

# Lovibond® Water Testing

Tintometer® Group



## Manual of Methods

MD50

Chlorine | Sodium hypochlorite

**(EN) MD50 Photometer**

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**(ES) Fotómetro MD50**

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**(PT) Fotómetro MD50**

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**(NL) MD50 Fotometer**

Zijde 64

**(RU) Фотометр MD50**

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**(DE) MD50 Photometer**

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**(FR) MD50 Photomètre**

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**(IT) Fotometro MD50**

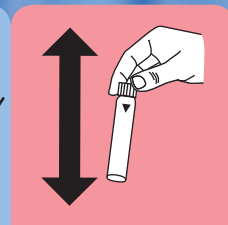
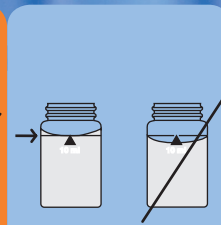
Pagina 54

**(TR) MD50 fotometre**

Sayfa 74

**(ZH) MD50 光度计**

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KS4.3 T / 20


Method name

Method number

Bar code for the detection of the methods

Measuring range

20

S:4.3

Display in the MD 100 / MD 110 / MD 200

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

**Material**

Required material (partly optional):

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

**Application List**

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

**Notes**

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

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

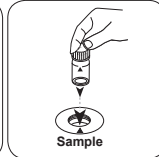
For this method, no ZERO measurements are to be carried out with the following devices: XD 7000, XD 7500



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.



Chlorine HR (KI) T

M105

5 - 200 mg/L Cl<sub>2</sub>

CLHr

KI / Acid

## Material

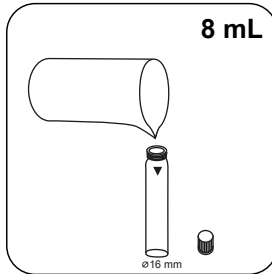
EN

Required material (partly optional):

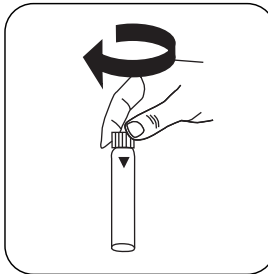
| Reagents                                     | Packaging Unit | Part Number |
|--|----------------|-------------|
| Chlorine HR (KI)                             | Tablet / 100   | 513000BT    |
| Chlorine HR (KI)                             | Tablet / 250   | 513001BT    |
| Acidifying GP                                | Tablet / 100   | 515480BT    |
| Acidifying GP                                | Tablet / 250   | 515481BT    |
| Set Chlorine HR (KI)/Acidifying GP 100 Pc. # | 100 each       | 517721BT    |
| Set Chlorine HR (KI)/Acidifying GP 250 Pc. # | 250 each       | 517722BT    |
| Chlorine HR (KI)                             | Tablet / 100   | 501210      |
| Chlorine HR (KI)                             | Tablet / 250   | 501211      |

## Determination of Chlorine HR (KI) with Tablet

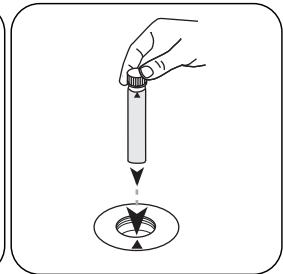
Select the method on the device.



Fill 16 mm vial with **8 mL sample**.



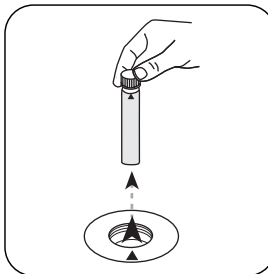
Close vial(s).



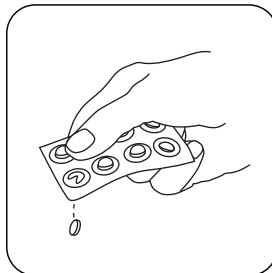
Place **sample vial** in the sample chamber. • Pay attention to the positioning.



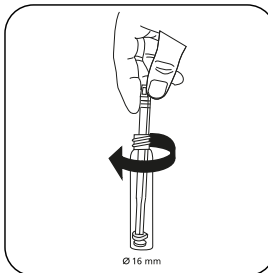
Press the **ZERO** button.



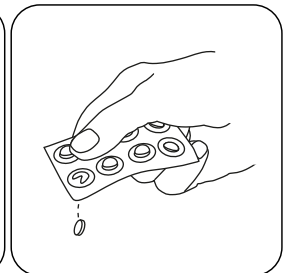
Remove **vial** from the sample chamber.



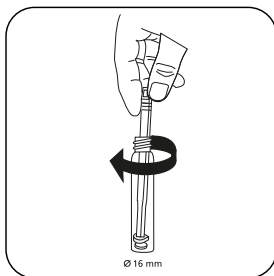
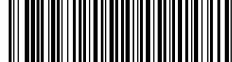
Add **Chlorine HR (KI) tablet**.



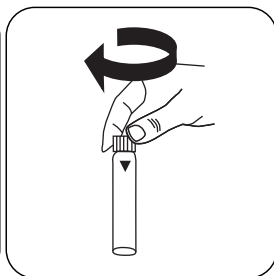
Crush tablet(s) by rotating slightly.



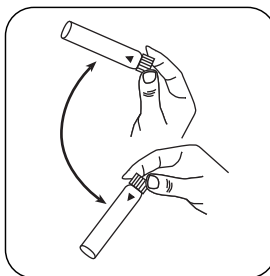
Add **ACIDIFYING GP tablet**.



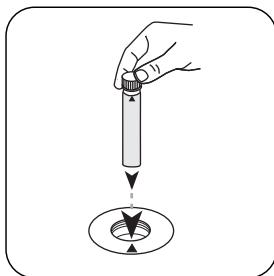
Crush tablet(s) by rotating slightly.



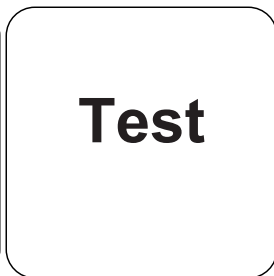
Close vial(s).



Dissolve tablet(s) by inverting.



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



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

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

## Chemical Method

KI / Acid

## Appendix

### Interferences

#### Persistent Interferences

- All oxidising agents in the samples react like chlorine, which leads to higher results.

### Method Validation

|                                |                  |
|--------------------------------|------------------|
| <b>Limit of Detection</b>      | 1.29 mg/L        |
| <b>Limit of Quantification</b> | 3.86 mg/L        |
| <b>End of Measuring Range</b>  | 200 mg/L         |
| <b>Sensitivity</b>             | 83.96 mg/L / Abs |
| <b>Confidence Intervall</b>    | 1.14 mg/L        |
| <b>Standard Deviation</b>      | 0.45 mg/L        |
| <b>Variation Coefficient</b>   | 0.45 %           |

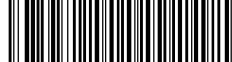
#### Derived from

EN ISO 7393-3

\* including stirring rod, 10 cm

EN





Hypochlorite T

M212

0.2 - 16 % NaOCI

Potassium Iodide

EN

## Material

Required material (partly optional):

| Reagents                                     | Packaging Unit | Part Number |
|--|----------------|-------------|
| Acidifying GP                                | Tablet / 100   | 515480BT    |
| Acidifying GP                                | Tablet / 250   | 515481BT    |
| Chlorine HR (KI)                             | Tablet / 100   | 513000BT    |
| Chlorine HR (KI)                             | Tablet / 250   | 513001BT    |
| Chlorine HR (KI)                             | Tablet / 100   | 501210      |
| Chlorine HR (KI)                             | Tablet / 250   | 501211      |
| Set Chlorine HR (KI)/Acidifying GP 100 Pc. # | 100 each       | 517721BT    |
| Set Chlorine HR (KI)/Acidifying GP 250 Pc. # | 250 each       | 517722BT    |
| Dilution set sodium hypochlorite             | 1 pc.          | 414470      |

## Notes

1. This method provides a fast and simple test. The test can be performed on site but the result will not be as precise as a laboratory method.
2. By strictly following the test procedure, an accuracy of +/- 1 weight % can be achieved.

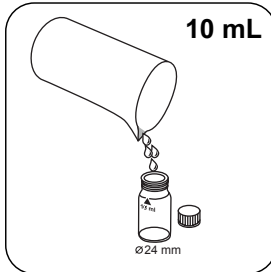
## Determination of Sodium hypochlorite with Tablet

Select the method on the device.

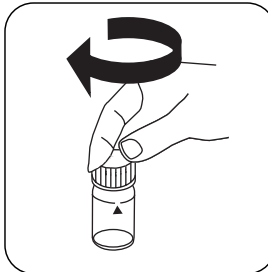
The sample is diluted x2000.

1. First rinse a 5 mL syringe with the solution to be examined and then fill to the 5 mL mark.
2. Empty the syringe into a 100-ml beaker.
3. Fill the measuring beaker up to the 100 mL mark with chlorine-free water.
4. Mix contents by stirring.
5. Fill a clean 5 mL syringe to the 1 mL mark with the diluted solution.
6. Empty the syringe into a clean 100 mL beaker.
7. Fill the measuring beaker up to the 100 mL mark with chlorine-free water.
8. Mix contents by stirring.

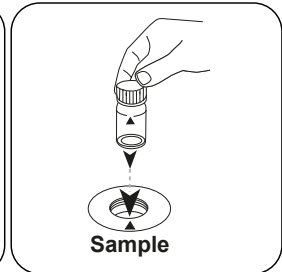
The test is performed with this solution.



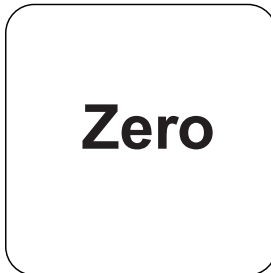
Fill 24 mm vial with **10 mL prepared sample**.



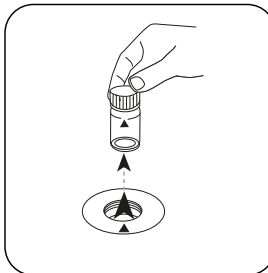
Close vial(s).



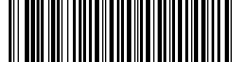
Place **sample vial** in the sample chamber. Pay attention to the positioning.



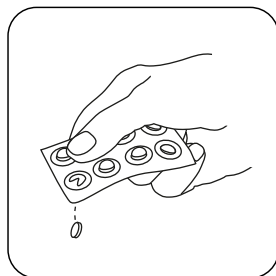
Press the **ZERO** button.



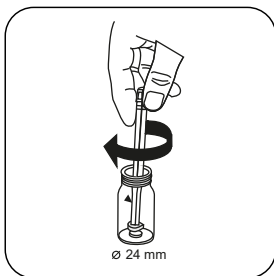
Remove the vial from the sample chamber.



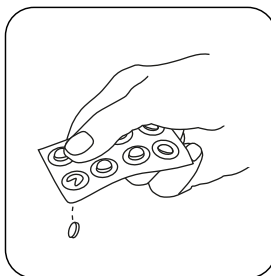
EN



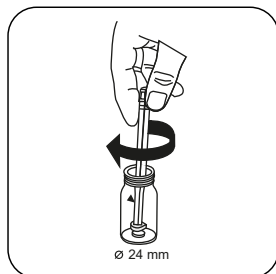
Add **CHLORINE HR (KI)** tablet.



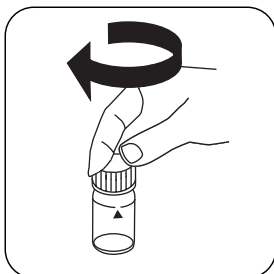
Crush tablet(s) by rotating slightly.



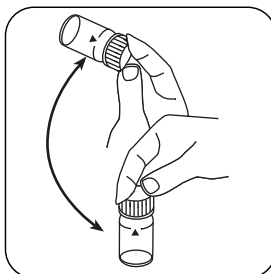
Add **ACIDIFYING GP** tablet.



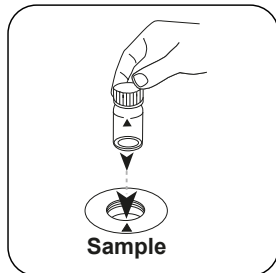
Crush tablet(s) by rotating slightly.



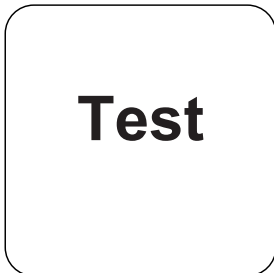
Close vial(s).



Dissolve tablet(s) by inverting.



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



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

The display will show the content of effective chlorine in % by weight (w/w %) relative to the **undiluted** sodium hypochlorite solution.



## Chemical Method

Potassium Iodide

## Appendix

### Method Validation


|                                |              |
|--------------------------------|--------------|
| <b>Limit of Detection</b>      | 0.03 %       |
| <b>Limit of Quantification</b> | 0.1 %        |
| <b>End of Measuring Range</b>  | 16.8 %       |
| <b>Sensitivity</b>             | 9.21 % / Abs |
| <b>Confidence Intervall</b>    | 0.12 %       |
| <b>Standard Deviation</b>      | 0.05 %       |
| <b>Variation Coefficient</b>   | 0.55 %       |

### Derived from

EN ISO 7393-3

\* including stirring rod, 10 cm

EN

KS4.3 T / 20


Methoden Name

Methodennummer

Barcode zur Methodenerkennung

Messbereich

20

S:4.3

Displayanzeige im MD 100 MD 110 / MD 200

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

**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

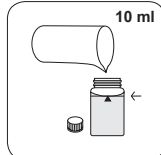
Revisionsstand

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.

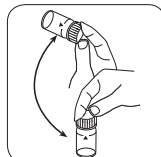


Küvette(n) verschließen.

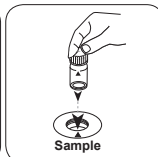


Die **Probeküvette** in den Messschacht stellen. Positionierung beachten.

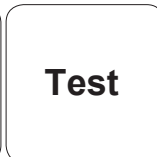
• • •



Tablette(n) durch Umschwenken lösen.



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



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

In der Anzeige erscheint das Ergebnis als Säurekapazität  $K_{s4,3}$ .



Chlor HR (KI) T

M105

5 - 200 mg/L Cl<sub>2</sub>

CLHr

KI / Säure

## Material

DE

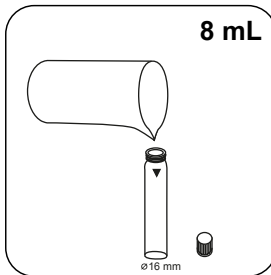
Benötigtes Material (zum Teil optional):

| Reagenzien                          | Form/Menge     | Bestell-Nr. |
|-------------------------------------|----------------|-------------|
| Chlorine HR (KI)                    | Tablette / 100 | 513000BT    |
| Chlorine HR (KI)                    | Tablette / 250 | 513001BT    |
| Acidifying GP                       | Tablette / 100 | 515480BT    |
| Acidifying GP                       | Tablette / 250 | 515481BT    |
| Set Chlorine HR (KI)/Acidifying GP# | je 100         | 517721BT    |
| Set Chlorine HR (KI)/Acidifying GP# | je 250         | 517722BT    |
| Chlorine HR (KI)                    | Tablette / 100 | 501210      |
| Chlorine HR (KI)                    | Tablette / 250 | 501211      |

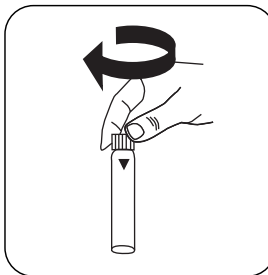


## Durchführung der Bestimmung Chlor HR (KI) mit Tablette

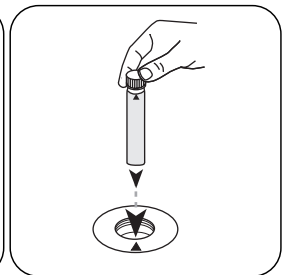
Die Methode im Gerät auswählen.



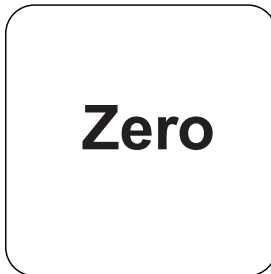
16-mm-Küvette mit **8 mL Probe** füllen.



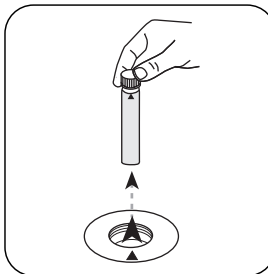
Küvette(n) verschließen.



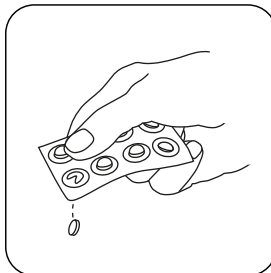
Die **Probeküvette** in den Messschacht stellen. Positionierung beachten.



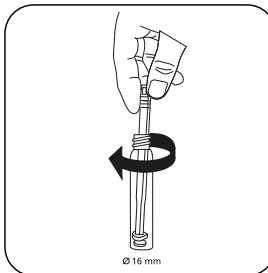
Taste **ZERO** drücken.



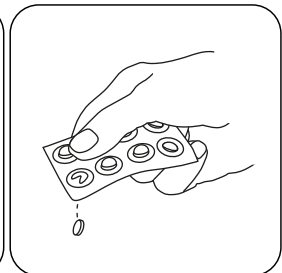
Die **Küvette** aus dem Messschacht nehmen.



Eine **Chlorine HR (KI) Tablette** zugeben.



Tablette(n) unter leichter Drehung zerdrücken.

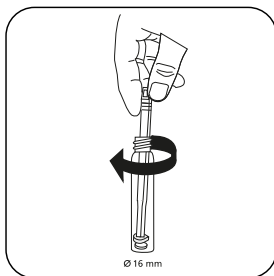


Eine **ACIDIFYING GP Tablette** zugeben.

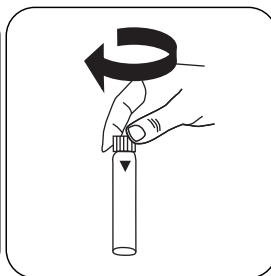




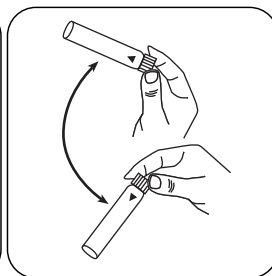
DE



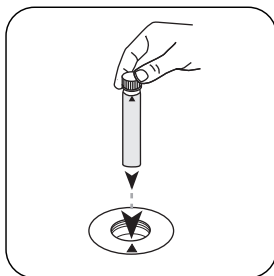
Tablette(n) unter leichter Drehung zerdrücken.



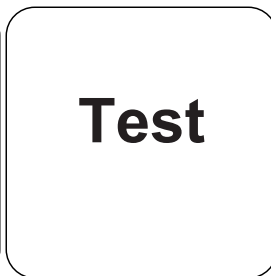
Küvette(n) verschließen.



Tablette(n) durch Umschwenken lösen.



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



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

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

## Chemische Methode

KI / Säure

## Appendix

### Störungen

#### Permanente Störungen

- Alle in den Proben vorhandenen Oxidationsmittel reagieren wie Chlor, was zu Mehrbefunden führt.

### Methodenvalidierung

|  |                  |
|--|------------------|
| <b>Nachweisgrenze</b>                  | 1.29 mg/L        |
| <b>Bestimmungsgrenze</b>               | 3.86 mg/L        |
| <b>Messbereichsende</b>                | 200 mg/L         |
| <b>Empfindlichkeit</b>                 | 83.96 mg/L / Abs |
| <b>Vertrauensbereich</b>               | 1.14 mg/L        |
| <b>Verfahrensstandardabweichung</b>    | 0.45 mg/L        |
| <b>Verfahrensvariationskoeffizient</b> | 0.45 %           |

#### Abgeleitet von

EN ISO 7393-3

\* inklusive Rührstab



## Hypochlorit T

M212

0,2 - 16 % NaOCI

Kaliumiodid

### Material

DE

Benötigtes Material (zum Teil optional):

| Reagenzien                          | Form/Menge     | Bestell-Nr. |
|-------------------------------------|----------------|-------------|
| Acidifying GP                       | Tablette / 100 | 515480BT    |
| Acidifying GP                       | Tablette / 250 | 515481BT    |
| Chlorine HR (KI)                    | Tablette / 100 | 513000BT    |
| Chlorine HR (KI)                    | Tablette / 250 | 513001BT    |
| Chlorine HR (KI)                    | Tablette / 100 | 501210      |
| Chlorine HR (KI)                    | Tablette / 250 | 501211      |
| Set Chlorine HR (KI)/Acidifying GP# | je 100         | 517721BT    |
| Set Chlorine HR (KI)/Acidifying GP# | je 250         | 517722BT    |
| Verdünnungsset Natriumhypochlorit   | 1 St.          | 414470      |

### Anmerkungen

1. Diese Methode bietet die Möglichkeit eines einfachen schnellen Tests, der an Ort und Stelle durchgeführt werden kann und ist demzufolge nicht so präzise, wie eine vergleichbare Labormethode.
2. Bei strenger Einhaltung der beschriebenen Vorgehensweise kann eine Genauigkeit von  $\pm 1$  Gew.% erreicht werden.

## Durchführung der Bestimmung Natriumhypochlorit mit Tablette

Die Methode im Gerät auswählen.

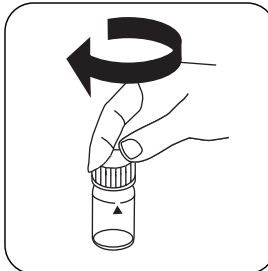
Die Probe wird 2000-fach verdünnt:

1. Eine 5-mL-Spritze zuerst mit der zu untersuchenden Lösung ausspülen und dann bis zur 5-mL-Marke füllen.
2. Die Spritze in einen 100-mL-Messbecher entleeren.
3. Den Messbecher bis zur 100-mL-Marke mit chlorfreiem Wasser auffüllen.
4. Den Inhalt durch Umrühren mischen.
5. Eine saubere 5-mL-Spritze bis zur 1-mL-Marke mit der verdünnten Lösung füllen.
6. Die Spritze in einen sauberen 100-mL-Messbecher entleeren.
7. Den Messbecher bis zur 100-mL-Marke mit chlorfreiem Wasser auffüllen.
8. Den Inhalt durch Umrühren mischen.

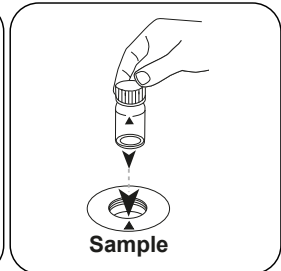
Der Test wird mit dieser Lösung durchgeführt.



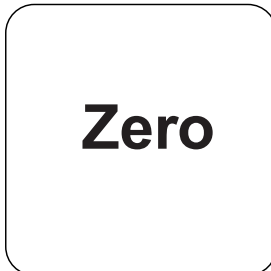
24-mm-Küvette mit **10 mL** vorbereiteter Probe füllen.



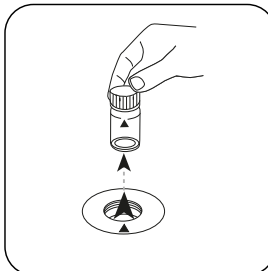
Küvette(n) verschließen.



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



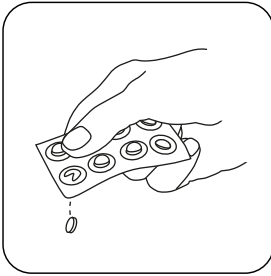
Taste **ZERO** drücken.



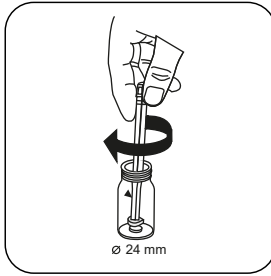
Küvette aus dem Messschacht nehmen.



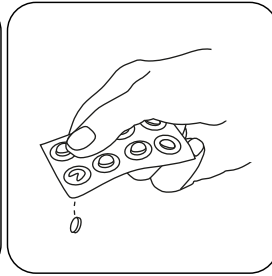
DE



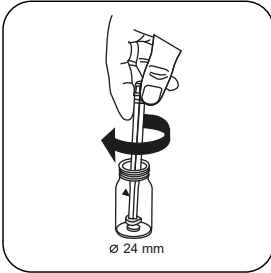
Eine **CHLORINE HR (KI) Tablette** zugeben.



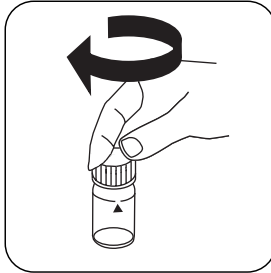
Tablette(n) unter leichter Drehung zerdrücken.



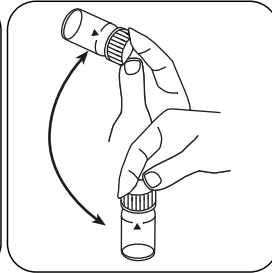
Eine **ACIDIFYING GP Tablette** zugeben.



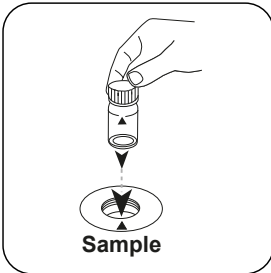
Tablette(n) unter leichter Drehung zerdrücken.



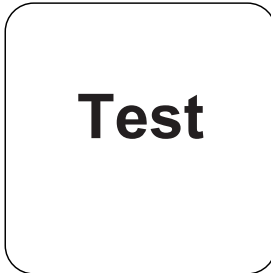
Küvette(n) verschließen.



Tablette(n) durch Umschwenken lösen.



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



Taste **TEST (XD: START)** drücken.

In der Anzeige erscheint der Gehalt an wirksamen Chlor in Gewichtprozent (w/w %) bezogen auf die **unverdünnte** Natriumhypochlorit-Lösung.



## Chemische Methode

Kaliumiodid

## Appendix

### Methodenvalidierung

|  |              |
|--|--------------|
| <b>Nachweisgrenze</b>                  | 0.03 %       |
| <b>Bestimmungsgrenze</b>               | 0.1 %        |
| <b>Messbereichsende</b>                | 16.8 %       |
| <b>Empfindlichkeit</b>                 | 9.21 % / Abs |
| <b>Vertrauensbereich</b>               | 0.12 %       |
| <b>Verfahrensstandardabweichung</b>    | 0.05 %       |
| <b>Verfahrensvariationskoeffizient</b> | 0.55 %       |


### Abgeleitet von

EN ISO 7393-3

\* inklusive Rührstab

DE

KS4.3 T / 20



**Nombre del método**

**Número de método**

**Código de barras para reconocer el método**

**Rango de medición**

$K_{S4.3} T$   
0.1 - 4 mmol/l  $K_{S4.3}$   
Ácido / Indicador

20  
S:4.3

**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              | $\lambda$ | Rango de medición         |
|---|---------------------|-----------|---------------------------|
| 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 $K_{S4.3}$ |

**Material**

Material requerido (parcialmente opcional):

| Título           | Unidad de embalaje | Referencia No |
|------------------|--------------------|---------------|
| Fotómetro alca-M | Tabletas / 100     | 513210BT      |
| Fotómetro alca-M | Tabletas / 250     | 513211BT      |

**Lista de aplicaciones**

- Tratamiento de aguas residuales
- Tratamiento de aguas potables
- Tratamiento de aguas de aporte

**Notas**

1. Las definiciones de alcalinidad-m, valor-m y capacidad ácida  $K_{S4.3}$  son idénticas.
2. Añadir un volumen de muestra de exactamente 10 ml, ya que este volumen influye de forma decisiva en la exactitud del resultado.

**Códigos de idioma ISO 639-1**

**Estado de revisión**

ES Manual de Métodos 01/20

## Realización de la determinación

Ejecución de la determinación Capacidad ácida  $K_{a4.3}$  con tableta

Seleccionar el método en el aparato.

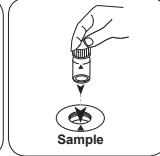
Para este método no es necesario realizar medición CERO en los aparatos siguientes: XD 7000, XD 7500



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

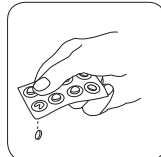


Cerrar la(s) cubeta(s).

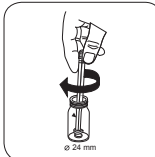


Poner la **cubeta de muestra** en el compartimiento de medición. ¡Debe tenerse en cuenta el posicionamiento!

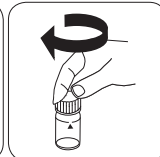
• • •



Añadir **tableta ALKA-M-PHOTOMETER**.



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



Cerrar la(s) cubeta(s).





Cloro HR (KI) T

M105

5 - 200 mg/L Cl<sub>2</sub>

CLHr

KI / ácido

## Material

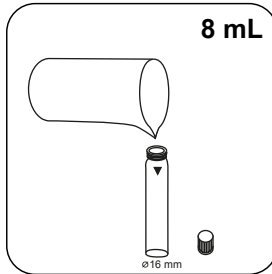
ES

Material requerido (parcialmente opcional):

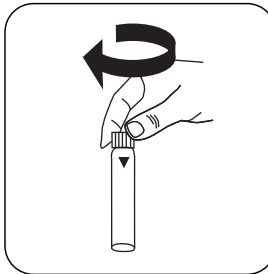
| Reactivos  | Unidad de embalaje | No. de referencia |
|--|--------------------|-------------------|
| Cloro HR (KI)                                    | Tabletas / 100     | 513000BT          |
| Cloro HR (KI)                                    | Tabletas / 250     | 513001BT          |
| Acidificante GP                                  | Tabletas / 100     | 515480BT          |
| Acidificante GP                                  | Tabletas / 250     | 515481BT          |
| Juego cloro HR (KI)/acidificante GP <sup>#</sup> | 100 cada           | 517721BT          |
| Juego cloro HR (KI)/acidificante GP <sup>#</sup> | 250 cada           | 517722BT          |
| Cloro HR (KI)                                    | Tabletas / 100     | 501210            |
| Cloro HR (KI)                                    | Tabletas / 250     | 501211            |

## Ejecución de la determinación Cloro HR (KI) con tableta

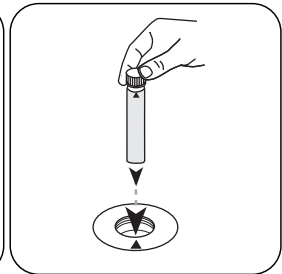
Seleccionar el método en el aparato.



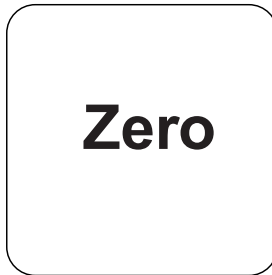
Llenar la cubeta de 16 mm con **8 mL de muestra**.



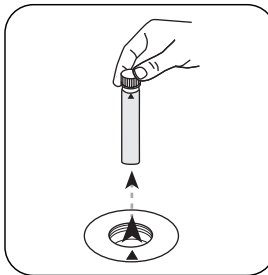
Cerrar la(s) cubeta(s).



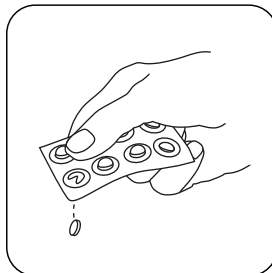
Poner la **cubeta de muestra** en el compartimento de medición. ¡Debe tenerse en cuenta el posicionamiento!



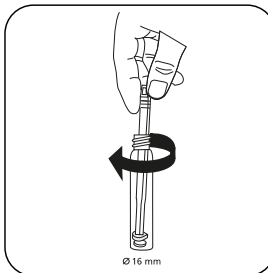
Pulsar la tecla **ZERO**.



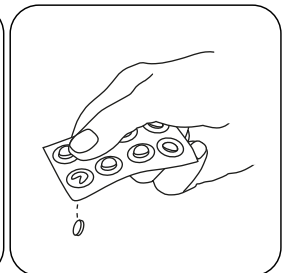
Extraer la **cubeta** del compartimento de medición.



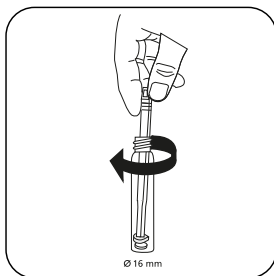
Añadir tableta **Chlorine HR (KI)**.



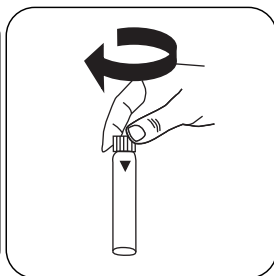
Triturar la(s) tableta(s) girando ligeramente.



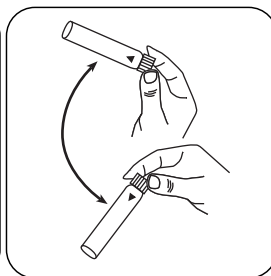
Añadir tableta **ACIDIFYING GP**.



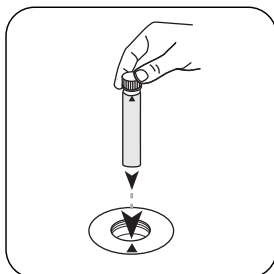
Triturar la(s) tableta(s) girando ligeramente.



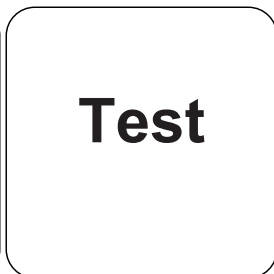
Cerrar la(s) cubeta(s).



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**).

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

## Método químico

KI / ácido

## Apéndice

### Interferencia

ES

#### Interferencias persistentes

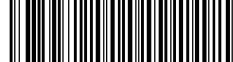
- Todos los elementos oxidantes existentes en la muestra reaccionan como el cloro, lo que produce un resultado más elevado.

### Validación del método

|                                     |                  |
|-------------------------------------|------------------|
| <b>Límite de detección</b>          | 1.29 mg/L        |
| <b>Límite de determinación</b>      | 3.86 mg/L        |
| <b>Límite del rango de medición</b> | 200 mg/L         |
| <b>Sensibilidad</b>                 | 83.96 mg/L / Abs |
| <b>Intervalo de confianza</b>       | 1.14 mg/L        |
| <b>Desviación estándar</b>          | 0.45 mg/L        |
| <b>Coefficiente de variación</b>    | 0.45 %           |

#### Derivado de

EN ISO 7393-3



## Hipoclorito sódico T

M212

0.2 - 16 % NaOCl

Yoduro de potasio

### Material

ES

Material requerido (parcialmente opcional):

| Reactivos  | Unidad de embalaje | No. de referencia |
|--|--------------------|-------------------|
| Acidificante GP                                  | Tabletas / 100     | 515480BT          |
| Acidificante GP                                  | Tabletas / 250     | 515481BT          |
| Cloro HR (KI)                                    | Tabletas / 100     | 513000BT          |
| Cloro HR (KI)                                    | Tabletas / 250     | 513001BT          |
| Cloro HR (KI)                                    | Tabletas / 100     | 501210            |
| Cloro HR (KI)                                    | Tabletas / 250     | 501211            |
| Juego cloro HR (KI)/acidificante GP <sup>#</sup> | 100 cada           | 517721BT          |
| Juego cloro HR (KI)/acidificante GP <sup>#</sup> | 250 cada           | 517722BT          |
| Juego de dilución hipoclorito sódico             | 1 Cantidad         | 414470            |

### Notas

1. Este método permite realizar una muestra rápida simple, que puede realizarse in situ y, por lo tanto, no es tan precisa como un método de laboratorio comparable.
2. Cumpliendo estrictamente el procedimiento descrito puede alcanzarse una exactitud de  $\pm 1$  peso %.

## Ejecución de la determinación Hipoclorito sódico con tableta

Seleccionar el método en el aparato.

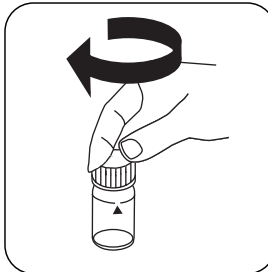
La muestra se diluye 1/2000:

1. Primero, lavar una jeringuilla de 5 mL con la solución a investigar y después llenar hasta la marca de 5 mL.
2. Vaciar la jeringuilla en un vaso graduado de 100 mL.
3. Llenar con agua sin cloro el vaso graduado hasta la marca de 100 mL.
4. Mezclar el contenido agitando.
5. Llenar una jeringuilla de 5 mL limpia con solución diluida hasta la marca de 1 mL.
6. Vaciar la jeringuilla en un vaso graduado limpio de 100 mL.
7. Llenar con agua sin cloro el vaso graduado hasta la marca de 100 mL.
8. Mezclar el contenido agitando.

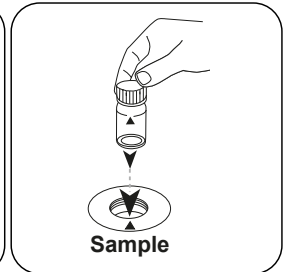
El test se realiza con esta solución.



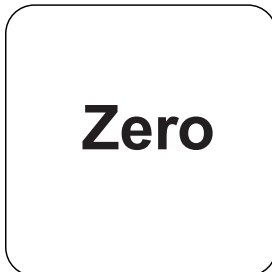
Llenar la cubeta de 24 mm con **10 mL de la muestra preparada**.



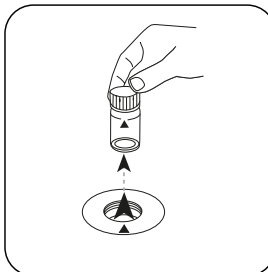
Cerrar la(s) cubeta(s).



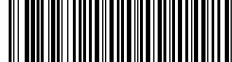
Poner la **cubeta de muestra** en el compartimento de medición. ¡Debe tenerse en cuenta el posicionamiento!



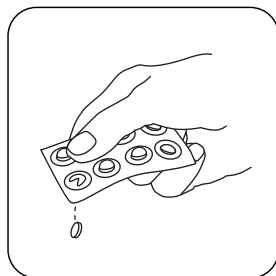
Pulsar la tecla **ZERO**.



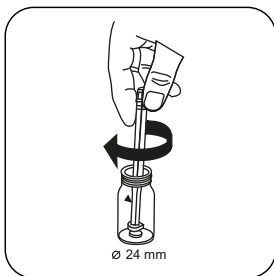
Extraer la cubeta del compartimento de medición.



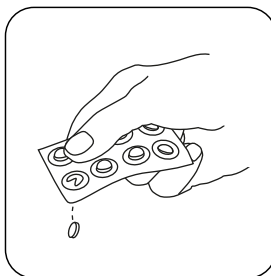
ES



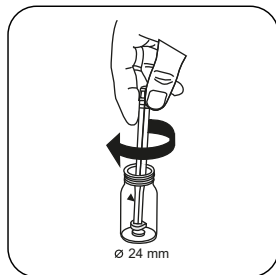
Añadir **tableta CHLORINE HR (KI)**.



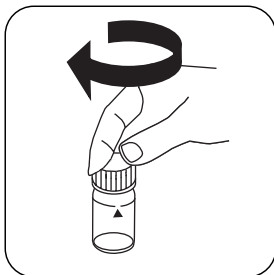
Triturar la(s) tableta(s) girando ligeramente.



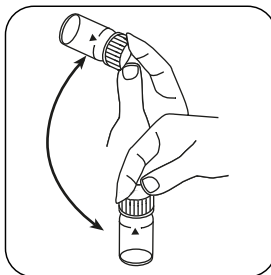
Añadir **tableta ACIDIFYING GP**.



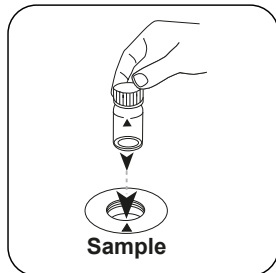
Triturar la(s) tableta(s) girando ligeramente.



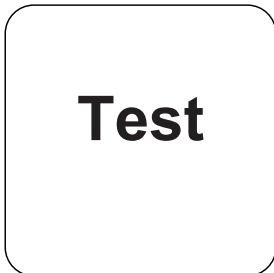
Cerrar la(s) cubeta(s).



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)**.

A continuación se visualiza el contenido en cloro efectivo en porcentaje del peso (w/w %) respecto a la solución de hipoclorito sódico **sin diluir**.



## Método químico

Yoduro de potasio

## Apéndice

### Validación del método

|                                     |              |
|-------------------------------------|--------------|
| <b>Límite de detección</b>          | 0.03 %       |
| <b>Límite de determinación</b>      | 0.1 %        |
| <b>Límite del rango de medición</b> | 16.8 %       |
| <b>Sensibilidad</b>                 | 9.21 % / Abs |
| <b>Intervalo de confianza</b>       | 0.12 %       |
| <b>Desviación estándar</b>          | 0.05 %       |
| <b>Coefficiente de variación</b>    | 0.55 %       |


### Derivado de

EN ISO 7393-3

ES



KS4.3 T / 20



**Nom de la méthode** → KS4.3 T

**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** → 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,<br>MD 640, MultiDirect, PM 620,<br>PM 630 | ø 24 mm | 610 nm    | 0.1 - 4 mmol/l $K_{S4.3}$ |
| SpectroDirect, XD 7000,<br>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

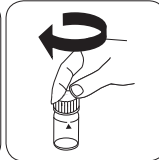
FR Méthodes Manuel 01/20

## Procédure du test

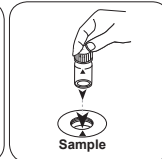
**Réalisation de la quantification Capacité acide  $K_{s4,3}$  avec pastille**

Sélectionnez la méthode sur l'appareil.

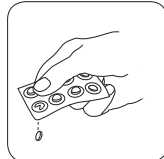
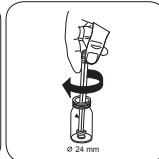
Cette méthode ne nécessite aucune mesure du zéro sur les appareils suivants : XD 7000, XD 7500

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

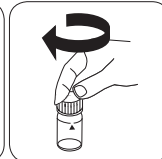
Fermez la(les) cuvette(s).

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).



Chlore HR (KI) T

M105

5 - 200 mg/L Cl<sub>2</sub>

CLHr

KI / Acide

## Matériel

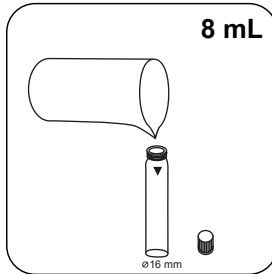
FR

Matériel requis (partiellement optionnel):

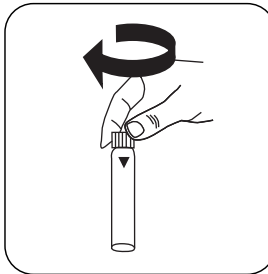
| Réactifs                          | Pack contenant  | Code     |
|-----------------------------------|-----------------|----------|
| Chlore HR (KI)                    | Pastilles / 100 | 513000BT |
| Chlore HR (KI)                    | Pastilles / 250 | 513001BT |
| Acidifiants PT                    | Pastilles / 100 | 515480BT |
| Acidifiants PT                    | Pastilles / 250 | 515481BT |
| Kit chlore HR (KI)/acidifiant GP# | 100 chacun      | 517721BT |
| Kit chlore HR (KI)/acidifiant GP# | 250 chacun      | 517722BT |
| Chlore HR (KI)                    | Pastilles / 100 | 501210   |
| Chlore HR (KI)                    | Pastilles / 250 | 501211   |

## Réalisation de la quantification Chlore HR (KI) avec pastille

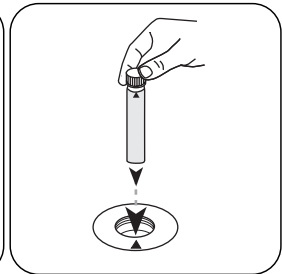
Sélectionnez la méthode sur l'appareil.



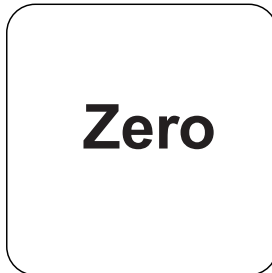
Remplissez une cuvette de 16 mm de **8 mL** d'échantillon.



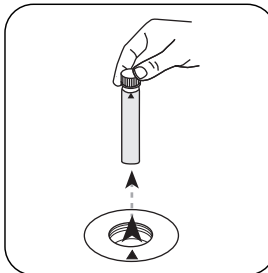
Fermez la(les) cuvette(s).



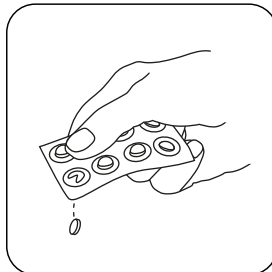
Placez la **cuvette réservée à l'échantillon** dans la chambre de mesure. Attention à la positionner correctement.



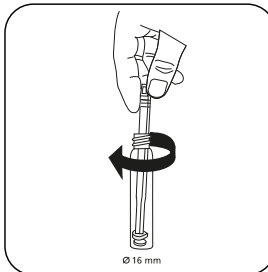
Appuyez sur la touche **ZERO**.



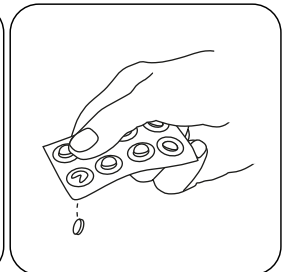
Retirez la **cuvette** de la chambre de mesure.



Ajoutez une **pastille de Chlorine HR (KI)**.



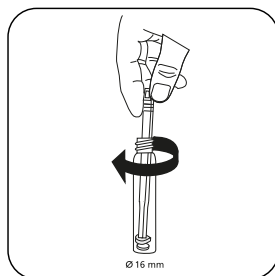
Écrasez la(les) pastille(s) en la(les) tournant un peu.



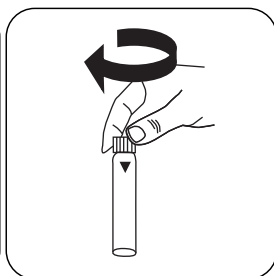
Ajoutez une **pastille de ACIDIFYING GP**.



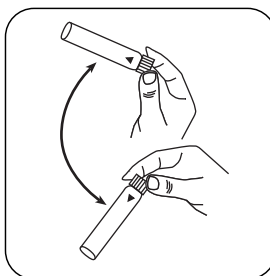
FR



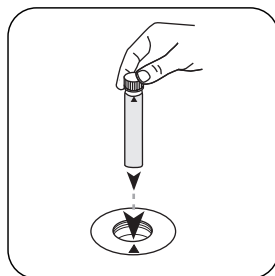
Écrasez la(les) pastille(s)  
en la(les) tournant un peu.



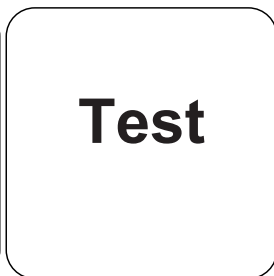
Fermez la(les) cuvette(s).



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)**.

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

## Méthode chimique

KI / Acide

## Appendice

### Interférences

#### Interférences persistantes

- Les agents oxydants contenus dans les échantillons réagissent tous comme le chlore, ce qui entraîne des résultats plus élevés.

### Méthode Validation

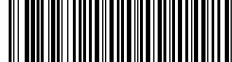
|                                  |                  |
|----------------------------------|------------------|
| <b>Limite de détection</b>       | 1.29 mg/L        |
| <b>Limite de détermination</b>   | 3.86 mg/L        |
| <b>Fin de la gamme de mesure</b> | 200 mg/L         |
| <b>Sensibilité</b>               | 83.96 mg/L / Abs |
| <b>Intervalle de confiance</b>   | 1.14 mg/L        |
| <b>Déviatoin standard</b>        | 0.45 mg/L        |
| <b>Coefficient de variation</b>  | 0.45 %           |

#### Dérivé de

EN ISO 7393-3

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

FR



## Hypochlorite de sodium T

M212

0.2 - 16 % NaOCI

Sodumiodide

FR

### Matériel

Matériel requis (partiellement optionnel):

| Réactifs                                  | Pack contenant  | Code     |
|---|-----------------|----------|
| Acidifiants PT                            | Pastilles / 100 | 515480BT |
| Acidifiants PT                            | Pastilles / 250 | 515481BT |
| Chlore HR (KI)                            | Pastilles / 100 | 513000BT |
| Chlore HR (KI)                            | Pastilles / 250 | 513001BT |
| Chlore HR (KI)                            | Pastilles / 100 | 501210   |
| Chlore HR (KI)                            | Pastilles / 250 | 501211   |
| Kit chlore HR (KI)/acidifiant GP#         | 100 chacun      | 517721BT |
| Kit chlore HR (KI)/acidifiant GP#         | 250 chacun      | 517722BT |
| Kit de dissolution Hypochlorite de sodium | 1 Pièces        | 414470   |

### Indication

1. Cette méthode est une possibilité simple et rapide, réalisée immédiatement. Elle n'est donc pas aussi fidèle qu'une méthode de laboratoire comparable.
2. En respectant exactement la marche à suivre décrite, il est possible d'obtenir une exactitude de  $\pm 1\%$  en poids.

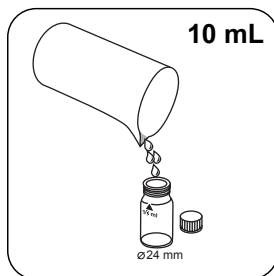
## Réalisation de la quantification Hypochlorite de sodium avec pastille

Sélectionnez la méthode sur l'appareil.

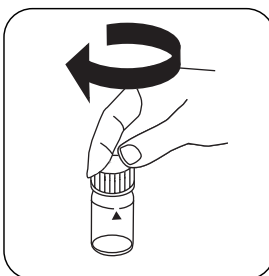
L'échantillon est dilué au 2 000ème :

1. Rincez tout d'abord une seringue de 5 mL en utilisant la solution à analyser et puis remplissez-la jusqu'au repère de 5 mL.
2. Videz la seringue dans un bécher de mesure 100 mL.
3. Remplissez le bécher de mesure d'eau déchlorée jusqu'au repère de 100 mL.
4. Mélangez le contenu.
5. Remplissez une seringue propre de 5 mL jusqu'au repère de 1 mL en utilisant la solution diluée.
6. Videz la seringue dans un bécher de mesure propre de 100 mL.
7. Remplissez le bécher de mesure d'eau déchlorée jusqu'au repère de 100 mL.
8. Mélangez le contenu.

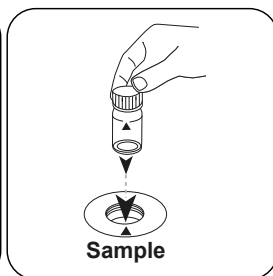
Le test est effectué avec cette solution.



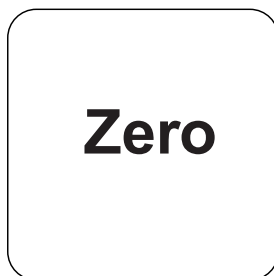
Remplissez une cuvette de 24 mm de **10 mL d'échantillon préparé**.



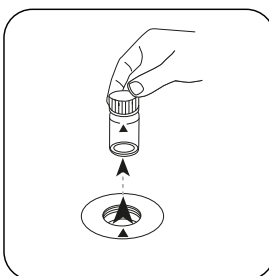
Fermez la(les) cuvette(s).



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

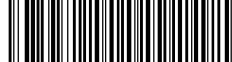


Appuyez sur la touche **ZERO**.

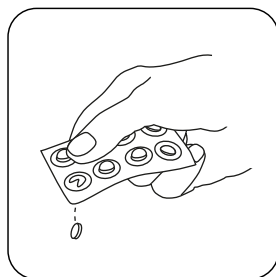


Retirez la cuvette de la chambre de mesure.

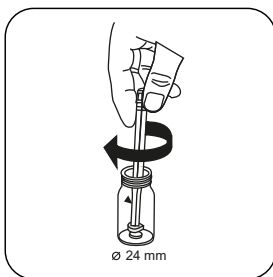




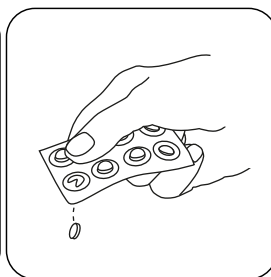
FR



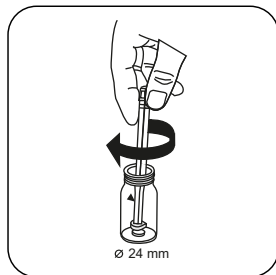
Ajoutez une **pastille de CHLORINE HR (KI)**.



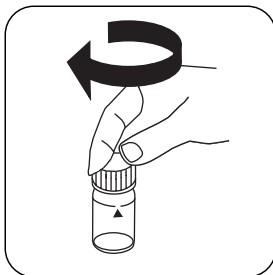
Écrasez la(les) pastille(s) en la(les) tournant un peu.



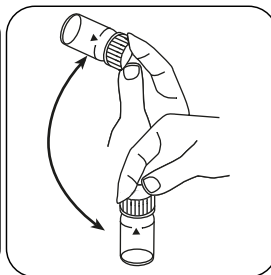
Ajoutez une **pastille de ACIDIFYING GP**.



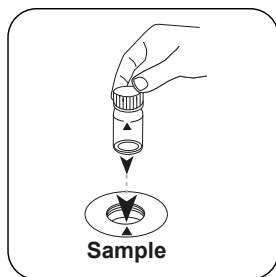
Écrasez la(les) pastille(s) en la(les) tournant un peu.



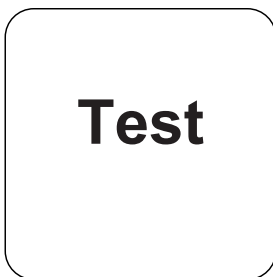
Fermez la(les) cuvette(s).



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)**.

La teneur en chlore actif s'affiche à l'écran en pourcentage en poids (w/w %) par rapport à la solution d'hypochlorite de sodium **non diluée**.



## Méthode chimique

Sodiumiodide

## Appendice

### Méthode Validation

|                                  |              |
|----------------------------------|--------------|
| <b>Limite de détection</b>       | 0.03 %       |
| <b>Limite de détermination</b>   | 0.1 %        |
| <b>Fin de la gamme de mesure</b> | 16.8 %       |
| <b>Sensibilité</b>               | 9.21 % / Abs |
| <b>Intervalle de confiance</b>   | 0.12 %       |
| <b>Déviation standard</b>        | 0.05 %       |
| <b>Coefficient de variation</b>  | 0.55 %       |

### Dérivé de

EN ISO 7393-3

†# agitateur inclus

FR

KS4.3 T / 20

Nome do método

Número do método

Código de barras para a detecção dos métodos

Área de medição

Método Químico

Indicado no display: MD 100 / MD 200

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

20  
S:4.3

**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,<br>MD 640, MultiDirect, PM 620,<br>PM 630 | ø 24 mm | 610 nm    | 0.1 - 4 mmol/l $K_{S_{4.3}}$ |
| SpectroDirect, XD 7000,<br>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

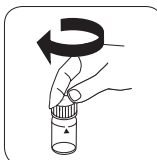
### Realização da determinação Capacidade de acidez $K_{s4.3}$ com pastilha

Escolher o método no equipamento.

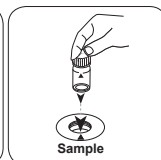
Para este método não tem de ser efetuada uma medição ZERO nos seguintes equipamentos: XD 7000, XD 7500



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

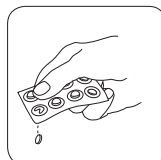


Fechar a(s) célula(s).

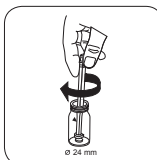


Colocar a **célula de amostra** no compartimento de medição. Observar o posicionamento.

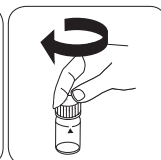
• • •



Pastilha ALKA-M-PHOTO-METER.



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



Fechar a(s) célula(s).

PT Métodos Manual 01/20

PT



Cloro HR (KI) T

M105

5 - 200 mg/L Cl<sub>2</sub>

CLHr

KI / Ácido

## Material

PT

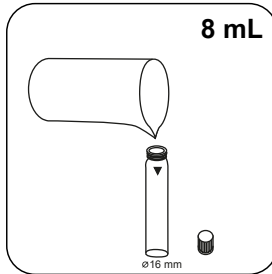
Material necessário (parcialmente opcional):

| Reagentes                            | Unidade de Embalagem | Código do Produto |
|--------------------------------------|----------------------|-------------------|
| Cloro HR (KI)                        | Pastilhas / 100      | 513000BT          |
| Cloro HR (KI)                        | Pastilhas / 250      | 513001BT          |
| Acidificante GP                      | Pastilhas / 100      | 515480BT          |
| Acidificante GP                      | Pastilhas / 250      | 515481BT          |
| Definir Cloro HR (KI)/Acidificar GP# | cada 100             | 517721BT          |
| Definir Cloro HR (KI)/Acidificar GP# | cada 250             | 517722BT          |
| Cloro HR (KI)                        | Pastilhas / 100      | 501210            |
| Cloro HR (KI)                        | Pastilhas / 250      | 501211            |

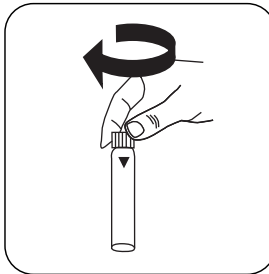


## Realização da determinação Cloro HR (KI) com pastilha

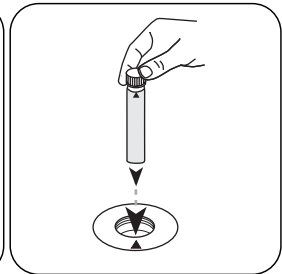
Escolher o método no equipamento.



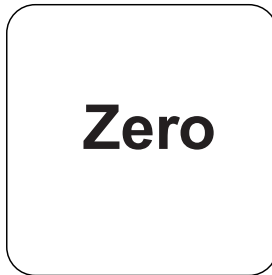
Encher a célula de 16 mm com **8 mL de amostra**.



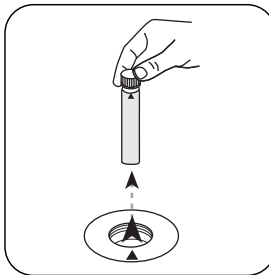
Fechar a(s) célula(s).



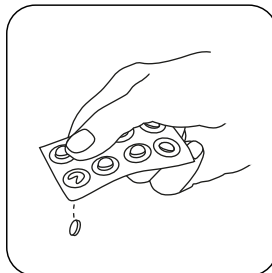
Colocar a **célula de amostra** no compartimento de medição. Observar o posicionamento.



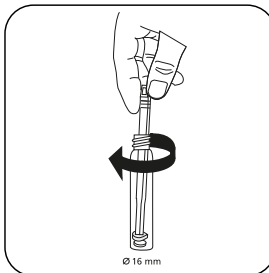
Premir a tecla **ZERO**.



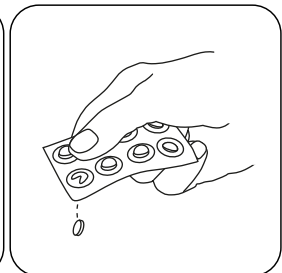
Retirar a **célula** do compartimento de medição.



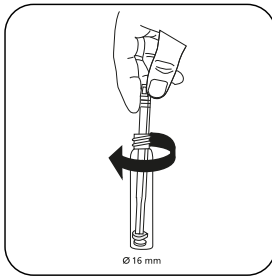
**Pastilha Chlorine HR (KI).**



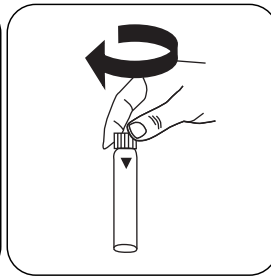
Esmagar a(s) pastilha(s) rodando ligeiramente.



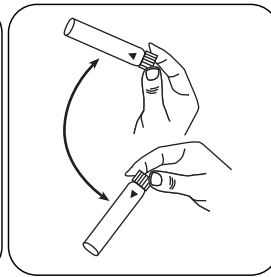
**Pastilha ACIDIFYING GP.**



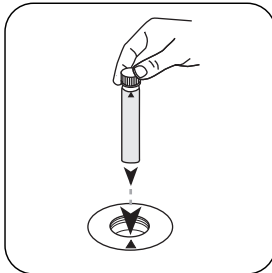
Esmagar a(s) pastilha(s) rodando ligeiramente.



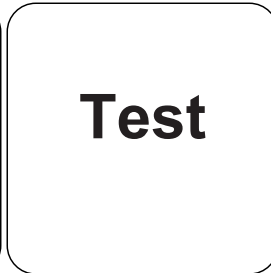
Fechar a(s) célula(s).



Dissolver a(s) pastilha(s) girando.



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



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

No visor aparece o resultado em mg/L Cloro.

## Método Químico

KI / Ácido

## Apêndice

### Texto de Interferências

#### Interferências Persistentes

- Todos os oxidantes presentes nas amostras reagem como o cloro, o que leva a resultados demasiado altos.

### Validação de método

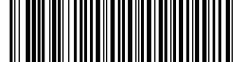
|                                 |                  |
|---------------------------------|------------------|
| <b>Limite de Detecção</b>       | 1.29 mg/L        |
| <b>Limite de Determinação</b>   | 3.86 mg/L        |
| <b>Fim da Faixa de Medição</b>  | 200 mg/L         |
| <b>Sensibilidade</b>            | 83.96 mg/L / Abs |
| <b>Faixa de Confiança</b>       | 1.14 mg/L        |
| <b>Desvio Padrão</b>            | 0.45 mg/L        |
| <b>Coefficiente de Variação</b> | 0.45 %           |

#### Derivado de

EN ISO 7393-3

\*incluindo vareta de agitação





## Hipoclorito de sódio T

M212

0.2 - 16 % NaOCl

Potassium Iodide

PT

### Material

Material necessário (parcialmente opcional):

| Reagentes                                 | Unidade de Embalagem | Código do Produto |
|---|----------------------|-------------------|
| Acidificante GP                           | Pastilhas / 100      | 515480BT          |
| Acidificante GP                           | Pastilhas / 250      | 515481BT          |
| Cloro HR (KI)                             | Pastilhas / 100      | 513000BT          |
| Cloro HR (KI)                             | Pastilhas / 250      | 513001BT          |
| Cloro HR (KI)                             | Pastilhas / 100      | 501210            |
| Cloro HR (KI)                             | Pastilhas / 250      | 501211            |
| Definir Cloro HR (KI)/Acidificar GP#      | cada 100             | 517721BT          |
| Definir Cloro HR (KI)/Acidificar GP#      | cada 250             | 517722BT          |
| Conjunto de diluição hipoclorito de sódio | 1 pc.                | 414470            |

### Notas

1. Este método permite um teste rápido e simples que pode ser realizado no local e, por isso, não é tão preciso como um método de laboratório equiparado.
2. Se o procedimento descrito for rigorosamente cumprido, pode conseguir-se uma previsão de  $\pm 1\%$  de peso.

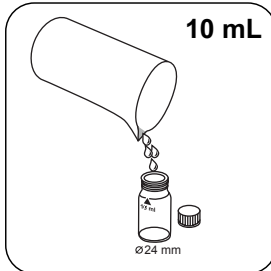
## Realização da determinação Hipoclorito de sódio com pastilha

Escolher o método no equipamento.

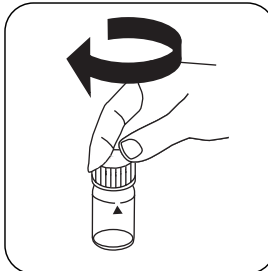
A amostra é 2000 vezes diluída:

1. Começar por enxaguar uma seringa de 5 mL com a solução a analisar e depois encher até à marca de 5 mL.
2. Esvaziar a seringa para um copo medida de 100 mL.
3. Encher o copo medida com água sem cloro até à marca de 100 mL.
4. Misturar o conteúdo agitando.
5. Encher uma seringa de 5 mL limpa com a solução diluída até à marca de 1 mL.
6. Esvaziar a seringa para um copo medida limpo de 100 mL.
7. Encher o copo medida com água sem cloro até à marca de 100 mL.
8. Misturar o conteúdo agitando.

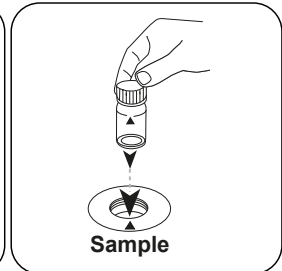
O teste é realizado com esta solução.



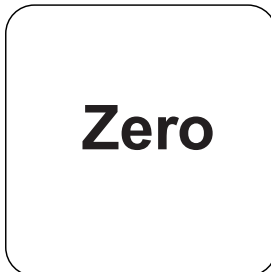
Encher a célula de 24 mm com **10 mL de amostra preparada**.



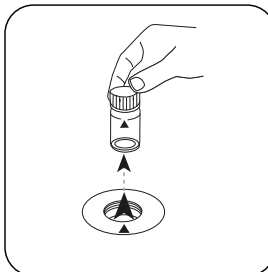
Fechar a(s) célula(s).



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



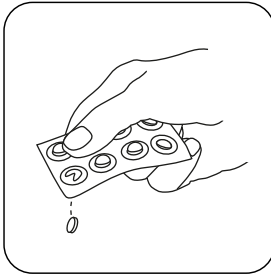
Premir a tecla **ZERO**.



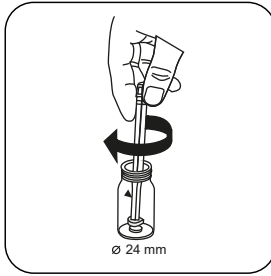
Retirar a célula do compartimento de medição.



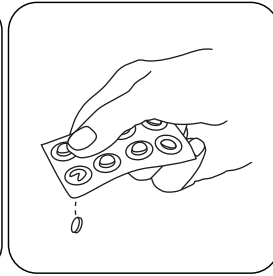
PT



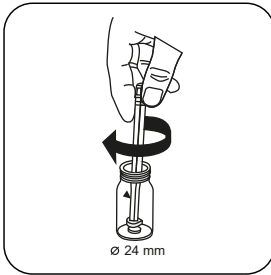
**Pastilha CHLORINE HR (KI).**



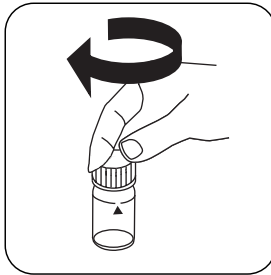
Esmagar a(s) pastilha(s) rodando ligeiramente.



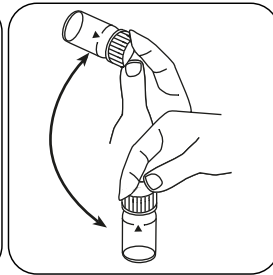
**Pastilha ACIDIFYING GP.**



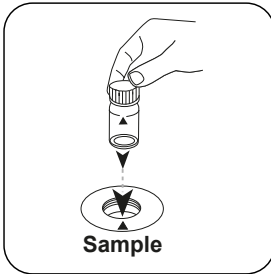
Esmagar a(s) pastilha(s) rodando ligeiramente.



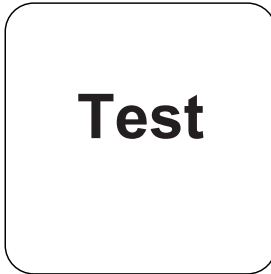
Fechar a(s) célula(s).



Dissolver a(s) pastilha(s) girando.



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



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

No visor aparece o teor de cloro eficaz em percentagem de peso (w/w %) relativamente à solução de hipoclorito de sódio **não diluída**.



## Método Químico

Potassium Iodide

## Apêndice

### Validação de método

|                                 |              |
|---------------------------------|--------------|
| <b>Limite de Detecção</b>       | 0.03 %       |
| <b>Limite de Determinação</b>   | 0.1 %        |
| <b>Fim da Faixa de Medição</b>  | 16.8 %       |
| <b>Sensibilidade</b>            | 9.21 % / Abs |
| <b>Faixa de Confiança</b>       | 0.12 %       |
| <b>Desvio Padrão</b>            | 0.05 %       |
| <b>Coefficiente de Variação</b> | 0.55 %       |


### Derivado de

EN ISO 7393-3

\*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

**Metodo chimico**

Acido/indicatore

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

**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,<br>MD 640, MultiDirect, PM 620,<br>PM 630 | ø 24 mm | 610 nm    | 0.1 - 4 mmol/l $K_{S_{4.3}}$ |
| SpectroDirect, XD 7000,<br>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**

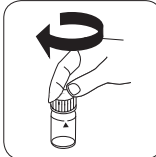
**Esecuzione della rilevazione Capacità acida  $K_{s4,3}$  con pastiglia**

Selezionare il metodo nel dispositivo.

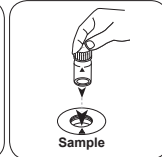
Con i seguenti dispositivi, per questo metodo non è necessario eseguire una misurazione ZERO: XD 7000, XD 7500



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

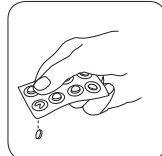


Chiudere la/e cuvetta/e.

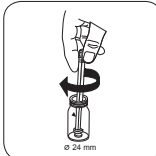


Posizionare la **cuvetta del campione** nel vano di misurazione. Fare attenzione al posizionamento.

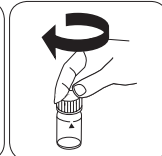
• • •



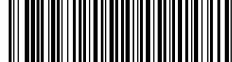
Aggiungere una **pastiglia ALKA-M-PHOTOMETER**.



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



Chiudere la/e cuvetta/e.



Cloro HR (KI) T

M105

5 - 200 mg/L Cl<sub>2</sub>

CLHr

KI/acido

IT

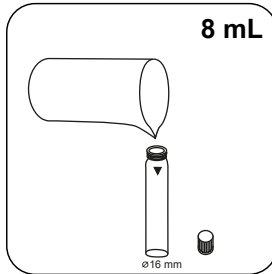
## Materiale

Materiale richiesto (in parte facoltativo):

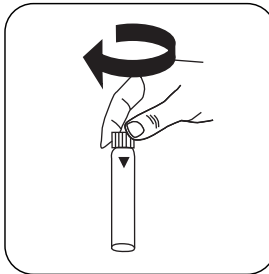
| Reagenti                                       | Unità di<br>imballaggio | N. ordine |
|--|-------------------------|-----------|
| Cloro HR (KI)                                  | Pastiglia / 100         | 513000BT  |
| Cloro HR (KI)                                  | Pastiglia / 250         | 513001BT  |
| Acidificante GP                                | Pastiglia / 100         | 515480BT  |
| Acidificante GP                                | Pastiglia / 250         | 515481BT  |
| Set Cloro HR (KI)/Acidificante GP <sup>#</sup> | ciascuna 100            | 517721BT  |
| Set Cloro HR (KI)/Acidificante GP <sup>#</sup> | ciascuna 250            | 517722BT  |
| Cloro HR (KI)                                  | Pastiglia / 100         | 501210    |
| Cloro HR (KI)                                  | Pastiglia / 250         | 501211    |

## Esecuzione della rilevazione Cloro HR (KI) con pastiglia

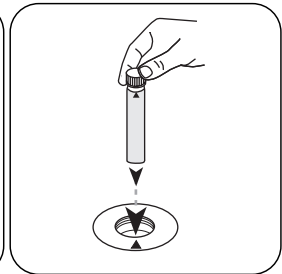
Selezionare il metodo nel dispositivo.



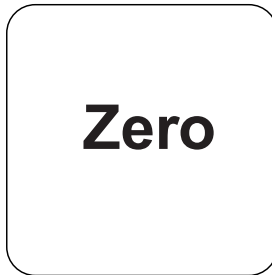
Riempire una cuvetta da 16 mm con **8 mL di campione**.



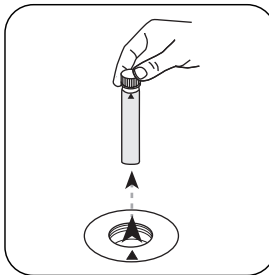
Chiudere la/e cuvetta/e.



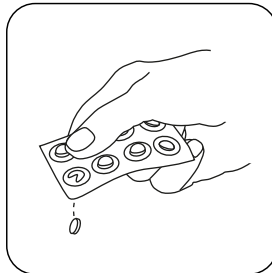
Posizionare la **cuvetta del campione** nel vano di misurazione. Fare attenzione al posizionamento.



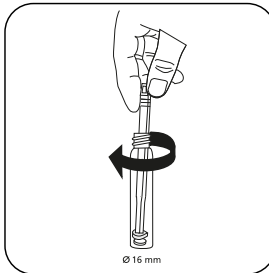
Premere il tasto **ZERO**.



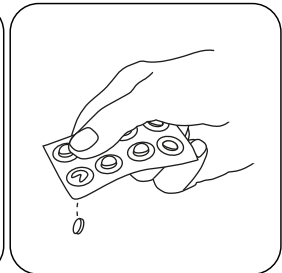
Prelevare la **cuvetta** dal vano di misurazione.



Aggiungere una **pastiglia Chlorine HR (KI)**.



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

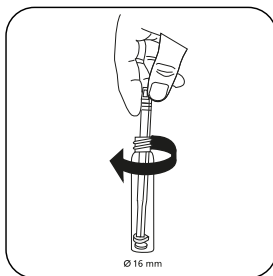


Aggiungere una **pastiglia ACIDIFYING GP**.

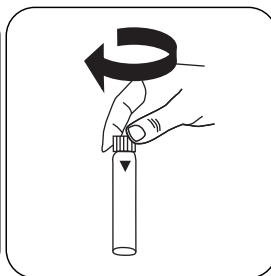




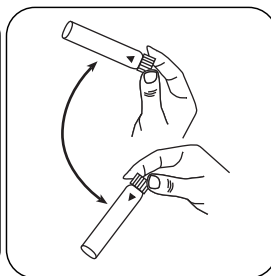
IT



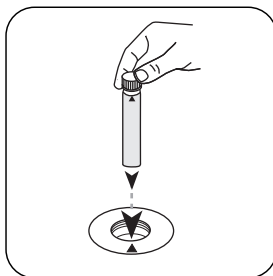
Frantumare la/e pastiglia/e con una leggera rotazione.



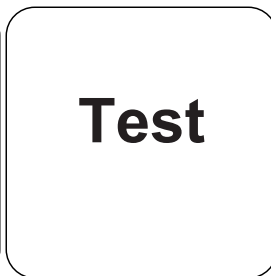
Chiudere la/e cuvetta/e.



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**).

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

## Metodo chimico

KI/acido

## Appendice

### Interferenze

#### Interferenze permanenti

- Tutti gli ossidanti presenti nei campioni reagiscono come il cloro dando risultati troppo elevati.

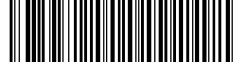
### Validazione metodo

|   |                  |
|---|------------------|
| <b>Limite di rilevabilità</b>                     | 1.29 mg/L        |
| <b>Limite di quantificazione</b>                  | 3.86 mg/L        |
| <b>Estremità campo di misura</b>                  | 200 mg/L         |
| <b>Sensibilità</b>                                | 83.96 mg/L / Abs |
| <b>Intervallo di confidenza</b>                   | 1.14 mg/L        |
| <b>Deviazione standard della procedura</b>        | 0.45 mg/L        |
| <b>Coefficiente di variazione della procedura</b> | 0.45 %           |

#### Derivato di

EN ISO 7393-3

<sup>#</sup>Bacchetta compresa



Ipoclorito di sodio T

M212

0.2 - 16 % NaOCl

Ioduro di potassio

IT

## Materiale

Materiale richiesto (in parte facoltativo):

| Reagenti                                       | Unità di<br>imballaggio | N. ordine |
|--|-------------------------|-----------|
| Acidificante GP                                | Pastiglia / 100         | 515480BT  |
| Acidificante GP                                | Pastiglia / 250         | 515481BT  |
| Cloro HR (KI)                                  | Pastiglia / 100         | 513000BT  |
| Cloro HR (KI)                                  | Pastiglia / 250         | 513001BT  |
| Cloro HR (KI)                                  | Pastiglia / 100         | 501210    |
| Cloro HR (KI)                                  | Pastiglia / 250         | 501211    |
| Set Cloro HR (KI)/Acidificante GP <sup>#</sup> | ciascuna 100            | 517721BT  |
| Set Cloro HR (KI)/Acidificante GP <sup>#</sup> | ciascuna 250            | 517722BT  |
| Set di diluizione Ipoclorito di sodio          | 1 pz.                   | 414470    |

## Note

1. Questo metodo consente di eseguire un test rapido e semplice sul posto, che non sarà accurato come un metodo di laboratorio comparabile.
2. Attenendosi scrupolosamente alla procedura descritta è possibile ottenere un'accuratezza di  $\pm 1\%$  in peso.

## Esecuzione della rilevazione Ipoclorito di sodio con pastiglia

Selezionare il metodo nel dispositivo.

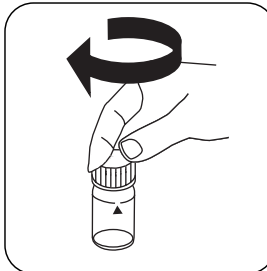
Il campione viene diluito per 2000 volte:

1. Sciacquare innanzitutto una siringa da 5 mL internamente con la soluzione da esaminare e quindi riempirla fino alla tacca dei 5 mL.
2. Iniettare l'intero contenuto della siringa in un misurino da 100 mL.
3. Riempire il misurino con acqua priva di cloro fino alla tacca dei 100 mL.
4. Miscelare il contenuto agitando.
5. Riempire una siringa pulita da 5 mL fino alla tacca di 1 mL con la soluzione diluita.
6. Iniettare l'intero contenuto della siringa in un misurino pulito da 100 mL.
7. Riempire il misurino con acqua priva di cloro fino alla tacca dei 100 mL.
8. Miscelare il contenuto agitando.

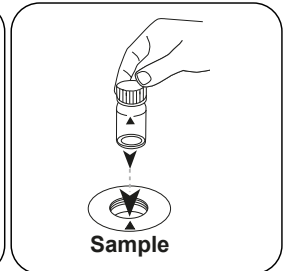
Il test viene eseguito con questa soluzione.



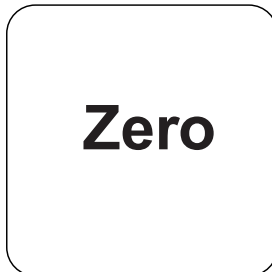
Riempire una cuvetta da 24 mm con **10 mL del campione preparato**.



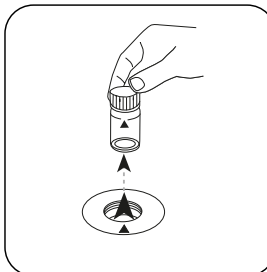
Chiudere la/e cuvetta/e.



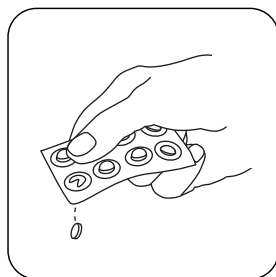
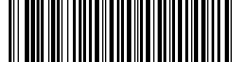
Posizionare la **cuvetta del campione** nel vano di misurazione. Fare attenzione al posizionamento.



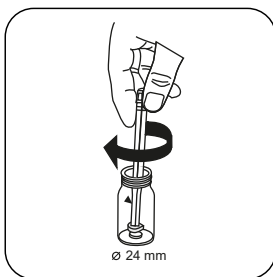
Premere il tasto **ZERO**.



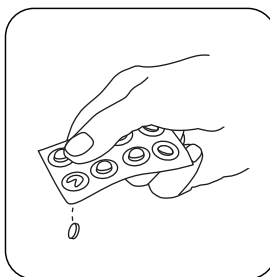
Prelevare la cuvetta dal vano di misurazione.



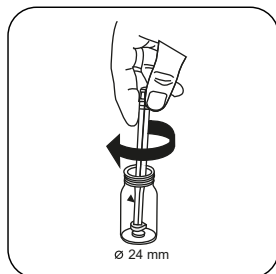
Aggiungere **una pastiglia CHLORINE HR (KI)**.



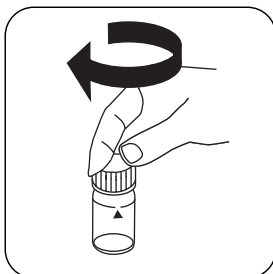
Frantumare la/e pastiglia/e con una leggera rotazione.



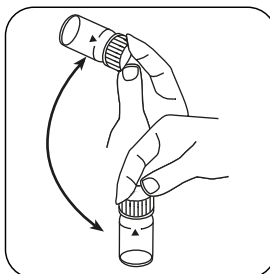
Aggiungere **una pastiglia ACIDIFYING GP**.



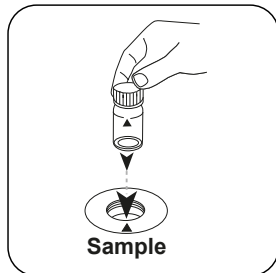
Frantumare la/e pastiglia/e con una leggera rotazione.



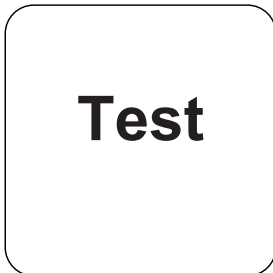
Chiudere la/e cuvetta/e.



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)**.

Sul display compare il tenore di cloro attivo in percentuale di peso (w/w %) riferita alla soluzione di ipoclorito di sodio **non diluita**.

## Metodo chimico

Ioduro di potassio

## Appendice

### Validazione metodo

|   |              |
|---|--------------|
| <b>Limite di rilevabilità</b>                     | 0.03 %       |
| <b>Limite di quantificazione</b>                  | 0.1 %        |
| <b>Estremità campo di misura</b>                  | 16.8 %       |
| <b>Sensibilità</b>                                | 9.21 % / Abs |
| <b>Intervallo di confidenza</b>                   | 0.12 %       |
| <b>Deviazione standard della procedura</b>        | 0.05 %       |
| <b>Coefficiente di variazione della procedura</b> | 0.55 %       |


### Derivato di

EN ISO 7393-3

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

IT

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**

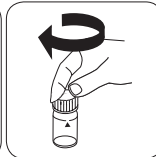
**Uitvoering van de bepaling Zuurcapaciteit  $K_{s4,3}$  met tablet**

De methode in het apparaat selecteren.

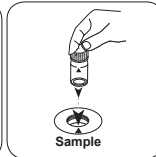
Voor deze methode moet bij de volgende apparaten geen nulmeting worden uitgevoerd:  
XD 7000, XD 7500



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  $K_{s4,3}$ .





Chloor HR (KI) T

M105

5 - 200 mg/L Cl<sub>2</sub>

CLHr

Al / Zuur

NL

## Reagentia

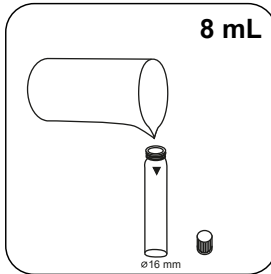
Benodigd materiaal (deels optioneel):

| Reagentia                         | Verpakkingseenheid | Bestelnr. |
|-----------------------------------|--------------------|-----------|
| Chloor HR (KI)                    | Tablet / 100       | 513000BT  |
| Chloor HR (KI)                    | Tablet / 250       | 513001BT  |
| Acidifying GP                     | Tablet / 100       | 515480BT  |
| Acidifying GP                     | Tablet / 250       | 515481BT  |
| Set chloor HR (KI)/Acidifying GP# | per 100            | 517721BT  |
| Set chloor HR (KI)/Acidifying GP# | per 250            | 517722BT  |
| Chloor HR (KI)                    | Tablet / 100       | 501210    |
| Chloor HR (KI)                    | Tablet / 250       | 501211    |

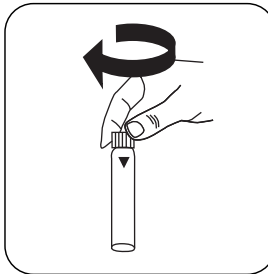


## Uitvoering van de bepaling Chloor HR (KI) met tablet

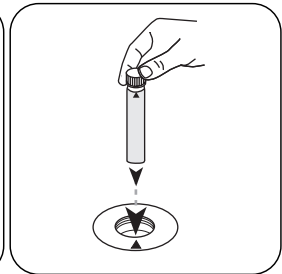
De methode in het apparaat selecteren.



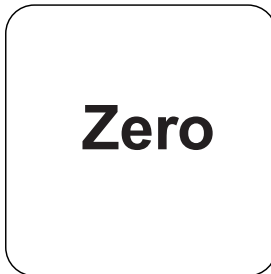
Spoelbakje van 16 mm met **8 mL staal** vullen.



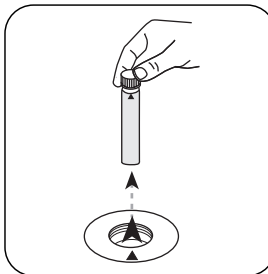
De spoelbakjes afsluiten.



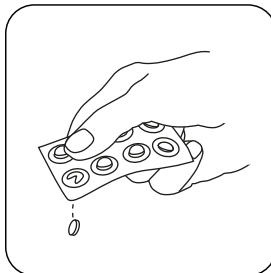
Het **staalspoelbakje** in de meetschacht plaatsen. Op de positionering letteren.



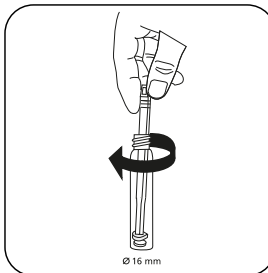
De toets **NUL** indrukken.



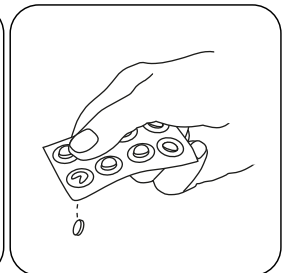
Het **spoelbakje** uit de meetschacht nemen.



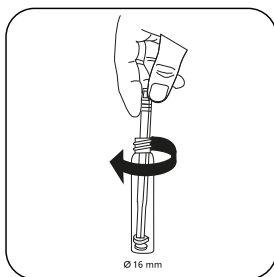
Een **Chloor HR (KI) tablet** toevoegen.



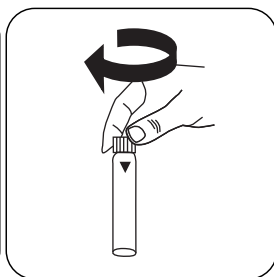
De tabletten onder lichte rotatie verpletteren.



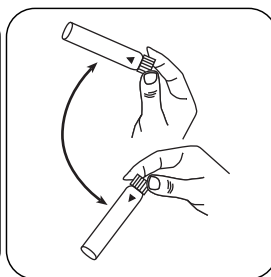
Een **ACIDIFYING GP tablet** toevoegen.



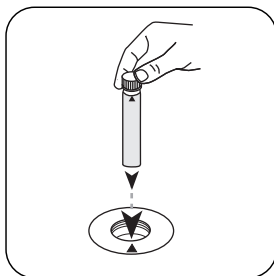
De tabletten onder lichte rotatie verpletteren.



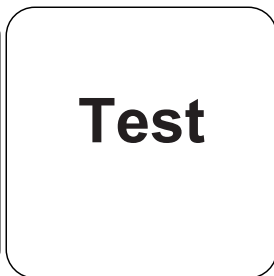
De spoelbakjes afsluiten.



Tabletten oplossen door om te draaien



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



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

De display toont het resultaat in mg/L Chloor.

## Chemische methode

Al / Zuur

## Aanhangsel

## Verstoringen

### Permanente verstoringen

- Alle oxidatiemiddelen in de monsters reageren als chloor, wat tot extra resultaten leidt.

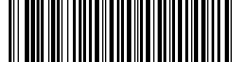
## Validatie van de methodes

|                                      |                  |
|--------------------------------------|------------------|
| <b>Aantoonbaarheidsgrens</b>         | 1.29 mg/L        |
| <b>Bepaalbaarheidsgrens</b>          | 3.86 mg/L        |
| <b>Einde meetbereik</b>              | 200 mg/L         |
| <b>Gevoeligheid</b>                  | 83.96 mg/L / Abs |
| <b>Betrouwbaarheidsgrenzen</b>       | 1.14 mg/L        |
| <b>Standaardafwijking procedure</b>  | 0.45 mg/L        |
| <b>Variatiecoëfficiënt procedure</b> | 0.45 %           |

### Afgeleid van

EN ISO 7393-3

\* met inbegrip van de mengstaaf



Hypochloriet T

M212

0.2 - 16 % NaOCI

Kaliumjodide

NL

## Reagentia

Benodigd materiaal (deels optioneel):

| Reagentia                                     | Verpakkingseenheid | Bestelnr. |
|---|--------------------|-----------|
| Acidifying GP                                 | Tablet / 100       | 515480BT  |
| Acidifying GP                                 | Tablet / 250       | 515481BT  |
| Chloor HR (KI)                                | Tablet / 100       | 513000BT  |
| Chloor HR (KI)                                | Tablet / 250       | 513001BT  |
| Chloor HR (KI)                                | Tablet / 100       | 501210    |
| Chloor HR (KI)                                | Tablet / 250       | 501211    |
| Set chloor HR (KI)/Acidifying GP <sup>#</sup> | per 100            | 517721BT  |
| Set chloor HR (KI)/Acidifying GP <sup>#</sup> | per 250            | 517722BT  |
| Verduunningsset natriumhypochloriet           | 1 St.              | 414470    |

## Aantekeningen

1. Deze methode biedt de mogelijkheid van een eenvoudige sneltest die ter plaatse kan worden uitgevoerd en is daarom niet zo nauwkeurig als een vergelijkbare laboratoriummethode.
2. Als de beschreven procedure strikt wordt gevolgd, kan een nauwkeurigheid van  $\pm 1$  gewichtsprocent worden bereikt.

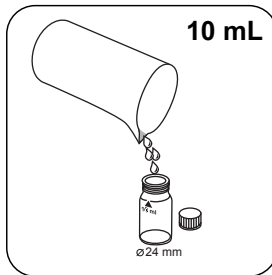
## Uitvoering van de bepaling Natriumhypochloriet met tablet

De methode in het apparaat selecteren.

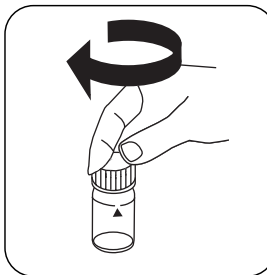
Het staal wordt 2000 keer verdund:

1. Een spuit van 5 mL eerst met de te onderzoeken oplossing uitspoelen en vervolgens tot aan de markering van 5 mL vullen.
2. De spuit in een maatbeker van 100 mL ledigen.
3. De maatbeker tot aan de markering van 100 mL met chloorvrij water vullen.
4. De inhoud mengen door te roeren.
5. Een propere spuit van 5 mL tot aan de markering van 1 mL met de verdunde oplossing vullen.
6. De spuit in een propere maatbeker van 100 mL vullen.
7. De maatbeker tot aan de markering van 100 mL met chloorvrij water vullen.
8. De inhoud mengen door te roeren.

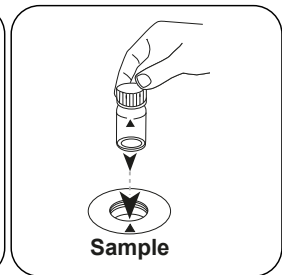
De test wordt met deze oplossing uitgevoerd.



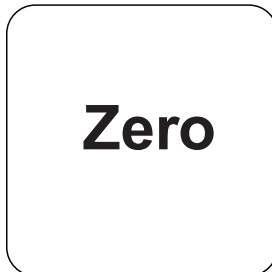
Spoelbakje van 24 mm met **10 mL voorbereid staal** vullen.



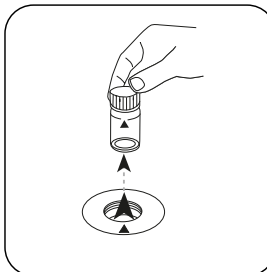
De spoelbakjes afsluiten.



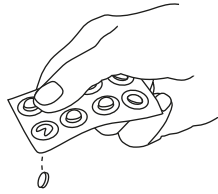
Het **staalspoelbakje** in de meetschacht plaatsen. Op de positionering letten.



De toets **NUL** indrukken.



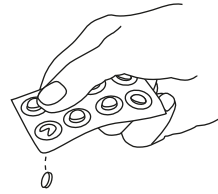
Het spoelbakje uit de meetschacht nemen.



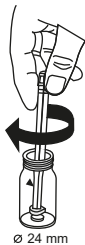
**Een CHLORINE HR (KI) tablet toevoegen.**



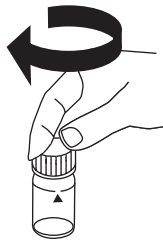
De tabletten onder lichte rotatie verpletteren.



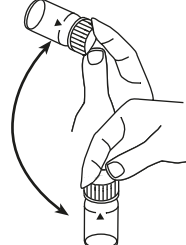
**Een ACIDIFYING GP tablet toevoegen.**



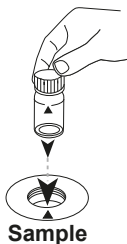
De tabletten onder lichte rotatie verpletteren.



De spoelbakjes afsluiten.



Tabletten oplossen door om te draaien



**Sample**

**Test**

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

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

De display toont het gehalte werkzaam chloor in gewichtsprocent (w/w %) met betrekking tot de **onverdunde** natriumhypochlorideoplossing.



## Chemische methode

Kaliumjodide

## Aanhangsel

### Validatie van de methodes

|                                      |              |
|--------------------------------------|--------------|
| <b>Aantoonbaarheidsgrens</b>         | 0.03 %       |
| <b>Bepaalbaarheidsgrens</b>          | 0.1 %        |
| <b>Einde meetbereik</b>              | 16.8 %       |
| <b>Gevoeligheid</b>                  | 9.21 % / Abs |
| <b>Betrouwbaarheidsgrenzen</b>       | 0.12 %       |
| <b>Standaardafwijking procedure</b>  | 0.05 %       |
| <b>Variatiecoëfficiënt procedure</b> | 0.55 %       |

### Afgeleid van

EN ISO 7393-3

\* 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,<br>MD 640, MultiDirect, PM 620,<br>PM 630 | ø 24 mm | 610 nm    | 0.1 - 4 mmol/l $K_{S4.3}$ |
| SpectroDirect, XD 7000,<br>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.

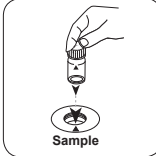
Bu metot için şu cihazlarda ZERO ölçümü yapılması gerekmez: XD 7000, XD 7500



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

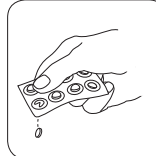


Küveti(küvetleri) kapatın.

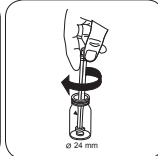


**Numune küvetini** ölçüm haznesine koyun. Doğru konumlandırılmasına dikkat edin.

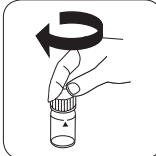
• • •



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



Tableti(tabletleri) hafifçe döndürerek ezin.



Küveti(küvetleri) kapatın.

**Klor HR (KI) T****M105****5 - 200 mg/L Cl<sub>2</sub>****CLHr****KI / Asit****Malzeme**

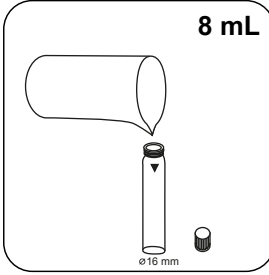
TR

Gerekli materyal (kısmen isteğe bağlı):

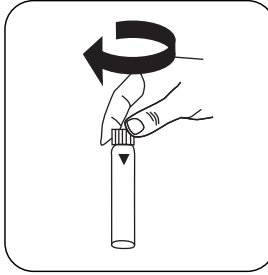
| <b>Ayırçalar</b>                  | <b>Paketleme Birimi</b> | <b>Ürün No</b> |
|-----------------------------------|-------------------------|----------------|
| Klor HR (KI)                      | Tablet / 100            | 513000BT       |
| Klor HR (KI)                      | Tablet / 250            | 513001BT       |
| Asitleştiren GP                   | Tablet / 100            | 515480BT       |
| Asitleştiren GP                   | Tablet / 250            | 515481BT       |
| Set klor HR (KI)/asitleştiren GP# | her bir 100             | 517721BT       |
| Set klor HR (KI)/asitleştiren GP# | her bir 250             | 517722BT       |
| Klor HR (KI)                      | Tablet / 100            | 501210         |
| Klor HR (KI)                      | Tablet / 250            | 501211         |

## Tespitin uygulanması Tabletli klor HR (KI)

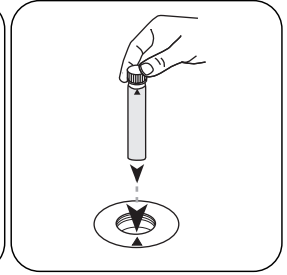
Cihazda metot seçin.



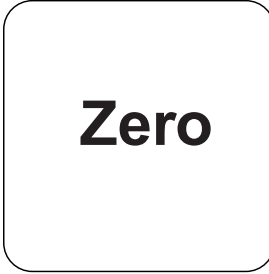
16 mm'lik küveti **8 mL numune** ile doldurun.



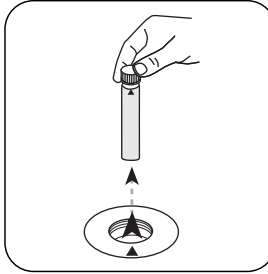
Küveti(küvetleri) kapatın.



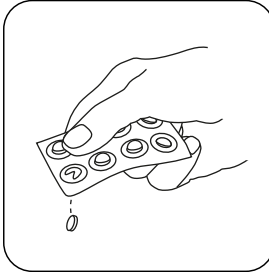
**Numune küvetini** ölçüm haznesine koyun. Doğru konumlandırılmasına dikkat edin.



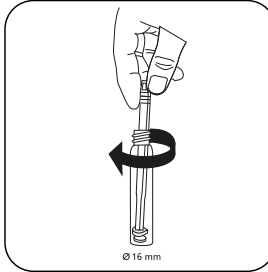
**ZERO** tuşuna basın.



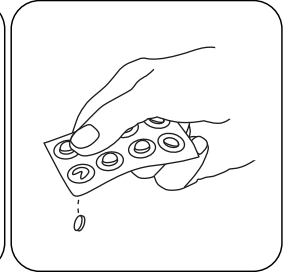
**Küveti** ölçüm haznesinden alın.



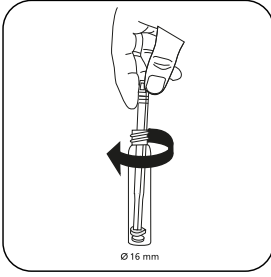
**Chlorine HR (KI) tablet** ilave edin.



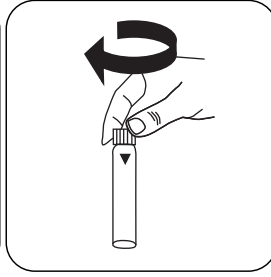
Tableti(tabletleri) hafifçe döndürerek ezin.



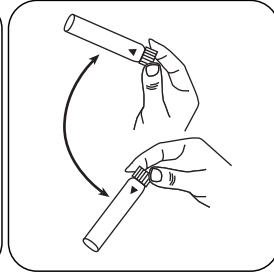
**ACIDIFYING GP tablet** ilave edin.



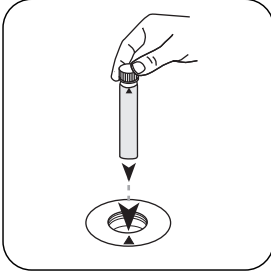
Tableti(tabletleri) hafifçe döndürerek ezin.



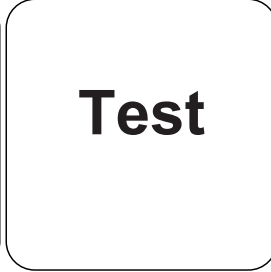
Küveti(küvetleri) kapatın.



Tableti(tabletleri) sallayarak çözündürün.



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



**TEST (XD: START)** tuşuna basın.

Ekranda sonuç mg/L klor cinsinden belirir.

## Kimyasal Metod

KI / Asit

## Apendis

### Girişim Metni

#### Kalıcı Girişimler

- Numunelerde bulunan tüm oksidasyon malzemeleri tıpkı klor gibi tepkime verir ve bu da fazla miktarda bulguya sebep olur.

### Yöntem Doğrulama

|                            |                  |
|----------------------------|------------------|
| <b>Algılama Limiti</b>     | 1.29 mg/L        |
| <b>Belirleme Limiti</b>    | 3.86 mg/L        |
| <b>Ölçüm Aralığı Sonu</b>  | 200 mg/L         |
| <b>Hassasiyet</b>          | 83.96 mg/L / Abs |
| <b>Güven Aralığı</b>       | 1.14 mg/L        |
| <b>Standart Sapma</b>      | 0.45 mg/L        |
| <b>Varyasyon Katsayısı</b> | 0.45 %           |

#### Elde edilen

EN ISO 7393-3

\* karıştırma çubuğu dahil



Hipoklorit T

M212

0.2 - 16 % NaOCI

Potasyum İyodid

## Malzeme

Gerekli materyal (kısmen isteğe bağlı):

| Ayırıcılar                        | Paketleme Birimi | Ürün No  |
|-----------------------------------|------------------|----------|
| Asitleştiren GP                   | Tablet / 100     | 515480BT |
| Asitleştiren GP                   | Tablet / 250     | 515481BT |
| Klor HR (KI)                      | Tablet / 100     | 513000BT |
| Klor HR (KI)                      | Tablet / 250     | 513001BT |
| Klor HR (KI)                      | Tablet / 100     | 501210   |
| Klor HR (KI)                      | Tablet / 250     | 501211   |
| Set klor HR (KI)/asitleştiren GP# | her bir 100      | 517721BT |
| Set klor HR (KI)/asitleştiren GP# | her bir 250      | 517722BT |
| Sodyum hipoklorit seyreltme seti  | 1 adetler        | 414470   |

## Notlar

1. Bu metot yerinde yapılabilecek basit bir hızlı test seçeneği sunar ve bundan dolayı mukayese edilebilir bir laboratuvar metodu kadar kesin değildir.
2. Açıklanan yöntem şekline tam olarak riayet edilmesi durumunda  $\pm 1$  ağı. %'si doğruluğuna ulaşılabilir.

## Tespitin uygulanması Tabletli sodyum hipoklorit

Cihazda metot seçin.

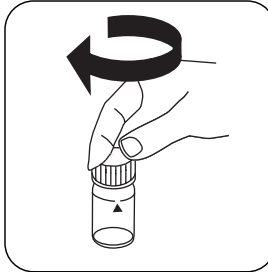
Numune 2000 kat seyreltilir:

1. 5 mL'lik enjektörü öncelikle incelenecek çözelti ile yıkayın ve ardından 5 mL işaretine kadar doldurun.
2. Enjektörü 100 mL'lik ölçü kabına boşaltın.
3. Ölçü kabını 100 mL işaretine kadar klorsuz su ile doldurun.
4. İçeriği dairesel hareketlerle karıştırın.
5. 5 mL'lik temiz enjektörü 1 mL işaretine kadar seyreltilmiş çözelti ile doldurun.
6. Enjektörü 100 mL'lik temiz ölçü kabına boşaltın.
7. Ölçü kabını 100 mL işaretine kadar klorsuz su ile doldurun.
8. İçeriği dairesel hareketlerle karıştırın.

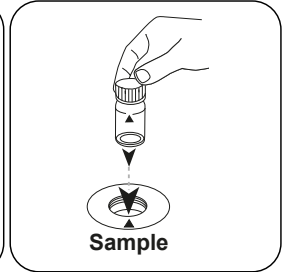
Test bu çözelti ile gerçekleştirilir.



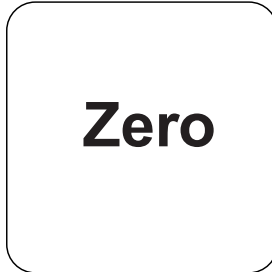
24 mm'lik küveti **önceden hazırlanmış 10 mL numune** ile doldurun.



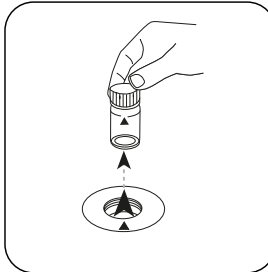
Küveti(küvetleri) kapatın.



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



**ZERO** tuşuna basın.

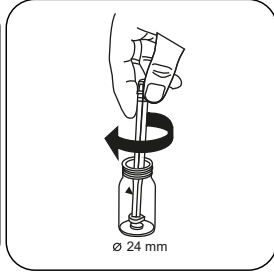


Küveti ölçüm haznesinden alın.

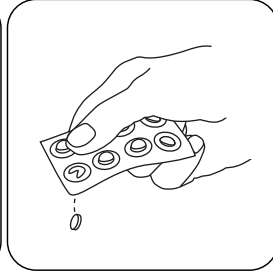




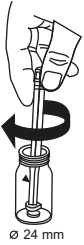
**CHLORINE HR (KI) tablet** ilave edin.



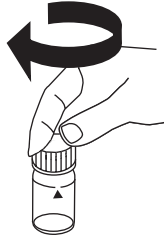
Tableti(tabletleri) hafifçe döndürerek ezin.



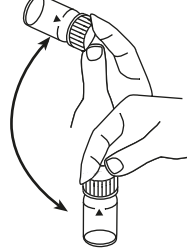
**ACIDIFYING GP tablet** ilave edin.



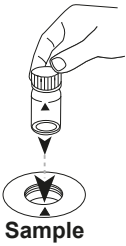
Tableti(tabletleri) hafifçe döndürerek ezin.



Küveti(küvetleri) kapatın.



Tableti(tabletleri) sallayarak çözünüz.



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

**TEST (XD: START)** tuşuna basın.

# Test

Ekranada **seyreltilmemiş** sodyum hipoklorit çözeltisine oranla ağırlık yüzdesi olarak (%w/w) verilen tesirli klor içeriği belirir.

## Kimyasal Metod

Potasyum İyodid

### Apendis

#### Yöntem Doğrulama

|                            |              |
|----------------------------|--------------|
| <b>Algılama Limiti</b>     | 0.03 %       |
| <b>Belirleme Limiti</b>    | 0.1 %        |
| <b>Ölçüm Aralığı Sonu</b>  | 16.8 %       |
| <b>Hassasiyet</b>          | 9.21 % / Abs |
| <b>Güven Aralığı</b>       | 0.12 %       |
| <b>Standart Sapma</b>      | 0.05 %       |
| <b>Varyasyon Katsayısı</b> | 0.55 %       |


#### Elde edilen

EN ISO 7393-3

\* 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 | ø 24 mm | 610 nm    | 0.1 - 4 mmol/l $K_{S4.3}$ |
| SpectroDirect, XD 7000, XD 7500                             | ø 24 mm | 615 nm    | 0.1 - 4 mmol/l $K_{S4.3}$ |

**Материал**

Необходимый материал (частично необязательный):

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

**Область применения**

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

**Примечания**

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

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

**Статус редакции**

RU Методическое руководство 01/20

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

Выберите метод в устройстве.

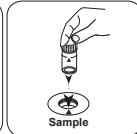
Для этого метода измерения нуля не требуется для следующих устройств: XD 7000, XD 7500



24-Наполните ковеву -мм  
10 пробой мл.



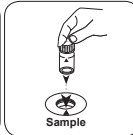
Закройте ковеву(ы).



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



Растворите таблетку  
(таблетки) покачиванием.



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



Нажмите клавишу TEST  
(XD: CTAPT).

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



Хлор HR (KI) Т

M105

5 - 200 mg/L Cl<sub>2</sub>

CLHr

KI / кислота

## Материал

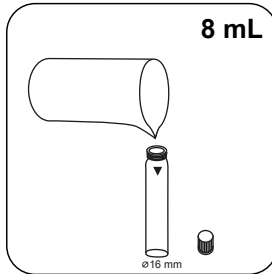
RU

Необходимый материал (частично необязательный):

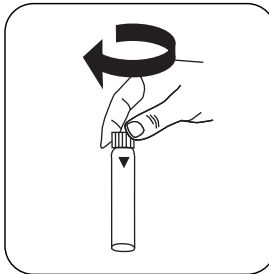
| Реактивы   | Упаковочная единица | Номер заказа |
|--|---------------------|--------------|
| хлорины HR (KI)                                  | Таблетка / 100      | 513000BT     |
| хлорины HR (KI)                                  | Таблетка / 250      | 513001BT     |
| Acidifying GP                                    | Таблетка / 100      | 515480BT     |
| Acidifying GP                                    | Таблетка / 250      | 515481BT     |
| Набор Хлорины HR (KI)/Acidifying GP <sup>#</sup> | 100 каждая          | 517721BT     |
| Набор Хлорины HR (KI)/Acidifying GP <sup>#</sup> | 250 каждая          | 517722BT     |
| хлорины HR (KI)                                  | Таблетка / 100      | 501210       |
| хлорины HR (KI)                                  | Таблетка / 250      | 501211       |

## Выполнение определения Хлор HR (KI) с таблеткой

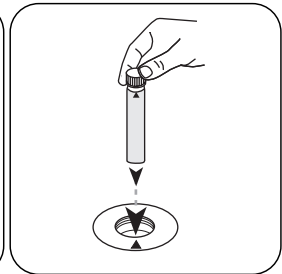
Выберите метод в устройстве.



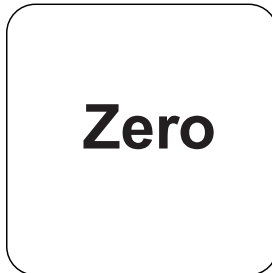
16-Наполните кювету -мм  
8 пробой мл.



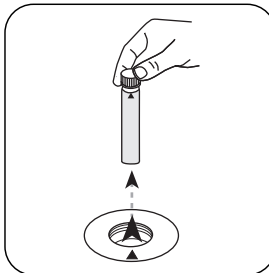
Закройте кювету(ы).



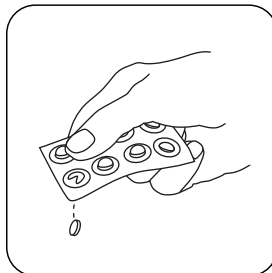
Поместите **кювету для проб** в измерительную шахту. Обращайте внимание на позиционирование.



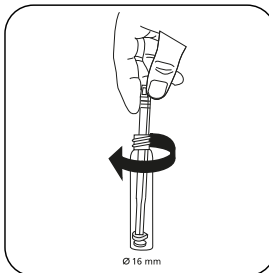
Нажмите клавишу **НОЛЬ**.



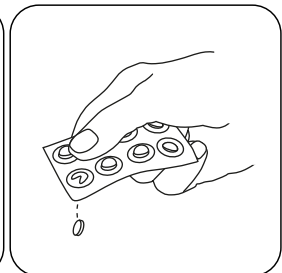
Извлеките **кювету** из измерительной шахты.



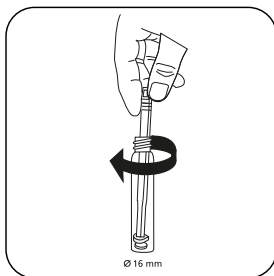
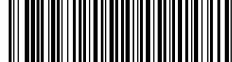
Добавить **таблетку Chlorine HR (KI)**.



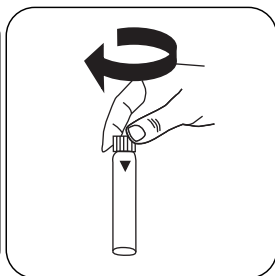
Раздавите таблетку (таблетки) легким вращением.



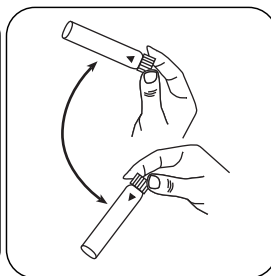
Добавить **таблетку ACIDIFYING GP**.



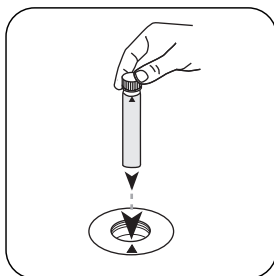
Раздавите таблетку (таблетки) легким вращением.



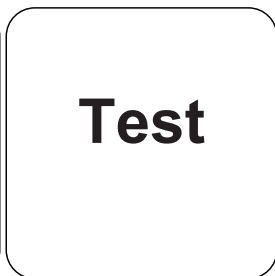
Закройте кювету(ы).



Растворите таблетку (таблетки) покачиванием.



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



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

На дисплее отображается результат в мг/л Хлор.

## Химический метод

KI / кислота

## Приложение

## Нарушения

### Постоянные нарушения

- Все оксидационные средства, присутствующие в пробах, реагируют как хлор, что приводит к повышенным результатам.

## Проверка метода

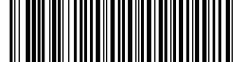
|   |                  |
|---|------------------|
| <b>Предел обнаружения</b>                       | 1.29 mg/L        |
| <b>Предел детерминации</b>                      | 3.86 mg/L        |
| <b>Конечное значение диапазона измерений</b>    | 200 mg/L         |
| <b>Восприимчивость</b>                          | 83.96 mg/L / Abs |
| <b>Доверительная область</b>                    | 1.14 mg/L        |
| <b>Среднеквадратическое отклонение процесса</b> | 0.45 mg/L        |
| <b>Коэффициент вариации метода</b>              | 0.45 %           |

### Выведено из

EN ISO 9963-1

\* в комплект входит палочка для перемешивания





Гипохлорит Т

M212

0.2 - 16 % NaOCl

Йодид калия

## Материал

RU

Необходимый материал (частично необязательный):

| Реактивы   | Упаковочная единица | Номер заказа |
|--|---------------------|--------------|
| Acidifying GP                                    | Таблетка / 100      | 515480BT     |
| Acidifying GP                                    | Таблетка / 250      | 515481BT     |
| хлорины HR (KI)                                  | Таблетка / 100      | 513000BT     |
| хлорины HR (KI)                                  | Таблетка / 250      | 513001BT     |
| хлорины HR (KI)                                  | Таблетка / 100      | 501210       |
| хлорины HR (KI)                                  | Таблетка / 250      | 501211       |
| Набор Хлорины HR (KI)/Acidifying GP <sup>#</sup> | 100 каждая          | 517721BT     |
| Набор Хлорины HR (KI)/Acidifying GP <sup>#</sup> | 250 каждая          | 517722BT     |
| Набор для разбавления гипохлорита натрия         | 1 Шт.               | 414470       |

## Примечания

1. Этот метод дает возможность проведения простого быстрого теста на месте, поэтому он не так точен, как аналогичный лабораторный метод.
2. При строгом соблюдении описанной процедуры может быть достигнута точность  $\pm 1\%$  по весу.

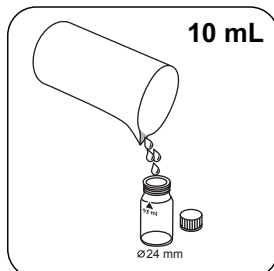
## Выполнение определения Гипохлорит натрия с таблеткой

Выберите метод в устройстве.

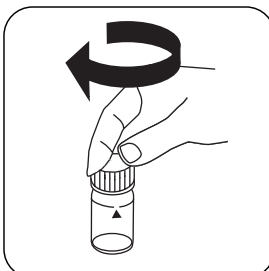
Проба разводится в пропорции 2000:

1. Сначала промойте 5 мл шприца раствором для тестирования, а затем наполните его до отметки 5 мл.
2. Опорожните шприц в мерную чашку емкостью 100 мл.
3. Наполните мерную чашку до отметки 100 мл бесхлорной водой.
4. Содержимое взболтать и перемешать.
5. Наполните чистый шприц 5 мл до отметки 1 мл разбавленным раствором.
6. Опорожните шприц в чистый мерный стаканчик 100 мл.
7. Наполните мерную чашку до отметки 100 мл бесхлорной водой.
8. Содержимое взболтать и перемешать.

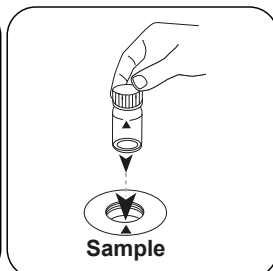
Тестирование проводится с помощью этого раствора.



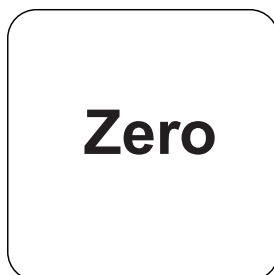
Наполните кювету 24-мм **10 мл подготовленной пробы**.



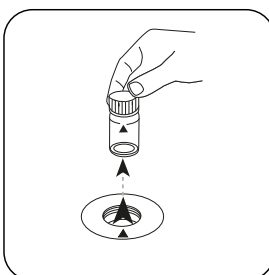
Закройте кювету(ы).



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



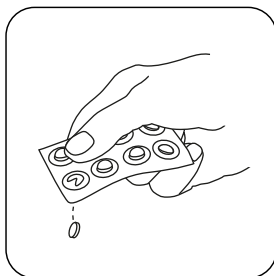
Нажмите клавишу **НОЛЬ**.



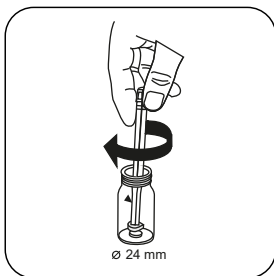
Извлеките кювету из измерительной шахты.



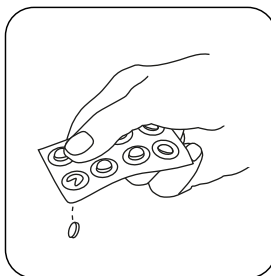
RU



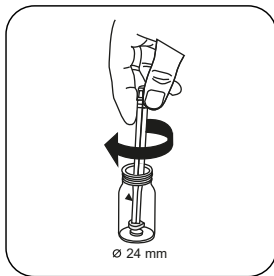
Добавить **таблетку CHLORINE HR (KI)**.



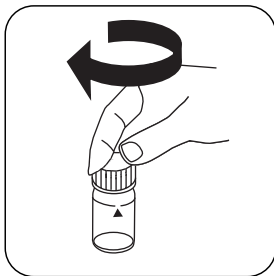
Раздавите таблетку (таблетки) легким вращением.



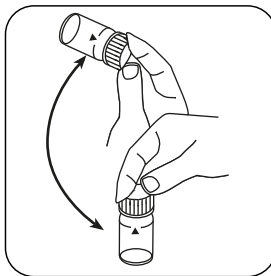
Добавить **таблетку ACIDIFYING GP**.



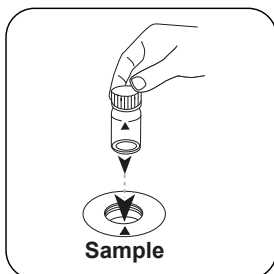
Раздавите таблетку (таблетки) легким вращением.



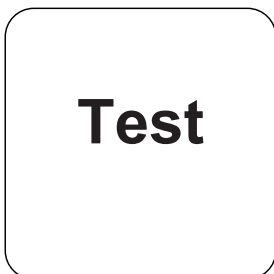
Закройте кювету(ы).



Растворите таблетку (таблетки) покачиванием.



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



Нажмите клавишу **ТЕСТ** (XD: СТАРТ).

На дисплее отображается содержание эффективного хлора в процентах веса (вес/вес в %) относительно **неразбавленного** раствора гипохлорита натрия.

**Химический метод**

Йодид калия

**Приложение****Проверка метода**


|   |              |
|---|--------------|
| <b>Предел обнаружения</b>                       | 0.03 %       |
| <b>Предел детерминации</b>                      | 0.1 %        |
| <b>Конечное значение диапазона измерений</b>    | 16.8 %       |
| <b>Восприимчивость</b>                          | 9.21 % / Abs |
| <b>Доверительная область</b>                    | 0.12 %       |
| <b>Среднеквадратическое отклонение процесса</b> | 0.05 %       |
| <b>Коэффициент вариации метода</b>              | 0.55 %       |

**Выведено из**

EN ISO 7393-3

\* 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,<br>MD 640, MultiDirect, PM 620,<br>PM 630 | $\varnothing$ 24 mm | 610 nm    | 0.1 - 4 mmol/l $K_{S4.3}$ |
| SpectroDirect, XD 7000,<br>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

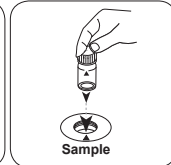
CN 方法手冊 01/20

开始测量

进行测定  $K_{s4.3}$  片剂酸容量

选择设备中的方法。

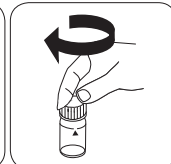
对于这种方法，在以下设备上不能进行 ZERO 测量：XD 7000, XD 7500

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。

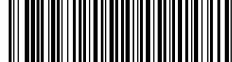
用轻微的扭转压碎片剂。



密封比色杯。

CN 方法手册 01/20

ZH



HR (KI) T 氯

M105

5 - 200 mg/L Cl<sub>2</sub>

CLHr

碘化钾 / 酸法

材料

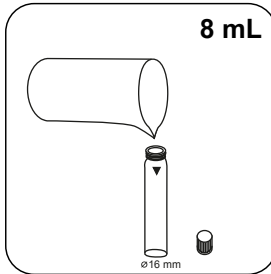
所需材料 ( 部分可選 ) :

ZH

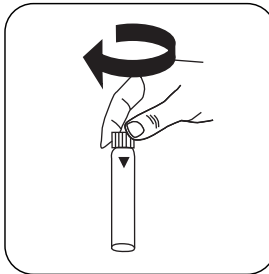
| 试剂                 | 包装单位     | 货号       |
|--------------------|----------|----------|
| 氯 HR (KI)          | 片剂 / 100 | 513000BT |
| 氯 HR (KI)          | 片剂 / 250 | 513001BT |
| 酸化 GP              | 片剂 / 100 | 515480BT |
| 酸化 GP              | 片剂 / 250 | 515481BT |
| 套件氯 HR (KI)/酸化 GP# | 各100次    | 517721BT |
| 套件氯 HR (KI)/酸化 GP# | 各250次    | 517722BT |
| 氯 HR (KI)          | 片剂 / 100 | 501210   |
| 氯 HR (KI)          | 片剂 / 250 | 501211   |

## 进行测定 HR (KI) 氯片剂

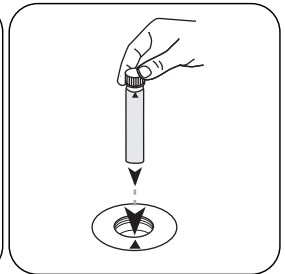
选择设备中的方法。



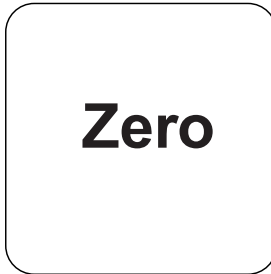
用 8 mL 样本填充 16 mm 比色杯。



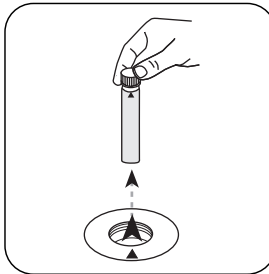
密封比色杯。



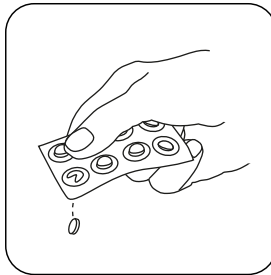
将样本比色杯放入测量轴中。注意定位。



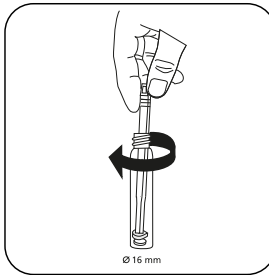
按下 ZERO 按钮。



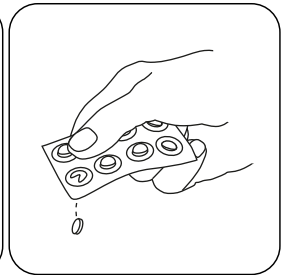
从测量轴上取下比色杯。



加入 Chlorine HR (KI) 片剂。



用轻微的扭转压碎片剂。

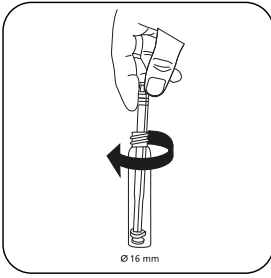


加入 ACIDIFYING GP 片剂。

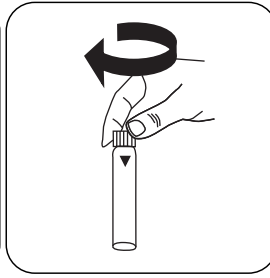




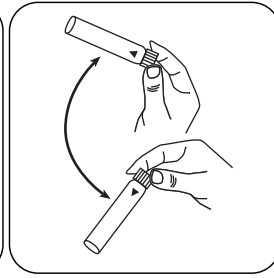
ZH



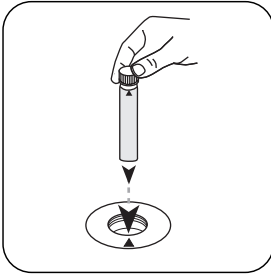
用轻微的扭转压碎片剂。



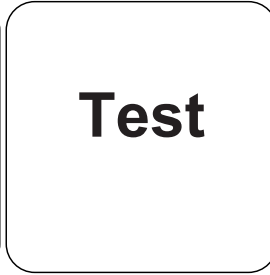
密封比色杯。



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。

结果在显示屏上显示为 mg / l 氯。

## 化学方法

碘化钾 / 酸法

## 附錄

## 干扰说明

### 持续干扰

- 存在于样本中的所有氧化剂都像氯一样反应，导致多重结果。

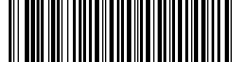
## 方法验证

|      |                  |
|------|------------------|
| 检出限  | 1.29 mg/L        |
| 测定下限 | 3.86 mg/L        |
| 测量上限 | 200 mg/L         |
| 灵敏度  | 83.96 mg/L / Abs |
| 置信范围 | 1.14 mg/L        |
| 标准偏差 | 0.45 mg/L        |
| 变异系数 | 0.45 %           |

### 源于

EN ISO 7393-3

\*i含搅拌棒, 10cm



## T 次氯酸盐

M212

0.2 - 16 % NaOCl

碘化钾

材料

所需材料 ( 部分可选 ) :

ZH

| 试剂                 | 包装单位     | 货号       |
|--------------------|----------|----------|
| 酸化 GP              | 片剂 / 100 | 515480BT |
| 酸化 GP              | 片剂 / 250 | 515481BT |
| 氯 HR (KI)          | 片剂 / 100 | 513000BT |
| 氯 HR (KI)          | 片剂 / 250 | 513001BT |
| 氯 HR (KI)          | 片剂 / 100 | 501210   |
| 氯 HR (KI)          | 片剂 / 250 | 501211   |
| 套件氯 HR (KI)/酸化 GP# | 各100次    | 517721BT |
| 套件氯 HR (KI)/酸化 GP# | 各250次    | 517722BT |
| 次氯酸钠稀释套件           | 1 片      | 414470   |

## 备注

1. 这种方法提供了一个简单的快速测试的可能性，可以在现场进行行，因而不如类似的实验室方法准确。
2. 严格遵守所述的操作方法时，可达到  $\pm 1\%$  的准确度。

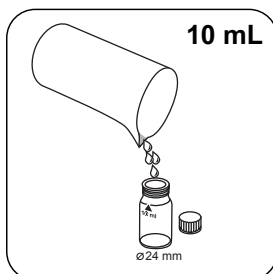
## 进行测定 次氯酸钠片剂

选择设备中的方法。

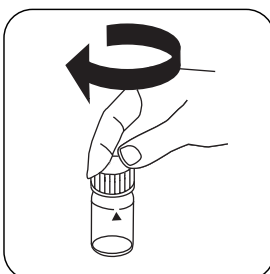
样本稀释 2000 倍：

1. 首先用待测溶液冲洗 5 mL 注射器，然后注入至 5 mL 刻度处。
2. 将注射器注入 100 mL 量杯中。
3. 用无氯水将量杯填充至 100 mL 刻度处。
4. 搅拌混合内容物。
5. 将稀释溶液注入到干净的 5 mL 注射器中至 1 mL 刻度处。
6. 将注射器注入到干净的 100 mL 量杯中。
7. 用无氯水将量杯填充至 100 mL 刻度处。
8. 搅拌混合内容物。

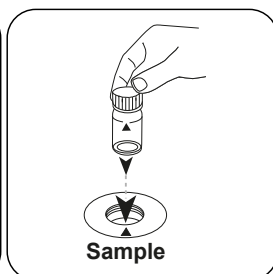
用该溶液进行测试。



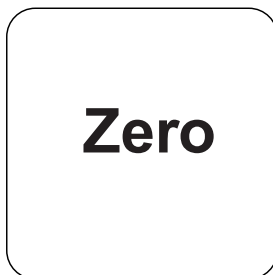
用 10 mL 准备好的样本填充 24 mm 比色杯。



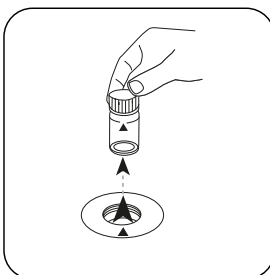
密封比色杯。



将样本比色杯放入测量轴中。注意定位。



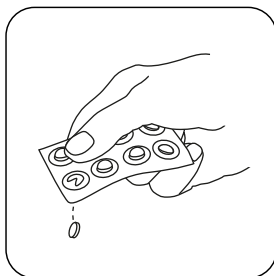
按下 ZERO 按钮。



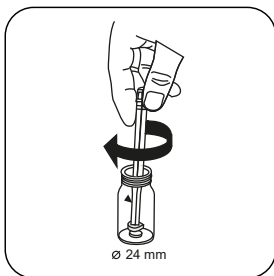
从测量轴上取下比色杯。



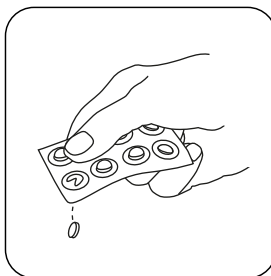
ZH



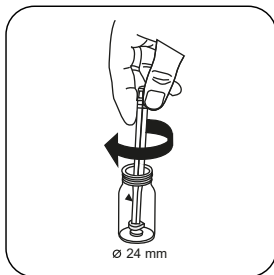
加入 **CHLORINE HR (KI)** 片剂。



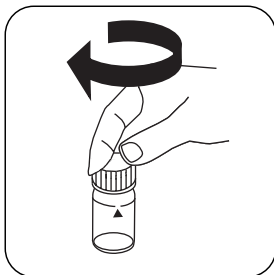
用轻微的扭转压碎片剂。



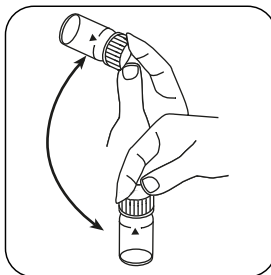
加入 **ACIDIFYING GP** 片剂。



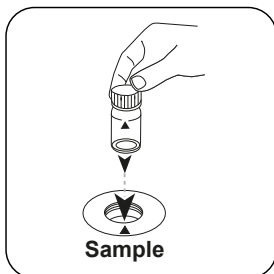
用轻微的扭转压碎片剂。



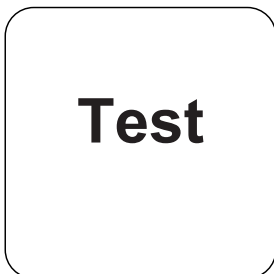
密封比色杯。



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。

显示屏显示相对于未稀释的次氯酸钠溶液的有效氯含量 ( w/w % ) 。



## 化学方法

碘化钾

## 附錄

### 方法验证

|      |              |
|------|--------------|
| 检出限  | 0.03 %       |
| 测定下限 | 0.1 %        |
| 测量上限 | 16.8 %       |
| 灵敏度  | 9.21 % / Abs |
| 置信范围 | 0.12 %       |
| 标准偏差 | 0.05 %       |
| 变异系数 | 0.55 %       |

源于

EN ISO 7393-3

\*i含搅拌棒, 10cm

ZH











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