Photometric tests

NANOCOLOR®


Test 6-03
Test 0-37
Test 0-54
Kupfer
Copper 7
MN
MN
MN
MN

NANOCOLOR® tube tests

Precise rapid tests for photometric water analysis

NANOCOLOR® tube tests for photometric analysis convince by their easy handling and therefore are the first choice for routine, laboratory and process analysis. A maximum in accuracy and precision is granted for the measurement results due to exactly pre-dosed reagents in 16 mm cuvettes and additional reagents. The tests are pre-programmed in MACHEREY-NAGEL photometers and selected automatically via a barcode on the cuvette. This perfect interaction of instruments and tests lets the user experience a high measurement safety, saving time and working cost-efficiently.

Ideally packed

All *NANOCOLOR*® tube tests are delivered in stable boxes with color coded labels, giving all relevant information about the test at one glance. The boxes provide a perfect protection from sunlight and convenient withdrawal of test tubes and reagents. LOT-specific information are available by scanning of the 2D barcode on the back of the box (see page 162). The colored pictograms in the lid, which are of special value for our customers, provide intuitive instructions on the test procedure also for inexperienced users.

The perfect test for every user

The user's choice of the correct test is the first step towards a successful analysis. MACHEREY-NAGEL offers various test kits with different measurement ranges for all typical parameters relevant in water and waste water analysis. It is recommended to choose a test kit, where the expected and measured measurement value is within the 20–80 % range of the measuring range of the used test. Here, the safety of the measurement result is at its optimum. The operator gets reliable results and safety for the reporting of his results to supervisors and towards authorities.

Good to know

Certificates of analysis for *NANOCOLOR*® tube tests can be downloaded fast and convenient via *www.mn-net.com/certificate*.

Good to know

Via the 2D barcode on the back of the packages, LOT-specific information can be read easily. For further information about the required *NANOCOLOR*® App see page 160.

Easy

- Colored pictograms as step-by-step instruction
- Big cuvettes for easy pipetting
- Barcoded cuvettes for automatic test selection

Safe

- Convenient withdrawal of tubes from the box
- No contact with chemicals
- Reactions based on internationally accepted standard methods

Reliable

- Precisely pre-dosed reagents
- Adequate test for every application
- Constant high quality from batch to batch

ISO conform COD tests

MACHEREY-NAGEL offers a complete analytical system with seven tube tests for an ISO conform COD analysis. The ISO 15705 describes the use of tube tests that are suitable for photometric evaluation and is a standardized and internationally accepted method for sewage and waste water analysis. This norm explicitly suggests to use commercial test kits.

Time-saving and reliable analysis of total nitrogen

The sum-parameter total nitrogen is of high relevance in water and waste water analysis. It gives valuable information about the grade of contaminations with e.g. ammonia, nitrite or nitrate. *NANOCOLOR*® total nitrogen tests impress with safe and reproducible results as well as fast and easy handling. Precisely pre-dosed reagents allow the performance of the test in only a few steps. A separate cuvette for every sample decomposition saves time is and minimizes errors from cross-contaminations.

Good to know

For further information on *NANOCOLOR*® photometers for the evaluation of *NANOCOLOR*® tube tests see page 12.

NANOCOLOR® tube tests

Ordering information

Test		REF	Measuring range *NANOCOLOR*® *VIS* II		Number of tests	Shelf life	Method
■ Aluminum 07 [2]		985 098	0.02–0.70 mg/L Al^{3+}		19	1 year	Eriochrome® Cyanine R
■ Ammonium 3		985 003	0.04–2.30 mg/L NH_4-N	0.05–3.00 mg/L NH_4^+	20	1 year	Indophenol
■ Ammonium 10		985 004	0.2–8.0 mg/L NH_4-N	0.2–10.0 mg/L NH_4^+	20	1 year	Indophenol
■ Ammonium 50		985 005	1–40 mg/L NH_4-N	1–50 mg/L NH_4^+	20	1 year	Indophenol
■ Ammonium 100		985 008	4–80 mg/L NH_4-N	5–100 mg/L NH_4^+	20	1 year	Indophenol
■ Ammonium 200		985 006	30–160 mg/L NH_4-N	40–200 mg/L NH_4^+	20	1 year	Indophenol
■ Ammonium 2000		985 002	300–1600 mg/L NH_4-N	400–2000 mg/L NH_4^+	20	1 year	Indophenol
■ AOX 3		985 007	0.1–3.0 mg/L AOX	0.01–0.30 mg/L AOX	20	1 year	Mercury(II)-thiocyanate / Iron(III)-nitrate
■ BOD_5 (in Winkler bottles)		985 822	2–3000 mg/L O_2		25–50	2 years	Winkler
■ BOD_5-TT		985 825	0.5–3000 mg/L O_2		22	2 years	Winkler
■ Cadmium 2		985 014	0.05–2.00 mg/L Cd^{2+}		10–19	1 year	Cadion
■ Carbonate hardness 15		985 015	1.25–18.75 °e	0.4–5.4 mmol/L H^+	20	1 year	Bromphenol blue
■ Chloride 50		985 021	0.5–50.0 mg/L Cl^-		20	1 year	Mercury(II)-thiocyanate / Iron(III)-nitrate
■ Chloride 200		985 019	5–200 mg/L Cl^-	0.10–1.00 g/L Cl^-	20	1 year	Mercury(II)-thiocyanate / Iron(III)-nitrate
■ Chlorine / Ozone 2		985 017	0.05–2.50 mg/L Cl_2	0.05–2.00 mg/L O_3	20	1 year	DPD
■ Chlorine dioxide 5		985 018	0.15–5.00 mg/L ClO_2		20	1 year	DPD
■ Chromate 5		985 024	0.05–2.00 mg/L Cr(VI) 0.005–0.500 mg/L Cr(VI) [1]	0.1–4.0 mg/L CrO_4^{2-} 0.01–1.00 mg/L CrO_4^{2-} [1]	20	2 years	Carbazide
■ total Chromium 2		985 059	0.05–2.00 mg/L Cr 0.005–0.500 mg/L Cr [1]		20	2 years	Carbazide
■ COD 40		985 027	2–40 mg/L O_2		20	1 year (2–8 °C)	Potassium dichromate
■ COD 60	ISO 15705	985 022	5–60 mg/L O_2		20	1 year (2–8 °C)	Potassium dichromate
■ COD 160	ISO 15705	985 026	15–160 mg/L O_2		20	1 year	Potassium dichromate
■ COD 160 Hg-free		963 026	15–160 mg/L O_2		20	1 year (2–8 °C)	Potassium dichromate
■ COD 300		985 033	50–300 mg/L O_2		20	1 year	Potassium dichromate
■ COD 600	ISO 15705	985 030	50–600 mg/L O_2		20	1 year	Potassium dichromate
■ COD 1500	ISO 15705	985 029	100–1500 mg/L O_2		20	1 year	Potassium dichromate
■ COD 1500 Hg-free		963 029	100–1500 mg/L O_2		20	1 year	Potassium dichromate
■ COD 4000		985 011	400–4000 mg/L O_2		20	1 year	Potassium dichromate
■ COD 10000		985 023	1.00–10.00 g/L O_2		20	1 year	Potassium dichromate
■ COD 15000	ISO 15705	985 028	1.0–15.0 g/L O_2		20	1 year	Potassium dichromate
■ COD 60000		985 012	5.0–60.0 g/L O_2		20	1 year	Potassium dichromate
■ COD LR 150	ISO 15705	985 036	3–150 mg/L O_2		20	1 year	Potassium dichromate
■ COD HR 1500	ISO 15705	985 038	20–1500 mg/L O_2		20	1 year	Potassium dichromate
■ org. Complexing agents 10		985 052	0.5–10.0 mg/L I_{BiC}		10–19	1 year	Bismut xylenol orange
■ Copper 5		985 053	0.10–7.00 mg/L Cu^{2+}		20	2 years	Cuprizone

On other photometers than the *NANOCOLOR*® *VIS* II measurement ranges and wavelengths can be different.
[1] A more sensitive measuring range is possible by using semi-micro cuvettes 50 mm (REF 919 50).
[2] Decomposition only possible in microwave.
[3] Special filter can be necessary for filter photometers.
[4] Without barcode.
[5] Please see the instruction leaflet.
[6] This test can be performed without a *NANOCOLOR*® reagent set. Determination only with *NANOCOLOR*® spectrophotometers and the PF-12^{Plus}.
GHS: Globally harmonized system: This product contains harmful substances which must be specially labeled as hazardous. For detailed information please see the SDS.

Spectrophotometer	500 D	PF-12^{Plus}	PF-3 COD	PF-3 Drinking Water	PF-3 Fish	PF-3 Pool	PF-3 Soil	NanOx N	NanOx Metal	Crack set	Sea water[5]	GHS	Test
■	■	■							■		■		Aluminum 07[2]
■	■	■			■		■				■	■	Ammonium 3
■	■	■					■				■	■	Ammonium 10
■	■	■					■				■	■	Ammonium 50
■	■	■									■	■	Ammonium 100
■	■	■									■	■	Ammonium 200
■	■	■									■	■	Ammonium 2000
■	■	■									■	■	AOX 3
■	■	■									■	■	BOD_5 (in Winkler bottles)
■	■	■									■	■	BOD_5-TT
■	■	■							■	■	■		Cadmium 2
■	■	■									■		Carbonat hardness 15
■	■	■										■	Chloride 50
■	■	■									■	■	Chloride 200
■	■	■		■		■					■		Chlorine / Ozone 2
■	■	■									■		Chlorine dioxide 5
■	■	■							■		■		Chromate 5
■	■	■										■	total Chromium 2
■	■	■	■									■	COD 40
■	■	■	■									■	COD 60
■	■	■	■									■	COD 160
■	■	■										■	COD 160 Hg-free
■	■	■										■	COD 300
■	■	■	■									■	COD 600
■	■	■	■									■	COD 1500
■	■	■	■									■	COD 1500 Hg-free
■	■	■	■									■	COD 4000
■	■	■	■									■	COD 10000
■	■	■	■									■	COD 15000
■	■	■	■									■	COD 60000
■	■	■	■									■	COD LR 150
■	■	■	■									■	COD HR 1500
■	■	■									■		org. Complexing agents 10
■	■	■							■	■	■		Copper 5

NANOCOLOR® tube tests

Test	REF	Measuring range *NANOCOLOR*® *VIS* II		Number of tests	Shelf life	Method
■ Cyanide 08	985 031	0.02–0.80 mg/L CN^- 0.005–0.100 mg/L CN^- [1]		20	1 year	Barbituric acid / Pyridine
■ DEHA 1 (Diethylhydroxylamine)	985 035	0.05–1.00 mg/L DEHA		20	1 year	Redox reaction
■ Ethanol 1000	985 838	0.10–1.00 g/L EtOH	0.013–0.130 Vol. % EtOH	23	2 years (< 0 °C)	Alcoholoxidase / Peroxidase
■ Fluoride 2	985 040	0.1–2.0 mg/L F^-		20	1.5 years	Lanthanum-Alizarine complexon
■ Formaldehyde 8	985 041	0.1–8.0 mg/L HCHO		20	2 years	Chromotropic acid
■ Formaldehyde 10 [3]	985 046	0.20–10.00 mg/L HCHO 0.02–1.00 mg/L HCHO [1]		20	2 years	Acetylacetone
■ Hardness Ca / Mg	985 044	1.25–25.00 °e 0.2–3.6 mmol/L	5–50 mg/L Mg^{2+} 10–100 mg/L Ca^{2+}	20	1.5 years	Phthalein purple
■ Hardness 20	985 043	1.25–25.00 °e 0.2–3.6 mmol/L	5–50 mg/L Mg^{2+} 10–100 mg/L Ca^{2+}	20	1.5 years	Phthalein purple
■ HC 300 (Hydrocarbons)	985 057	0.5–5.6 mg/L HC	30–300 mg/kg HC	20	1 year	Potassium dichromate
■ Iron 3	985 037	0.10–3.00 mg/L Fe 0.02–1.00 mg/L Fe [1]		20	1 year	Diphenylpyridyltriazine
■ Lead 5	985 009	0.10–5.00 mg/L Pb^{2+}		20	1 year	4-(2-Pyridyl-(2)-azo)-resorcine (PAR)
■ Manganese 10	985 058	0.1–10.0 mg/L Mn 0.02–2.00 mg/L Mn [1]		20	1.5 years	Formaldoxime
■ Methanol 15	985 859	0.2–15.0 mg/L MeOH		23	1 year (< 0 °C)	Alcoholoxidase / Peroxidase
■ Molybdenum 40	985 056	1.0–40.0 mg/L Mo(VI)	1.6–65.0 mg/L MoO_4^{2-}	20	2 years	Thioglycolic acid
■ Nickel 4	985 071	0.10–7.00 mg/L Ni^{2+} 0.02–1.00 mg/L Ni^{2+} [1]		20	2 years	Dimethylglyoxime
■ Nitrate 8	985 065	0.30–8.00 mg/L NO_3-N	1.3–35.0 mg/L NO_3^-	20	2 years	2,6-Dimethylphenol
■ Nitrate 50	985 064	0.3–22.0 mg/L NO_3-N	2–100 mg/L NO_3^-	20	2 years	2,6-Dimethylphenol
■ Nitrate 250	985 066	4–60 mg/L NO_3-N	20–250 mg/L NO_3^-	20	2 years	2,6-Dimethylphenol
■ Nitrite 2	985 068	0.003–0.460 mg/L NO_2-N	0.02–1.50 mg/L NO_2^-	20	1 year	Sulfanilic acid / 1-Naphthylamine
■ Nitrite 4	985 069	0.1–4.0 mg/L NO_2-N	0.3–13.0 mg/L NO_2^-	20	1.5 years	Sulfanilic acid / 1-Naphthylamine
■ total Nitrogen TN_b 22	985 083	0.5–22.0 mg/L N		20	1 year	2,6-Dimethylphenol
■ total Nitrogen TN_b 60	985 092	3–60 mg/L N		20	1 year	2,6-Dimethylphenol
■ total Nitrogen TN_b 220	985 088	5–220 mg/L N		20	1 year	2,6-Dimethylphenol
■ Organic acids 3000	985 050	30–3000 mg/L CH_3COOH	0.5–50.0 mmol/L CH_3COOH	20	1.5 years	Ethylenglycole / Iron(III)-Ions
■ Oxygen 12	985 082	0.5–12.0 mg/L O_2		22	2 years	Winkler
■ Peroxide 2	985 871	0.03–2.00 mg/L H_2O_2		10–19	1 year (2–8 °C)	Peroxidase
■ pH 6.5–8.2 [4]	918 72	pH 6.5–8.2		100	1.5 years	Phenol red
■ Phenolic Index 5	985 074	0.2–5.0 mg/L Phenol		20	1.5 years	4-Aminoantipyrine
■ ortho- and total Phosphate 1	985 076	0.05–1.50 mg/L P 0.010–0.800 mg/L P [1]	0.2–5.0 mg/L PO_4^{3-} 0.03–2.50 mg/L PO_4^{3-} [1]	20	1 year	Phosphomolybdenum blue

On other photometers than the *NANOCOLOR*® *VIS* II measurement ranges and wavelengths can be different.
[1] A more sensitive measuring range is possible by using semi-micro cuvettes 50 mm (REF 919 50).
[2] Decomposition only possible in microwave.
[3] Special filter can be necessary for filter photometers.
[4] Without barcode.
[5] Please see the instruction leaflet.
[6] This test can be performed without a *NANOCOLOR*® reagent set. Determination only with *NANOCOLOR*® spectrophotometers and the PF-12^{Plus}.
GHS: Globally harmonized system: This product contains harmful substances which must be specially labeled as hazardous. For detailed information please see the SDS.

Spectrophotometer	500 D	PF-12^{Plus}	PF-3 COD	PF-3 Drinking Water	PF-3 Fish	PF-3 Pool	PF-3 Soil	NanOx N	NanOx Metal	Crack set	Sea water [5]	GHS	Test
■	■	■									■	■	Cyanide 08
■	■	■									■	■	DEHA 1 (Diethylhydroxylamine)
■	■	■										■	Ethanol 1000
■	■	■									■	■	Fluoride 2
■	■	■										■	Formaldehyde 8
■	■	■									■		Formaldehyde 10 [3]
■		■									■		Hardness Ca / Mg
■	■	■									■		Hardness 20
■	■	■									■	■	HC 300 (Hydrocarbons)
■	■	■							■	■	■	■	Iron 3
■	■	■								■		■	Lead 5
■	■	■									■	■	Manganese 10
■	■	■										■	Methanol 15
■	■	■										■	Molybdenum 40
■	■	■							■	■	■	■	Nickel 4
■	■	■										■	Nitrate 8
■	■	■					■					■	Nitrate 50
■	■	■										■	Nitrate 250
■	■	■									■	■	Nitrite 2
■	■	■									■		Nitrite 4
■	■	■						■				■	total Nitrogen TN_b 22
■	■	■						■				■	total Nitrogen TN_b 60
■	■	■						■				■	total Nitrogen TN_b 220
■	■	■									■	■	Organic acids 3000
■	■	■									■	■	Oxygen 12
■	■	■									■		Peroxide 2
■	■	■		■		■					■		pH 6.5–8.2 [4]
■	■	■									■	■	Phenolic index 5
■	■	■							■		■	■	ortho- and total Phosphate 1

NANOCOLOR® tube tests

Test	REF	Measuring range *NANOCOLOR*® *VIS* II		Number of tests	Shelf life	Method
■ ortho- and total Phosphate 5	985 081	0.20–5.00 mg/L P	0.5–15.0 mg/L PO_4^{3-}	20	1 year	Phosphomolybdenum blue
■ ortho- and total Phosphate 15	985 080	0.30–15.00 mg/L P	1.0–45.0 mg/L PO_4^{3-}	20	1 year	Phosphomolybdenum blue
■ ortho- and total Phosphate 45	985 055	5.0–50.0 mg/L P	15–150 mg/L PO_4^{3-}	20	1 year	Phosphomolybdenum blue
■ ortho- and total Phosphate 50	985 079	10.0–50.0 mg/L P	30–150 mg/L PO_4^{3-}	19	3 years	Vanadate molybdate
■ ortho- and total Phosphate LR 1	985 095	0.05–0.50 mg/L P	0.2–1.5 mg/L PO_4^{3-}	20	1 year	Phosphomolybdenum blue
■ POC 200	985 070	20–200 mg/L POC	2–40 mg/L KWI	20	1.5 years	Turbidity
■ Potassium 50	985 045	2–50 mg/L K^+		20	2 years	Potassium tetraphenylborate (Turbidity)
■ Residual hardness 1	985 084	0.03–1.25 °e	0.004–0.180 mmol/L	20	1 year	Phthalein purple
■ Silver 3	985 049	0.20–3.00 mg/L Ag^+	0.08–0.50 mg/L Ag^+ [1]	20	1.5 years	Indicator
■ Starch 100	985 085	5–100 mg/L starch		19	1 year	Iodine-starch reaction
■ Sulfate 200	985 086	10–200 mg/L SO_4^{2-}		20	3 years	Bariumsulfate (Turbidity)
■ Sulfate 1000	985 087	200–1000 mg/L SO_4^{2-}		20	3 years	Bariumsulfate (Turbidity)
■ Sulfate LR 200	985 062	20–200 mg/L SO_4^{2-}		20	3 years	Bariumsulfate (Turbidity)
■ Sulfide 3	985 073	0.05–3.00 mg/L S^{2-}		20	3 years	Methylene blue
■ Sulfite 10	985 089	0.2–10.0 mg/L SO_3^{2-}	0.05–2.40 mg/L SO_3^{2-} [1]	20	1 year	Thiobenzoic acid derivative
■ Sulfite 100	985 090	5–100 mg/L SO_3^{2-}		19	1 year	Potassium iodate / -iodide
■ Anionic surfactants 4	985 032	0.20–4.00 mg/L MBAS	0.20–3.500 mg/L SDS	20	2 years	Methylene blue
■ Cationic surfactants 4	985 034	0.20–4.00 mg/L CTAB		20	2 years	Disulfin blue
■ Nonionic surfactants 15	985 047	0.3–15.0 mg/L Triton® X-100		20	2 years	TBPE
■ Thiocyanate 50	985 091	0.5–50.0 mg/L SCN^-		20	2 years	Iron(III)-thiocyanate
■ Tin 3 [3]	985 097	0.10–3.00 mg/L Sn		18	1 year	9-Phenyl-3-fluoron
■ TOC 25	985 093	2.0–25.0 mg/L C		10	1 year	Indicator
■ TOC 30	985 075	2.0–30.0 mg/L C		20	1 year (2–8 °C)	Indicator
■ TOC 60	985 094	10–60 mg/L C		10	1 year	Indicator
■ TOC 300	985 078	20–300 mg/L C		20	1 year (2–8 °C)	Indicator
■ TOC 600	985 099	40–600 mg/L C		10	1 year	Indicator
■ TTC / Sludge activity	985 890	5–150 µg TPF	0.050–2.300 A	20	2 years (2–8 °C)	2,3,5-Triphenyltetrazoliumchloride (TTC)
■ Turbidity [6]	Test 9-06	0.1–1000 NTU		–	–	Turbidity
■ Zinc 4	985 096	0.10–4.00 mg/L Zn^{2+}		20	1 year	Zincon
■ Zirconium 100	985 001	5–100 mg/L Zr		20	3 years	Indicator

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[5] Please see the instruction leaflet.
[6] This test can be performed without a *NANOCOLOR*® reagent set. Determination only with *NANOCOLOR*® spectrophotometers and the PF-12*Plus*.
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Spectrophotometer	500 D	PF-12^{Plus}	PF-3 COD	PF-3 Drinking Water	PF-3 Fish	PF-3 Pool	PF-3 Soil	NanOx N	NanOx Metal	Crack set	Sea water [5]	GHS	Test
■	■	■					■		■		■	■	ortho- and total Phosphate 5
■	■	■					■		■		■	■	ortho- and total Phosphate 15
■	■	■							■		■	■	ortho- and total Phosphate 45
■	■	■							■		■	■	ortho- and total Phosphate 50
■	■	■							■		■	■	ortho- and total Phosphate LR 1
■	■	■									■		POC 200
■	■	■					■				■	■	Potassium 50
■	■	■											Residual hardness 1
■	■	■							■				Silver 3
■	■	■									■	■	Starch 100
■	■	■										■	Sulfate 200
■	■	■										■	Sulfate 1000
■	■	■										■	Sulfate LR 200
■	■	■									■	■	Sulfide 3
■	■	■									■	■	Sulfite 10
■	■	■									■	■	Sulfite 100
■	■	■									■	■	Anionic surfactants 4
■	■	■									■	■	Cationic surfactants 4
■	■	■										■	Nonionic surfactants 15
■	■	■									■	■	Thiocyanate 50
■	■	■									■	■	Tin 3 [3]
■	■	■										■	TOC 25
■	■	■										■	TOC 30
■	■	■										■	TOC 60
■	■	■										■	TOC 300
■	■	■										■	TOC 600
■	■	■										■	TTC / Sludge activity
■		■									■		Turbidity [6]
■	■	■							■	■	■	■	Zinc 4
■	■	■							■	■	■		Zirconium 100

NANOCOLOR® standard tests

High sensitivity for photometric water analysis

NANOCOLOR® standard tests are convenient reagent kits for photometric analysis. With ready-to-use reagents up to 500 determinations are possible with only one test kit, resulting in low costs per determination for the user. Even very low limits can be evaluated precisely, due to high sample volumes and the measurement in 50 mm cuvettes. An enhancement of selectivity is possible for various parameters by extraction, where potentially interfering substances remain in the aqueous phase. The colored complex with the substance of interest is extracted with an organic solvent from the aqueous phase and is then analyzed within the organic phase.

Good to know

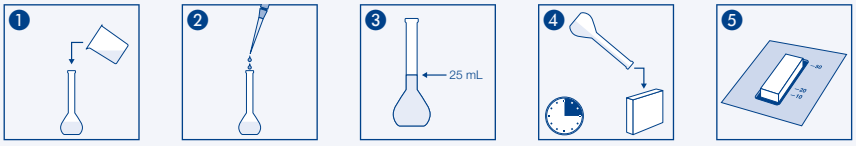
NANOCOLOR® standard tests offer maximum sensitivity and accuracy in photometric analysis.

Good to know

For further information on *NANOCOLOR*® photometers for the evaluation of *NANOCOLOR*® standard tests see page 12.

How it's done

Procedure of standard tests



1. Fill 20 mL sample into 25 mL flask
2. Add reagents
3. Fill up to 25 mL with dist. water and mix
4. After reaction time fill into cuvette
5. Measure


MN
WESTERN GERMANY
DIN
A
20°C

NANOCOLOR® standard tests

Ordering information

Test	REF	Measuring range *NANOCOLOR*® *VIS* II		Number of tests [1]	Shelf life	Method
Aluminum [2]	918 02	0.01–1.00 mg/L Al^{3+}		250	2 years	Eriochrome® Cyanine R
Ammonium	918 05	0.01–2.0 mg/L NH_4-N	0.01–2.5 mg/L NH_4^+	100	1 year	Indophenol
Cadmium [3]	918 131	0.002–0.50 mg/L Cd^{2+}		25	1.5 years	Dithizone
Chloride	918 20	0.2–125 mg/L Cl^-		250	1 year	Mercury(II)-thiocyanate / iron(III)-nitrate
Chlorine	918 16	0.02–10.0 mg/L Cl_2		250	3 years	DPD
Chlorine dioxide	918 163	0.04–4.00 mg/L ClO_2		50	1.5 years	DPD
Chromate	918 25	0.01–3.0 mg/L Cr(VI)	0.01–6.0 mg/L CrO_4^{2-}	250	2 years	Carbazide
Cobalt	918 51	0.002–0.70 mg/L Co^{2+}		250	2 years	5-Cl-PADAB
Color (Hazen/DIN) [4]	Test 1-39	5–500 mg/L Pt (Hazen)	0.2–20.0 ^{1}/m	–	–	Hazen
Copper	918 53	0.01–10.0 mg/L Cu^{2+}		250	2 years	Cuprizone
Cyanide	918 30	0.001–0.50 mg/L CN^-		250	1 year	Barbituric acid / pyridine
Detergents, anionic	918 32	0.02–5.0 mg/L MBAS		40	3 years	Methylene blue
Detergents, cationic	918 34	0.05–5.0 mg/L CTAB		100	3 years	Bromphenol blue
Fluoride	918 142	0.05–2.00 mg/L F^-		500	1.5 years	SPADNS
Hydrazine	918 44	0.002–1.50 mg/L N_2H_4		250	1 year	4-(Dimethylamino)-benzaldehyde
Iron	918 36	0.01–15.0 mg/L Fe		250	3 years	1,10-Phenanthroline
Lead [3]	918 101	0.005–1.00 mg/L Pb^{2+}		50	1.5 years	Dithizone
Manganese	918 60	0.01–10.0 mg/L Mn		250	3 years	Formaldoxime
Nickel	918 62	0.01–10.0 mg/L Ni^{2+}		250	2 years	Dimethylglyoxime
Nitrate	918 65	0.1–30.0 mg/L NO_3-N	0.5–140 mg/L NO_3^-	100	2 years	2,6-Dimethylphenol
Nitrate Z	918 63	0.02–1.0 mg/L NO_3-N	0.1–5.0 mg/L NO_3^-	500	1.5 years	Sulfanilic acid / 1-Naphthylamine
Nitrite	918 67	0.002–0.30 mg/L NO_2-N	0.005–1.00 mg/L NO_2^-	250	1.5 years	Sulfanilic acid / 1-Naphthylamine
Ozone	918 85	0.01–1.50 mg/L O_3		200	1 year (2–8 °C)	Indigotrisulfonate
Phenol	918 75	0.01–7.0 mg/L Phenol		500	3 years	4-Nitroaniline
ortho-Phosphate	918 77	0.04–6.5 mg/L PO_4-P	0.1–20.0 mg/L PO_4^{3-}	500	3 years	Phospho molybdenum blue
ortho-Phosphate	918 78	0.2–17 mg/L PO_4-P	0.5–50 mg/L PO_4^{3-}	500	3 years	Vanadate molybdate
SAC [4] [7]	Test 3-01	0.1-150.0 ^{1}/m		–	–	–
Silica	918 48	0.01–10.0 mg/L Si 0.002–0.1 mg/L Si [5]	0.02–10.0 mg/L SiO_2 0.005–0.200 mg/L SiO_2 [5]	250	3 years	Silicomolybdenum blue
Sulfide	918 88	0.01–3.0 mg/L S^{2-}		250	3 years	Methylene blue
Turbidity (Formazine/DIN) [4]	Test 1-92	1–100 TE/F (= FAU)	0.5–40.0 ^{1}/m	–	–	Turbidity
Zinc	918 95	0.02–3.0 mg/L Zn^{2+}		250	3 years	Zincon

[1] Maximal number of tests. The number of tests depends on the used sample volume.
[2] Decomposition in micro wave is possible.
[3] Organic phase tetrachloro ethylene p.a. or tetrachloro methane is needed additionally.
[4] No *NANOCOLOR*® test is necessary for this determination.
[5] Highly sensitive measurement.
[6] Please see the instruction leaflet.
[7] This test can only be performed with *NANOCOLOR*® *UV/VIS* II.
GHS: Globally harmonized system: This product contains harmful substances which must be specially labeled as hazardous. For detailed information please see the SDS.

Spectrophotometer	500 D	Reduced sample volume	Simplified procedure	*NanOx* N	*NanOx* Metal	Sludge analysis	Crack set	Sea water [6]	GHS	Test
■	■	■			■			■	■	Aluminum [2]
■	■								■	Ammonium
■	■					■	■		■	Cadmium [3]
■	■	■							■	Chloride
■	■	■	■					■		Chlorine
■	■							■	■	Chlorine dioxide
■	■	■			■	■		■	■	Chromate
■	■	■			■		■	■	■	Cobalt
■	■							■		Color (Hazen/DIN) [4]
■	■	■	■		■	■	■	■		Copper
■	■	■						■	■	Cyanide
■	■								■	Detergents, anionic
■	■								■	Detergents, cationic
■	■	■						■	■	Fluoride
■	■	■	■					■	■	Hydrazine
■	■	■	■		■		■	■	■	Iron
■	■					■	■		■	Lead [3]
■	■	■	■						■	Manganese
■	■	■	■		■	■	■	■	■	Nickel
■	■			■					■	Nitrate
■	■	■							■	Nitrate Z
■	■	■	■					■	■	Nitrite
■	■							■	■	Ozone
■	■	■						■	■	Phenol
■	■	■	■					■	■	ortho-Phosphate
■	■	■	■					■	■	ortho-Phosphate
■										SAC [4] [7]
■	■	■	■					■	■	Silica
■	■	■						■	■	Sulfide
■	■							■		Turbidity (Formazine/DIN) [4]
■	■	■			■	■	■	■	■	Zinc

NANOCONTROL

Analytical quality control for a complete analytical system

With *NANOCONTROL* the user can check the complete *NANOCOLOR*® analytical system and his own work comprehensively and prove the correctness of his results. The performance of consequent analytical quality assurance allows for an objective proof of the accuracy of the photometric analysis resulting in acceptance by local authorities. MACHEREY-NAGEL offers a complete system to test and document the performance of the system for internal quality control. Together with our customers we developed a user-friendly system, future-proof, and tailor-made for the needs of the operator. Continuous development and innovation make us the market leader in all questions regarding quality control in photometric water analysis.

Single and multistandards

In *NANOCONTROL* standards the respective reference substances are dissolved with a defined concentration. This concentration of the standard solution is selected to be in the middle of the measuring range of the suitable test kit with a narrow confidence interval. The standard solution is applied in the test instead of a normal water sample. The test kit is then handled as described in the instructions. When the result of the test is within the confidence interval, the operator can be sure that all components of his analytical system are working correctly and that no handling error was made. In case of deviations from the given value, equipment and test kit have to be monitored and checked. In addition to solutions with only one standard substance also multistandards are available, containing a mixture of different standard substances. They are designed for special fields of application, e.g. waste water or drinking water analysis.

Hereby various characteristic parameters can be controlled with only one standard solution and the results can then be conveniently documented.

Good to know

All requirements on quality assurance (IQC) can be fulfilled with the *NANOCONTROL* System from MACHEREY-NAGEL.

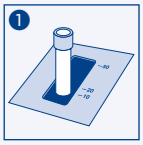
Find an overview on page 16.

Spiking solutions

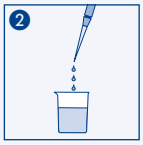
The concentration of a parameter in samples is increased by a defined value by spiking it with a standard addition using *NANOCONTROL* 100+ solutions. Possible interferences in the sample matrix can be detected under consideration of the recovery rates. This kind of plausibility test is especially recommended if an unknown sample has to be analyzed for the first time, or if it is known that the sample contains interfering substances as e.g. large amounts of salt or proteins. In addition to a dilution, this method can give insight to possible sources of error, if there is a continuous deviation from the expected measurement result. *NANOCONTROL* 100+ solutions are available for multi-standards as well as single standards.

How it's done

Procedure for *NANOCONTROL* 100+ addition

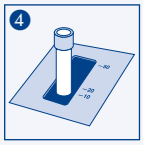


Determination of concentration of sample before spiking



Fill 10 mL of sample into beaker (or cuvette)

Add 100 µL 100+ addition solution and mix



Determination of new concentration

The difference in concentration should equal the theoretical value of the 100+ addition solution.

Ordering information

Standards

Standard	REF	Test number	Test	Number of tests	Concentration of standard [1]	Confidence interval
Single standards						
■ AOX 3	925 07	0-07	AOX 3	20	1.0 mg/L AOX	0.8–1.2 mg/L AOX
■ BOD_5	925 82	8-22 / 8-25	BOD_5 / BOD_5-TT	10	210 mg/L O_2	170–250 mg/L O_2
■ Chlorine	925 17	0-17 1-16	Chlorine / Ozone 2 Chlorine	30	0.80 mg/L Cl_2 1.00 mg/L Cl_2	0.70–0.90 mg/L Cl_2 0.90–1.10 mg/L Cl_2
■ Chromate	925 24	0-24 0-59 1-25	Chromate 5 total Chromium 2 Chromate	15	2.0 mg/L CrO_4^{2-} 1.12 mg/L Cr 0.40 mg/L CrO_4^{2-}	1.8–2.2 mg/L CrO_4^{2-} 1.00–1.23 mg/L Cr 0.36–0.44 mg/L CrO_4^{2-}
■ COD 60	925 22	0-27 / 0-22	COD 40 / COD 60	15	30 mg/L O_2	26–34 mg/L O_2
■ COD 160	925 26	0-26 / 0-33 / 0-36	COD 160 / COD 300 / COD LR 150	15	100 mg/L O_2	90–110 mg/L O_2
■ COD 1500	925 29	0-30 / 0-29 / 0-38	COD 600 / COD 1500 / COD HR 1500	15–30	400 mg/L O_2	360–440 mg/L O_2
■ COD 15000	925 28	0-23 0-28	COD 10000 COD 15000	30–150	4.00 g/L O_2 4.0 g/L O_2	3.60–4.40 g/L O_2 3.6–4.4 g/L O_2
■ Nitrite	925 68	0-68 0-69 1-67	Nitrite 2 Nitrite 4 Nitrite	15–150	0.30 mg/L NO_2-N 2.10 mg/L NO_2-N 0.060 mg/L NO_2-N	0.25–0.35 mg/L NO_2-N 1.9–2.3 mg/L NO_2-N 0.054–0.066 mg/L NO_2-N
■ ortho-Phosphate	925 76	0-76 1-77	ortho- and total Phosphate 1 ortho-Phosphate	15	1.00 mg/L PO_4-P 0.2 mg/L PO_4-P	0.90–1.10 mg/L PO_4-P 0.18–0.22 mg/L PO_4-P
■ Sulfate	925 86	0-86	Sulfate 200	15	120 mg/L SO_4^{2-}	102–138 mg/L SO_4^{2-}
■ Sulfite	925 90	0-90	Sulfite 100	15	50 mg/L SO_3^{2-}	45–55 mg/L SO_3^{2-}
■ TOC 30	925 75	0-75	TOC 30	15	10 mg/L C	8.5–11.5 mg/L C
■ TOC 300	925 78	0-78	TOC 300	15	100 mg/L C	85–115 mg/L C
Multistandards						
■ Sewage outflow 1	925 011	0-04 0-26 0-33 0-11 0-36 0-65 0-64 1-65 0-81 0-92	Ammonium 10 COD 160 COD 300 COD 4000 COD LR 150 Nitrate 8 Nitrate 50 Nitrate ortho- and total Phosphate 5 total Nitrogen TN_b 60	12–120	3.0 mg/L NH_4-N 114 mg/L O_2 114 mg/L O_2 2600 mg/L O_2 114 mg/L O_2 6.00 mg/L NO_3-N 6.0 mg/L NO_3-N 6.0 mg/L NO_3-N 2.50 mg/L P 20 mg/L N	2.7–3.3 mg/L NH_4-N 103–125 mg/L O_2 103–125 mg/L O_2 2340–2860 mg/L O_2 103-125 mg/L O_2 5.20–6.80 mg/L NO_3-N 5.2–6.8 mg/L NO_3-N 5.2–6.8 mg/L NO_3-N 2.25–2.75 mg/L P 18–22 mg/L N
■ Sewage outflow 2	925 010	0-03 0-27 0-22 0-65 0-64 1-65 0-76 0-81 0-83	Ammonium 3 COD 40 COD 60 Nitrate 8 Nitrate 50 Nitrate total Phosphate 1 total Phosphate 5 total Nitrogen TN_b 22	12–120	1.50 mg/L NH_4-N 30 mg/L O_2 30 mg/L O_2 3.00 mg/L NO_3-N 3.0 mg/L NO_3-N 3.0 mg/L NO_3-N 1.00 mg/L P 1.00 mg/L P 12.0 mg/L N	1.30–1.70 mg/L NH_4-N 26–34 mg/L O_2 26–34 mg/L O_2 2.60–3.40 mg/L NO_3-N 2.6–3.4 mg/L NO_3-N 2.6–3.4 mg/L NO_3-N 0.90–1.10 mg/L P 0.90–1.10 mg/L P 10.0–14.0 mg/L N
■ Sewage inflow	925 012	0-05 0-30 0-29 0-28 0-12 0-38 0-64 0-66 0-80 0-88	Ammonium 50 COD 600 COD 1500 COD 15000 COD 60000 COD HR 1500 Nitrate 50 Nitrate 250 total Phosphate 15 total Nitrogen TN_b 220	30–300	25.0 mg/L NH_4-N 400 mg/L O_2 400 mg/L O_2 10.0 g/L O_2 10.0 g/L O_2 400 mg/L O_2 15.0 mg/L NO_3-N 15 mg/L NO_3-N 8.00 mg/L P 75 mg/L N	22.0–28.0 mg/L NH_4-N 360–440 mg/L O_2 360–440 mg/L O_2 9.0–11.0 g/L O_2 9.0–11.0 g/L O_2 360–440 mg/L O_2 13.5–16.5 mg/L NO_3-N 13–17 mg/L NO_3-N 7.20–8.80 mg/L P 67–83 mg/L N

[1] Please see the instruction leaflet / evaluation sheet.
[2] Shelf life 6 weeks after first opening / see instruction leaflet.
GHS: Globally harmonized system: This product contains harmful substances which must be specially labeled as hazardous. For detailed information please see the SDS.

Addition	Shelf life [2]	GHS	Standard
			Single standards
1.0 mg/L AOX	1 year		AOX 3
–	1 year (2–8 °C)		BOD_5
–	1 year	■	Chlorine
0.5 mg/L CrO_4^{2-}	1 year	■	Chromate
–	1 year (2–8 °C)		COD 60
–	1 year (2–8 °C)		COD 160
–	1 year (2–8 °C)		COD 1500
–	1 year (2–8 °C)		COD 15000
0.02 mg/L NO_2-N – 0.02 mg/L NO_2-N	1 year		Nitrite
0.10 mg/L PO_4-P 0.10 mg/L PO_4-P	1 year		ortho-Phosphate
–	1 year		Sulfate 200
–	1 year		Sulfite
–	1 year (2–8 °C)		TOC 30
–	1 year (2–8 °C)		TOC 300
			Multistandards
1.0 mg/L NH_4-N 25 mg/L O_2 25 mg/L O_2 – – 1.50 mg/L NO_3-N 1.5 mg/L NO_3-N 1.5 mg/L NO_3-N 0.25 mg/L P 10 mg/L N	1 year		Sewage outflow 1
0.30 mg/L NH_4-N 10 mg/L O_2 10 mg/L O_2 3.00 mg/L NO_3-N 3.0 mg/L NO_3-N 3.0 mg/L NO_3-N 0.30 mg/L P 0.30 mg/L P 3.3 mg/L N	8 months (2–8 °C)		Sewage outflow 2
10 mg/L NH_4-N 100 mg/L O_2 100 mg/L O_2 – – 100 mg/L O_2 6.0 mg/L NO_3-N 6 mg/L NO_3-N 1.00 mg/L P 20 mg/L N	1 year		Sewage inflow

NANOCONTROL

Standard	REF	Test number	Test	Number of tests	Concentration of standard [1]	Confidence interval
■ Metals 1	925 015	0-14	Cadmium 2	15–60	1.00 mg/L Cd^{2+}	0.80–1.20 mg/L Cd^{2+}
		1-13	Cadmium		0.10 mg/L Cd^{2+}	0.08–0.12 mg/L Cd^{2+}
		0-21	Chloride 50		20 mg/L Cl^-	17–23 mg/L Cl^-
		0-19	Chloride 200		80 mg/L Cl^-	70–90 mg/L Cl^-
		0-244	Chromate 5 + *NanOx* Metal		1.0 mg/L Cr	0.8–1.2 mg/L Cr
		0-59	total Chromium 2		1.0 mg/L Cr	0.8–1.2 mg/L Cr
		1-251	Chromate + *NanOx* Metal		1.0 mg/L Cr	0.8–1.2 mg/L Cr
		1-253	Chromate + total Chromium		1.0 mg/L Cr	0.8–1.2 mg/L Cr
		0-37	Iron 3		1.00 mg/L Fe^{3+}	0.80–1.20 mg/L Fe^{3+}
		1-36	Iron		0.10 mg/L Fe^{3+}	0.08–0.12 mg/L Fe^{3+}
		0-40	Fluoride 2		1.0 mg/L F^-	0.8–1.2 mg/L F^-
		1-42	Fluoride		1.00 mg/L F^-	0.80–1.20 mg/L F^-
		0-86	Sulfate 200		80 mg/L SO_4^{2-}	70–90 mg/L SO_4^{2-}
		0-96	Zinc 4		1.00 mg/L Zn^{2+}	0.80–1.20 mg/L Zn^{2+}
		1-95	Zinc		0.10 mg/L Zn^{2+}	0.08–0.12 mg/L Zn^{2+}
■ Metals 2	925 016	0-09	Lead 5	15	2.50 mg/L Pb^{2+}	2.25–2.75 mg/L Pb^{2+}
		1-10	Lead		0.25 mg/L Pb^{2+}	0.22–0.28 mg/L Pb^{2+}
		0-45	Potassium 50		20 mg/L K^+	18–22 mg/L K^+
		0-53 / 0-54	Copper 5 / Copper 7		2.00 mg/L Cu^{2+}	1.80–2.20 mg/L Cu^{2+}
		1-53	Copper		0.60 mg/L Cu^{2+}	0.50–0.70 mg/L Cu^{2+}
		0-61 / 0-71	Nickel 7 / Nickel 4		2.00 mg/L Ni^{2+}	1.80–2.20 mg/L Ni^{2+}
		1-62	Nickel		0.60 mg/L Ni^{2+}	0.50–0.70 mg/L Ni^{2+}
■ Sewage	925 013	0-08	Ammonium 100	15–300	40 mg/L NH_4-N	36–44 mg/L NH_4-N
		0-06	Ammonium 200		80 mg/L NH_4-N	72–88 mg/L NH_4-N
		0-23	COD 10000		4.00 g/L O_2	3.60–4.40 g/L O_2
		0-28	COD 15000		4.0 g/L O_2	3.6–4.4 g/L O_2
		0-66	Nitrate 250		30 mg/L NO_3-N	27–33 mg/L NO_3-N
		0-55	total Phosphate 45		25.0 mg/L P	22.0–28.0 mg/L P
		0-79	ortho-Phosphate 50		25.0 mg/L PO_4-P	22.0–28.0 mg/L PO_4-P
■ Drinking water	925 018	0-98	Aluminum 07	15–30	0.50 mg/L Al^{3+}	0.44–0.56 mg/L Al^{3+}
		1-02	Aluminium		0.50 mg/L Al^{3+}	0.44–0.56 mg/L Al^{3+}
		1-05	Ammonium		0.20 mg/L NH_4-N	0.17–0.23 mg/L NH_4-N
		0-21	Chloride 50		20 mg/L Cl^-	17–23 mg/L Cl^-
		1-20	Chloride		20 mg/L Cl^-	17–23 mg/L Cl^-
		0-37	Iron 3		1.50 mg/L Fe^{3+}	1.30–1.70 mg/L Fe^{3+}
		1-36	Iron		1.50 mg/L Fe^{3+}	1.30–1.70 mg/L Fe^{3+}
		0-58	Manganese 10		1.5 mg/L Mn^{2+}	1.3–1.7 mg/L Mn^{2+}
		1-60	Manganese		1.50 mg/L Mn^{2+}	1.30–1.70 mg/L Mn^{2+}
		0-86	Sulfate 200		120 mg/L SO_4^{2-}	102–138 mg/L SO_4^{2-}
		0-62	Sulfate LR 200		120 mg/L SO_4^{2-}	102–138 mg/L SO_4^{2-}

[1] Please see the instruction leaflet / evaluation sheet.
[2] Shelf life 6 weeks after first opening / see instruction leaflet.
GHS: Globally harmonized system: This product contains harmful substances which must be specially labeled as hazardous. For detailed information please see the SDS.

Addition	Shelf life [2)]	GHS	Standard
– – 10 mg/L Cl^- 50 mg/L Cl^- 0.2 mg/L Cr 0.2 mg/L Cr 0.2 mg/L Cr 0.2 mg/L Cr 0.30 mg/L Fe^{3+} 0.30 mg/L Fe^{3+} 0.5 mg/L F^- 0.50 mg/L F^- 50 mg/L SO_4^{2-} 0.40 mg/L Zn^{2+} 0.40 mg/L Zn^{2+}	1 year		Metals 1
0.50 mg/L Pb^{2+} – 10 mg/L K^+ 0.70 mg/L Cu^{2+} 0.70 mg/L Cu^{2+} 0.70 mg/L Ni^{2+} 0.70 mg/L Ni^{2+}	1 year		Metals 2
30 mg/L NH_4-N 30 mg/L NH_4-N – – 10 mg/L NO_3-N 5.0 mg/L P 5.0 mg/L PO_4-P	1 year		Sewage
0.20 mg/L Al^{3+} 0.20 mg/L Al^{3+} 0.20 mg/L NH_4-N 5.0 mg/L Cl^- 5.0 mg/L Cl^- 0.20 mg/L Fe^{3+} 0.20 mg/L Fe^{3+} 1.0 mg/L Mn^{2+} 0.20 mg/L Mn^{2+} 50 mg/L SO_4^{2-} 50 mg/L SO_4^{2-}	1 year		Drinking water

NANOCOLOR® reagents for sample decomposition

Sample preparation for photometric analysis

Usually only dissolved compounds of a parameter are detected in water analysis. In strongly contaminated waters and industrial waste water these parameters are often bound in complexes or other structures and are therefore not directly accessible for the respective test. If it is necessary to determine the total amount of these substances, a decomposition step has to be done prior to analysis, where on most cases large amounts of organic material have to be decomposed. Within the *NANOCOLOR*® system there are various rapid and easy methods available for conventional sample decomposition with solid reagents and kits with liquid reagents for complex matrices. In some of the *NANOCOLOR*® tube tests the reagents for sample preparation are already included and pre-dosed in additional test tubes next to the cuvettes. This is the perfect combination for the determination of total parameters such as total nitrogen or total chromium. Other reagents for sample preparation are available separately and are suitable for more than one parameter. After digestion the samples are then processed as described in the instructions for the respective *NANOCOLOR*® test kit.

NANOCOLOR® *NanOx* N – Oxidative digestion of samples containing nitrogen

NANOCOLOR® *NanOx* N consists of an easy-to-dose solid oxidation reagent (peroxodisulfate) and a compensation reagent to eliminate interfering substances. After digestion, all inorganic and organic nitrogen compounds in the sample have been converted to nitrate and can be detected. The digestion of larger sample volumes allows a multiple determination from just one preparation.

NANOCOLOR® *NanOx* Metal – Oxidation of samples containing heavy metals

Undissolved metal ions and metal oxides are dissolved with the aid of acids and heat, metal ions are de-complexated and adsorptive or interfering substances are eliminated. Optimal recovery rates can be found in the analysis of heavy metals. *NANOCOLOR*® *NanOx* Metal consists of an easy-to-dose solid oxidation reagent (peroxodisulfate) and a neutralizing reagent to adjust the pH value for the following determination of different metals. In addition to the digestion in the heating block, it is possible to digest samples in less time using a microwave.

Good to know

For further accessories for digestions with *NANOCOLOR*® *NanOx* Metal in a heating block or a microwave see page 106.

NANOCOLOR® reagents for sample decomposition

NANOCOLOR® crack set

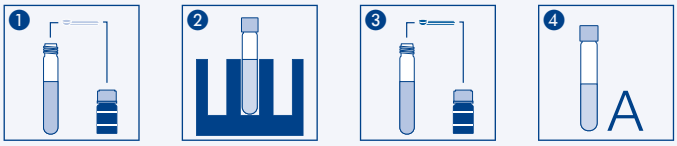
For a more powerful and complete digestion of resistant samples we recommend to use the *NANOCOLOR*® crack set. The included liquid reagents allow an oxidative sample preparation under acidic conditions (peroxodisulfate / sulfuric acid) and normal pressure at 100 °C in the heating block.

NANOCOLOR® sludge

In Germany, the sewage sludge regulation regularizes the use of sludge as fertilizer in agriculture and in market gardens. Therein a limit for seven heavy metals is established. The determination of these parameters is possible with high accuracy using *NANOCOLOR*® sludge (aqua regia) for digestion. A thorough training is recommended to learn the special working techniques before using the kit. Detailed instructions regarding sludge analysis can be provided free of charge.

How it's done

Decomposition in heating block with *NanOx* N



1 Add decomposition reagent
2 Heat
3 Add compensation reagent
4 Decomposed sample

Ordering information

Description	REF	Number of decompositions	Shelf life	GHS
Determination of total Nitrogen				
■ *NANOCOLOR*® *NanOx* N solid reagents for the oxidative digestion prior to total nitrogen determination (heating block or microwave)	918 979	50–100	1 year	■
Sludge analysis				
■ Reagent set *NANOCOLOR*® sludge: aqua regia digestion of sludge- and soil samples in the heating block	918 50	10	3 years	■
■ Starter set combination of necessary accessories for sludge analysis (without reagents, photometer, heating block) incl. instructions	916 10	–	–	
Crack set for aqueous systems				
■ Crack set incl. sulfuric acid / potassium peroxodisulfate for the oxidative digestion in the heating block	918 08	100	3 years	■
■ Decomposition apparatus for sample decomposition incl. decomposition tube, reducing adaptor and condensor	916 29	–	–	
Determination of total metals and phosphorous				
■ *NANOCOLOR*® *NanOx* Metal solid reagents for the oxidative decomposition of samples containing heavy metals and total phosphate (heating block or microwave)	918 978	75–150	1 year	■

GHS: Globally harmonized system: This product contains harmful substances which must be specially labeled as hazardous. For detailed information please see the SDS.

NANOCOLOR® accessories

Everything from one hand

An indicator for the quality of an analytical system is its completeness. Therefore, accessories for sample drawing, preparation, and conservation as well as for decomposition, extraction and filtration are part of the *NANOCOLOR*® system.

Getting all these components from one hand allows a smooth work flow leading to optimal results.

Ordering information

Description	REF	Content	Number of tests	Shelf life	GHS
General accessories					
Volumetric flask 10 mL for reduced analytical preparations	916 42	2 pieces			
Volumetric flask 25 mL with NS 10/19 and PE stopper for analytical preparations	916 61	2 pieces			
Volumetric flask 100 mL with NS 12/21 and PE stopper	916 83	2 pieces			
Erlenmeyer flask 50 mL	916 212	1 piece			
Erlenmeyer flask 100 mL	916 38	1 piece			
Measuring cylinder 50 mL	916 84	1 piece			
Bulb for filling 20 mL pipettes	916 65	1 piece			
Glass rod 30 cm	916 39	1 piece			
Tweezers for picking of *NANOFIX* capsules	916 114	1 piece			
Plastic wash bottle 500 mL with spraying attachment	916 89	1 piece			
Magnetic stirring unit	970 115	1 piece			
Mini-magnet for stirring (30 x 6 mm)	916 211	1 piece			
Timer with digital display and acoustic signal (up to 99:59 min)	916 96	1 piece			
Porcelain mortar 90 mm Ø with pestle	916 88	1 piece			
Holder for 15 round glass tubes and 2 tubes for sample digestion	916 23	1 piece			
Safety kit, consists of safety glasses, gloves and rubber apron	916 90	1 piece			
Adhesive tape, glass fiber reinforced, for closing the shipping boxes for hazardous goods	916 20	1 roll, 50 m			
Glass funnel 60 mm Ø	916 81	1 piece			
Glass funnel 80 mm Ø	916 82	1 piece			
Filter circles MN 1670, 11 cm Ø	470 011	100 pieces			
Filter circles MN 640 d, 15 cm Ø	205 015	100 pieces			
Membrane filtration					
Membrane filtration kit: 2 syringes 20 mL, 25 CHROMAFIL® membrane filters 0.45 µm	916 50	1 set			
CHROMAFIL® membrane filters 0.45 µm	916 52	50 pieces			
Membrane filtration kit: 2 syringes 20 mL, 25 CHROMAFIL® membrane filters 1.2 µm	916 511	1 set			
CHROMAFIL® membrane filters 1.2 µm	916 513	50 pieces			
Membrane filtration kit: 2 syringes 20 mL, 25 CHROMAFIL® membrane filters GF / PET 0.45 µm	916 01	1 set			
CHROMAFIL® membrane filters GF / PET 0.45 µm	916 02	50 pieces			
Pipetting					
Piston pipette 200 µL	916 72	1 piece			
Plastic tips transparent for piston pipettes 5–200 µL	916 915	100 pieces			
Piston pipette 500 µL	916 53	1 piece			
Plastic tips transparent for piston pipettes 100–1000 µL	916 76	100 pieces			
Piston pipette 1.0 mL	916 71	1 piece			
Plastic tips transparent for piston pipettes 100–1000 µL	916 76	100 pieces			

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Description	REF	Content	Number of tests	Shelf life	GHS
■ Piston pipette 2.0 mL	916 917	1 piece			
■ Plastic tips transparent for piston pipettes 1.0–5.0 mL	916 916	100 pieces			
■ Digital piston pipette 5–50 µL, adjustable, with tip ejector	916 58	1 piece			
■ Digital piston pipette 50–200 µL, adjustable, with tip ejector	916 914	1 piece			
■ Plastic tips transparent for piston pipettes 5–50 µL and 50–200 µL	916 915	100 pieces			
■ Digital piston pipette 100–1000 µL, adjustable, with tip ejector	916 77	1 piece			
■ Plastic tips transparent for piston pipettes 100–1000 µL	916 76	100 pieces			
■ Digital piston pipette 1.0–5.0 mL, adjustable, with tip ejector	916 909	1 piece			
■ Plastic tips transparent for piston pipettes 1.0–5.0 mL	916 916	100 pieces			
■ Pipette stand for 6 piston pipettes	916 79	1 piece			
Extraction					
■ 100 mL separation funnel with NS glass tap and PE stopper for extraction methods	916 64	2 pieces			
■ Stand with clamps and bosses for 4 separation funnels, height 70 cm	916 95	1 piece			
AOX					
■ Supplement kit for AOX for the sensitive AOX range (0.01–0.30 mg/L AOX) and for higher COD values (required above 50 mg/L COD)	918 072	2 x 4 g	20	1 year	■
■ Chloride detection kit AOX for samples with high chloride contents	918 073	10 mL		1 year	■
■ Starter set for AOX, consists of tweezers, funnel, cartridge adaptor, beaker, glass rods, 1 L bottle and syringes	916 111	1 set			
■ Pump set for AOX, consists of centrifugal pump, connecting tubes, graduated 1 L reservoir with tap and stand with clamps and bosses	916 115	1 set			
■ *NANOCOLOR*® cartridge adapter for AOX pump-set	916 113	1 piece			
BOD_5					
■ BOD_5 nutrient mixture (without *N*-allylthiourea [NATU])	918 994	20 cuvettes	20–80	2 years	
■ BOD_5 nutrient mixture PLUS (with *N*-allylthiourea [NATU])	918 995	20 cuvettes	20–80	2 years	
■ BOD_5 accessories set, consists of electric air pump, 10 L PE container, 2 aerating bricks, 1 L laboratory bottle, 4 Winkler bottles	916 918	1 set			
■ BOD_5-TT accessories set, consists of electric air pump, 2 aerating bricks, 1 L PE container, 2 reaction vessels (40 mL)	916 925	1 set			
■ Reaction vessels for BOD_5-TT	916 926	10 pieces			
■ Oxygen bottles according to Winkler (250–300 mL)	916 919	4 pieces			
■ Aerating bricks for BOD_5 determination	916 920	4 pieces			
COD					
■ Chloride complexing agent for chloride concentration of 1000–7000 mg/L Cl^-	918 911	100 mL	100	1.5 years	■
■ Cartridges for chloride elimination of up to 2000 mg/L chloride per cartridge	963 911	10 pieces	10	1 year (2–8 °C)	■
■ COD- and TOC-free water	918 993	50 mL		1 year	
■ Safety bottle for shaking COD tubes	916 37	1 piece			
Hydrocarbons					
■ Extraction of HC from water	918 571	1 box	20	1.5 years	■
■ Extraction of HC from soil	918 572	1 box	20	1.5 years	■
■ Separation funnel 500 mL with PTFE tap and glass stopper	916 08	2 pieces			
■ CHROMABOND® column 45 mL with 4 g aluminum oxide ALOX N for purification of water and soil extracts by solid phase extraction	730 250	20 pieces	20	3 years	
■ Syringe adaptor for CHROMABOND® columns 45 mL	916 03	2 pieces			
■ Plastic syringes 50 mL	916 09	10 pieces			

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NANOCOLOR® accessories

Description	REF	Content	Number of tests	Shelf life	GHS
■ Stop valve for pipette tips for low-viscosity liquids	916 21	100 pieces			
■ Threaded union for coupling the sample tube with the COD tube	916 04	2 pieces			
■ Soxhlet apparatus 30 mL, with 100 mL round flask with flat bottom and condenser (3 parts); additionally a heater is required	916 05	1 set			
■ Extraction thimbles MN 645 23 mm Ø x 100 mm	645 008	25 pieces			
■ Measuring flask 50 mL with PE stopper	916 06	2 pieces			
TOC					
■ *NANOCOLOR*® TIC-Ex for removal of TIC, incl. cuvette holder, power supply 100–240 V, 50/60 Hz, 9 V + 3 adapters, manual	916 993	1 piece			
■ Manual for *NANOCOLOR*® TIC-Ex	916 994	1 piece			
■ Cuvette holder for *NANOCOLOR*® TIC-Ex	916 995	1 piece			
■ Power supply for QUANTOFIX® Relax and *NANOCOLOR*® TIC-Ex	930 995	1 piece			
■ Pipette tips for *NANOCOLOR*® TIC-Ex	916 997	20 pieces			
■ Pipette tips for *NANOCOLOR*® TIC-Ex	916 998	200 pieces			
■ Cover for *NANOCOLOR*® *VIS* for TOC determination	916 996	1 piece			
■ Holder for 15 round glass tubes and 2 tubes	916 23	1 piece			
■ *NANOCOLOR*® accessory set for TOC (small), content: 1 magnetic stirrer (1 stirring position), 2 beakers 100 mL, 2 magnetic stirring bars 35 mm	916 990	1 set			
■ *NANOCOLOR*® accessory set for the determination of TOC (big), content: 1 magnetic stirrer (15 stirring positions), 6 beakers 100 mL, 6 magnetic stirring bars	916 991	1 set			
■ *NANOCOLOR*® beaker 100 mL with magnetic stirring bar 35 mm	916 992	2 pieces			
■ *NANOCOLOR*® thermocaps for TOC determination	916 116	3 pieces			
Special chemicals for elimination of interferences					
■ Distilled water	918 932	1 L		1 year	
■ Silica-free water	918 912	1 L		1 year	
■ Isobutyl methyl ketone (MIBK) for phenol test 0-74	918 929	100 mL			■
Reagents for sample preparation					
■ Carrez solutions 1 + 2, for nitrite in cooling lubricants, sewage water from landfills etc.	918 937	2 x 30 mL	30	2 years	
■ Removal of interfering calcium for determinations of copper, nickel and zinc by lime precipitation clarification	918 939	100 g	20	2.5 years	
■ Amidosulfuric acid for nitrite elimination	918 973	25 g		2 years	■
■ Ammonium compensation reagent for tube test *NANOCOLOR*® Potassium 50	918 045	30 mL	100	2 years	■

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