

Chlorine 1

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 Cl₂

Contents of test kit (*refill pack):

sufficient for 150 tests

- 6 g Cl₂-1*
- 30 mL Cl₂-2*
- 1 measuring spoon 70 mm*
- 2 screw-plug measuring glasses
- 1 slide comparator
- 1 color chart
- 1 plastic syringe 5 mL
- 1 instructions for use*

Hazard warning:

This test does not contain any harmful substances which must be specially labelled as hazardous.

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 each of the measuring glasses using the plastic syringe. Place a measuring glass on position A in the comparator.

Only add the reagent to measuring glass B.

2. Add **1 level measuring spoon of Cl₂-1**, seal the glass and shake well for 20 s.
3. Open the glass **after 1 min** and place it on position B in the comparator.
4. Slide the comparator until the colors match in the inspection hole on top. Check the measurement reading in the recess on the comparator reed. Mid-values can be estimated.

b) Total chlorine

5. Add **3 drops of Cl₂-2**. Seal the glass and mix.
6. Open the glass **after 2 min**, place it on position B in the comparator and read off the chlorine value as described above.
7. 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-3/PF-12 and PF-12^{Plus}.

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 Cl₂-2 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 Cl₂ x 2.25 = mg/L Br₂.

Conversion table:

mg/L Cl ₂	mg/L ClO ₂	mg/L OCl ⁻	mg/L NaOCl	mg/L Br ₂	mg/L I ₂
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.