

# Chlorine 2

**Test kit for performing colorimetric tests on free and total chlorine in drinking water, swimming pools, and water reservoirs**

## Method:

At a pH value of 5 to 6, free chlorine reacts with *N,N*-diethyl-1,4-phenylene diamine (DPD) and forms a red-violet dye. In the presence of iodide ions, the content of total chlorine (free and combined chlorine together) can be determined.

## Measurement range:

0.1–2.0 mg/L Cl<sub>2</sub>

## Contents of test kit (\*refill pack):

sufficient for 150 tests

- 18 mL Cl<sub>2</sub>-1\*
- 25 mL Cl<sub>2</sub>-2\*
- 30 mL Cl<sub>2</sub>-3\* (only REF 931 015/931 215)
- 2 screw-plug measuring glasses
- 1 slide comparator
- 1 color chart
- 1 plastic syringe 5 mL
- 1 instructions for use\*

## Hazard warning:

Cl<sub>2</sub>-2 contains sulfuric acid 5–15%.

For further information please ask for a safety data sheet.

## Instructions for use:

also refer to the pictogram on the back of the color chart

### a) Free chlorine

1. Pour a **5 mL water sample** into one of the measuring glasses using the plastic syringe and place it on position A in the comparator.

### Only add the reagent to measuring glass B.

2. Fill the second measuring glass with **3 drops of Cl<sub>2</sub>-1**.
3. Add **3 drops of Cl<sub>2</sub>-2**.
4. Add a **5 mL water sample** using the plastic syringe, seal the glass and mix.
5. Open the glass and place it on position B in the comparator.
6. Slide the comparator until the colors match in the inspection hole on top. **Immediately** check the measurement reading in the recess on the comparator reed. Mid-values can be estimated.

### b) Total chlorine (only REF 931 015/931 215)

7. Add **3 drops of Cl<sub>2</sub>-3**. Seal the glass and mix.
8. Open the glass after **2 min**, place it on position B in the comparator and read off the chlorine value as described above.
9. After use, rinse out both measuring glasses thoroughly and seal them.

### c) Combined chlorine

The content of combined chlorine can be calculated as difference of total and free chlorine.

The reagents can be used also for the **photometric evaluation** with photometers PF-11/PF-12/PF-3.

This technique can be used also for analyzing sea water.

## Disposing of the samples:

The used analysis specimens can be flushed down the drain with tap water and channelled off to the local sewage treatment works.

## Interferences:

The determination of free chlorine measures bromine, bromamine, chloramine, iodine and, in part, chlorine dioxide as well. Higher manganese compounds simulate free chlorine.

Chlorine concentrations above 10 mg/L can bleach the red reaction color (low results).

Rinse glass tubes several times thoroughly. Residues of Cl<sub>2</sub>-3 can cause higher values for free chlorine.

## Note:

Determination of bromine besides chlorine: If chlorine is present in the sample, it can be destroyed by adding a spatula of glycine (approx. 20 mg) to 25 mL sample. The sample for the bromine determination is taken from this solution. Result in mg/L Cl<sub>2</sub> x 2.25 = mg/L Br<sub>2</sub>.

## Conversion table:

mg/L Cl <sub>2</sub>	mg/L ClO <sub>2</sub>	mg/L OCl <sup>-</sup>	mg/L NaOCl	mg/L Br <sub>2</sub>	mg/L I <sub>2</sub>
0.1	0.2	0.1	0.2	0.2	0.4
0.2	0.4	0.3	0.4	0.5	0.7
0.3	0.6	0.4	0.6	0.7	1.1
0.4	0.8	0.6	0.8	0.9	1.4
0.6	1.1	0.9	1.3	1.4	2.1
0.9	1.7	1.3	1.9	2.0	3.2
1.2	2.3	1.7	2.5	2.7	4.3
2.0	3.8	2.9	4.2	4.5	7.2

## For swimming pools (in Germany) please note:

If the content of free chlorine is below 0.3 mg/L, add some chlorinating reagent. If the content is above 0.6 mg/L, add fresh water. The ideal pH value is 7.4.

## Storage:

Store the test kit in a cool (< 25 °C) and dry place.