Hardness total HR T M201

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

Metallphthaleine

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 100, MD 600, MD 610, MD 640, MultiDirect, PM 620, PM 630	ø 24 mm	560 nm	20 - 500 mg/L $CaCO_3$ [i]
SpectroDirect, XD 7000, XD 7500	ø 24 mm	571 nm	20 - 500 mg/L $CaCO_3$ [i]

Material

Required material (partly optional):

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

Application List

- Cooling Water
- Boiler Water
- Drinking Water Treatment
- Raw Water Treatment

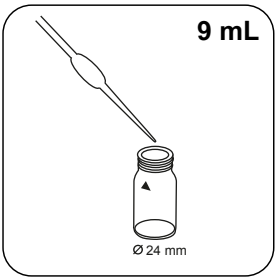
Preparation

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).

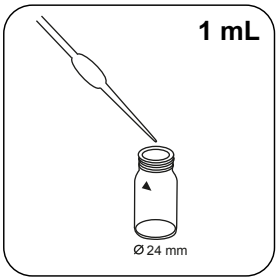
Determination of Hardness total HR with tablet

Select the method on the device.

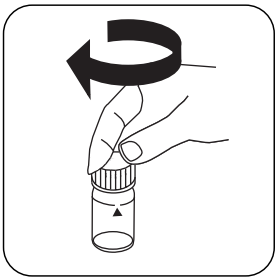
For this method, a ZERO measurement does not have to be carried out every time on the following devices: XD 7000, XD 7500



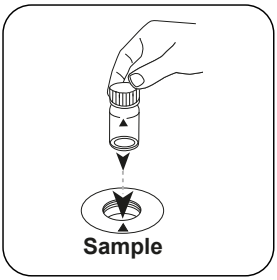
Fill 24 mm vial with **9 mL deionised water** .



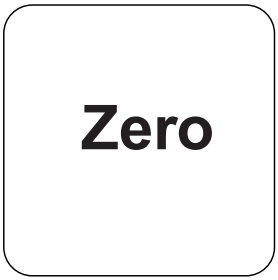
Put **1 mL sample** in the vial.



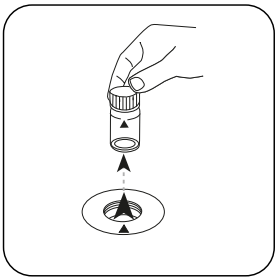
Close vial(s).



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

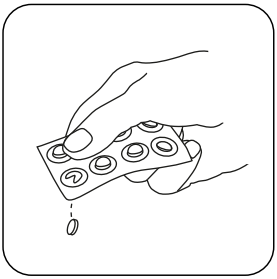


Press the **ZERO** button.

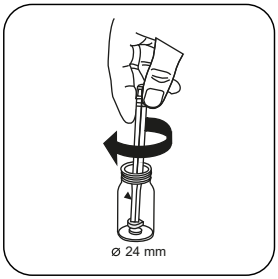


Remove the vial from the sample chamber.

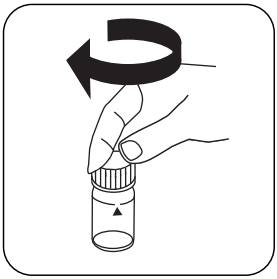
For devices that require **no ZERO measurement** , **start here**.



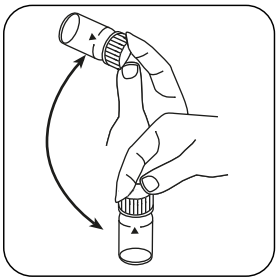
Add **HARDCHECK P tablet**.



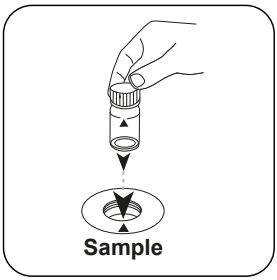
Crush tablet(s) by rotating slightly.



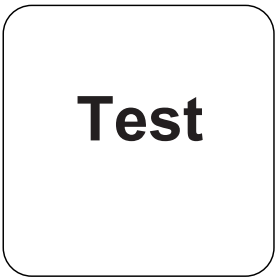
Close vial(s).



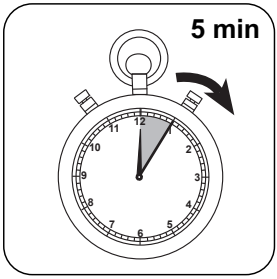
Dissolve tablet(s) by inverting.



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



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



Wait for **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

Calibration function for 3rd-party photometers

Conc. = a + b•Abs + c•Abs^2 + d•Abs^3 + e•Abs^4 + f•Abs^5

	ø 24 mm	□ 10 mm
a	$-3.06466 \cdot 10^{+1}$	$-3.06466 \cdot 10^{+1}$
b	$5.0694 \cdot 10^{+2}$	$1.08992 \cdot 10^{+3}$
c	$-6.33317 \cdot 10^{+1}$	$-2.92751 \cdot 10^{+2}$
d		
e		
f		

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