chlorine up to 2 mg/L (two tablets up to 4 mg/L, 3 tablets up to 6 mg/L).

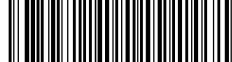
Interference	from / [mg/L]
Cl <sub>2</sub>	2

#### Bibliography

R.J. Creno, R.E. Wenk, P. Bohling, Automated Micromasurement of Urea Using Urease and the Berthelot Reaction, American Journal of Clinical Pathology (1970), 54 (6), p. 828-832

\* including stirring rod, 10 cm





Urea T

M391

0.2 - 5 mg/L Urea<sup>1)</sup>

Ur2

Indophenol / Urease

## Material

EN

Required material (partly optional):

Reagents	Packaging Unit	Part Number
UREA Reagent 1	15 mL	459300
UREA Reagent 2	10 mL	459400
Ammonia No. 1	Tablet / 100	512580BT
Ammonia No. 1	Tablet / 250	512581BT
Ammonia No. 2	Tablet / 100	512590BT
Ammonia No. 2	Tablet / 250	512591BT
Set Ammonia No. 1/No. 2 100 Pc.#	100 each	517611BT
Set Ammonia No. 1/No. 2 250 Pc.#	250 each	517612BT
Ammonia Conditioning Powder	Powder / 26 g	460170
Urea Pretreat (compensates for the interference of free Chlorine up to 2 mg/l)	Tablet / 100	516110BT
UREA Reagent Set	1 Set	517800BT

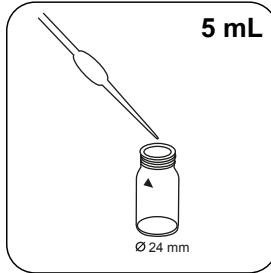
## Preparation

1. With the analysis of sea water samples, before the addition of Ammonia No. 1 Tablet, two scoops of ammonium conditioning powder must be added to the sample and dissolved by swirling.

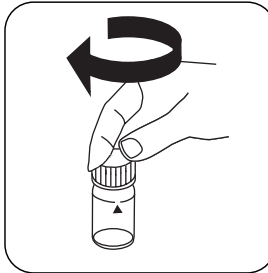
## Determination of Urea with Tablet and Liquid Reagent

Select the method on the device.

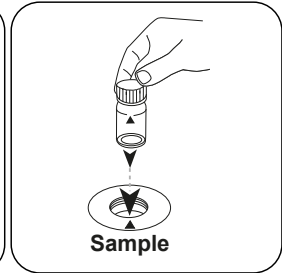
For this method, a ZERO measurement does not have to be carried out every time on the following devices: XD 7000, XD 7500



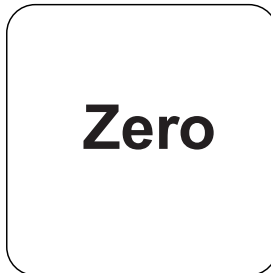
Put **5 mL sample** and **5 mL of deionised water** in the sample vessel.



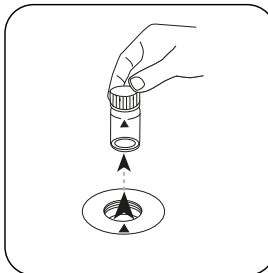
Close vial(s).



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

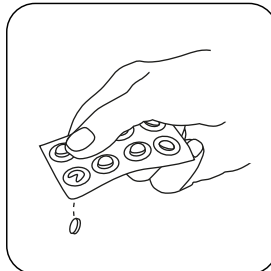


Press the **ZERO** button.

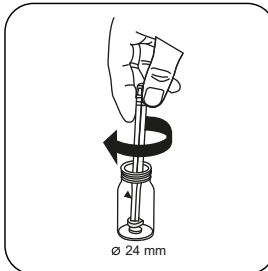


Remove the vial from the sample chamber.

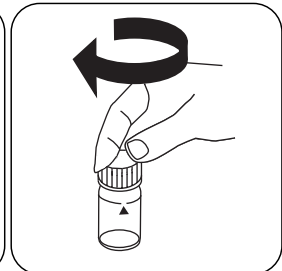
For devices that require **no ZERO measurement**, start here.



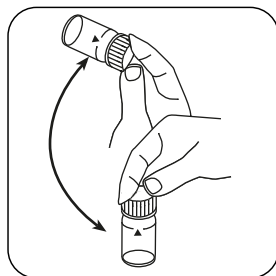
If free chlorine (HOCl) is present, add a **UREA PRETREAT** tablet.



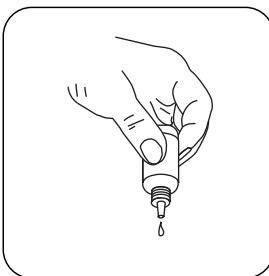
Crush tablet(s) by rotating slightly.



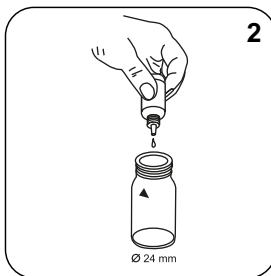
Close vial(s).



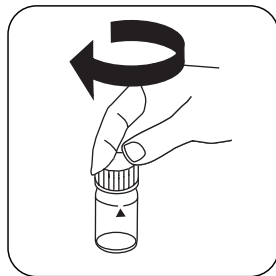
Dissolve tablet(s) by inverting.



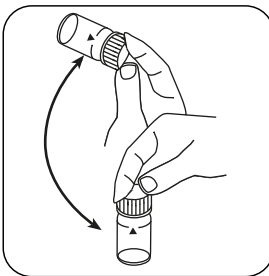
Hold cuvettes vertically and add equal drops by pressing slowly.



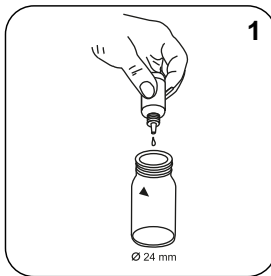
Add **2 drops UREA Reagenz 1.**



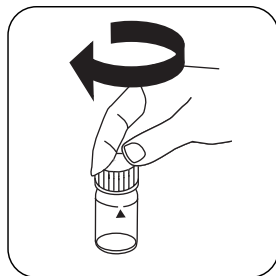
Close vial(s).



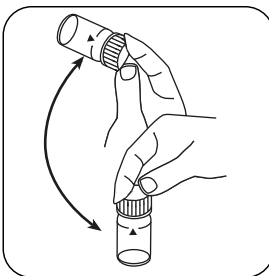
Invert several times to mix the contents.



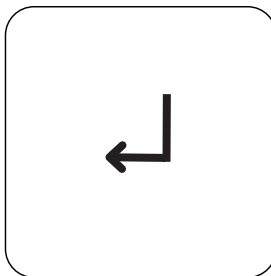
Add **1 drops UREA Reagenz 2.**



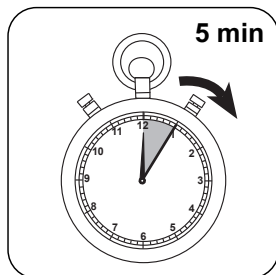
Close vial(s).



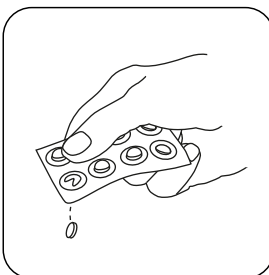
Invert several times to mix the contents.



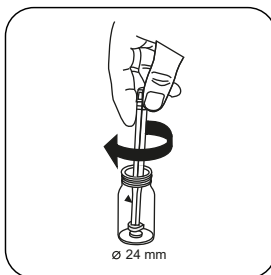
Press the **ENTER** button.



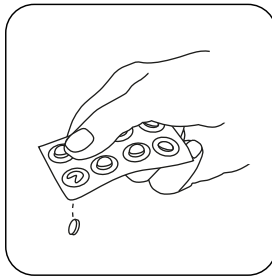
Wait for **5 minute(s) reaction time.**



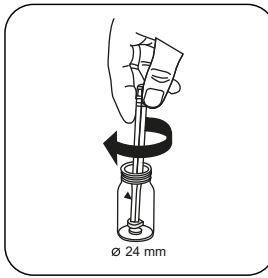
Add **AMMONIA No. 1 tablet .**



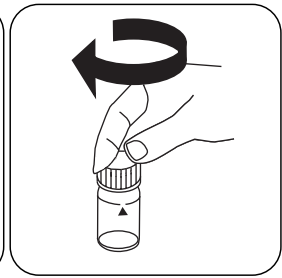
Crush tablet(s) by rotating slightly.



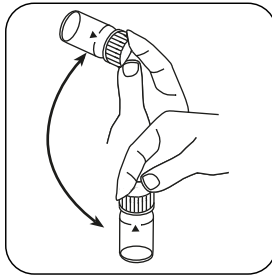
Add **AMMONIA No. 2** tablet .



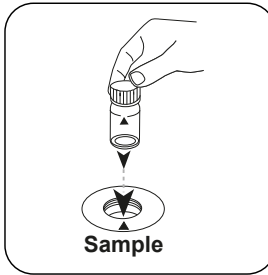
Crush tablet(s) by rotating slightly.



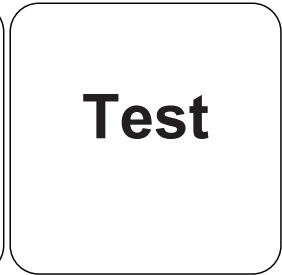
Close vial(s).



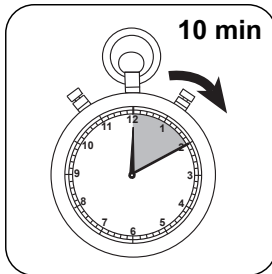
Dissolve tablet(s) by inverting.



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



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



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

Once the reaction period is finished, the measurement takes place automatically. The result in mg/L Urea appears on the display.



## Chemical Method


Indophenol / Urease

<sup>9</sup> high range by dilution | <sup>8</sup> including stirring rod, 10 cm

EN





KS4.3 T / 20


Methoden Name

Methodennummer

Barcode zur Methodenerkennung

Messbereich

20

S:4.3

**Chemische Methode**

$K_{S_{4.3}} T$   
0,1 - 4 mmol/l  $K_{S_{4.3}}$   
Säure / Indikator

**Displayanzeige im MD 100 MD 110 / MD 200**

**Chemische Methode**

**Instrumentenspezifische Informationen**

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

Geräte	Küvette	$\lambda$	Messbereich
MD 200, MD 600, MD 610, MD 640, MultiDirect, PM 620, PM 630	ø 24 mm	610 nm	0,1 - 4 mmol/l $K_{S_{4.3}}$
SpectroDirect, XD 7000, XD 7500	ø 24 mm	615 nm	0,1 - 4 mmol/l $K_{S_{4.3}}$

**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  $K_{S_{4.3}}$  sind identisch.
2. Die exakte Einhaltung des Probevolumens von 10 ml ist für die Genauigkeit des Analyseergebnisses entscheidend.

Sprachkürzel nach ISO 639-1

Revisionsstand

DE Methodenhandbuch 01/20

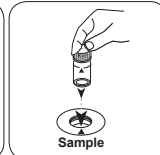
Durchführung der  
Messung**Durchführung der Bestimmung Säurekapazität  $K_{s4,3}$  mit Tablette**

Die Methode im Gerät auswählen.

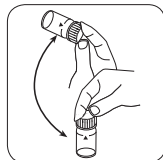
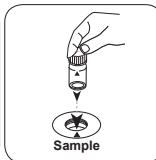
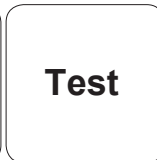
Für diese Methode muss bei folgenden Geräten keine ZERO-Messung durchgeführt werden: XD 7000, XD 7500

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

Küvette(n) verschließen.

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

• • •

Tablette(n) durch Um-  
schwenken lösen.Die **Probenküvette** in  
den Messschacht stellen.  
Positionierung beachten.Taste **TEST** (XD: **START**)  
drücken.In der Anzeige erscheint das Ergebnis als Säurekapazität  $K_{s4,3}$ .



Harnstoff T

M390

0,1 - 2,5 mg/L Urea

Ur1

Indophenol / Urease

## Material

DE

Benötigtes Material (zum Teil optional):

Reagenzien	Form/Menge	Bestell-Nr.
UREA Reagenz 1	15 mL	459300
UREA Reagenz 2	10 mL	459400
Ammonia No. 1	Tablette / 100	512580BT
Ammonia No. 1	Tablette / 250	512581BT
Ammonia No. 2	Tablette / 100	512590BT
Ammonia No. 2	Tablette / 250	512591BT
Set Ammonia No. 1/No. 2 <sup>#</sup>	je 100	517611BT
Set Ammonia No. 1/No. 2 <sup>#</sup>	je 250	517612BT
Ammonium Konditionierpulver	Pulver / 26 g	460170
Urea Pretreat (eliminiert die Störung von freiem Chlor bis zu 2 mg/l)	Tablette / 100	516110BT
UREA Reagenzien Set	1 Satz	517800BT

## Vorbereitung

1. Die Probentemperatur sollte zwischen 20 °C und 30 °C liegen.
2. Die Analyse spätestens eine Stunde nach der Probennahme durchführen.
3. Bei der Analyse von Meerwasserproben muss vor Zugabe der Ammonia No. 1 Tablette zwei Messlöffel Ammonium Konditionierungs-Pulver zur Probe gegeben und durch Schwenken aufgelöst werden.

## Anmerkungen

1. Die AMMONIA No. 1 Tablette löst sich erst vollständig nach Zugabe der AMMONIA No. 2 Tablette auf.
2. Ammonium und Chloramine werden bei der Harnstoffbestimmung miterfasst.

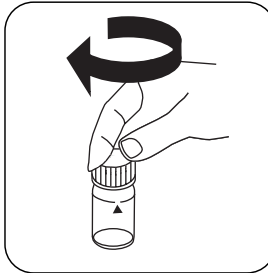
## Durchführung der Bestimmung Harnstoff mit Tablette und Flüssigreagenz

Die Methode im Gerät auswählen.

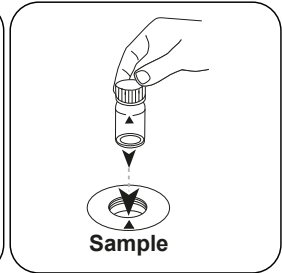
Für diese Methode muss bei folgenden Geräten nicht jedes mal eine ZERO-Messung durchgeführt werden: XD 7000, XD 7500



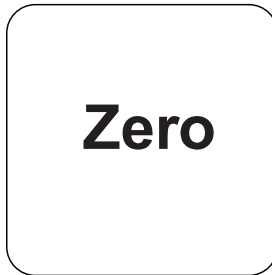
24-mm-Küvette mit **10 mL Probe** füllen.



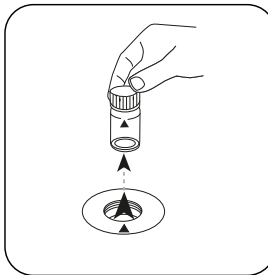
Küvette(n) verschließen.



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

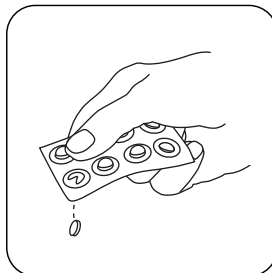


Taste **ZERO** drücken.

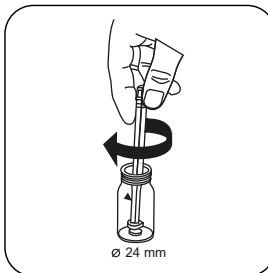


Küvette aus dem Messschacht nehmen.

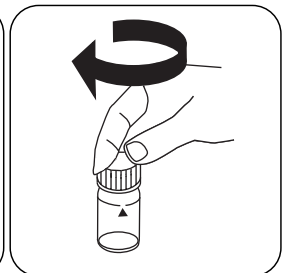
Bei Geräten, die **keine ZERO-Messung** erfordern, **hier beginnen**.



Bei Anwesenheit von freiem Chlor (HOCl) eine **UREA PRETREAT Tablette** zugeben.



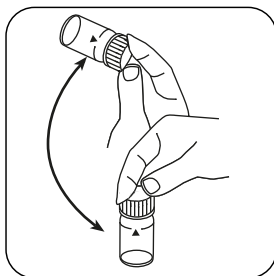
Tablette(n) unter leichter Drehung zerdrücken.



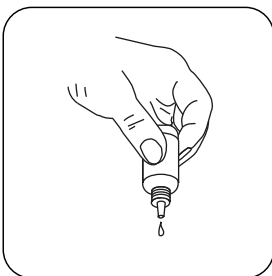
Küvette(n) verschließen.



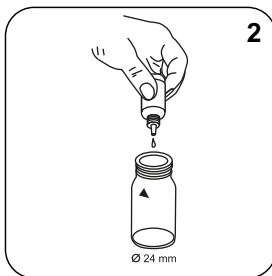
DE



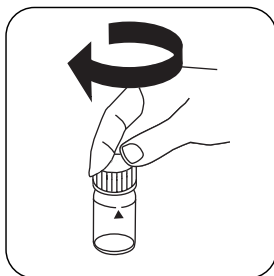
Tablette(n) durch Umschwenken lösen.



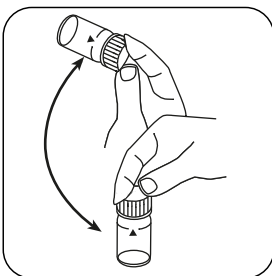
Die Tropfflaschen senkrecht halten und durch langsames Drücken gleich große Tropfen zugeben.



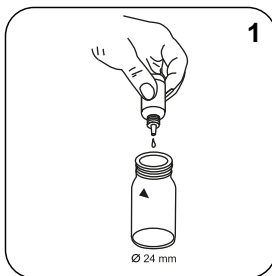
**2 Tropfen Urea Reagenz 1** zugeben.



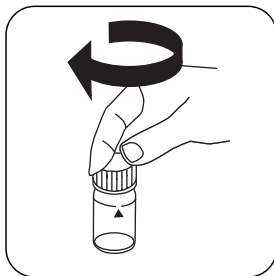
Küvette(n) verschließen.



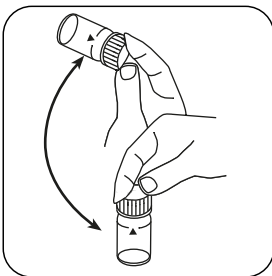
Inhalt durch Umschwenken mischen.



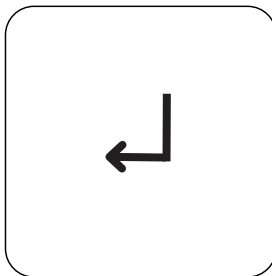
**1 Tropfen Urea Reagenz 2** zugeben.



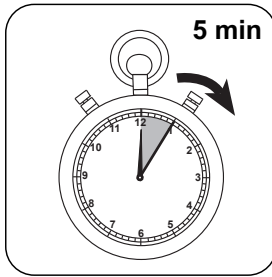
Küvette(n) verschließen.



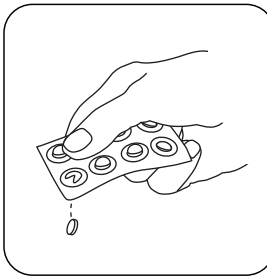
Inhalt durch Umschwenken mischen.



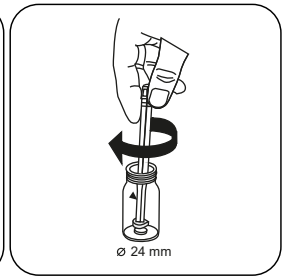
Taste **ENTER** drücken.



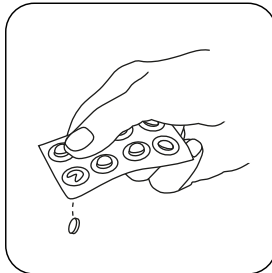
**5 Minute(n) Reaktionszeit**  
abwarten.



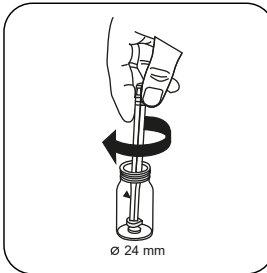
Eine **AMMONIA**  
**No.1 Tablette** zugeben.



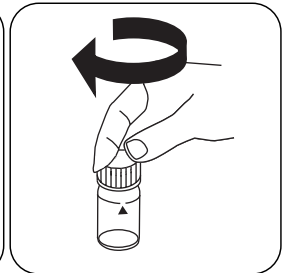
Tablette(n) unter leichter  
Drehung zerdrücken.



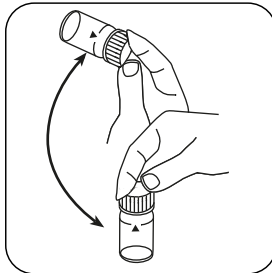
Eine **AMMONIA**  
**No.2 Tablette** zugeben.



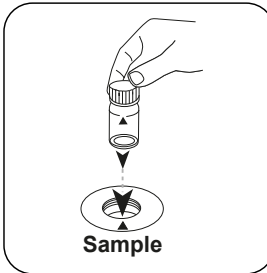
Tablette(n) unter leichter  
Drehung zerdrücken.



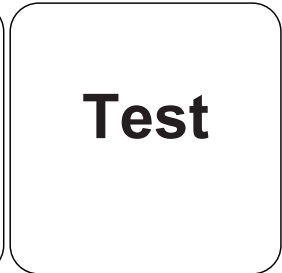
Küvette(n) verschließen.



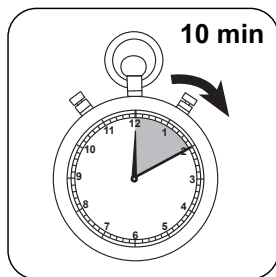
Tablette(n) durch  
Umschwenken lösen.



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



Taste **TEST (XD: START)**  
drücken.



DE

**10 Minute(n)****Reaktionszeit** abwarten.

Nach Ablauf der Reaktionszeit erfolgt automatisch die Messung.

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

## Chemische Methode

Indophenol / Urease

## Appendix

### Störungen

#### Permanente Störungen

- Konzentrationen über 2 mg/L Harnstoff können zu Ergebnissen innerhalb des Messbereiches führen. In diesem Fall ist die Wasserprobe mit harnstofffreiem Wasser zu verdünnen und die Messung zu wiederholen (Plausibilitätstest).

#### Ausschließbare Störungen

- Eine UREA PRETREAT Tablette eliminiert die Störung von freiem Chlor bis zu 2 mg/L (zwei Tabletten bis zu 4 mg/L, drei Tabletten bis zu 6 mg/L).

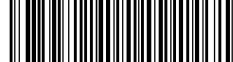
Störung	Stört ab / [mg/L]
Cl <sub>2</sub>	2

#### Literaturverweise

R.J. Creno, R.E. Wenk, P. Bohling, Automated Micromasurement of Urea Using Urease and the Berthelot Reaction, American Journal of Clinical Pathology (1970), 54 (6), p. 828-832

\* inklusive Rührstab





Harnstoff T

M391

0,2 - 5 mg/L Urea<sup>1)</sup>

Ur2

Indophenol / Urease

## Material

DE

Benötigtes Material (zum Teil optional):

Reagenzien	Form/Menge	Bestell-Nr.
UREA Reagenz 1	15 mL	459300
UREA Reagenz 2	10 mL	459400
Ammonia No. 1	Tablette / 100	512580BT
Ammonia No. 1	Tablette / 250	512581BT
Ammonia No. 2	Tablette / 100	512590BT
Ammonia No. 2	Tablette / 250	512591BT
Set Ammonia No. 1/No. 2 <sup>#</sup>	je 100	517611BT
Set Ammonia No. 1/No. 2 <sup>#</sup>	je 250	517612BT
Ammonium Konditionierpulver	Pulver / 26 g	460170
Urea Pretreat (eliminiert die Störung von freiem Chlor bis zu 2 mg/l)	Tablette / 100	516110BT
UREA Reagenzien Set	1 Satz	517800BT

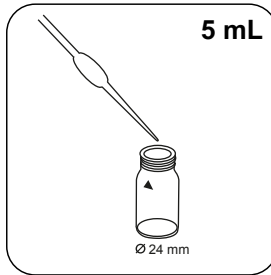
## Vorbereitung

- Bei der Analyse von Meerwasserproben muss vor Zugabe der Ammonia No. 1 Tablette zwei Messlöffel Ammonium Konditionierungs-Pulver zur Probe gegeben und durch Schwenken aufgelöst werden.

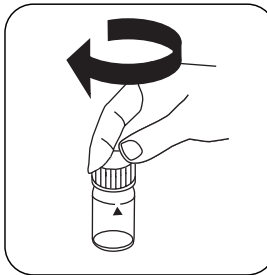
## Durchführung der Bestimmung Harnstoff mit Tablette und Flüssigreagenz

Die Methode im Gerät auswählen.

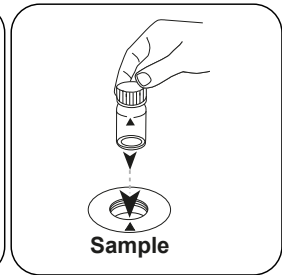
Für diese Methode muss bei folgenden Geräten nicht jedes mal eine ZERO-Messung durchgeführt werden: XD 7000, XD 7500



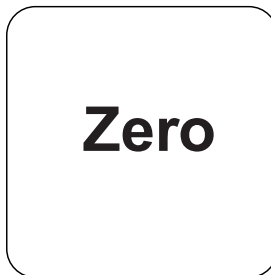
**5 mL Probe** und **5 mL VE-Wasser** in die Probenküvette geben.



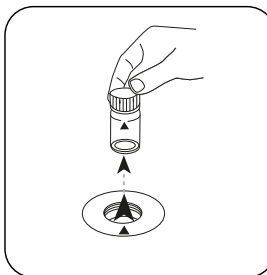
Küvette(n) verschließen.



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

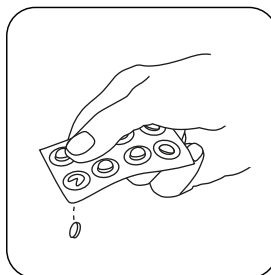


Taste **ZERO** drücken.

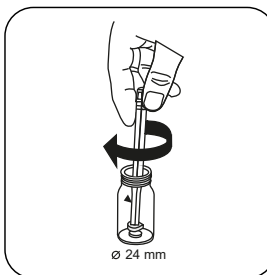


Küvette aus dem Messschacht nehmen.

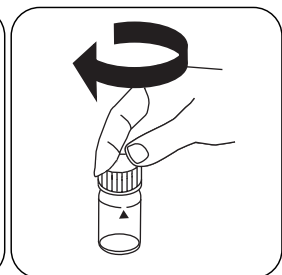
Bei Geräten, die **keine ZERO-Messung** erfordern, **hier beginnen**.



Bei Anwesenheit von freiem Chlor (HOCl) eine **UREA PRETREAT** Tablette zugeben.



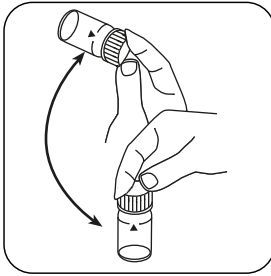
Tablette(n) unter leichter Drehung zerdrücken.



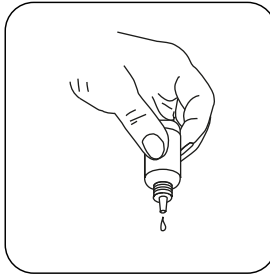
Küvette(n) verschließen.



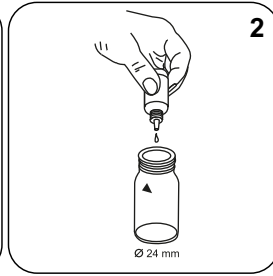
DE



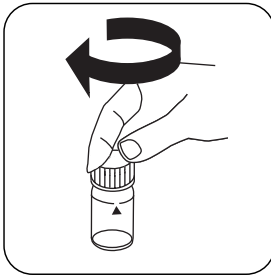
Tablette(n) durch Umschwenken lösen.



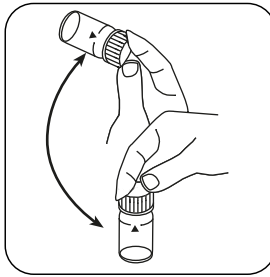
Die Tropfflaschen senkrecht halten und durch langsames Drücken gleich große Tropfen zugeben.



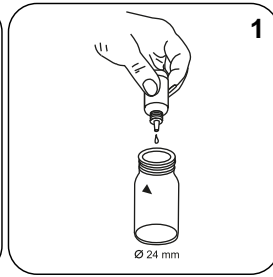
**2 Tropfen UREA Reagenz 1** zugeben.



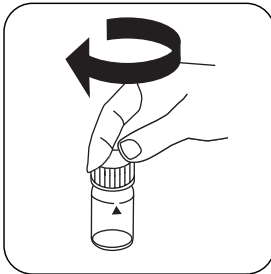
Küvette(n) verschließen.



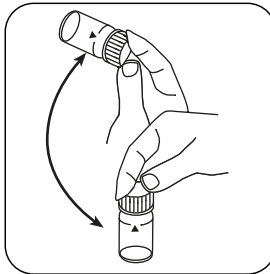
Inhalt durch Umschwenken mischen.



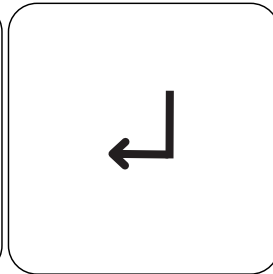
**1 Tropfen UREA Reagenz 2** zugeben.



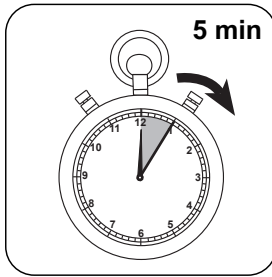
Küvette(n) verschließen.



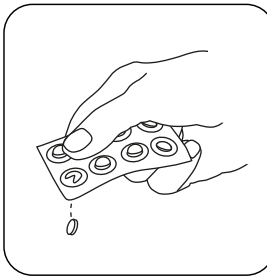
Inhalt durch Umschwenken mischen.



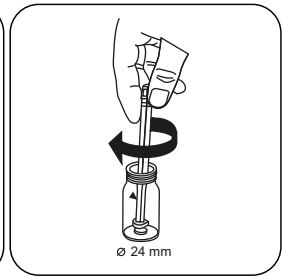
Taste **ENTER** drücken.



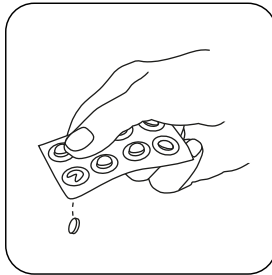
**5 Minute(n) Reaktionszeit**  
abwarten.



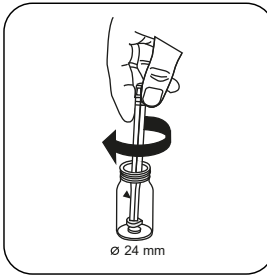
Eine **AMMONIA No.**  
**1 Tablette** zugeben.



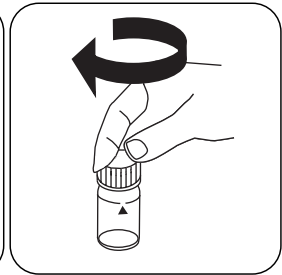
Tablette(n) unter leichter  
Drehung zerdrücken.



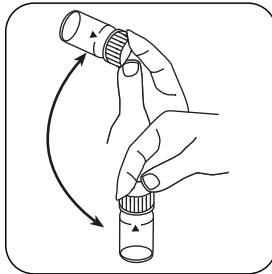
Eine **AMMONIA No.**  
**2 Tablette** zugeben.



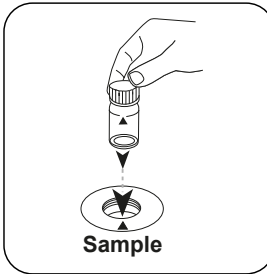
Tablette(n) unter leichter  
Drehung zerdrücken.



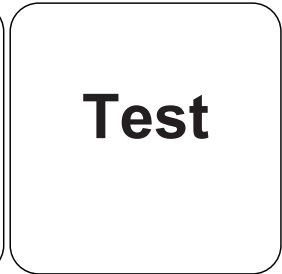
Küvette(n) verschließen.



Tablette(n) durch  
Umschwenken lösen.

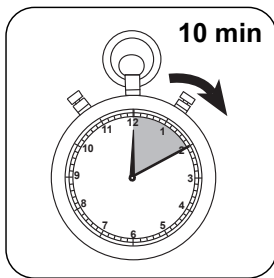


Die **Probenküvette** in  
den Messschacht stellen.  
Positionierung beachten.



Taste **TEST (XD: START)**  
drücken.

DE



DE

**10 Minute(n)****Reaktionszeit** abwarten.

Nach Ablauf der Reaktionszeit erfolgt automatisch die Messung.

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



## Chemische Methode

Indophenol / Urease

<sup>9</sup> Hoher Messbereich durch Verdünnung | <sup>\*</sup> inklusive Rührstab

DE

KS4.3 T / 20

Nombre del método

Número de método

Código de barras para reconocer el método

Rango de medición

20

S:4.3

K<sub>S4.3</sub> T  
0.1 - 4 mmol/l K<sub>S4.3</sub>  
Ácido / Indicador

Método químico

**Indicación en la pantalla de MD 100 / MD 110 / MD 200**

**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 <sub>S4.3</sub>
SpectroDirect, XD 7000, XD 7500	ø 24 mm	615 nm	0.1 - 4 mmol/l K <sub>S4.3</sub>

**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<sub>S4.3</sub> 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  $K_{24.3}$  con tableta**

Seleccionar el método en el aparato.

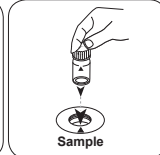
Para este método no es necesario realizar medición CERO en los aparatos siguientes: XD 7000, XD 7500



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

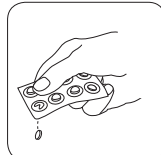


Cerrar la(s) cubeta(s).

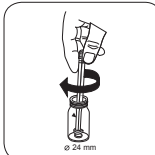


Poner la **cubeta de muestra** en el compartimiento de medición. ¡Debe tenerse en cuenta el posicionamiento!

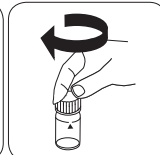
• • •



Añadir **tableta ALKA-M-PHOTOMETER**.



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



Cerrar la(s) cubeta(s).





Urea T

M390

0.1 - 2.5 mg/L Urea

Ur1

Urease / Indofenol

## Material

ES

Material requerido (parcialmente opcional):

Reactivos	Unidad de embalaje	No. de referencia
Reactivo 1 para UREA	15 mL	459300
UREA Reagent 2-10 ml	10 mL	459400
Amonio nº 1	Tabletas / 100	512580BT
Amonio nº 1	Tabletas / 250	512581BT
Amonio nº 2	Tabletas / 100	512590BT
Amonio nº 2	Tabletas / 250	512591BT
Juego amonio nº 1/nº 2 <sup>a</sup>	100 cada	517611BT
Juego amonio nº 1/nº 2 <sup>a</sup>	250 cada	517612BT
Polvo de acondicionamiento de amonio	Polvos / 26 g	460170
Urea Pretreat (compensates for the interference of free Chlorine up to 2 mg/l)	Tabletas / 100	516110BT
Juego de reactivos para urea	1 Set	517800BT

## Preparación

1. La temperatura de la muestra deberá encontrarse entre 20 °C y 30 °C.
2. Realizar la determinación en el plazo máximo de una hora después de la toma de la muestra.
3. En la determinación de muestras marinas, se deberá añadir a la muestra acuosa dos cucharas de polvo acondicionador de amonio, antes de agregar la tableta Ammonia nº 1, disolviéndola mediante agitación.

## Notas

1. La tableta AMMONIA nº 1 se disolverá completamente una vez añadida la tableta AMMONIA nº 2.
2. En la determinación de ácido úrico se detectarán también amonio y cloroaminas.

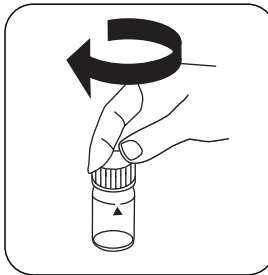
## Ejecución de la determinación Urea con tableta y reactivo líquido

Seleccionar el método en el aparato.

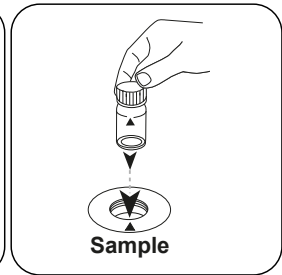
Para este método, no es necesario realizar una medición CERO cada vez en los siguientes dispositivos: XD 7000, XD 7500



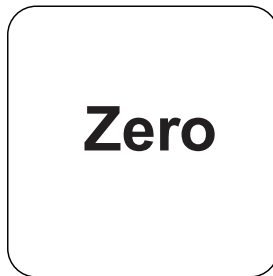
Llenar la cubeta de 24 mm con **10 mL de muestra**.



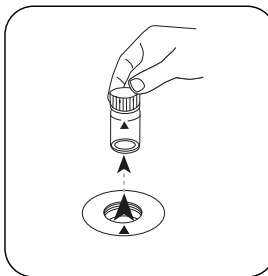
Cerrar la(s) cubeta(s).



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

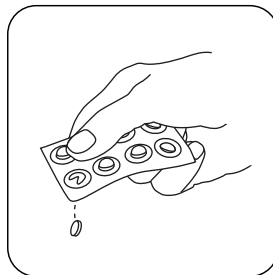


Pulsar la tecla **ZERO**.

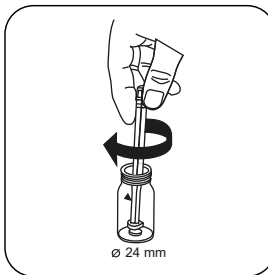


Extraer la cubeta del compartimiento de medición.

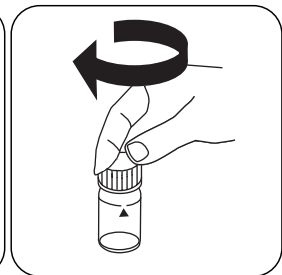
Para los aparatos que **no requieran medición CERO**, empezar aquí.



Si hay cloro libre (HOCl), añadir **una tableta UREA PRETREAT**.



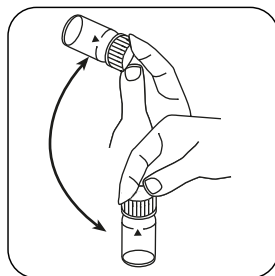
Triturar la(s) tableta(s) girando ligeramente.



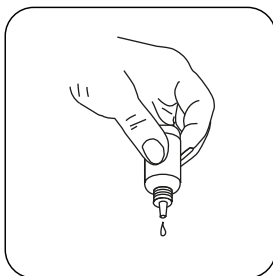
Cerrar la(s) cubeta(s).



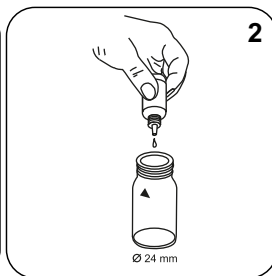
ES



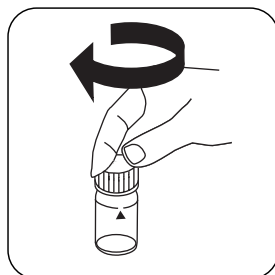
Disolver la(s) tableta(s) girando.



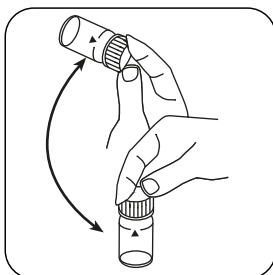
Mantener la botella cuentagotas vertical y añadir gotas del mismo tamaño presionando lentamente.



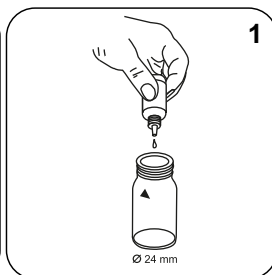
Añadir **2 gotas de Urea Reagenz 1.**



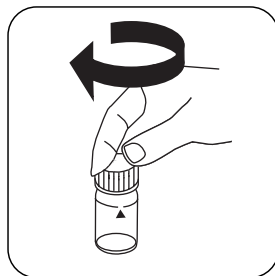
Cerrar la(s) cubeta(s).



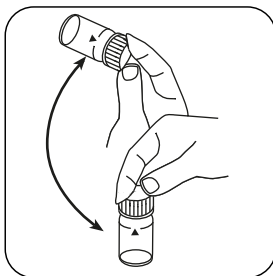
Mezclar el contenido girando.



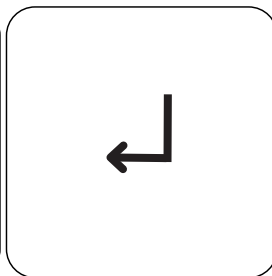
Añadir **1 gotas de Urea Reagenz 2.**



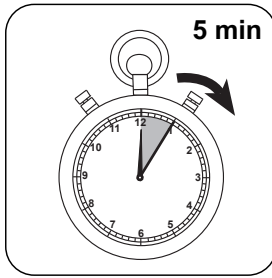
Cerrar la(s) cubeta(s).



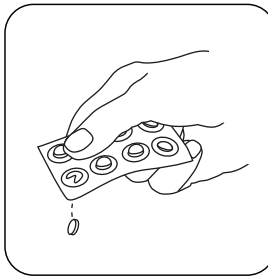
Mezclar el contenido girando.



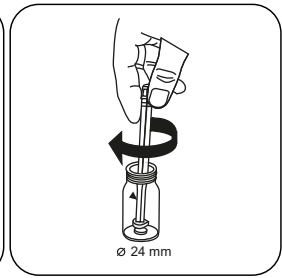
Pulsar la tecla **ENTER.**



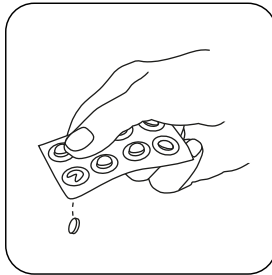
Esperar **5 minutos como periodo de reacción.**



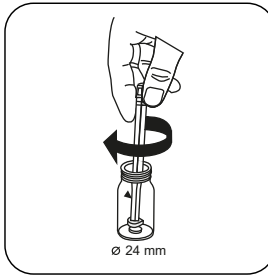
Añadir **tableta AMMONIA No.1.**



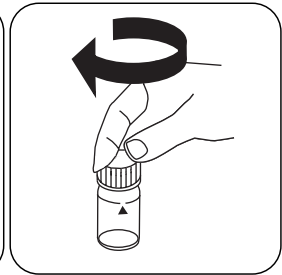
Triturar la(s) tableta(s) girando ligeramente.



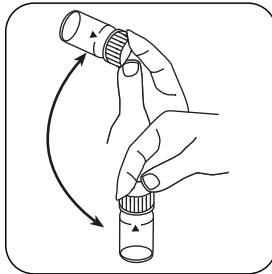
Añadir **tableta AMMONIA No.2.**



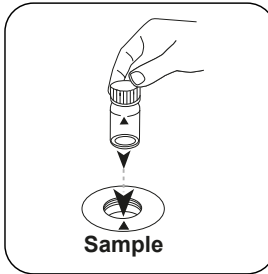
Triturar la(s) tableta(s) girando ligeramente.



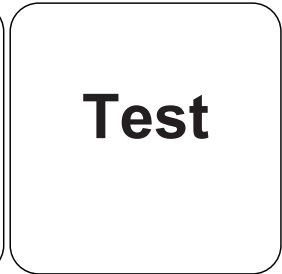
Cerrar la(s) cubeta(s).



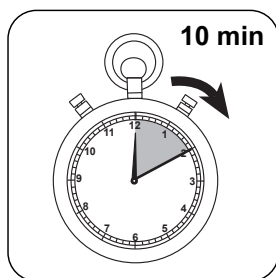
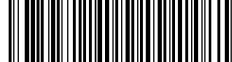
Disolver la(s) tableta(s) girando.



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



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



ES

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

Finalizado el periodo de reacción se realizará la determinación automáticamente.

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

## Método químico

Urease / Indofenol

## Apéndice

### Interferencia

#### Interferencias persistentes

- Las concentraciones de urea mayores a 2 mg/L pueden conducir a resultados hasta dentro del campo de medición. En este caso, se deberá diluir la muestra con agua libre de cloro y repetirse a continuación el análisis (prueba de plausibilidad).

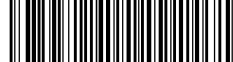
#### Interferencias extraíbles

- Una tableta UREA PRETREAT elimina la perturbación del cloro libre hasta 2 mg/L (dos tabletas hasta 4 mg/L, tres tabletas hasta 6 mg/L).

Interferencia	de / [mg/L]
Cl <sub>2</sub>	2

#### Bibliografía

R.J. Creno, R.E. Wenk, P. Bohling, Automated Micromasurement of Urea Using Urease and the Berthelot Reaction, American Journal of Clinical Pathology (1970), 54 (6), p. 828-832



Urea T

M391

0.2 - 5 mg/L Urea<sup>1)</sup>

Ur2

Urease / Indofenol

## Material

ES

Material requerido (parcialmente opcional):

Reactivos	Unidad de embalaje	No. de referencia
Reactivo 1 para UREA	15 mL	459300
UREA Reagent 2-10 ml	10 mL	459400
Amonio n° 1	Tabletas / 100	512580BT
Amonio n° 1	Tabletas / 250	512581BT
Amonio n° 2	Tabletas / 100	512590BT
Amonio n° 2	Tabletas / 250	512591BT
Juego amonio n° 1/n° 2 <sup>a</sup>	100 cada	517611BT
Juego amonio n° 1/n° 2 <sup>a</sup>	250 cada	517612BT
Polvo de acondicionamiento de amonio	Polvos / 26 g	460170
Urea Pretreat (compensates for the interference of free Chlorine up to 2 mg/l)	Tabletas / 100	516110BT
Juego de reactivos para urea	1 Set	517800BT

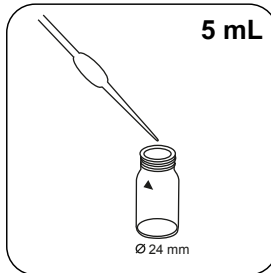
## Preparación

1. En la determinación de muestras marinas, se deberá añadir a la muestra acuosa dos cucharas de polvo acondicionador de amonio, antes de agregar la tableta Ammonia n° 1, disolviéndola mediante agitación.

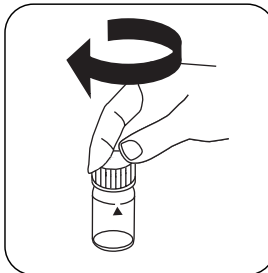
## Ejecución de la determinación Urea con tableta y reactivo líquido

Seleccionar el método en el aparato.

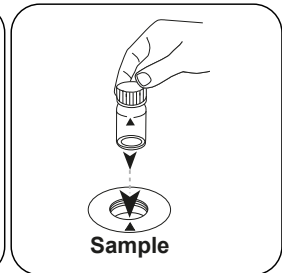
Para este método, no es necesario realizar una medición CERO cada vez en los siguientes dispositivos: XD 7000, XD 7500



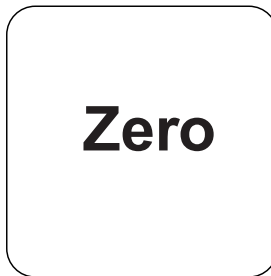
Añadir en la cubeta de muestra **5 mL de muestra y 5 mL de agua desionizada**.



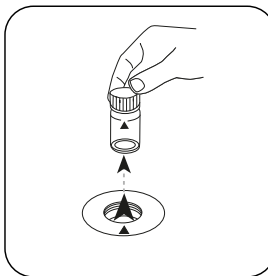
Cerrar la(s) cubeta(s).



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

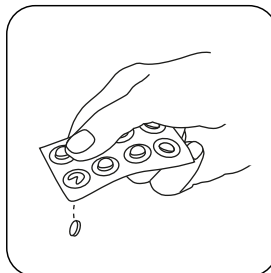


Pulsar la tecla **ZERO**.

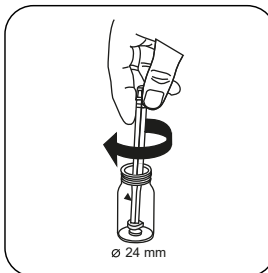


Extraer la cubeta del compartimiento de medición.

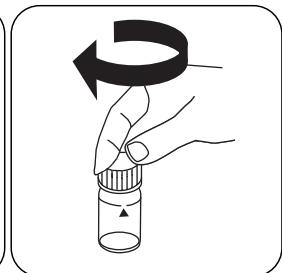
Para los aparatos que **no requieran medición CERO**, empezar aquí.



Si hay cloro libre (HOCl), añadir **una tableta UREA PRETREAT**.



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

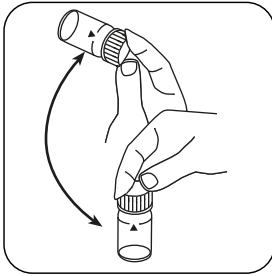


Cerrar la(s) cubeta(s).

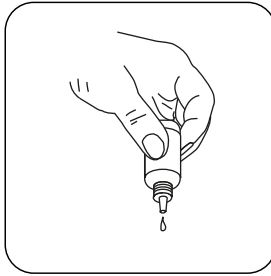




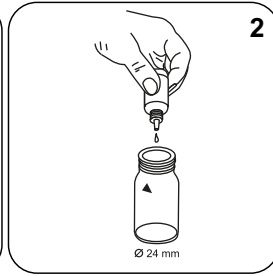
ES



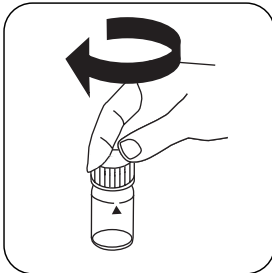
Disolver la(s) tableta(s) girando.



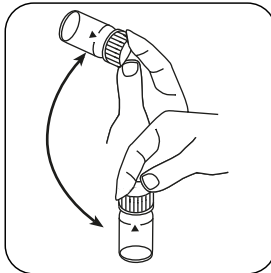
Mantener la botella cuentagotas vertical y añadir gotas del mismo tamaño presionando lentamente.



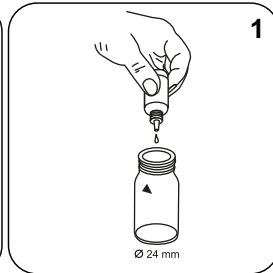
Añadir **2 gotas de UREA Reagenz 1.**



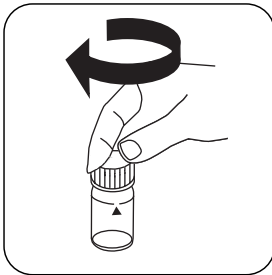
Cerrar la(s) cubeta(s).



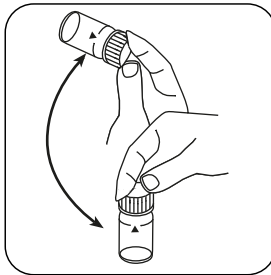
Mezclar el contenido girando.



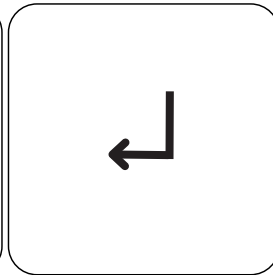
Añadir **1 gota de UREA Reagenz 2.**



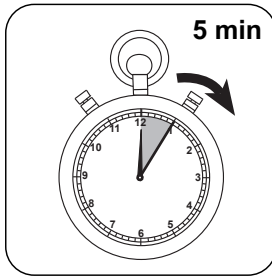
Cerrar la(s) cubeta(s).



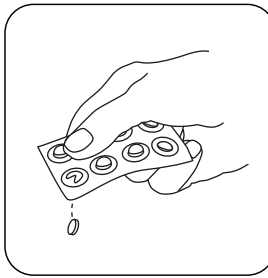
Mezclar el contenido girando.



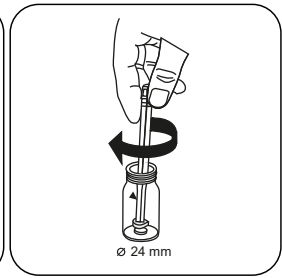
Pulsar la tecla **ENTER.**



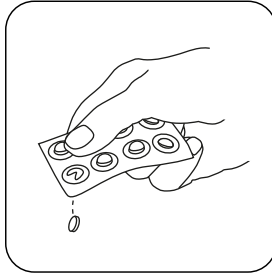
Esperar **5 minutos como periodo de reacción.**



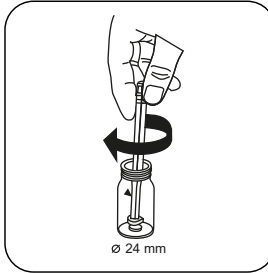
Añadir **tableta AMMONIA No. 1.**



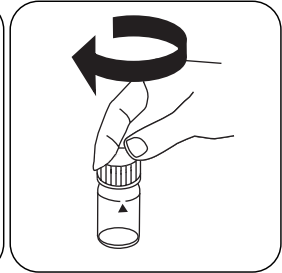
Triturar la(s) tableta(s) girando ligeramente.



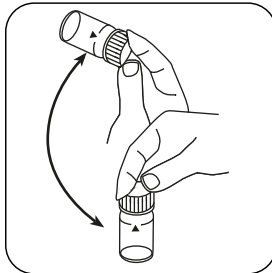
Añadir **tableta AMMONIA No. 2.**



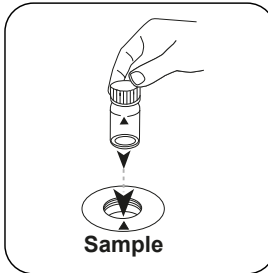
Triturar la(s) tableta(s) girando ligeramente.



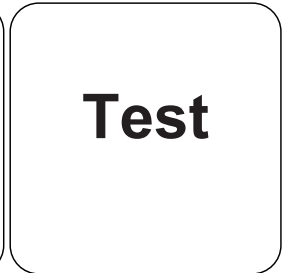
Cerrar la(s) cubeta(s).



Disolver la(s) tableta(s) girando.

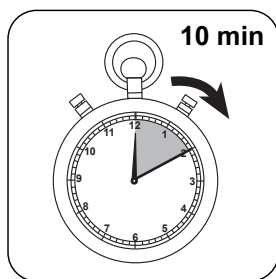
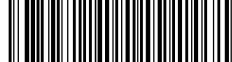


Poner la **cubeta de muestra** en el compartimiento de medición. ¡Debe tenerse en cuenta el posicionamiento!



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

ES



ES

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

Finalizado el periodo de reacción se realizará la determinación automáticamente.

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




## Método químico

Urease / Indofenol

<sup>1</sup> Campo de medición elevado con dilución

ES

KS4.3 T / 20



**Nom de la méthode** → KS4.3 T / 20

**Numéro de méthode** → 20

**Code à barres pour reconnaître la méthode** → [Barcode]

**Plage de mesure** → 0.1 - 4 mmol/l  $K_{S4.3}$

**Méthode chimique** → Acide / Indicateur

**Affichage dans le MD 100 / MD 110 / MD 200** → 20 S:4.3

**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	$\lambda$	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** → FR

**État de révision** → 01/20

FR Méthodes Manuel 01/20

## Procédure du test

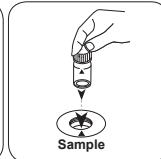
**Réalisation de la quantification Capacité acide  $K_{s4.3}$  avec pastille**

Sélectionnez la méthode sur l'appareil.

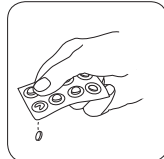
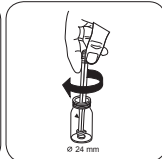
Cette méthode ne nécessite aucune mesure du zéro sur les appareils suivants : XD 7000, XD 7500

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

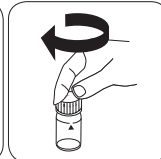
Fermez la(les) cuvette(s).

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).



Urée T

M390

0.1 - 2.5 mg/L Urea

Ur1

Indophénol / Uréase

## Matériel

FR

Matériel requis (partiellement optionnel):

Réactifs	Pack contenant	Code
UREE Réactif 1	15 mL	459300
UREE Réactif 2	10 mL	459400
Ammoniac N° 1	Pastilles / 100	512580BT
Ammoniac N° 1	Pastilles / 250	512581BT
Ammoniac N° 2	Pastilles / 100	512590BT
Ammoniac N° 2	Pastilles / 250	512591BT
Kit ammoniac N° 1/N° 2 <sup>e</sup>	100 chacun	517611BT
Kit ammoniac N° 1/N° 2 <sup>e</sup>	250 chacun	517612BT
Poudre de conditionnement ammonium	Poudre / 26 g	460170
Traitement préliminaire urée (compensates for the interference of free Chlorine up to 2 mg/l)	Pastilles / 100	516110BT
Kit de réactifs UREE	1 Kit	517800BT

## Préparation

1. La température de l'échantillon devrait être comprise entre 20 °C et 30 °C.
2. L'analyse devra avoir lieu au plus tard une heure après le prélèvement de l'échantillon.
3. Lors de l'analyse des échantillons d'eau de mer, il faudra ajouter avant l'apport de la pastille Ammonia N° 1, deux cuillères de mesure de poudre réactive de traitement de l'ammonium à l'échantillon qui sera dissoute en mettant le tube à l'envers puis à l'endroit.

## Indication

1. La pastille AMMONIA No. 1 ne se dissout entièrement qu'après avoir ajouté la pastille AMMONIA No. 2.
2. L'ammonium et les chloramines sont également pris en compte lors de la quantification de l'urée.

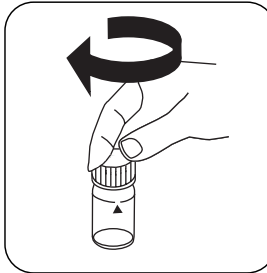
## Réalisation de la quantification Urée avec pastille et réactif liquide

Sélectionnez la méthode sur l'appareil.

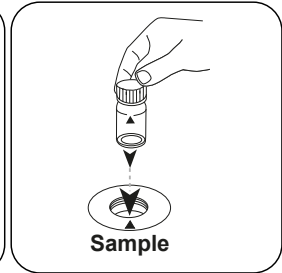
Pour cette méthode, il n'est pas nécessaire d'effectuer une mesure ZERO à chaque fois sur les appareils suivants : XD 7000, XD 7500



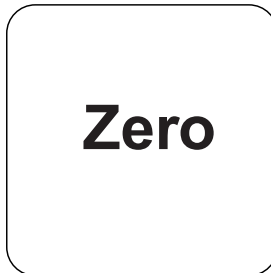
Remplissez une cuvette de 24 mm de **10 mL** d'échantillon.



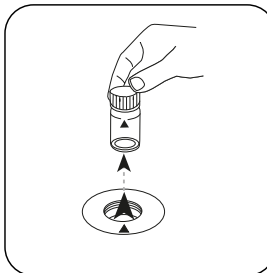
Fermez la(les) cuvette(s).



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

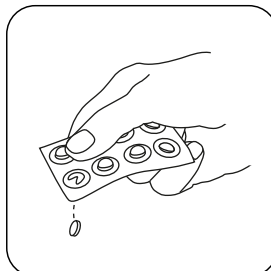


Appuyez sur la touche **ZERO**.

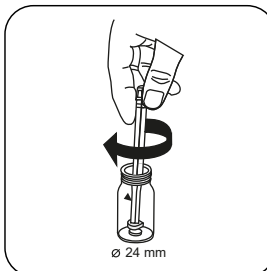


Retirez la cuvette de la chambre de mesure.

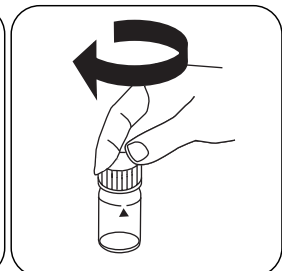
Sur les appareils ne nécessitant **aucune mesure ZÉRO**, commencez ici.



En présence de chlore libre (HOCl), ajoutez une **pastille de UREA PRETREAT**.



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

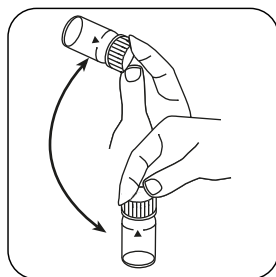


Fermez la(les) cuvette(s).

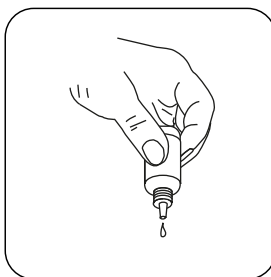




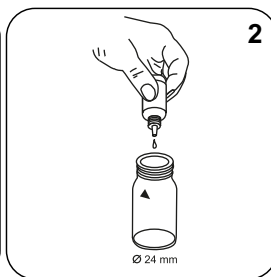
FR



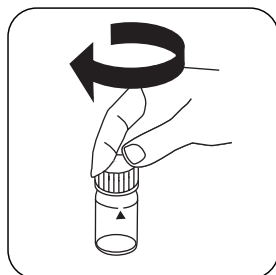
Dissolvez la(les) pastille(s) en mettant le tube plusieurs fois à l'envers.



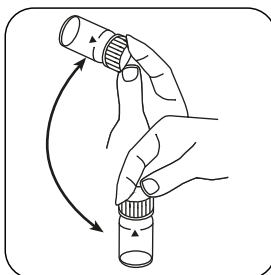
Tenez les flacons compte-goutte à la verticale et ajoutez des gouttes uniformes en appuyant lentement.



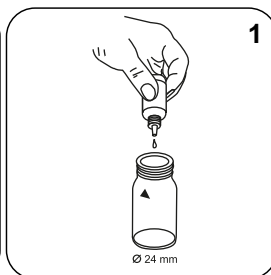
Ajoutez **2 gouttes de Urea Reagenz 1.**



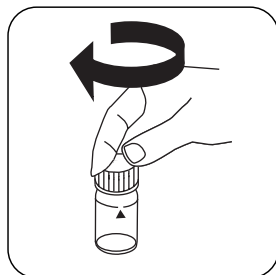
Fermez la(les) cuvette(s).



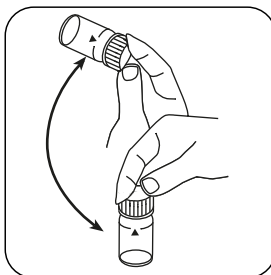
Mélangez le contenu en mettant le tube plusieurs fois à l'envers puis à l'endroit.



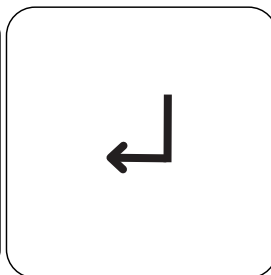
Ajoutez **1 goutte de Urea Reagenz 2.**



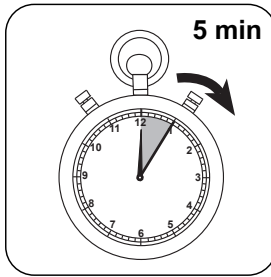
Fermez la(les) cuvette(s).



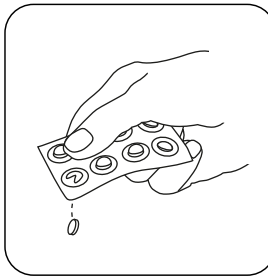
Mélangez le contenu en mettant le tube plusieurs fois à l'envers puis à l'endroit.



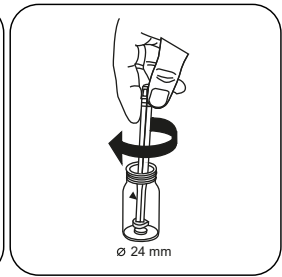
Appuyez sur la touche **ENTER.**



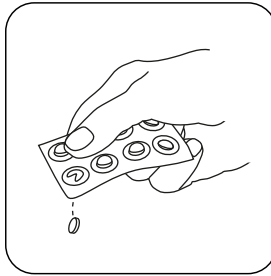
Attendez la fin du  
temps de réaction de  
5 minute(s) .



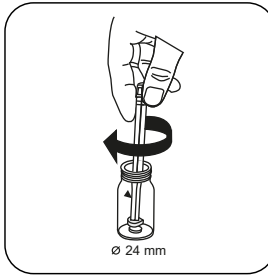
Ajoutez une **pastille de  
AMMONIA No.1.**



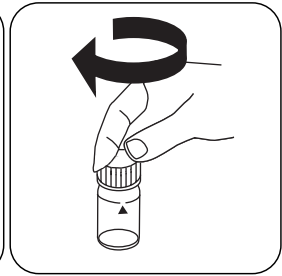
Écrasez la(les) pastille(s) en  
la(les) tournant un peu.



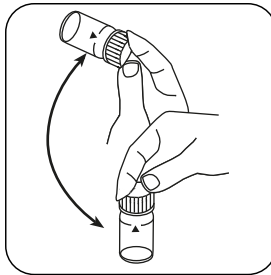
Ajoutez une **pastille de  
AMMONIA No.2.**



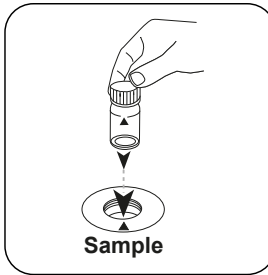
Écrasez la(les) pastille(s)  
en la(les) tournant un peu.



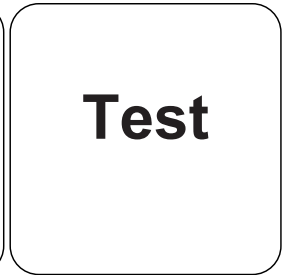
Fermez la(les) cuvette(s).



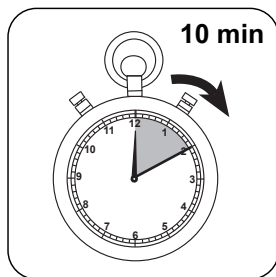
Dissolvez la(les) pastille(s)  
en mettant le tube plusieurs  
fois à l'envers.



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



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



FR

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

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

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

## Méthode chimique

Indophénol / Uréase

## Appendice

### Interférences

#### Interférences persistantes

- Les concentrations d'urée supérieures à 2 mg/L peuvent donner des résultats dans la plage de mesure. Dans ce cas, diluez l'échantillon d'eau en utilisant de l'eau exempte d'urée et répétez la mesure (test de plausibilité).

#### Interférences exclues

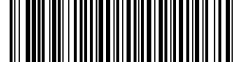
- Une pastille UREA PRETREAT élimine la perturbation causée par le chlore libre jusqu'à 2 mg/L (deux pastilles jusqu'à 4 mg/L, trois pastilles jusqu'à 6 mg/L).

Interférences	de / [mg/L]
Cl <sub>2</sub>	2

### Bibliographie

R.J. Creno, R.E. Wenk, P. Bohling, Automated Micromasurement of Urea Using Urease and the Berthelot Reaction, American Journal of Clinical Pathology (1970), 54 (6), p. 828-832

<sup>ii</sup>\* agitateur inclus



Urée T

M391

0.2 - 5 mg/L Urea<sup>1)</sup>

Ur2

Indophénol / Uréase

## Matériel

FR

Matériel requis (partiellement optionnel):

Réactifs	Pack contenant	Code
UREE Réactif 1	15 mL	459300
UREE Réactif 2	10 mL	459400
Ammoniac N° 1	Pastilles / 100	512580BT
Ammoniac N° 1	Pastilles / 250	512581BT
Ammoniac N° 2	Pastilles / 100	512590BT
Ammoniac N° 2	Pastilles / 250	512591BT
Kit ammoniac N° 1/N° 2 <sup>#</sup>	100 chacun	517611BT
Kit ammoniac N° 1/N° 2 <sup>#</sup>	250 chacun	517612BT
Poudre de conditionnement ammonium	Poudre / 26 g	460170
Traitement préliminaire urée (compensates for the interference of free Chlorine up to 2 mg/l)	Pastilles / 100	516110BT
Kit de réactifs UREE	1 Kit	517800BT

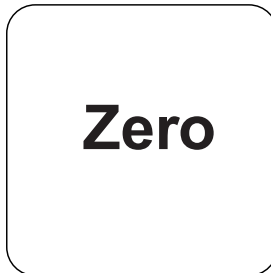
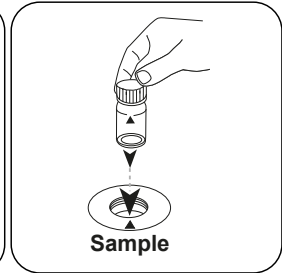
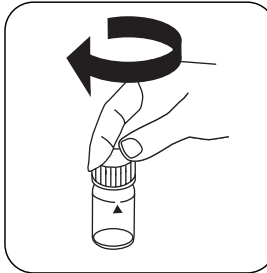
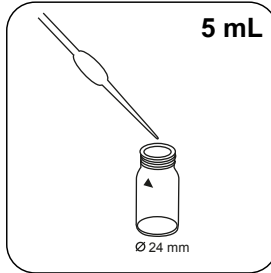
## Préparation

1. Lors de l'analyse des échantillons d'eau de mer, il faudra ajouter avant l'apport de la pastille Ammonia N° 1, deux cuillères de mesure de poudre réactive de traitement de l'ammonium à l'échantillon qui sera dissoute en mettant le tube à l'envers puis à l'endroit.

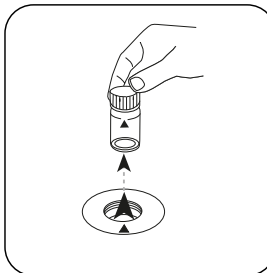
## Réalisation de la quantification Urée avec pastille et réactif liquide

Sélectionnez la méthode sur l'appareil.

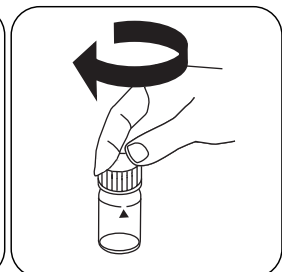
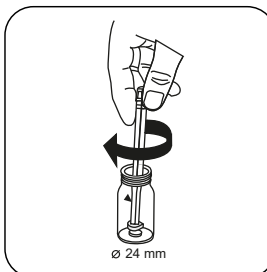
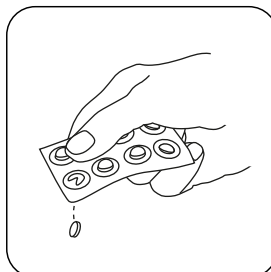
Pour cette méthode, il n'est pas nécessaire d'effectuer une mesure ZERO à chaque fois sur les appareils suivants : XD 7000, XD 7500



Appuyez sur la touche **ZERO**.

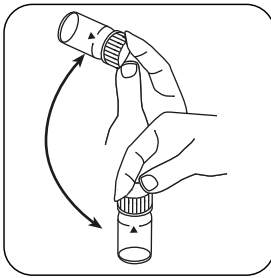


Sur les appareils ne nécessitant **aucune mesure ZÉRO**, commencez ici.

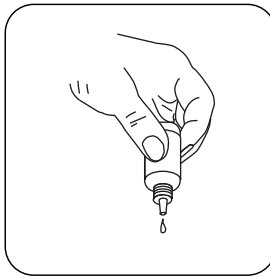




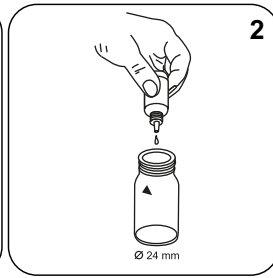
FR



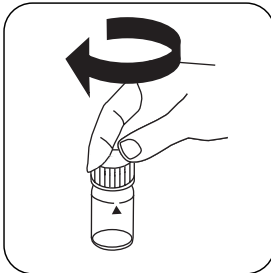
Dissolvez la(les) pastille(s) en mettant le tube plusieurs fois à l'envers.



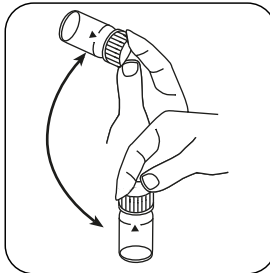
Tenez les flacons compte-goutte à la verticale et ajoutez des gouttes uniformes en appuyant lentement.



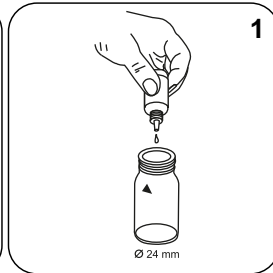
Ajoutez **2 gouttes de UREA Reagent 1.**



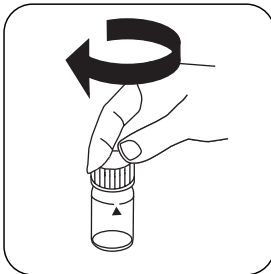
Fermez la(les) cuvette(s).



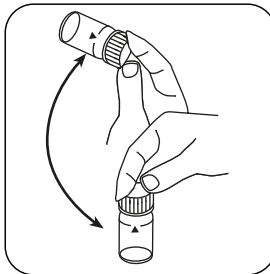
Mélangez le contenu en mettant le tube plusieurs fois à l'envers puis à l'endroit.



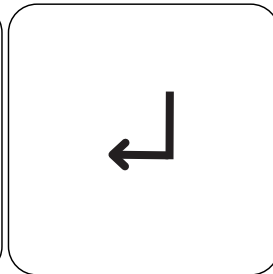
Ajoutez **1 goutte de UREA Reagent 2.**



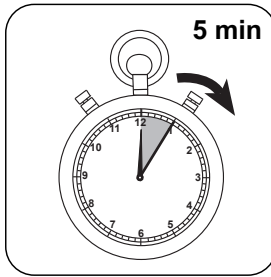
Fermez la(les) cuvette(s).



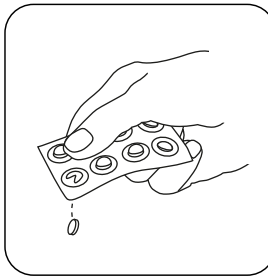
Mélangez le contenu en mettant le tube plusieurs fois à l'envers puis à l'endroit.



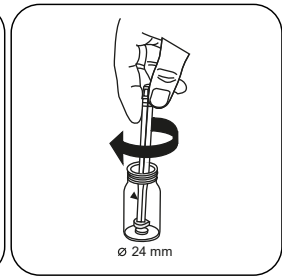
Appuyez sur la touche **ENTER.**



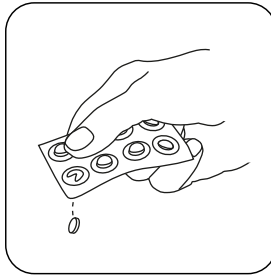
Attendez la fin du  
temps de réaction de  
5 minute(s) .



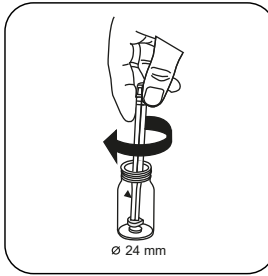
Ajoutez une **pastille de  
AMMONIA No. 1.**



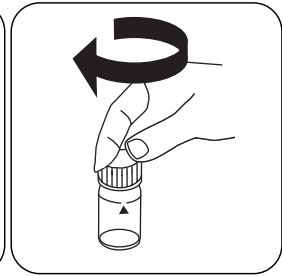
Écrasez la(les) pastille(s) en  
la(les) tournant un peu.



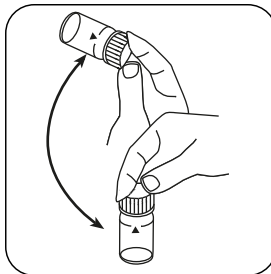
Ajoutez une **pastille de  
AMMONIA No. 2.**



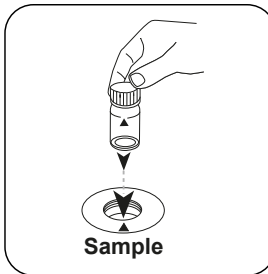
Écrasez la(les) pastille(s)  
en la(les) tournant un peu.



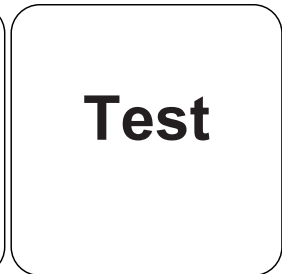
Fermez la(les) cuvette(s).



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

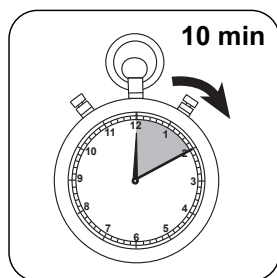
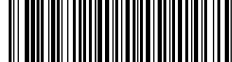


Placez la **cuvette réservée  
à l'échantillon** dans la  
chambre de mesure.  
Attention à la positionner  
correctement.



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





FR

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

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

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




## Méthode chimique

Indophénol / Uréase

<sup>9</sup> Gamme haute par dilution | <sup>10</sup> agitateur inclus

FR

KS4.3 T / 20



**Nome do método**

**Número do método**

**Código de barras para a detecção dos métodos**

**Área de medição**

$K_{S_{4.3}} T$   
0.1 - 4 mmol/l  $K_{S_{4.3}}$   
Ácido / Indicador

20  
S:4.3

**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 fotómetro são indicadas.

Dispositivos	Cubeta	$\lambda$	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 $K_{S_{4.3}}$
SpectroDirect, XD 7000, XD 7500	ø 24 mm	615 nm	0.1 - 4 mmol/l $K_{S_{4.3}}$

**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  $K_{S_{4.3}}$  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

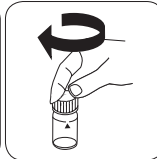
### Realização da determinação Capacidade de acidez $K_{s4.3}$ com pastilha

Escolher o método no equipamento.

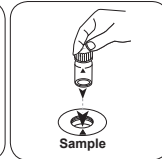
Para este método não tem de ser efetuada uma medição ZERO nos seguintes equipamentos: XD 7000, XD 7500



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

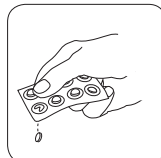


Fechar a(s) célula(s).

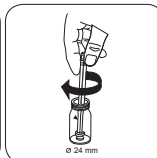


Colocar a **célula de amostra** no compartimento de medição. Observar o posicionamento.

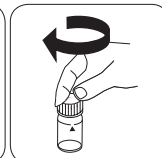
• • •



Pastilha ALKA-M-PHOTO-METER.



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



Fechar a(s) célula(s).

PT Métodos Manual 01/20

PT



Ureia T

M390

0.1 - 2.5 mg/L Urea

Ur1

Indophenol / Urease

## Material

PT

Material necessário (parcialmente opcional):

Reagentes	Unidade de Embalagem	Código do Produto
UREA Reagente 1	15 mL	459300
UREA Reagente 2	10 mL	459400
Amónia Não. 1	Pastilhas / 100	512580BT
Amónia Não. 1	Pastilhas / 250	512581BT
Amónia Não. 2	Pastilhas / 100	512590BT
Amónia Não. 2	Pastilhas / 250	512591BT
Set Amónio Não. 1/Não. 2 <sup>#</sup>	cada 100	517611BT
Set Amónio Não. 1/Não. 2 <sup>#</sup>	cada 250	517612BT
Pó de condicionamento de amónio	Pó / 26 g	460170
Pré-tratamento da ureia (compensates for the interference of free Chlorine up to 2 mg/l)	Pastilhas / 100	516110BT
Kit de reagentes UREA	1 Conjunto	517800BT

## Preparação

1. A temperatura da amostra deve situar-se entre 20 °C e 30 °C.
2. A análise tem de ser efetuada o mais tardar uma hora após a recolha da amostra.
3. Na análise de amostras de água do mar deve se, antes da adição da pastilha Ammonia No. 1, introduzir na amostra duas colheres medida de pó de condicionamento de amónio e dissolver por agitação.

## Notas

1. A pastilha AMMONIA No. 1 dissolve-se totalmente apenas depois da adição da pastilha AMMONIA No. 2.
2. O amónio e a cloramina são juntamente captados na determinação de ureia.

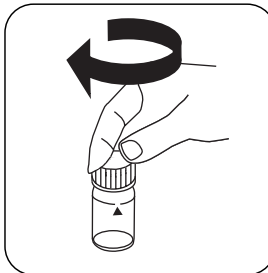
## Realização da determinação Ureia com pastilha e reagente líquido

Escolher o método no equipamento.

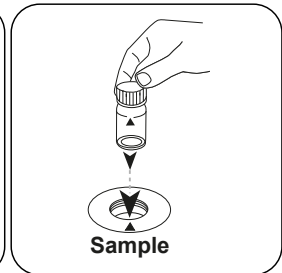
Para este método, uma medição ZERO não precisa ser realizada todas as vezes nos seguintes dispositivos: XD 7000, XD 7500



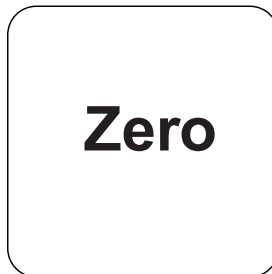
Encher a célula de 24 mm com **10 mL de amostra**.



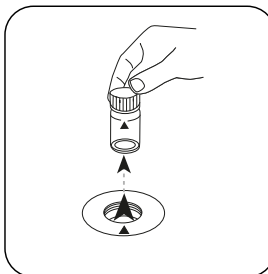
Fechar a(s) célula(s).



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

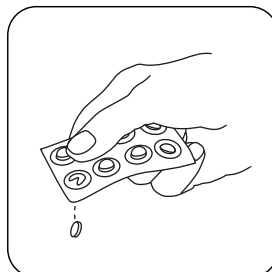


Premir a tecla **ZERO**.

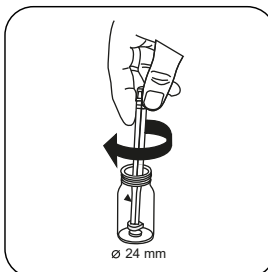


Retirar a célula do compartimento de medição.

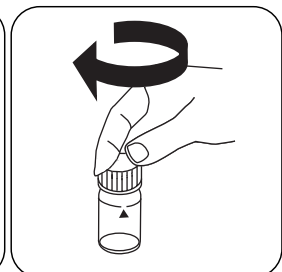
Nos equipamentos que **não requerem uma medição ZERO**, deve começar aqui.



Na presença de cloro livre (HOCl) adicionar **umas pastilha UREA PRETREAT**.



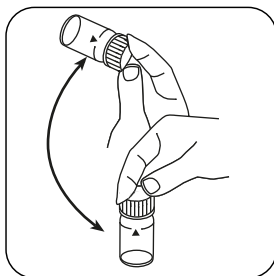
Esmagar a(s) pastilha(s) rodando ligeiramente.



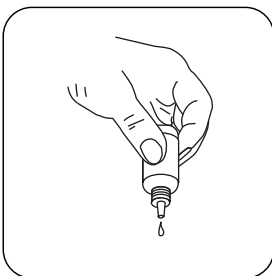
Fechar a(s) célula(s).



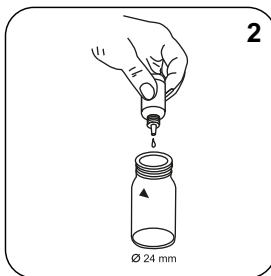
PT



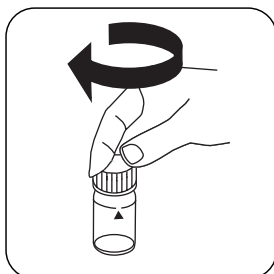
Dissolver a(s) pastilha(s) girando.



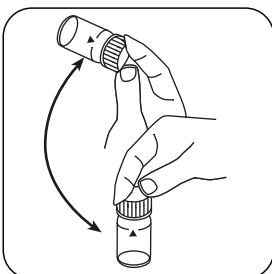
Manter os frascos conta gotas na vertical e pressionar lentamente para adicionar gotas de igual dimensão.



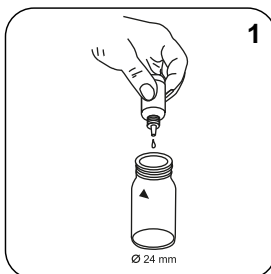
Adicionar **2 gotas Urea Reagenz 1.**



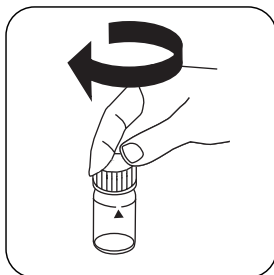
Fechar a(s) célula(s).



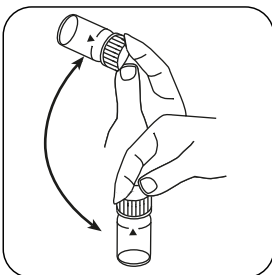
Misturar o conteúdo girando.



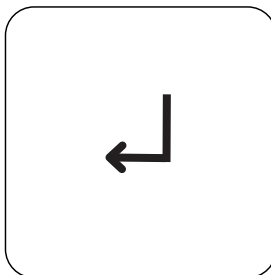
Adicionar **1 gotas Urea Reagenz 2.**



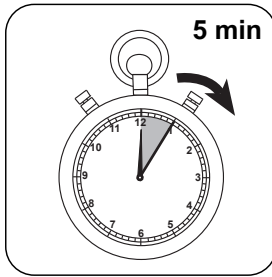
Fechar a(s) célula(s).



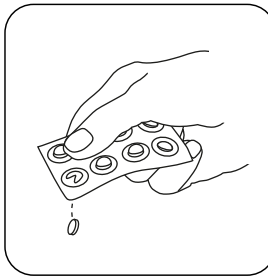
Misturar o conteúdo girando.



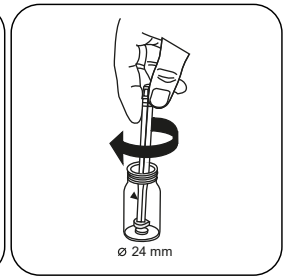
Premir a tecla **ENTER.**



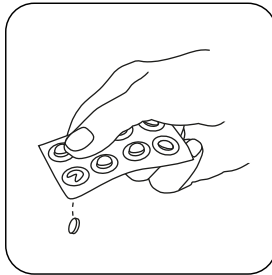
Aguardar **5 minuto(s)** de tempo de reação.



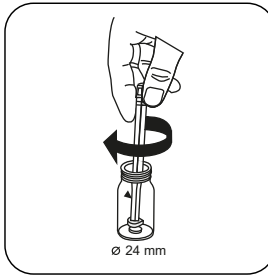
Pastilha **AMMONIA No.1.**



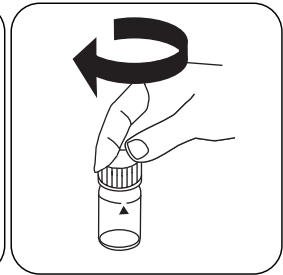
Esmagar a(s) pastilha(s) rodando ligeiramente.



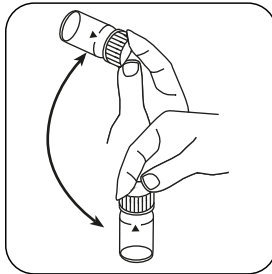
Pastilha **AMMONIA No.2.**



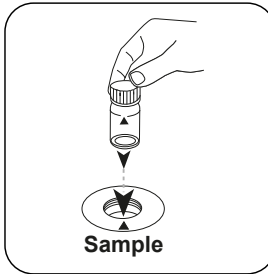
Esmagar a(s) pastilha(s) rodando ligeiramente.



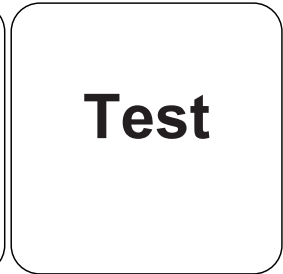
Fechar a(s) célula(s).



Dissolver a(s) pastilha(s) girando.

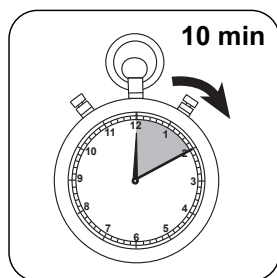
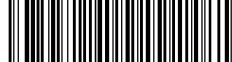


Colocar a **célula de amostra** no compartimento de medição. Observar o posicionamento.



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





PT

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

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

No visor aparece o resultado em mg/L Uréia.

## Método Químico

Indophenol / Urease

## Apêndice

### Texto de Interferências

#### Interferências Persistentes

- Concentrações de ureia superiores a 2 mg/L podem causar resultados dentro da área de medição. Neste caso, deve diluir a amostra de água em água sem ureia e repetir a medição (teste de plausibilidade).

#### Interferências Removíveis

- Uma pastilha de UREA PRETREAT elimina a interferência do cloro livre até 2 mg/L (duas pastilhas até 4 mg/L, três pastilhas até 6 mg/L).

Interferências	a partir de / [mg/L]
Cl <sub>2</sub>	2

#### Bibliografia

R.J. Creno, R.E. Wenk, P. Bohling, Automated Micromasurement of Urea Using Urease and the Berthelot Reaction, American Journal of Clinical Pathology (1970), 54 (6), p. 828-832

\*incluindo vareta de agitação



Ureia T

M391

0.2 - 5 mg/L Urea<sup>1)</sup>

Ur2

Indophenol / Urease

## Material

PT

Material necessário (parcialmente opcional):

Reagentes	Unidade de Embalagem	Código do Produto
UREA Reagente 1	15 mL	459300
UREA Reagente 2	10 mL	459400
Amónia Não. 1	Pastilhas / 100	512580BT
Amónia Não. 1	Pastilhas / 250	512581BT
Amónia Não. 2	Pastilhas / 100	512590BT
Amónia Não. 2	Pastilhas / 250	512591BT
Set Amónio Não. 1/Não. 2 <sup>#</sup>	cada 100	517611BT
Set Amónio Não. 1/Não. 2 <sup>#</sup>	cada 250	517612BT
Pó de condicionamento de amónio	Pó / 26 g	460170
Pré-tratamento da ureia (compensates for the interference of free Chlorine up to 2 mg/l)	Pastilhas / 100	516110BT
Kit de reagentes UREA	1 Conjunto	517800BT

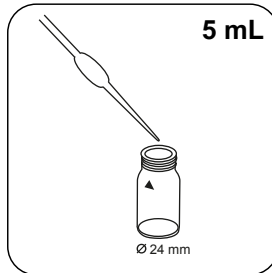
## Preparação

1. Na análise de amostras de água do mar deve se, antes da adição da pastilha Ammonia No. 1, introduzir na amostra duas colheres medida de pó de condicionamento de amónio e dissolver por agitação.

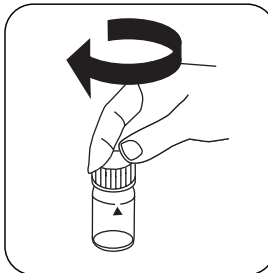
## Realização da determinação Ureia com pastilha e reagente líquido

Escolher o método no equipamento.

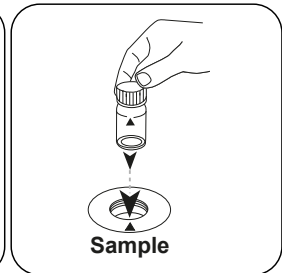
Para este método, uma medição ZERO não precisa ser realizada todas as vezes nos seguintes dispositivos: XD 7000, XD 7500



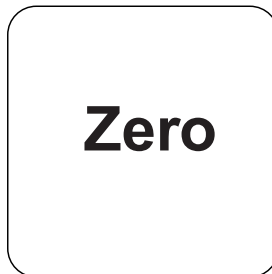
Adicionar **5 mL de amostra** e **5 mL de água desmineralizada** à célula de amostra.



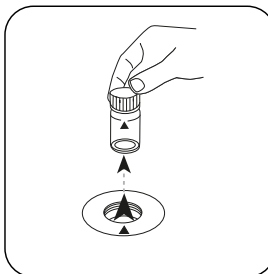
Fechar a(s) célula(s).



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

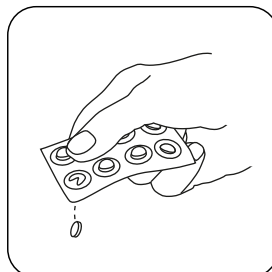


Premir a tecla **ZERO**.

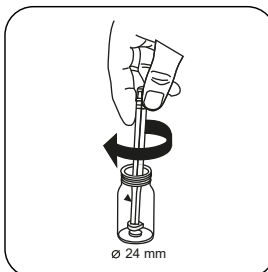


Retirar a célula do compartimento de medição.

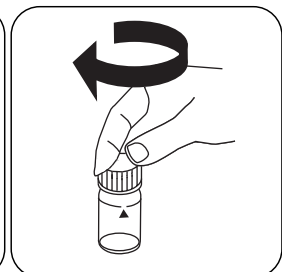
Nos equipamentos que **não requerem uma medição ZERO**, deve começar aqui.



Na presença de cloro livre (HOCl) adicionar **umas pastilha UREA PRETREAT**.



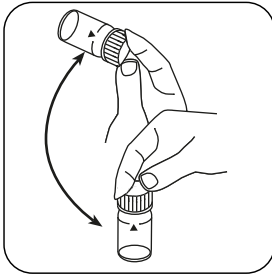
Esmagar a(s) pastilha(s) rodando ligeiramente.



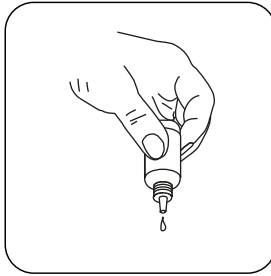
Fechar a(s) célula(s).



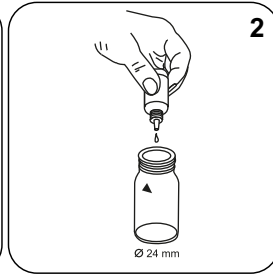
PT



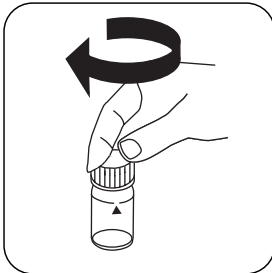
Dissolver a(s) pastilha(s) girando.



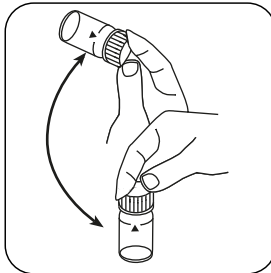
Manter os frascos conta gotas na vertical e pressionar lentamente para adicionar gotas de igual dimensão.



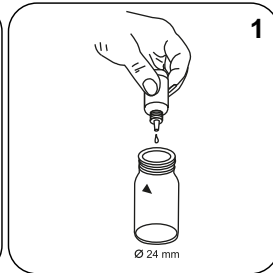
Adicionar **2 gotas UREA Reagenz 1.**



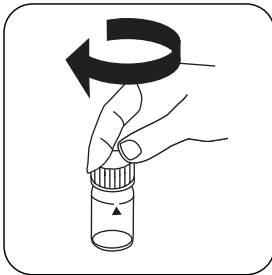
Fechar a(s) célula(s).



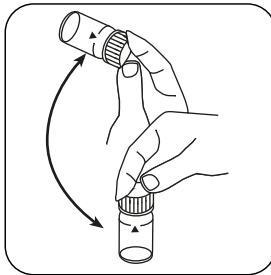
Misturar o conteúdo girando.



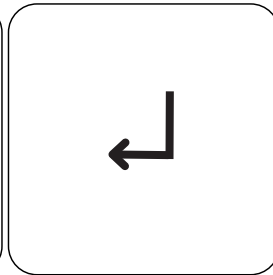
Adicionar **1 gotas UREA Reagenz 2.**



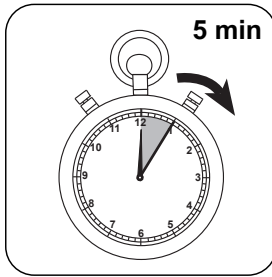
Fechar a(s) célula(s).



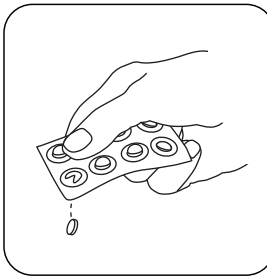
Misturar o conteúdo girando.



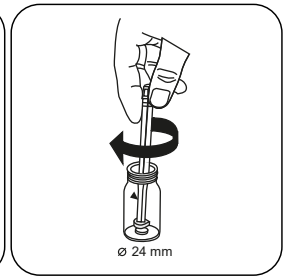
Premir a tecla **ENTER.**



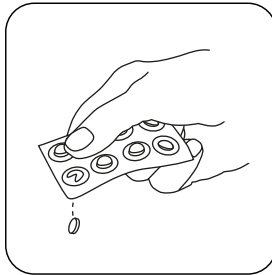
Aguardar **5 minuto(s)** de tempo de reação.



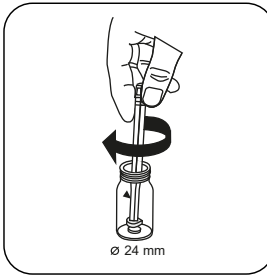
**Pastilha AMMONIA No. 1.**



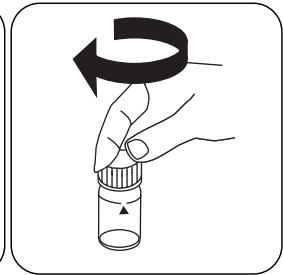
Esmagar a(s) pastilha(s) rodando ligeiramente.



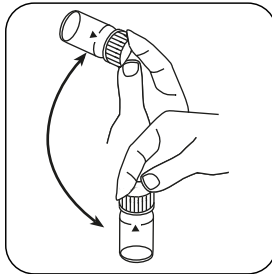
**Pastilha AMMONIA No. 2.**



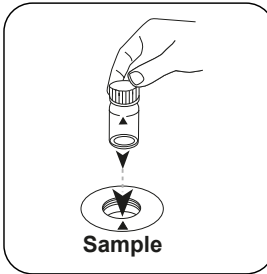
Esmagar a(s) pastilha(s) rodando ligeiramente.



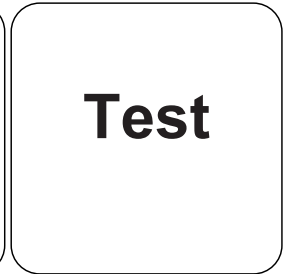
Fechar a(s) célula(s).



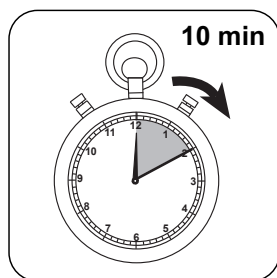
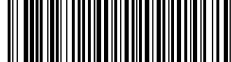
Dissolver a(s) pastilha(s) girando.



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



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



PT

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

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

No visor aparece o resultado em mg/L Uréia.



## Método Químico


Indophenol / Urease

<sup>3</sup>Faixa de medição alta devido à diluição | <sup>4</sup>Incluindo vareta de agitação

PT



KS4.3 T / 20



**Denominazione metodo**

**Numero metodo**

**Codice a barre per riconoscere il metodo**

**Range di misura**

$K_{S_{4.3} T}$   
0.1 - 4 mmol/l  $K_{S_{4.3}}$

20  
S:4.3

**Indicazione sul display del MD 100 / MD 110 / MD 200**

**Metodo chimico**

**Acido/indicatore**

**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	$\lambda$	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 $K_{S_{4.3}}$
SpectroDirect, XD 7000, XD 7500	ø 24 mm	615 nm	0.1 - 4 mmol/l $K_{S_{4.3}}$

**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  $K_{S_{4.3}}$  sono equivalenti.
2. Per l'accuratezza del risultato dell'analisi è fondamentale che il volume del campione misuri esattamente 10 ml.

**ISO 639-1 codici linguistici**

**Stato di revisione**

IT Manuale dei Metodi 01/20

**Svolgimento della  
misurazione**

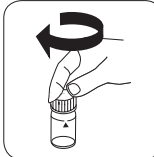
**Esecuzione della rilevazione Capacità acida  $K_{s4,3}$  con pastiglia**

Selezionare il metodo nel dispositivo.

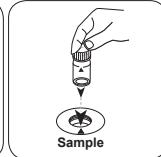
Con i seguenti dispositivi, per questo metodo non è necessario eseguire una misurazione ZERO: XD 7000, XD 7500



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

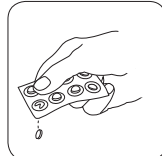


Chiudere la/e cuvetta/e.

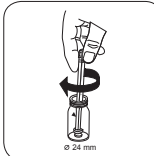


Posizionare la **cuvetta del campione** nel vano di misurazione. Fare attenzione al posizionamento.

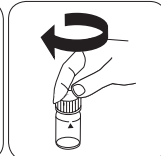
• • •



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



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



Chiudere la/e cuvetta/e.



Urea T

M390

0.1 - 2.5 mg/L Urea

Ur1

Indofenolo/ureasi

IT

## Materiale

Materiale richiesto (in parte facoltativo):

Reagenti	Unità di imballaggio	N. ordine
Reagente UREA 1	15 mL	459300
Reagente UREA 2	10 mL	459400
Ammonio No. 1	Pastiglia / 100	512580BT
Ammonio No. 1	Pastiglia / 250	512581BT
Ammonio No. 2	Pastiglia / 100	512590BT
Ammonio No. 2	Pastiglia / 250	512591BT
Set Ammonia No. 1/no. 2 <sup>a</sup>	ciascuna 100	517611BT
Set Ammonia No. 1/no. 2 <sup>a</sup>	ciascuna 250	517612BT
Polvere condizionante di ammonio	Polvere / 26 g	460170
Urea Pretreat (compensates for the interference of free Chlorine up to 2 mg/l)	Pastiglia / 100	516110BT
Set di reagenti UREA	1 set	517800BT

## Preparazione

1. La temperatura del campione deve essere compresa tra 20 °C e 30 °C.
2. Eseguire l'analisi al più tardi un'ora dopo il prelievo del campione.
3. Nell'analisi di campioni di acqua di mare, prima di aggiungere la pastiglia AMMONIA No. 1 si deve aggiungere due cucchiaini dosatore di polvere condizionante di ammonio al campione e quindi farla sciogliere con un movimento oscillatorio.

## Note

1. La pastiglia AMMONIA No. 1 si scioglie completamente soltanto dopo aver aggiunto la pastiglia AMMONIA No. 2.
2. L'ammonio e la clorammina vengono rilevati nell'ambito della rilevazione dell'urea.

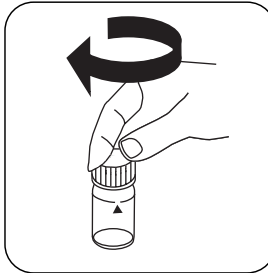
## Esecuzione della rilevazione Urea con pastiglia e reagente liquido

Selezionare il metodo nel dispositivo.

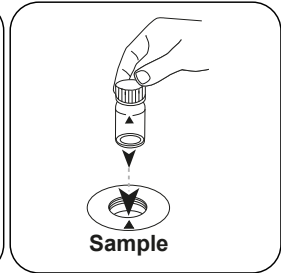
Per questo metodo, non è necessario eseguire una misurazione ZERO ogni volta sui seguenti dispositivi: XD 7000, XD 7500



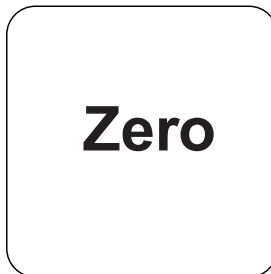
Riempire una cuvetta da 24 mm con **10 mL di campione**.



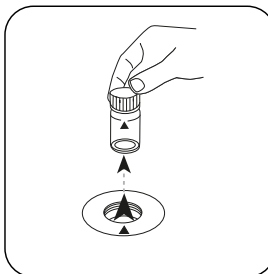
Chiudere la/e cuvetta/e.



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

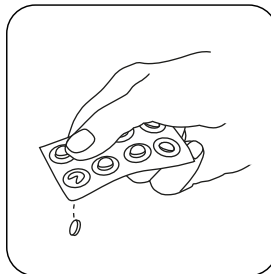


Premere il tasto **ZERO**.

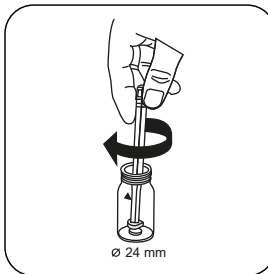


Prelevare la cuvetta dal vano di misurazione.

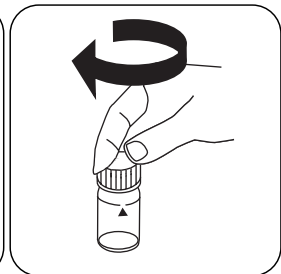
In caso di dispositivi che **non richiedono una misurazione ZERO**, iniziare da qui.



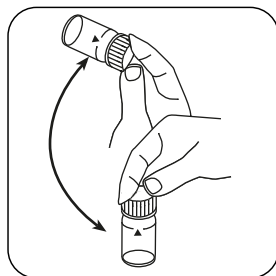
In presenza di cloro libero (HOCl) aggiungere una pastiglia **UREA PRETREAT**.



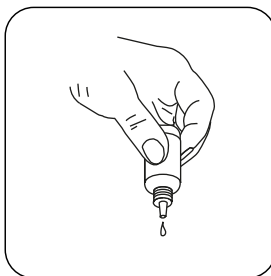
Frantumare la/e pastiglia/e con una leggera rotazione.



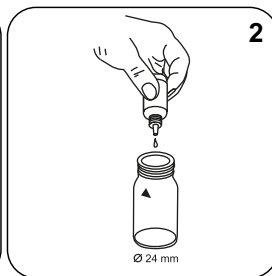
Chiudere la/e cuvetta/e.



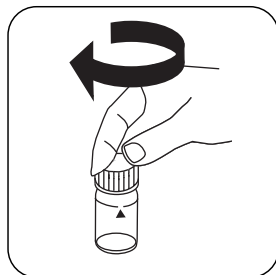
Far sciogliere la/e pastiglia/e agitando.



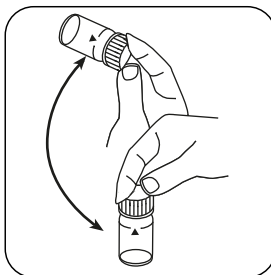
Tenere le boccette contagocce in posizione verticale e introdurre, premendo lentamente, gocce della stessa dimensione nella cuvetta.



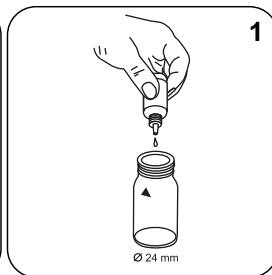
Aggiungere **2 gocce di Urea Reagenz 1.**



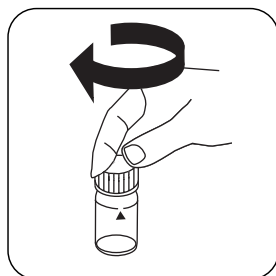
Chiudere la/e cuvetta/e.



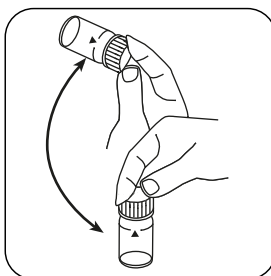
Miscelare il contenuto capovolgendo.



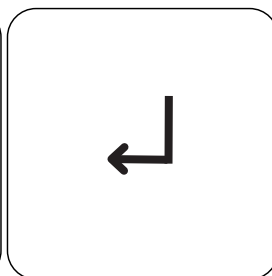
Aggiungere **1 gocce di Urea Reagenz 2.**



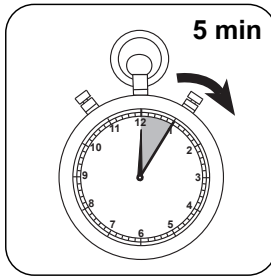
Chiudere la/e cuvetta/e.



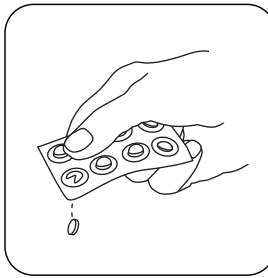
Miscelare il contenuto capovolgendo.



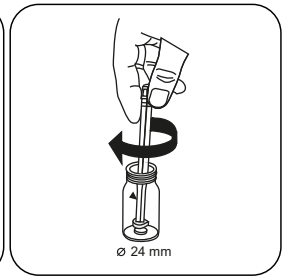
Premere il tasto **ENTER.**



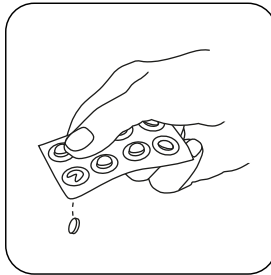
Attendere un **tempo di reazione di 5 minuti**/i .



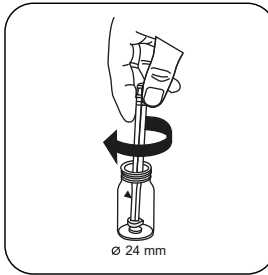
Aggiungere **una pastiglia AMMONIA No.1**.



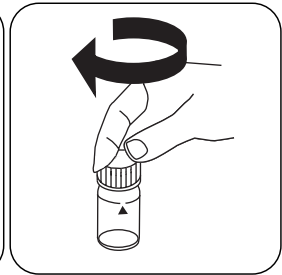
Frantumare la/e pastiglia/e con una leggera rotazione.



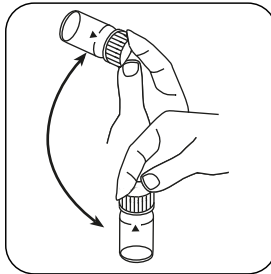
Aggiungere **una pastiglia AMMONIA No.2**.



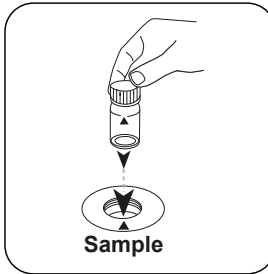
Frantumare la/e pastiglia/e con una leggera rotazione.



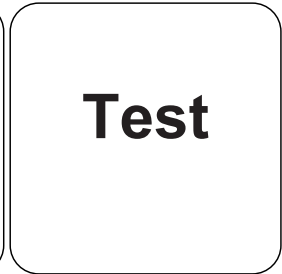
Chiudere la/e cuvetta/e.



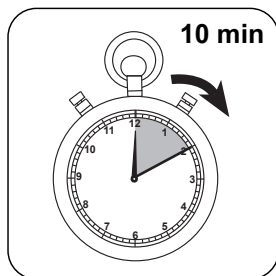
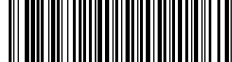
Far sciogliere la/e pastiglia/e agitando.



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



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



IT

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

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

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

## Metodo chimico

Indofenolo/ureasi

## Appendice

### Interferenze

#### Interferenze permanenti

- Le concentrazioni di urea maggiori di 2 mg/L possono dare risultati entro il range di misura. In questo caso il campione di acqua deve essere diluito con acqua priva di urea e la misurazione deve essere ripetuta (test di plausibilità).

#### Interferenze escludibili

- Una pastiglia di UREA PRETREAT elimina l'interferenza del cloro libero fino a 2 mg/L (due pastiglie fino a 4 mg/L, tre pastiglie fino a 6 mg/L).

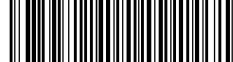
Interferenze	da / [mg/L]
Cl <sub>2</sub>	2

#### Riferimenti bibliografici

R.J. Creno, R.E. Wenk, P. Bohling, Automated Micromasurement of Urea Using Urease and the Berthelot Reaction, American Journal of Clinical Pathology (1970), 54 (6), pagg. 828-832

<sup>ii</sup>\*Bacchetta compresa





Urea T

M391

0.2 - 5 mg/L Urea<sup>1)</sup>

Ur2

Indofenolo/ureasi

IT

## Materiale

Materiale richiesto (in parte facoltativo):

Reagenti	Unità di imballaggio	N. ordine
Reagente UREA 1	15 mL	459300
Reagente UREA 2	10 mL	459400
Ammonio No. 1	Pastiglia / 100	512580BT
Ammonio No. 1	Pastiglia / 250	512581BT
Ammonio No. 2	Pastiglia / 100	512590BT
Ammonio No. 2	Pastiglia / 250	512591BT
Set Ammonia No. 1/no. 2 <sup>#</sup>	ciascuna 100	517611BT
Set Ammonia No. 1/no. 2 <sup>#</sup>	ciascuna 250	517612BT
Polvere condizionante di ammonio	Polvere / 26 g	460170
Urea Pretreat (compensates for the interference of free Chlorine up to 2 mg/l)	Pastiglia / 100	516110BT
Set di reagenti UREA	1 set	517800BT

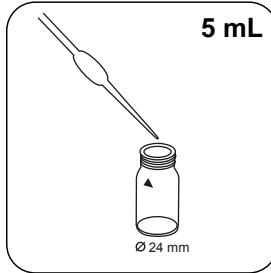
## Preparazione

1. Nell'analisi di campioni di acqua di mare, prima di aggiungere la pastiglia AMMONIA No. 1 si deve aggiungere due cucchiari dosatore di polvere condizionante di ammonio al campione e quindi farla sciogliere con un movimento oscillatorio.

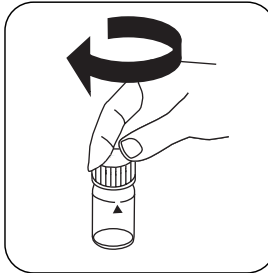
## Esecuzione della rilevazione Urea con pastiglia e reagente liquido

Selezionare il metodo nel dispositivo.

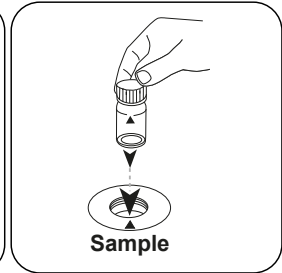
Per questo metodo, non è necessario eseguire una misurazione ZERO ogni volta sui seguenti dispositivi: XD 7000, XD 7500



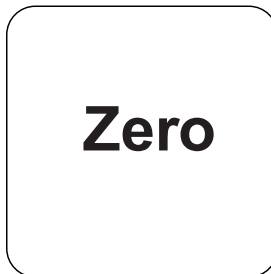
Immettere **5 mL di campione** e **5 mL di acqua demineralizzata** nella cuvetta del campione.



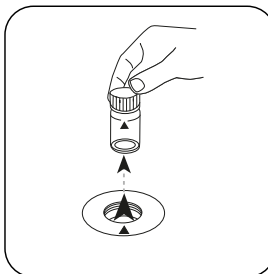
Chiudere la/e cuvetta/e.



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

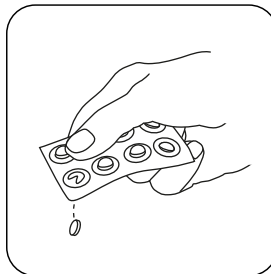


Premere il tasto **ZERO**.

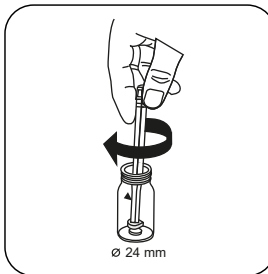


Prelevare la cuvetta dal vano di misurazione.

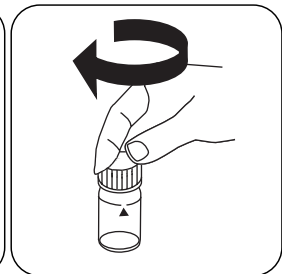
In caso di dispositivi che **non richiedono una misurazione ZERO**, iniziare da qui.



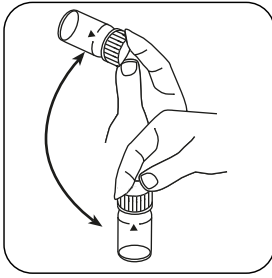
In presenza di cloro libero (HOCl) aggiungere una pastiglia **UREA PRETREAT**.



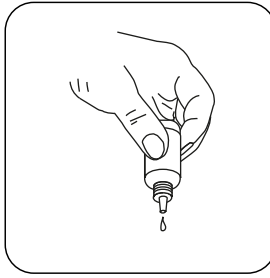
Frantumare la/e pastiglia/e con una leggera rotazione.



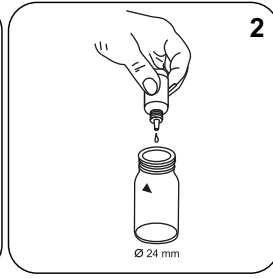
Chiudere la/e cuvetta/e.



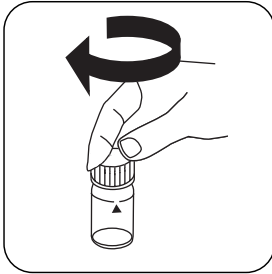
Far sciogliere la/e pastiglia/e agitando.



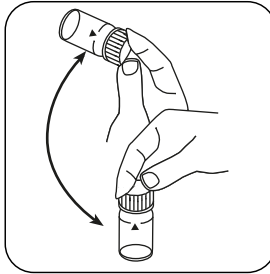
Tenere le boccette contagocce in posizione verticale e introdurre, premendo lentamente, gocce della stessa dimensione nella cuvetta.



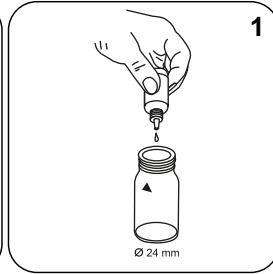
Aggiungere **2 gocce di UREA Reagenz 1.**



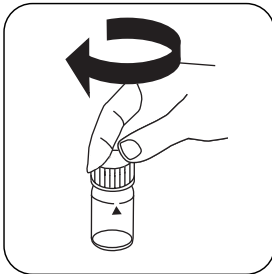
Chiudere la/e cuvetta/e.



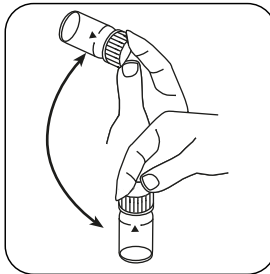
Miscelare il contenuto capovolgendo.



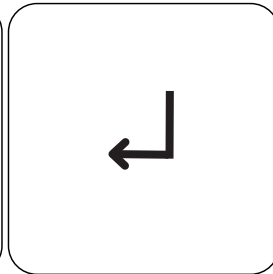
Aggiungere **1 gocce di UREA Reagenz 2.**



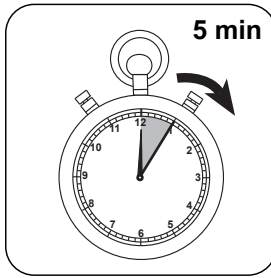
Chiudere la/e cuvetta/e.



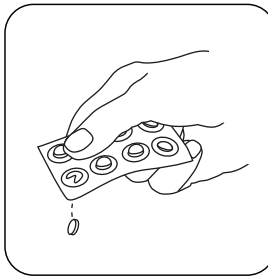
Miscelare il contenuto capovolgendo.



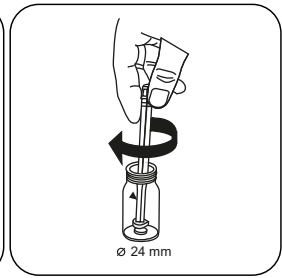
Premere il tasto **ENTER.**



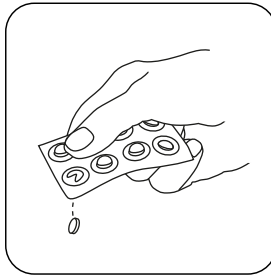
Attendere un **tempo di reazione di 5 minuti**/i .



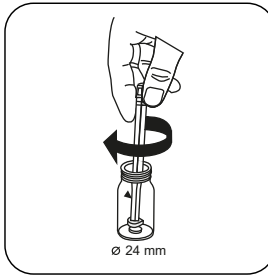
Aggiungere **una pastiglia AMMONIA No. 1.**



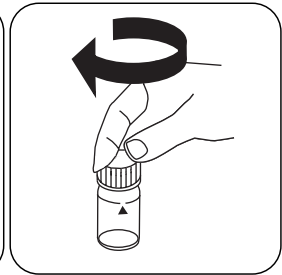
Frantumare la/e pastiglia/e con una leggera rotazione.



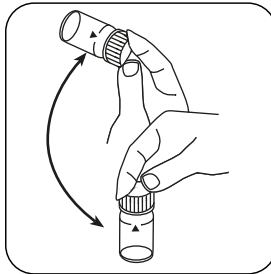
Aggiungere **una pastiglia AMMONIA No. 2.**



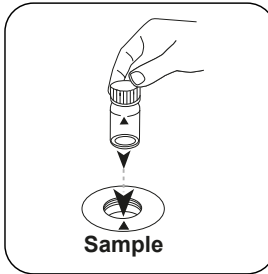
Frantumare la/e pastiglia/e con una leggera rotazione.



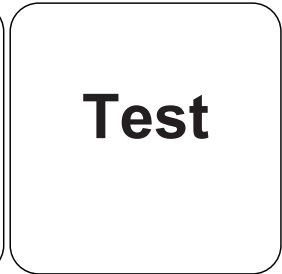
Chiudere la/e cuvetta/e.



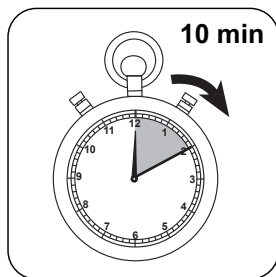
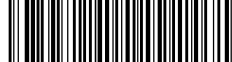
Far sciogliere la/e pastiglia/e agitando.



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



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



IT

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

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

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




## Metodo chimico

Indofenolo/ureasi

<sup>1</sup> Elevato intervallo di misurazione grazie alla diluizione | <sup>2</sup> Bacchetta compressa

KS4.3 T / 20



**Naam van de methode**

**Nummer methode**

**Streepjescode ter identificatie van de methode**

**Meetbereik**

$K_{S_{4.3}} T$  M20  
0.1 - 4 mmol/l  $K_{S_{4.3}}$  S:4.3  
Zuur / Indicator

**Chemische methode**

**Uitlezing in MD**  
100 MD 110 / MD  
200

**Instrument specifieke informatie**

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

Toestellen	Cuvet	$\lambda$	Meetbereik
MD 200, MD 600, MD 610, MD 640, MultiDirect, PM 620, PM 630	$\varnothing$ 24 mm	610 nm	0.1 - 4 mmol/l $K_{S_{4.3}}$
SpectroDirect, XD 7000, XD 7500	$\varnothing$ 24 mm	615 nm	0.1 - 4 mmol/l $K_{S_{4.3}}$

**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<sub>S<sub>4.3</sub></sub> zijn identiek.
2. De exacte naleving van het monstervolume van 10 ml is bepalend voor de nauwkeurigheid van het analysesresultaat.

**Beknopte naam conform de norm ISO 639-1**

**Herziene versie**

NL Handboek van Methoden 01/20

**Uitvoering van de meting**

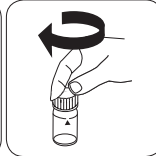
**Uitvoering van de bepaling Zuurcapaciteit  $K_{s4,3}$  met tablet**

De methode in het apparaat selecteren.

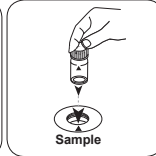
Voor deze methode moet bij de volgende apparaten geen nulmeting worden uitgevoerd:  
XD 7000, XD 7500



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

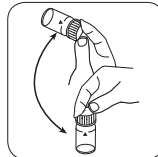


De spoelbakjes afsluiten.

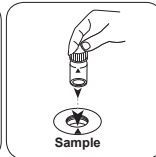


Het **staalspoelbakje** in de meetschacht plaatsen. Op de positionering letten.

• • •



Tabletten oplossen door om te draaien



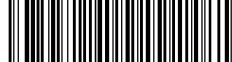
Het **staalspoelbakje** in de meetschacht plaatsen. Op de positionering letten.



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

De display toont het resultaat als Zuurcapaciteit  $K_{s4,3}$ .





Ureum T

M390

0.1 - 2.5 mg/L Urea

Ur1

Indofenol / Urease

NL

## Reagentia

Benodigd materiaal (deels optioneel):

Reagentia	Verpakkingseenheid	Bestelnr.
UREUM reagens 1	15 mL	459300
UREUM reagens 2	10 mL	459400
Ammonia Nr. 1	Tablet / 100	512580BT
Ammonia Nr. 1	Tablet / 250	512581BT
Ammonia Nr. 2	Tablet / 100	512590BT
Ammonia Nr. 2	Tablet / 250	512591BT
Set ammonia nr. 1/Nr. 2 <sup>#</sup>	per 100	517611BT
Set ammonia nr. 1/Nr. 2 <sup>#</sup>	per 250	517612BT
Ammonium conditioneringspoeder	Poeder / 26 g	460170
Urea Pretreat (compenseert de interferentie van vrij chloor tot 2 mg / l)	Tablet / 100	516110BT
UREA reagentia set	1 Zin	517800BT

## Vorbereiding

1. De bemonsteringstemperatuur moet tussen 20 en 30 °C liggen.
2. Voer de analyse uiterlijk één uur na de bemonstering uit.
3. Bij de analyse van zeewatermonsters moet voor toediening van het ammoniak-nr. 1 tablet, twee maatlepels ammoniumconditioneringspoeder aan het monster worden toegevoegd en door roteren opgelost.

## Aantekeningen

1. Het AMMONIA-nr. 1 tablet lost pas volledig op na toevoeging van AMMONIA-nr. 2 tablet.
2. Ammonium en chlooraminen zijn inbegrepen in de bepaling van ureum.

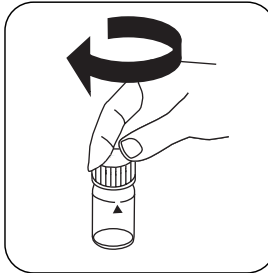
## Uitvoering van de bepaling Ureum met tablet en vloeibaar reagens

De methode in het apparaat selecteren.

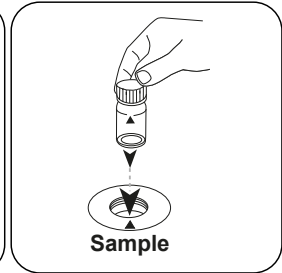
Voor deze methode hoeft niet elke keer een nulmeting uitgevoerd te worden op de volgende apparaten: XD 7000, XD 7500



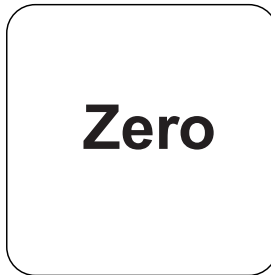
Spoelbakje van 24 mm met 10 mL staal vullen.



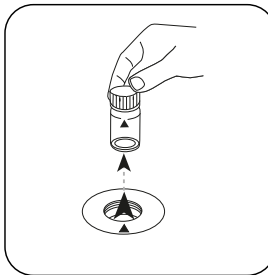
De spoelbakjes afsluiten.



Het **staal**spoelbakje in de meetschacht plaatsen. Op de positionering letten.

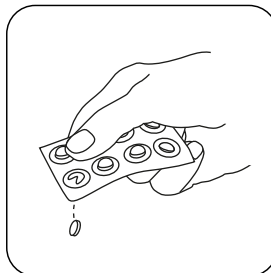


De toets **NUL** indrukken.

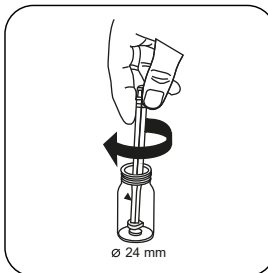


Het spoelbakje uit de meetschacht nemen.

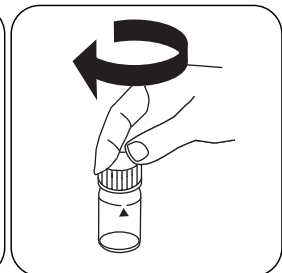
Bij apparaten die **geen nulmeting** vereisen, **hier beginnen**.



Bij de aanwezigheid van vrij chloor (HOCl) een **UREA PRETREAT**tablet toevoegen.



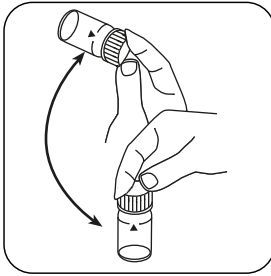
De tabletten onder lichte rotatie verpletteren.



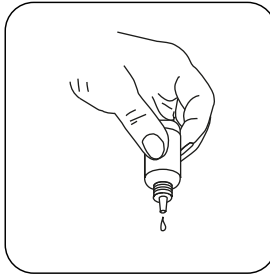
De spoelbakjes afsluiten.



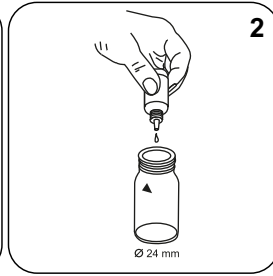
NL



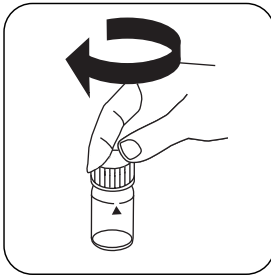
Tabletten oplossen door om te draaien



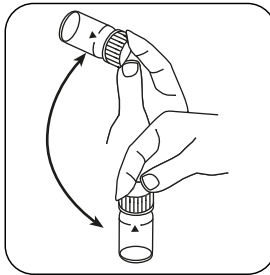
De druppelflessen verticaal houden en even grote druppels toevoegen door langzaam te drukken.



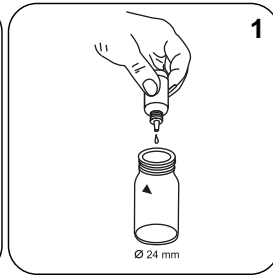
**2 druppels Ureum reagens 1** toevoegen.



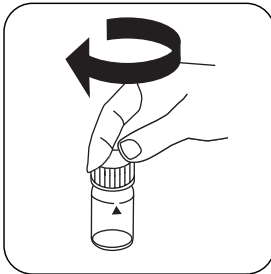
De spoelbakjes afsluiten.



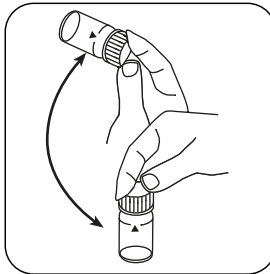
De inhoud mengen door om te draaien.



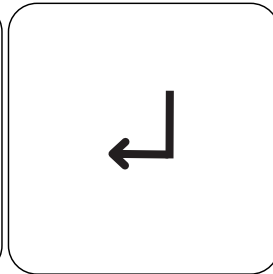
**1 druppels Ureum reagens 2** toevoegen.



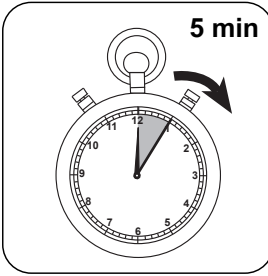
De spoelbakjes afsluiten.



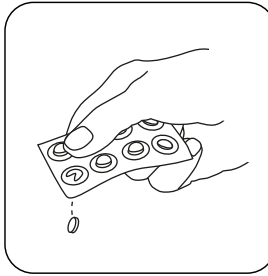
De inhoud mengen door om te draaien.



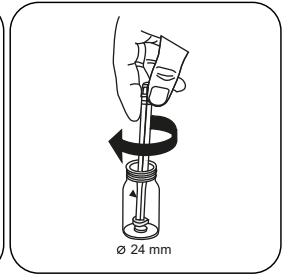
De toets **ENTER** indrukken.



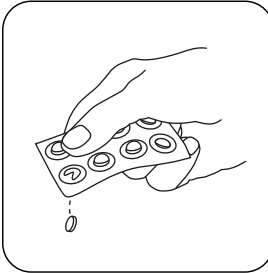
De reactietijd van  
5 minuten afwachten.



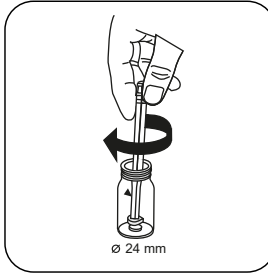
Een AMMONIA Nr.  
1 tablet toevoegen.



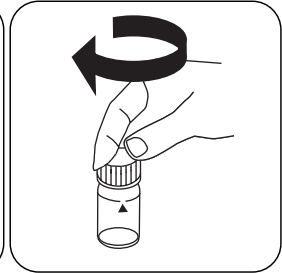
De tabletten onder lichte  
rotatie verpletteren.



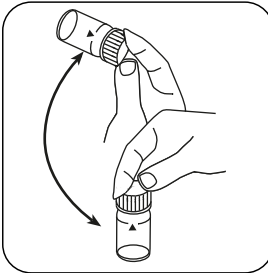
Een AMMONIA Nr.  
2 tablet toevoegen.



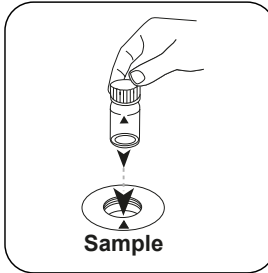
De tabletten onder lichte  
rotatie verpletteren.



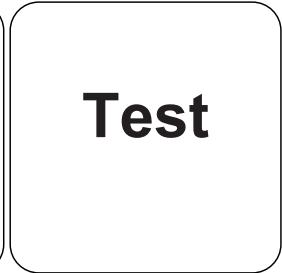
De spoelbakjes afsluiten.



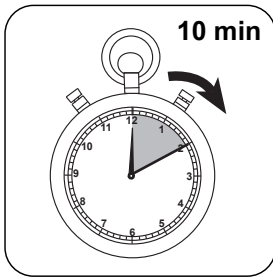
Tabletten oplossen door  
om te draaien



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



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



NL

**De reactietijd van  
10 minuten** afwachten.

Na afloop van de reactietijd wordt de meting automatisch uitgevoerd.

De display toont het resultaat in mg/L Ureum.

## Chemische methode

Indofenol / Urease

## Aanhangsel

### Verstoringen

#### Permanente verstoringen

- Concentraties boven 2 mg/L ureum kunnen leiden tot resultaten binnen het meetbereik. Verdun in dit geval het watermonster met ureumvrij water en herhaal de meting (plausibiliteitstest).

#### Uit te sluiten verstoringen

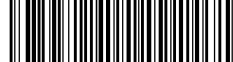
- Eén UREA PRETREAT-tablet elimineert de verstoring van vrij chloor tot 2 mg/L (twee tabletten tot 4 mg/L, drie tabletten tot 6 mg/L).

Verstoringen	verstoort vanaf
Cl <sub>2</sub>	2

#### Literatuurverwijzing

R.J. Creno, R.E. Wenk, P. Bohling, Automated Micromasurement of Urea Using Urease and the Berthelot Reaction, American Journal of Clinical Pathology (1970), 54 (6), blz. 828-832

\* met inbegrip van de mengstaaf



Ureum T

M391

0.2 - 5 mg/L Urea<sup>1)</sup>

Ur2

Indofenol / Urease

## Reagentia

NL

Benodigd materiaal (deels optioneel):

Reagentia	Verpakkingseenheid	Bestelnr.
UREUM reagens 1	15 mL	459300
UREUM reagens 2	10 mL	459400
Ammonia Nr. 1	Tablet / 100	512580BT
Ammonia Nr. 1	Tablet / 250	512581BT
Ammonia Nr. 2	Tablet / 100	512590BT
Ammonia Nr. 2	Tablet / 250	512591BT
Set ammonia nr. 1/Nr. 2 <sup>#</sup>	per 100	517611BT
Set ammonia nr. 1/Nr. 2 <sup>#</sup>	per 250	517612BT
Ammonium conditioneringspoeder	Poeder / 26 g	460170
Urea Pretreat (compenseert de interferentie van vrij chloor tot 2 mg / l)	Tablet / 100	516110BT
UREA reagentia set	1 Zin	517800BT

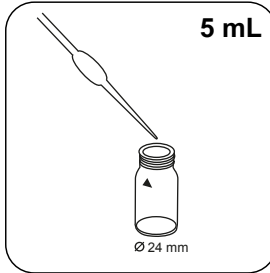
## Voorbereiding

1. Bij de analyse van zeewatermonsters moet voor toediening van het ammoniak-nr. 1 tablet, twee maatlepels ammoniumconditioneringspoeder aan het monster worden toegevoegd en door roteren opgelost.

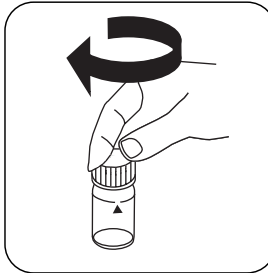
## Uitvoering van de bepaling Ureum met tablet en vloeibaar reagens

De methode in het apparaat selecteren.

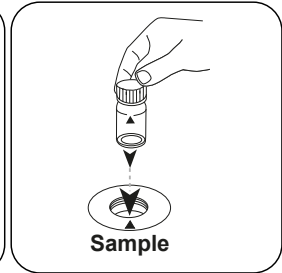
Voor deze methode hoeft niet elke keer een nulmeting uitgevoerd te worden op de volgende apparaten: XD 7000, XD 7500



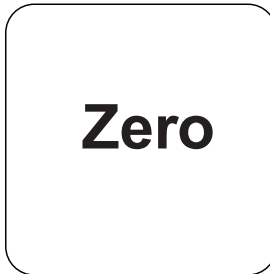
5 mL staal en 5 mL gedeïoniseerd water aan het staalspoelbakje toevoegen.



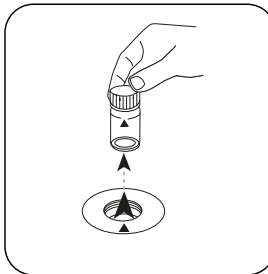
De spoelbakjes afsluiten.



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

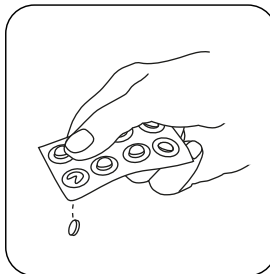


De toets **NUL** indrukken.

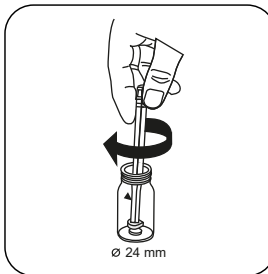


Het spoelbakje uit de meetschacht nemen.

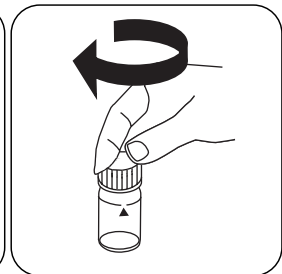
Bij apparaten die **geen nulmeting** vereisen, **hier beginnen**.



Bij de aanwezigheid van vrij chloor (HOCl) een **UREA PRETREAT** tablet toevoegen.



De tabletten onder lichte rotatie verpletteren.

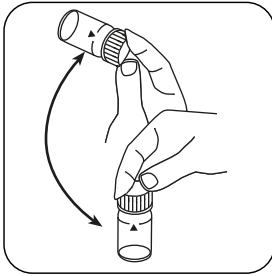


De spoelbakjes afsluiten.

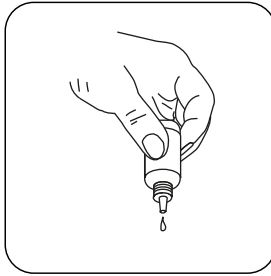




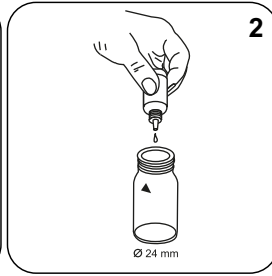
NL



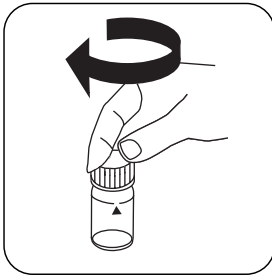
Tabletten oplossen door om te draaien



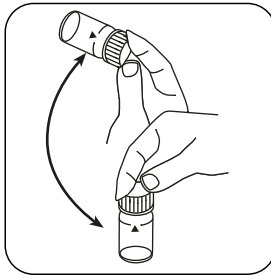
De druppelflessen verticaal houden en even grote druppels toevoegen door langzaam te drukken.



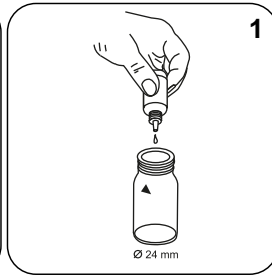
**2 druppels UREUM reagens 1** toevoegen.



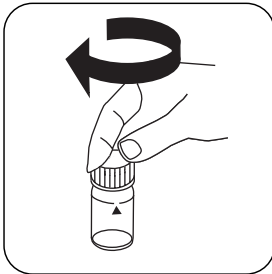
De spoelbakjes afsluiten.



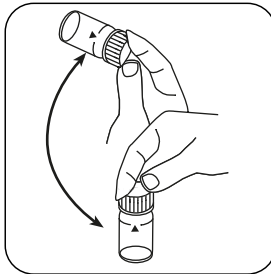
De inhoud mengen door om te draaien.



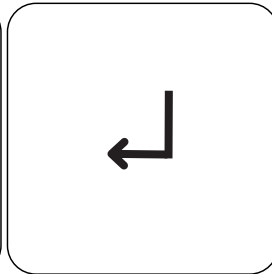
**1 druppels UREUM reagens 2** toevoegen.



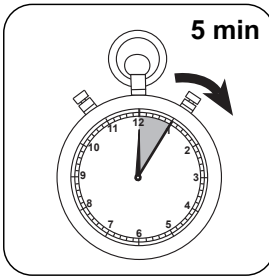
De spoelbakjes afsluiten.



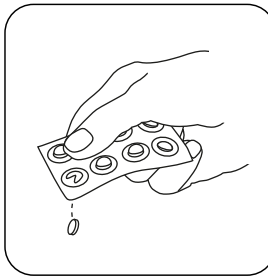
De inhoud mengen door om te draaien.



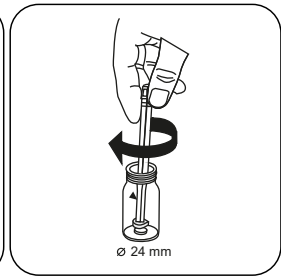
De toets **ENTER** indrukken.



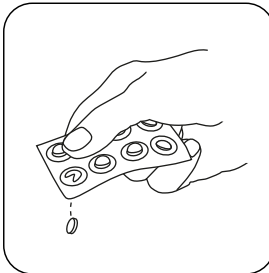
De reactietijd van  
5 minuten afwachten.



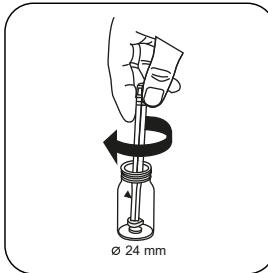
Een AMMONIA Nr.  
1 tablet toevoegen.



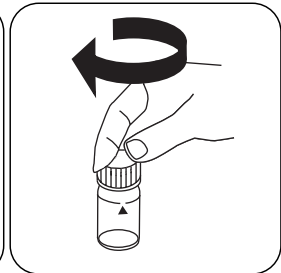
De tabletten onder lichte  
rotatie verpletteren.



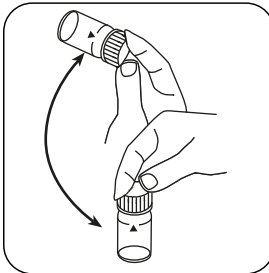
Een AMMONIA Nr.  
2 tablet toevoegen.



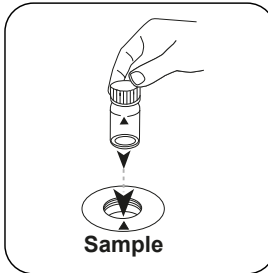
De tabletten onder lichte  
rotatie verpletteren.



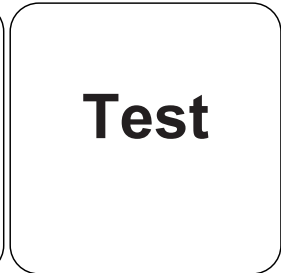
De spoelbakjes afsluiten.



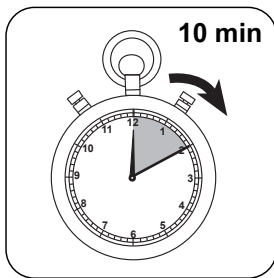
Tabletten oplossen door  
om te draaien



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



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



NL

**De reactietijd van  
10 minuten** afwachten.

Na afloop van de reactietijd wordt de meting automatisch uitgevoerd.

De display toont het resultaat in mg/L Ureum.



## Chemische methode

Indofenol / Urease

<sup>§</sup> hoog meetbereik als gevolg van verdunning | \* met inbegrip van de mengstaaf

NL

KS4.3 T / 20

Yöntem Adı

Yöntemleri numarası

Yöntemi tanımak için barkod

Ölçüm aralığı

Kimyasal Metod

$K_{S4.3} T$   
0.1 - 4 mmol/l  $K_{S4.3}$   
Asit / Gösterge

20  
S:4.3

Ekrandaki: MD  
100 MD 110 / MD  
200

**Enstrümana özel bilgi**

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

Cihazlar	Küvet	$\lambda$	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 ayrıdır.
2. 10 ml'lik numune hacmine tam riayet edilmesi, analiz sonucunun doğruluğu bakımından önemlidir.

Dil kodları ISO  
639-1

Revizyon durumu

TR Metotlar Kılavuzu 01/20

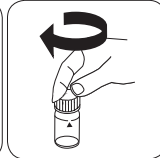
**Testin uygulanması**
**Tespitin uygulanması Tabletli asit kapasitesi  $K_{S4,3}$** 

Cihazda metot seçin.

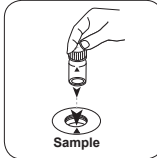
Bu metot için şu cihazlarda ZERO ölçümü yapılması gerekmez: XD 7000, XD 7500



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

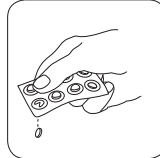


Küveti(küvetleri) kapatın.

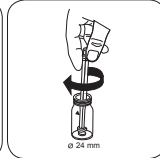


**Numune küvetini** ölçüm haznesine koyun. Doğru konumlandırılmasına dikkat edin.

• • •



**ALKA-M-PHOTOMETER tablet** ilave edin.



Tablet(i/tabletleri) hafifçe döndürerek ezin.



Küveti(küvetleri) kapatın.



Üre T

M390

0.1 - 2.5 mg/L Urea

Ur1

Indofenol/Ureaz

## Malzeme

Gerekli materyal (kısmen isteğe bağlı):

Ayırıcılar	Paketleme Birimi	Ürün No
UREA ayıraç 1	15 mL	459300
UREA ayıraç 2	10 mL	459400
Amonyak No. 1	Tablet / 100	512580BT
Amonyak No. 1	Tablet / 250	512581BT
Amonyak No. 2	Tablet / 100	512590BT
Amonyak No. 2	Tablet / 250	512591BT
Set amonyak No. 1/No. 2 <sup>a</sup>	her bir 100	517611BT
Set amonyak No. 1/No. 2 <sup>a</sup>	her bir 250	517612BT
Amonyum şartlandırma tozu	Toz / 26 g	460170
Üre ön işlemi (compensates for the interference of free Chlorine up to 2 mg/l)	Tablet / 100	516110BT
UREA ayıraç seti	1 Set	517800BT

## Hazırlık

1. Numune sıcaklığı 20 °C ve 30 °C arasında olmalıdır.
2. Analiz en geç numune alımından bir saat sonra yapılmalıdır.
3. Amonyak no. 1 tablet ilave edilmeden önce, deniz suyu numunelerinin analizinde numuneye iki ölçü kaşığı amonyum ayarlama tozu eklenmeli ve sallayarak çözünmesi sağlanmalıdır.

## Notlar

1. AMONYAK no. 1 tablet AMONYAK no. 2 tablet ilave edildikten sonra tamamen çözünür.
2. Üre tespitinde amonyum ve kloramin de tespit edilir.

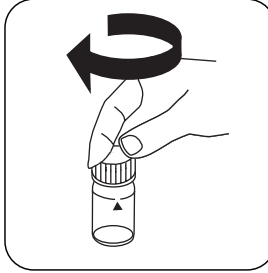
## Tespitin uygulanması Tabletli ve sıvı ayrıçlı üre

Cihazda metod seçin.

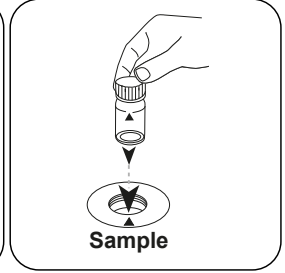
Bu yöntem için, aşağıdaki cihazlarda her seferinde SIFIR ölçümünün yapılması gerekmez: XD 7000, XD 7500



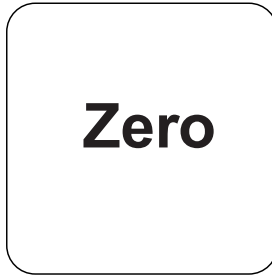
24 mm'lik küveti **10 mL numune** ile doldurun.



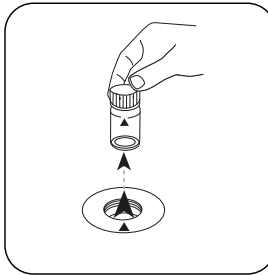
Küveti(küvetleri) kapatın.



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

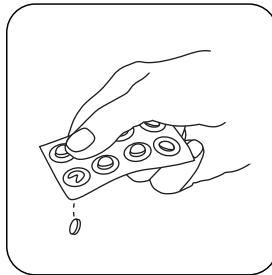


**ZERO** tuşuna basın.

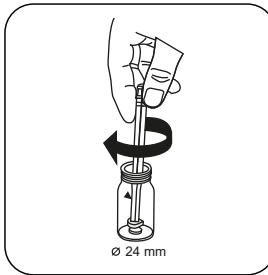


Küveti ölçüm haznesinden alın.

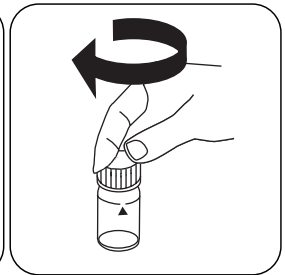
**ZERO ölçümü gerektirmeyen cihazlarda buradan başlayın.**



Serbest klor (HOCl) mevcutsa **bir UREA PRETREAT tablet** ilave edin.



Tableti(tabletleri) hafifçe döndürerek ezin.

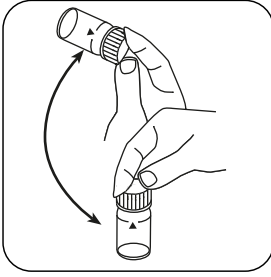


Küveti(küvetleri) kapatın.

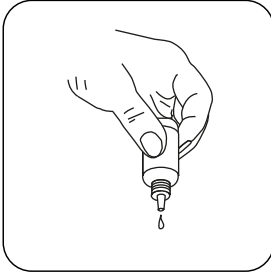




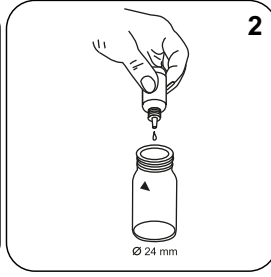
TR



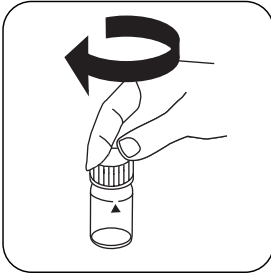
Tableti(tabletleri) sallayarak  
çözdürün.



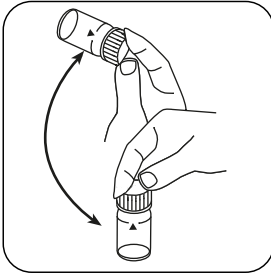
Damla şişelerini dik tutun  
ve yavaşça pompalayarak  
aynı büyüklükte damlalar  
ilave edin.



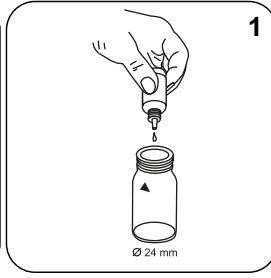
**2 damla Urea Reagenz 1**  
ilave edin.



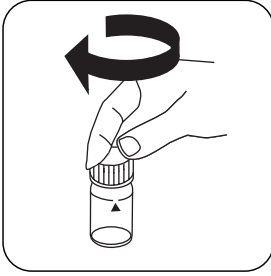
Küveti(küvetleri) kapatın.



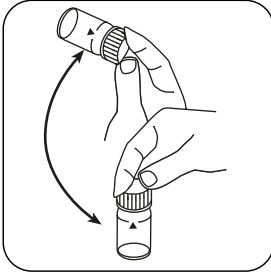
Sallayarak içeriği karıştırın.



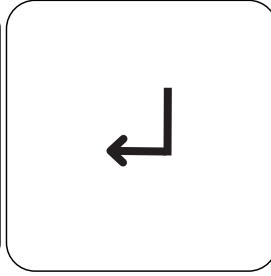
**1 damla Urea Reagenz 2**  
ilave edin.



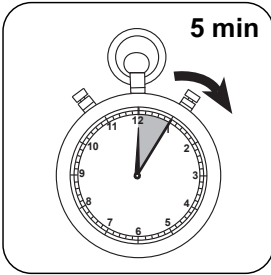
Küveti(küvetleri) kapatın.



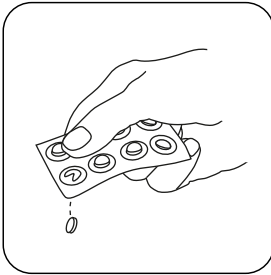
Sallayarak içeriği karıştırın.



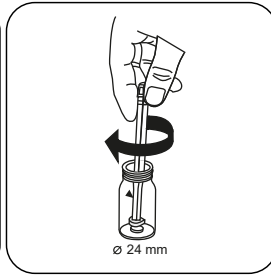
**ENTER** tuşuna basın.



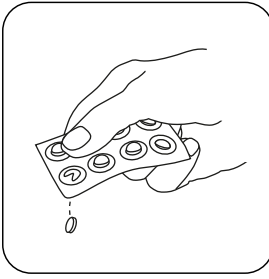
**5 dakika tepkime süresi**  
bekleyin.



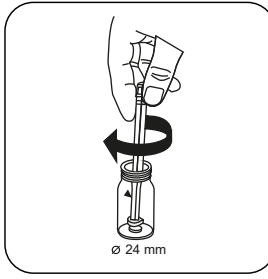
**AMMONIA No.1 tablet**  
ilave edin.



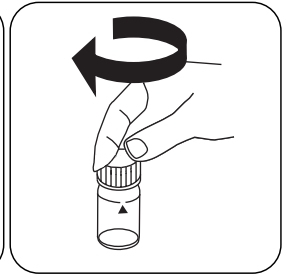
Tableti(tabletleri) hafifçe  
döndürerek ezin.



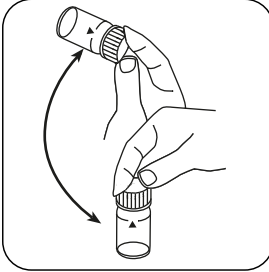
**AMMONIA No.2 tablet**  
ilave edin.



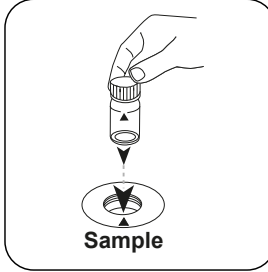
Tableti(tabletleri) hafifçe  
döndürerek ezin.



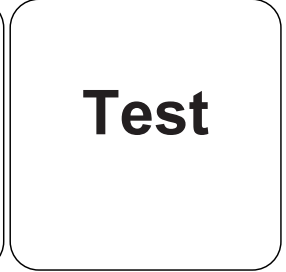
Küveti(küvetleri) kapatın.



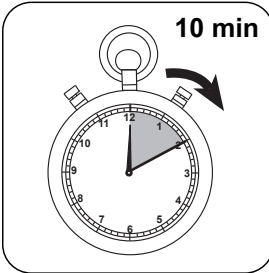
Tableti(tabletleri) sallayarak  
çözdürün.



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



**TEST (XD: START)** tuşuna  
basın.



**10 dakika tepkime süresi**  
bekleyin.

Tepkime süresinin sona ermesinden sonra ölçüm otomatik gerçekleşir.  
Ekranda sonuç mg/L üre cinsinden belirir.



## Kimyasal Metod

Indofenol/Ureaz

## Apandis

TR

## Girişim Metni

### Kalıcı Girişimler

- 2 mg/L üre üzerindeki konsantrasyonlar, ölçüm aralığı içinde sonuçlara neden olabilir. Bu durumda su numunesi üre içermeyen su ile seyreltilmelidir ve ölçüm tekrarlanmalıdır (uygunluk testi).

### Giderilebilir Girişimler

- Bir UREA PRETREAT tablet serbest klor bozukluğunu 2 mg/L'ye kadar elimine eder (4 mg/L'ye kadar iki tablet, 6 mg/L'ye kadar üç tablet).

Kaşırmalar	itibaren / [mg/L]
Cl <sub>2</sub>	2

### Bibliyografi

R.J. Creno, R.E. Wenk, P. Bohling, Automated Micromasurement of Urea Using Urease and the Berthelot Reaction, American Journal of Clinical Pathology (1970), 54 (6), p. 828-832

\* karıştırma çubuğu dahil





Üre T

M391

0.2 - 5 mg/L Urea<sup>1)</sup>

Ur2

Indofenol/Ureaz

## Malzeme

Gerekli materyal (kısmen isteğe bağlı):

Ayıracılar	Paketleme Birimi	Ürün No
UREA ayıracı 1	15 mL	459300
UREA ayıracı 2	10 mL	459400
Amonyak No. 1	Tablet / 100	512580BT
Amonyak No. 1	Tablet / 250	512581BT
Amonyak No. 2	Tablet / 100	512590BT
Amonyak No. 2	Tablet / 250	512591BT
Set amonyak No. 1/No. 2 <sup>#</sup>	her bir 100	517611BT
Set amonyak No. 1/No. 2 <sup>#</sup>	her bir 250	517612BT
Amonyum şartlandırma tozu	Toz / 26 g	460170
Üre ön işlemi (compensates for the interference of free Chlorine up to 2 mg/l)	Tablet / 100	516110BT
UREA ayıracı seti	1 Set	517800BT

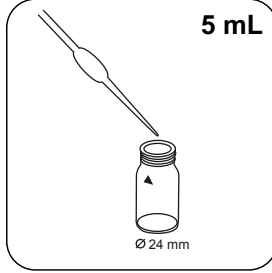
## Hazırlık

1. Amonyak no. 1 tablet ilave edilmeden önce, deniz suyu numunelerinin analizinde numuneye iki ölçü kaşığı amonyum ayarlama tozu eklenmeli ve sallayarak çözünmesi sağlanmalıdır.

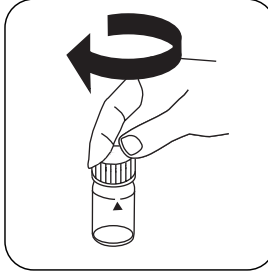
## Tespitin uygulanması Tabletli ve sıvı ayrıçlı üre

Cihazda metot seçin.

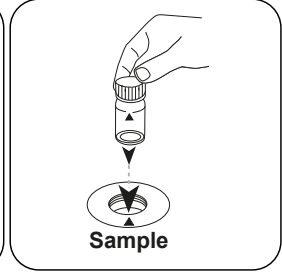
Bu yöntem için, aşağıdaki cihazlarda her seferinde SIFIR ölçümünün yapılması gerekmez: XD 7000, XD 7500



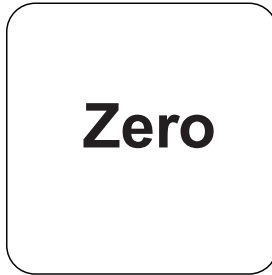
Numune küvetine **5 mL numune** ve **5 mL demineralize su** ekleyin.



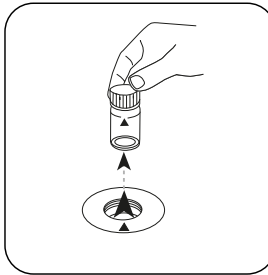
Küveti(küvetleri) kapatın.



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

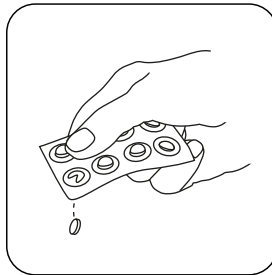


**ZERO** tuşuna basın.

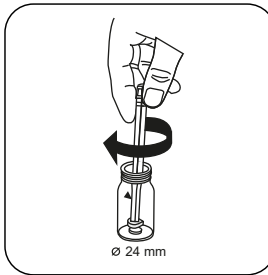


Küveti ölçüm haznesinden alın.

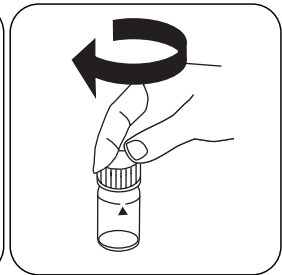
**ZERO ölçümü gerektirmeyen cihazlarda buradan başlayın.**



Serbest klor (HOCl) mevcutsa **bir UREA PRETREAT tablet** ilave edin.



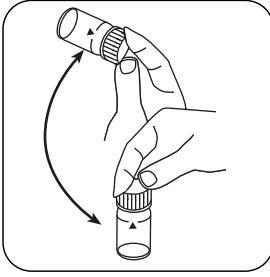
Tableti(tabletleri) hafifçe döndürerek ezin.



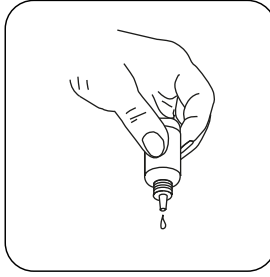
Küveti(küvetleri) kapatın.



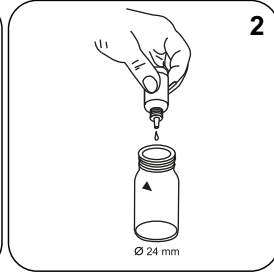
TR



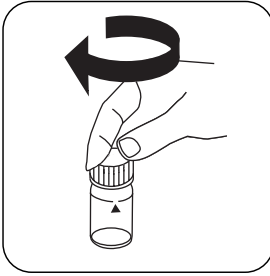
Tableti(tabletleri) sallayarak  
çözdürün.



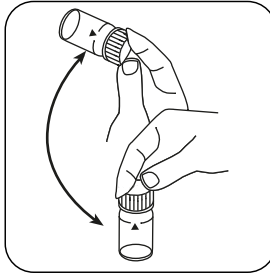
Damla şişelerini dik tutun  
ve yavaşça pompalayarak  
aynı büyüklükte damlalar  
ilave edin.



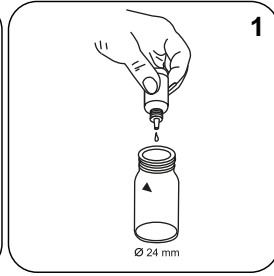
**2 damla UREA Reagenz 1**  
ilave edin.



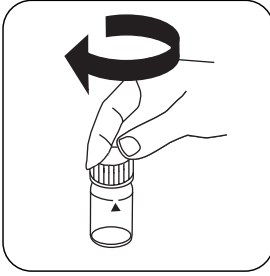
Küveti(küvetleri) kapatın.



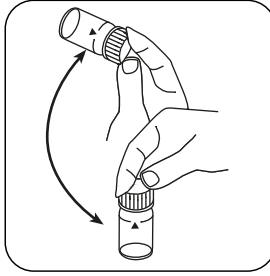
Sallayarak içeriği karıştırın.



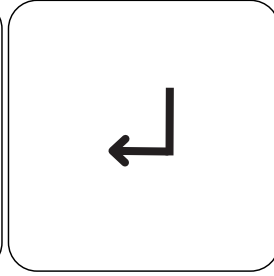
**1 damla UREA Reagenz 2**  
ilave edin.



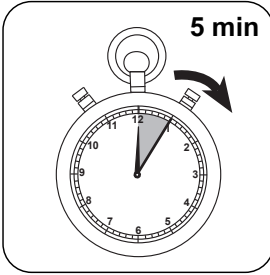
Küveti(küvetleri) kapatın.



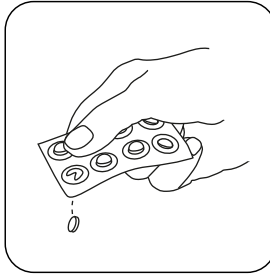
Sallayarak içeriği karıştırın.



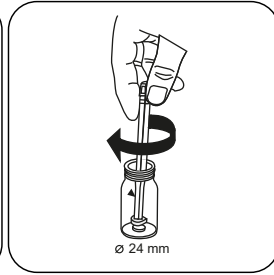
**ENTER** tuşuna basın.



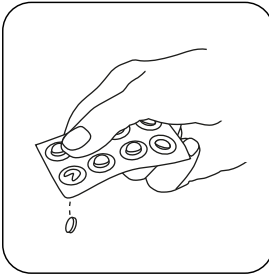
**5 dakika tepkime süresi**  
bekleyin.



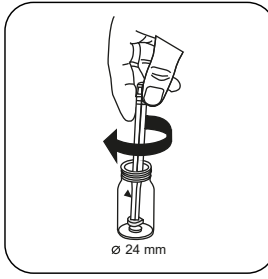
**AMMONIA No. 1 tablet**  
ilave edin.



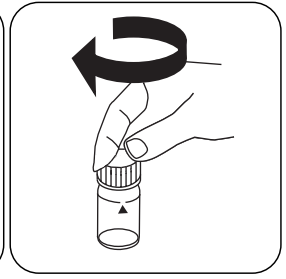
Tableti(tabletleri) hafifçe  
döndürerek ezin.



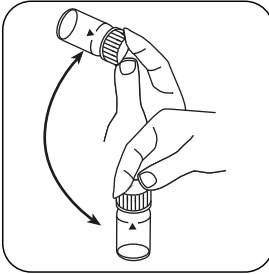
**AMMONIA No. 2 tablet**  
ilave edin.



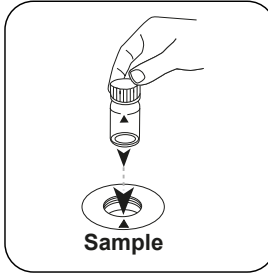
Tableti(tabletleri) hafifçe  
döndürerek ezin.



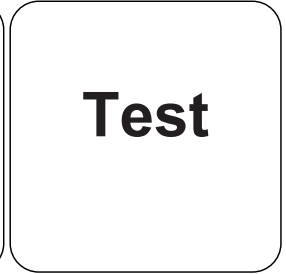
Küveti(küvetleri) kapatın.



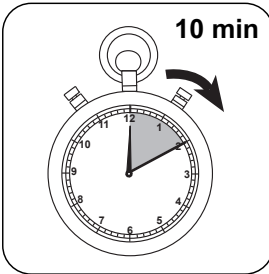
Tableti(tabletleri) sallayarak  
çözdürün.



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



**TEST (XD: START)** tuşuna  
basın.



**10 dakika tepkime süresi**  
bekleyin.

Tepkime süresinin sona ermesinden sonra ölçüm otomatik gerçekleşir.

Ekranda sonuç mg/L üre cinsinden belirir.





## Kimyasal Metod


Indofenol/Ureaz

<sup>9)</sup> seyreltmede geniş aralık | \* karıştırma çubuğu dahil

TR



KS4.3 T / 20



**Название метода** → KS4.3 T

**Номер метода** → M20

**Штрих-код для распознавания метода** → [Barcode]

**Диапазон измерений** → 0.1 - 4 mmol/l  $K_{S4.3}$

**Химический метод** → Кислота / индикатор

**Отображение на дисплее в MD 100 MD 110 / MD 200** → S:4.3

**Специфическая информация об инструменте**

Тест может быть выполнен на следующих устройствах. Кроме того, указывается требуемая кювета и диапазон поглощения фотометра.

Приборы	Кювета	$\lambda$	Диапазон измерений
MD 200, MD 600, MD 610, MD 640, MultiDirect, PM 620, PM 630	$\varnothing$ 24 mm	610 nm	0.1 - 4 mmol/l $K_{S4.3}$
SpectroDirect, XD 7000, XD 7500	$\varnothing$ 24 mm	615 nm	0.1 - 4 mmol/l $K_{S4.3}$

**Материал**

Необходимый материал (частично необязательный):

Заголовок	Упаковочная единица	Номер заказа
Alka-M-Photometer	Таблетка / 100	513210BT
Alka-M-Photometer	Таблетка / 250	513211BT

**Область применения**

- Обработка сточных вод
- Подготовка питьевой воды
- Обработка сырой воды

**Примечания**

1. Термины Щелочность M, m-значение, общая калийность и кислотная сила  $K_{S4.3}$  идентичны.
2. Точное соблюдение объема пробы в 10 мл имеет решающее значение для точности результатов анализа.

**Сокращенное обозначение языка в соответствии с ISO 639-1** → RU

**Статус редакции** → 01/20

RU Методическое руководство 01/20

**Выполнение  
измерения**
**Выполнение определения Кислотная сила  $K_{s4.3}$  с таблеткой**

Выберите метод в устройстве.

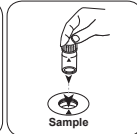
Для этого метода измерения нуля не требуется для следующих устройств: XD 7000, XD 7500



24-Наполните ковчег -мм  
10 пробой мл.



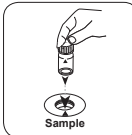
Закройте ковчег(ы).



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



Растворите таблетку  
(таблетки) покачиванием.



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



Нажмите клавишу TEST  
(XD: CTAPT).

На дисплее отображается результат в виде Кислотная сила  $K_{s4.3}$ .



Карбамид Т

М390

0.1 - 2.5 mg/L Urea

Ur1

Индофенол / уреазы

## Материал

Необходимый материал (частично необязательный):

Реактивы	Упаковочная единица	Номер заказа
UREA Реагент 1	15 mL	459300
UREA Реагент 2	10 mL	459400
Аммиак № 1	Таблетка / 100	512580BT
Аммиак № 1	Таблетка / 250	512581BT
Аммиак № 2	Таблетка / 100	512590BT
Аммиак № 2	Таблетка / 250	512591BT
Набор Аммиак № 1/№ 2 <sup>#</sup>	100 каждая	517611BT
Набор Аммиак № 1/№ 2 <sup>#</sup>	250 каждая	517612BT
Аммоний, порошковый реагент	Порошок / 26 g	460170
Предварительная обработка мочевины (compensates for the interference of free Chlorine up to 2 mg/l)	Таблетка / 100	516110BT
Набор реагентов UREA	1 Набор	517800BT

## Подготовка

1. Температура пробы должна быть в диапазоне от 20 °C до 30 °C.
2. Выполните анализ не позднее, чем через час после взятия пробы.
3. При анализе проб морской воды перед добавлением таблетки AMMONIA № 1 две мерные ложки порошка для кондиционирования аммония добавляют в пробу и растворяют путем покачивания.

## Примечания

1. AMMONIA № 1 - таблетка растворяется только после добавления таблетки AMMONIA № 2 полностью.
2. Аммоний и хлорамины включены в определение содержания карбамида.

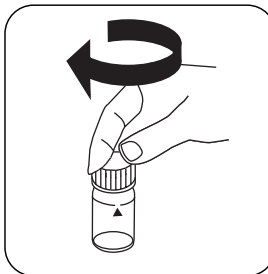
## Выполнение определения Мочевина с таблеткой и жидким реагентом

Выберите метод в устройстве.

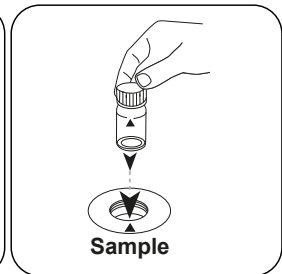
Для этого метода необязательно проводить измерение НУЛЯ каждый раз на следующих устройствах: XD 7000, XD 7500



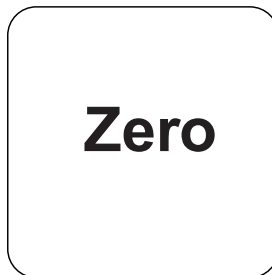
24-Наполните кювету -мм  
10 пробой мл.



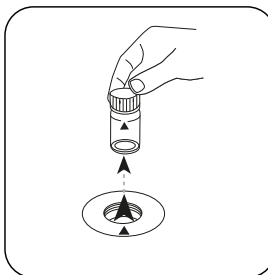
Закройте кювету(ы).



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



Нажмите клавишу **НОЛЬ** .

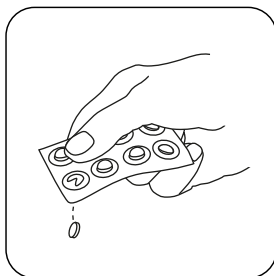


Извлеките кювету из измерительной шахты.

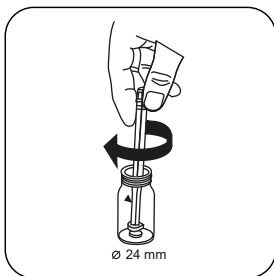
Для приборов, для которых не требуется **измерение нулевого значения** ,  
**начните отсюда.**



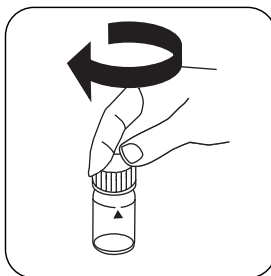
RU



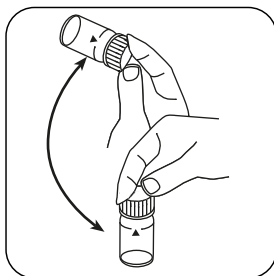
При наличии свободного хлора (НОСl), добавьте **одну UREA PRETREAT таблетку**.



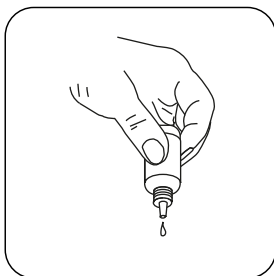
Раздавите таблетку (таблетки) легким вращением.



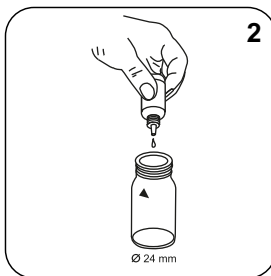
Закройте кювету(ы).



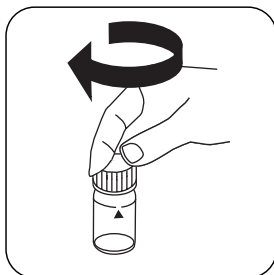
Растворите таблетку (таблетки) покачиванием.



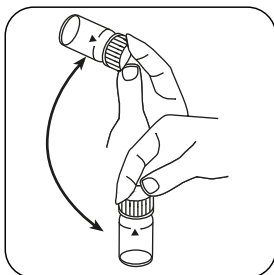
Держите капельницы вертикально и добавляйте капли того же размера, медленно нажимая на них.



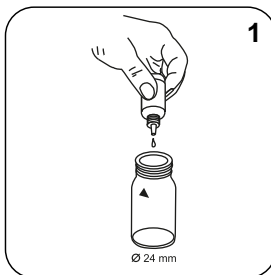
Добавьте **2 капли Urea Reagenz 1**.



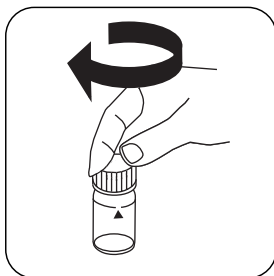
Закройте кювету(ы).



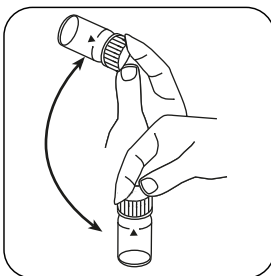
Перемешайте содержимое покачиванием.



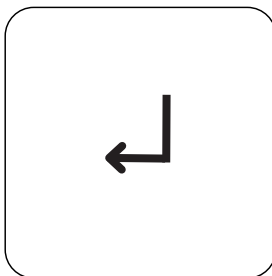
Добавьте **1 капли Urea Reagenz 2**.



Закройте кювету(ы).

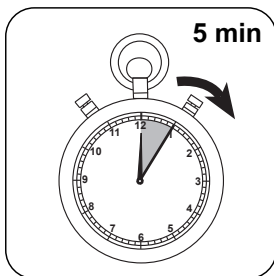


Перемешайте содержимое покачиванием.

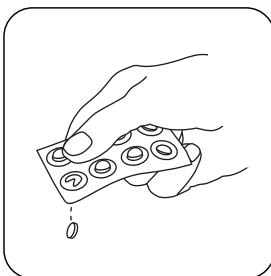


Нажмите клавишу **ENTER**.

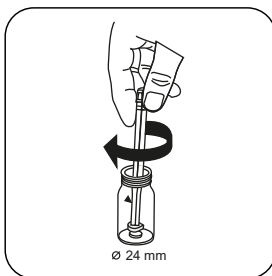
RU



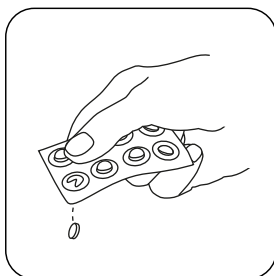
Выдержите **5 минут(ы)** времени реакции.



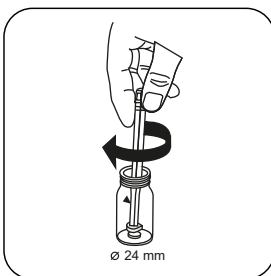
Добавить **таблетку AMMONIA No.1.**



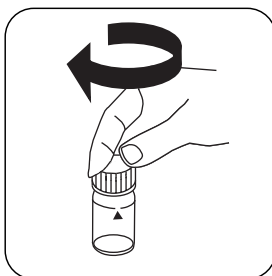
Раздавите таблетку (таблетки) легким вращением.



Добавить **таблетку AMMONIA No.2.**



Раздавите таблетку (таблетки) легким вращением.

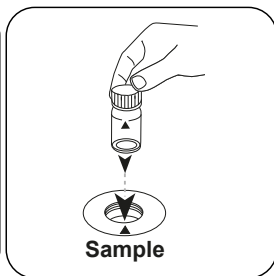


Закройте кювету(ы).

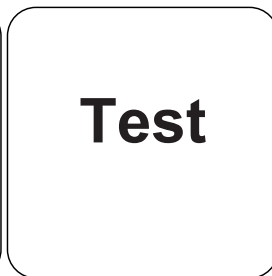




Растворите таблетку (таблетки) покачиванием.

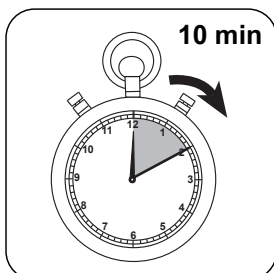


Поместите **кювету для проб** в измерительную шахту. Обращайте внимание на позиционирование.



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

RU



Выдержите **10 минут(ы)** времени реакции.

По истечении времени реакции измерение выполняется автоматически.

На дисплее отображается результат в мг/л Карбамид.

## Химический метод

Индофенол / уреазы

## Приложение

## Нарушения

### Постоянные нарушения

- Концентрации выше 2 мг/л мочевины могут привести к результатам в пределах диапазона измерения. В этом случае разбавьте пробу воды водой, не содержащей мочевины, и повторите измерение (проверка достоверности).

### Исключаемые нарушения

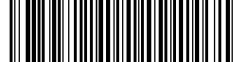
- Одна таблетка UREA PRETREAT устраняет нарушение концентрации свободного хлора до 2 мг/л (две таблетки до 4 мг/л, три таблетки до 6 мг/л).

Помехи	от / [мг/л]
Cl <sub>2</sub>	2

### Ссылки на литературу

R.J. Creno, R.E. Wenk, P. Bohling, Automated Micromeasurement of Urea Using Urease and the Berthelot Reaction, American Journal of Clinical Pathology (1970), 54 (6), p. 828-832

\* в комплект входит палочка для перемешивания



Карбамид Т

М391

0.2 - 5 mg/L Urea<sup>1)</sup>

Ur2

Индофенол / уреазы

## Материал

RU

Необходимый материал (частично необязательный):

Реактивы	Упаковочная единица	Номер заказа
UREA Реагент 1	15 mL	459300
UREA Реагент 2	10 mL	459400
Аммиак № 1	Таблетка / 100	512580BT
Аммиак № 1	Таблетка / 250	512581BT
Аммиак № 2	Таблетка / 100	512590BT
Аммиак № 2	Таблетка / 250	512591BT
Набор Аммиак № 1/№ 2 <sup>#</sup>	100 каждая	517611BT
Набор Аммиак № 1/№ 2 <sup>#</sup>	250 каждая	517612BT
Аммоний, порошковый реагент	Порошок / 26 g	460170
Предварительная обработка мочевины (compensates for the interference of free Chlorine up to 2 mg/l)	Таблетка / 100	516110BT
Набор реагентов UREA	1 Набор	517800BT

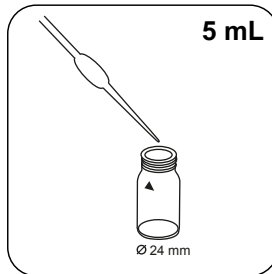
## Подготовка

1. При анализе проб морской воды перед добавлением таблетки AMMONIA № 1 две мерные ложки порошка для кондиционирования аммония добавляют в пробу и растворяют путем покачивания.

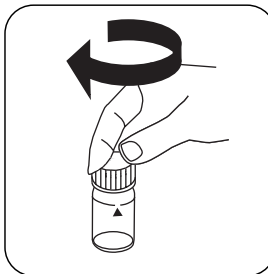
## Выполнение определения Мочевина с таблеткой и жидким реагентом

Выберите метод в устройстве.

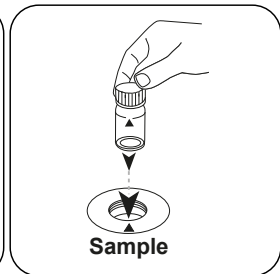
Для этого метода обязательно проводить измерение НУЛЯ каждый раз на следующих устройствах: XD 7000, XD 7500



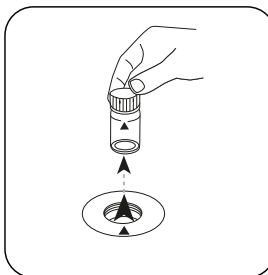
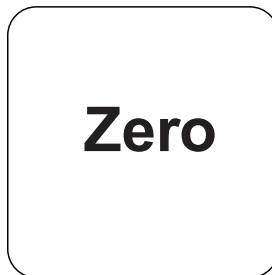
Добавьте **5 мл пробы** и **5 мл полностью деминерализованной воды** в кювету для проб.



Закройте кювету(ы).

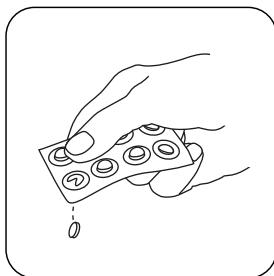


Поместите **кювету для проб** в измерительную шахту. Обращайте внимание на позиционирование.

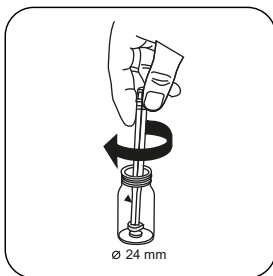


Нажмите клавишу **НОЛЬ** . Извлеките кювету из измерительной шахты.

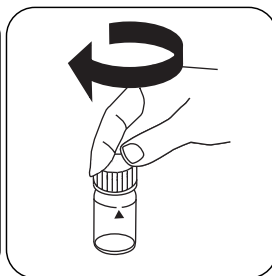
Для приборов, для которых не требуется **измерение нулевого значения** , **начните отсюда**.



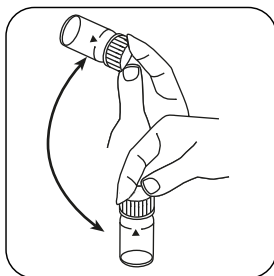
При наличии свободного хлора (НОСl), добавьте **одну UREA PRETREAT таблетку.**



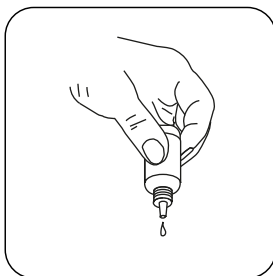
Раздавите таблетку (таблетки) легким вращением.



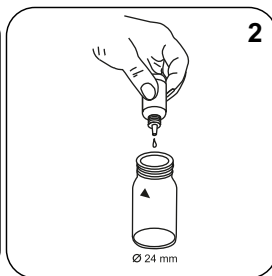
Закройте кювету(ы).



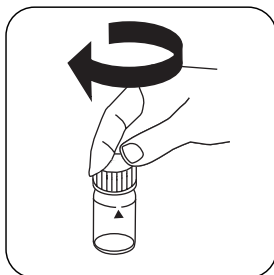
Растворите таблетку (таблетки) покачиванием.



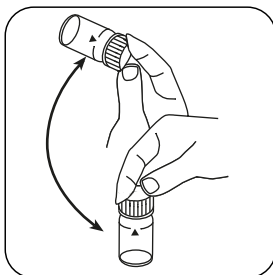
Держите капельницы вертикально и добавляйте капли того же размера, медленно нажимая на них.



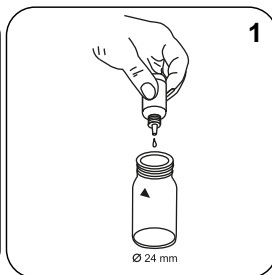
Добавьте **2 капли UREA Reagenz 1.**



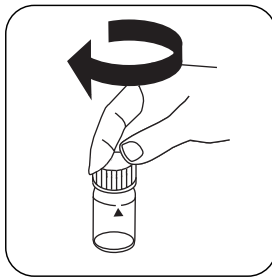
Закройте кювету(ы).



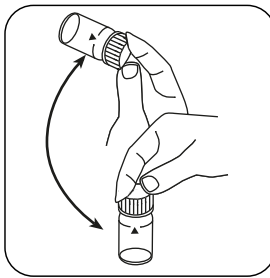
Перемешайте содержимое покачиванием.



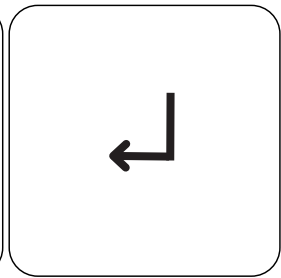
Добавьте **1 капли UREA Reagenz 2.**



Закройте кювету(ы).

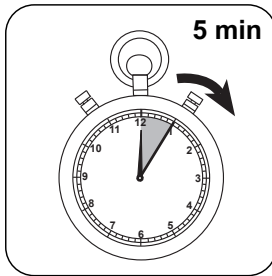


Перемешайте содержимое покачиванием.

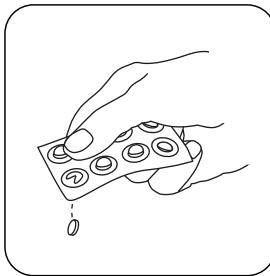


Нажмите клавишу **ENTER**.

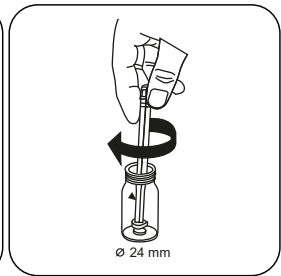
RU



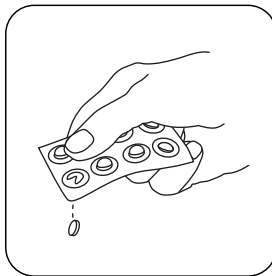
Выдержите **5 минут(ы)** времени реакции.



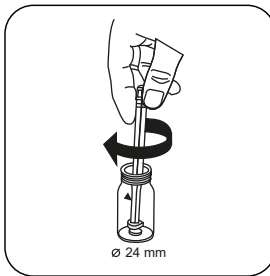
Добавить **таблетку AMMONIA No. 1.**



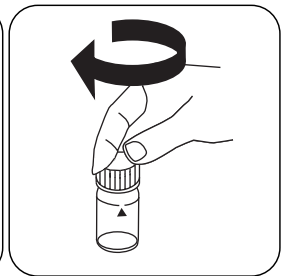
Раздавите таблетку (таблетки) легким вращением.



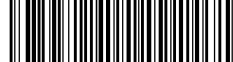
Добавить **таблетку AMMONIA No. 2.**



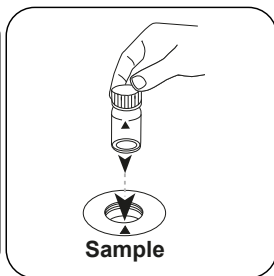
Раздавите таблетку (таблетки) легким вращением.



Закройте кювету(ы).



Растворите таблетку (таблетки) покачиванием.

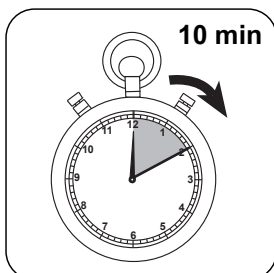


Поместите **кювету для проб** в измерительную шахту. Обращайте внимание на позиционирование.



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

RU



Выдержите **10 минут(ы)** времени реакции.

По истечении времени реакции измерение выполняется автоматически.

На дисплее отображается результат в мг/л Карбамид.



## Химический метод

Индофенол / уреазы

<sup>9</sup> широкий диапазон разбавления | <sup>8</sup> в комплект входит палочка для перемешивания

RU



KS4.3 T / 20

方法名称

方法号

用于方法检测的条形码

测量范围

酸性 / 指示剂

化学方法

**仪器的具體信息**

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。

儀器類型	比色皿	$\lambda$	測量範圍
MD 200, MD 600, MD 610, MD 640, MultiDirect, PM 620, PM 630	$\varnothing$ 24 mm	610 nm	0.1 - 4 mmol/l $K_{S4.3}$
SpectroDirect, XD 7000, XD 7500	$\varnothing$ 24 mm	615 nm	0.1 - 4 mmol/l $K_{S4.3}$

**材料**

所需材料 (部分可選) :

標題	包裝單位	貨號
Alka-M-Photometer	片劑 / 100	513210BT
Alka-M-Photometer	片劑 / 250	513211BT

**應用列表**

- 污水處理
- 飲用水處理
- 原水處理

**備註**

1. 術語總度-m、m-值、總碱度和酸容量  $K_{S4.3}$  是相同的。
2. 準確地遵守 10 ml 的樣本體積對分析結果的準確度至關重要。

語言代碼ISO 639-1

修訂狀態

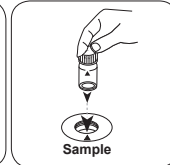
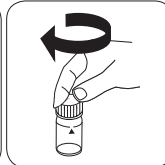
CN 方法手冊 01/20

开始测量

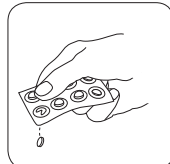
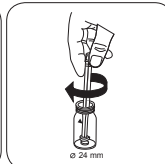
进行测定  $K_{s4.3}$  片剂酸容量

选择设备中的方法。

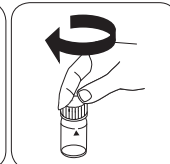
对于这种方法，在以下设备上不能进行 ZERO 测量：XD 7000, XD 7500

用 10 ml 样本填充 24 mm 比密封比色杯。  
色杯。将样本比色杯放入测量轴  
中。注意定位。

• • •

加入 ALKA-M-PHOTOME-  
TER 片剂。

用轻微的扭转压碎片剂。



密封比色杯。

CN 方法手册 01/20

ZH



T 尿素

M390

0.1 - 2.5 mg/L Urea

Ur1

脲酚/ 尿酸

材料

所需材料 ( 部分可選 ) :

ZH

试剂	包装单位	货号
尿素试剂 1	15 mL	459300
尿素试剂 2	10 mL	459400
氨 No.1	片剂 / 100	512580BT
氨 No.1	片剂 / 250	512581BT
氨 No.2	片剂 / 100	512590BT
氨 No.2	片剂 / 250	512591BT
套件氨 No.1/No.2 <sup>#</sup>	各100次	517611BT
套件氨 No.1/No.2 <sup>#</sup>	各250次	517612BT
铵调制粉	粉剂 / 26 g	460170
尿素预处理 (compensates for the interference of free Chlorine up to 2 mg/l)	片剂 / 100	516110BT
尿素试剂套件	1 组	517800BT

## 准备

1. 样本温度必须在 20 °C 至 30 °C 之间。
2. 取样后不得迟于 1 小时进行分析。
3. 分析海水样本时必须在加入 AMMONIA No.1 片剂之前将两勺铵调节粉末加入到样本中并通过晃动来溶解。

## 备注

1. AMMONIA No.1 片剂只有在加入 AMMONIA No.2 片剂后才能完全溶解。
2. 尿素测定中包括铵和氰胺。

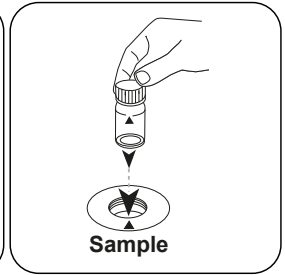
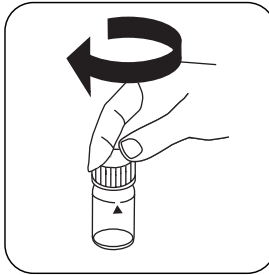
## 进行测定 尿素片剂和液剂

选择设备中的方法。

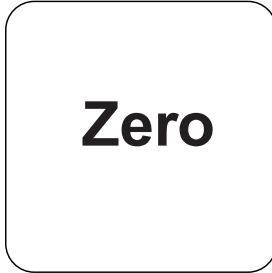
对于此方法，不必每次都在以下设备上上进行零测量：XD 7000, XD 7500



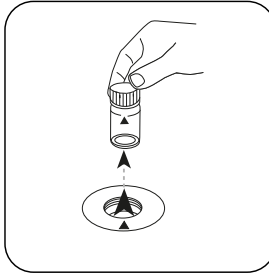
用 10 mL 样本填充 24 mm 密封比色杯。



将样本比色杯放入测量轴中。注意定位。

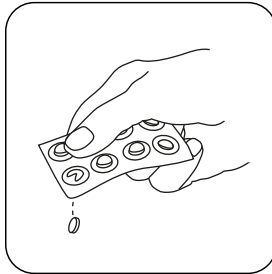


按下 **ZERO** 按钮。

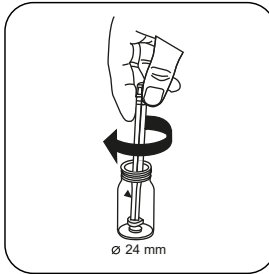


从测量轴上取下比色杯。

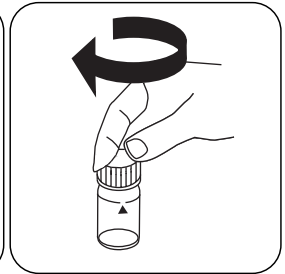
对于不需要 **ZERO** 测量的设备，从这里开始。



在游离氯 (HOCl) 的存在下，加入一片 **UREA PRETREAT** 片剂。



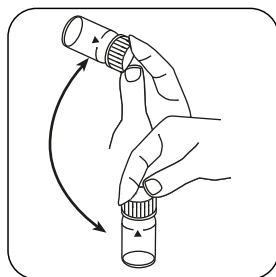
用轻微的扭转压碎片剂。



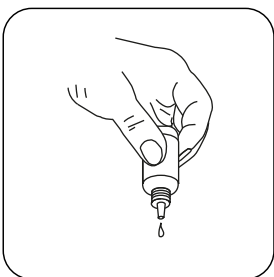
密封比色杯。



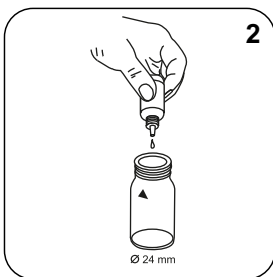
ZH



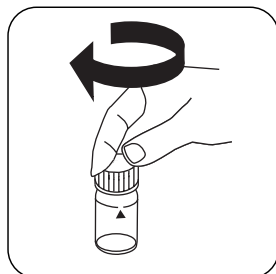
通过旋转溶解片剂。



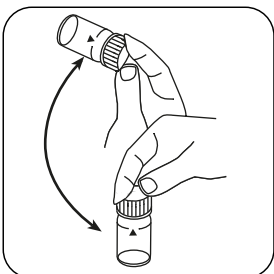
垂直握住滴瓶，慢慢加入相同大小的滴剂。



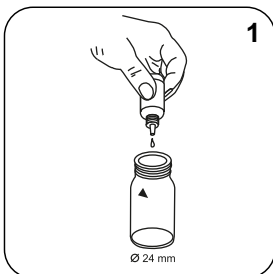
加入 2 滴 Urea Reagent 1。



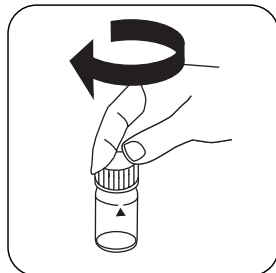
密封比色杯。



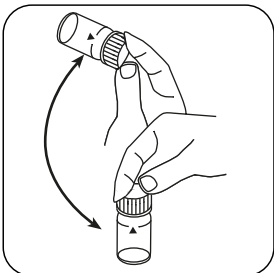
通过旋转混合内容物。



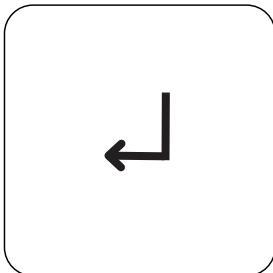
加入 1 滴 Urea Reagent 2。



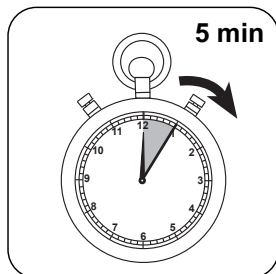
密封比色杯。



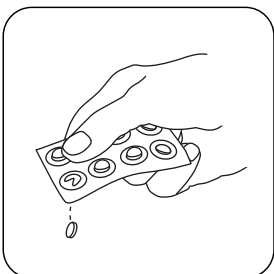
通过旋转混合内容物。



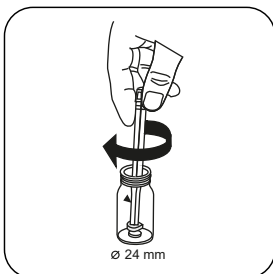
按下 ENTER 按钮。



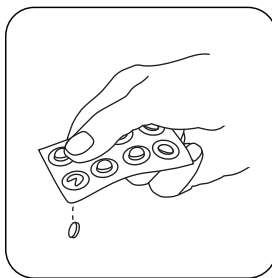
等待 5 分钟反应时间。



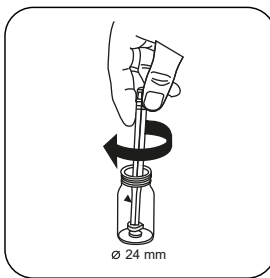
加入 AMMONIA No.1 片剂



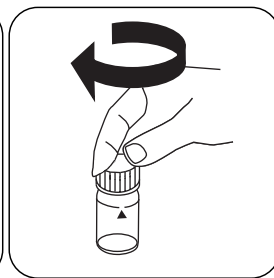
用轻微的扭转压碎片剂。



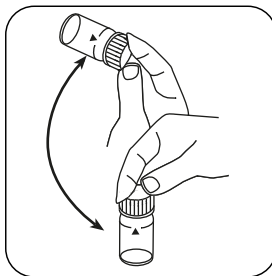
加入 **AMMONIA No.2** 片剂



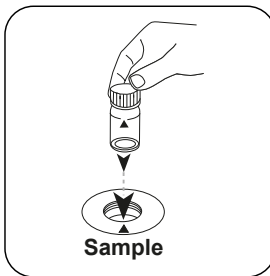
用轻微的扭转压碎片剂。



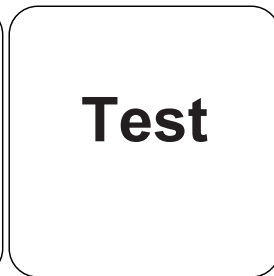
密封比色杯。



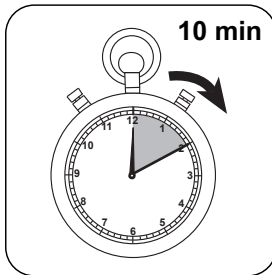
通过旋转溶解片剂。



将样本比色杯放入测量轴中。注意定位。



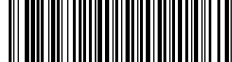
按下 **TEST (XD: START)** 按钮。



等待 **10 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 尿素**。



## 化学方法

靛酚 / 尿酸

## 附录

ZH

### 干扰说明

#### 持续干扰

- 高于 2 mg/L 尿素的浓度可导致测量范围内的结果。在这种情况下应用不含尿素的水稀释水样，并重复测量（可信度测试）。

#### 可消除干扰

- 一片 UREA PRETREAT 片剂可消除高达 2 mg/L 游离氯的干扰（两片高达 4 mg/L，三片高达 6 mg/L）。

干扰	從 / [mg/l]
Cl <sub>2</sub>	2

#### 参考文献

R.J.Creno, R.E.Wenk, P. Bohling, Automated Micromasurement of Urea Using Urease and the Berthelot Reaction, American Journal of Clinical Pathology (1970), 54 (6), p. 828-832

\* i含搅拌棒, 10cm







T 尿素

M391

0.2 - 5 mg/L Urea<sup>1)</sup>

Ur2

靛酚/ 尿酸

材料

所需材料 ( 部分可選 ) :

ZH

试剂	包装单位	货号
尿素试剂 1	15 mL	459300
尿素试剂 2	10 mL	459400
氨 No.1	片剂 / 100	512580BT
氨 No.1	片剂 / 250	512581BT
氨 No.2	片剂 / 100	512590BT
氨 No.2	片剂 / 250	512591BT
套件氨 No.1/No.2 <sup>#</sup>	各100次	517611BT
套件氨 No.1/No.2 <sup>#</sup>	各250次	517612BT
铵调制粉	粉剂 / 26 g	460170
尿素预处理 (compensates for the interference of free Chlorine up to 2 mg/l)	片剂 / 100	516110BT
尿素试剂套件	1 组	517800BT

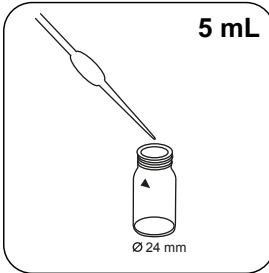
## 准备

1. 分析海水样本时必须在加入 AMMONIA No.1 片剂之前将两勺铵调节粉末加入到样本中并通过晃动来溶解。

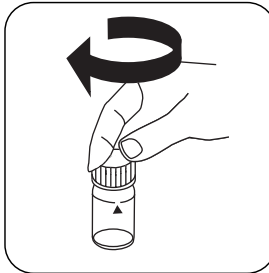
## 进行测定 尿素片剂和液剂

选择设备中的方法。

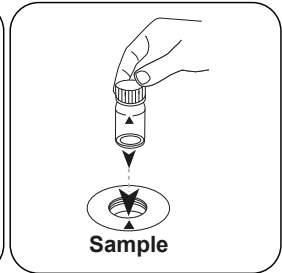
对于此方法，不必每次都在以下设备上上进行零测量：XD 7000, XD 7500



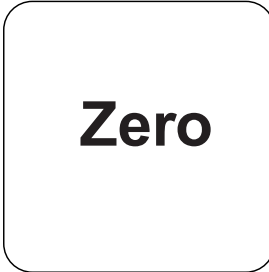
添加 5 mL 样本和 5 mL 去离子水到样本比色杯中。



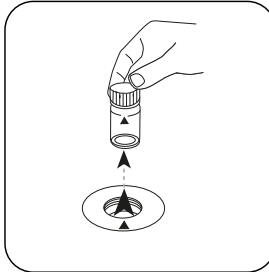
密封比色杯。



将样本比色杯放入测量轴中。注意定位。

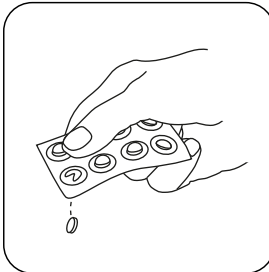


按下 ZERO 按钮。

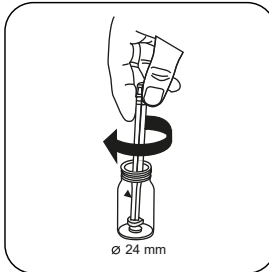


从测量轴上取下比色杯。

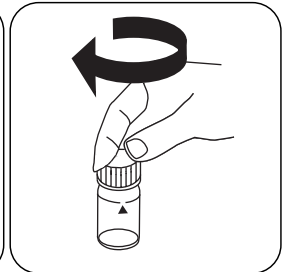
对于不需要 ZERO 测量的设备，从这里开始。



在游离氯 (HOCl) 的存在下，加入一片 UREA PRETREAT 片剂。



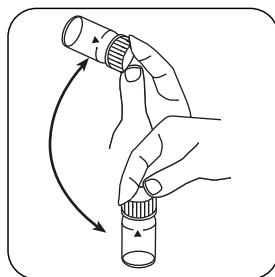
用轻微的扭转压碎片剂。



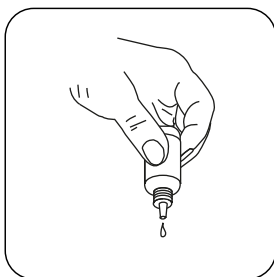
密封比色杯。



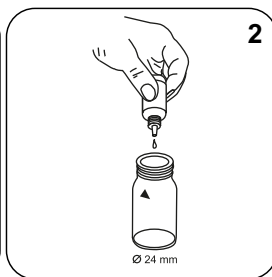
ZH



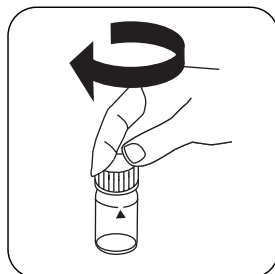
通过旋转溶解片剂。



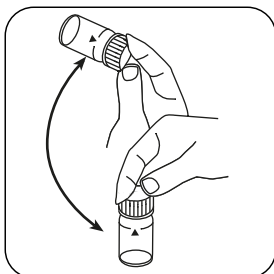
垂直握住滴瓶，慢慢加入相同大小的滴剂。



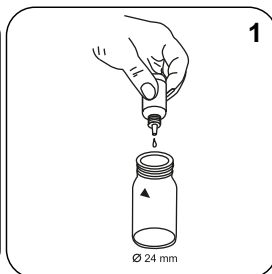
加入 2 滴 UREA Reagent 1。



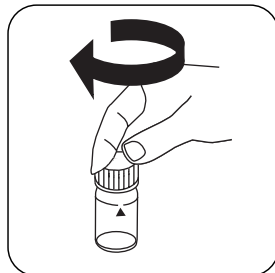
密封比色杯。



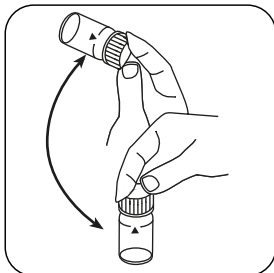
通过旋转混合内容物。



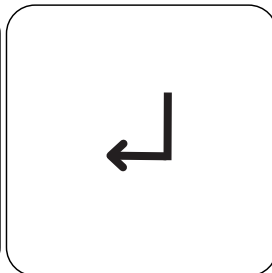
加入 1 滴 UREA Reagent 2。



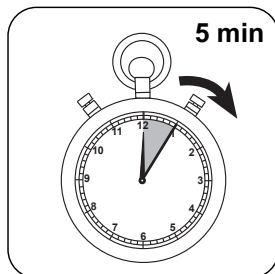
密封比色杯。



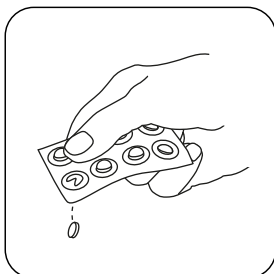
通过旋转混合内容物。



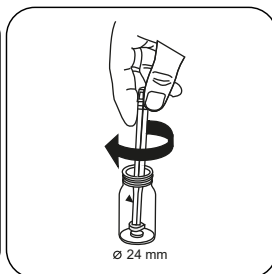
按下 ENTER 按钮。



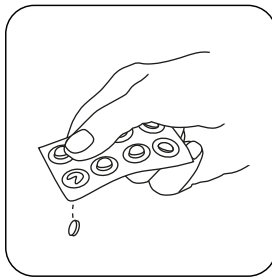
等待 5 分钟反应时间。



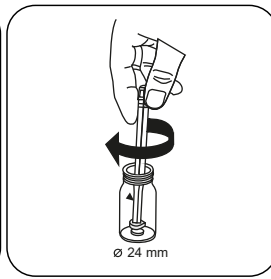
加入 AMMONIA No. 1 片剂



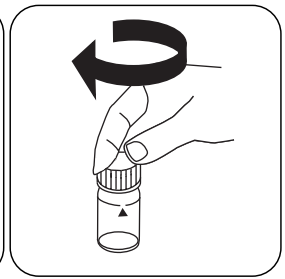
用轻微的扭转压碎片剂。



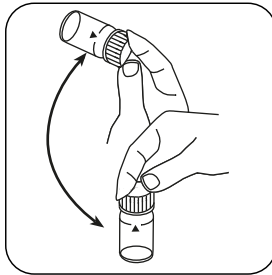
加入 **AMMONIA No. 2** 片剂



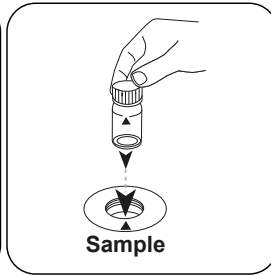
用轻微的扭转压碎片剂。



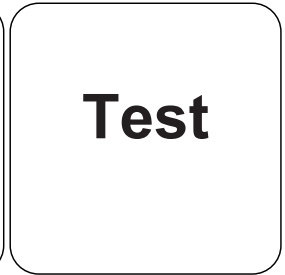
密封比色杯。



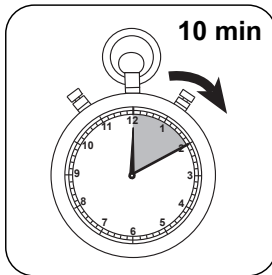
通过旋转溶解片剂。



将样本比色杯放入测量轴中。注意定位。



按下 **TEST (XD: START)** 按钮。



等待 **10 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 尿素**。



## 化学方法

### 靛酚 / 尿酸

<sup>1)</sup> 通过稀释进行高量程测定 | \* 含搅拌棒, 10cm

ZH









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