

**Chlorine T****M100****0.01 - 6.0 mg/l Cl₂ ^{a)}****CL6****DPD**

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 110, MD 200, MD 600, MD 610, MD 640, MultiDirect, PM 600, PM 620, PM 630	ø 24 mm	530 nm	0.01 - 6.0 mg/l Cl ₂ ^{a)}
Scuba II	ø 24 mm	530 nm	0.1 - 6.0 mg/l Cl ₂ ^{a)}
XD 7000, XD 7500	ø 24 mm	510 nm	0.01 - 6.0 mg/l Cl ₂ ^{a)}
SpectroDirect	ø 24 mm	510 nm	0.02 - 6.0 mg/l Cl ₂ ^{a)}

Application List

- Waste Water Treatment
- Disinfection Control
- Boiler Water
- Cooling Water
- Raw Water Treatment
- Pool Water Control
- Pool Water Treatment
- Drinking Water Treatment

Sampling

1. When preparing the sample, Chlorine outgassing, e.g. through the pipette or shaking, must be avoided.
2. The analysis must take place immediately after taking the sample.



Preparation

1. Cleaning of vials:
As many household cleaners (e.g. dishwasher detergent) contain reducing substances, this can lead to lower results with the determination of Chlorine. To avoid measurement errors, the glassware used should be free of chlorine consumption. To achieve this, all glassware should be placed in a sodium hypochlorite solution (0.1 g/l) for one hour and then rinsed thoroughly with deionised water.
2. For individual testing of free and total Chlorine, the use of different sets of glassware is recommended (EN ISO 7393-2, 5.3)
3. The DPD colour development is carried out at a pH value of 6.2 to 6.5. The reagents therefore contain a buffer for the pH adjustment. Strong alkaline or acidic water samples must therefore be adjusted between pH 6 and pH 7 before the analysis (use 0.5 mol/l Sulphuric acid or 1 mol/l Sodium hydroxide).



Implementation of the provision free chlorine with tablet

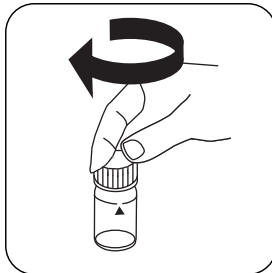
Select the method on the device

In addition, choose the test: free

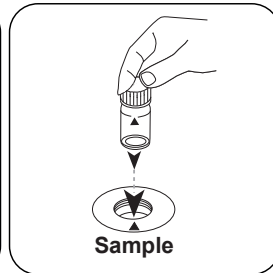
For this method, no ZERO measurements are to be carried out with the following devices: XD 7000, XD 7500



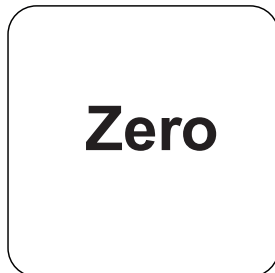
Fill 24 mm vial with **10 ml sample**.



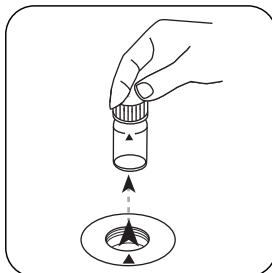
Close vial(s).



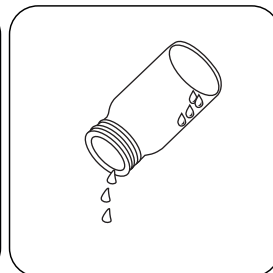
Place **sample vial** in the sample chamber. • Pay attention to the positioning.



Press the **ZERO** button.

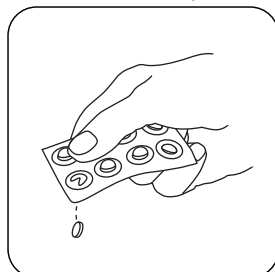


Remove the vial from the sample chamber.

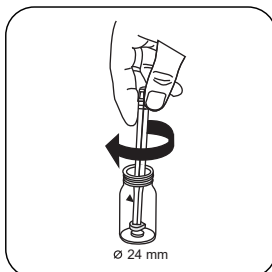


Empty vial except for a few drops.

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



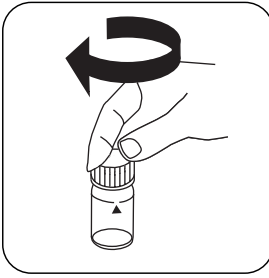
Add **DPD No. 1 tablet**.



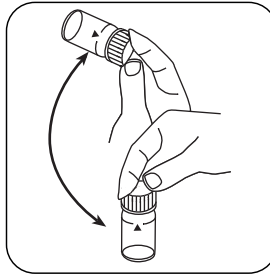
Crush tablet(s) by rotating slightly.



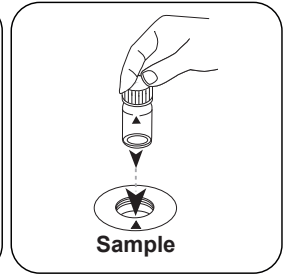
Fill up vial with **sample** to the **10 ml mark**.



Close vial(s).



Dissolve tablet(s) by inverting.



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

Test

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

The result in mg/l free chlorine appears on the display.



Implementation of the provision total Chlorine with tablet

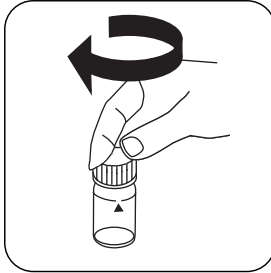
Select the method on the device

In addition, choose the test: total

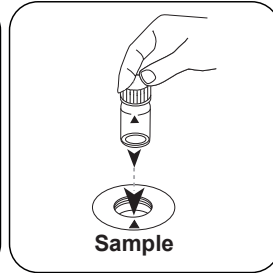
For this method, no ZERO measurements are to be carried out with the following devices: XD 7000, XD 7500



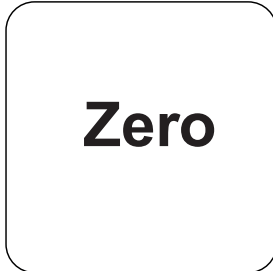
Fill 24 mm vial with **10 ml sample**.



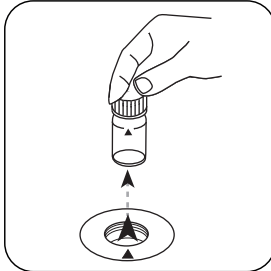
Close vial(s).



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



Press the **ZERO** button.

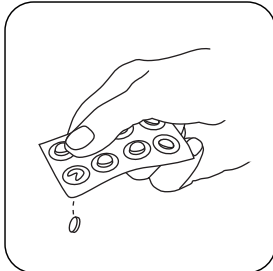


Remove the vial from the sample chamber.

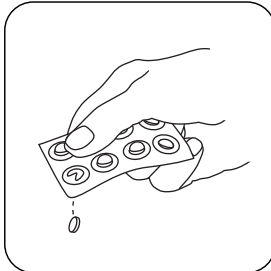


Empty vial except for a few drops.

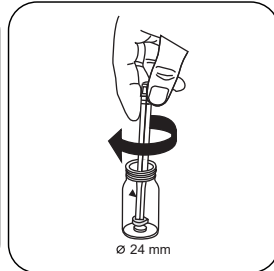
For devices that require **no ZERO measurement**, start here.



Add **DPD No. 1 tablet**.



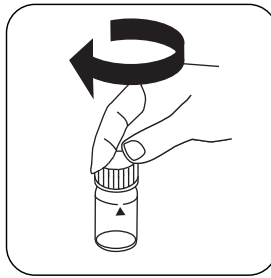
Add **DPD No. 3 tablet**.



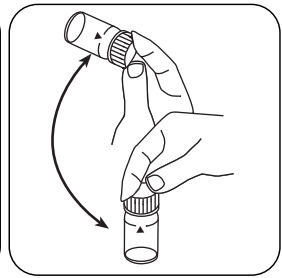
Crush tablet(s) by rotating slightly.



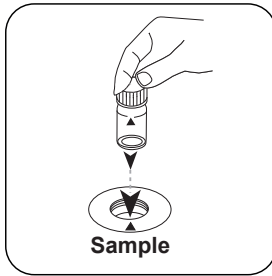
Fill up vial with **sample** to the **10 ml** mark.



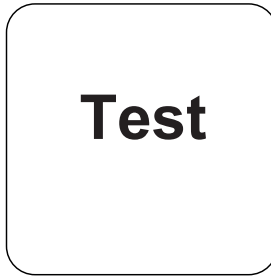
Close vial(s).



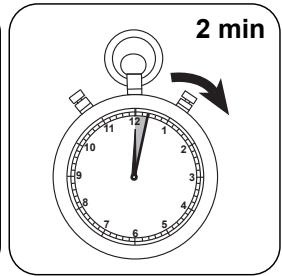
Dissolve tablet(s) by invert-
ing.



Place **sample vial** in the
sample chamber. • Pay at-
tention to the positioning.



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



Wait for **2 minute(s)** reac-
tion time.

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



Implementation of the provision Chlorine differentiated with tablet

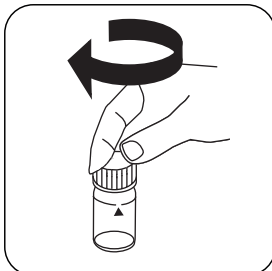
Select the method on the device

In addition, choose the test: differentiated

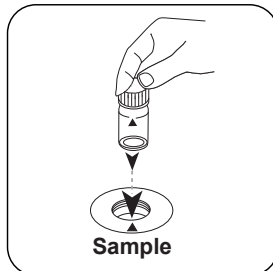
For this method, no ZERO measurements are to be carried out with the following devices: XD 7000, XD 7500



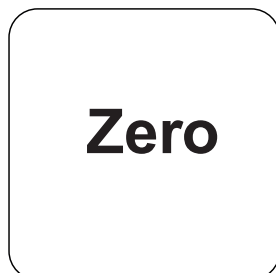
Fill 24 mm vial with **10 ml sample**.



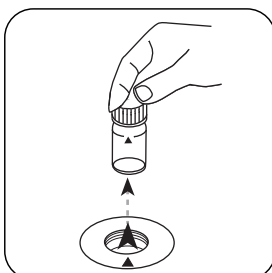
Close vial(s).



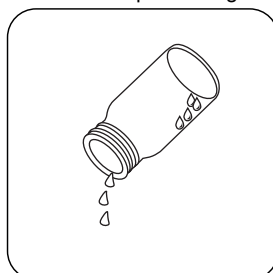
Place **sample vial** in the sample chamber. • Pay attention to the positioning.



Press the **ZERO** button.

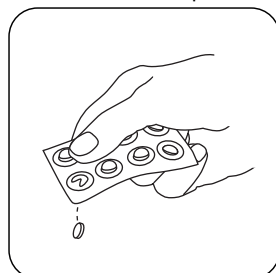


Remove the vial from the sample chamber.

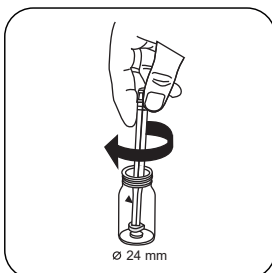


Empty vial except for a few drops.

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



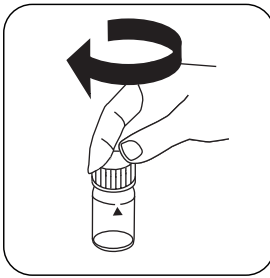
Add **DPD No. 1 tablet**.



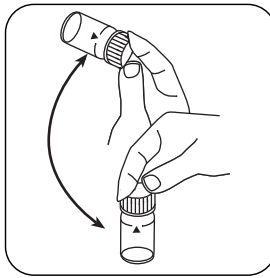
Crush tablet(s) by rotating slightly.



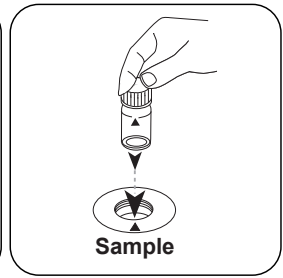
Fill up vial with **sample** to the **10 ml mark**.



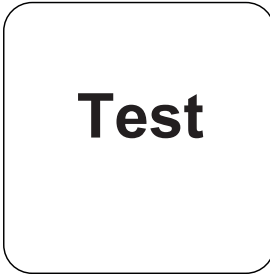
Close vial(s).



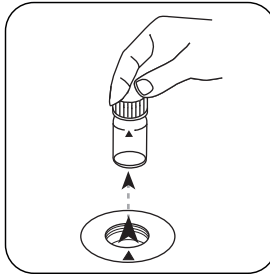
Dissolve tablet(s) by invert-
ing.



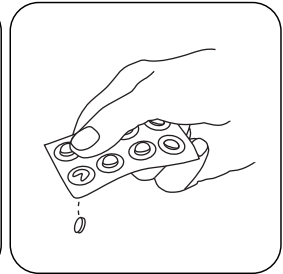
Place **sample vial** in the
sample chamber. • Pay at-
tention to the positioning.



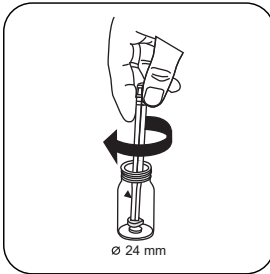
Press the **TEST** (XD:
START) button.



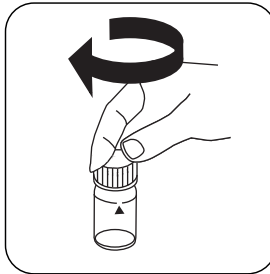
Remove the vial from the
sample chamber.



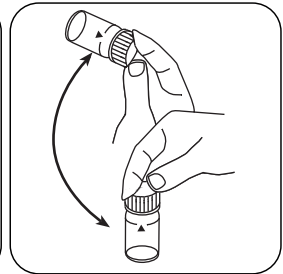
Add **DPD No. 3 tablet** .



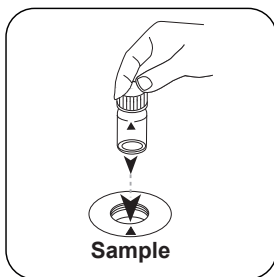
Crush tablet(s) by rotating
slightly.



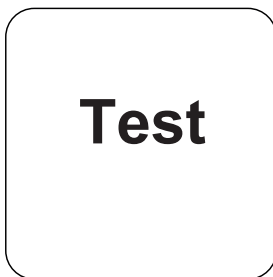
Close vial(s).



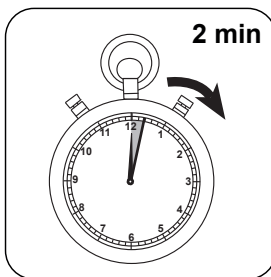
Dissolve tablet(s) by invert-
ing.



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



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



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

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

The result in mg/l free chlorine, mg/l combined chlorine, mg/l total chlorine appears on the display.

Chemical Method

DPD

Appendix

Calibration function for 3rd-party photometers

$$\text{Conc.} = a + b \cdot \text{Abs} + c \cdot \text{Abs}^2 + d \cdot \text{Abs}^3 + e \cdot \text{Abs}^4 + f \cdot \text{Abs}^5$$

Note

Please select items for "Fields".

Interferences

Persistent Interferences

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

Removeable Interferences

- Interference from Copper and Iron (III) are eliminated by the addition of EDTA.
- The use of reagent tablets in samples with high Calcium content* and/or high conductivity* can lead to turbidity of the sample and therefore incorrect measurements. In this case, the alternative reagent tablet DPD No. 1 High Calcium and reagent tablet DPD No. 3 High Calcium should be used.
*it is not possible to give exact values, because the development of turbidity depends on the composition and nature of the sample.
- Concentrations above 10 mg/l Chlorine, in the event of using fluid reagents, can lead to results within the measuring range of up to 0 mg/l. In the event of a high concentration of Chlorine, the sample must be diluted with chlorine-free water. 10 ml of the diluted sample should be mixed with the reagent and the measurement taken again (plausibility test).

Interference	from / [mg/l]
CrO_4^{2-}	0.01
MnO_2	0.01



Method Validation

Limit of Detection	0.02 mg/l
Limit of Quantification	0.06 mg/l
End of Measuring Range	6 mg/l
Sensitivity	2.05 mg/l / Abs
Confidence Intervall	0.04 mg/l
Standard Deviation	0.019 mg/l
Variation Coefficient	0.87 %

Conformity

EN ISO 7393-2

^{a)} determination of free, combined and total

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