

Water Analysis

NANOCOLOR® Reagents



Solutions for photometry

- Bar coded tube tests with **pre-dosed reagents**
- For **highest accuracy** and **sensitivity** in water analysis
- **NANOCONTROL** for **analytical quality control**

MACHEREY-NAGEL

www.mn-net.com



NANOCOLOR® Reagents for photometric water analysis

NANOCOLOR® reagents are analytical reagents for photometric water analysis. They are particularly suitable for pre-calibrated NANOCOLOR® photometers from MACHEREY-NAGEL. Calibration data for evaluation with photometers from other manufacturers are listed in the product leaflets or are available on request.

Clear step-by-step instructions guide you through the test procedures of all NANOCOLOR® tests. Thus even operators with basic analytical experience can be confident in getting reliable results in no time. However, NANOCOLOR® reagents are also fully recognized and appreciated by qualified analysts, who look for time saving procedures with no loss of accuracy. The instruction leaflets provide additional information on storage, interferences, analytical quality control and safety precautions.



NANOCOLOR® tube tests

- Bar code cuvette identification
- Precisely pre-dosed reagents in 16 mm tubes
- Accurate reagent dosage with NANOFIX capsules
- Measurement directly in the test tube
- Minimal exposure to chemicals
- Reduced reagent consumption
- No preparation of blank values necessary
- Time saving and easy procedures
- Fast and reliable results
- 20 tests per pack

NANOCOLOR® standard tests

- Measurement in 10, 20 or 50 mm cuvettes
- Extreme sensitivity due to large cuvette size
- Outstanding accuracy due to large sample volume
- Ready-to-use reagents
- Exact sample dosage in volumetric flasks
- Variable measuring ranges due to different cuvette sizes
- Easy dilutions for analysis of higher concentrations
- Low costs
- Up to 440 tests per pack



NANOCONTROL standards

In many labs, reagents, measuring equipment and personal handling are already subject to validation from frequent internal or external control. Therefore, numerous customers rely on our NANOCONTROL standards to obtain objective proof of the NANOCOLOR® systems' accuracy.






























































NANOCONTROL standards permit easy analytical quality control, simplify the corresponding documentation and give operators confidence in their measured results.



- Ready-to-use standard solutions, containing one or several substances in known concentrations.
- Separate spiked-solutions detect possible interferences in the sample.
- Composition and concentrations of multistandards tailored to specific user groups e.g. waste water treatment, drinking water production or others.
- The standards are supplied with a document, in which the expected concentration and given tolerance range are stated for each parameter. There is also plenty of space for documentation of quality control procedures performed by the operator.
- Production control based on DIN/EN standards ensures reproducible accuracy of NANOCONTROL standards.

















































NANOCOLOR® Reagents for photometric water analysis

NANOCOLOR® tube tests and standard tests

Test	Measuring ranges	Wave-length	No of tests	REF		
Aluminium	0.01 – 1.00 mg/l Al ³⁺	540 nm	200	918 02		
Aluminium 07	0.02 – 0.70 mg/l Al ³⁺	540 nm	19	985 098		
Ammonium	0.01 – 2.0 mg/l NH ₄ -N	690 nm	100	918 05		
Ammonium 3	0.04 – 2.30 mg/l NH ₄ -N	690 nm	20	985 003		
Ammonium 10	0.2 – 8.0 mg/l NH ₄ -N	690 nm	20	985 004		
Ammonium 50	1.0 – 40.0 mg/l NH ₄ -N	690 nm	20	985 005		
Ammonium 100	4 – 80 mg/l NH ₄ -N	585 nm	20	985 008		
Ammonium 200	30 – 160 mg/l NH ₄ -N	585 nm	20	985 006		
AOX 3	0.1 – 3.0 mg/l AOX	470 nm	20	985 007		
BOD ₅	2 – 3000 mg/l O ₂	436 nm	25 – 50	985 822		
BOD ₅ -TT	2 – 3000 mg/l O ₂	436 nm	22	985 825		
Cadmium 2 ¹⁾	0.05 – 2.00 mg/l Cd ²⁺	520 nm	10 – 19	985 014		
Carbonate hardness 15	1.0 – 15.0 °d	436/585 nm	20	985 015		
Chloride	0.2 – 125 mg/l Cl ⁻	470 nm	220	918 20		
Chloride 50	0.5 – 50.0 mg/l Cl ⁻	470 nm	20	985 021		
Chloride 200	5 – 200 mg/l Cl ⁻	470 nm	20	985 019		
Chlorine	0.02 – 10.0 mg/l Cl ₂	540 nm	250	918 16		
Chlorine/Ozone 2	0.05 – 2.50 mg/l Cl ₂	540 nm	20	985 017		
Chlorine dioxide	0.04 – 4.00 mg/l ClO ₂	540 nm	50	918 163		
Chlorine dioxide 5	0.15 – 5.00 mg/l ClO ₂	540 nm	20	985 018		
Chromate	0.01 – 3.0 mg/l Cr(VI)	540 nm	250	918 25		
Chromate 5	0.05 – 2.00 mg/l Cr(VI)	540 nm	20	985 024		
Cobalt	0.002 – 0.70 mg/l Co ²⁺	540 nm	220	918 51		
COD 40	2 – 40 mg/l O ₂	345 nm	20	985 027		
COD 60	5 – 60 mg/l O ₂	345 nm	20	985 022		
COD 160	15 – 160 mg/l O ₂	436 nm	20	985 026		
COD 160 Hg-free	15 – 160 mg/l O ₂	436 nm	20	963 026		
COD 300	50 – 300 mg/l O ₂	436 nm	20	985 033		
COD 1500	100 – 1500 mg/l O ₂	620 nm	20	985 029		
COD 10000	1.00 – 10.00 g/l O ₂	620 nm	20	985 023		
COD 15000	1.0 – 15.0 g/l O ₂	620 nm	20	985 028		
COD 60000	5.0 – 60.0 g/l O ₂	620 nm	20	985 012		
Colour (Hazen/DIN) ⁶⁾	5 – 500 mg/l Pt (Hazen)	436 nm	–	Test 1-39		
org. Complexing agents 10 (screening test)	0.5 – 10.0 mg/l I _{Bik}	540 nm	10 – 19	985 052		
Copper ⁸⁾	0.01 – 10.0 mg/l Cu ²⁺	585 nm	250	918 53		
Copper 7	0.10 – 7.00 mg/l Cu ²⁺	585 nm	20	985 054		
Cyanide	0.001 – 0.50 mg/l CN ⁻	585 nm	250	918 30		
Cyanide 08	0.01 – 0.80 mg/l CN ⁻	585/605 nm	20	985 031		
DEHA 1	0.05 – 1.00 mg/l DEHA	540 nm	20	985 035		
Ethanol 1000	0.10 – 1.00 g/l EtOH	620 nm	23	985 838		
Fluoride	0.05 – 2.00 mg/l F ⁻	585 nm	200	918 142		
Fluoride 2	0.1 – 2.0 mg/l F ⁻	620 nm	20	985 040		
Formaldehyde 8	0.1 – 8.0 mg/l HCHO	585 nm	20	985 041		
Formaldehyde 10	0.20 – 10.00 mg/l HCHO	412 nm ⁴⁾	20	985 046		
Hardness 20	1.0 – 20.0 °d	540 nm	20	985 043		
residual Hardness 1	0.02 – 3.6 mmol/l	540 nm	20	985 084		
HC 300 (Hydrocarbons)	0.02 – 1.00 °d	436 nm	20	985 057		
Hydrazine	0.002 – 1.50 mg/l N ₂ H ₄	436 nm	220	918 44		
Iron ⁸⁾	0.01 – 15.0 mg/l Fe	470 nm	250	918 36		
Iron 3	0.10 – 3.00 mg/l Fe	540 nm	20	985 037		
Lead 5 ¹⁾	0.10 – 5.00 mg/l Pb ²⁺	520 nm	20	985 009		
Manganese ⁸⁾	0.01 – 10.0 mg/l Mn	470 nm	250	918 60		
Manganese 10	0.1 – 10.0 mg/l Mn	470 nm	20	985 058		
Methanol 15	0.2 – 15.0 mg/l MeOH	620 nm	23	985 859		
Molybdenum 40	1.0 – 40.0 mg/l Mo(VI)	345/365 nm	20	985 056		
Nickel ⁴⁾	0.01 – 10.0 mg/l Ni ²⁺	436 nm	250	918 62		
Nickel 7	0.10 – 7.00 mg/l Ni ²⁺	470 nm	20	985 061		
Nitrate	0.9 – 30.0 mg/l NO ₃ -N	365/385 nm	100	918 65		
Nitrate Z	0.02 – 1.0 mg/l NO ₃ -N	520 nm	440	918 63		

NANOCOLOR® Reagents for photometric water analysis

NANOCOLOR® tube tests and standard tests

Test	Measuring ranges	Wave-length	No of tests	REF		
Nitrat 8	0.30 – 8.00 mg/l NO ₃ -N	470 nm	20	985 061		
Nitrate 50	0.3 – 22.0 mg/l NO ₃ -N	365 nm	20	985 064		
		385 nm				
Nitrate 250	4 – 60 mg/l NO ₃ -N	365/	20	985 066		
		385 nm				
Nitrite ⁸⁾	0.002 – 0.30 mg/l NO ₂ -N	520 nm	220	918 67		
Nitrite 2	0.003 – 0.460 mg/l NO ₂ -N	540 nm	20	985 068		
Nitrite 4	0.1 – 4.0 mg/l NO ₂ -N	540 nm	20	985 069		
total Nitrogen TN _b 22	0.5 – 22.0 mg/l N	365/	20	985 083		
		385 nm				
total Nitrogen TN _b 220	5 – 220 mg/l N	365/	20	985 088		
		385 nm				
Organic acids 3000	30 – 3000 mg/l CH ₃ COOH	470 nm	20	985 050		
Oxygen 12	0.5 – 12.0 mg/l O ₂	436 nm	22	985 082		
Peroxide 2	0.03 – 2.00 mg/l H ₂ O ₂	620 nm	10 – 19	985 871		
pH 6.5 – 8.2 ³⁾	pH 6.5 – 8.2	436 nm	100	918 72		
		540 nm				
Phenol	0.01 – 7.0 mg/l Phenol	470 nm	440	918 75		
Phenolic index 5 ¹⁾	0.2 – 5.0 mg/l	520 nm	20	985 074		
ortho-Phosphate	0.04 – 6.5 mg/l PO ₄ -P	690 nm	440	918 77		
ortho-Phosphate ⁸⁾	0.2 – 17 mg/l PO ₄ -P	436 nm	440	918 78		
ortho- and total-Phosphate 1	0.05 – 1.50 mg/l P	690 nm	19	985 076		
	0.010 – 0.800 mg/l P ²⁾	0.03 – 2.50 mg/l PO ₄ ³⁻ ²⁾				
ortho- and total-Phosphate 5	0.20 – 5.00 mg/l P	690 nm	19	985 081		
ortho- and total-Phosphate 15	0.30 – 15.00 mg/l P	690 nm	19	985 080		
ortho- and total-Phosphate 45	5.0 – 50.0 mg/l P	690 nm	19	985 055		
ortho- and total-Phosphate 50	10.0 – 50.0 mg/l P	436 nm	19	985 079		
POC 200	20 – 200 mg/l POC	436 nm	20	985 070		
(polyoxycarboxylic acids)		2 – 40 mg/l KWI				
Potassium 50	2 – 50 mg/l K ⁺	690 nm	20	985 045		
Silica ⁸⁾	0.01 – 5.00 mg/l Si	690 nm	250	918 48		
	0.002 – 0.100 mg/l Si ³⁾	800 nm				
		0.005 – 0.200 mg/l SiO ₂ ⁷⁾				
Silver 3	0.20 – 3.00 mg/l Ag ⁺	620 nm	20	985 049		
Starch 100	5 – 100 mg/l Starch	540 nm	19	985 085		
Sulphate 200	10 – 200 mg/l SO ₄ ²⁻	436 nm	20	985 086		
Sulphate 1000	200 – 1000 mg/l SO ₄ ²⁻	436 nm	20	985 087		
Sulphide	0.01 – 3.0 mg/l S ²⁻	620 nm	250	918 88		
		660 nm				
Sulphide 3	0.05 – 3.00 mg/l S ²⁻	620 nm	20	985 073		
Sulphite 10	0.2 – 10.0 mg/l SO ₃ ²⁻	436 nm	20	985 089		
		0.05 – 2.40 mg/l SO ₃ ²⁻ ²⁾				
Sulphite 100	5 – 100 mg/l SO ₃ ²⁻	470 nm	19	985 090		
anionic Surfactants 4	0.20 – 4.00 mg/l MBAS	620 nm	20	985 032		
cationic Surfactants 4	0.20 – 4.00 mg/l CTAB	620 nm	20	985 034		
nonionic Surfactants 15	0.3 – 15.0 mg/l Triton® X-100	610 nm	20	985 047		
		620 nm				
Thiocyanate 50	0.5 – 50.0 mg/l SCN ⁻	470 nm	20	985 091		
Tin 3 ¹⁾	0.10 – 3.00 mg/l Sn	520 nm	18	985 097		
TOC 25	2.0 – 25.0 mg/l C	585 nm	10	985 093		
TOC 60	10 – 60 mg/l C	585 nm	10	985 094		
TOC 600	40 – 600 mg/l C	585 nm	10	985 099		
TTC / Sludge activity 150	5 – 150 µg TPF	470 nm	20	985 890		
Turbidity (formazine/DIN) ⁵⁾	1 – 100 TE/F (= FAU)	620 nm	–	Test		
		860 nm		1-92		
Turbidity ^{5) 6)}	1 – 1000 NTU	–	–	Test		
				9-06		
Zinc	0.02 – 3.0 mg/l Zn ²⁺	620 nm	250	918 95		
Zinc 4	0.10 – 4.00 mg/l Zn ²⁺	620 nm	20	985 096		

1) This test cannot be evaluated with the NANOCOLOR® 250 D

2) a more sensitive measuring range is possible by using 50 mm semi-micro cuvettes (REF 919 50)

3) without bar code

4) special filter necessary

5) evaluation only possible with NANOCOLOR® ^{UV/VIS}

6) A NANOCOLOR® standard test is not required. The original sample has to be measured without additional reagents.

7) High sensitivity measurement

8) Simplified procedure in a beaker is possible. Please ask for special instructions!

NANOCOLOR® Reagents for photometric water analysis

Application areas

Test	Municipal waste water	Industrial waste water	Drinking water	Boiler feed water	Cooling water	Surface water	Breweries	Paper industry	Textile industry	Leather industry	Chemical industry	Metal processing industry	Electroplating industry	Photo industry	Food and beverages industry	Dairy industry	Aquaculture and fish farming	Sea water analysis	Pharmaceutical industry	Concrete and cement production	Leakage from garbage dumps	Swimming pools	Disinfection	
Aluminium																								
Ammonium																								
AOX																								
BOD ₅																								
Cadmium																								
Carbonate hardness																								
Chloride																								
Chlorine																								
Chlorine dioxide																								
Chromium/Chromate																								
Cobalt																								
COD																								
Colour																								
Org. complexing agents																								
Copper																								
Cyanide																								
Detergents																								
DEHA																								
Ethanol																								
Fluoride																								
Formaldehyde																								
Hardness, Calcium, Magnesium																								
Hydrocarbons																								
Hydrazine																								
Iron																								
Lead																								
Manganese																								
Methanol																								
Molybdenum																								
Nickel																								
Nitrate																								
Nitrite																								
Total Nitrogen																								
Organic Acids																								
Oxygen																								
Ozone																								
Peroxide																								
pH																								
Phenol																								
Phosphate																								
POC																								
Potassium																								
Residual hardness																								
Silica																								
Starch																								
Sulphate																								
Sulphide																								
Sulphite																								
Surfactants																								
Thiocyanate																								
Tin																								
TOC																								
Turbidity																								
TTC																								
Zinc																								

NANOCOLOR® Reagents for photometric water analysis

Legal acceptance

The chemistry of our *NANOCOLOR*® test kits is based on international norms and regulations for the analysis of water, waste water and sludge (DIN, EN, ISO, APHA and EPA, e.g. ISO 15705 – Water quality – Determination of the chemical oxygen demand index (ST-COD) – Small-scale sealed tube method). Accuracy, precision and detection limits of test kits fulfil the requirements of specific national and international guidelines for water quality and water analysis (e.g. EC Drinking Water Directive 98/83/EC, German Drinking Water Directive, German Federal laws and State laws governing water protection and water analysis).

COD tube tests in accordance to ISO 15705



With the *NANOCOLOR*® system for photometric water analysis, MACHEREY-NAGEL offers an environment-friendly, cost-effective and time-saving system for the determination of chemical oxygen demand in accordance with the ISO norm 15705.

For the first time ever, the ISO 15705 (“Water quality - Determination of the chemical oxygen demand index (ST-COD) - Small-scale sealed tube method”) describes a photometric tube test as a standardized and internationally accepted method for the analysis of water and waste water.

MACHEREY-NAGEL confirms, that every component of the *NANOCOLOR*® system for photometric water analysis fulfils all requirements concerning reagents, sample volume, digestion conditions and photometric determination of the ISO 15705.

Quality Assurance

During production, filling and storage, *NANOCOLOR*® reagents are constantly controlled by a quality system, which fulfils the requirements of DIN EN ISO 9001. Our routine quality assurance ensures consistent calibration accuracy, as well as highly accurate results during the entire shelf-life of *NANOCOLOR*® test kits.

Accuracy of results

Ring tests among our customers and participation in external ring tests have shown that deviations of less than 5% from nominal results, given by standard methods, can be expected when using *NANOCOLOR*® reagents. Nominal calibration values deviate less than 3% from photometers’ calibrations.

NANOCONTROL NANOCHECK

REF 925 701

NANOCONTROL NANOCHECK test solutions are suitable for the determination of photometric accuracy of MACHEREY-NAGEL photometers. They are secondary standards for the control of inspection, measuring and test equipment in accordance to ISO 9001 and ISO 14001. They are checked and documented with a reference photometer which is monitored with primary standards (NIST traceable standards). The results are documented.

Only 2 stable colour solutions are necessary to check the wavelength accuracy and the linearity of the absorbance measurement.



Your local distributor:

www.mn-net.com

MACHEREY-NAGEL



MACHEREY-NAGEL GmbH & Co. KG · Neumann-Neander-Str. 6-8 · D-52355 Düren · Germany

Germany

and international:

Tel.: +49 (0) 24 21 96 90

Fax: +49 (0) 24 21 96 91 99

E-mail: info@mn-net.com

Switzerland:

MACHEREY-NAGEL AG

Tel.: +41 (0) 62 388 55 00

Fax: +41 (0) 62 388 55 05

E-mail: sales-ch@mn-net.com

France:

MACHEREY-NAGEL EURL

Tel.: +33 (0) 3 88 68 22 68

Fax: +33 (0) 3 88 51 76 88

E-mail: sales-fr@mn-net.com



Since 1911