

# Parameters A-Z





# Parameters A–Z

## Acetic acid (CH<sub>3</sub>COOH)

See Organic acids (page 40)

## Acid binding capacity

See Alkalinity (page 23)

## Acid capacity

See Acidity (page 22)

## Acidity

Acidity is a measure for the amount of acid in water. It gives the amount of NaOH that needs to be added to cause a color change of the pH indicator phenolphthalein (pH = 8.2)

Product	Platform	Measuring range	Number of tests	REF
■ VISOCOLOR® HE Acidity AC 7	TI	0.2–7.2 mmol/L H <sup>+</sup>	200	915 006

## Active oxygen

“Active oxygen” and potassium monopersulfate (KMPS), respectively, is widely used as a green alternative to chlorine in the disinfection of swimming pools.

Product	Platform	Measuring range	Number of tests	REF
■ QUANTOFIX® Active oxygen	HT	0 · 4 · 8 · 15 · 25 mg/L KMPS	100	913 49

## Air humidity (relative)

Products that are sensitive to moisture must be kept dry. To achieve this, such products are often packed in PE bags with a desiccant. Moisture indicators allow a simple, visual control whether the product is still kept dry. Conventional moisture indicators are based on cobalt chloride, which is classified as toxic and carcinogenic. The cobalt chloride-free moisture indicators do not contain toxic or carcinogenic substances.



Product	Platform	Measuring range	Number of tests	REF
■ Moisture indicator	HT	20 · 30 · 40 · 50 · 60 · 70 · 80 % relative humidity	12	908 01
■ Moisture indicator	QT	> 8 % relative humidity	1000	908 901
■ Non-toxic moisture indicator without cobalt chloride	QT	> 8 % relative humidity	1000	908 903

## Alcohol

See Ethanol (page 32) and Methanol (page 37).

pH: Products for pH determination / QT: Qualitative test papers / HT: Semi-quantitative test strips / CO: Colorimetric test kits / TI: Titrimetric test kits  
TT: NANOCOLOR® tube tests / ST: NANOCOLOR® standard tests / MB: Microbiological tests

## Alkalinity

Alkalinity is a measure for the buffer capacity of natural waters. It gives the amount of acid that needs to be added to cause a color change of the indicator methylorange (*m*-value, pH 4.3) or phenolphthalein (*p*-value, pH 8.2). Alkalinity is mainly caused by a combination of carbonate, bicarbonate, and hydroxide ions. If the alkalinity is high, the addition of acids or bases has only a little influence on the pH.

Alkalinity inhibits corrosion in boiler and cooling water. Additionally, alkalinity is an important parameter for quality control in process water, aquariums, and swimming pools.



Product	Platform	Measuring range	Number of tests	REF
■ QUANTOFIX® Carbonate hardness	HT	0 · 3.8 · 7.5 · 12.5 · 18.8 · 25.0 °e	100	913 23
■ QUANTOFIX® LubriCheck	HT	0 · 15 · 50 · 75 · 130 · 200 mmol/L KOH	100	913 36
■ Swimming pool test 3 in 1	HT	Free chlorine: 0 · 0.5 · 1 · 3 · 5 · 10 mg/L Cl <sub>2</sub> Alkalinity: 0 · 80 · 120 · 180 · 240 mg/L CaCO <sub>3</sub> pH: 6.4 · 6.8 · 7.2 · 7.6 · 8.4	50	907 52
■ Swimming pool test 5 in 1	HT	Total chlorine: 0 · 1 · 3 · 5 · 10 mg/L Cl <sub>2</sub> Free chlorine: 0 · 0.5 · 1 · 3 · 5 · 10 mg/L Cl <sub>2</sub> Alkalinity: 0 · 80 · 120 · 180 · 240 mg/L CaCO <sub>3</sub> Total hardness: 0 · 100 · 250 · 500 · 1000 mg/L CaCO <sub>3</sub> pH: 6.4 · 6.8 · 7.2 · 7.6 · 8.4	50	907 59
■ VISOCOLOR® <i>alpha</i> Carbonate hardness	TI	1 drop equals 1.25 °e	100	935 016
■ VISOCOLOR® ECO Alkalinity TA <sup>2)</sup>	CO	5–250 mg/L CaCO <sub>3</sub>	100	931 204
■ VISOCOLOR® ECO Carbonate hardness	TI	1 drop equals 1.25 °e	100	931 014
■ VISOCOLOR® HE Alkalinity AL 7	TI	0.2–7.2 mmol/L OH <sup>-</sup>	200	915 007
■ VISOCOLOR® HE Carbonate hardness C20	TI	0.2–7.2 mmol/L H <sup>+</sup>	200	915 003
■ NANOCOLOR® Carbonate hardness 15	TT	1.25–18.75 °e / 0.4–5.4 mmol/L H <sup>+</sup>	20	985 015

<sup>2)</sup> Only photometrically evaluable, with the photometers PF-3 and / or PF-12 / PF-12<sup>plus</sup>.

## Aluminum (Al<sup>3+</sup>)

Water-treatment plants use aluminum potassium sulfate (Alum) in order to flocculate suspended solids. The level of aluminum in finally treated drinking water may increase because of this process and therefore has to be tested. Depending on national regulations, different aluminum concentrations are tolerated in industrial effluents. In natural waters, the concentration of aluminum compounds is usually low.

Product	Platform	Measuring range	Number of tests	REF
■ Aluminum test paper	QT	> 10 mg/L Al <sup>3+</sup>	100	907 21
■ QUANTOFIX® Aluminum	HT	0 · 5 · 20 · 50 · 200 · 500 mg/L Al <sup>3+</sup>	100	913 07
■ VISOCOLOR® ECO Aluminum	CO	0 · 0.10 · 0.15 · 0.20 · 0.25 · 0.30 · 0.40 · 0.50 mg/L Al <sup>3+</sup>	50	931 006
■ NANOCOLOR® Aluminum 07	TT	0.02–0.70 mg/L Al <sup>3+</sup>	19	985 098
■ NANOCOLOR® Aluminum	ST	0.01–1.00 mg/L Al <sup>3+</sup>	250	918 02

pH: Products for pH determination / QT: Qualitative test papers / HT: Semi-quantitative test strips / CO: Colorimetric test kits / TI: Titrimetric test kits  
TT: NANOCOLOR® tube tests / ST: NANOCOLOR® standard tests / MB: Microbiological tests

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## Ammonia (NH<sub>4</sub><sup>+</sup>)

In surface and ground waters, ammonium ions are an indication for the decomposition of animal or vegetable matter. High ammonia concentrations in surface waters can indicate contamination from waste water treatment plants, fertilizer runoff, or industrial effluents. Excess ammonia levels are toxic to aquatic life.

Product	Platform	Measuring range	Number of tests	REF
■ Ammonium test paper	QT	> 10 mg/L NH <sub>4</sub> <sup>+</sup>	200	907 22
■ Ammonia test	HT	0 · 0.5 · 1 · 3 · 6 mg/L NH <sub>4</sub> <sup>+</sup>	25	907 14
■ QUANTOFIX® Ammonium <sup>3)</sup>	HT	0 · 10 · 25 · 50 · 100 · 200 · 400 mg/L NH <sub>4</sub> <sup>+</sup>	100	913 15
■ VISOCOLOR® alpha Ammonium	CO	0 · 0.2 · 0.5 · 1 · 2 · 3 mg/L NH <sub>4</sub> <sup>+</sup>	50	935 012
■ VISOCOLOR® ECO Ammonium 15 <sup>1)</sup>	CO	0 · 0.5 · 1 · 2 · 3 · 5 · 7 · 10 · 15 mg/L NH <sub>4</sub> <sup>+</sup>	50	931 010
■ VISOCOLOR® ECO Ammonium 3 <sup>1)</sup>	CO	0 · 0.2 · 0.3 · 0.5 · 0.7 · 1 · 2 · 3 mg/L NH <sub>4</sub> <sup>+</sup>	50	931 008
■ VISOCOLOR® HE Ammonium	CO	0.0 · 0.02 · 0.04 · 0.07 · 0.10 · 0.15 · 0.20 · 0.30 · 0.40 · 0.50 mg/L NH <sub>4</sub> <sup>+</sup>	110	920 006
■ NANOCOLOR® Ammonium 2000	TT	300–1600 mg/L NH <sub>4</sub> -N	20	985 002
■ NANOCOLOR® Ammonium 200	TT	30–160 mg/L NH <sub>4</sub> -N	20	985 006
■ NANOCOLOR® Ammonium 100	TT	4–80 mg/L NH <sub>4</sub> -N	20	985 008
■ NANOCOLOR® Ammonium 50	TT	1–40 mg/L NH <sub>4</sub> -N	20	985 005
■ NANOCOLOR® Ammonium 10	TT	0.2–8.0 mg/L NH <sub>4</sub> -N	20	985 004
■ NANOCOLOR® Ammonium 3	TT	0.04–2.30 mg/L NH <sub>4</sub> -N	20	985 003
■ NANOCOLOR® Ammonium	ST	0.01–2.0 mg/L NH <sub>4</sub> -N	100	918 05

<sup>1)</sup> Also suitable for photometrical evaluation on photometers PF-3 and / or PF-12 / PF-12<sup>2)3)</sup>. Measuring range can differ in photometrical evaluation.

<sup>3)</sup> Also suitable for evaluation on QUANTOFIX® Relax. Measuring range on QUANTOFIX® Relax can differ from visual range.

## Anionic detergents

See Surfactants (detergents) (page 46)

## Antimony (Sb<sup>3+</sup>)

Antimony is used in lead alloys, batteries, bullets, solder, pyrotechnics, and semiconductors.

Product	Platform	Measuring range	Number of tests	REF
■ Antimony test paper	QT	> 5 mg/L Sb <sup>3+</sup>	200	907 23

## AOX (adsorbable organically bound halogens)

AOX represents the sum of organically bound halogens (chlorine, bromine, iodine) which are adsorbable to a suitable adsorbent. It is an important parameter for the control of water quality and sludge. The result is given in mg/L chloride.

Product	Platform	Measuring range	Number of tests	REF
■ NANOCOLOR® AOX 3	TT	0.01–3.0 mg/L AOX	20	985 007

## Aquarium parameters, multi test

The determination of total hardness, carbonate hardness (alkalinity) and pH provides a good overview on the water quality of an aquarium.

Product	Platform	Measuring range	Number of tests	REF
■ QUANTOFIX® Multistick for aquarium owners	HT	Total hardness: 0 · 6.3 · 12.5 · 18.8 · 25.0 · 31.3 °e Carbonate hardness: 0 · 3.8 · 7.5 · 12.5 · 18.8 · 25 °e pH: 6.4 · 6.8 · 7.2 · 7.6 · 8.0 · 8.4	100	913 26
■ QUANTOFIX® Multistick for aquarium owners	HT	Total hardness: 0 · 6.3 · 12.5 · 18.8 · 25.0 · 31.3 °e Carbonate hardness: 0 · 3.8 · 7.5 · 12.5 · 18.8 · 25 °e pH: 6.4 · 6.8 · 7.2 · 7.6 · 8.0 · 8.4	25	913 27

## Arsenic (As<sup>3+/5+</sup>)

As a naturally occurring element, arsenic is widely distributed in the earth's crust. Organic arsenic compounds can be used as pesticides.

Arsenic is toxic and causes skin diseases, keratosis, and melanoma. Therefore, arsenic levels have to be monitored regularly in drinking water. The WHO recommends a limit for drinking water of 0.01 mg/L arsenic.



Product	Platform	Measuring range	Number of tests	REF
■ Arsenic test paper	QT	> 0.5 µg As	200	907 62
■ QUANTOFIX® Arsenic 50	HT	0 · 0.05 · 0.1 · 0.5 · 1.0 · 1.7 · 3.0 mg/L As <sup>3+/5+</sup>	100	913 32
■ QUANTOFIX® Arsenic 10	HT	0 · 0.01 · 0.025 · 0.05 · 0.1 · 0.5 mg/L As <sup>3+/5+</sup>	100	913 34
■ QUANTOFIX® Arsenic Sensitive	HT	0 · 0.005 · 0.01 · 0.025 · 0.05 · 0.1 · 0.25 · 0.5 mg/L As <sup>3+/5+</sup>	100	913 45

## Ascorbic acid (vitamin C)

Ascorbic acid or vitamin C is found in many foods and vegetables. Often it is added to juice or fruits as stabilizing and reducing agent.

Product	Platform	Measuring range	Number of tests	REF
■ QUANTOFIX® Ascorbic acid <sup>3)</sup>	HT	0 · 50 · 100 · 200 · 300 · 500 · 700 · 1000 · 2000 mg/L vitamin C	100	913 14

<sup>3)</sup> Also suitable for evaluation on QUANTOFIX® Relax. Measuring range on QUANTOFIX® Relax can differ from visual range.

## Biotoxicity / Bioluminescence

See Toxicity (page 47)

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## Bismuth (Bi<sup>3+</sup>)

Bismuth is present in lead and silver ores, and occasionally as the natural element. The metal is used in alloys of lead, tin, and cadmium, and in some pharmaceuticals.

Product	Platform	Measuring range	Number of tests	REF
■ Bismuth test paper	QT	> 60 mg/L Bi <sup>3+</sup>	200	907 33

## Blood

The rapid detection of blood may be important in the investigation of evidence and crime scenes.

Product	Platform	Measuring range	Number of tests	REF
■ Peroxtesmo KM	QT	Traces of blood	25	906 05

## BOD (biological oxygen demand)

Together with the chemical oxygen demand (COD) the biological oxygen demand (BOD) represents one of the most important sum parameters for the evaluation of waste water pollution. BOD is defined as the amount of oxygen per volume, which is used by the microorganisms for oxidative degradation of organic substances in a water sample. The BOD<sub>5</sub> value is usually determined over a period of 5 days at 20 °C

Product	Platform	Measuring range	Number of tests	REF
■ NANOCOLOR® BOD <sub>5</sub> -TT	TT	0.5–3000 mg/L O <sub>2</sub>	22	985 825
■ NANOCOLOR® BOD <sub>5</sub>	TT	2–3000 mg/L O <sub>2</sub>	25–50	985 822

## Borate (boric acid, BO<sub>3</sub><sup>3-</sup>)

Borates are for example used in wood protection or as buffer substance (pH buffer). Perborates are used as bleaching agents in detergents.

Product	Platform	Measuring range	Number of tests	REF
■ Tumeric paper	QT	> 20 mg/L B	200	907 47

## Bromide (Br<sup>-</sup>)

See Chloride (page 27)

## Bromine (Br<sub>2</sub>)

Bromine is used as an alternative to chlorine in disinfection. It does not produce the typical swimming pool odor, is more effective than chlorine and less corrosive at higher pH values. Overdosing may cause irritation of skin, eyes and mucous membranes.

Product	Platform	Measuring range	Number of tests	REF
■ Chlortesmo	QT	> 1 mg/L Cl <sub>2</sub>	200	906 03
■ VISOCOLOR® ECO Bromine <sup>2)</sup>	CO	0.10–13.00 mg/L Br <sub>2</sub>	200	931 211
■ with NANOCOLOR® Chlorine Tests	TT	See Chlorine (page 28)		

<sup>2)</sup> Only photometrically evaluable, with photometers PF-3 and / or PF-12 / PF-12<sup>plus</sup>.

## Cadmium (Cd<sup>2+</sup>)

Cadmium is used in corrosion protection, in Ni-Cd batteries and as a color pigment. Due to its high toxicity, it is banned from use in solder in the EU since 2011.

Product	Platform	Measuring range	Number of tests	REF
■ NANOCOLOR® Cadmium 2	TT	0.05–2.00 mg/L Cd <sup>2+</sup>	10–19	985 014
■ NANOCOLOR® Cadmium	ST	0.002–0.50 mg/L Cd <sup>2+</sup>	25	918 131

## Calcium (Ca<sup>2+</sup>)

Along with magnesium, calcium is responsible for water hardness and can lead to deposits. It is therefore part of the analysis of boiler feed water. Calcium is also an important part of a diet because calcium deficiency can lead to osteoporosis.

Product	Platform	Measuring range	Number of tests	REF
■ QUANTOFIX® Calcium	HT	0 · 10 · 25 · 50 · 100 mg/L Ca <sup>2+</sup>	60	913 24
■ VISOCOLOR® ECO Calcium	TI	1 drop equals 5 mg/L Ca <sup>2+</sup>	100	931 012
■ VISOCOLOR® HE Calcium CA 20	TI	0.1–3.6 mmol/L Ca <sup>2+</sup>	200	915 010
■ NANOCOLOR® Hardness 20	TT	10–100 mg/L Ca <sup>2+</sup>	20	985 043
■ NANOCOLOR® Hardness Ca/Mg	TT	10–100 mg/L Ca <sup>2+</sup>	20	985 044

## Carbonate hardness

See Hardness (page 34)

## Carbonic acid (H<sub>2</sub>CO<sub>3</sub>)

See Acidity (page 22)

## Cationic surfactants

See Surfactants (page 46)

## Chloride (Cl<sup>-</sup>)

Chloride ions are present in all natural waters. The concentration depends on the geological and local situation. The chloride concentration can reach high levels in waste waters, polluted rivers, or in winter time when road salt is used. Very high levels of chloride can interfere with the determination of COD.

Product	Platform	Measuring range	Number of tests	REF
■ Saltesmo	HT	0 · 0.25 · 0.5 · 1 · 2 · 3 · 4 · 5 g/L NaCl	30	906 08
■ QUANTOFIX® Chloride	HT	0 · 500 · 1000 · 1500 · 2000 · ≥ 3000 mg/L Cl <sup>-</sup>	100	913 21
■ VISOCOLOR® ECO Chloride <sup>1)</sup>	CO	1 · 2 · 4 · 7 · 12 · 20 · 40 · 60 mg/L Cl <sup>-</sup>	90	931 018
■ VISOCOLOR® HE Chloride CL 500	CO	5–500 mg/L Cl <sup>-</sup>	300	915 004
■ NANOCOLOR® Chloride 200	TT	5–200 mg/L Cl <sup>-</sup>	20	985 019
■ NANOCOLOR® Chloride 50	TT	0.5–50.0 mg/L Cl <sup>-</sup>	20	985 021
■ NANOCOLOR® Chloride	ST	0.2–125 mg/L Cl <sup>-</sup>	250	918 20

<sup>1)</sup> Also suitable for photometrical evaluation on photometers PF-3 and /or PF-12 / PF-12<sup>Pro</sup>. Measuring range can differ in photometrical evaluation.

# Parameters A–Z

## Chlorine (Cl<sub>2</sub>)

Chlorine is widely used for disinfection of swimming pools, water mains, and water reservoirs. Electroplaters use chlorine for the detoxification of cyanide-containing waste. Regular monitoring of chlorine level is essential as excessive chlorine not only impairs the smell and taste of water but also can be hazardous. One distinguishes between free chlorine and combined chlorine (chloroamines); the sum of both is called total chlorine.



Product	Platform	Measuring range	Number of tests	REF
■ Potassium iodide starch paper	QT	> 1 mg/L Cl <sub>2</sub>	Reel, 5 m length refill pack 100 200	907 54 907 55 907 56 907 58
■ Chlortesmo	QT	> 1 mg/L Cl <sub>2</sub>	200	906 03
■ Chlorine test	HT	10 · 50 · 100 · 200 mg/L Cl <sub>2</sub>	Reel, 5 m length	907 09
■ Swimming pool test 3 in 1	HT	Free chlorine: 0 · 0.5 · 1 · 3 · 5 · 10 mg/L Cl <sub>2</sub> Alkalinity: 0 · 80 · 120 · 180 · 240 mg/L CaCO <sub>3</sub> pH: 6.4 · 6.8 · 7.2 · 7.6 · 8.4	50	907 52
■ Swimming pool test 5 in 1	HT	Total chlorine: 0 · 1 · 3 · 5 · 10 mg/L Cl <sub>2</sub> Free chlorine: 0 · 0.5 · 1 · 3 · 5 · 10 mg/L Cl <sub>2</sub> Alkalinity: 0 · 80 · 120 · 180 · 240 mg/L CaCO <sub>3</sub> Total hardness: 0 · 100 · 250 · 500 · 1000 mg/L CaCO <sub>3</sub> pH: 6.4 · 6.8 · 7.2 · 7.6 · 8.4	50	907 59
■ QUANTOFIX® Chlorine	HT	0 · 1 · 3 · 10 · 30 · 100 mg/L Cl <sub>2</sub>	100	913 17
■ QUANTOFIX® Chlorine Sensitive <sup>3)</sup>	HT	0 · 0.1 · 0.5 · 1 · 3 · 10 mg/L Cl <sub>2</sub>	100	913 39
■ VISOCOLOR® alpha Chlorine	CO	0.25 · 0.5 · 1.0 · 1.5 · 2.0 mg/L Cl <sub>2</sub>	150	935 019
■ VISOCOLOR® ECO Swimming pool	CO	Free chlorine: < 0.1 · 0.1 · 0.2 · 0.3 · 0.4 · 0.6 · 0.9 · 1.2 · 2.0 mg/L Cl <sub>2</sub> pH: 6.9 · 7.2 · 7.4 · 7.6 · 7.8 · 8.2	150	931 090
■ VISOCOLOR® ECO Chlorine 1, free + total <sup>1)</sup>	CO	< 0.1 · 0.1 · 0.2 · 0.3 · 0.4 · 0.6 · 0.9 · 1.2 · 2.0 mg/L Cl <sub>2</sub>	150	931 035
■ VISOCOLOR® ECO Chlorine 2, free + total <sup>1)</sup>	CO	< 0.1 · 0.1 · 0.2 · 0.3 · 0.4 · 0.6 · 0.9 · 1.2 · 2.0 mg/L Cl <sub>2</sub>	150	931 015
■ VISOCOLOR® ECO free Chlorine 2 <sup>1)</sup>	CO	< 0.1 · 0.1 · 0.2 · 0.3 · 0.4 · 0.6 · 0.9 · 1.2 · 2.0 mg/L Cl <sub>2</sub>	150	931 016
■ VISOCOLOR® ECO Chlorine 6, free and total <sup>2)</sup>	CO	0.05–6.00 mg/L Cl <sub>2</sub>	200	931 217
■ VISOCOLOR® ECO free Chlorine 6 <sup>2)</sup>	CO	0.05–6.00 mg/L Cl <sub>2</sub>	400	931 219
■ VISOCOLOR® HE Chlorine, free + total	CO	0.0 · 0.02 · 0.04 · 0.06 · 0.10 · 0.15 · 0.20 · 0.30 · 0.40 · 0.60 mg/L Cl <sub>2</sub>	160	920 015
■ NANOCOLOR® Chlorine / Ozone 2	TT	0.05–2.00 mg/L Cl <sub>2</sub>	20	985 017
■ NANOCOLOR® Chlorine	ST	0.02–10.0 mg/L Cl <sub>2</sub>	250	918 16

<sup>1)</sup> Also suitable for photometrical evaluation on photometers PF-3 and / or PF-12 / PF-12<sup>Plus</sup>. Measuring range can differ in photometrical evaluation.

<sup>2)</sup> Only photometrically evaluable, with photometers PF-3 and / or PF-12 / PF-12<sup>Plus</sup>.

<sup>3)</sup> Also suitable for evaluation on QUANTOFIX® Relax. Measuring range on QUANTOFIX® Relax can differ from visual range.

## Chlorine dioxide (ClO<sub>2</sub>)

Chlorine dioxide is a powerful disinfectant which is used as an alternative to chlorine in drinking water and swimming pools. It is also used as a bleaching agent in paper industry and as a biocide in industrial cooling waters and in food industry. Chlorine dioxide is more oxidizing than chlorine.

Product	Platform	Measuring range	Number of tests	REF
■ VISOCOLOR® ECO Chlorine dioxide <sup>1)</sup>	CO	< 0.2 · 0.2 · 0.4 · 0.6 · 0.8 · 1.1 · 1.7 · 2.3 · 3.8 mg/L ClO <sub>2</sub>	150	931 021
■ NANOCOLOR® Chlorine dioxide 5	TT	0.15–5.00 mg/L ClO <sub>2</sub>	20	985 018
■ NANOCOLOR® Chlorine dioxide	ST	0.04–4.00 mg/L ClO <sub>2</sub>	50	918 163

<sup>1)</sup> Also suitable for photometrical evaluation on photometers PF-3 and / or PF-12 / PF-12<sup>Plus</sup>. Measuring range can differ in photometrical evaluation.

## Chlorite (ClO<sub>2</sub><sup>-</sup>)

See Chlorine dioxide (page 28)

## Chromate / Chromium(VI) (CrO<sub>4</sub><sup>2-</sup>)

Chromates are for example used in the electroplating industry. They are toxic and carcinogenic and therefore need to be monitored carefully. Many companies are obliged to control the level of chromate in their effluents.

Product	Platform	Measuring range	Number of tests	REF
■ Chromium test paper	QT	> 2 mg/L Cr <sup>3+</sup> or > 5 mg/L CrO <sub>4</sub> <sup>2-</sup>	200	907 24
■ QUANTOFIX® Chromate	HT	0 · 3 · 10 · 30 · 100 mg/L CrO <sub>4</sub> <sup>2-</sup>	100	913 01
■ VISOCOLOR® ECO Chromium(VI) <sup>1)</sup>	CO	0.02 · 0.05 · 0.10 · 0.15 · 0.20 · 0.30 · 0.40 · 0.50 mg/L Cr(VI)	140	931 020
■ NANOCOLOR® total Chromium 2	TT	0.005–2.00 mg/L Cr	20	985 059
■ NANOCOLOR® Chromate 5	TT	0.01–4.0 mg/L CrO <sub>4</sub> <sup>2-</sup>	20	985 024
■ NANOCOLOR® Chromate	ST	0.01–6.0 mg/L CrO <sub>4</sub> <sup>2-</sup>	250	918 25

<sup>1)</sup> Also suitable for photometrical evaluation on photometers PF-3 and/or PF-12 / PF-12<sup>2RS</sup>. Measuring range can differ in photometrical evaluation.

## Cobalt (Co<sup>2+</sup>)

Cobalt is used in alloys and as a component of catalysts.

Product	Platform	Measuring range	Number of tests	REF
■ Cobalt test paper	QT	> 25 mg/L Co <sup>2+</sup>	100	907 28
■ QUANTOFIX® Cobalt	HT	0 · 10 · 25 · 50 · 100 · 250 · 500 · 1000 mg/L Co <sup>2+</sup>	100	913 03
■ NANOCOLOR® Cobalt	ST	0.002–0.70 mg/L Co <sup>2+</sup>	250	918 51

### PF-3 Pool

Compact photometer for swimming pool analysis

**Small, strong, smart**

- Intuitive operation with only 4 keys
- Robust and waterproof according to IP 68
- Mobile determination of chlorine, cyanuric acid, pH, alkalinity
- Various case solutions including reagents

# Parameters A–Z

## COD (chemical oxygen demand)

Besides the biological oxygen demand (BOD), the COD is the most important sum parameter for assessing the pollution of water. MACHEREY-NAGEL test tubes provide results that are comparable to the DIN 38409 H-41. Many also fulfill the requirements of DIN ISO 15705.

Product	Platform	Measuring range	Number of tests	REF
■ NANOCOLOR® COD 60000	TT	5000–60000 mg/L O <sub>2</sub>	20	985 012
■ NANOCOLOR® COD 15000	TT	1000–15000 mg/L O <sub>2</sub>	20	985 028
■ NANOCOLOR® COD 10000	TT	1000–10000 mg/L O <sub>2</sub>	20	985 023
■ NANOCOLOR® COD 4000	TT	400–4000 mg/L O <sub>2</sub>	20	985 011
■ NANOCOLOR® COD 1500	ISO 15705 TT	100–1500 mg/L O <sub>2</sub>	20	985 029
■ NANOCOLOR® COD 1500 Hg-free	TT	100–1500 mg/L O <sub>2</sub>	20	963 029
■ NANOCOLOR® COD HR 1500	ISO 15705 TT	20–1500 mg/L O <sub>2</sub>	20	985 038
■ NANOCOLOR® COD 600	ISO 15705 TT	50–600 mg/L O <sub>2</sub>	20	985 030
■ NANOCOLOR® COD 300	TT	50–300 mg/L O <sub>2</sub>	20	985 033
■ NANOCOLOR® COD 160	ISO 15705 TT	15–160 mg/L O <sub>2</sub>	20	985 026
■ NANOCOLOR® COD 160 Hg-free	TT	15–160 mg/L O <sub>2</sub>	20	963 026
■ NANOCOLOR® COD LR 150	ISO 15705 TT	3–150 mg/L O <sub>2</sub>	20	985 036
■ NANOCOLOR® COD 60	ISO 15705 TT	5–60 mg/L O <sub>2</sub>	20	985 022
■ NANOCOLOR® COD 40	ISO 15705 TT	2–40 mg/L O <sub>2</sub>	20	985 027

## Coloring / Color

Natural waters are usually brown to yellow. The Hazen scale, which is calibrated with platinum cobalt chloride standards, is a reference for the color strength. Color measurements are special methods available in certain photometers and do not require additional reagents. Please see photometer manuals for details.

Product	Platform	Measuring range	Number of tests	REF
■ Color (Hazen / DIN)	ST	5–500 mg/L Pt (Hazen)	–	–

## Complexing agents

See EDTA (page 32)

## Cooking salt (NaCl)

See Chloride (page 27)

## Cooling lubricants

Cooling lubricants or coolants are used when metal parts are machined (drilling, cutting, etc.). Different parameters, e.g. pH and lubricant concentration, are checked to ensure the optimal function.

Product	Platform	Measuring range	Number of tests	REF
■ QUANTOFIX® LubriCheck	HT	0 · 15 · 50 · 75 · 130 · 200 mmol/L KOH	100	913 36
■ QUANTOFIX® Nitrite / pH	HT	Nitrite: 0 · 1 · 5 · 10 · 20 · 40 · 80 mg/L NO <sub>2</sub> <sup>-</sup> pH: 6.0 · 6.4 · 6.7 · 7.0 · 7.3 · 7.6 · 7.9 · 8.2 · 8.4 · 8.6 · 8.8 · 9.0 · 9.3 · 9.6	100	913 38

pH: Products for pH determination / QT: Qualitative test papers / HT: Semi-quantitative test strips / CO: Colorimetric test kits / TI: Titrimetric test kits  
TT: NANOCOLOR® tube tests / ST: NANOCOLOR® standard tests / MB: Microbiological tests

## Copper (Cu<sup>2+</sup>)

Copper is one of the most widely used metals in the industry for example on surfaces and as a component of alloys. In addition, it is also used in pesticides.

Product	Platform	Measuring range	Number of tests	REF
■ Copper test paper	QT	> 20 mg/L Cu <sup>2+</sup>	200	907 29
■ Cuprotesmo	QT	> 5 mg/L Cu <sup>+/2+</sup> or > 0.05 µg Cu	40	906 01
■ QUANTOFIX® Copper	HT	0 · 10 · 30 · 100 · 300 mg/L Cu <sup>2+</sup>	100	913 04
■ VISOCOLOR® ECO Copper <sup>1)</sup>	CO	0 · 0.1 · 0.2 · 0.3 · 0.5 · 0.7 · 1.0 · 1.5 mg/L Cu <sup>2+</sup>	100	931 037
■ VISOCOLOR® HE Copper	CO	0.0 · 0.04 · 0.07 · 0.10 · 0.15 · 0.20 · 0.25 · 0.30 · 0.40 · 0.50 mg/L Cu <sup>2+</sup>	150	920 050
■ NANOCOLOR® Copper 5	TT	0.10–7.00 mg/L Cu <sup>2+</sup>	20	985 053
■ NANOCOLOR® Copper	ST	0.01–10.0 mg/L Cu <sup>2+</sup>	250	918 53

<sup>1)</sup> Also suitable for photometrical evaluation on photometers PF-3 and /or PF-12 / PF-12<sup>Plus</sup>. Measuring range can differ in photometrical evaluation.

## Cyanide (CN<sup>-</sup>)

Cyanide is extremely toxic. The lethal dose is about 1 mg/kg body weight. A careful control is therefore essential, whenever cyanides are used for industrial processes, e.g. in electroplating or in the extraction of gold. Intense control is also required in the production of fruit brandy from stone fruit.



Product	Platform	Measuring range	Number of tests	REF
■ Cyantesmo	QT	> 0.2 mg/L CN <sup>-</sup> or HCN	Reel, 5 m length	906 04
■ QUANTOFIX® Cyanide	HT	0 · 1 · 3 · 10 · 30 mg/L CN <sup>-</sup>	100	913 18
■ VISOCOLOR® ECO Cyanide <sup>1)</sup>	CO	0 · 0.01 · 0.02 · 0.03 · 0.05 · 0.07 · 0.10 · 0.15 · 0.20 mg/L CN <sup>-</sup>	100	931 022
■ VISOCOLOR® HE Cyanide	CO	0.0 · 0.002 · 0.004 · 0.007 · 0.010 · 0.015 · 0.020 · 0.025 · 0.030 · 0.040 mg/L CN <sup>-</sup>	50	920 028
■ NANOCOLOR® Cyanide 08	TT	0.005–0.80 mg/L CN <sup>-</sup>	20	985 031
■ NANOCOLOR® Cyanide	ST	0.001–0.50 mg/L CN <sup>-</sup>	250	918 30

<sup>1)</sup> Also suitable for photometrical evaluation on photometers PF-3 and /or PF-12 / PF-12<sup>Plus</sup>. Measuring range can differ in photometrical evaluation.

## Cyanuric acid

Cyanuric acid is a common stabilizer for chlorine in swimming pools which is degraded by intensive UV radiation, if it is not stabilized. Therefore, cyanuric acid ensures the water's safe and proper disinfection.

Product	Platform	Measuring range	Number of tests	REF
■ Cyanuric acid test	HT	0 · 50 · 100 · 150 · 300 mg/L Cya	25	907 10
■ VISOCOLOR® ECO Cyanuric acid <sup>1)</sup>	CO	10 · 15 · 20 · 30 · 40 · 60 · 80 · 100 mg/L Cya	100	931 023

<sup>1)</sup> Also suitable for photometrical evaluation on photometers PF-3 and /or PF-12 / PF-12<sup>Plus</sup>. Measuring range can differ in photometrical evaluation.

# Parameters A–Z

## DEHA (diethylhydroxylamine)

*N,N*-diethylhydroxylamine (DEHA) is used as an oxygen scavenger in boiler feed water that effectively prevents corrosion.

Product	Platform	Measuring range	Number of tests	REF
■ VISOCOLOR® ECO DEHA	CO	0 · 0.01 · 0.03 · 0.05 · 0.10 · 0.15 · 0.20 · 0.25 · 0.30 mg/L DEHA	125	931 024
■ NANOCOLOR® DEHA 1	TT	0.05–1.00 mg/L DEHA	20	985 035

## Detergents

See Surfactants (detergents) (page 46)

## Disinfectants

With QUATs as active substance: see Quaternary ammonium complexes (page 43)

With peracetic acid as the active substance: see Peracetic acid (page 41)

With peroxide as the active substance: see Peroxide (page 41)

With glutaraldehyde as the active substance: see Glutaraldehyde (page 33)

With chlorine as the active substance: see Chlorine (page 28)

With chlorine dioxide as the active substance: see Chlorine dioxide (page 28)

With ozone as the active substance: see Ozone (page 40)

## Dithionite (S<sub>2</sub>O<sub>4</sub><sup>2-</sup>)

The detection of dithionite is important to determine the end point of the conversion of vat dyes to the leuco form in textile industry.

Product	Platform	Measuring range	Number of tests	REF
■ Nitrazine yellow paper	QT	Traces of sodium dithionite	200	907 51
■ VISOCOLOR® HE Sulfite SU 100	TI	2–100 mg/L SO <sub>3</sub> <sup>2-</sup>	100	915 008

## EDTA (ethylenediaminetetraacetic acid)

EDTA and other chelating agents are often used as additives in detergents and cleaning agents, cosmetics and in the food industry. They are poorly biodegradable and can interfere with the photometric determination of metal ions. Other chelating agents are also detected (for details see instruction leaflet).

Product	Platform	Measuring range	Number of tests	REF
■ QUANTOFIX® EDTA	HT	0 · 100 · 200 · 300 · 400 mg/L EDTA	100	913 35
■ NANOCOLOR® org. Complexing agents 10	TT	0.5–10.0 mg/L I <sub>BIC</sub> / 0.7–14 mg/L EDTA	10–19	985 052

## Ethanol (C<sub>2</sub>H<sub>5</sub>OH)

Ethanol is the least toxic alcohol to humans and is present in beer, wine, liquor and other alcoholic beverages. It can also be used as a disinfectant and for preservation.

Product	Platform	Measuring range	Number of tests	REF
■ NANOCOLOR® Ethanol 1000	TT	100–1000 mg/L EtOH / 0.013–0.130 Vol. % EtOH	23	985 838

pH: Products for pH determination / QT: Qualitative test papers / HT: Semi-quantitative test strips / CO: Colorimetric test kits / TI: Titrimetric test kits  
 TT: NANOCOLOR® tube tests / ST: NANOCOLOR® standard tests / MB: Microbiological tests

## Fatty acids

See Organic acids (page 40)

## Fluoride (F<sup>-</sup>)

Fluoride is naturally present in water but is sometimes also added to drinking water as a health care measure. The determination of fluoride can be used for the rapid detection of hydrofluoric acid (HF), which is used in large quantities in semiconductor industry.

Product	Platform	Measuring range	Number of tests	REF
■ Fluoride test paper	QT	> 20 mg/L F <sup>-</sup>	200	907 50
■ Fluoride test	HT	0 · 2 · 5 · 10 · 20 · 50 · 100 mg/L F <sup>-</sup>	30	907 34
■ VISOCOLOR® ECO Fluoride <sup>2)</sup>	CO	0.1–2.0 mg/L F <sup>-</sup>	150	931 227
■ NANOCOLOR® Fluoride 2	TT	0.1–2.0 mg/L F <sup>-</sup>	20	985 040
■ NANOCOLOR® Fluoride	ST	0.05–2.00 mg/L F <sup>-</sup>	500	918 142

<sup>2)</sup> Only photometrically evaluable, with photometers PF-3 and / or PF-12 / PF-12<sup>plus</sup>.

## Formaldehyde (HCHO)

Formaldehyde is used in large quantities as a raw material in chemical industry and as a biocide in closed cooling or heating circuits. Additionally, it is used for the production of wood-based panels (chipboards), and for textile treatment. Formaldehyde can cause allergies and irritation of skin, eyes and the respiratory tract.

Product	Platform	Measuring range	Number of tests	REF
■ QUANTOFIX® Formaldehyde <sup>3)</sup>	HT	0 · 10 · 20 · 40 · 60 · 100 · 200 mg/L HCHO	100	913 28
■ NANOCOLOR® Formaldehyde 10	TT	0.02–10.00 mg/L HCHO	20	985 046
■ NANOCOLOR® Formaldehyde 8	TT	0.1–8.0 mg/L HCHO	20	985 041

<sup>3)</sup> Also suitable for evaluation on QUANTOFIX® Relax. Measuring range on the QUANTOFIX® Relax can differ from visual range.

## Glucose

Glucose is an important ingredient in many foods. Similar to total sugar (see page 47) it is a quality criterion for potato processing and in beverage industry.

Product	Platform	Measuring range	Number of tests	REF
■ QUANTOFIX® Glucose <sup>3)</sup>	HT	0 · 50 · 100 · 250 · 500 · 1000 · 2000 mg/L glucose	100	913 48

<sup>3)</sup> Also suitable for evaluation on QUANTOFIX® Relax. Measuring range on the QUANTOFIX® Relax can differ from visual range.

## Glutaraldehyde

Glutaraldehyde is a strong disinfectant that is used e.g. for the disinfection of surgical instruments. The concentration must be sufficiently high to ensure that instruments are free of contaminants.

Product	Platform	Measuring range	Number of tests	REF
■ QUANTOFIX® Glutaraldehyde	HT	0 · 0.5 · 1 · 1.5 · 2 · 2.5 % glutaraldehyde	100	913 43

# Parameters A–Z

## Hardness

Water hardness is primarily caused by calcium and magnesium. It forms deposits in pipes and on heating elements and can lead to damages. Testing water hardness is important to dose water softeners correctly. Very low residual hardness is required in industrial boiler feed water.

Water is often classified as “soft” or “hard”. The following ranges apply in European households:

< 150 ppm (10.5 °e) = soft water

150–250 ppm (10.5 to 17.5 °e) = moderately hard water

> 250 ppm (17 °e) = hard water



Product	Platform	Measuring range	Number of tests	REF
■ QUANTOFIX® Carbonate hardness	HT	0 · 3.75 · 7.5 · 12.5 · 18.75 · 25 °e	100	913 23
■ QUANTOFIX® Multistick for aquarium owners	HT	Total hardness: 0 · 6.25 · 12.5 · 18.75 · 25 · 31.25 °e Carbonate hardness: 0 · 3.75 · 7.5 · 12.5 · 18.75 · 25 °e pH: 6.4 · 6.8 · 7.2 · 7.6 · 8.0 · 8.4	100	913 26
■ QUANTOFIX® Multistick for aquarium owners	HT	Total hardness: 0 · 6.25 · 12.5 · 18.75 · 25 · 31.25 °e Carbonate hardness: 0 · 3.75 · 7.5 · 12.5 · 18.75 · 25 °e pH: 6.4 · 6.8 · 7.2 · 7.6 · 8.0 · 8.4	25	913 27
■ Swimming pool test 5 in 1	HT	Total chlorine: 0 · 1 · 3 · 5 · 10 mg/L Cl <sub>2</sub> Free chlorine: 0 · 0.5 · 1 · 3 · 5 · 10 mg/L Cl <sub>2</sub> Alkalinity: 0 · 80 · 120 · 180 · 240 mg/L CaCO <sub>3</sub> Total hardness: 0 · 100 · 250 · 500 · 1000 mg/L CaCO <sub>3</sub> pH: 6.4 · 6.8 · 7.2 · 7.6 · 8.4	50	907 59
■ AQUADUR®	HT	< 54 · > 90 · > 180 · > 270 · > 360 · > 450 ppm CaCO <sub>3</sub>	100	912 01
■ AQUADUR®	HT	< 54 · > 90 · > 180 · > 270 · > 360 · > 450 ppm CaCO <sub>3</sub>	1000	912 23
■ AQUADUR®	HT	< 54 · > 90 · > 180 · > 270 · > 360 · > 450 ppm CaCO <sub>3</sub>	5000	912 21
■ AQUADUR®	HT	< 54 · > 90 · > 180 · > 270 · > 360 · > 450 ppm CaCO <sub>3</sub>	50 x 3 pieces	912 902
■ AQUADUR®	HT	< 54 · > 72 · > 126 · > 252 · > 378 ppm CaCO <sub>3</sub>	100	912 20
■ AQUADUR®	HT	< 54 · > 72 · > 126 · > 252 · > 378 ppm CaCO <sub>3</sub>	1000	912 24
■ AQUADUR®	HT	< 54 · > 72 · > 126 · > 252 · > 378 ppm CaCO <sub>3</sub>	5000	912 22
■ AQUADUR®	HT	< 54 · > 72 · > 151.2 · > 252 ppm CaCO <sub>3</sub>	100	912 39
■ AQUADUR®	HT	< 54 · > 72 · > 151.2 · > 252 · > 378 ppm CaCO <sub>3</sub>	1000	912 40
■ AQUADUR® Sensitive	HT	0 · 5.4 · 10.8 · 18.8 ppm CaCO <sub>3</sub>	100	912 10
■ VISOCOLOR® alpha Carbonate hardness	TI	1 drop equals 1.25 °e	100	935 016
■ VISOCOLOR® alpha Total hardness	TI	1 drop equals 1.25 °e	100	935 042
■ VISOCOLOR® alpha Residual hardness	CO	0.00 · 0.05 · 0.10 · 0.19 · 0.38 °e	200	935 080
■ VISOCOLOR® ECO Carbonate hardness	TI	1 drop equals 1.25 °e	100	931 014
■ VISOCOLOR® ECO Total hardness	TI	1 drop equals 1.25 °e	110	931 029
■ VISOCOLOR® HE Carbonate hardness C 20	TI	0.6–25 °e	200	915 003
■ VISOCOLOR® HE Total hardness H 20 F	TI	0.6–25.0 °e	200	915 005
■ VISOCOLOR® HE Total hardness H 2	TI	0.06–2.50 °e	200	915 002
■ NANOCOLOR® Carbonate hardness 15	TT	1.25–18.75 °e	20	985 015
■ NANOCOLOR® Hardness 20	TT	1.25–25.00 °e	20	985 043
■ NANOCOLOR® Hardness Ca/Mg	TT	1.25–25.0 °e	20	985 044
■ NANOCOLOR® Residual hardness 1	TT	0.03–1.25 °e	20	985 084

pH: Products for pH determination / QT: Qualitative test papers / HT: Semi-quantitative test strips / CO: Colorimetric test kits / TI: Titrimetric test kits  
TT: NANOCOLOR® tube tests / ST: NANOCOLOR® standard tests / MB: Microbiological tests

## Hydrazine (N<sub>2</sub>H<sub>4</sub>)

Hydrazine is a powerful oxygen scavenger for boiler feed water and is used to prevent corrosion. Since it is toxic and carcinogenic, the use must be carefully controlled. In many areas, it was replaced by the less dangerous DEHA.

Product	Platform	Measuring range	Number of tests	REF
■ VISOCOLOR® ECO Hydrazine <sup>1)</sup>	CO	0 · 0.05 · 0.10 · 0.15 · 0.20 · 0.25 · 0.30 · 0.40 mg/L N <sub>2</sub> H <sub>4</sub>	130	931 030
■ NANOCOLOR® Hydrazine	ST	0.002–1.50 mg/L N <sub>2</sub> H <sub>4</sub>	250	918 44

<sup>1)</sup> Also suitable for photometrical evaluation on photometers PF-3 and /or PF-12 / PF-12<sup>Plus</sup>. Measuring range can differ in photometrical evaluation.

## Hydrocarbons

Even low concentrations of hydrocarbons such as gasoline, diesel or oil can contaminate water and soil.

Product	Platform	Measuring range	Number of tests	REF
■ Oil test paper	QT	> 250 mg/L petroleum ether or > 10 mg/L gasoline > 5 mg/L fuel oil or > 1 mg/L lubricating oil	100	907 60
■ NANOCOLOR® HC 300	TT	0.5–5.6 mg/L HC	20	985 057

## Hydrogen cyanide (HCN)

See Cyanide (page 31)

## Hydrogen peroxide (H<sub>2</sub>O<sub>2</sub>)

See Peroxide (page 41)

## Iodine (I<sup>-</sup>)

See Chlorine (page 28)

## Iron (Fe<sup>2+/3+</sup>)

Iron is used in the industry for example for piping and containers. The determination of iron is a key indicator for the level of corrosion.

Iron is not desired in drinking water as it leads to a brown color and a foul smell.

Product	Platform	Measuring range	Number of tests	REF
■ Dipyriddy paper (specific for Fe <sup>2+</sup> )	QT	> 2 mg/L Fe <sup>2+</sup>	200	907 25
■ Iron test paper	QT	> 10 mg/L Fe <sup>2+/3+</sup>	100	907 26
■ QUANTOFIX® Total iron 1000	HT	0 · 5 · 20 · 50 · 100 · 250 · 500 · 1000 mg/L Fe <sup>2+/3+</sup>	100	913 30
■ QUANTOFIX® Total iron 100	HT	0 · 2 · 5 · 10 · 25 · 50 · 100 mg/L Fe <sup>2+/3+</sup>	100	913 44
■ VISOCOLOR® ECO Iron 1 <sup>1)</sup>	CO	0 · 0.04 · 0.07 · 0.10 · 0.15 · 0.20 · 0.30 · 0.50 · 1.0 mg/L Fe	200	931 025
■ VISOCOLOR® ECO Iron 2 <sup>1)</sup>	CO	0 · 0.04 · 0.07 · 0.10 · 0.15 · 0.20 · 0.30 · 0.50 · 1.0 mg/L Fe	100	931 026
■ VISOCOLOR® HE Iron	CO	0.0 · 0.01 · 0.02 · 0.03 · 0.04 · 0.05 · 0.07 · 0.10 · 0.15 · 0.20 mg/L Fe	300	920 040
■ NANOCOLOR® Iron 3	TT	0.02–3.00 mg/L Fe	20	985 037
■ NANOCOLOR® Iron	ST	0.01–15.0 mg/L Fe	250	918 36

<sup>1)</sup> Also suitable for photometrical evaluation on photometers PF-3 and /or PF-12 / PF-12<sup>Plus</sup>. Measuring range can differ in photometrical evaluation.

# Parameters A–Z

## Lactoperoxidase

See Peroxidase (page 41)

## Lead (Pb<sup>2+</sup>)

Lead in a water supply may have different sources, e.g. industrial, mine, and smelter discharges or dissolution of plumbing and plumbing fixtures. Lead also is used in service pipes, thus tap water may also contain lead. Lead is toxic if ingested and is a cumulative poison.

Product	Platform	Measuring range	Number of tests	REF
■ Plumbtesmo	QT	> 5 mg/L Pb <sup>2+</sup>	40	906 02
■ NANOCOLOR® Lead 5	TT	0.10–5.00 mg/L Pb <sup>2+</sup>	20	985 009
■ NANOCOLOR® Lead	ST	0.005–1.00 mg/L Pb <sup>2+</sup>	50	918 101

## Luminous bacteria test

See Toxicity (page 47)

## Magnesium (Mg<sup>2+</sup>)

Magnesium and calcium are responsible for the hardness of water and can lead to lime deposits. Magnesium is also an important parameter in the food industry, since it is essential for a number of physiological processes.

Product	Platform	Measuring range	Number of tests	REF
■ VISOCOLOR® ECO Total hardness and VISOCOLOR® ECO Calcium	TI	1 drop equals 1.25 °e	110	931 029
	TI	1 drop equals 0.875 °e	100	931 012
■ NANOCOLOR® Hardness 20	TT	1.25–25.0 °e	20	985 043
■ NANOCOLOR® Hardness Ca/Mg	TT	1.25–25.0 °e / 5–50 mg/L Mg <sup>2+</sup>	20	985 044

## Manganese (Mn)

Manganese is widely used in steel alloys together with iron, aluminum and other metals. It is also an essential trace element, since it is part of several enzymes. Manganese can negatively influence the quality of food.

Product	Platform	Measuring range	Number of tests	REF
■ VISOCOLOR® ECO Manganese <sup>1)</sup>	CO	0 · 0.1 · 0.2 · 0.3 · 0.5 · 0.7 · 0.9 · 1.2 · 1.5 mg/L Mn	70	931 038
■ VISOCOLOR® HE Manganese	CO	0.0 · 0.03 · 0.06 · 0.10 · 0.15 · 0.20 · 0.25 · 0.30 · 0.40 · 0.50 mg/L Mn	100	920 055
■ NANOCOLOR® Manganese 10	TT	0.1–10.0 mg/L Mn	20	985 058
■ NANOCOLOR® Manganese	ST	0.01–10.0 mg/L Mn	250	918 60

<sup>1)</sup> Also suitable for photometrical evaluation on photometers PF-3 and/or PF-12 / PF-12<sup>Plus</sup>. Measuring range can differ in photometrical evaluation.

## Mastitis

Mastitis (inflammation) of a cow's udder must be detected promptly, because the milk of infected animals may not be placed on the market. It can be recognized by a check of the milk's pH value, e.g. with the udder test paper.

Product	Platform	Measuring range	Number of tests	REF
■ Udder test paper	QT	Traces of Mastitis	20	907 48

## Methanol (CH<sub>3</sub>OH)

In wastewater treatment plants, methanol can be used as a carbon source in the denitrification process. It is naturally present in different fruit juices. Because of its toxicity, this alcohol may also be carefully controlled during juice production.

Product	Platform	Measuring range	Number of tests	REF
■ NANOCOLOR® Methanol 15	TT	0.2–15.0 mg/L MeOH	23	985 859

## Milk

Alkaline phosphatase (control of pasteurization) see Phosphatase (page 42)

Lactoperoxidase (control of ultra high temperature milk) see Peroxidase (page 41)



## Molybdenum (Mo<sup>6+</sup>)

Molybdenum salts are used as corrosion inhibitors, mainly in coolant water and boiler feed water. The careful control of molybdenum is necessary to ensure a sufficient corrosion prevention.

Product	Platform	Measuring range	Number of tests	REF
■ QUANTOFIX® Molybdenum	HT	0 · 5 · 20 · 50 · 100 · 250 mg/L Mo <sup>6+</sup>	100	913 25
■ NANOCOLOR® Molybdenum 40	TT	1.0–40.0 mg/L Mo(VI)	20	985 056

## Nickel (Ni<sup>2+</sup>)

Nickel can cause allergic reactions on the skin. Metal objects that can have skin contact, are therefore regularly tested for their nickel content.

Nickel is also used for metal plating processes. Here, the nickel content is controlled in the baths as well as in the outflow.

Product	Platform	Measuring range	Number of tests	REF
■ Nickel test paper	QT	> 10 mg/L Ni <sup>2+</sup>	200	907 30
■ QUANTOFIX® Nickel	HT	0 · 10 · 25 · 50 · 100 · 250 · 500 · 1000 mg/L Ni <sup>2+</sup>	100	913 05
■ VISOCOLOR® ECO Nickel <sup>1)</sup>	CO	0 · 0.1 · 0.2 · 0.3 · 0.5 · 0.7 · 0.9 · 1.2 · 1.5 mg/L Ni <sup>2+</sup>	150	931 040
■ NANOCOLOR® Nickel 4	TT	0.10–7.00 mg/L Ni <sup>2+</sup>	20	985 071
■ NANOCOLOR® Nickel	ST	0.01–10.0 mg/L Ni <sup>2+</sup>	250	918 62

<sup>1)</sup> Also suitable for photometrical evaluation on photometers PF-3 and /or PF-12 / PF-12<sup>Pro</sup>. Measuring range can differ in photometrical evaluation.

# Parameters A–Z

## Nitrate (NO<sub>3</sub><sup>-</sup>)

Nitrate is a by-product of biological decay from plant and animal matter (nitrification). Nitrate is reduced to nitrite easily, which can lead to diseases and increased fish mortality. Furthermore, high concentrations of nitrate itself are also harmful. Such concentrations are found predominantly in agricultural areas where nitrogen fertilizer is regularly used. The EU's limit for nitrate in drinking water is 50 mg/L. Nitrate is also an important parameter in the outflow of wastewater treatment plants.



Product	Platform	Measuring range	Number of tests	REF
■ Nitratesmo	QT	> 10 mg/L NO <sub>3</sub> <sup>-</sup> or > 5 mg/L NO <sub>2</sub> <sup>-</sup>	Reel, 5 m length	906 11
■ QUANTOFIX® Nitrate 100 <sup>3)</sup>	HT	0 · 5 · 10 · 25 · 50 · 75 · 100 mg/L NO <sub>3</sub> <sup>-</sup>	100	913 51
■ QUANTOFIX® Nitrate / Nitrite <sup>3)</sup>	HT	Nitrate: 0 · 10 · 25 · 50 · 100 · 250 · 500 mg/L NO <sub>3</sub> <sup>-</sup> Nitrite: 0 · 1 · 5 · 10 · 20 · 40 · 80 mg/L NO <sub>2</sub> <sup>-</sup>	100	913 13
■ VISOCOLOR® alpha Nitrate	CO	2 · 8 · 15 · 30 · 50 mg/L NO <sub>3</sub> <sup>-</sup>	100	935 065
■ VISOCOLOR® ECO Nitrate <sup>1)</sup>	CO	0 · 1 · 3 · 5 · 10 · 20 · 30 · 50 · 70 · 90 · 120 mg/L NO <sub>3</sub> <sup>-</sup>	110	931 041
■ NANOCOLOR® Nitrate 250	TT	4–60 mg/L NO <sub>3</sub> -N	20	985 066
■ NANOCOLOR® Nitrate 50	TT	0.3–22.0 mg/L NO <sub>3</sub> -N	20	985 064
■ NANOCOLOR® Nitrate 8	TT	0.30–8.00 mg/L NO <sub>3</sub> -N	20	985 065
■ NANOCOLOR® Nitrate	ST	0.1–30.0 mg/L NO <sub>3</sub> -N	100	918 65
■ NANOCOLOR® Nitrate Z	ST	0.02–1.0 mg/L NO <sub>3</sub> -N	500	918 63

<sup>1)</sup> Also suitable for photometrical evaluation on photometers PF-3 and /or PF-12 / PF-12<sup>Plus</sup>. Measuring range can differ in photometrical evaluation.

<sup>3)</sup> Also suitable for evaluation on QUANTOFIX® Relax. Measuring range on the QUANTOFIX® Relax can differ from visual range.

### NANOCOLOR® VIS II

Spectrophotometer for high-precision analysis

#### Smart photometry

- Unique user experience due to icon based menu guidance
- 10.1" HD-display for a clear overview
- Safe results due to automatic turbidity control function (NTU-check)
- Safeguarding of results via integrated IQC menu

Since 1911

## Nitrite (NO<sub>2</sub><sup>-</sup>)

Nitrite is produced as an intermediate in the nitrification in sewage treatment plants. An excessive content of nitrite indicates that the plant's biology does not work optimally. A high level of nitrite in cooling lubricants indicates a microbiological contamination of the circuit (see also cooling lubricants page 30). Nitrite has to be controlled in aquariums as well in order to ensure optimum living conditions for the aquatic life.

Product	Platform	Measuring range	Number of tests	REF
■ Potassium iodide starch paper	QT	> 1 mg/L NO <sub>2</sub> <sup>-</sup>	Reel, 5 m length Refill pack 100 200	907 54 907 55 907 56 907 58
■ Nitratesmo	QT	> 10 mg/L NO <sub>3</sub> <sup>-</sup> or > 5 mg/L NO <sub>2</sub> <sup>-</sup>	Reel, 5 m length	906 11
■ QUANTOFIX® Nitrite 3000	HT	0·0.1·0.3·0.6·1·2·3 g/L NO <sub>2</sub> <sup>-</sup>	100	913 22
■ QUANTOFIX® Nitrite <sup>3)</sup>	HT	0·1·5·10·20·40·80 mg/L NO <sub>2</sub> <sup>-</sup>	100	913 11
■ QUANTOFIX® Nitrate / Nitrite <sup>3)</sup>	HT	Nitrate: 0·10·25·50·100·250·500 mg/L NO <sub>3</sub> <sup>-</sup> Nitrite: 0·1·5·10·20·40·80 mg/L NO <sub>2</sub> <sup>-</sup>	100	913 13
■ QUANTOFIX® Nitrite / pH	HT	Nitrite: 0·1·5·10·20·40·80 mg/L NO <sub>2</sub> <sup>-</sup> pH: 6.0·6.4·6.7·7.0·7.3·7.6·7.9·8.2·8.4·8.6·8.8·9.0·9.3·9.6	100	913 38
■ VISOCOLOR® alpha Nitrite	CO	0.05·0.10·0.25·0.5·1.0 mg/L NO <sub>2</sub> <sup>-</sup>	200	935 066
■ VISOCOLOR® ECO Nitrite <sup>1)</sup>	CO	0·0.02·0.03·0.05·0.07·0.1·0.2·0.3·0.5 mg/L NO <sub>2</sub> <sup>-</sup>	120	931 044
■ VISOCOLOR® HE Nitrite	CO	0.0·0.005·0.010·0.015·0.02·0.03·0.04·0.06·0.08·0.10 mg/L NO <sub>2</sub> <sup>-</sup>	150	920 063
■ NANOCOLOR® Nitrite 4	TT	0.1–4.0 mg/L NO <sub>2</sub> -N	20	985 069
■ NANOCOLOR® Nitrite 2	TT	0.003–0.460 mg/L NO <sub>2</sub> -N	20	985 068
■ NANOCOLOR® Nitrite	ST	0.002–0.30 mg/L NO <sub>2</sub> -N	250	918 67

<sup>1)</sup> Also suitable for photometrical evaluation on photometers PF-3 and / or PF-12 / PF-12<sup>2</sup>as. Measuring range can differ in photometrical evaluation.

<sup>3)</sup> Also suitable for evaluation on QUANTOFIX® Relax. Measuring range on QUANTOFIX® Relax can differ from visual range.

## Nitrification inhibition

The nitrification is an important part in the process of nitrogen elimination in sewage treatment plants. A number of different substances in the sewage plant inflow may interfere this process.

Product	Platform	Measuring range	Number of tests	REF
■ BioFix® A-Tox	MB	0–100 % inhibition of the oxidation of ammonium	25	970 001
■ BioFix® N-Tox	MB	0–100 % inhibition of the oxidation of nitrite	25	970 002

## Nitrogen (total, N)

Total nitrogen is the sum of all nitrogen-containing compounds in a water sample. It is an important parameter in the outflow control of water treatment plants.

Product	Platform	Measuring range	Number of tests	REF
■ NANOCOLOR® total Nitrogen TN <sub>b</sub> 220	TT	5–220 mg/L N	20	985 088
■ NANOCOLOR® total Nitrogen TN <sub>b</sub> 60	TT	3–60 mg/L N	20	985 092
■ NANOCOLOR® total Nitrogen TN <sub>b</sub> 22	TT	0.5–22.0 mg/L N	20	985 083

pH: Products for pH determination / QT: Qualitative test papers / HT: Semi-quantitative test strips / CO: Colorimetric test kits / TI: Titrimetric test kits  
TT: NANOCOLOR® tube tests / ST: NANOCOLOR® standard tests / MB: Microbiological tests

# Parameters A–Z

## Non-ionic detergents

See Surfactants (detergents) (page 46)

## Oil

See Hydrocarbons (page 35)

## Organic acids

Fatty acids and acetic acid are examples of organic acids in the field of water analysis. Acetic acid (table vinegar) has a germicidal effect, which is utilized for the preservation of food.



Product	Platform	Measuring range	Number of tests	REF
■ NANOCOLOR® Organic acids 3000	TT	30–3000 mg/L CH <sub>3</sub> COOH	20	985 050

## Oxygen (O<sub>2</sub>)

Oxygen in water is an important parameter for aquatic life, but also in the prevention of corrosion, e.g. in boiler feed water.

Product	Platform	Measuring range	Number of tests	REF
■ QUANTOFIX® Active oxygen	HT	0 · 4 · 8 · 15 · 25 mg/L KMPS	100	913 49
■ VISOCOLOR® ECO Oxygen <sup>1)</sup>	CO	0 · 1 · 2 · 3 · 4 · 6 · 8 · 10 mg/L O <sub>2</sub>	50	931 088
■ VISOCOLOR® HE Oxygen SA 10	TI	0.2–10.0 mg/L O <sub>2</sub>	100	915 009
■ NANOCOLOR® Oxygen 12	TT	0.5–12.0 mg/L O <sub>2</sub>	22	985 082

<sup>1)</sup> Also suitable for photometrical evaluation on photometers PF-3 and / or PF-12 / PF-12<sup>Plus</sup>. Measuring range can differ in photometrical evaluation.

## Ozone (O<sub>3</sub>)

Ozone, a potent disinfectant, is widely used for the sterilization and purification of water in swimming baths, breweries, pharmaceutical industries, and mineral water factories. The gas is toxic to humans and is also produced in the environment from oxygen and nitrogen oxide under the influence of sunlight. When ozone concentrations in air are higher than 180 µg/m<sup>3</sup> sensitive persons should avoid physical exertion outdoors.

Product	Platform	Measuring range	Number of tests	REF
■ Potassium iodide starch paper	QT	Qualitative	Reel, 5 m length refill pack 100 200	907 54 907 55 907 56 907 58
■ Ozone test (measurement in air)	HT	< 90 · 90–150 · 150–210 · > 210 µg/m <sup>3</sup> O <sub>3</sub> (ozone content in air)	12	907 36
■ NANOCOLOR® Chlorine / Ozone 2	TT	0.05–2.00 mg/L O <sub>3</sub>	20	985 017
■ NANOCOLOR® Ozone	ST	0.01–1.50 mg/L O <sub>3</sub>	200	918 85

pH: Products for pH determination / QT: Qualitative test papers / HT: Semi-quantitative test strips / CO: Colorimetric test kits / TI: Titrimetric test kits  
TT: NANOCOLOR® tube tests / ST: NANOCOLOR® standard tests / MB: Microbiological tests

## Peracetic acid (CH<sub>3</sub>COOOH)

Peracetic acid is a widely used, very strong disinfectant which is applied both for piping and tanks in the food industry and for bleaching in the pulp and paper industry. Disinfectant baths in the medical sector must be checked regularly, as peracetic acid can decompose in the presence of traces of blood.

Product	Platform	Measuring range	Number of tests	REF
■ QUANTOFIX® Peracetic acid 2000 <sup>3)</sup>	HT	0 · 500 · 1000 · 1500 · 2000 mg/L peracetic acid	100	913 42
■ QUANTOFIX® Peracetic acid 500 <sup>3)</sup>	HT	0 · 50 · 100 · 200 · 300 · 400 · 500 mg/L peracetic acid	100	913 41
■ QUANTOFIX® Peracetic acid 50 <sup>3)</sup>	HT	0 · 5 · 10 · 20 · 30 · 50 mg/L peracetic acid	100	913 40

<sup>3)</sup> Also suitable for evaluation on QUANTOFIX® Relax. Measuring range on the QUANTOFIX® Relax can differ from visual range.

## Peroxidase

The enzyme peroxidase is an important parameter in food industry to control the quality of canned food. Lactoperoxidase is an indicator of the integrity of high-temperature heating in dairy industry.

Product	Platform	Measuring range	Number of tests	REF
■ Peroxtesmo KM (for criminalistics)	QT	Traces of blood	25	906 05
■ Peroxtesmo KO (for food industry)	QT	Traces of peroxidase	100	906 06
■ Peroxtesmo MI (for dairy industry)	QT	> 3 % raw milk in UHT milk	100	906 27

## Peroxide (H<sub>2</sub>O<sub>2</sub>)

Hydrogen peroxide is a disinfectant. It is used in the dairy and beverage industry for disinfection of packaging. Prior to the disinfection, the check for a sufficiently high concentration of peroxide is mandatory. After the disinfection, the complete removal of peroxides has to be controlled.

Some solvents, which are used in the chemical industry, tend to form peroxides. The check for peroxides in such solvents is of importance to avoid explosions during heating.



Product	Platform	Measuring range	Number of tests	REF
■ QUANTOFIX® Peroxide 1000 <sup>3)</sup>	HT	0 · 50 · 150 · 300 · 500 · 800 · 1000 mg/L H <sub>2</sub> O <sub>2</sub>	100	913 33
■ QUANTOFIX® Peroxide 100 <sup>3)</sup>	HT	0 · 1 · 3 · 10 · 30 · 100 mg/L H <sub>2</sub> O <sub>2</sub>	100	913 12
■ QUANTOFIX® Peroxide 25 <sup>3)</sup>	HT	0 · 0.5 · 2 · 5 · 10 · 25 mg/L H <sub>2</sub> O <sub>2</sub>	100	913 19
■ NANOCOLOR® Peroxide 2	TT	0.03–2.00 mg/L H <sub>2</sub> O <sub>2</sub>	10–19	985 871

<sup>3)</sup> Also suitable for evaluation on QUANTOFIX® Relax. Measuring range on the QUANTOFIX® Relax can differ from visual range.

## Phenol

Phenols are found in domestic and industrial waste water. They are used i.a. for the production of pharmaceuticals and pesticides.

Product	Platform	Measuring range	Number of tests	REF
■ NANOCOLOR® Phenolic index 5	TT	0.2–5.0 mg/L phenol	20	985 074
■ NANOCOLOR® Phenol	ST	0.01–7.0 mg/L phenol	500	918 75

# Parameters A–Z

## Phosphatase

The determination of alkaline phosphatase in milk allows a quick and easy quality control of pasteurization (Phosphatesmo MI).

The test for acid phosphatase (Phosphatesmo KM) enables a quick and simple check for sperm in stains. However, this test does not replace the detection of intact sperm.

Product	Platform	Measuring range	Number of tests	REF
■ Phosphatesmo KM (for criminalistics)	QT	Traces of sperm	25	906 07
■ Phosphatesmo MI (for dairy industry)	QT	> 0.5 % raw milk in pasteurized milk or > 300 U/L alkaline phosphatase in UHT milk	50	906 12

## Phosphate (phosphorous, PO<sub>4</sub><sup>3-</sup>)

High levels of phosphate in surface water are an indication of domestic sewage, fertilizer or industrial wastewater. Very high levels lead to eutrophication (over-fertilization) of rivers and lakes and can ultimately lead to the death of fish and plants. The elimination of phosphorus from wastewater is therefore an important target of cleaning in sewage treatment plants.

Product	Platform	Measuring range	Number of tests	REF
■ QUANTOFIX® Phosphate <sup>3)</sup>	HT	0.3 · 10 · 25 · 50 · 100 mg/L PO <sub>4</sub> <sup>3-</sup>	100	913 20
■ VISOCOLOR® alpha Phosphate	CO	2 · 5 · 10 · 15 · 20 mg/L PO <sub>4</sub> <sup>3-</sup>	70	935 079
■ VISOCOLOR® ECO Phosphate <sup>1)</sup>	CO	0.2 · 0.3 · 0.5 · 0.7 · 1 · 2 · 3 · 5 mg/L PO <sub>4</sub> -P	80	931 084
■ VISOCOLOR® HE Phosphate	CO	0.0 · 0.05 · 0.10 · 0.15 · 0.20 · 0.3 · 0.4 · 0.6 · 0.8 · 1.0 mg/L P	300	920 082
■ VISOCOLOR® HE Phosphate (DEV)	CO	0.0 · 0.01 · 0.02 · 0.03 · 0.05 · 0.07 · 0.10 · 0.15 · 0.20 · 0.25 mg/L P	100	920 080
■ NANOCOLOR® ortho- and total Phosphate 50	TT	10.0–50.0 mg/L P	19	985 079
■ NANOCOLOR® ortho- and total Phosphate 45	TT	5.0–50.0 mg/L P	20	985 055
■ NANOCOLOR® ortho- and total Phosphate 15	TT	0.30–15.00 mg/L P	20	985 080
■ NANOCOLOR® ortho- and total Phosphate 5	TT	0.20–5.00 mg/L P	20	985 081
■ NANOCOLOR® ortho- and total Phosphate 1	TT	0.05–1.50 mg/L P	20	985 076
■ NANOCOLOR® ortho- and total Phosphate LR 1	TT	0.05–0.50 mg/L P	20	985 095
■ NANOCOLOR® ortho-Phosphate	ST	0.2–17 mg/L PO <sub>4</sub> -P	500	918 78
■ NANOCOLOR® ortho-Phosphate	ST	0.04–6.5 mg/L PO <sub>4</sub> -P	500	918 77

<sup>1)</sup> Also suitable for photometrical evaluation on photometers PF-3 and/or PF-12/PF-12<sup>2</sup>as. Measuring range can differ in photometrical evaluation.

<sup>3)</sup> Also suitable for evaluation on QUANTOFIX® Relax. Measuring range on QUANTOFIX® Relax can differ from visual range.

## pH value

The pH is a measure of the acidity or alkalinity of an aqueous solution. It is defined as the negative decadic logarithm of the hydrogen ion concentration.

Product	Platform	Measuring range	Number of tests	REF
■ pH test papers see corresponding chapter (from page 52)	pH			
■ VISOCOLOR® alpha pH 5–9	CO	pH: 5.0 · 5.5 · 6.0 · 6.5 · 7.0 · 7.5 · 8.0 · 8.5 · 9.0	200	935 075
■ VISOCOLOR® ECO pH 4.0–9.0	CO	pH: 4.0 · 5.0 · 6.0 · 6.5 · 7.0 · 7.5 · 8.0 · 8.5 · 9.0	450	931 066
■ VISOCOLOR® ECO pH 6.0–8.2	CO	pH: 6.1–8.4	150	931 270
■ VISOCOLOR® HE pH 4.0–10.0	CO	pH: 4.0 · 5.0 · 5.5 · 6.0 · 6.5 · 7.0 · 7.5 · 8.0 · 8.5 · 9.0 · 10.0	500	920 074
■ NANOCOLOR® pH 6.5–8.2	TT	pH: 6.5–8.2	100	918 72

pH: Products for pH determination / QT: Qualitative test papers / HT: Semi-quantitative test strips / CO: Colorimetric test kits / TI: Titrimetric test kits  
TT: NANOCOLOR® tube tests / ST: NANOCOLOR® standard tests / MB: Microbiological tests

## POC (polyoxycarboxylic acids)

POCs are used in boiler feed water to prevent lime deposits.

Product	Platform	Measuring range	Number of tests	REF
■ NANOCOLOR® POC 200	TT	20–200 mg/L POC AS 2020 / 20–200 mg/L POC HS 2020 / 20–200 mg/L Polystabil® DK / 2–40 mg/L Polystabil® KWI	20	985 070

## Potassium (K<sup>+</sup>)

Potassium is an essential element for nutrition. Water-soluble potassium compounds are used as fertilizers and therefore have a great importance in agriculture.



Product	Platform	Measuring range	Number of tests	REF
■ Potassium test paper	QT	> 250 mg/L K <sup>+</sup>	200	907 27
■ QUANTOFIX® Potassium	HT	0 · 200 · 400 · 700 · 1000 · 1500 mg/L K <sup>+</sup>	100	913 16
■ VISOCOLOR® ECO Potassium <sup>1)</sup>	CO	2 · 3 · 4 · 6 · 8 · 10 · 15 mg/L K <sup>+</sup>	60	931 032
■ NANOCOLOR® Potassium 50	TT	2–50 mg/L K <sup>+</sup>	20	985 045

<sup>1)</sup> Also suitable for photometrical evaluation on photometers PF-3 and/or PF-12 / PF-12<sup>Plus</sup>. Measuring range can differ in photometrical evaluation.

**NANOCOLOR® VARIO 4**  
Heating block for reliable digestions



**Experience versatility**

- Touch screen with intuitive menu guidance
- Short warm-up times and high temperature stability
- Internal quality control via NANOCOLOR® T-Set
- COD, total-N and total-P within 30 minutes



## Proteins

Proteins are easily detected on surfaces and can be used as an indication of incomplete cleaning in food processing companies.

Product	Platform	Measuring range	Number of tests	REF
■ INDIPRO	QT	> 50 µg BSA (bovine serum albumin)	60	907 65

## Quaternary ammonium compounds (QUATs)

Quaternary ammonium compounds are widely used for disinfection of medical devices and surfaces. In addition, they are also used as biocides in cooling circuits.

Product	Platform	Measuring range	Number of tests	REF
■ INDIQUAT	HT	on request		909 000
■ QUANTOFIX® QUAT	HT	0 · 10 · 25 · 50 · 100 · 250 · 500 · 1000 mg/L benzalkonium chloride	100	913 37

pH: Products for pH determination / QT: Qualitative test papers / HT: Semi-quantitative test strips / CO: Colorimetric test kits / TI: Titrimetric test kits  
TT: NANOCOLOR® tube tests / ST: NANOCOLOR® standard tests / MB: Microbiological tests

# Parameters A–Z

## Residual hardness

See hardness (page 34)

## Silica / Silicon (Si)

Depending on the geology, silica can be present in fresh water. In heating systems it can form dangerous silicate deposits which can lead to severe damages.

Product	Platform	Measuring range	Number of tests	REF
■ VISOCOLOR® ECO Silica <sup>1)</sup>	CO	0 · 0.2 · 0.4 · 0.6 · 1.0 · 1.5 · 2.0 · 2.5 · 3.0 mg/L SiO <sub>2</sub>	80	931 033
■ VISOCOLOR® ECO Silica HR 200 <sup>2)</sup>	CO	10–200 mg/L SiO <sub>2</sub>	100	931 234
■ VISOCOLOR® HE Silicon	CO	0.0 · 0.01 · 0.02 · 0.03 · 0.05 · 0.07 · 0.10 · 0.15 · 0.20 · 0.30 mg/L Si	120	920 087
■ NANOCOLOR® Silica	ST	0.01–10.0 mg/L Si	250	918 48

<sup>1)</sup> Also suitable for photometrical evaluation on photometers PF-3 and / or PF-12 / PF-12<sup>Plus</sup>. Measuring range can differ in photometrical evaluation.

<sup>2)</sup> Only photometrically evaluable, with photometers PF-3 and / or PF-12 / PF-12<sup>Plus</sup>.

## Silver (Ag<sup>+</sup>)

The precious metal silver is used in jewelry making, but also for batteries and mirrors. At low concentrations it acts also as a disinfectant for drinking water.

Product	Platform	Measuring range	Number of tests	REF
■ Silver test paper	QT	> 20 mg/L Ag <sup>+</sup>	200	907 32
■ Ag-Fix	HT	Silver: 0 · 0.5 · 1 · 2 · 3 · 5 · 7 · 10 g/L Ag <sup>+</sup> pH: 4 · 5 · 6 · 7 · 8	100	907 41
■ QUANTOFIX® Silver	HT	0 · 1 · 2 · 3 · 5 · 7 · 10 g/L Ag <sup>+</sup>	100	913 50
■ NANOCOLOR® Silver 3	TT	0.20–3.00 mg/L Ag <sup>+</sup>	20	985 049

## Sludge activity / TTC

The biochemical activity of sludge is an important parameter for the control of a sewage treatment plant.

Product	Platform	Measuring range	Number of tests	REF
■ NANOCOLOR® TTC 150	TT	5–150 µg TPF	20	985 890

## Sperm

See Phosphatase (page 42)

## Starch

Starch is a polysaccharide and therefore a carbohydrate. The determination of starch is of special interest in food industry.

Product	Platform	Measuring range	Number of tests	REF
■ NANOCOLOR® Starch 100	TT	5–100 mg/L starch	19	985 085

## Sulfate (SO<sub>4</sub><sup>2-</sup>)

Sulfate is present in natural water and has an impact on its taste and smell. Therefore, it is controlled both in drinking water treatment and in food industry.

Product	Platform	Measuring range	Number of tests	REF
■ QUANTOFIX® Sulfate	HT	< 200 · > 400 · > 800 · > 1200 · > 1600 mg/L SO <sub>4</sub> <sup>2-</sup>	100	913 29
■ VISOCOLOR® ECO Sulfate	CO	25 · 30 · 35 · 40 · 50 · 60 · 70 · 80 · 100 · 120 · 150 · 200 mg/L SO <sub>4</sub> <sup>2-</sup>	100	931 092
■ NANOCOLOR® Sulfate 1000	TT	200–1000 mg/L SO <sub>4</sub> <sup>2-</sup>	20	985 087
■ NANOCOLOR® Sulfate 200	TT	10–200 mg/L SO <sub>4</sub> <sup>2-</sup>	20	985 086
■ NANOCOLOR® Sulfate LR 200	TT	20–200 mg/L SO <sub>4</sub> <sup>2-</sup>	20	985 062

## Sulfide (S<sup>2-</sup>)

Sulfides are produced e.g. in the rotting of organic material. High concentrations of sulfides in waste water can cause damage to pipings and an unpleasant smell.

Product	Platform	Measuring range	Number of tests	REF
■ Lead acetate paper	QT	> 5 mg/L H <sub>2</sub> S or S <sup>2-</sup>	Reel, 5 m length Refill pack 100 strips	907 44 907 45 907 46
■ Sulfide test paper	QT	> 5 mg/L H <sub>2</sub> S or S <sup>2-</sup>	Reel, 5 m length	907 61
■ VISOCOLOR® ECO Sulfide <sup>1)</sup>	CO	0.1 · 0.2 · 0.3 · 0.4 · 0.5 · 0.6 · 0.7 · 0.8 mg/L S <sup>2-</sup>	90	931 094
■ NANOCOLOR® Sulfide 3	TT	0.05–3.00 mg/L S <sup>2-</sup>	20	985 073
■ NANOCOLOR® Sulfide	ST	0.01–3.0 mg/L S <sup>2-</sup>	250	918 88

<sup>1)</sup> Also suitable for photometrical evaluation on photometers PF-3 and /or PF-12 / PF-12<sup>Pro</sup>. Measuring range can differ in photometrical evaluation.

# Parameters A–Z

## Sulfite (SO<sub>3</sub><sup>2-</sup>)

Sulfite determination is important in wine industry for the control of production and quality of wine. Sulfite is used as an oxygen scavenger in process and boiler water. Here sulfite tests are carried out in order to avoid overdosing. These tests are also used to control the sulfite content of foods in which sulfur compounds are used as a preservative.

Product	Platform	Measuring range	Number of tests	REF
■ Potassium iodide starch paper	QT	> 5 mg/L SO <sub>2</sub>	Reel, 5 m length Refill pack 100 200	907 54 907 55 907 56 907 58
■ Sulfite test paper	QT	> 10 mg/L Na <sub>2</sub> SO <sub>3</sub>	100	907 63
■ QUANTOFIX® Sulfite <sup>3)</sup>	HT	0 · 10 · 25 · 50 · 100 · 250 · 500 · 1000 mg/L SO <sub>3</sub> <sup>2-</sup>	100	913 06
■ VISOCOLOR® ECO Sulfite	TI	1 drop equals 1 mg/L SO <sub>3</sub> <sup>2-</sup>	60	931 095
■ VISOCOLOR® HE Sulfite SU 100	TI	2–100 mg/L SO <sub>3</sub> <sup>2-</sup>	100	915 008
■ NANOCOLOR® Sulfite 100	TT	5–100 mg/L SO <sub>3</sub> <sup>2-</sup>	19	985 090
■ NANOCOLOR® Sulfite 10	TT	0.2–10.0 mg/L SO <sub>3</sub> <sup>2-</sup>	20	985 089

<sup>3)</sup> Also suitable for evaluation on QUANTOFIX® Relax. Measuring range on the QUANTOFIX® Relax can differ from visual range.

## Surfactants (detergents)

Surfactants are surface-active substances which are widely used in various industries, by soap manufacturers, and also in private households. Generally, one distinguishes between anionic, cationic, and nonionic surfactants. The concentration in municipal waste water can reach high levels, which are caused for example by laundry surfactants.

Product	Platform	Measuring range	Number of tests	REF
■ VISOCOLOR® ECO Detergents, anionic	CO	0.1 · 0.25 · 0.5 · 1.0 · 2.0 · 5.0 mg/L MBAS	50	931 050
■ VISOCOLOR® ECO Detergents, cationic	CO	0 · 1 · 3 · 5 · 10 · 15 · 20 mg/L CTAB	50	931 051
■ NANOCOLOR® Anionic surfactants 4	TT	0.20–4.00 mg/L MBAS	20	985 032
■ NANOCOLOR® Cationic surfactants 4	TT	0.20–4.00 mg/L CTAB	20	985 034
■ NANOCOLOR® Nonionic surfactants 15	TT	0.3–15.0 mg/L Triton® X–100	20	985 047
■ NANOCOLOR® Detergents, anionic	ST	0.02–5.0 mg/L MBAS	40	918 32
■ NANOCOLOR® Detergents, cationic	ST	0.05–5.0 mg/L CTAB	100	918 34

## Thiocyanate (SCN<sup>-</sup>)

Thiocyanate-containing waste water can form toxic cyanogen chloride if chlorine is added.

Product	Platform	Measuring range	Number of tests	REF
■ NANOCOLOR® Thiocyanate 50	TT	0.5–50.0 mg/L SCN <sup>-</sup>	20	985 091

## Tin (Sn<sup>2+</sup>)

Tin is used as an alloying element e.g. in tinplate. Furthermore, soldering tin consists of more than 95 % tin nowadays. The food industry controls how much tin from a can is liberated into the food, since it can adversely affect the taste.

Product	Platform	Measuring range	Number of tests	REF
■ QUANTOFIX® Tin	HT	0 · 10 · 25 · 50 · 100 · 250 · 500 mg/L Sn <sup>2+</sup>	100	913 09
■ NANOCOLOR® Tin 3	TT	0.10–3.00 mg/L Sn	18	985 097

## TOC (total organic carbon)

The TOC value is a measure of all organic substances in waste water. It is easier to be determined instrumentally than the COD or BOD value. A conversion of the TOC value into COD is generally not readily possible.

Product	Platform	Measuring range	Number of tests	REF
■ NANOCOLOR® TOC 600	TT	40–600 mg/L C	10	985 099
■ NANOCOLOR® TOC 60	TT	10–60 mg/L C	10	985 094
■ NANOCOLOR® TOC 25	TT	2.0–25.0 mg/L C	10	985 093
■ NANOCOLOR® TOC 300	TT	20–300 mg/L C	20	985 078
■ NANOCOLOR® TOC 30	TT	2.0–30.0 mg/L C	20	985 075

## Total hardness

See Hardness (page 34)

## Total sugar

Sugar is a key nutrient in food. In the context of the QUANTOFIX® test, total sugar means the sum of glucose and fructose. It is a quality criterion for potatoe processing and in beverage industry.



Product	Platform	Measuring range	Number of tests	REF
■ QUANTOFIX® Total sugar <sup>3)</sup>	HT	0 · 55 · 100 · 250 · 400 · 600 · 800 mg/L fructose / glucose	100	913 52

<sup>3)</sup> Also suitable for evaluation on QUANTOFIX® Relax. Measuring range on the QUANTOFIX® Relax can differ from visual range.

## Toxicity

With the help of luminescent bacteria, the toxic effects of different substances can be investigated.

Product	Platform	Measuring range	Number of tests	REF
■ Luminous bacteria toxicity tests BioFix® Lumi	MB	–		940 ... 945 ...

## TTC / Sludge activity

See Sludge activity / TTC (page 44)

# Parameters A–Z

## Turbidity

Turbidity is caused by small non-dissolved particles. These particles cause absorption, scattering and reflection of incident light. Turbidity is a frequently underestimated source of error in photometry. It affects the reading and is often visually not easy to recognize. Even a slight turbidity, imperceptible to the human eye, can extremely falsify analytical results. The turbidity measurements are carried out in the photometer with pre-programmed special methods. No separate test kits are needed for these measurements.

Product	Platform	Measuring range	Number of tests	REF
■ Turbidity (Formazin / DIN)	ST	1–100 TE/F (=FAU)/0.5–40 1/m	–	–
■ Turbidity (NTU)	TT	0.1–1000 NTU	–	–

## Udder inflammation

See Mastitis (page 37)

## Vat dyes

See Dithionite (page 32)

## Water (H<sub>2</sub>O)

Various tests enable the detection of water in different applications.

Product	Platform	Measuring range	Number of tests	REF
■ AQUATEC test strips	QT	> 1–2 mm water layer	100	907 42
■ Waterfinder test paper	QT	Traces of water in non-polar solvents	Reel, 7 m length	906 30
■ Watesmo	QT	Traces of water in non-polar solvents	Reel, 5 m length	906 09
■ Water	QT	Traces of water in butter	50	906 10

## Water hardness

See Hardness (page 34)

## Zinc (Zn<sup>2+</sup>)

Zinc salts are used in electroplating for the galvanic zinc coating of steel in order to achieve an effective rust prevention. Also in cooling waters, zinc salts are applied as corrosion protection agents.



Product	Platform	Measuring range	Number of tests	REF
■ QUANTOFIX® Zinc	HT	0 · 2 · 5 · 10 · 25 · 50 · 100 mg/L Zn <sup>2+</sup>	100	913 10
■ VISOCOLOR® ECO Zinc <sup>1)</sup>	CO	0 · 0.5 · 1 · 2 · 3 mg/L Zn <sup>2+</sup>	120	931 098
■ NANOCOLOR® Zinc 4	TT	0.10–4.00 mg/L Zn <sup>2+</sup>	20	985 096
■ NANOCOLOR® Zinc	ST	0.02–3.0 mg/L Zn <sup>2+</sup>	250	918 95


<sup>1)</sup> Also suitable for photometrical evaluation on photometers PF-3 and / or PF-12 / PF-12<sup>2</sup>ss. Measuring range can differ in photometrical evaluation.


Zirconium ( $Zr^{4+}$ )

Zirconium is used in various applications as a replacement for chromate. It is also used as an adhesion promoter in surface treatment.

Product	Platform	Measuring range	Number of tests	REF
■ Zirconium test paper	QT	> 20 mg/L $Zr^{4+}$	100	907 21
■ NANOCOLOR® Zirconium 100	TT	5–100 mg/L Zr	20	985 001

**PF-12<sup>Plus</sup>**  
Compact photometer for mobile water analysis





**Increased flexibility**

- Easy handling for precise results
- Flexible power supply via batteries or accu pack
- Robust and waterproof according to IP 68
- Applicable in all fields of water and waste water analysis

