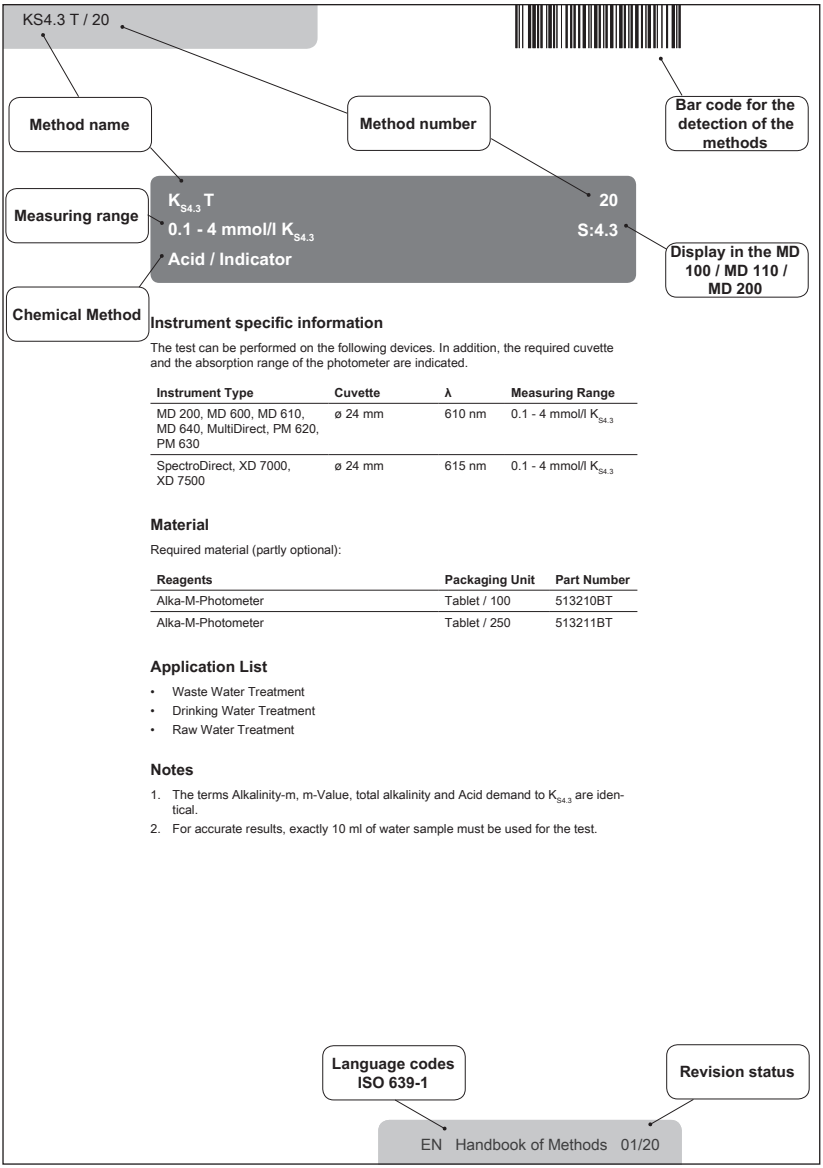
Lovibond® Water Testing

Tintometer® Group

Manual of Methods

MD 100 • MD 110 • MD 200

Hardness



Instrument specific information

The test can be performed on the following devices. In addition, the required cuvette and the absorption range of the photometer are indicated.

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

Material

Required material (partly optional):

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

Application List

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

Notes

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

Performing test procedure

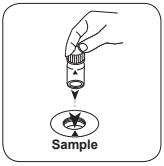
Implementation of the provision Acid capacity $K_{S4.3}$ with Tablet

Select the method on the device

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

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

Close vial(s).



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

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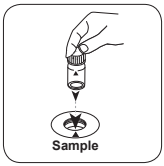
Dissolve tablet(s) by inverting.



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

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

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

Hardness total T M200

2 - 50 mg/L $CaCO_3$ tH1

Metallphthaleine

EN

Material

Required material (partly optional):

Reagents	Packaging Unit	Part Number
Hardcheck P	Tablet / 100	515660BT
Hardcheck P	Tablet / 250	515661BT

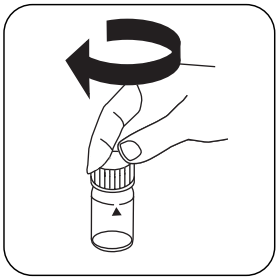
Preparation

1. Strong alkaline or acidic water samples should be adjusted between pH 4 and pH 10 before the analysis (use 1 mol/l Sulphuric acid or 1 mol/l Sodium hydroxide).

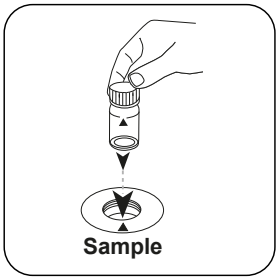
Determination of Hardness, Total with Tablet

Select the method on the device.

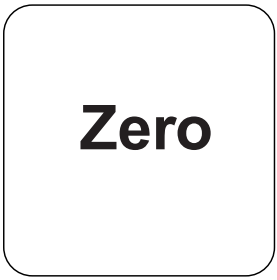
Fill 24 mm vial with **10 mL sample**.



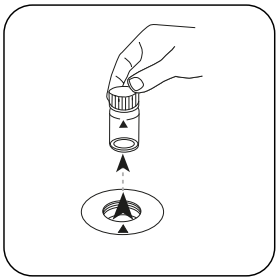
Close vial(s).



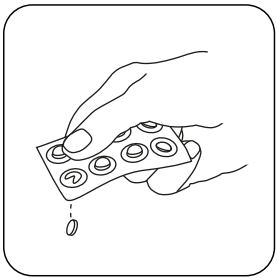
Place **sample vial** in the sample chamber. Pay attention to the positioning.



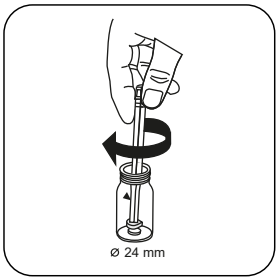
Press the **ZERO** button.



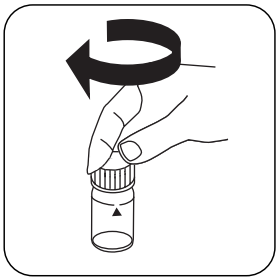
Remove the vial from the sample chamber.



Add **HARDCHECK P tablet**.



Crush tablet(s) by rotating slightly.



Close vial(s).

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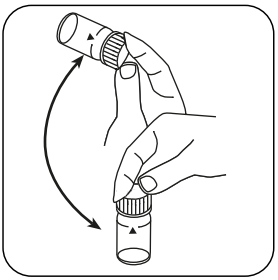
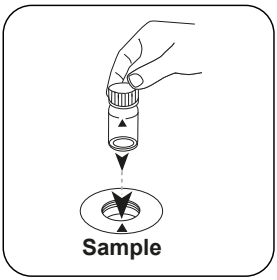
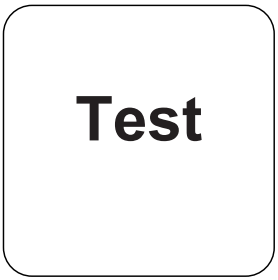


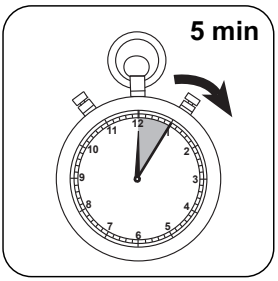
Dissolve tablet(s) by inverting.



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



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



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

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

The result in total Hardness appears on the display.

Analyses

The following table identifies the output values can be converted into other citation forms.

Unit	Cite form	Scale Factor
mg/l	$CaCO_3$	1
	°dH	0.056
	°eH	0.07
	°fH	0.1
	°aH	1
mg/l	Ca	0.40043

Chemical Method

Metallphthaleine

Appendix

Interferences

Removeable Interferences

1. Interference from zinc and magnesium can be eliminated by the addition of 8-hydroxychinoline.
2. Concentrations of strontium and barium that occur in waters and soils do not interfere.

Method Validation

Limit of Detection	0.88 mg/L
Limit of Quantification	2.64 mg/L
End of Measuring Range	50 mg/L
Sensitivity	42.5 mg/L / Abs
Confidence Intervall	2.62 mg/L
Standard Deviation	1.08 mg/L
Variation Coefficient	4.17 %

Bibliography

Photometrische Analyseverfahren, Schwedt, Wissenschaftliche Verlagsgesellschaft mbH, Stuttgart 1989

Hardness total HR T M201

20 - 500 mg/L $CaCO_3$ [i] tH2

Metallphthaleine

EN

Material

Required material (partly optional):

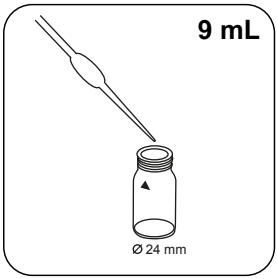
Reagents	Packaging Unit	Part Number
Hardcheck P	Tablet / 100	515660BT
Hardcheck P	Tablet / 250	515661BT

Preparation

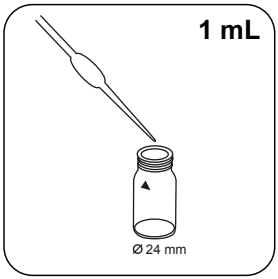
1. Strong alkaline or acidic water samples should be adjusted between pH 4 and pH 10 before the analysis (use 1 mol/l Sulphuric acid or 1 mol/l Sodium hydroxide).

Determination of Hardness total HR with tablet

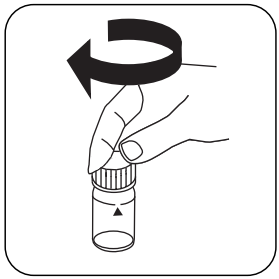
Select the method on the device.



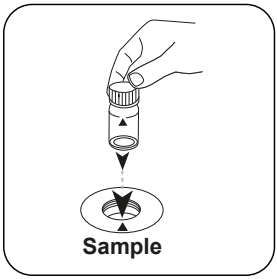
Fill 24 mm vial with **9 mL deionised water** .



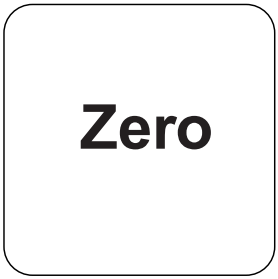
Put **1 mL sample** in the vial.



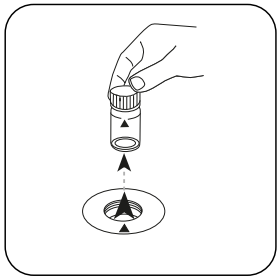
Close vial(s).



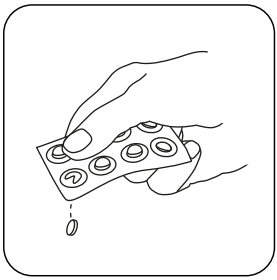
Place **sample vial** in the sample chamber. Pay attention to the positioning.



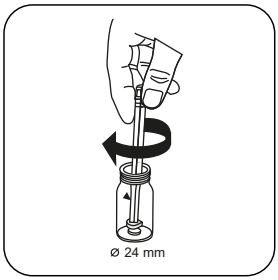
Press the **ZERO** button.



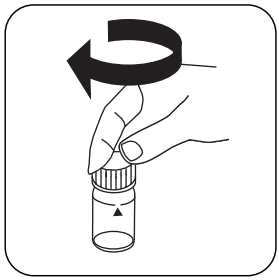
Remove the vial from the sample chamber.



Add **HARDCHECK P tablet**.



Crush tablet(s) by rotating slightly.



Close vial(s).

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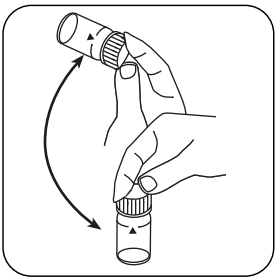
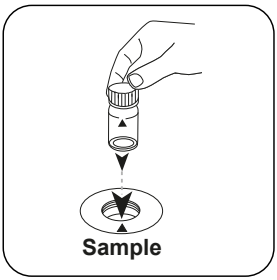
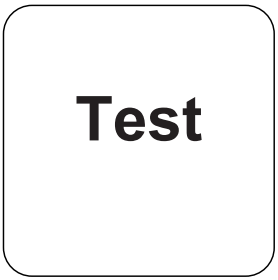


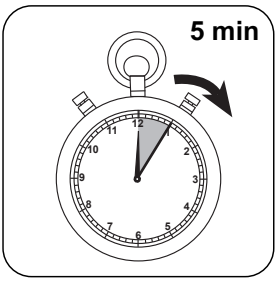
Dissolve tablet(s) by inverting.



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



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



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

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

The result in total Hardness appears on the display.

Analyses

The following table identifies the output values can be converted into other citation forms.

Unit	Cite form	Scale Factor
mg/l	$CaCO_3$	1
	°dH	0.056
	°eH	0.07
	°fH	0.1
	°aH	1
mg/l	Ca	0.40043

Chemical Method

Metallphthaleine

Appendix

Interferences

Removeable Interferences

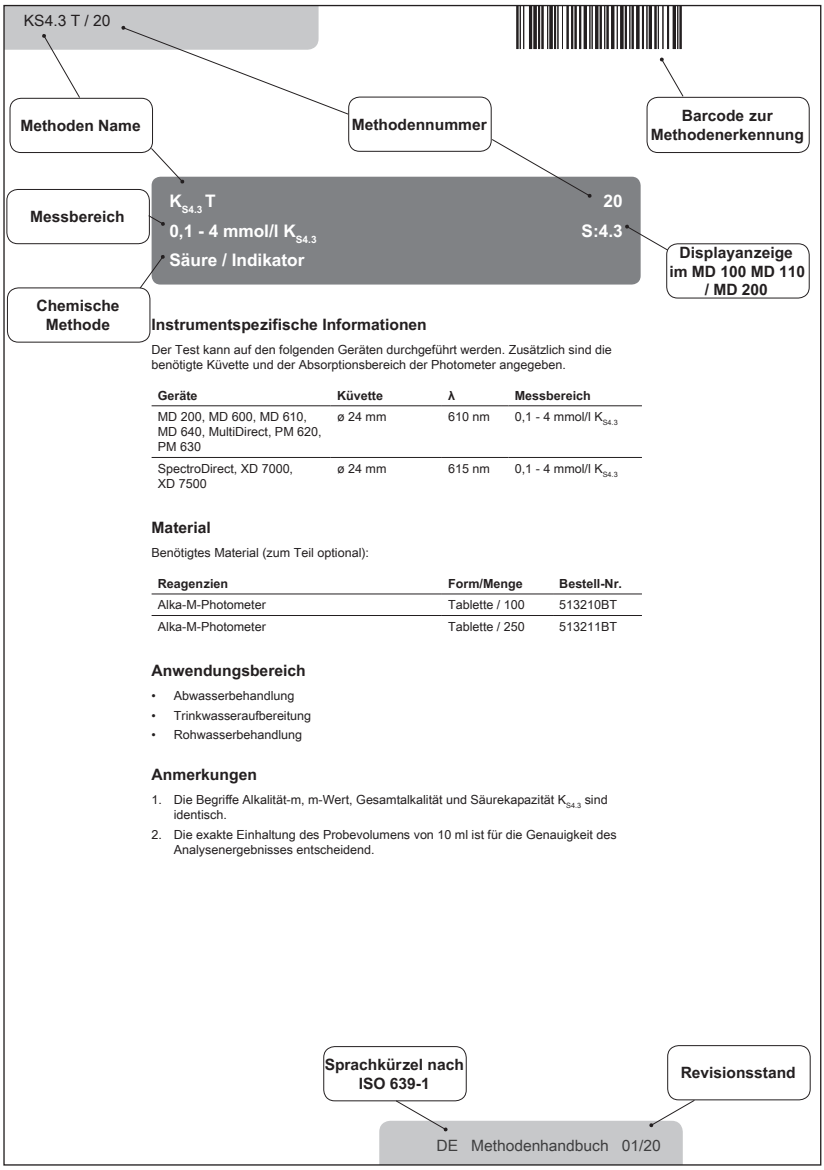
1. Interference from zinc and magnesium can be eliminated by the addition of 8-hydroxychinoline.
2. Concentrations of strontium and barium that occur in waters and soils do not interfere.

Bibliography

Photometrische Analyseverfahren, Schwedt, Wissenschaftliche Verlagsgesellschaft mbH, Stuttgart 1989

[i] high range by dilution

DE



Instrumentspezifische Informationen

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

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

Material

Benötigtes Material (zum Teil optional):

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

Anwendungsbereich

- Abwasserbehandlung
- Trinkwasseraufbereitung
- Rohwasserbehandlung

Anmerkungen

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

Durchführung der Messung

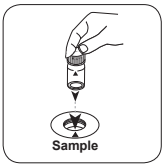
Durchführung der Bestimmung Säurekapazität $K_{S4.3}$ mit Tablette

Die Methode im Gerät auswählen.

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

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

Küvette(n) verschließen.



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

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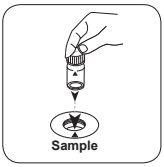
Tablette(n) durch Umschwenken lösen.



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

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

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

Härte gesamt T M200

2 - 50 mg/L $CaCO_3$ tH1

Metallphthalein

DE

Material

Benötigtes Material (zum Teil optional):

Reagenzien	Form/Menge	Bestell-Nr.
Hardcheck P	Tablette / 100	515660BT
Hardcheck P	Tablette / 250	515661BT

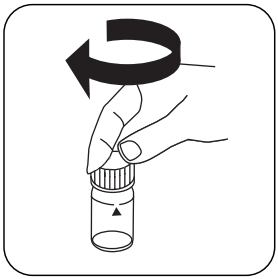
Vorbereitung

1. Stark alkalische oder saure Wässer sollten vor der Analyse in einen pH-Bereich zwischen 4 und 10 gebracht werden (mit 1 mol/l Salzsäure bzw. 1 mol/l Natronlauge).

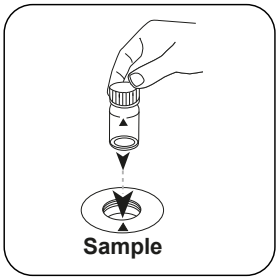
Durchführung der Bestimmung Härte, gesamt mit Tablette

Die Methode im Gerät auswählen.

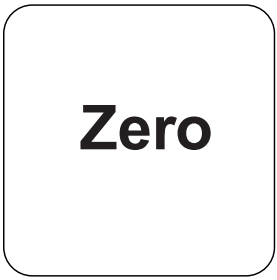
24-mm-Küvette mit **10 mL Probe** füllen.



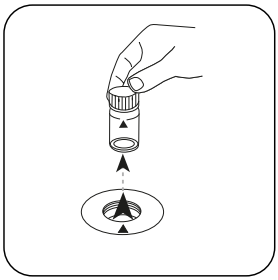
Küvette(n) verschließen.



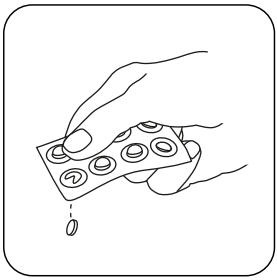
Die **Probenküvette** in den Messschacht stellen. Positionierung beachten.



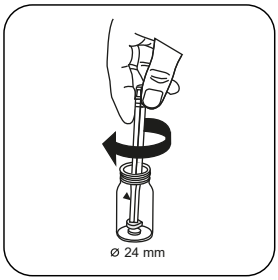
Taste **ZERO** drücken.



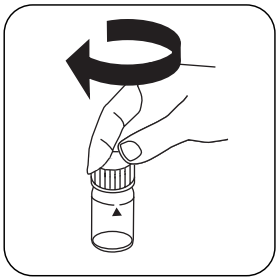
Küvette aus dem Messschacht nehmen.



Eine **HARDCHECK P Tablette** zugeben.

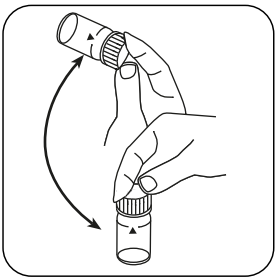


Tablette(n) unter leichter Drehung zerdrücken.

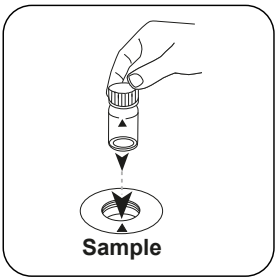


Küvette(n) verschließen.

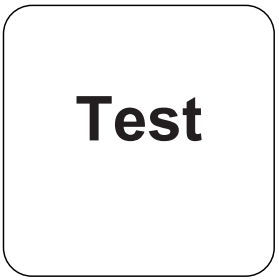
DE



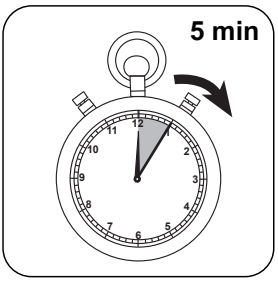
Tablette(n) durch Umschwenken lösen.



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



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



5 Minute(n) Reaktionszeit abwarten.

Nach Ablauf der Reaktionszeit erfolgt automatisch die Messung.

In der Anzeige erscheint das Ergebnis als Gesamthärte.

Auswertung

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

Einheit	Zitierform	Umrechnungsfaktor
mg/l	$CaCO_3$	1
	°dH	0.056
	°eH	0.07
	°fH	0.1
	°aH	1
mg/l	Ca	0.40043

Chemische Methode

Metallphthalein

Appendix

Störungen

Ausschließbare Störungen

1. Die Störung durch Zink und Magnesium wird durch die Zugabe von 8-hydroxychinolin beseitigt.
2. Strontium und Barium treten in Wässern und Böden nicht in störenden Konzentrationen auf.

Methodenvalidierung

Nachweisgrenze	0.88 mg/L
Bestimmungsgrenze	2.64 mg/L
Messbereichsende	50 mg/L
Empfindlichkeit	42.5 mg/L / Abs
Vertrauensbereich	2.62 mg/L
Verfahrensstandardabweichung	1.08 mg/L
Verfahrensvariationskoeffizient	4.17 %

Literaturverweise

Photometrische Analyseverfahren, Schwedt, Wissenschaftliche Verlagsgesellschaft mbH, Stuttgart 1989

Härte gesamt HR T M201

20 - 500 mg/L $CaCO_3$ [i] tH2

Metallphthalein

DE

Material

Benötigtes Material (zum Teil optional):

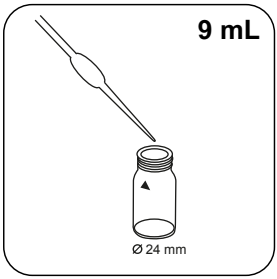
Reagenzien	Form/Menge	Bestell-Nr.
Hardcheck P	Tablette / 100	515660BT
Hardcheck P	Tablette / 250	515661BT

Vorbereitung

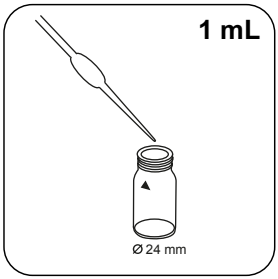
1. Stark alkalische oder saure Wässer sollten vor der Analyse in einen pH-Bereich zwischen 4 und 10 gebracht werden (mit 1 mol/l Salzsäure bzw. 1 mol/l Natronlauge).

Durchführung der Bestimmung Härte, gesamt HR mit Tablette

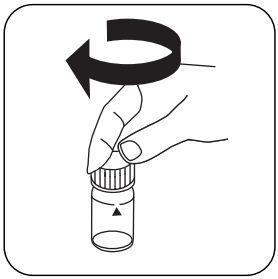
Die Methode im Gerät auswählen.



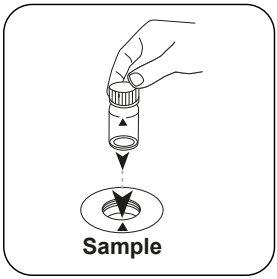
24 mm-Küvette mit **9 mL VE-Wasser** füllen.



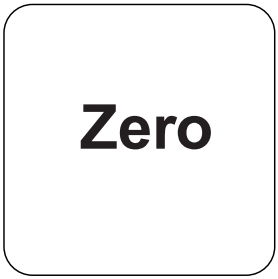
1 mL Probe in die Küvette geben.



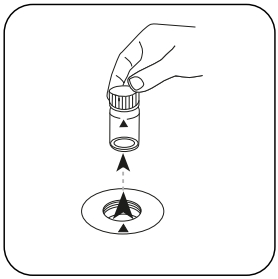
Küvette(n) verschließen.



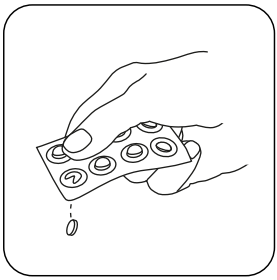
Die **Probenküvette** in den Messschacht stellen. Positionierung beachten.



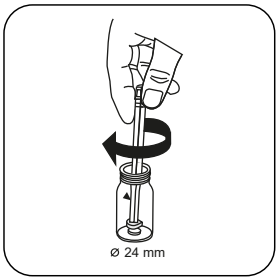
Taste **ZERO** drücken.



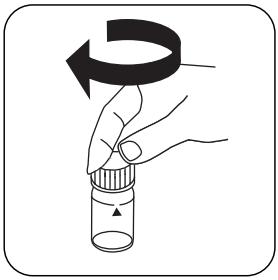
Küvette aus dem Messschacht nehmen.



Eine **HARDCHECK P Tablette** zugeben.

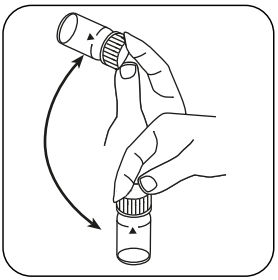


Tablette(n) unter leichter Drehung zerdrücken.

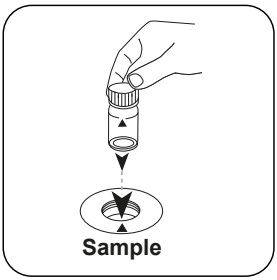


Küvette(n) verschließen.

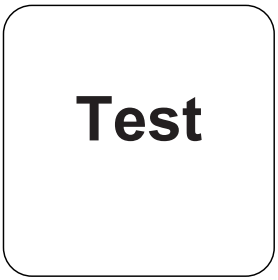
DE



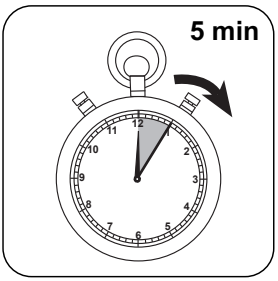
Tablette(n) durch Umschwenken lösen.



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



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



5 Minute(n) Reaktionszeit abwarten.

Nach Ablauf der Reaktionszeit erfolgt automatisch die Messung.

In der Anzeige erscheint das Ergebnis als Gesamthärte.

Auswertung

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

Einheit	Zitierform	Umrechnungsfaktor
mg/l	$CaCO_3$	1
	°dH	0.056
	°eH	0.07
	°fH	0.1
	°aH	1
mg/l	Ca	0.40043

Chemische Methode

Metallphthalein

Appendix

Störungen

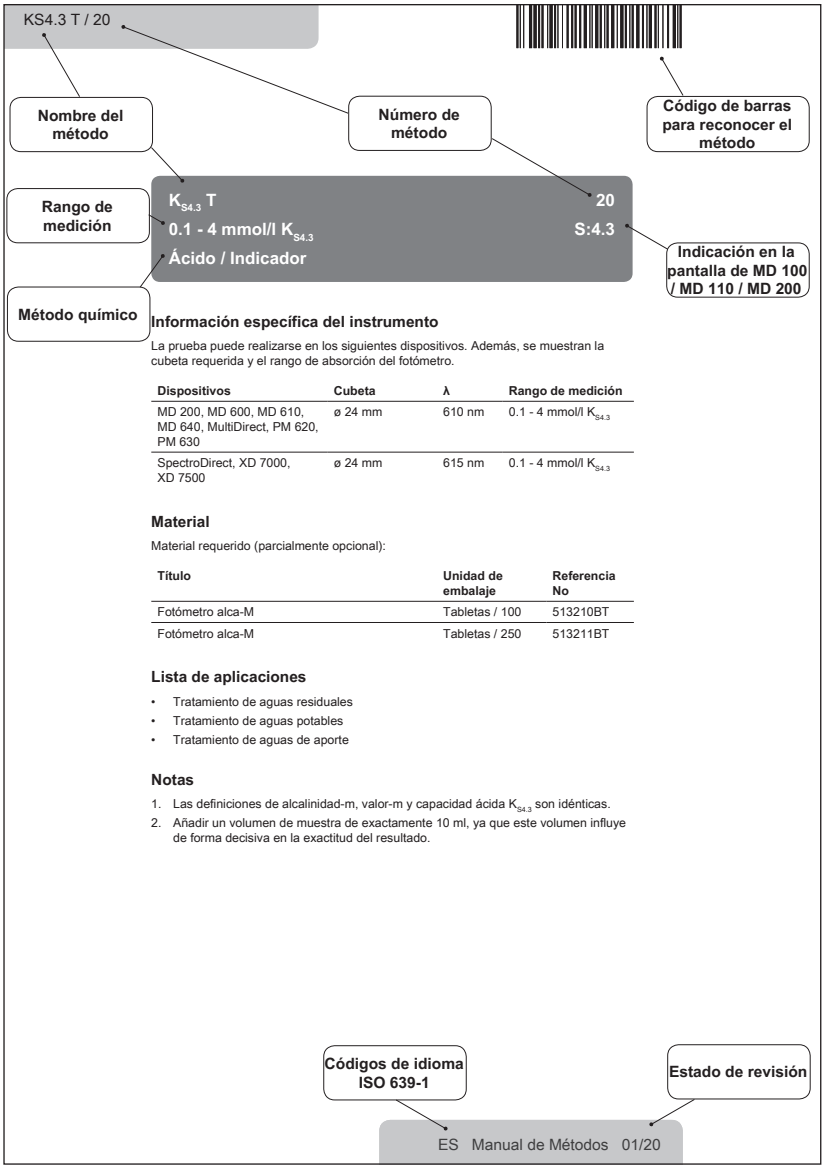
Ausschließbare Störungen

1. Die Störung durch Zink und Magnesium wird durch die Zugabe von 8-hydroxychinolin beseitigt.
2. Strontium und Barium treten in Wässern und Böden nicht in störenden Konzentrationen auf.

Literaturverweise

Photometrische Analyseverfahren, Schwedt, Wissenschaftliche Verlagsgesellschaft mbH, Stuttgart 1989

[9] Hoher Messbereich durch Verdünnung


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

Realización de la determinación

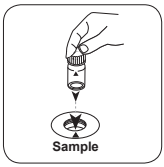
Ejecución de la determinación Capacidad ácida $K_{S4.3}$ con tableta

Seleccionar el método en el aparato.

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

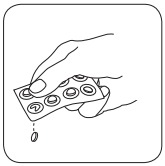
Llenar la cubeta de 24 mm con **10 ml de muestra** .

Cerrar la(s) cubeta(s).

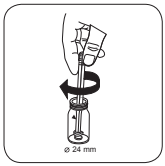


Poner la **cubeta de muestra** en el compartimiento de medición. ¡Debe tenerse en cuenta el posicionamiento!

• • •



Añadir **tableta ALKA-M-PHOTOMETER**.



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

Cerrar la(s) cubeta(s).

Dureza total T M200

2 - 50 mg/L $CaCO_3$ tH1

Ftaleina metal

ES

Material

Material requerido (parcialmente opcional):

Reactivos	Unidad de embalaje	No. de referencia
Hardcheck P	Tabletas / 100	515660BT
Hardcheck P	Tabletas / 250	515661BT

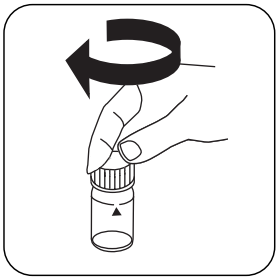
Preparación

1. Las muestras acuosas muy ácidas o muy básicas se deberán neutralizar a un valor de pH entre 4 y 10 antes de realizar el análisis (con 1 mol/l de ácido clorhídrico o 1 mol/l de hidróxido sódico).

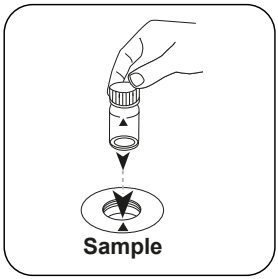
Ejecución de la determinación Dureza, total con tableta

Seleccionar el método en el aparato.

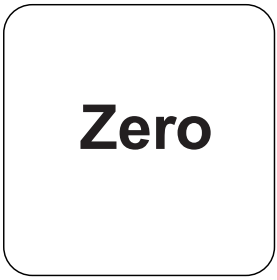
Llenar la cubeta de 24 mm con **10 mL de muestra** .



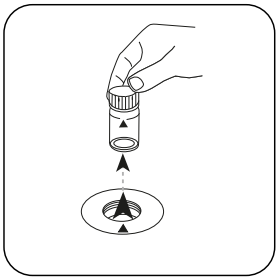
Cerrar la(s) cubeta(s).



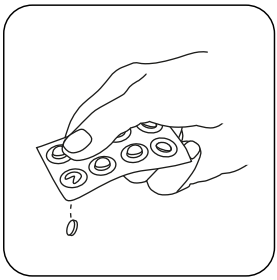
Poner la **cubeta de muestra** en el compartimiento de medición. ¡Debe tenerse en cuenta el posicionamiento!



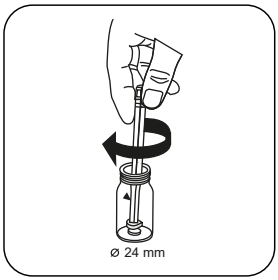
Pulsar la tecla **ZERO**.



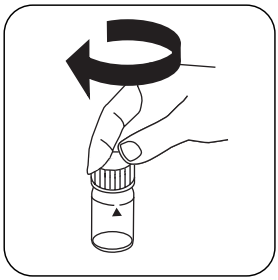
Extraer la cubeta del compartimiento de medición.



Añadir **tableta HARDCHECK P**.

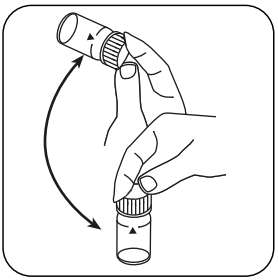


Triturar la(s) tableta(s) girando ligeramente.

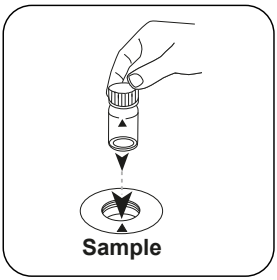


Cerrar la(s) cubeta(s).

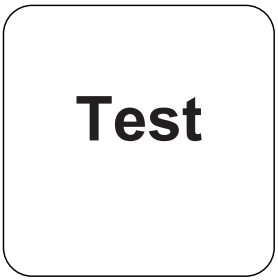
ES



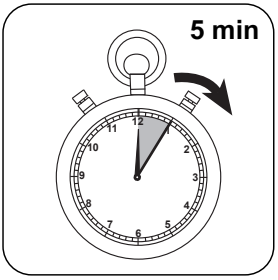
Disolver la(s) tableta(s) girando.



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



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



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

Finalizado el periodo de reacción se realizará la determinación automáticamente.

A continuación se visualizará el resultado como Dureza total.

Evaluación

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

Unidad	Conversión	Factor de conversión
mg/l	$CaCO_3$	1
	°dH	0.056
	°eH	0.07
	°fH	0.1
	°aH	1
mg/l	Ca	0.40043

Método químico

Ftaleina metal

Apéndice

Interferencia

Interferencias extraibles

1. La perturbación por cinc y magnesio se elimina añadiendo 8-hidroxiquinolina.
2. El estroncio y el bario se encuentran en las aguas y en los suelos, en concentraciones no perturbadoras.

Validación del método

Límite de detección	0.88 mg/L
Límite de determinación	2.64 mg/L
Límite del rango de medición	50 mg/L
Sensibilidad	42.5 mg/L / Abs
Intervalo de confianza	2.62 mg/L
Desviación estándar	1.08 mg/L
Coeficiente de variación	4.17 %

Bibliografía

Photometrische Analyseverfahren, Schwedt, Wissenschaftliche Verlagsgesellschaft mbH, Stuttgart 1989

Dureza total HR T M201

20 - 500 mg/L $CaCO_3$ [i] tH2

Ftaleina metal

ES

Material

Material requerido (parcialmente opcional):

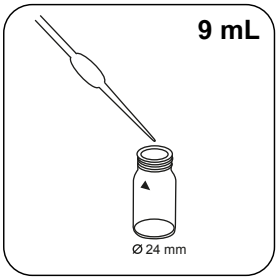
Reactivos	Unidad de embalaje	No. de referencia
Hardcheck P	Tabletas / 100	515660BT
Hardcheck P	Tabletas / 250	515661BT

Preparación

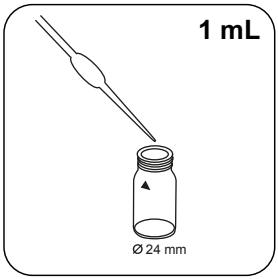
1. Las muestras acuosas muy ácidas o muy básicas se deberán neutralizar a un valor de pH entre 4 y 10 antes de realizar el análisis (con 1 mol/l de ácido clorhídrico o 1 mol/l de hidróxido sódico).

Ejecución de la determinación Dureza, total HR con tableta

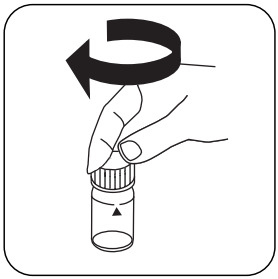
Seleccionar el método en el aparato.



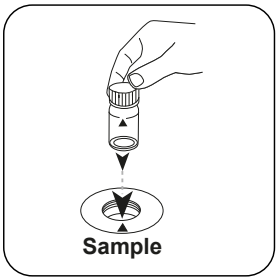
Llenar la cubeta de 24 mm con **9 mL de agua desionizada**.



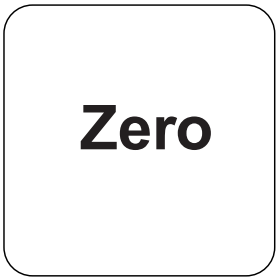
Añadir **1 mL de muestra** en la cubeta.



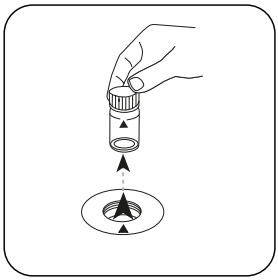
Cerrar la(s) cubeta(s).



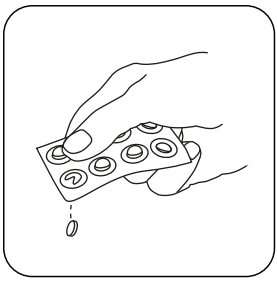
Poner la **cubeta de muestra** en el compartimiento de medición. ¡Debe tenerse en cuenta el posicionamiento!



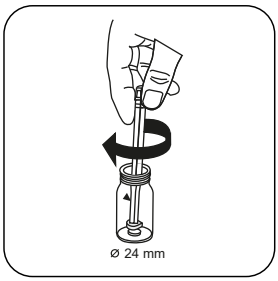
Pulsar la tecla **ZERO**.



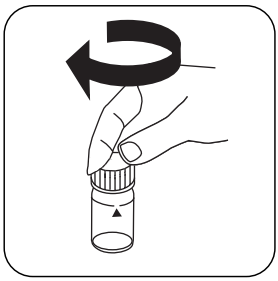
Extraer la cubeta del compartimiento de medición.



Añadir **tableta HARDCHECK P**.

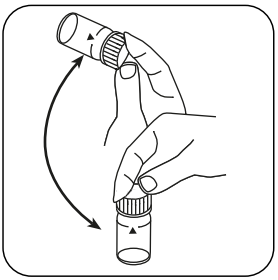


Triturar la(s) tableta(s) girando ligeramente.

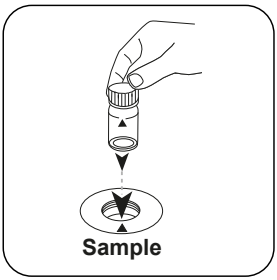


Cerrar la(s) cubeta(s).

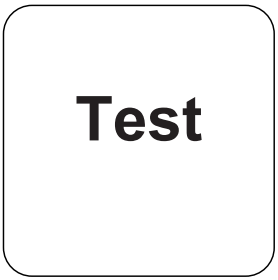
ES



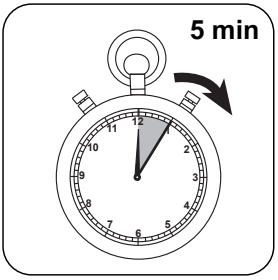
Disolver la(s) tableta(s) girando.



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



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



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

Finalizado el periodo de reacción se realizará la determinación automáticamente.

A continuación se visualizará el resultado como Dureza total.

Evaluación

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

Unidad	Conversión	Factor de conversión
mg/l	$CaCO_3$	1
	°dH	0.056
	°eH	0.07
	°fH	0.1
	°aH	1
mg/l	Ca	0.40043

Método químico

Ftaleina metal

Apéndice

Interferencia

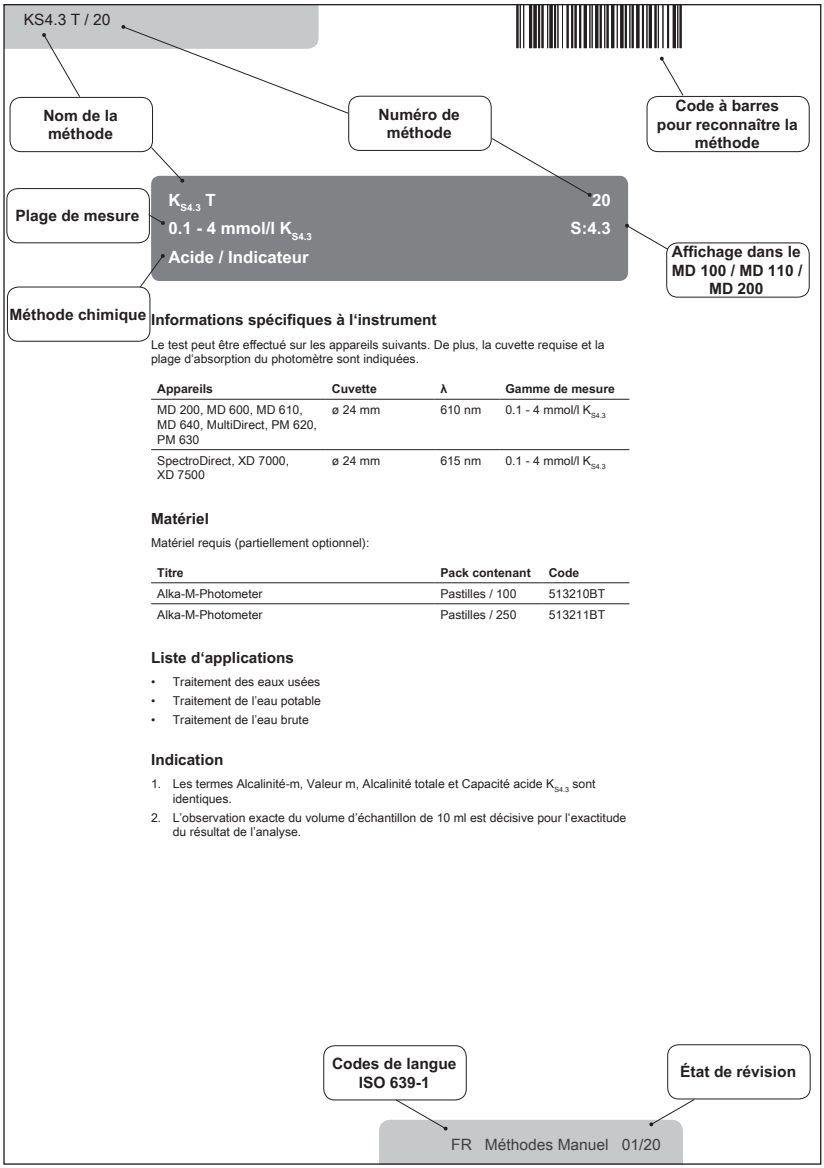
Interferencias extraibles

1. La perturbación por cinc y magnesio se elimina añadiendo 8-hidroxiquinolina.
2. El estroncio y el bario se encuentran en las aguas y en los suelos, en concentraciones no perturbadoras.

Bibliografía

Photometrische Analyseverfahren, Schwedt, Wissenschaftliche Verlagsgesellschaft mbH, Stuttgart 1989

[i] Campo de medición elevado con dilución



Informations spécifiques à l'instrument

Le test peut être effectué sur les appareils suivants. De plus, la cuvette requise et la plage d'absorption du photomètre sont indiquées.

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

Matériel

Matériel requis (partiellement optionnel):

Titre	Pack contenant	Code
Alka-M-Photometer	Pastilles / 100	513210BT
Alka-M-Photometer	Pastilles / 250	513211BT

Liste d'applications

- Traitement des eaux usées
- Traitement de l'eau potable
- Traitement de l'eau brute

Indication

1. Les termes Alcalinité-m, Valeur m, Alcalinité totale et Capacité acide $K_{S4.3}$ sont identiques.
2. L'observation exacte du volume d'échantillon de 10 ml est décisive pour l'exactitude du résultat de l'analyse.

Procédure du test

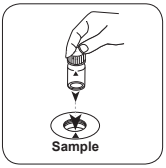
Réalisation de la quantification Capacité acide $K_{S4.3}$ avec pastille

Sélectionnez la méthode sur l'appareil.

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

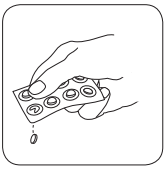
Remplissez une cuvette de 24 mm de **10 ml d'échantillon**.

Fermez la(les) cuvette(s).

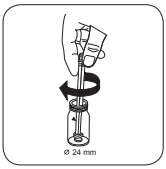


Placez la **cuvette réservée à l'échantillon** dans la chambre de mesure. Attention à la positionner correctement.

• • •



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



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

Fermez la(les) cuvette(s).

Dureté totale T M200

2 - 50 mg/L $CaCO_3$ tH1

Métalophtaléine

FR

Matériel

Matériel requis (partiellement optionnel):

Réactifs	Pack contenant	Code
Test de dureté P	Pastilles / 100	515660BT
Test de dureté P	Pastilles / 250	515661BT

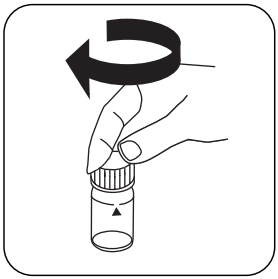
Préparation

1. Avant l'analyse, les eaux fortement alcalines ou acides devraient être ajustées sur un pH compris entre 4 et 10 (avec 1 mol/l d'acide chlorhydrique ou 1 mol/l de soude caustique).

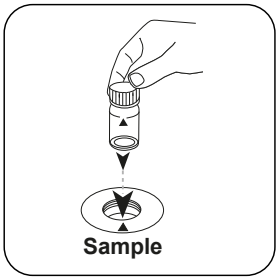
Réalisation de la quantification Dureté, totale avec pastille

Sélectionnez la méthode sur l'appareil.

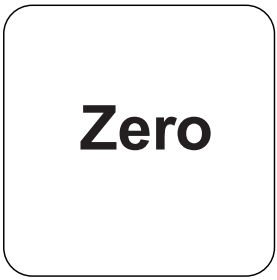
Remplissez une cuvette de 24 mm de **10 mL d'échantillon**.



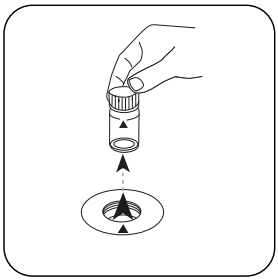
Fermez la(les) cuvette(s).



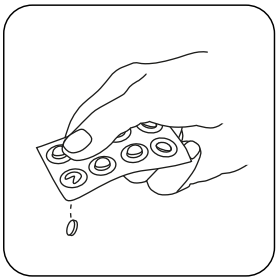
Placez la **cuvette réservée à l'échantillon** dans la chambre de mesure. Attention à la positionner correctement.



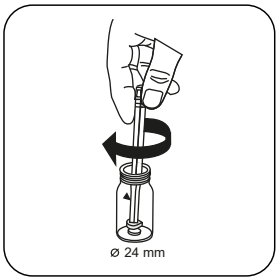
Appuyez sur la touche **ZERO**.



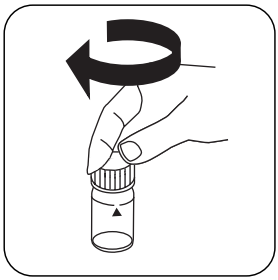
Retirez la cuvette de la chambre de mesure.



Ajoutez une **pastille de HARDCHECK P**.

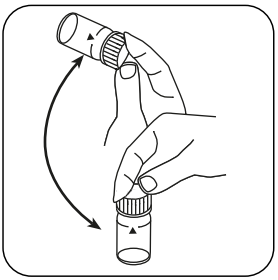


Écrasez la(les) pastille(s) en la(les) tournant un peu.

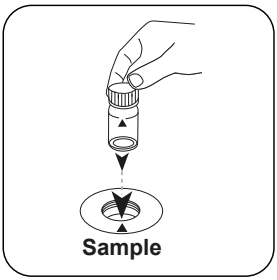


Fermez la(les) cuvette(s).

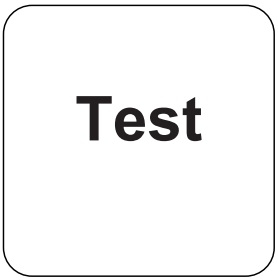
FR



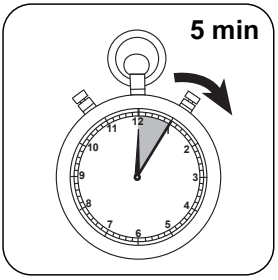
Dissolvez la(les) pastille(s) en mettant le tube plusieurs fois à l'envers.



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



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



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

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

Le résultat s'affiche à l'écran en Dureté totale.

Analyses

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

Unité	Formes de citation	Facteur de conversion
mg/l	$CaCO_3$	1
	°dH	0.056
	°eH	0.07
	°fH	0.1
	°aH	1
mg/l	Ca	0.40043

Méthode chimique

Métalophtaléine

Appendice

Interférences

Interférences exclues

1. La perturbation par le zinc et le magnésium est éliminée par un apport de 8-hydroxyquinoléine.
2. La concentration du strontium et le baryum contenus dans les eaux et sols n'est pas perturbatrice.

Méthode Validation

Limite de détection	0.88 mg/L
Limite de détermination	2.64 mg/L
Fin de la gamme de mesure	50 mg/L
Sensibilité	42.5 mg/L / Abs
Intervalle de confiance	2.62 mg/L
Déviation standard	1.08 mg/L
Coefficient de variation	4.17 %

Bibliographie

Photometrische Analyseverfahren, Schwedt, Wissenschaftliche Verlagsgesellschaft mbH, Stuttgart 1989

Dureté totale HR T M201

20 - 500 mg/L $CaCO_3$ [i] tH2

Métalophtaléine

FR

Matériel

Matériel requis (partiellement optionnel):

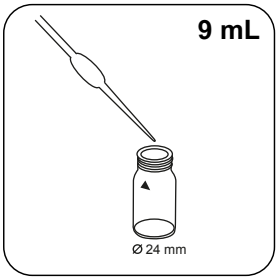
Réactifs	Pack contenant	Code
Test de dureté P	Pastilles / 100	515660BT
Test de dureté P	Pastilles / 250	515661BT

Préparation

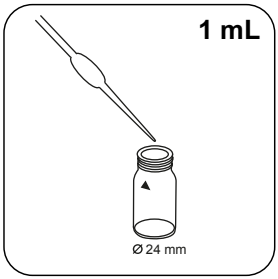
1. Avant l'analyse, les eaux fortement alcalines ou acides devraient être ajustées sur un pH compris entre 4 et 10 (avec 1 mol/l d'acide chlorhydrique ou 1 mol/l de soude caustique).

Réalisation de la quantification Dureté totale HR avec pastille

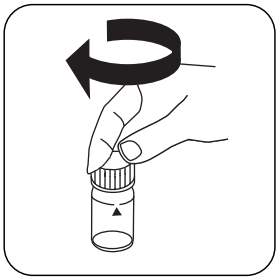
Sélectionnez la méthode sur l'appareil.



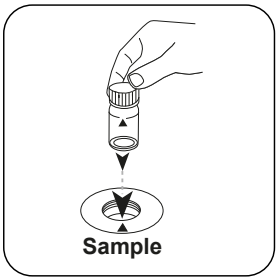
Remplissez une cuvette de 24 mm de **9 mL d'eau déminéralisée**.



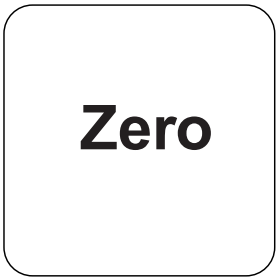
Versez **1 mL d'échantillon** dans la cuvette.



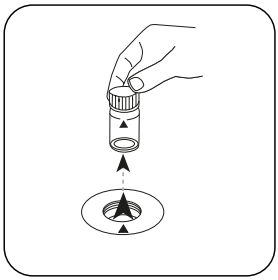
Fermez la(les) cuvette(s).



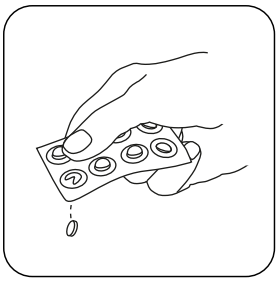
Placez la **cuvette réservée à l'échantillon** dans la chambre de mesure. Attention à la positionner correctement.



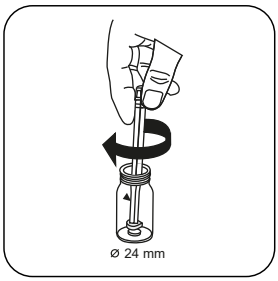
Appuyez sur la touche **ZERO**.



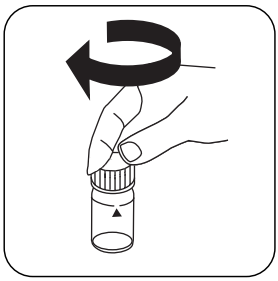
Retirez la cuvette de la chambre de mesure.



Ajoutez une **pastille de HARDCHECK P**.

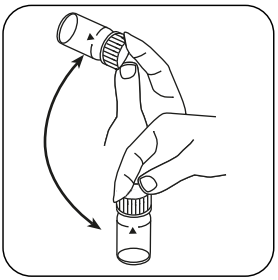


Écrasez la(les) pastille(s) en la(les) tournant un peu.

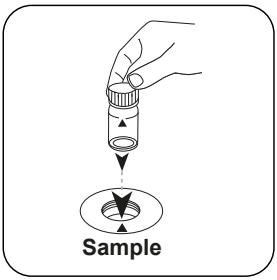


Fermez la(les) cuvette(s).

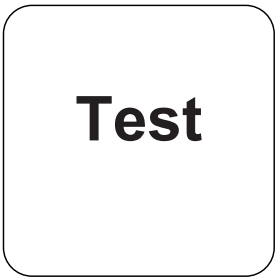
FR



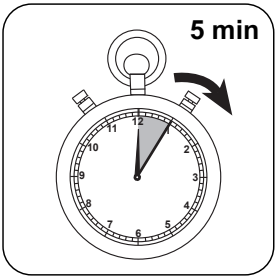
Dissolvez la(les) pastille(s) en mettant le tube plusieurs fois à l'envers.



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



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



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

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

Le résultat s'affiche à l'écran en Dureté totale.

Analyses

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

Unité	Formes de citation	Facteur de conversion
mg/l	$CaCO_3$	1
	°dH	0.056
	°eH	0.07
	°fH	0.1
	°aH	1
mg/l	Ca	0.40043

Méthode chimique

Métalophtaléine

Appendice

Interférences

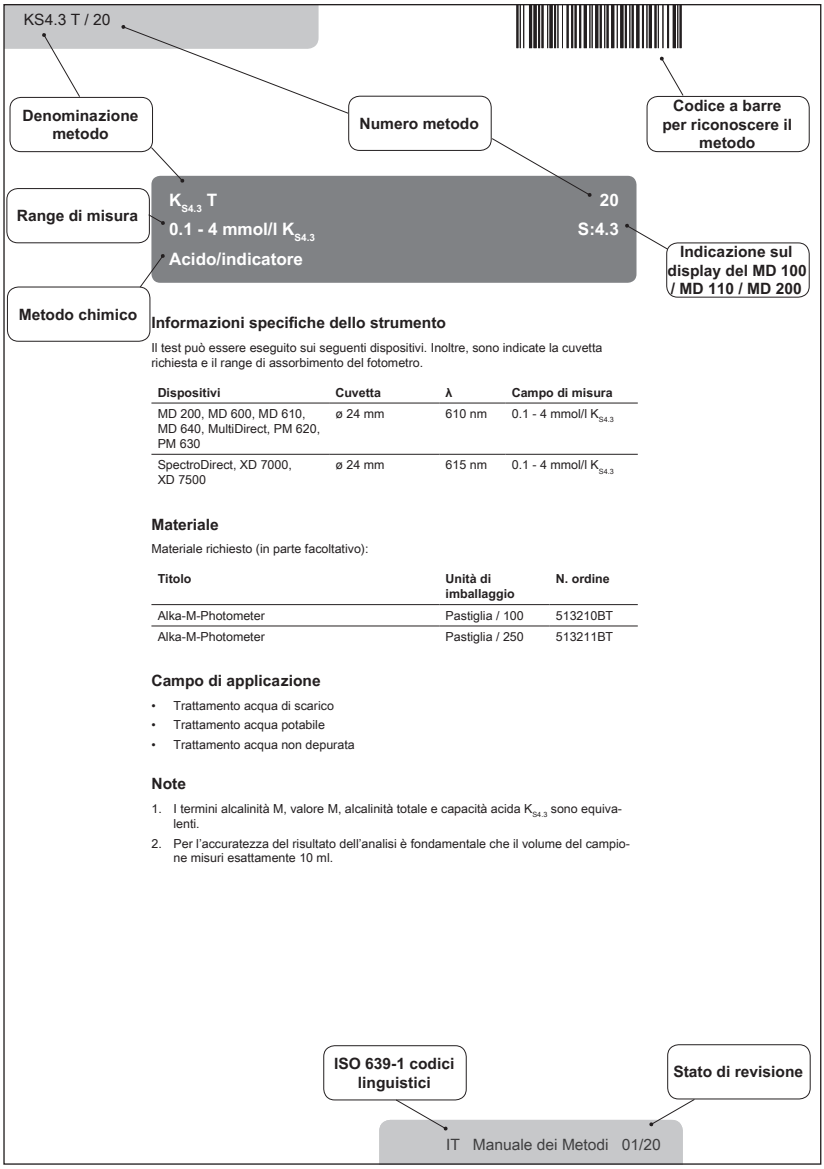
Interférences exclues

1. La perturbation par le zinc et le magnésium est éliminée par un apport de 8-hydroxyquinoléine.
2. La concentration du strontium et le baryum contenus dans les eaux et sols n'est pas perturbatrice.

Bibliographie

Photometrische Analyseverfahren, Schwedt, Wissenschaftliche Verlagsgesellschaft mbH, Stuttgart 1989

[i] Gamme haute par dilution



Informazioni specifiche dello strumento

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

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

Materiale

Materiale richiesto (in parte facoltativo):

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

Campo di applicazione

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

Note

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

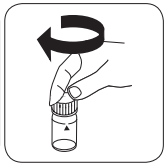
Svolgimento della misurazione

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

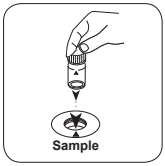
Selezionare il metodo nel dispositivo.

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

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



Chiudere la/e cuvetta/e.



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

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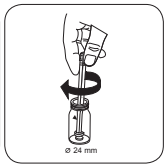
Aggiungere **una pastiglia ALKA-M-PHOTOMETER**.



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

Chiudere la/e cuvetta/e.

Durezza totale T M200

2 - 50 mg/L $CaCO_3$ tH1

Violetto di ftaleina

IT

Materiale

Materiale richiesto (in parte facoltativo):

Reagenti	Unità di imballaggio	N. ordine
Hardcheck P	Pastiglia / 100	515660BT
Hardcheck P	Pastiglia / 250	515661BT

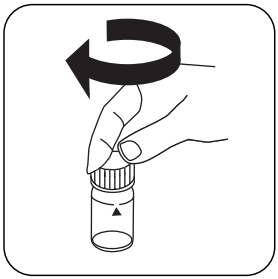
Preparazione

1. Le acque fortemente alcaline o acide dovrebbero essere portate prima dell'analisi entro un range di pH compreso tra 4 e 10 (con 1 mol/l di acido cloridrico o 1 mol/l di liscivia).

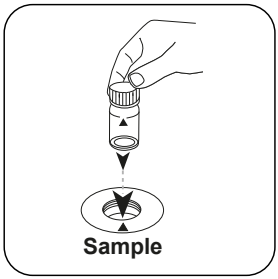
Esecuzione della rilevazione Durezza totale con pastiglia

Selezionare il metodo nel dispositivo.

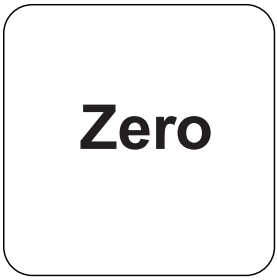
Riempire una cuvetta da 24 mm con **10 mL di campione**.



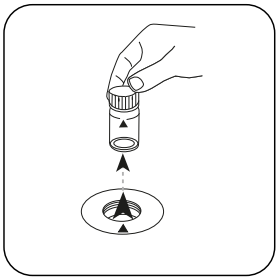
Chiudere la/e cuvetta/e.



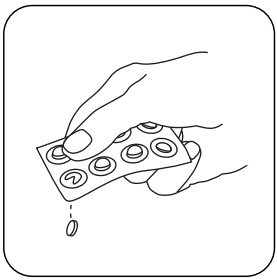
Posizionare la **cuvetta del campione** nel vano di misurazione. Fare attenzione al posizionamento.



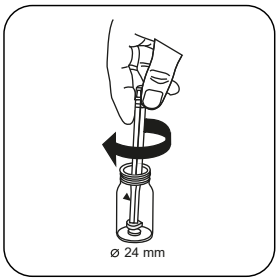
Premere il tasto **ZERO**.



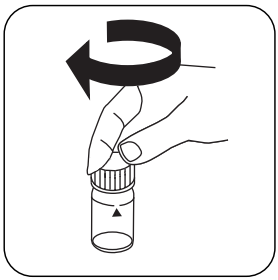
Prelevare la cuvetta dal vano di misurazione.



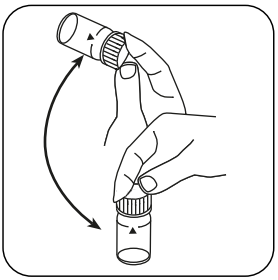
Aggiungere **una pastiglia HARDCHECK P**.



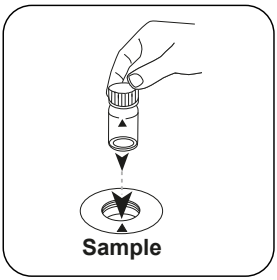
Frantumare la/e pastiglia/e con una leggera rotazione.



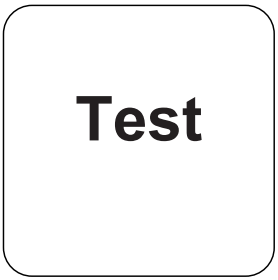
Chiudere la/e cuvetta/e.



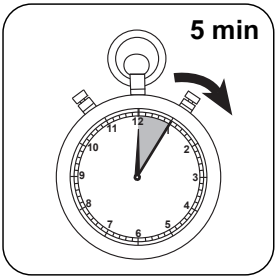
Far sciogliere la/e pastiglia/e agitando.



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



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



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

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

Sul display compare il risultato come Durezza totale.

Valutazione

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

Unità di misura	Forma di citazione	Fattore di conversione
mg/l	$CaCO_3$	1
	°dH	0.056
	°eH	0.07
	°fH	0.1
	°aH	1
mg/l	Ca	0.40043

Metodo chimico

Violetto di ftaleina

Appendice

Interferenze

Interferenze escludibili

1. L'interferenza da parte di zinco e magnesio viene eliminata con l'aggiunta di 8-idrossichinolina.
2. Nell'acqua e nel terreno lo stronzio e il bario non compaiono in concentrazioni tali da provocare interferenze.

Validazione metodo

Limite di rilevabilità	0.88 mg/L
Limite di quantificazione	2.64 mg/L
Estremità campo di misura	50 mg/L
Sensibilità	42.5 mg/L / Abs
Intervallo di confidenza	2.62 mg/L
Deviazione standard della procedura	1.08 mg/L
Coefficiente di variazione della procedura	4.17 %

Riferimenti bibliografici

Photometrische Analyseverfahren, Schwedt, Wissenschaftliche Verlagsgesellschaft mbH, Stoccarda 1989

Durezza totale HR T M201

20 - 500 mg/L $CaCO_3$ [i] tH2

Violetto di ftaleina

IT

Materiale

Materiale richiesto (in parte facoltativo):

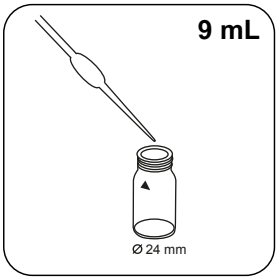
Reagenti	Unità di imballaggio	N. ordine
Hardcheck P	Pastiglia / 100	515660BT
Hardcheck P	Pastiglia / 250	515661BT

Preparazione

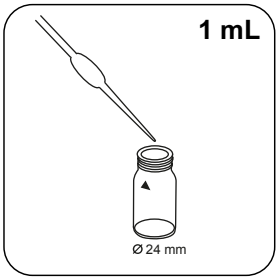
1. Le acque fortemente alcaline o acide dovrebbero essere portate prima dell'analisi entro un range di pH compreso tra 4 e 10 (con 1 mol/l di acido cloridrico o 1 mol/l di liscivia).

Esecuzione della rilevazione Durezza HR totale con pastiglia

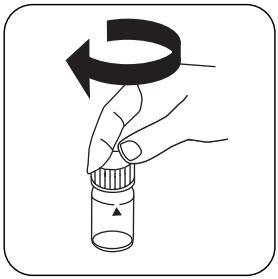
Selezionare il metodo nel dispositivo.



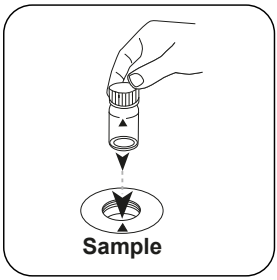
Riempire una cuvetta da 24 mm con **9 mL di acqua demineralizzata**.



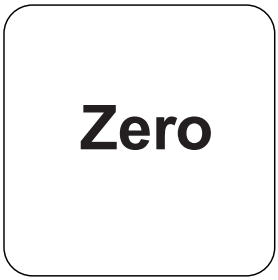
Immettere **1 mL di campione** nella cuvetta.



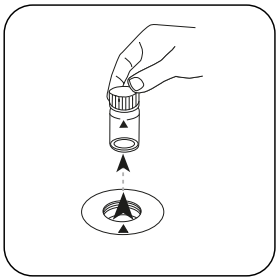
Chiudere la/e cuvetta/e.



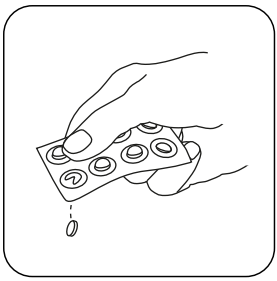
Posizionare la **cuvetta del campione** nel vano di misurazione. Fare attenzione al posizionamento.



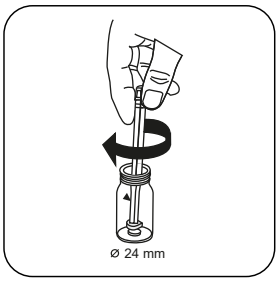
Premere il tasto **ZERO**.



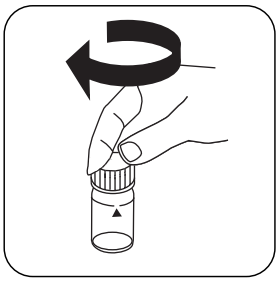
Prelevare la cuvetta dal vano di misurazione.



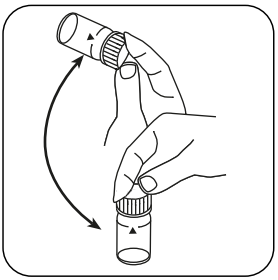
Aggiungere **una pastiglia HARDCHECK P**.



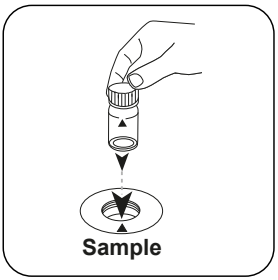
Frantumare la/e pastiglia/e con una leggera rotazione.



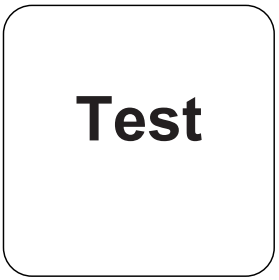
Chiudere la/e cuvetta/e.



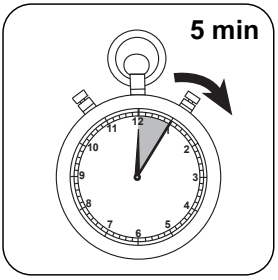
Far sciogliere la/e pastiglia/e agitando.



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



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



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

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

Sul display compare il risultato come Durezza totale.

Valutazione

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

Unità di misura	Forma di citazione	Fattore di conversione
mg/l	$CaCO_3$	1
	°dH	0.056
	°eH	0.07
	°fH	0.1
	°aH	1
mg/l	Ca	0.40043

Metodo chimico

Violetto di ftaleina

Appendice

Interferenze

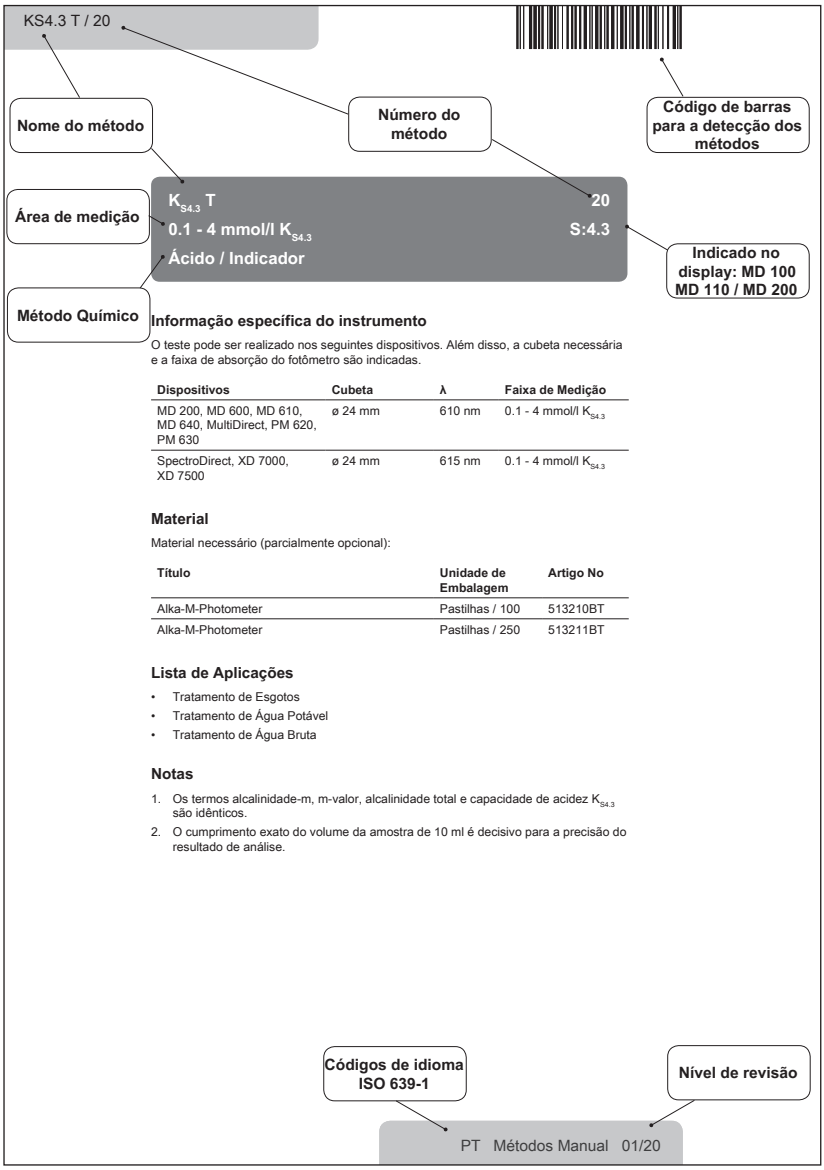
Interferenze escludibili

1. L'interferenza da parte di zinco e magnesio viene eliminata con l'aggiunta di 8-idrossichinolina.
2. Nell'acqua e nel terreno lo stronzio e il bario non compaiono in concentrazioni tali da provocare interferenze.

Riferimenti bibliografici

Photometrische Analyseverfahren, Schwedt, Wissenschaftliche Verlagsgesellschaft mbH, Stoccarda 1989

[i] Elevato intervallo di misurazione grazie alla diluizione


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

Efetuar a medição

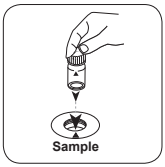
Realização da determinação Capacidade de acidez $K_{S4.3}$ com pastilha

Escolher o método no equipamento.

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

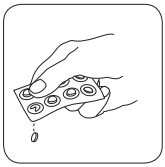
Encher a célula de 24 mm com **10 ml de amostra** .

Fechar a(s) célula(s).

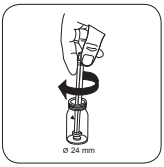


Colocar a **célula de amostra** no compartimento de medição. Observar o posicionamento.

• • •



Pastilha ALKA-M-PHOTOMETER.



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

Fechar a(s) célula(s).

PT Métodos Manual 01/20

Dureza total T M200

2 - 50 mg/L $CaCO_3$ tH1

Metallphthaleine

PT

Material

Material necessário (parcialmente opcional):

Reagentes	Unidade de Embalagem	Código do Produto
Hardcheck P	Pastilhas / 100	515660BT
Hardcheck P	Pastilhas / 250	515661BT

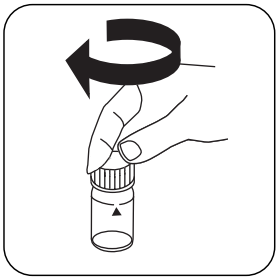
Preparação

1. As águas fortemente alcalinas ou ácidas deviam, antes da análise, ser ajustadas para um valor pH entre 4 e 10 (com 1 mol/l de ácido sulfúrico ou 1 mol/l soda cáustica).

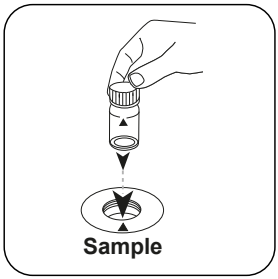
Realização da determinação Dureza, total com pastilha

Escolher o método no equipamento.

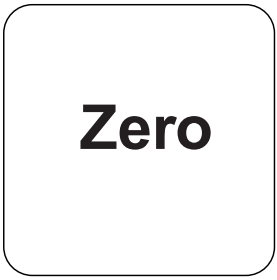
Encher a célula de 24 mm com **10 mL de amostra** .



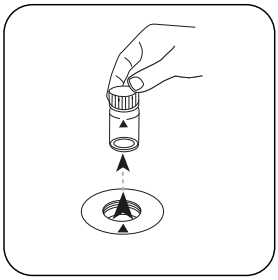
Fechar a(s) célula(s).



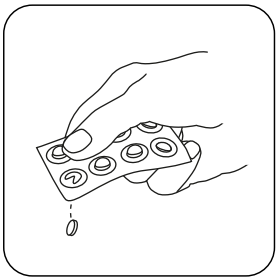
Colocar a **célula de amostra** no compartimento de medição. Observar o posicionamento.



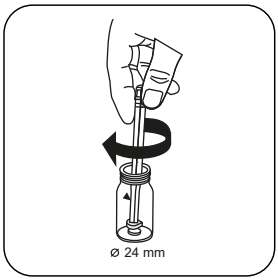
Premir a tecla **ZERO**.



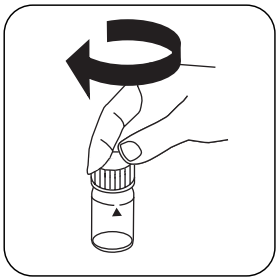
Retirar a célula do compartimento de medição.



Pastilha HARDCHECK P.

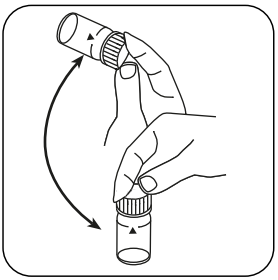


Esmagar a(s) pastilha(s) rodando ligeiramente.

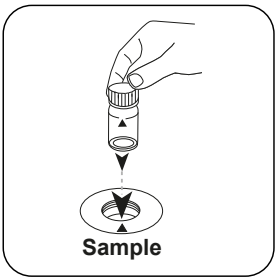


Fechar a(s) célula(s).

PT

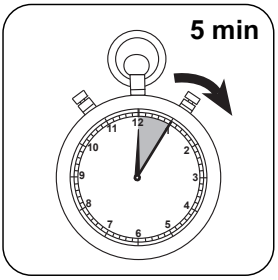


Dissolver a(s) pastilha(s) girando.



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

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



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

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

No visor aparece o resultado como Dureza total.

Análises

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

Unidade	Forma de citação	Fator de conversão
mg/l	$CaCO_3$	1
	°dH	0.056
	°eH	0.07
	°fH	0.1
	°aH	1
mg/l	Ca	0.40043

Método Químico

Metallphthaleine

Apêndice

Texto de Interferências

Interferências Removíveis

1. A interferência por zinco e magnésio pode ser eliminada com a adição de 8-hidroxiquinolina.
2. O estrôncio e o bário não aparecem em concentrações perturbadoras em águas e solos.

Validação de método

Limite de Detecção	0.88 mg/L
Limite de Determinação	2.64 mg/L
Fim da Faixa de Medição	50 mg/L
Sensibilidade	42.5 mg/L / Abs
Faixa de Confiança	2.62 mg/L
Desvio Padrão	1.08 mg/L
Coeficiente de Variação	4.17 %

Bibliografia

Processo de análise fotométrico, Schwedt, Wissenschaftliche Verlagsgesellschaft mbH, Stuttgart 1989

Dureza total HR T M201

20 - 500 mg/L $CaCO_3$ [i] tH2

Metallphthaleine

PT

Material

Material necessário (parcialmente opcional):

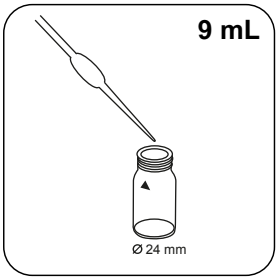
Reagentes	Unidade de Embalagem	Código do Produto
Hardcheck P	Pastilhas / 100	515660BT
Hardcheck P	Pastilhas / 250	515661BT

Preparação

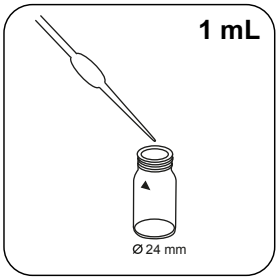
1. As águas fortemente alcalinas ou ácidas deviam, antes da análise, ser ajustadas para um valor pH entre 4 e 10 (com 1 mol/l de ácido sulfúrico ou 1 mol/l soda cáustica).

Realização da determinação Dureza HR total com pastilha

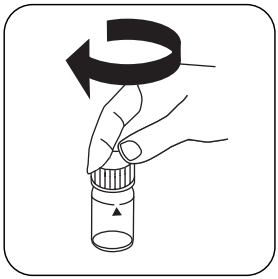
Escolher o método no equipamento.



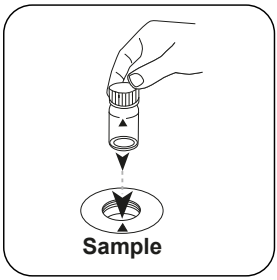
Encher a célula de 24 mm com **9 mL de água desmineralizada**.



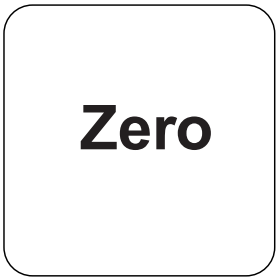
Adicionar **1 mL de amostra** à célula.



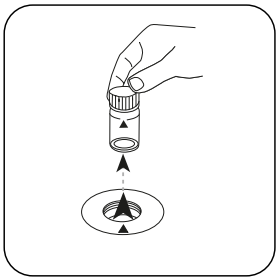
Fechar a(s) célula(s).



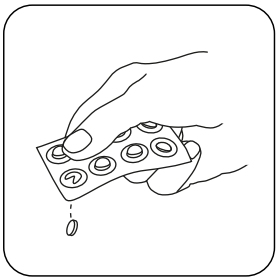
Colocar a **célula de amostra** no compartimento de medição. Observar o posicionamento.



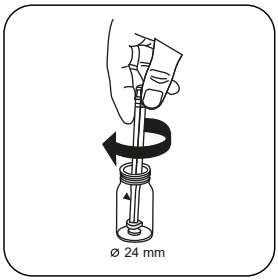
Premir a tecla **ZERO**.



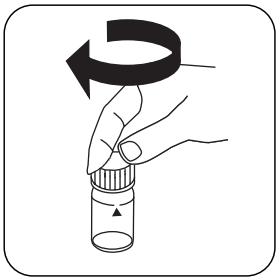
Retirar a célula do compartimento de medição.



Pastilha HARDCHECK P.

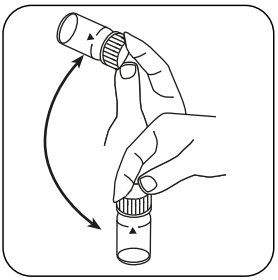


Esmagar a(s) pastilha(s) rodando ligeiramente.

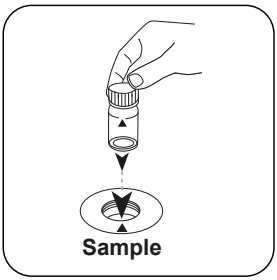


Fechar a(s) célula(s).

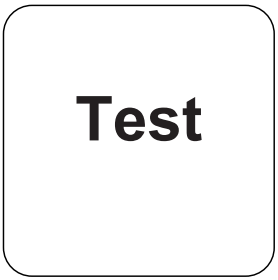
PT



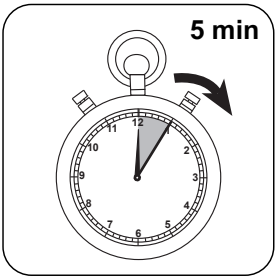
Dissolver a(s) pastilha(s) girando.



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



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



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

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

No visor aparece o resultado como Dureza total.

Análises

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

Unidade	Forma de citação	Fator de conversão
mg/l	$CaCO_3$	1
	°dH	0.056
	°eH	0.07
	°fH	0.1
	°aH	1
mg/l	Ca	0.40043

Método Químico

Metallphthaleine

Apêndice

Texto de Interferências

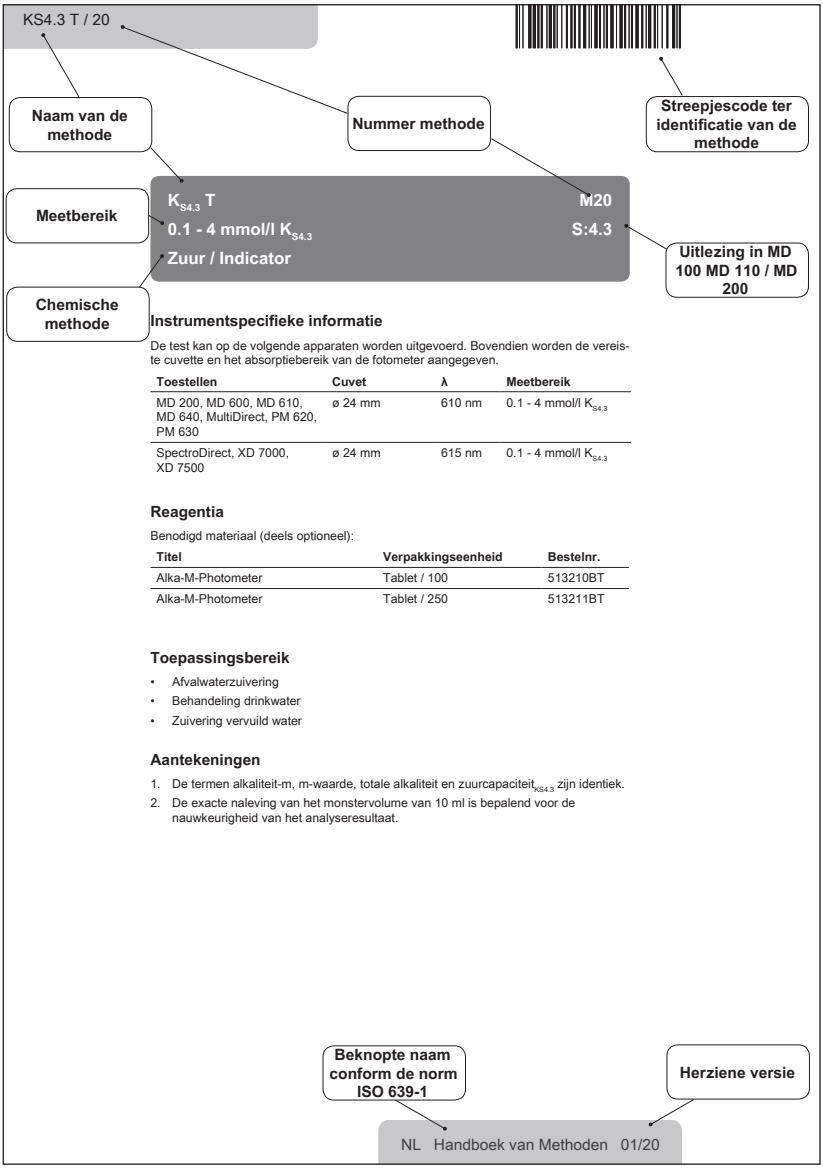
Interferências Removíveis

1. A interferência por zinco e magnésio pode ser eliminada com a adição de 8-hidroxiquinolina.
2. O estrôncio e o bário não aparecem em concentrações perturbadoras em águas e solos.

Bibliografia

Processo de análise fotométrico, Schwedt, Wissenschaftliche Verlagsgesellschaft mbH, Stuttgart 1989

[9]Faixa de medição alta devido à diluição


KS4.3 T / 20
Naam van de methode
Nummer methode
Streepjescode ter identificatie van de methode
Meetbereik
Chemische methode
Uitlezing in MD 100 MD 110 / MD 200
K S4.3 T
M20
0.1 - 4 mmol/l K S4.3
S:4.3
Zuur / Indicator
Instrumentspecifieke informatie
De test kan op de volgende apparaten worden uitgevoerd. Bovendien worden de vereiste cuvette en het absorptiebereik van de fotometer aangegeven.
Toestellen
Cuvet
λ
Meetbereik
MD 200, MD 600, MD 610, MD 640, MultiDirect, PM 620, PM 630
ø 24 mm
610 nm
0.1 - 4 mmol/l K S4.3
SpectroDirect, XD 7000, XD 7500
ø 24 mm
615 nm
0.1 - 4 mmol/l K S4.3
Reagentia
Benodigd materiaal (deels optioneel):
Titel
Verpakkingseenheid
Bestelnr.
Alka-M-Photometer
Tablet / 100
513210BT
Alka-M-Photometer
Tablet / 250
513211BT
Toepassingsbereik
• Afvalwaterzuivering
• Behandeling drinkwater
• Zuivering vervuild water
Aantekeningen
1. De termen alkaliteit-m, m-waarde, totale alkaliteit en zuurcapaciteit KS4.3 zijn identiek.
2. De exacte naleving van het monstervolume van 10 ml is bepalend voor de nauwkeurigheid van het analyseresultaat.
Beknopte naam conform de norm ISO 639-1
Herziene versie
NL Handboek van Methoden 01/20

Uitvoering van de meting

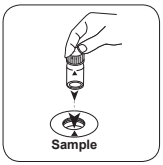
Uitvoering van de bepaling Zuurcapaciteit $K_{S4.3}$ met tablet

De methode in het apparaat selecteren.

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

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

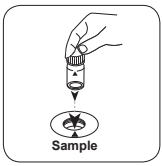
De spoelbakjes afsluiten.



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

• • •

Tabletten oplossen door om te draaien



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

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

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

Totale hardheid T M200

2 - 50 mg/L $CaCO_3$ tH1

Metaalftaleïne

Reagentia

Benodigd materiaal (deels optioneel):

Reagentia	Verpakkingseenheid	Bestelnr.
Hardcheck P	Tablet / 100	515660BT
Hardcheck P	Tablet / 250	515661BT

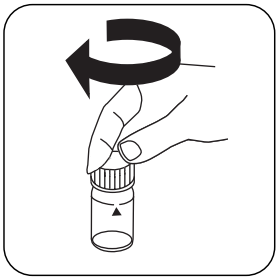
Voorbereiding

1. Sterk alkalisch of zuur water moet vóór de analyse in een pH-gebied tussen 4 en 10 (met 1 mol/l-zoutzuur of 1 mol/l-natriumhydroxideoplossing) worden geplaatst.

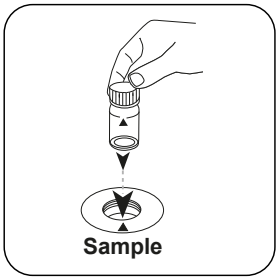
Uitvoering van de bepaling Hardheid, totaal met tablet

De methode in het apparaat selecteren.

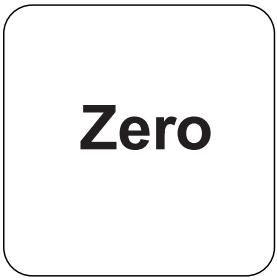
Spoelbakje van 24 mm met **10 mL staal** vullen.



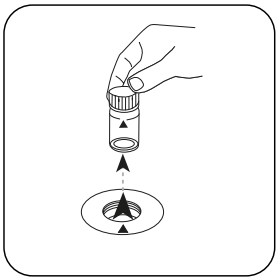
De spoelbakjes afsluiten.



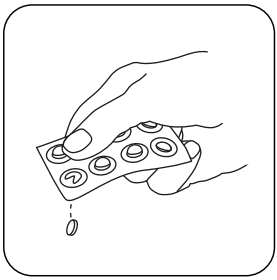
Het **staalspoelbakje** in de meetschacht plaatsen. Op de positionering letten.



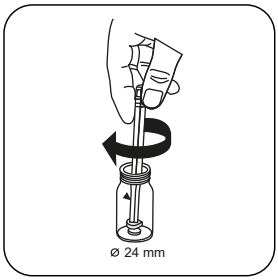
De toets **NUL** indrukken.



Het spoelbakje uit de meetschacht nemen.



Een HARDCHECK P tablet toevoegen.



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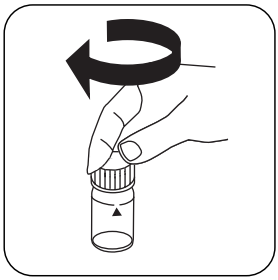
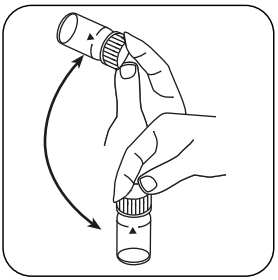
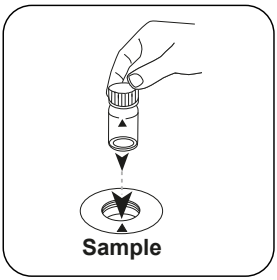


De spoelbakjes afsluiten.

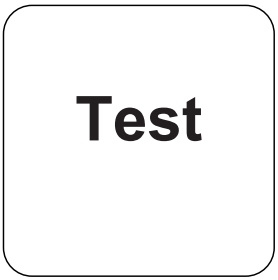
NL



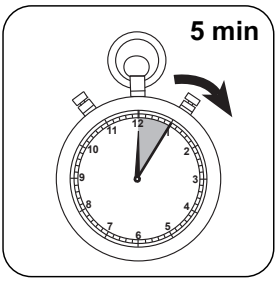
Tabletten oplossen door om te draaien



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



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



De reactietijd van 5 minuten afwachten.

Na afloop van de reactietijd wordt de meting automatisch uitgevoerd.

De display toont het resultaat als Totale hardheid.

Evaluatie

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

Eenheid	Dagvaardingsformulier	Omrekeningsfactor
mg/l	$CaCO_3$	1
	°dH	0.056
	°eH	0.07
	°fH	0.1
	°aH	1
mg/l	Ca	0.40043

Chemische methode

Metaalftaleïne

Aanhangsel

Verstoringen

Uit te sluiten verstoringen

1. De verstoring door zink en magnesium wordt geëlimineerd door de toevoeging van 8-hydroxyquinoline.
2. Strontium en barium komen niet voor in storende concentraties in water en bodem.

Validatie van de methodes

Aantoonbaarheidsgrens	0.88 mg/L
Bepaalbaarheidsgrens	2.64 mg/L
Einde meetbereik	50 mg/L
Gevoeligheid	42.5 mg/L / Abs
Betrouwbaarheidsgrenzen	2.62 mg/L
Standaardafwijking procedure	1.08 mg/L
Variatiecoefficient procedure	4.17 %

Literatuurverwijzing

Photometrische Analyseverfahren, Schwedt, Wissenschaftliche Verlagsgesellschaft mbH, Stuttgart 1989

Totale hardheid HR T M201

20 - 500 mg/L $CaCO_3$ [i] tH2

Metaalftaleïne

NL

Reagentia

Benodigd materiaal (deels optioneel):

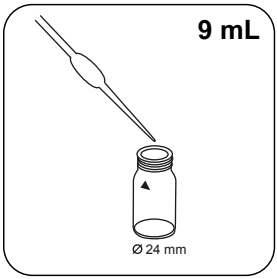
Reagentia	Verpakkingseenheid	Bestelnr.
Hardcheck P	Tablet / 100	515660BT
Hardcheck P	Tablet / 250	515661BT

Voorbereiding

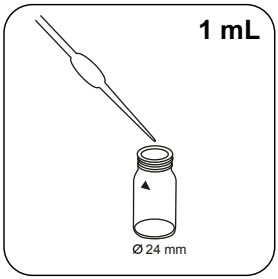
1. Sterk alkalisch of zuur water moet vóór de analyse in een pH-gebied tussen 4 en 10 (met 1 mol/l-zoutzuur of 1 mol/l-natriumhydroxideoplossing) worden geplaatst.

Uitvoering van de bepaling Hardheid, totaal HR met tablet

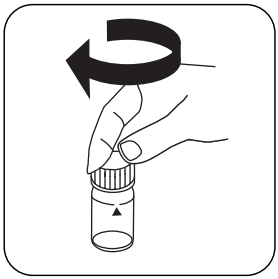
De methode in het apparaat selecteren.



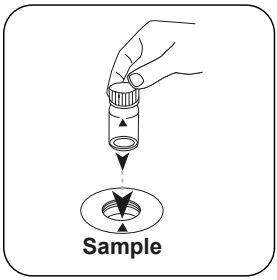
Spoelbakje van 24 mm met **9 mL gedeïoniseerd water** vullen.



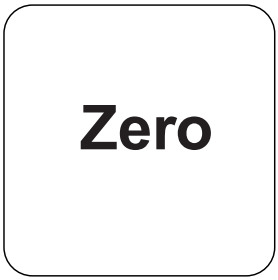
1 mL staal aan het spoelbakje toevoegen.



De spoelbakjes afsluiten.



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



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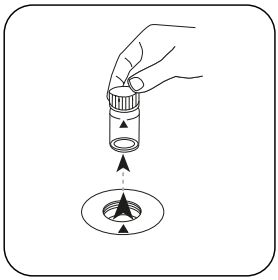
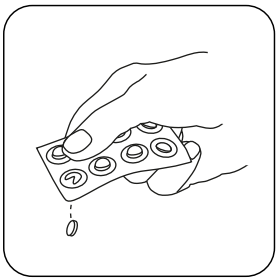
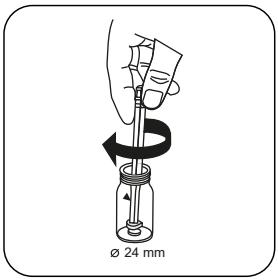


Het spoelbakje uit de meetschacht nemen.



Een HARDCHECK P tablet toevoegen.



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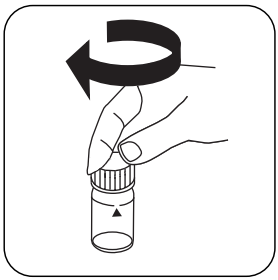

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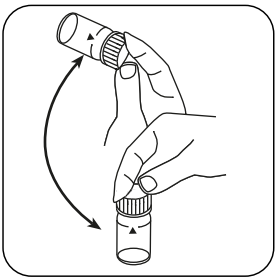

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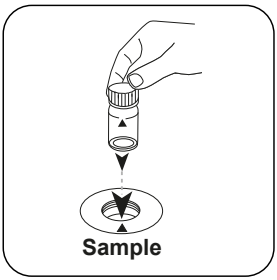
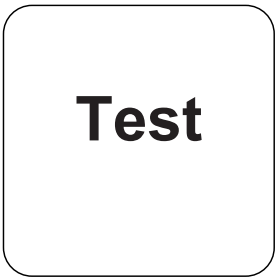
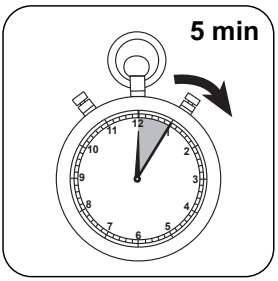


Het **staalspoelbakje** in de meetschacht plaatsen. Op de positionering letten.



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



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Evaluatie

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Metaalftaleïne

Aanhangsel

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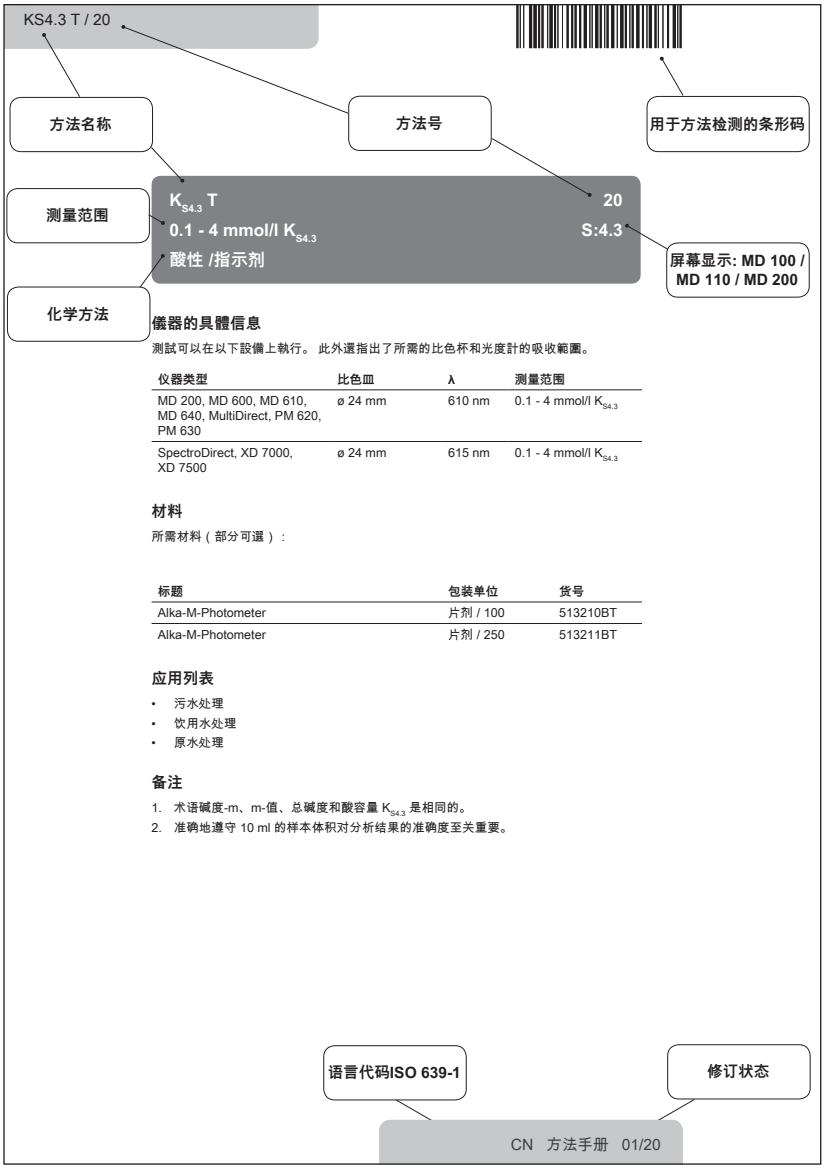
Literatuurverwijzing

Photometrische Analyseverfahren, Schwedt, Wissenschaftliche Verlagsgesellschaft mbH, Stuttgart 1989

[i] hoog meetbereik als gevolg van verdunning



儀器的具體信息

測試可以在以下設備上執行。 此外還指出了所需的比色杯和光度計的吸收範圍。

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

材料

所需材料（部分可選）：

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

应用列表

- 污水处理
- 饮用水处理
- 原水处理

备注

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

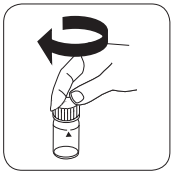
开始测量

进行测定 $K_{S4.3}$ 片剂酸容量

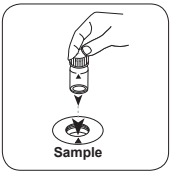
选择设备中的方法。

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

用 **10 ml** 样本填充 24 mm 比色杯。

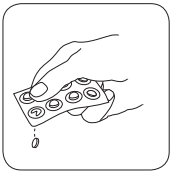


密封比色杯。

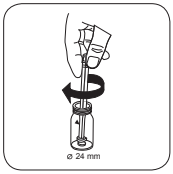


将样本比色杯放入测量轴中。注意定位。

• • •



加入 **ALKA-M-PHOTOMETER** 片剂。



用轻微的扭转压碎片剂。

密封比色杯。

CN 方法手册 01/20

总 T 硬度 M200

2 - 50 mg/L $CaCO_3$ tH1

Metallphthaleine

材料
所需材料（部分可選）：

ZH

试剂	包装单位	货号
Hardcheck P	片剂 / 100	515660BT
Hardcheck P	片剂 / 250	515661BT

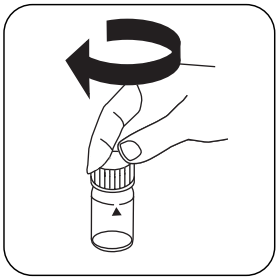
准备

1. 在分析前（用 1 mol/l 盐酸或 1 mol/l 氢氧化钠溶液）应将强碱性或酸性水的 pH 范围调节到 4 和 10 之间。

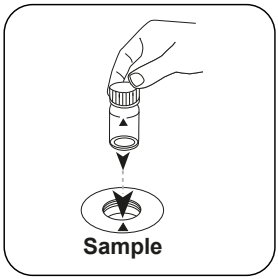
进行测定 硬度，含片剂的总硬度

选择设备中的方法。

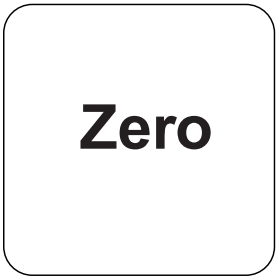
用 **10 mL 样本**填充 24 mm 比色杯。



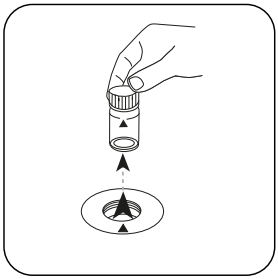
密封比色杯。



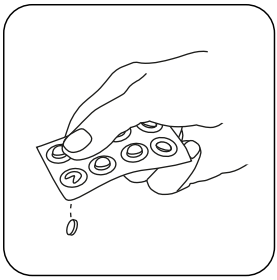
将**样本比色杯**放入测量轴中。注意定位。



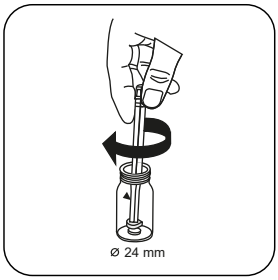
按下 **ZERO** 按钮。



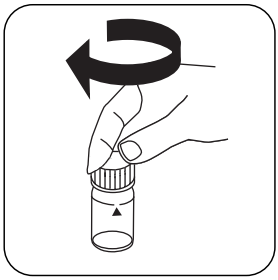
从测量轴上取下比色杯。



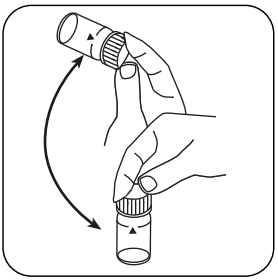
加入 **HARDCHECK P 片剂**。



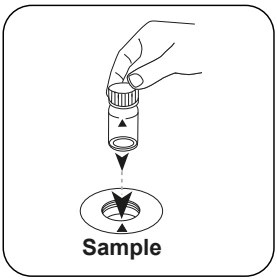
用轻微的扭转压碎片剂。



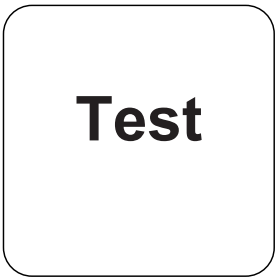
密封比色杯。



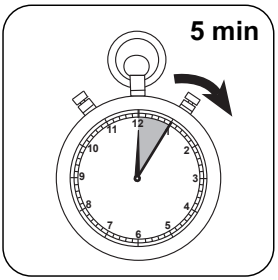
通过旋转溶解片剂。



将**样本比色杯**放入测量轴中。注意定位。



按下 **TEST** (XD: **START**) 按钮。



等待 5 分钟反应时间 。

反应时间结束后，自动进行测量。

结果在显示屏上显示为 total Hardness。

分析

下表中输出数据也可转换为其他格式表示.

单位	参考表格	因素
mg/l	$CaCO_3$	1
	°dH	0.056
	°eH	0.07
	°fH	0.1
	°aH	1
mg/l	Ca	0.40043

化学方法

Metallphthaleine

附錄

干扰说明

可消除干扰

1. 通过加入 8-羟基喹啉消除锌和镁的干扰。
2. 锶和钡不会以可产生干扰的浓度出现在水和土壤中。

方法验证

检出限	0.88 mg/L
测定下限	2.64 mg/L
测量上限	50 mg/L
灵敏度	42.5 mg/L / Abs
置信范围	2.62 mg/L
标准偏差	1.08 mg/L
变异系数	4.17 %

参考文献

Photometrische Analyseverfahren, Schwedt, Wissenschaftliche Verlagsgesellschaft mbH, Stuttgart 1989

总 HR T 硬度 M201

20 - 500 mg/L $CaCO_3$ [i] tH2

Metallphthaleine

材料
所需材料（部分可選）：

ZH

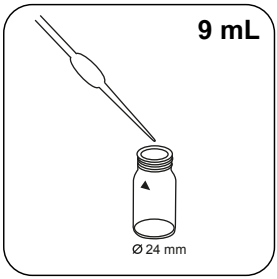
试剂	包装单位	货号
Hardcheck P	片剂 / 100	515660BT
Hardcheck P	片剂 / 250	515661BT

准备

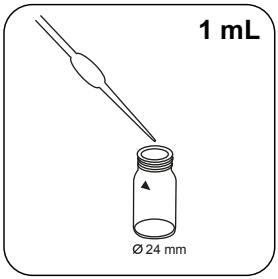
1. 在分析前（用 1 mol/l 盐酸或 1 mol/l 氢氧化钠溶液）应将强碱性或酸性水的 pH 范围调节到 4 和 10 之间。

进行测定 总硬度 HR 片剂法

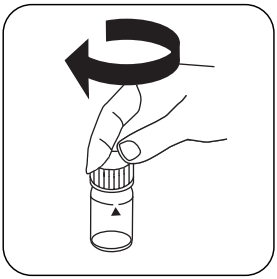
选择设备中的方法。



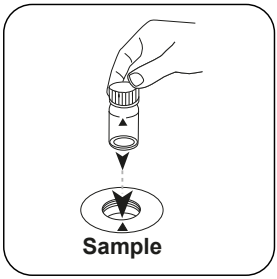
用 **9 mL 去离子水**填充 24 mm 比色杯。



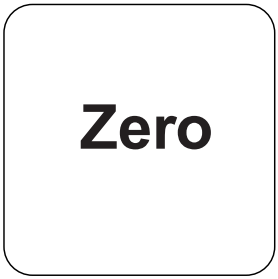
添加 **1 mL 样本**到比色杯中。



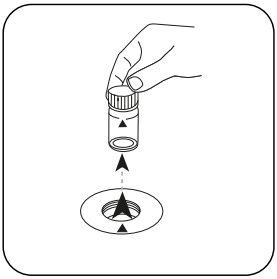
密封比色杯。



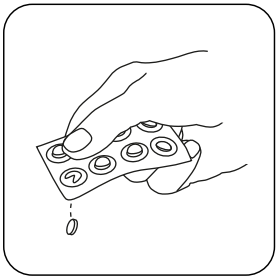
将**样本比色杯**放入测量轴中。注意定位。



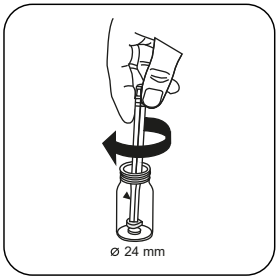
按下 **ZERO** 按钮。



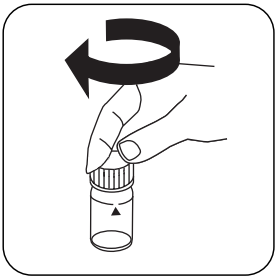
从测量轴上取下比色杯。



加入 **HARDCHECK P 片剂**。

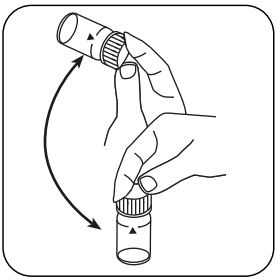


用轻微的扭转压碎片剂。



密封比色杯。

ZH



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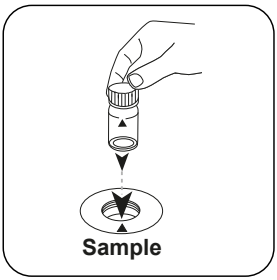
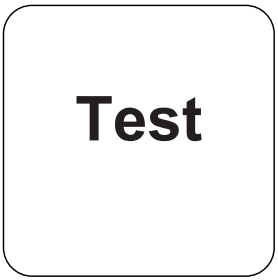
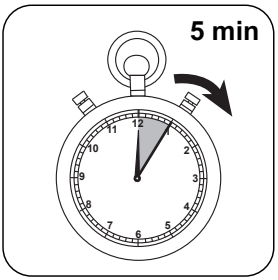


将**样本比色杯**放入测量轴中。注意定位。



按下 **TEST** (XD: **START**) 按钮。



等待 **5 分钟反应时间** 。

反应时间结束后，自动进行测量。

结果在显示屏上显示为 总硬度。

分析

下表中输出数据也可转换为其他格式表示.

单位	参考表格	因素
mg/l	$CaCO_3$	1
	°dH	0.056
	°eH	0.07
	°fH	0.1
	°aH	1
mg/l	Ca	0.40043

化学方法

Metallphthaleine

附錄

干扰说明

可消除干扰

1. 通过加入 8-羟基喹啉消除锌和镁的干扰。
2. 锶和钡不会以可产生干扰的浓度出现在水和土壤中。

参考文献

Photometrische Analyseverfahren, Schwedt, Wissenschaftliche Verlagsgesellschaft mbH, Stuttgart 1989

[9] 通过稀释进行高量程测定

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