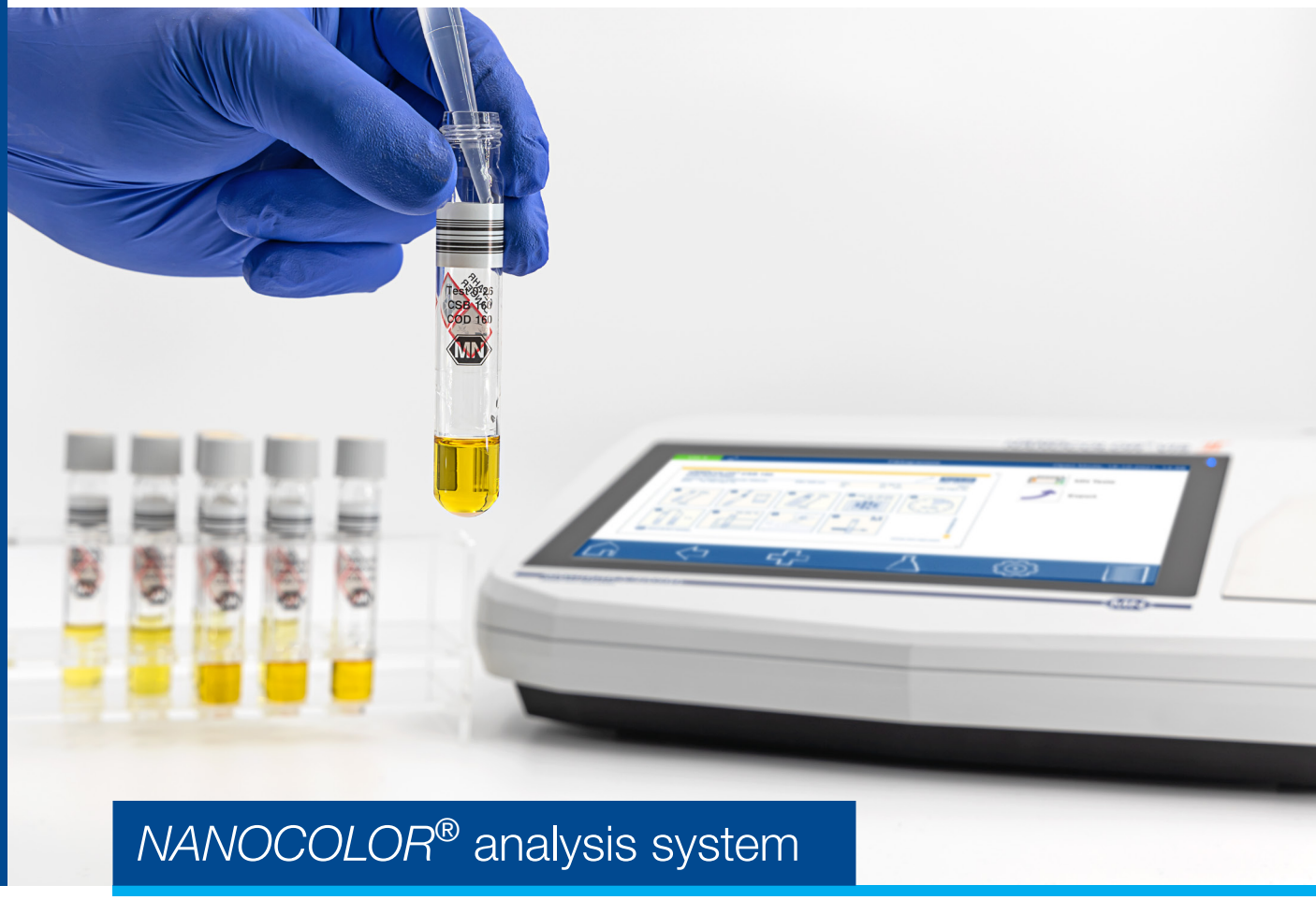
Water Analysis

MACHEREY-NAGEL

NANOCOLOR®
analysis system



NANOCOLOR® analysis system

- Expertise
- Continuity
- Passion

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

Good to know

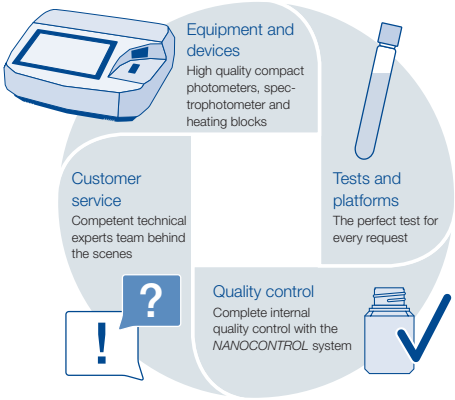
Certified

Since 1996 we are certified according to the international standards ISO 9001 and EN ISO 13458.

TÜVRheinland CERTIFIED

Management System
EN ISO 13485:2016
ISO 9001:2015

www.tuv.com
ID 0000056401



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.

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

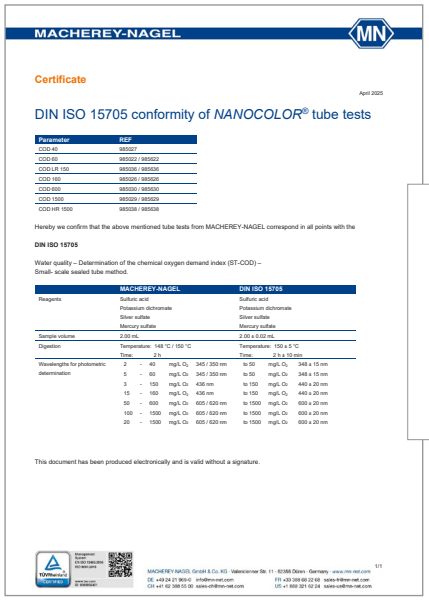
2D Barcode

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/nanocolor-qr-codes*

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



MACHEREY-NAGEL

Certificate

April 2025

DIN ISO 15705 conformity of *NANOCOLOR*® tube tests

Parameter	REF
COD 40	985027
COD 60	985022 / 985622
COD LR 150	985036 / 985636
COD 160	985026 / 985626
COD 600	985030 / 985630
COD 1500	985029 / 985629
COD HR 1500	985038 / 985638

Hereby we confirm that the above mentioned tube tests from MACHEREY-NAGEL correspond in all points with the

DIN ISO 15705

Water quality – Determination of the chemical oxygen demand index (ST-COD) – Small- scale sealed tube method.

	MACHEREY-NAGEL	DIN ISO 15705
Reagents	Sulfuric acid Potassium dichromate Silver sulfate Mercury sulfate	Sulfuric acid Potassium dichromate Silver sulfate Mercury sulfate
Sample volume	2.00 mL	2.00 ± 0.02 mL
Digestion	Temperature: 148 °C / 150 °C Time: 2 h	Temperature: 150 ± 5 °C Time: 2 h ± 10 min
Wavelenghts for photometric determination	2 - 40 mg/L O_2 345 / 350 nm 5 - 60 mg/L O_2 345 / 350 nm 3 - 150 mg/L O_2 436 nm 15 - 160 mg/L O_2 436 nm 50 - 600 mg/L O_2 605 / 620 nm 100 - 1500 mg/L O_2 605 / 620 nm 20 - 1500 mg/L O_2 605 / 620 nm	to 50 mg/L O_2 348 ± 15 nm to 50 mg/L O_2 348 ± 15 nm to 150 mg/L O_2 440 ± 20 nm to 150 mg/L O_2 440 ± 20 nm to 1500 mg/L O_2 600 ± 20 nm to 1500 mg/L O_2 600 ± 20 nm to 1500 mg/L O_2 600 ± 20 nm

This document has been produced electronically and is valid without a signature.

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DIN ISO 15705 conformity of *NANOCOLOR*® tube tests

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COD HR 1500	985038 / 985638

Time-saving and reliable analysis of total nitrogen

The proven *NANOCOLOR*® 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

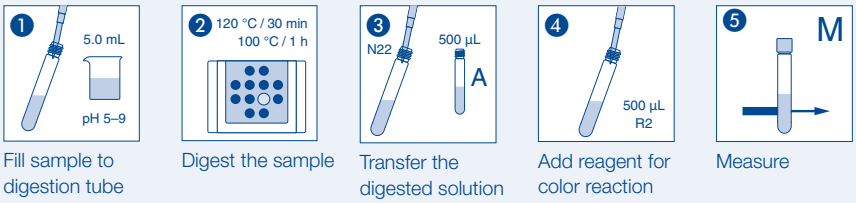
Good to know

ISO conformity

Our *NANOCOLOR*® total nitrogen test kits comply with ISO 23697-1:2023-02: Water quality – Determination of total bound nitrogen (ST-TN_b) in water using small-scale sealed tubes – Part 1 – Dimethylphenol colour reaction.

How it's done

Application of a *NANOCOLOR*® total nitrogen test



1. Fill sample to digestion tube
2. Digest the sample
3. Transfer the digested solution
4. Add reagent for color reaction
5. Measure

NANOCOLOR® 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

Smart photometry

Spectrophotometers *NANOCOLOR*® $^{UV}/_{VIS}$ II, *VIS* II and Advance

With the spectrophotometers *NANOCOLOR*® $^{UV}/_{VIS}$ 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 %.

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*® 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

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

www.mn-net.com/NANOCHECK

MACHEREY-NAGEL

Evaluation sheet for / Auswertebogen für / Fiche d'évaluation pour
NANOCOLOR® *VIS* II / *UV/VIS* II / Advance

NANOCONTROL NANOCHECK 2.0

REF 925703 LOT No.: 3453 MP 04.2024

Date / Datum

Photometer type / Photometertyp / Type de photomètre

Photometer serial number / Photometer Seriennummer / N° de série du photomètre

Tester / Prüfer / Contrôleur

Performed by organisation / Prüfende Organisation / Organisme de contrôle

Location / Ort / Lieu

Temperature / Temperatur / Température

Checksolution / Prüflösung / 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 yes / ja / oui	no / nein / non
345 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		○	○
365 nm	0,218 E	±0,025 E	0,193 E	0,243 E		○	○
412 nm	0,202 E	±0,020 E	0,182 E	0,222 E		○	○
436 nm	0,172 E	±0,030 E	0,142 E	0,202 E		○	○
470 nm	0,177 E	±0,030 E	0,147 E	0,207 E		○	○
490 nm	0,179 E	±0,020 E	0,159 E	0,199 E		○	○
520 nm	0,184 E	±0,025 E	0,159 E	0,209 E		○	○
530 nm	0,193 E	±0,020 E	0,173 E	0,213 E		○	○
540 nm	0,198 E	±0,030 E	0,178 E	0,218 E		○	○
585 nm	0,181 E	±0,030 E	0,151 E	0,211 E		○	○
600 nm	0,172 E	±0,025 E	0,147 E	0,197 E		○	○
605 nm	0,168 E	±0,020 E	0,148 E	0,188 E		○	○
620 nm	0,158 E	±0,030 E	0,128 E	0,188 E		○	○

Checksolution / Prüflösung / 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 yes / ja / oui	no / nein / non
345 nm	0,529 E	±0,035 E	0,494 E	0,564 E		○	○
350 nm	0,529 E	±0,030 E	0,499 E	0,559 E		○	○
365 nm	0,550 E	±0,025 E	0,525 E	0,575 E		○	○
412 nm	0,514 E	±0,025 E	0,489 E	0,539 E		○	○
436 nm	0,441 E	±0,035 E	0,406 E	0,476 E		○	○
470 nm	0,446 E	±0,030 E	0,416 E	0,476 E		○	○
490 nm	0,450 E	±0,025 E	0,425 E	0,475 E		○	○
520 nm	0,467 E	±0,030 E	0,437 E	0,497 E		○	○
530 nm	0,487 E	±0,025 E	0,462 E	0,512 E		○	○
540 nm	0,495 E	±0,025 E	0,470 E	0,520 E		○	○
585 nm	0,457 E	±0,030 E	0,427 E	0,487 E		○	○
600 nm	0,431 E	±0,025 E	0,406 E	0,456 E		○	○
605 nm	0,423 E	±0,025 E	0,398 E	0,448 E		○	○
620 nm	0,392 E	±0,035 E	0,357 E	0,427 E		○	○

Evaluation sheet for / Auswertebogen für / Fiche d'évaluation pour
NANOCOLOR® *VIS* II / UV/VIS II

Checksolution / Prüflösung / 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 yes / ja / oui	no / nein / non
345 nm	0,835 E	±0,035 E	0,800 E	0,870 E		○	○
350 nm	0,833 E	±0,035 E	0,798 E	0,868 E		○	○
365 nm	0,869 E	±0,030 E	0,839 E	0,898 E		○	○
412 nm	0,822 E	±0,030 E	0,792 E	0,852 E		○	○
436 nm	0,709 E	±0,030 E	0,679 E	0,739 E		○	○
470 nm	0,721 E	±0,035 E	0,686 E	0,756 E		○	○
490 nm	0,728 E	±0,025 E	0,703 E	0,753 E		○	○
520 nm	0,749 E	±0,030 E	0,719 E	0,779 E		○	○
530 nm	0,780 E	±0,025 E	0,755 E	0,805 E		○	○
540 nm	0,791 E	±0,030 E	0,761 E	0,821 E		○	○
585 nm	0,718 E	±0,030 E	0,688 E	0,748 E		○	○
600 nm	0,674 E	±0,030 E	0,644 E	0,704 E		○	○
605 nm	0,663 E	±0,030 E	0,633 E	0,693 E		○	○
620 nm	0,614 E	±0,035 E	0,579 E	0,649 E		○	○

Checksolution / Prüflösung / 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 yes / ja / oui	no / nein / non
690 nm	0,195 E	±0,030 E	0,165 E	0,225 E		○	○
800 nm	0,092 E	±0,020 E	0,072 E	0,112 E		○	○

Checksolution / Prüflösung / Solution de contrôles 2.2

Wavelength / Wellenlänge / Longueur d'onde	Target value / Sollwert / Valeur cible	Tolerance / Toleranz / Tolérance	Min.	Max.	Result / Messwert / Valeur mesurée	Assessment / Bewertung / Conformité yes / ja / oui	no / nein / non
690 nm	0,496 E	±0,035 E	0,461 E	0,531 E		○	○
800 nm	0,230 E	±0,025 E	0,205 E	0,255 E		○	○

Checksolution / Prüflösung / Solution de contrôle 2.3

Wavelength / Wellenlänge / Longueur d'onde	Target value / Sollwert / Valeur cible	Tolerance / Toleranz / Tolérance	Min.	Max.	Result / Messwert / Valeur mesurée	Assessment / Bewertung / Conformité yes / ja / oui	no / nein / non
690 nm	0,795 E	±0,030 E	0,765 E	0,825 E		○	○
800 nm	0,370 E	±0,030 E	0,340 E	0,400 E		○	○

The photometer meets all requirements /
Das Photometer erfüllt alle Vorgaben /
Le photomètre est conforme à tous les critères.

yes / ja / oui ○ no / nein / non ○

Tester / Prüfer / Contrôleur

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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.

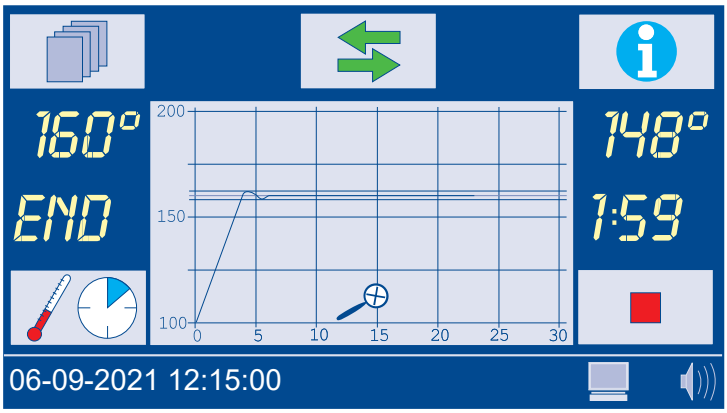
Important data from photometric measurements can thus be automatically included in the overall archiving, logging and evaluation. The *NANOCOLOR*® system becomes even more attractive and can further increase the effectiveness and efficiency of your processes.

- 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.

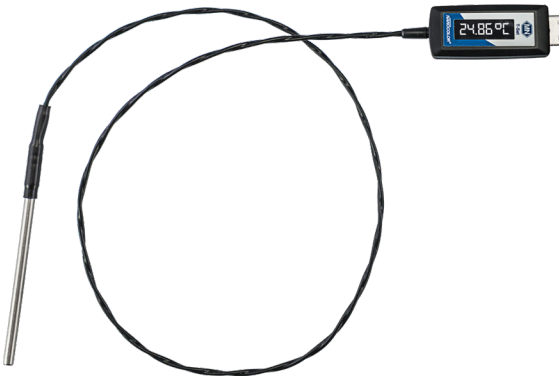
- 2 separate heating units for parallel rapid digestion of COD, total nitrogen and total phosphate
- Touch screen with intuitive menu navigation for easy handling
- Lockable protective lids and safety covers for maximum protection
- Display of the heating curve for maximum reliability of results
- Extremely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



NANOCOLOR® USB T-Set

The unique test equipment *NANOCOLOR*® 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*® 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

Filtration · Rapid Tests · Water Analysis · Chromatography · Bioanalysis
Filtration · Schnelltests · Wasseranalytik · Chromatographie · Bioanalytik

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

Gerätenummer / serial number: NVC20071
Software Version / software version:

Hersteller Kalibration / factory calibration

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

Anwendertest / user test [°C]

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

T-Set Daten / data of T-Set:
Kalibrationsdatum / 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:** 26.09.2014

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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*Plus*

- 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^{3+}		985098
Ammonium 3	ISO 23695	0.04 – 2.30 mg/L NH_4-N	0.05 – 3.00 mg/L NH_4^+	985003
Ammonium 10	ISO 23695	0.2 – 8.0 mg/L NH_4-N	0.2 – 10.0 mg/L NH_4^+	985004
Ammonium 50	ISO 23695	1 – 40 mg/L NH_4-N	1 – 50 mg/L NH_4^+	985005
Ammonium 100	ISO 23695	4 – 80 mg/L NH_4-N	5 – 100 mg/L NH_4^+	985008
Ammonium 200	ISO 23695	30 – 160 mg/L NH_4-N	40 – 200 mg/L NH_4^+	985006
Ammonium 2000	ISO 23695	300 – 1600 mg/L NH_4-N 400 – 2000 mg/L NH_4^+	400 – 2000 mg/L NH_4^+	985002
AOX 3		0.1 – 3.0 mg/L AOX	0.01 – 0.30 mg/L AOX	985007
Bitter units		2.0 – 80.0 BE		918172
BOD_5 (in Winkler bottles)		2 – 3000 mg/L O_2		985822
BOD_5-TT		0.5 – 3000 mg/L O_2		985825
Cadmium 2		0.05 – 2.00 mg/L Cd^{2+}		985014
Carbonate hardness 15		1.25 – 18.75 °e	0.4 – 5.4 mmol/L H^+	985015
Chloride 200		5 – 200 mg/L Cl^-		985019
Chloride 50		0.5 – 50.0 mg/L Cl^-	0.10 – 1.00 g/L Cl^-	985021
Chlorine / Ozone 2		0.05 – 2.50 mg/L Cl_2	0.05 – 2.00 mg/L O_3	985017
Chlorine dioxid 5		0.15 – 5.00 mg/L ClO_2		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_4^{2-} 0.01 – 1.00 mg/L CrO_4^{2-}	985024
Total Chromium 2		0.05 – 2.00 mg/L Cr 0.005 – 0.500 mg/L Cr(VI)		985059
COD 40	ISO 15705	2 – 40 mg/L O_2		985027
COD 60	ISO 15705	5 – 60 mg/L O_2		985022
COD 60 in salt water		5 – 60 mg/L O_2		985020
COD 160	ISO 15705	15 – 160 mg/L O_2		985026
COD 160 Hg-free		15 – 160 mg/L O_2		963026
COD 300		50 – 300 mg/L O_2		985033
COD 600	ISO 15705	50 – 600 mg/L O_2		985030
COD 1500	ISO 15705	100 – 1500 mg/L O_2		985029
COD 1500 Hg-free		100 – 1500 mg/L O_2		963029
COD 4000		400 – 4000 mg/L O_2		985011
COD 10000		1.00 – 10.00 g/L O_2		985023
COD 15000		1.0 – 15.0 g/L O_2		985028
COD 60000		5.0 – 60.0 g/L O_2		985012
COD LR 150	ISO 15705	3 – 150 mg/L O_2		985036
COD HR 1500	ISO 15705	20 – 1500 mg/L O_2		985038
org. Complexing agents 10		0.5 – 10.0 mg/L I_{BiK}		985052
Copper 5		0.10 – 7.00 mg/L Cu^{2+}		985053
Cyanide 08		0.02 – 0.80 mg/L CN^- 0.005 – 0.100 mg/L CN^-		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^-		985025
Fluoride 2		0.1 – 2.0 mg/L F^-		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^{2+} 10 – 100 mg/L Ca^{2+}	985044
Hardness 20		1.25 – 25.0 °e 0.2 – 3.6 mmol/L	5 – 50 mg/L Mg^{2+} 10 – 100 mg/L Ca^{2+}	985043
HC 300 (Hydrocarbons)		0.5 – 5.6 mg/L KW	30 – 300 mg/kg KW	985057

NANOCOLOR® analysis system

Test		Measuring range		REF
Iron 3		0.10 – 3.00 mg/L Fe		985037
Lead 5		0.10 – 5.00 mg/L Pb^{2+}		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_4^{2-}	985056
Nickel 4		0.10 – 7.00 mg/L Ni^{2+}		985071
Nitrate 8	ISO 23696-1	0.30 – 8.00 mg/L NO_3-N	1.3 – 35.0 mg/L NO_3^-	985065
Nitrate 50	ISO 23696-1	0.3 – 22.0 mg/L NO_3-N	2 – 100 mg/L NO_3^-	985064
Nitrate 250	ISO 23696-1	4 – 60 mg/L NO_3-N	20 – 250 mg/L NO_3^-	985066
Nitrite 2		0.003 – 0.460 mg/L NO_2-N	0.02 – 1.50 mg/L NO_2^-	985068
Nitrite 4		0.1 – 4.0 mg/L NO_2-N	0.3 – 13.0 mg/L NO_2^-	985069
total Nitrogen TN_b 22	ISO 23697-1	0.5 – 22.0 mg/L N		985083
total Nitrogen TN_b 60	ISO 23697-1	3 – 60 mg/L N		985092
total Nitrogen TN_b 220	ISO 23697-1	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_3COOH	0.5 – 50.0 mmol/L CH_3COOH	985050
Oxygen 12		0.5 – 12.0 mg/L O_2		985082
Peroxide 2		0.03 – 2.00 mg/L H_2O_2		985871
pH 6.5 – 8.2 [4]		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_4^{3-} 0.03 – 2.50 mg/L PO_4^{3-}	985076
ortho- and total Phosphate 5		0.20 – 5.00 mg/L P	0.5 – 15.0 mg/L PO_4^{3-}	985081
ortho- and total Phosphate 15		0.30 – 15.00 mg/L P	1.0 – 45.0 mg/L PO_4^{3-}	985080
ortho- and total Phosphate 45		5.0 – 50.0 mg/L P	15 – 150 mg/L PO_4^{3-}	985055
ortho- and total Phosphate 50		10.0 – 50.0 mg/L P	30 – 150 mg/L PO_4^{3-}	985079
ortho- and total Phosphate LR 1		0.05 – 0.50 mg/L P	0.2 – 1.5 mg/L PO_4^{3-}	985095
POC 200		20 – 200 mg/L POC	2 – 40 mg/L KWI	985070
Potassium 50		2 – 50 mg/L K^+		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^+	0.08 – 0.50 mg/L Ag^+	985049
Starch 100		5 – 100 mg/L starch		985085
Sulfate LR 200		20 – 200 mg/L SO_4^{2-}		985062
Sulfate MR 400		40 – 400 mg/L SO_4^{2-}		985060
Sulfate HR 1000		200 – 1000 mg/L SO_4^{2-}		985063
Sulfite 100		5 – 100 mg/L SO_3^{2-}		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^-		985091
Tin 3 [3]		0.10 – 3.00 mg/L Sn		985 097
TOC 30 Neo [6]		2.0 – 30.0 mg/L C		985048
TOC 300 Neo [6]		20 – 300 mg/L C		985051
TTC / Sludge activity 150		5 – 150 µg TPF	0.050 – 2.300 E	985890
Turbidity (Formazin/DIN) [5]		1 – 100 TE/F (= FAU)	0.5 – 40.0 ^{1}/m	Test 1-92
Vicinal diketones		0.015 – 0.600 mg/kg diacetyl		985010
Zinc 6		0.20 – 6.00 mg/L Zn^{2+}		985042
Zirconium 100		5 – 100 mg/L Zr		985001

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 91950)
[2] Decomposition only possible in microwave
[3] Special filter can be necessary for filter photometers (Formaldehyde 10: 412 nm, Tin 3: 520 nm)
[4] Without barcode
[5] This test can be performed without a *NANOCOLOR*® reagent set. Determination only with *NANOCOLOR*® spectrophotometers and the PF-12^{Plus}
[6] Additionally required with first order: *NANOCOLOR*® TIC-Ex (REF 916993)

NANOCOLOR® standard tests – At a glance

Test	Measuring range		REF
Aluminum	0.01 – 1.00 mg/L Al^{3+}		91802
Ammonium	0.01 – 2.0 mg/L NH_4-N	0.01 – 2.5 mg/L NH_4^+	91805
Cadmium	0.002 – 0.50 mg/L Cd^{2+}		918131
Chloride	0.2 – 125 mg/L Cl^-		91820
Chlorine	0.02 – 10.0 mg/L Cl_2		91816
Chlorine dioxid	0.04 – 4.00 mg/L ClO_2		918163
Chromate	0.01 – 3.0 mg/L Cr(VI)	0.01 – 6.0 mg/L CrO_4^{2-}	91825
Cobalt	0.002 – 0.70 mg/L Co^{2+}		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^{2+}		91853
Cyanide	0.001 – 0.50 mg/L CN^-		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^-		918142
Hydrazine	0.002 – 1.50 mg/L N_2H_4		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^{2+}		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^{2+}		91862
Nitrate	0.1 – 30.0 mg/L NO_3-N	0.5 – 140 mg/L NO_3^-	91865
Nitrate Z	0.02 – 1.0 mg/L NO_3-N	0.1 – 5.0 mg/L NO_3^-	91863
Nitrite	0.002 – 0.30 mg/L NO_2-N	0.005 – 1.00 mg/L NO_2^-	91867
Ozone	0.01 – 1.50 mg/L O_3		91885
Phenol	0.01 – 7.0 mg/L Phenol		91875
ortho-Phosphate	0.04 – 6.5 mg/L PO_4-P	0.1 – 20.0 mg/L PO_4^{3-}	91877
ortho-Phosphate	0.2 – 17 mg/L PO_4-P	0.5 – 50 mg/L PO_4^{3-}	91878
SAC	0.1 – 150.0 ^{1}/m		Test 3-01
Silica	0.01 – 10.00 mg/L Si 0.002 – 0.100 mg/L Si	0.02 – 10.0 mg/L SiO_2 0.005 – 0.200 mg/L SiO_2	91848
Sulfide	0.01 – 3.0 mg/L S^{2-}		91888
Turbidity	1 – 1000 NTU		Test 9-06
Zinc	0.02 – 3.0 mg/L Zn^{2+}		91895

[1] Decomposition in micro wave is possible
[2] Organic phase tetrachloro ethylene p. a. or tetrachloro methane is needed additionally
[3] No *NANOCOLOR*® test is necessary for this determination
[4] Test SAK 254 nm can only be performed with *NANOCOLOR*® *UV/VIS* II

Complete analytics from a single source – Ordering information Accessories

Inspection equipment monitoring	Description	REF
NANOCONTROL® NANOCHECK 2.0	Secondary standard for inspection equipment monitoring according to ISO 9001	925703
NANOCONTROL® NANOTURB	Turbidity standard for the nephelometric turbidity calibration for *NANOCOLOR*® spectrophotometers and PF-12*Plus*	925702
NANOCOLOR® USB T-Set	electronic temperature sensor for temperature control and automatic calibration of *NANOCOLOR*® heating blocks	919921
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_b 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_b 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_b 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_5	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	0-48	92575
TOC 300	0-51	92878

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