

# MACHEREY-NAGEL NANOCOLOR<sup>®</sup> analysis system

Water Analysis



NANOCOLOR<sup>®</sup> analysis system

- Expertise
- Continuity
- Passion

**MACHEREY-NAGEL**

[www.mn-net.com](http://www.mn-net.com)



# NANOCOLOR® analysis system

## More than 50 years of expertise, continuity and passion for our customers

For over 50 years, MACHEREY-NAGEL has been developing solutions in the field of photometry. Continuous equipment and software development, extraordinary close customer relations and passion for our work allow us to offer you the NANOCOLOR® system with high reliability and quality.

Our competent service team and our distributors are at your disposal at any time with help and advice. Thus, the user is supplied by a central source with maximum service by the regional distributors. Quality and service make MACHEREY-NAGEL and the NANOCOLOR® analysis system the ideal partner.

- ISO-certified production in Germany ensuring highest quality “Made in Germany”
- Consistent quality from batch to batch – no LOT-specific updates required
- SDS, LOT-specific certificates and method validation data
- Intensive research and development in the field of water analysis to meet future demands and requirements
- One-on-one service by our trained distributors on site and our Customer Service Center in Düren, Germany

## Into the future with MACHEREY-NAGEL


Even after 111 years of successful MACHEREY-NAGEL company history, we are looking forward into a positive future. Further investments in our headquarters in Düren are planned. Our steady growth is reflected not only in locations, but also in the steadily growing number of employees.




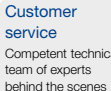
**Good to know** 



 Management System  
EN ISO 13485:2016  
ISO 9001:2015  
www.tuv.com  
ID: 3000005339

**Certified**  
Since 1996 we are certified according to the international standards ISO 9001 and EN ISO 13485.

 **Equipment and devices**  
High quality compact photometers, spectrophotometer and heating blocks

 **Tests and platforms**  
The perfect test for every requirement

 **Customer service**  
Competent technical team of experts behind the scenes

 **Quality control**  
Complete internal quality control with the NANOCOLOR system 

### Extensive online seminar and training program

Our online trainings are an integral part of the NANOCOLOR® analysis system. They underline our proximity to customers and support you in building up experience with our analysis system. The positive response and the constantly growing number of participants show, that the online seminars are an important part of our NANOCOLOR® system.

- Teaching of theoretical basics
- Practical demonstrations with helpful tips and tricks
- Latest news on new products and developments
- Answering customer-specific questions
- Exchange of experience with colleagues



### E-Training

We help you to improve your analytical skills. The MACHEREY-NAGEL E-Training presents helpful information and videos for successful analysis using products from the MN portfolio. New articles are published on regular basis and offer you a growing pool of knowledge.



## Test tubes in convenient packaging for safe and easy handling

NANOCOLOR® reagents impress by easy handling and are suited for routine analysis, self-monitoring and process control. Due to the precise and practical pre-dosing in 16 mm round tubes, the user can experience the highest measurement and work safety.

- 16 mm cuvettes in stable boxes with perfect light protection
- Color-coded labels with all important information
- Colored pictograms in package lid for intuitive test execution
- Convenient and safe removal of test tubes
- Describable top-label enabling an explicit allocation of test tubes
- Wide test tube openings for easy handling and safe pipetting



### Good to know

#### 2D Barcode

The NANOCOLOR® barcodes on all NANOCOLOR® tubel tests can be scanned with the camera function of a smartphone. They allow quick and easy access to all important data for these tests. For more information, visit: [www.mn-net.com/de/NANOCOLOR-QR-Codes](http://www.mn-net.com/de/NANOCOLOR-QR-Codes)

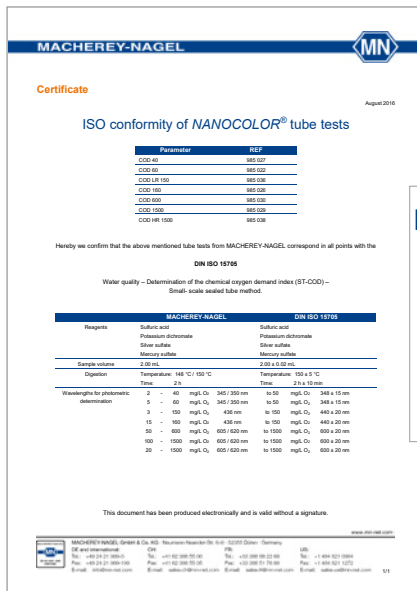


# NANOCOLOR® analysis system

## The perfect COD test for each and every user

For one of the most important parameters for determination of industrial and municipal waste water MACHEREY-NAGEL offers you even 13 different tests and measurement ranges. At the same time our COD tests allow safe handling without any risk from exposure to dichromate or mercury traces. Even after the REACH restrictions in 2017, our customers can continue using our NANOCOLOR® COD cuvette tests without limitation.

- 13 measuring ranges for all requirements and for compliance with the 20–80 % range according to DWA
- Reaction base according to ISO 6060
- 7 COD tests compliant with ISO 15705
- No zero measurement required
- Audited and certified: no mercury and dichromate contamination for users
- Mercury-free COD tests available for inflow and outflow measurements



## ISO conformity of NANOCOLOR® tube tests

Parameter	REF
COD 40	985 027
COD 60	985 022
COD LR 150	985 036
COD 160	985 026
COD 600	985 030
COD 1500	985 029
COD HR 1500	985 038



# NANOCOLOR<sup>®</sup> analysis system

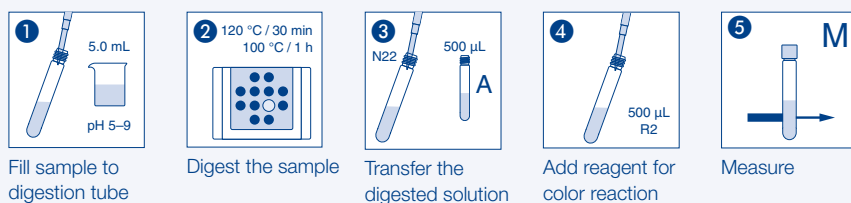
## Time-saving and reliable analysis of total nitrogen

The proven NANOCOLOR<sup>®</sup> total nitrogen tests are perfectly suited for the reliable determination of total nitrogen in waste water. Beside reproducible results they offer you a very simple and fast handling.

- One single test tube for each digestion
- Less testing steps through prefilled digestion reagents
- No contamination since digestion tubes are never used twice
- No cleaning of digestion tubes required
- Safe results through sufficiently large sample volumes

### How it's done

Application of a NANOCOLOR<sup>®</sup> total nitrogen test



# NANOCOLOR<sup>®</sup> analysis system

## Quality control for photometric water analysis

MACHEREY-NAGEL offers a complete system for your safety and for the accurate documentation for internal quality control. Continuous new developments and innovations in this field make us the experts in all questions concerning quality control in photometric wastewater analysis.

## Standard and addition solutions

Standard measurements are the basis of good internal quality control.

A standard measurement not only checks the function of the test, but also the measuring device, the user and the accessories. NANOCONTROL Standards contain reference substances in a defined concentration and are used instead of the water sample. The results are compared with the expected value and confidence interval. Most standards contain a NANOCONTROL 100+ addition solution. This can be used to reliably detect matrix-related disturbances in a water sample.



- Standard solutions for all important parameters
- Multistandards combine parameters for specific application areas
- 100+ addition solutions already included in many standards



# NANOCOLOR<sup>®</sup> analysis system

## Smart photometry

### Spectrophotometers NANOCOLOR<sup>®</sup> UV/VIS II, VIS II and Advance

With the spectrophotometers NANOCOLOR<sup>®</sup> UV/VIS II, VIS II and Advance we revolutionize your daily laboratory work. Operate these innovative photometers like your smartphone or tablet and enjoy the intuitive, icon-based menu navigation every day anew. Thanks to clear and high-resolution 10 inch HD touchscreens the daily measuring routine becomes a pleasure.

- Revolutionary user experience through color touchscreen display
- Intuitive and completely icon-based menu guidance
- Detection of interfering turbidity (NTU check)
- Test equipment monitoring and printout of certificates directly in the instrument
- Automatic check of photometric accuracy via NANOCHECK 2.0
- Wavelength accuracy test with integrated holmium oxide filter

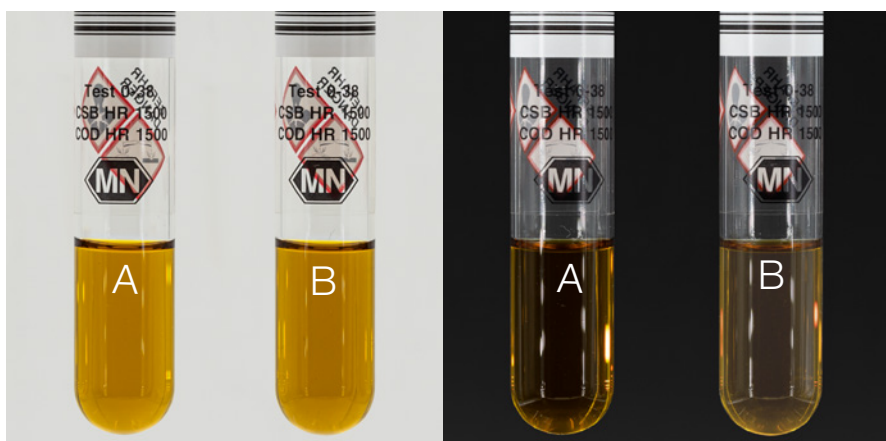




## Automatic turbidity check for tube tests

In photometry, turbidity is a frequently underestimated source of error and is not always easy to detect visually. Therefore, we offer a unique turbidity control function in our spectrophotometers for a higher reliability of measurements and a better feeling in your daily work routine - without any additional work or labor costs.

- Innovative and unique solution for turbidity problems, warns in case of potential interferences
- Elimination of a frequently underestimated source of errors in the field of photometry
- Turbidity displayed directly in NTU according to EN ISO 7027
- Maximum reliability of measured values, especially in COD analysis
- Complete documentation through parallel storage of measurements and NTU values
- Convenient turbidity calibration with *NANOCONTROL NANOTURB*



2 cuvettes (A | B) with the same COD concentration. The turbidity in cuvette B influences the result by up to 30 %.



# NANOCOLOR<sup>®</sup> analysis system

## NANOCONTROL NANOCHECK 2.0

Verification of photometric accuracy and linearity

NANOCONTROL NANOCHECK 2.0 is used as a secondary standard for the determination of photometric accuracy and linearity. It is a crucial tool for the inspection of spectrophotometers and filter photometers, besides the use of standards and spiking solutions. Two different colored solutions are included in three concentrations each. They are checked in production on a calibrated reference photometer and the results are supplied in a comprehensive certificate. This also provides the customer with the nominal values and confidence intervals of these NIST-traceable control solutions.

- Testing of all wavelengths of the NANOCOLOR<sup>®</sup> tests in the range from 340–800 nm
- 2D barcode for import of LOT-specific data
- Extensive documentation in CoA with reference absorbance values
- Unique photometric linearity test in VIS II and UV/VIS II
- Automatically generated test report as proof of testing for audits

### Good to know

**Evaluation sheet**



Electronically fillable evaluation forms for each photometer are available online. The NANOCOLOR NANOCHECK 2.0 evaluation sheets meet all requirements for quality assurance and serve as proof for authorities and superiors.

[www.mn-net.com/NANOCHECK](http://www.mn-net.com/NANOCHECK)



Evaluation sheet for / Auswertbogen für / Fiche d'évaluation pour  
NANOCOLOR<sup>®</sup> VIS II / UV/VIS II / Advance

NANOCONTROL NANOCHECK 2.0  
REF: 652703 622 No. 3463 04-2024

Date/Date: \_\_\_\_\_  
Photometer type/Photometer-Typ/Type du photomètre: \_\_\_\_\_  
Photometer serial number / Photometer Seriennummer / N° de série du photomètre: \_\_\_\_\_  
Tester / Prüfer / Contrôleur: \_\_\_\_\_  
Production no / Organisation / Production-Organisation / Organisme de contrôle: \_\_\_\_\_  
Location / Ort / Lieu: \_\_\_\_\_  
Temperature / Température / Température: \_\_\_\_\_

**Check solution / Prüfösung / Solution de contrôle 1.1**

Wavelength / Wellenlänge / Longueur d'onde	Target value / Sollwert / Valeur cible	Tolerance / Toleranz / Tolérance	Min.	Max.	Result / Messwert / Valeur mesurée	Assessment / Bewertung / Conformité
340 nm	0,211 E	±0,025 E	0,186 E	0,236 E		○
350 nm	0,211 E	±0,025 E	0,186 E	0,236 E		○
360 nm	0,215 E	±0,025 E	0,190 E	0,240 E		○
370 nm	0,220 E	±0,025 E	0,195 E	0,245 E		○
380 nm	0,225 E	±0,025 E	0,200 E	0,250 E		○
390 nm	0,230 E	±0,025 E	0,205 E	0,255 E		○
400 nm	0,235 E	±0,025 E	0,210 E	0,260 E		○
410 nm	0,240 E	±0,025 E	0,215 E	0,265 E		○
420 nm	0,245 E	±0,025 E	0,220 E	0,270 E		○
430 nm	0,250 E	±0,025 E	0,225 E	0,275 E		○
440 nm	0,255 E	±0,025 E	0,230 E	0,280 E		○
450 nm	0,260 E	±0,025 E	0,235 E	0,285 E		○
460 nm	0,265 E	±0,025 E	0,240 E	0,290 E		○
470 nm	0,270 E	±0,025 E	0,245 E	0,295 E		○
480 nm	0,275 E	±0,025 E	0,250 E	0,300 E		○
490 nm	0,280 E	±0,025 E	0,255 E	0,305 E		○
500 nm	0,285 E	±0,025 E	0,260 E	0,310 E		○
510 nm	0,290 E	±0,025 E	0,265 E	0,315 E		○
520 nm	0,295 E	±0,025 E	0,270 E	0,320 E		○
530 nm	0,300 E	±0,025 E	0,275 E	0,325 E		○
540 nm	0,305 E	±0,025 E	0,280 E	0,330 E		○
550 nm	0,310 E	±0,025 E	0,285 E	0,335 E		○
560 nm	0,315 E	±0,025 E	0,290 E	0,340 E		○
570 nm	0,320 E	±0,025 E	0,295 E	0,345 E		○
580 nm	0,325 E	±0,025 E	0,300 E	0,350 E		○
590 nm	0,330 E	±0,025 E	0,305 E	0,355 E		○
600 nm	0,335 E	±0,025 E	0,310 E	0,360 E		○

**Check solution / Prüfösung / Solution de contrôle 1.2**

Wavelength / Wellenlänge / Longueur d'onde	Target value / Sollwert / Valeur cible	Tolerance / Toleranz / Tolérance	Min.	Max.	Result / Messwert / Valeur mesurée	Assessment / Bewertung / Conformité
340 nm	0,520 E	±0,030 E	0,490 E	0,550 E		○
350 nm	0,520 E	±0,030 E	0,490 E	0,550 E		○
360 nm	0,525 E	±0,030 E	0,495 E	0,555 E		○
370 nm	0,530 E	±0,030 E	0,500 E	0,560 E		○
380 nm	0,535 E	±0,030 E	0,505 E	0,565 E		○
390 nm	0,540 E	±0,030 E	0,510 E	0,570 E		○
400 nm	0,545 E	±0,030 E	0,515 E	0,575 E		○
410 nm	0,550 E	±0,030 E	0,520 E	0,580 E		○
420 nm	0,555 E	±0,030 E	0,525 E	0,585 E		○
430 nm	0,560 E	±0,030 E	0,530 E	0,590 E		○
440 nm	0,565 E	±0,030 E	0,535 E	0,595 E		○
450 nm	0,570 E	±0,030 E	0,540 E	0,600 E		○
460 nm	0,575 E	±0,030 E	0,545 E	0,605 E		○
470 nm	0,580 E	±0,030 E	0,550 E	0,610 E		○
480 nm	0,585 E	±0,030 E	0,555 E	0,615 E		○
490 nm	0,590 E	±0,030 E	0,560 E	0,620 E		○
500 nm	0,595 E	±0,030 E	0,565 E	0,625 E		○
510 nm	0,600 E	±0,030 E	0,570 E	0,630 E		○
520 nm	0,605 E	±0,030 E	0,575 E	0,635 E		○
530 nm	0,610 E	±0,030 E	0,580 E	0,640 E		○
540 nm	0,615 E	±0,030 E	0,585 E	0,645 E		○
550 nm	0,620 E	±0,030 E	0,590 E	0,650 E		○
560 nm	0,625 E	±0,030 E	0,595 E	0,655 E		○
570 nm	0,630 E	±0,030 E	0,600 E	0,660 E		○
580 nm	0,635 E	±0,030 E	0,605 E	0,665 E		○
590 nm	0,640 E	±0,030 E	0,610 E	0,670 E		○
600 nm	0,645 E	±0,030 E	0,615 E	0,675 E		○

Evaluation sheet for / Auswertbogen für / Fiche d'évaluation pour  
NANOCOLOR<sup>®</sup> VIS II / UV/VIS II

Check solution / Prüfösung / Solution de contrôle 1.3

Wavelength / Wellenlänge / Longueur d'onde	Target value / Sollwert / Valeur cible	Tolerance / Toleranz / Tolérance	Min.	Max.	Result / Messwert / Valeur mesurée	Assessment / Bewertung / Conformité
340 nm	0,800 E	±0,030 E	0,770 E	0,830 E		○
350 nm	0,800 E	±0,030 E	0,770 E	0,830 E		○
360 nm	0,805 E	±0,030 E	0,775 E	0,835 E		○
370 nm	0,810 E	±0,030 E	0,780 E	0,840 E		○
380 nm	0,815 E	±0,030 E	0,785 E	0,845 E		○
390 nm	0,820 E	±0,030 E	0,790 E	0,850 E		○
400 nm	0,825 E	±0,030 E	0,795 E	0,855 E		○
410 nm	0,830 E	±0,030 E	0,800 E	0,860 E		○
420 nm	0,835 E	±0,030 E	0,805 E	0,865 E		○
430 nm	0,840 E	±0,030 E	0,810 E	0,870 E		○
440 nm	0,845 E	±0,030 E	0,815 E	0,875 E		○
450 nm	0,850 E	±0,030 E	0,820 E	0,880 E		○
460 nm	0,855 E	±0,030 E	0,825 E	0,885 E		○
470 nm	0,860 E	±0,030 E	0,830 E	0,890 E		○
480 nm	0,865 E	±0,030 E	0,835 E	0,895 E		○
490 nm	0,870 E	±0,030 E	0,840 E	0,900 E		○
500 nm	0,875 E	±0,030 E	0,845 E	0,905 E		○
510 nm	0,880 E	±0,030 E	0,850 E	0,910 E		○
520 nm	0,885 E	±0,030 E	0,855 E	0,915 E		○
530 nm	0,890 E	±0,030 E	0,860 E	0,920 E		○
540 nm	0,895 E	±0,030 E	0,865 E	0,925 E		○
550 nm	0,900 E	±0,030 E	0,870 E	0,930 E		○
560 nm	0,905 E	±0,030 E	0,875 E	0,935 E		○
570 nm	0,910 E	±0,030 E	0,880 E	0,940 E		○
580 nm	0,915 E	±0,030 E	0,885 E	0,945 E		○
590 nm	0,920 E	±0,030 E	0,890 E	0,950 E		○
600 nm	0,925 E	±0,030 E	0,895 E	0,955 E		○

Check solution / Prüfösung / Solution de contrôle 2.1

Wavelength / Wellenlänge / Longueur d'onde	Target value / Sollwert / Valeur cible	Tolerance / Toleranz / Tolérance	Min.	Max.	Result / Messwert / Valeur mesurée	Assessment / Bewertung / Conformité
340 nm	0,150 E	±0,005 E	0,145 E	0,155 E		○
350 nm	0,150 E	±0,005 E	0,145 E	0,155 E		○
360 nm	0,155 E	±0,005 E	0,150 E	0,160 E		○
370 nm	0,160 E	±0,005 E	0,155 E	0,165 E		○
380 nm	0,165 E	±0,005 E	0,160 E	0,170 E		○
390 nm	0,170 E	±0,005 E	0,165 E	0,175 E		○
400 nm	0,175 E	±0,005 E	0,170 E	0,180 E		○
410 nm	0,180 E	±0,005 E	0,175 E	0,185 E		○
420 nm	0,185 E	±0,005 E	0,180 E	0,190 E		○
430 nm	0,190 E	±0,005 E	0,185 E	0,195 E		○
440 nm	0,195 E	±0,005 E	0,190 E	0,200 E		○
450 nm	0,200 E	±0,005 E	0,195 E	0,205 E		○
460 nm	0,205 E	±0,005 E	0,200 E	0,210 E		○
470 nm	0,210 E	±0,005 E	0,205 E	0,215 E		○
480 nm	0,215 E	±0,005 E	0,210 E	0,220 E		○
490 nm	0,220 E	±0,005 E	0,215 E	0,225 E		○
500 nm	0,225 E	±0,005 E	0,220 E	0,230 E		○
510 nm	0,230 E	±0,005 E	0,225 E	0,235 E		○
520 nm	0,235 E	±0,005 E	0,230 E	0,240 E		○
530 nm	0,240 E	±0,005 E	0,235 E	0,245 E		○
540 nm	0,245 E	±0,005 E	0,240 E	0,250 E		○
550 nm	0,250 E	±0,005 E	0,245 E	0,255 E		○
560 nm	0,255 E	±0,005 E	0,250 E	0,260 E		○
570 nm	0,260 E	±0,005 E	0,255 E	0,265 E		○
580 nm	0,265 E	±0,005 E	0,260 E	0,270 E		○
590 nm	0,270 E	±0,005 E	0,265 E	0,275 E		○
600 nm	0,275 E	±0,005 E	0,270 E	0,280 E		○

Check solution / Prüfösung / Solution de contrôle 2.2

Wavelength / Wellenlänge / Longueur d'onde	Target value / Sollwert / Valeur cible	Tolerance / Toleranz / Tolérance	Min.	Max.	Result / Messwert / Valeur mesurée	Assessment / Bewertung / Conformité
340 nm	0,400 E	±0,015 E	0,385 E	0,415 E		○
350 nm	0,400 E	±0,015 E	0,385 E	0,415 E		○
360 nm	0,405 E	±0,015 E	0,390 E	0,420 E		○
370 nm	0,410 E	±0,015 E	0,395 E	0,425 E		○
380 nm	0,415 E	±0,015 E	0,400 E	0,430 E		○
390 nm	0,420 E	±0,015 E	0,405 E	0,435 E		○
400 nm	0,425 E	±0,015 E	0,410 E	0,440 E		○
410 nm	0,430 E	±0,015 E	0,415 E	0,445 E		○
420 nm	0,435 E	±0,015 E	0,420 E	0,450 E		○
430 nm	0,440 E	±0,015 E	0,425 E	0,455 E		○
440 nm	0,445 E	±0,015 E	0,430 E	0,460 E		○
450 nm	0,450 E	±0,015 E	0,435 E	0,465 E		○
460 nm	0,455 E	±0,015 E	0,440 E	0,470 E		○
470 nm	0,460 E	±0,015 E	0,445 E	0,475 E		○
480 nm	0,465 E	±0,015 E	0,450 E	0,480 E		○
490 nm	0,470 E	±0,015 E	0,455 E	0,485 E		○
500 nm	0,475 E	±0,015 E	0,460 E	0,490 E		○
510 nm	0,480 E	±0,015 E	0,465 E	0,495 E		○
520 nm	0,485 E	±0,015 E	0,470 E	0,500 E		○
530 nm	0,490 E	±0,015 E	0,475 E	0,505 E		○
540 nm	0,495 E	±0,015 E	0,480 E	0,510 E		○
550 nm	0,500 E	±0,015 E	0,485 E	0,515 E		○
560 nm	0,505 E	±0,015 E	0,490 E	0,520 E		○
570 nm	0,510 E	±0,0				

## NANOCOLOR® analysis system

### Convenient data export to LIMS and other standard PC-programs

The linking of different data sets and measurement values is also used in modern water and wastewater laboratories. Data from NANOCOLOR® spectrophotometers can be conveniently exported as CSV files via the interfaces of the spectrophotometers and integrated into laboratory information systems.

Important data from photometric measurements can thus be automatically included in the overall archiving, logging and evaluation. The NANOCOLOR® system becomes even more attractive and can further increase the effectiveness and efficiency of your processes.

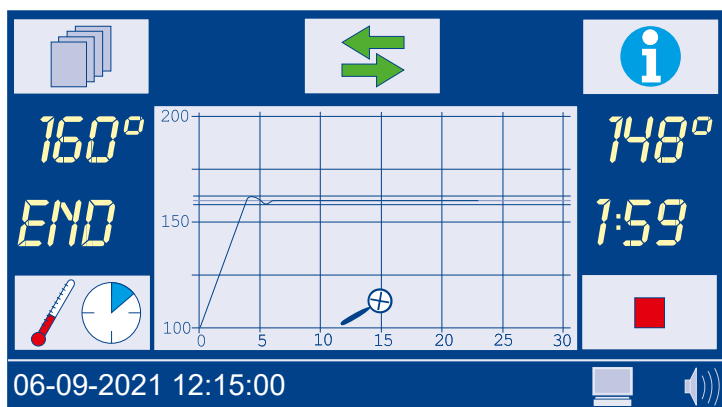
- Future-proof interface options on our spectrophotometers
- Easy data transfer to Microsoft® Excel
- Fulfillment of TSM 1000 point 8 quality management requirements
- Fast, secure and GLP-compliant documentation
- Data transfer to USB stick, network drives and LIMS



## Future-proof heating blocks for reliable sample digestion

The NANOCOLOR® heating blocks enable fast and reliable performance of all samples required in water and wastewater analysis. The preprogrammed standard parameters for all routine digestions, e. g., for COD, TOC, total nitrogen, total phosphate and metals help avoid errors.

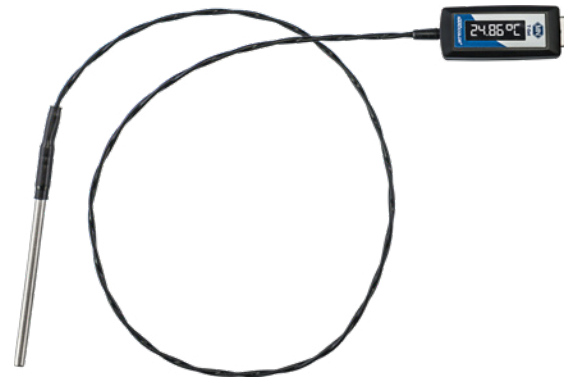
- 2 separate heating units for parallel rapid digestion of COD, total nitrogen and total phosphate
- Touch screen with intuitive menu navigation for easy handling
- Lockable protective lids and safety covers for maximum protection
- Display of the heating curve for maximum reliability of results
- Extremely short heating times translate into time savings for the user
- High temperature stability for consistent digestion conditions



## NANOCOLOR<sup>®</sup> USB T-Set and T-Set

The unique test equipment NANOCOLOR<sup>®</sup> USB T-Set is an electronic thermal sensor, which is suitable for temperature control and automatic calibration of all MACHEREY-NAGEL heating blocks. For internal quality control, the user can check the heating blocks independently with the NANOCOLOR<sup>®</sup> USB T-Set. This represents an important building block in the context of seamless analytical quality assurance.

- Calibrated temperature sensors made to monitor digestion temperatures
- Easy monitoring of temperature stability through external recordings of heating curves
- Thanks to its own display, it can also be used as a universal thermometer for external temperature measurements
- Convenient data transfer of test documents via the USB interface of the heating block
- Traceable to internationally recognized standards
- GLP conform documentation with automatically generated inspection reports



**MACHEREY-NAGEL**

**Zertifikat/Certificate**

**VARIO compact / compact 2 / HC – Testdaten / test data**

Gerätekennung / serial number: NVC20071  
Software Version / software version: .....

Hersteller Kalibrierung / factory calibration

Steigung / slope [°C°]:  
Achsenabschnitt / intercept [°C]:

Anwenderwert / user test [°C]

Soll-Temperatur Nominal temperature
70
100
120
148
160
40
78
157

Testdatum / date of test:

T-Set Daten / data of T-Set:  
Kalibrierdatum / date of calibration:  
T-Set Nummer / T-Set number:  
Zertifikatsnummer / certificate number:

Kommentar / notes:  
Zertifikat NANOCOLOR VARIO C2 mit zusätzlich programmierten Temperaturen (40°C, 78°C, 157°C) für eigene Sondermethoden.

Anwender / user: Druckdatum / printing date: 28.09.2014

**MACHEREY-NAGEL GmbH & Co. KG** Neumann-Neander-Str. 6 – 8 D-52055 Düren | Germany  
Tel.: +49 (0) 24 21 969 0 | Fax: +49 (0) 24 21 969 150 | e-mail: sales-de@mn-net.com

Soll-Temperatur Nominal temperature	Ist-Temperatur Actual temperature
70	70.4
100	100.7
120	120.9
148	148.8
160	160.6
40	39.7
78	78.5
-	-
157	157.6
-	-
-	-
-	-
Testdatum / date of test:	23.09.2014



# NANOCOLOR® analysis system

## NANOCOLOR® photometers – At a glance

### NANOCOLOR® UV/VIS II

- High precision UV/VIS spectrophotometer with outstanding usability
  - Nephelometric turbidity measurement from 0.1–1000 NTU
  - Integrated f. o. c. inspection equipment monitoring
- REF 919600



### NANOCOLOR® VIS II

- Revolutionary user experience by 10 inch HD touch screen display
  - Automatic detection of interfering turbidities (NTU-Check)
  - Comprehensive internal quality control functions
- REF 919650



### NANOCOLOR® Advance

- Large spectrum of evaluable test kits
  - Shock resistant according to military standard
  - Cuvette slot also suitable for 24 mm round tubes
- REF 919750



### Compact photometer PF-12<sup>Plus</sup>

- Flexible filter photometer with more than 100 preprogrammed methods
  - Applicable in all fields of water and wastewater analysis
  - Automatic detection of interfering turbidities (NTU-Check)
- REF 919250



### Compact photometer PF-3

- Lightweight and robust with very compact dimensions
- Intuitive operation using just 4 buttons
- Different versions for different applications available

PF-3 Pool	REF 934102
PF-3 Drinking Water	REF 934402
PF-3 Soil	REF 934202
PF-3 COD	REF 934302
PF-3 Fish	REF 934602



# NANOCOLOR® analysis system

## NANOCOLOR® heating blocks – At a glance

### NANOCOLOR® VARIO 4

- Simultaneous digestion of 24 samples
- Two independently usable heating units
- The most flexible solution

REF 919300



### NANOCOLOR® VARIO C2

- Simultaneous digestion of 12 samples
- The ideal choice for small sample amounts
- Cost-effective quality

REF 919350



### NANOCOLOR® VARIO C2 M

- Simultaneous digestion of 10 samples
- Heating block for metall analysis with big bores
- Digestion of big and small reaction tubes

REF 919350.1



### NANOCOLOR® VARIO HC

- Simultaneous digestion of 12 samples
- Active rapid cooling after digestion
- Heating unit with aerator

REF 919330



### NANOCOLOR® VARIO Mini

- Simultaneous digestion of 6 samples
- The ideal choice for mobile digestions
- Flexible power supply

REF 919380



## NANOCOLOR® tube tests - At a glance

Test	Measuring range	REF	
Aluminum 07	0.02–0.70 mg/L Al <sup>3+</sup>	985098	
Ammonium 3	0.04–2.30 mg/L NH <sub>4</sub> -N	0.05–3.00 mg/L NH <sub>4</sub> <sup>+</sup>	985003
Ammonium 10	0.2–8.0 mg/L NH <sub>4</sub> -N	0.2–10.0 mg/L NH <sub>4</sub> <sup>+</sup>	985004
Ammonium 50	1–40 mg/L NH <sub>4</sub> -N	1–50 mg/L NH <sub>4</sub> <sup>+</sup>	985005
Ammonium 100	4–80 mg/L NH <sub>4</sub> -N	5–100 mg/L NH <sub>4</sub> <sup>+</sup>	985008
Ammonium 200	30–160 mg/L NH <sub>4</sub> -N	40–200 mg/L NH <sub>4</sub> <sup>+</sup>	985006
Ammonium 2000	300–1600 mg/L NH <sub>4</sub> -N 400–2000 mg/L NH <sub>4</sub> <sup>+</sup>	400–2000 mg/L NH <sub>4</sub> <sup>+</sup>	985002
AOX 3	0.1–3.0 mg/L AOX	0.01–0.30 mg/L AOX	985007
BOD <sub>5</sub> (in Winkler bottles)	2–3000 mg/L O <sub>2</sub>		985822
BOD <sub>5</sub> -TT	0.5–3000 mg/L O <sub>2</sub>		985825
Cadmium 2	0.05–2.00 mg/L Cd <sup>2+</sup>		985014
Carbonate hardness 15	1.25–18.75 °e	0.4–5.4 mmol/L H <sup>+</sup>	985015
Chloride 200	5–200 mg/L Cl <sup>-</sup>		985019
Chloride 50	0.5–50.0 mg/L Cl <sup>-</sup>	0.10–1.00 g/L Cl <sup>-</sup>	985021
Chlorine / Ozone 2	0.05–2.50 mg/L Cl <sub>2</sub>	0.05–2.00 mg/L O <sub>3</sub>	985017
Chlorine dioxid 5	0.15–5.00 mg/L ClO <sub>2</sub>		985018
Chromate 5	0.05–2.00 mg/L Cr(VI) 0.005–0.500 mg/L Cr(VI)	0.1–4.0 mg/L CrO <sub>4</sub> <sup>2-</sup> 0.01–1.00 mg/L CrO <sub>4</sub> <sup>2-</sup>	985024
Total Chromium 2	0.05–2.00 mg/L Cr 0.005–0.500 mg/L Cr(VI)		985059
COD 40	2–40 mg/L O <sub>2</sub>		985027
COD 60	5–60 mg/L O <sub>2</sub>		985022
COD 60 in salt water	5–60 mg/L O <sub>2</sub>		985020
COD 160	15–160 mg/L O <sub>2</sub>		985026
COD 160 Hg-free	15–160 mg/L O <sub>2</sub>		963026
COD 300	50–300 mg/L O <sub>2</sub>		985033
COD 600	50–600 mg/L O <sub>2</sub>		985030
COD 1500	100–1500 mg/L O <sub>2</sub>		985029
COD 1500 Hg-free	100–1500 mg/L O <sub>2</sub>		963029
COD 4000	400–4000 mg/L O <sub>2</sub>		985011
COD 10000	1.00–10.00 g/L O <sub>2</sub>		985023
COD 15000	1.0–15.0 g/L O <sub>2</sub>		985028
COD 60000	5.0–60.0 g/L O <sub>2</sub>		985012
COD LR 150	3–150 mg/L O <sub>2</sub>		985036
COD HR 1500	20–1500 mg/L O <sub>2</sub>		985038
org. Complexing agents 10	0.5–10.0 mg/L I <sub>BK</sub>		985052
Copper 5	0.10–7.00 mg/L Cu <sup>2+</sup>		985053
Cyanide 08	0.02–0.80 mg/L CN <sup>-</sup> 0.005–0.100 mg/L CN <sup>-</sup>		985031
DEHA 1 (Diethylhydroxylamine)	0.05–1.00 mg/L DEHA		985035
Ethanol 1000	0.10–1.00 g/L EtOH	0.013–0.130 Vol. % EtOH	985838
Easily liberated cyanide 04	0.01–0.40 mg/L CN <sup>-</sup>		985025
Fluoride 2	0.1–2.0 mg/L F <sup>-</sup>		985040
Formaldehyde 8	0.1–8.0 mg/L HCHO		985041
Formaldehyde 10	0.20–10.00 mg/L HCHO		985046
Hardness Ca / Mg	1.25–25.0 °e 0.2–3.6 mmol/L	5–50 mg/L Mg <sup>2+</sup> 10–100 mg/L Ca <sup>2+</sup>	985044
Hardness 20	1.25–25.0 °e 0.2–3.6 mmol/L	5–50 mg/L Mg <sup>2+</sup> 10–100 mg/L Ca <sup>2+</sup>	985043
HC 300 (Hydrocarbons)	0.5–5.6 mg/L KW	30–300 mg/kg KW	985057
Iron 3	0.10–3.00 mg/L Fe		985037



Test	Measuring range	REF	
Lead 5	0.10–5.00 mg/L Pb <sup>2+</sup>	985009	
Manganese 10	0.1–10.0 mg/L Mn	985058	
Methanol 15	0.2–15.0 mg/L MeOH	985859	
Molybdenum 40	1.0–40.0 mg/L Mo(VI)	1.6–65.0 mg/L MoO <sub>4</sub> <sup>2-</sup>	985056
Nickel 4	0.10–7.00 mg/L Ni <sup>2+</sup>	985071	
Nitrate 8	0.30–8.00 mg/L NO <sub>3</sub> -N	1.3–35.0 mg/L NO <sub>3</sub> <sup>-</sup>	985065
Nitrate 50	0.3–22.0 mg/L NO <sub>3</sub> -N	2–100 mg/L NO <sub>3</sub> <sup>-</sup>	985064
Nitrate 250	4–60 mg/L NO <sub>3</sub> -N	20–250 mg/L NO <sub>3</sub> <sup>-</sup>	985066
Nitrite 2	0.003–0.460 mg/L NO <sub>2</sub> -N	0.02–1.50 mg/L NO <sub>2</sub> <sup>-</sup>	985068
Nitrite 4	0.1–4.0 mg/L NO <sub>2</sub> -N	0.3–13.0 mg/L NO <sub>2</sub> <sup>-</sup>	985069
total Nitrogen TN <sub>b</sub> 22	0.5–22.0 mg/L N	985083	
total Nitrogen TN <sub>b</sub> 60	3–60 mg/L N	985092	
total Nitrogen TN <sub>b</sub> 220	5–220 mg/L N	985088	
total Kjeldahl Nitrogen TKN 16	1.0–16 mg/L TKN	985067	
Organic acids 3000	30–3000 mg/L CH <sub>3</sub> COOH	0.5–50.0 mmol/L CH <sub>3</sub> COOH	985050
Oxygen 12	0.5–12.0 mg/L O <sub>2</sub>	985082	
Peroxide 2	0.03–2.00 mg/L H <sub>2</sub> O <sub>2</sub>	985871	
pH 6.5–8.2 <sup>4)</sup>	pH 6.5–8.2	91872	
Phenolic Index 5	0.2–5.0 mg/L Phenol	985074	
ortho- and total Phosphate 1	0.05–1.50 mg/L P 0.010–0.800 mg/L P	0.2–5.0 mg/L PO <sub>4</sub> <sup>3-</sup> 0.03–2.50 mg/L PO <sub>4</sub> <sup>3-</sup>	985076
ortho- and total Phosphate 5	0.20–5.00 mg/L P	0.5–15.0 mg/L PO <sub>4</sub> <sup>3-</sup>	985081
ortho- and total Phosphate 15	0.30–15.00 mg/L P	1.0–45.0 mg/L PO <sub>4</sub> <sup>3-</sup>	985080
ortho- and total Phosphate 45	5.0–50.0 mg/L P	15–150 mg/L PO <sub>4</sub> <sup>3-</sup>	985055
ortho- and total Phosphate 50	10.0–50.0 mg/L P	30–150 mg/L PO <sub>4</sub> <sup>3-</sup>	985079
ortho- and total Phosphate LR 1	0.05–0.50 mg/L P	0.2–1.5 mg/L PO <sub>4</sub> <sup>3-</sup>	985095
POC 200	20–200 mg/L POC	2–40 mg/L KWI	985070
Potassium 50	2–50 mg/L K <sup>+</sup>	985045	
Residual hardness 1	0.03–1.25 °e	0.004–0.180 mmol/L	985084
Silver 3	0.20–3.00 mg/L Ag <sup>+</sup>	0.08–0.50 mg/L Ag <sup>+</sup>	985049
Starch 100	5–100 mg/L starch	985085	
Sulfate LR 200	20–200 mg/L SO <sub>4</sub> <sup>2-</sup>	985062	
Sulfat MR 400	40–400 mg/L SO <sub>4</sub> <sup>2-</sup>	985060	
Sulfat HR 1000	200–1000 mg/L SO <sub>4</sub> <sup>2-</sup>	985063	
Sulfite 100	5–100 mg/L SO <sub>3</sub> <sup>2-</sup>	985090	
Anionic Surfactants 4	0.20–4.00 mg/L MBAS	0.20–3.500 mg/L SDS	985032
Cationic Surfactants 4	0.20–4.00 mg/L CTAB	985034	
Nonionic Surfactants 15	0.3–15.0 mg/L Triton® X-100	985047	
Thiocyanate 50	0.5–50.0 mg/L SCN <sup>-</sup>	985091	
Tin 3 <sup>3)</sup>	0.10–3.00 mg/L Sn	985 097	
TOC 30 <sup>6)</sup>	2.0–30.0 mg/L C	985075	
TOC 300 <sup>6)</sup>	20–300 mg/L C	985078	
TTC/Sludge activity 150	5–150 µg TPF	0.050–2.300 E	985890
Turbidity (Formazin/DIN) <sup>5)</sup>	1–100 TE/F (= FAU)	0.5–40.0 1/m	Test 1-92
Zinc 6	0.20–6.00 mg/L Zn <sup>2+</sup>	985042	
Zirconium 100	5–100 mg/L Zr	985001	

On other photometers than the NANOCOLOR® VIS II measurement ranges and wavelengths can be different

<sup>1)</sup> A more sensitive measuring range is possible by using semi-micro cuvettes 50 mm (REF 91950)

<sup>2)</sup> Decomposition only possible in microwave

<sup>3)</sup> Special filter can be necessary for filter photometers (Formaldehyde 10: 412 nm, Tin 3: 520 nm)

<sup>4)</sup> Without barcode

<sup>5)</sup> This test can be performed without a NANOCOLOR® reagent set. Determination only with NANOCOLOR® spectrophotometers and the PF-12<sup>Plus</sup>

<sup>6)</sup> Additionally required with first order: NANOCOLOR® TIC-Ex (REF 916993)

## NANOCOLOR<sup>®</sup> standard tests – At a glance

Test	Measuring range	REF	
Aluminum	0.01–1.00 mg/L Al <sup>3+</sup>	91802	
Ammonium	0.01–2.0 mg/L NH <sub>4</sub> -N	0.01–2.5 mg/L NH <sub>4</sub> <sup>+</sup>	91805
Cadmium	0.002–0.50 mg/L Cd <sup>2+</sup>	918131	
Chloride	0.2–125 mg/L Cl <sup>-</sup>	91820	
Chlorine	0.02–10.0 mg/L Cl <sub>2</sub>	91816	
Chlorine dioxide	0.04–4.00 mg/L ClO <sub>2</sub>	918163	
Chromate	0.01–3.0 mg/L Cr(VI)	0.01–6.0 mg/L CrO <sub>4</sub> <sup>2-</sup>	91825
Cobalt	0.002–0.70 mg/L Co <sup>2+</sup>	91851	
Color (Hazen/DIN)	5–500 mg/L Pt (Hazen)	0.2–20.0 1/m	Test 1-39
Copper	0.01–10.0 mg/L Cu <sup>2+</sup>	91853	
Cyanide	0.001–0.50 mg/L CN <sup>-</sup>	91830	
Detergents, anionic	0.02–5.0 mg/L MBAS	91832	
Detergents, cationic	0.05–5.0 mg/L CTAB	91834	
Fluoride	0.05–2.00 mg/L F <sup>-</sup>	918142	
Hydrazine	0.002–1.50 mg/L N <sub>2</sub> H <sub>4</sub>	91844	
Iron	0.01–15.0 mg/L Fe	91836	
Iron LR	0.005–5.00 mg/L Fe	918128	
Lead	0.005–1.00 mg/L Pb <sup>2+</sup>	918101	
Manganese	0.01–10.0 mg/L Mn	91860	
Manganese LR	0.005–3.00 mg/L Mn	918126	
Nickel	0.01–10.0 mg/L Ni <sup>2+</sup>	91862	
Nitrate	0.1–30.0 mg/L NO <sub>3</sub> -N	0.5–140 mg/L NO <sub>3</sub> <sup>-</sup>	91865
Nitrate Z	0.02–1.0 mg/L NO <sub>3</sub> -N	0.1–5.0 mg/L NO <sub>3</sub> <sup>-</sup>	91863
Nitrite	0.002–0.30 mg/L NO <sub>2</sub> -N	0.005–1.00 mg/L NO <sub>2</sub> <sup>-</sup>	91867
Ozone	0.01–1.50 mg/L O <sub>3</sub>	91885	
Phenol	0.01–7.0 mg/L Phenol	91875	
ortho-Phosphate	0.04–6.5 mg/L PO <sub>4</sub> -P	0.1–20.0 mg/L PO <sub>4</sub> <sup>3-</sup>	91877
ortho-Phosphate	0.2–17 mg/L PO <sub>4</sub> -P	0.5–50 mg/L PO <sub>4</sub> <sup>3-</sup>	91878
SAC	0.1–150.0 1/m	Test 3–01	
Silica	0.01–10.00 mg/L Si	0.02–10.0 mg/L SiO <sub>2</sub>	91848
	0.002–0.100 mg/L Si	0.005–0.200 mg/L SiO <sub>2</sub>	
Sulfide	0.01–3.0 mg/L S <sup>2-</sup>	91888	
Turbidity	1–1000 NTU	Test 9–06	
Zinc	0.02–3.0 mg/L Zn <sup>2+</sup>	91895	

<sup>1)</sup> Decomposition in micro wave is possible

<sup>2)</sup> Organic phase tetrachloro ethylene p. a. or tetrachloro methane is needed additionally

<sup>3)</sup> No NANOCOLOR<sup>®</sup> test is necessary for this determination

<sup>4)</sup> Test SAK 254 nm can only be performed with NANOCOLOR<sup>®</sup> UV/VIS II



## Complete analytics from a single source – Ordering information Accessories

Inspection equipment monitoring	Description	REF	
NANOCOLOR® NANOCHECK 2.0	Secondary standard for inspection equipment monitoring according to ISO 9001	925703	
NANOCOLOR® NANOTURB	Turbidity standard for the nephelometric turbidity calibration for NANOCOLOR® spectrophotometers and PF-12 <sup>Plus</sup>	925702	
NANOCOLOR® USB T-Set	electronic temperature sensor for temperature control and automatic calibration of NANOCOLOR® heating blocks	919921	
NANOCOLOR® T-Set	electronic temperature sensor for temperature control and automatic calibration of NANOCOLOR® heating blocks	919917	
NANOCOLOR® Calibration cuvette 16 mm		916908	
NANOCOLOR® Calibration cuvette 24 mm	for the NANOCOLOR® Advance	916930	
Multistandard	for checking the parameters	Test-Number	REF
Sewage outflow 1	Ammonium 10 / COD 160 / COD 300 / COD 4000 / COD LR 150 / Nitrate 8 / Nitrate 50 / Nitrate / ortho- and total Phosphate 5 total Nitrogen TN <sub>b</sub> 60	0-04 / 0-26 / 0-33 / 0-11 / 0-36 / 0-65 / 0-64 / 1-65 / 0-81 / 0-92	925011
Sewage outflow 2	Ammonium 3 / COD 40 / COD 60 / Nitrate 8 / Nitrate 50 / Nitrate / total-Phosphate 1 / total-Phosphate 5 / total-Phosphate LR 1 / total-Nitrogen TN <sub>b</sub> 22 / TKN 16	0-03 / 0-27 / 0-22 / 0-65 / 0-64 / 1-65 / 0-76 / 0-81 / 0-95 / 0-83 / 0-67	925010
Sewage influx	Ammonium 50 / COD 600 / COD 1500 / COD 15000 / COD 60000 / COD HR 1500 / Nitrate 50 / Nitrate 250 / total-Phosphate 15 / total-Nitrogen TN <sub>b</sub> 220	0-05 / 0-30 / 0-29 / 0-28 / 0-12 / 0-38 / 0-64 / 0-66 / 0-80 / 0-88	925012
Metals 1	Cadmium 2 / Cadmium / Chloride 50 / Chloride 200 / Chromate 5 + NanOx Metal / total-Chromium / Chromium 2 / Chromium + NanOx Meta / Iron 3 / Iron / Iron LR / Fluoride 2 / Fluoride / Sulfate LR 200 / Sulfate MR 400 / Zink 4 / Zinc / Zinc 6	0-14 / 1-13 / 0-21 / 0-19 / 0-24 / 0-59 / 1-25 / 0-37 / 1-36 / 1-28 / 0-40 / 1-42 / 0-62 / 0-60 / 0-96 / 1-95 / 0-42	925015
Metals 2	Lead 5 / Lead / Potassium 50 / Copper 5 / Copper 7 / Copper / Nickel 7 / Nickel 4 / Nickel	0-09 / 1-10 / 0-45 / 0-53 / 0-54 / 1-53 / 0-61 / 0-71 / 1-62	925016
Sewage water	Ammonium 100 / Ammonium 200 / COD 10000 / COD 15000 / Nitrate 250 / total-Phosphate 45 / ortho-Phosphate 50	0-08 / 0-06 / 0-23 / 0-28 / 0-66 / 0-55 / 0-79	925013
Drinking water	Aluminum 07 / Aluminum / Ammonium / Chloride 50 / Chloride / Iron 3 / Iron / Manganese 10 / Manganese / Sulfate LR 200 / Sulfate MR 400	0-98 / 1-02 / 1-05 / 0-21 / 1-20 / 0-37 / 1-36 / 0-58 / 1-60 / 0-62 / 0-60	925018
Sample preparation			
NANOCOLOR® TIC-Ex	Device for removing the TIC, incl. cuvette holder, manual, power supply unit and certificate in box		916993
Sipper NANOCOLOR® FP-200	for NANOCOLOR® UV/VIS II and NANOCOLOR® VIS II incl. manual USB-cabel, tygon-tube-set with adapters, intake needle and certificate		919180
NANOCOLOR® NanOx Metal	Solid reagents for the oxidative decomposition of samples containing heavy metals and total phosphate in the heating block or microwave.		918978
NANOCOLOR® NanOx N	Solid reagents for the oxidative digestion in heating block or microwave prior to total nitrogen determination		918979
Safety bottle for COD tubes	Safety bottle for shaking COD tubes. Enhanced safety during COD determination.		91637
NANOCOLOR® Membrane filtration kit GF/PET	Membrane filtration kit for sample preparation. The combination of glass fiber filter and membrane guarantees excellent filtration even in highly turbid samples. Content: 2 syringes 20 mL, 25 CHROMAFIL membrane filters pore size 0.45 µm.		91601
NANOCOLOR® Reaction tubes 16 mm OD	Reaction tubes with 16 mm outer diameter (OD). For decomposition or the use with e. g. VISOCOLOR ECO or Powder Pillow tests in the photometer.		91680
NANOCOLOR® Holder for test tubes	for 15 round glass tubes and 2 tubes for sample digestion		91623
Single standard		Test-Number	REF
AOX 3		0-07	92507
BOD <sub>5</sub>		8-22 / 8-25	92582
Chlorine		0-17 / 1-16	92517
Chromate		0-24 / 0-59 / 1-25	92524
COD 60		0-27 / 0-22	92522
COD 160		0-26 / 0-33 / 0-36	92526
COD 1500		0-30 / 0-29 / 0-38	92529
COD 15000		0-23 / 0-28	92528
Nitrite		0-68 / 0-69 / 1-67	92568
ortho-Phosphate		0-76 / 0-95 / 1-77	92576
Sulfate		0-62	92562
Sulfite		0-90	92590
TOC 30		0-75	92575
TOC 300		0-78	92878

## Products for analytical chemistry

Since 1911, MACHERY-NAGEL has stood for high quality, innovation and reliability in chemical and biomolecular analysis. Friendly and competent advice to our valued customers and outstanding product quality have been the cornerstones of our company's success for more than 111 years. MACHERY-NAGEL is a family-run company, now in its fourth generation. As one of today's leading manufacturers of products for analytical chemistry and life science, we offer a wide range of products for filtration, rapid tests, water analysis, chromatography and bioanalysis.



Filtration



Rapid Tests



Water Analysis



Chromatography



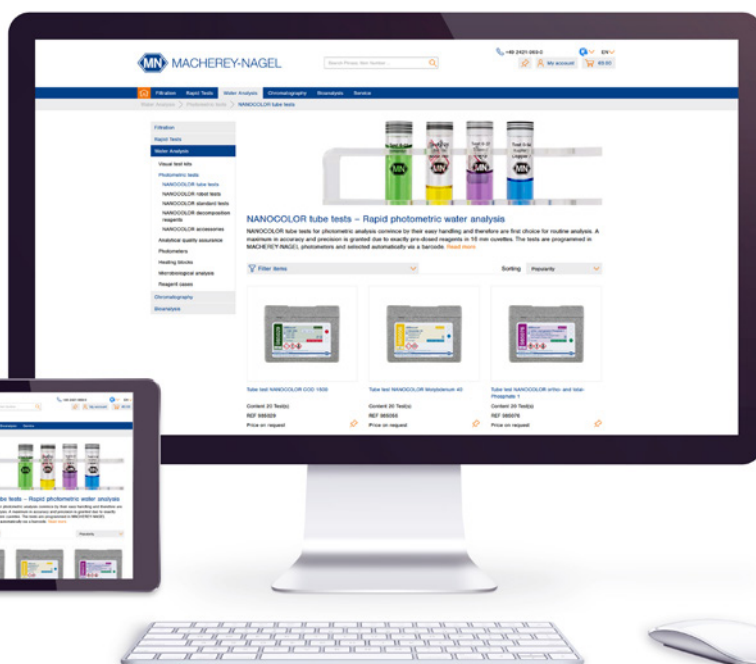
Bioanalysis

## Curious about MACHERY-NAGEL?

Simply contact us at:

Tel.: +49 24 21 969 332

E-Mail: [csc@mn-net.com](mailto:csc@mn-net.com)



[www.mn-net.com](http://www.mn-net.com)

# MACHERY-NAGEL



MACHERY-NAGEL GmbH & Co. KG  
Valenciennner Str. 11  
52355 Düren · Germany

DE Tel.: +49 24 21 969-0 info@mn-net.com  
CH Tel.: +41 62 388 55 00 sales-ch@mn-net.com  
FR Tel.: +33 388 68 22 68 sales-fr@mn-net.com  
US Tel.: +1 888 321 62 24 sales-us@mn-net.com