







Test sticks and test papers for semi-quantitative determinations

QUANTOFIX® test sticks for semi-quantitative determinations



QUANTOFIX® test sticks meet the most important requirements for a modern quick-test:

-  **rapid** dip and read
-  **convenient** the analysis can be carried out without any further equipment, only a single test stick of QUANTOFIX® is needed
-  **specific** QUANTOFIX® test sticks are highly specific – possible interferences are eliminated by precipitation or masking
-  **stable** shelf life 2 1/2 years when stored below +30 °C

Type	Gradation	Colour change	Cat. No.
QUANTOFIX® Aluminium ¹⁾	0–5–20–50–200–500 mg/l Al ³⁺	pink to red	913 07
QUANTOFIX® Ammonium ¹⁾	0–10–25–50–100–200–400 mg/l NH ₄ ⁺	yellow to orange	913 15
QUANTOFIX® Ascorbic acid	0–50–100–200–300–500–1000–2000 mg/l vitamin C	yellow to green-blue	913 14
QUANTOFIX® Calcium ¹⁾	0–10–25–50–100 mg/l Ca ²⁺	yellow to red	913 24²⁾
QUANTOFIX® Carbonate hardness	0–3–6–10–15–20 °d	light green to blue	913 23
QUANTOFIX® Chloride	0–500–1000–1500–2000– ≥ 3000 mg/l Cl ⁻	brown to yellow	913 21
QUANTOFIX® Chlorine ¹⁾	0–1–3–10–30–100 mg/l Cl ₂	white to red-violet	913 17
QUANTOFIX® Chromate ¹⁾	0–3–10–30–100 mg/l CrO ₄ ²⁻	white to violet	913 01
QUANTOFIX® Cobalt	0–10–25–50–100–250–500–1000 mg/l Co ²⁺	white to green-blue	913 03
QUANTOFIX® Copper	0–10–30–100–300 mg/l Cu ⁺²⁺	white to red-violet	913 04
QUANTOFIX® Cyanide ¹⁾	0–1–3–10–30 mg/l CN ⁻	white to red-violet	913 18
QUANTOFIX® Formaldehyde ¹⁾	0–10–20–40–60–100–200 mg/l HCHO	beige to blue-violet	913 28
QUANTOFIX® Iron 1000 ¹⁾	0–5–20–50–100–250–500–1000 mg/l Fe ^{2+/3+}	white to dark red	913 02
QUANTOFIX® Iron 100 ¹⁾	0–2–5–10–25–50–100 mg/l Fe ^{2+/3+}	white to blue-violet	913 08
QUANTOFIX® Molybdenum ¹⁾ NEW!	0–5–20–50–100–250 mg/l Mo ⁶⁺	white to green	913 25
QUANTOFIX® Nickel	0–10–25–50–100–250–500–1000 mg/l Ni ²⁺	white to light red	913 05
QUANTOFIX® Nitrate/nitrite	0–10–25–50–100–250–500 mg/l NO ₃ ⁻	white to red-violet	913 13
	0–1–5–10–20–40–80 mg/l NO ₂ ⁻	white to red-violet	
QUANTOFIX® Nitrite	0–1–5–10–20–40–80 mg/l NO ₂ ⁻	white to red-violet	913 11
QUANTOFIX® Nitrite 3000	0–0.1–0.3–0.6–1–2–3 g/l NO ₂ ⁻	yellow to red	913 22
Ozone	see Ozone test sticks page 27	light yellow to brown	–
QUANTOFIX® Peroxide e100	0–1–3–10–30–100 mg/l H ₂ O ₂	white to blue	913 12
QUANTOFIX® Peroxide 25	0–0.5–2–5–10–25 mg/l H ₂ O ₂	white to blue	913 19
QUANTOFIX® Phosphate ¹⁾	0–3–10–25–50–100 mg/l PO ₄ ³⁻	white to blue-green	913 20
QUANTOFIX® Potassium ¹⁾	0–200–400–700–1000–1500 mg/l K ⁺	yellow to orange	913 16
Silver	see Ag-Fix page 25	yellow to brown	–
QUANTOFIX® Sulphate	0– >400– >800– >1200– >1600 mg/l SO ₄ ²⁻	red to yellow	913 29
QUANTOFIX® Sulphite	0–10–25–50–100–250–500–1000 mg/l SO ₃ ²⁻	white to salmon	913 06
Swimming pool	see Swimming pool test page 28	–	–
QUANTOFIX® Tin	0–10–25–50–100–250–500 mg/l Sn ²⁺	white to dark blue	913 09
total Hardness	see AQUADUR® test sticks page 26	green to red	–
QUANTOFIX® Zinc ¹⁾	0–2–5–10–25–50–100 mg/l Zn ²⁺	orange to red	913 10
QUANTOFIX® Multistick	0–5–10–15–20–25 °d total hardness	green to red	913 26
for aquarium owners	0–3–6–10–15–20 °d carbonate hardness	light green to blue	913 27³⁾
	pH 6.4–6.8–7.2–7.6–8.0–8.4	yellow to red	

Presentation: container with 100 test sticks 6 x 95 mm

¹⁾ These tests are supplied complete with all reagents required for the determination.

²⁾ Presentation: container with 60 test sticks ³⁾ Presentation: container with 25 test sticks



Description of QUANTOFIX® test sticks in alphabetical order

QUANTOFIX® Aluminium Cat. No. 913 07

Test sticks and reagents for the semi-quantitative determination of aluminium in solutions

Range: 5 – 500 mg/l Al³⁺

After dipping the test stick into the strongly alkaline test solution (pH 13.5 – 14) immerse the test area in 10 % acetic acid for about 1 minute.

Be²⁺ interferes. Cu²⁺ interferes > 10 mg/l (precipitation with KI or Cd powder). The following anions cause low results:

- > 100 mg/l MnO₄⁻, PO₄³⁻, SO₃²⁻, S²⁻
- > 500 mg/l B₄O₇²⁻, F⁻, [Fe(CN)₆]³⁻, S₂O₄²⁻, SiO₄⁴⁻, citrate and tartrate.

QUANTOFIX® Ammonium Cat. No. 913 15

Test sticks and reagents for the semi-quantitative determination of ammonium in solutions

Range: 10 – 400 mg/l NH₄⁺

QUANTOFIX® Ascorbic acid Cat. No. 913 14

Test sticks for the semi-quantitative determination of vitamin C in solutions.

Range: 50 – 2000 mg/l ascorbic acid

Store test sticks for ascorbic acid in a cool and dry place, protected from sunlight and moisture.

QUANTOFIX® Calcium Cat. No. 913 24

Test sticks and reagents for the semi-quantitative determination of calcium in solutions

Range: 10 – 100 mg/l Ca²⁺

The following ions only interfere above the indicated concentrations:

- > 1000 mg/l Al³⁺, As³⁺, NH₄⁺, Sb³⁺, K⁺, Na⁺, Bi³⁺, Br⁻, Cl⁻, CN⁻, CrO₄²⁻, [Fe(CN)₆]³⁻, [Fe(CN)₆]⁴⁻, I⁻, NO₂⁻, NO₃⁻, PO₄³⁻, SCN⁻, S₂O₅²⁻, acetate, ascorbate, citrate, tartrate
- > 500 mg/l Ba²⁺, Mg²⁺ > 250 mg/l Sr²⁺
- > 100 mg/l MnO₄⁻

Heavy metals interfere above the following concentrations:

- > 100 mg/l Mn²⁺ > 50 mg/l Ni²⁺
- > 25 mg/l Fe²⁺, Fe³⁺, Pb²⁺
- > 10 mg/l Cr³⁺, Co²⁺, Cu²⁺, Hg²⁺, Zn²⁺

QUANTOFIX® Carbonate hardness Cat. No. 913 23

Test sticks for the semi-quantitative determination of the carbonate hardness

Carbonate hardness is that part of the total hardness resulting from the content of alkaline earth ions, which are equivalent to the carbonate and hydrogen carbonate ions present in the water. Thus the carbonate hardness is the portion of the total hardness which contributes to the formation of alkaline earth carbonates (boiler scale).

Range: 3° – 20 °d

Strong bases or other acid-consuming substances cause false results.

QUANTOFIX® Chloride Cat. No. 913 21

Test sticks for the semi-quantitative determination of chloride (Cl⁻) in solutions

Range: 500 – 3000 mg/l Cl⁻

QUANTOFIX® Chloride uses the same general principle as the AQUADUR® test sticks (see page 26).

In the pH range 2 to 12 the reaction is independent of the pH value of the solution to be analysed. Strongly acidic solutions have to be adjusted to pH 5 – 7 with sodium hydroxide solution, alkaline solutions are adjusted to the same pH range with nitric acid. Chloride concentrations greater 3000 mg/l can be determined after defined dilution of the test sample with distilled water.

The following ions only interfere above the indicated concentrations:

- > 1000 mg/l Al³⁺, Ca²⁺, Cd²⁺, Ce⁴⁺, Cu²⁺, K⁺, Mg²⁺, Mn²⁺, Na⁺, NH₄⁺, Ni²⁺, Pb²⁺, Sn²⁺, Zn²⁺, BO₃⁻, CO₃²⁻, CrO₄²⁻, NO₂⁻, NO₃⁻, PO₄³⁻, SO₃²⁻, SO₄²⁻, acetate, citrate, oxalate, tartrate, EDTA
- > 500 mg/l Fe²⁺, Fe³⁺
- > 200 mg/l I⁻,
- > 100 mg/l Ag⁺, Br⁻, SCN⁻
- > 75 mg/l Hg²⁺
- > 20 mg/l CN⁻, S₂O₃²⁻
- > 10 mg/l S²⁻, ascorbate

Chloride test sticks have to be stored cool and dry, protected from sunlight and moisture!

Store unopened packages in the refrigerator!





Test sticks and test papers for semi-quantitative determinations

Description of QUANTOFIX[®] test sticks in alphabetical order

QUANTOFIX[®] Chlorine Cat. No. 913 17

Test sticks and reagents for the semi-quantitative determination of free chlorine in solutions

Range: 1 – 100 mg/l Cl₂

Bromide and iodide above 5 mg/l cause fading of the colour. Higher concentrations bleach out the colour. Nitrite can also cause low readings. Strongly alkaline solutions (pH > 10) have to be adjusted to a pH value of 6 – 7 using dilute sulphuric acid.

QUANTOFIX[®] Chromate Cat. No. 913 01

Test sticks and reagents for the semi-quantitative determination of chromate in solutions

Range: 3 – 100 mg/l CrO₄²⁻

Interferences caused by molybdates are eliminated by addition of oxalic acid in crystalline form to the strongly acidic solution. Iron(III) ions are precipitated with sodium hydroxide solution 32 %.

QUANTOFIX[®] Cobalt Cat. No. 913 03

Test sticks for the semi-quantitative determination of cobalt in solutions

Range: 10 – 1000 mg/l Co²⁺

If the reaction colour does not appear on the colour scale, larger quantities of interfering ions (Cu²⁺, Hg⁺) are present. To eliminate these interferences, follow the procedure given in the instructions for use provided with the test sticks.

QUANTOFIX[®] Copper Cat. No. 913 04

Test sticks for the semi-quantitative determination of copper (Cu⁺/Cu²⁺) in solutions

Range: 10 – 300 mg/l Cu⁺/Cu²⁺

Strongly acid solutions (pH < 2) have to be buffered to pH 2 to 6 using crystalline sodium acetate.

QUANTOFIX[®] Cyanide Cat. No. 913 18

Test sticks and reagents for the semi-quantitative determination of cyanide in solutions

Range: 1 – 30 mg/l CN⁻

Only free cyanides or cyanide complexes which can be decomposed with chlorine are detected. Strongly alkaline solutions (pH > 10) must be adjusted to a pH of 6 – 7 using dilute sulphuric acid. Thiocyanates in excess of 1 mg/l produce a similar coloration. Iodide and bromide above 5 mg/l cause the colour to fade as does sulphide above 20 mg/l.

QUANTOFIX[®] Formaldehyde Cat. No. 913 28

Test sticks and reagents for the semi-quantitative determination of formaldehyde in solutions

Range: 10 – 200 mg/l HCHO

Other aldehydes such as e. g. acetaldehyde or glutardialdehyde only react at higher concentrations, resulting in a discoloration which deviates from the colour scale. Acetone does not react. Strong oxidising and reducing agents cause low results.

QUANTOFIX[®] Iron 1000 Cat. No. 913 02

Test sticks and reagents for the semi-quantitative determination of iron (Fe²⁺/Fe³⁺) in solutions

Range: 5 – 1000 mg/l Fe²⁺/Fe³⁺

Some heavy metals, when present in larger concentrations, can cause slight discolorations. These can be eliminated by addition of a small quantity of cadmium powder.

QUANTOFIX[®] Iron 100 Cat. No. 913 08

Test sticks and reagents for the semi-quantitative determination of iron (Fe²⁺/Fe³⁺) in solutions

Range: 2 – 100 mg/l Fe²⁺/Fe³⁺

Cobalt > 50 mg/l Co²⁺ produces a yellow-brown colour, which can be eliminated by boiling with sodium dithionite. Iron in hexacyanoferrates is not determined unless it is first decomposed with conc. sulphuric acid.

QUANTOFIX[®] Molybdenum Cat. No. 913 25

Test sticks and reagents for the semi-quantitative determination of molybdenum

Range: 5 – 250 mg/l Mo⁶⁺

Store molybdenum test sticks in a cool and dry place, protected from sunlight and moisture (storage temperature below + 30 °C).



QUANTOFIX[®] Nickel Cat. No. 913 05

Test sticks for the semi-quantitative determination of nickel (Ni²⁺) in solutions

Range: 10 – 1000 mg/l Ni²⁺

If the reaction colour does not appear on the colour scale, larger quantities of interfering ions (Co²⁺, Hg⁺) are present. To eliminate these interferences, follow the procedure given in the instructions for use provided with the test sticks.

QUANTOFIX[®] Nitrate/Nitrite Cat. No. 913 13

Test sticks for the semi-quantitative determination of nitrate and nitrite in solutions

Range: 10 – 500 mg/l NO₃⁻, 1 – 80 mg/l NO₂⁻

Because nitrite interferes with the determination of nitrate, the test sticks contain an additional test field for nitrite. If this upper test field turns red indicating the presence of nitrite, the NO₂⁻ has to be destroyed with amidosulphuric acid (Cat. No. 918 973); then the nitrate test is repeated with another test stick. Following this procedure, 10 mg/l nitrate can be determined even when 1000 mg/l nitrite are present. Store nitrate test sticks in a cool and dry place, protected from sunlight and moisture.





Description of QUANTOFIX® test sticks in alphabetical order

QUANTOFIX® Nitrite

Cat. No. 913 11

Test sticks for the semi-quantitative determination of nitrite (NO_2^-) in solutions

Range: 1 – 80 mg/l NO_2^-

Between pH 1 and 13 the reaction is independent of the pH value of the test solution. Strongly acidic solutions ($\text{pH} < 1$) should be buffered with sodium acetate, and strongly alkaline solutions ($\text{pH} > 13$) are adjusted to about pH 3 – 5 using citric acid.

Store nitrite test sticks in a cool and dry place, protected from sunlight and moisture.

QUANTOFIX® Nitrite 3000

Cat. No. 913 22

Test sticks for the semi-quantitative determination of high concentrations of nitrite (NO_2^-) in solutions

Range: 0.1 – 3 g/l NO_2^-

Between pH 2 and 12 the reaction is independent of the pH value of the test solution. Adjust strongly acidic solutions with dilute sodium hydroxide solution and strongly alkaline solutions with dilute sulphuric acid to a pH of about 4 – 6.

Store nitrite test sticks in a cool and dry place, protected from sunlight and moisture.



QUANTOFIX® Peroxide 100

Cat. No. 913 12

QUANTOFIX® Peroxide 25

Cat. No. 913 19

Test sticks for the semi-quantitative determination of hydrogen peroxide (H_2O_2) and peroxides in solutions

Ranges:

QUANTOFIX® Peroxide 100: 1 – 100 mg/l H_2O_2

QUANTOFIX® Peroxide 25: 0.5 – 25 mg/l H_2O_2

QUANTOFIX® Peroxide is also suited for the determination of other inorganic and organic hydroperoxides.

For the determination of hydroperoxides in organic solvents the test field is moistened with a drop of water after evaporation of the solvent.

Between pH 2 and 9 the reaction is independent of the pH value of the test solution. Strongly acidic solutions should be buffered with sodium acetate, alkaline solutions are adjusted to pH 5 – 7 using citric acid. Strong oxidising agents interfere.

QUANTOFIX® Phosphate

Cat. No. 913 20

Test sticks and reagents for the semi-quantitative determination of ortho-phosphate (PO_4^{3-}) in solutions

Range: 3 – 100 mg/l PO_4^{3-}

Only ortho-phosphate is determined. Other phosphates, such as poly-, pyro-, and metaphosphates, have to be decomposed for the determination of total phosphates. Silica (SiO_2) contents above 10 mg/l react in the same way giving a blue coloration. Larger amounts of sulphide ions (S^{2-}) cause a brown colour of the test field, smaller concentrations cause low results.

The following ions do not interfere:

< 1000 mg/l Ag^+ , Al^{3+} , Cd^{2+} , Co^{2+} , Cr^{3+} , Mg^{2+} , Mn^{2+} , NH_4^+ ,

Ni^{2+} , Zn^{2+} , Cl^- , F^- , NO_3^- , SO_4^{2-} , citrate, oxalate, tartrate,

< 500 mg/l Ca^{2+} , < 250 mg/l Pb^{2+} , < 50 mg/l Cu^{2+} ,

< 25 mg/l Fe^{3+} , 5 mg/l Fe^{2+} , < 2 mg/l NO_2^-

QUANTOFIX® Potassium

Cat. No. 913 16

Test sticks and reagents for the semi-quantitative determination of potassium (K^+) in solutions

Range: 200 – 1500 mg/l K^+

Sodium ions > 3000 mg/l cause low results.

The following ions do not interfere:

< 1000 mg/l Al^{3+} , Ba^{2+} , Bi^{3+} , Ca^{2+} , $\text{Fe}^{2+}/\text{Fe}^{3+}$, Mg^{2+} , Mn^{2+} , Sr^{2+} , Zn^{2+} ; < 200 mg/l NH_4^+ , $\text{Hg}^+/\text{Hg}^{2+}$, Tl^+ ; < 25 mg/l S^{2-}

Protect test sticks from sunlight and moisture. Store package in a cool and dry place (storage temperature below +30 °C).





Test sticks and test papers for semi-quantitative determinations

Description of QUANTOFIX® test sticks in alphabetical order

QUANTOFIX® Sulphate

Cat. No. 913 29

Test sticks for the semi-quantitative determination of sulphate in solutions

Range: 400 – 1600 mg/l SO_4^{2-}

QUANTOFIX® sulphate uses the same general principle as the AQUADUR® test sticks (see page 26).

Between pH 4 and 8 the reaction is independent of the pH value of the test solution. Strongly acidic samples have to be adjusted with sodium acetate, alkaline solutions are adjusted using tartaric acid.

The following ions only interfere above the indicated concentrations:

> 1000 mg/l BrO_3^- , ClO_3^- , CrO_4^{2-} , SO_3^{2-} , $\text{S}_2\text{O}_5^{2-}$, SeO_3^{2-} ,
> 500 mg/l $\text{S}_2\text{O}_4^{2-}$, > 100 mg/l CN^- , S^{2-}

QUANTOFIX® Sulphite

Cat. No. 913 06

Test sticks for the semi-quantitative determination of sulphite in solutions

Range: 10 – 1000 mg/l SO_3^{2-}

Strongly or weakly acidic solutions have to be buffered with solid sodium acetate prior to testing, since the test paper does not react with sulphites in acidic media. Sulphide ions interfere since they also produce a red reaction colour of the test paper in neutral solution. This interference can be eliminated by the addition of an excess of nickel(II) ions. The NiS formed can be removed by filtration. Larger amounts of reducing agents, such as hydroxylammonium chloride or ascorbic acid, interfere, causing low sulphite results.

QUANTOFIX® Tin

Cat. No. 913 09

Test sticks for the semi-quantitative determination of tin(II)-ions in solutions

Range: 10 – 500 mg/l Sn^{2+}

Tetravalent tin has to be reduced. To do this, add 0.5 ml hydrochloric acid 37% and some magnesium turnings to 5 ml of the test solution and heat to boiling temperature. Hexacyanoferrates interfere > 10 mg/l (yellow-brown colour) and must be decomposed by evaporation with sulphuric acid 96%.

QUANTOFIX® Zinc

Cat. No. 913 10

Test sticks and reagents for the semi-quantitative determination of zinc (Zn^{2+}) in solutions

Range: 2 – 100 mg/l Zn^{2+}

The following ions only interfere in larger concentrations:

> 1000 mg/l Ag^+ , Al^{3+} , Bi^{3+} , Ca^{2+} , Cd^{2+} , Co^{2+} , Fe^{2+} , Fe^{3+} ,
 Mn^{2+} , NH_4^+ , Pb^{2+} , Sn^{2+} , Sn^{4+} , Cl^- , CrO_4^{2-} ,
 NO_2^- , NO_3^- , PO_4^{3-} , SCN^- , SO_3^{2-} , SO_4^{2-} , acetate, ascorbate, citrate, oxalate, tartrate

The following ions will cause low results:

> 500 mg/l Cr^{3+} ,
> 200 mg/l CN^- ,
> 100 mg/l Mg^{2+} ,
> 50 mg/l S^{2-} ,
> 25 mg/l Ni^{2+} .

The presence of Cu^{2+} , > 10 mg/l Hg^+ / Hg^{2+} (precipitation with iron or cadmium powder in weakly acidic solution) and > 50 mg/l MnO_4^- (destroy with hydroxylammonium chloride in acidic solution) cause a brown coloration of the test field.

QUANTOFIX® Multisticks for aquarium owners

Cat. No. 913 26 / 913 27

Test sticks for the semi-quantitative determination of the total hardness (Ca^{2+} , Mg^{2+}), carbonate hardness (HCO_3^- , CO_3^{2-}) and the pH value of aquarium water

Ranges:

total hardness 5° – 25 °d

carbonate hardness 3° – 20 °d

pH value 6,4 – 8,4

The **total hardness** of a water is caused by its content of calcium and magnesium salts (Ca^{2+} , Mg^{2+}). When measuring the total hardness, the sum of these salts is determined.

The **carbonate hardness** is a part of the total hardness and is caused by that portion of alkaline earth metals which are equivalent to the carbonate and hydrogen carbonate ions (CO_3^{2-} , HCO_3^-) present in the water. The carbonate hardness is thus a measure for the buffer properties of the water. Water with a low carbonate hardness is not sufficiently buffered, therefore the pH value can fluctuate easily.

The **pH value** indicates whether the water is acidic, alkaline or neutral. Water with a pH of 7 is called neutral. Towards lower pH values the water becomes increasingly acidic, towards higher pH values it becomes more alkaline.

The QUANTOFIX® multisticks are a convenient tool for orienting measurement of these three parameters, which are very important for aquarium waters.

