Brewery Analytics

MACHEREY-NAGEL

Brewery Analytics
“Made in Germany”

Complete laboratory and process analysis

- Analysis according to MEBAK and new rapid tests for VDK and bitter units
- Filter papers for malt analysis, decarbonation and turbidity
- Rapid tests for disinfection and water analysis
- Hop and pesticide analysis by HPLC and GC

Products for analytical chemistry

Since 1911, MACHEREY-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. MACHEREY-NAGEL is a family-run company, now in its fourth generation. As one of the leading manufacturers of products for the analytical chemistry and life science industries we offer a wide range of products for filtration, rapid tests, water analysis, chromatography and bioanalytics.

Filtration | Rapid Tests | Water Analysis | Chromatography | Bioanalysis

Brewery analysis according to MEBAK

The Central European Brewing Analysis Commission (MEBAK) has defined uniform analysis procedures for all raw materials, auxiliary materials and supplies. With the *NANOCOLOR*® $^{UV}/_{VIS}$ II spectrophotometer, you can easily and reliably analyze all photometrically evaluable parameters, e.g.:

- Exercise EBC
- Beer color
- Bitter units
- Vicinal Diketone (VDK)
- Ph. iodine sample
- Free amino nitrogen (FAN)

Methods manual

You can download an overview and instructions for carrying out all photometrically evaluable parameters from our website. Simply scan the following QR code to go directly to the download:

New tests for vicinal diketones and bitter units

New in our portfolio are the vicinal diketone and bitter units tests. With the *NANOCOLOR*® Bitter Units tubetest, the bitter substances in beer, primarily iso-α-acids, are extracted from a beer sample using isooctane. They are then measured in a 10 mm quartz cuvette in the UV range at 275 nm.

- Fastest determination of bitter units with a reaction time of 80 sec.
- Easier handling compared to MEBAK
- Storable zero: Reagent blank value can be stored in the photometer

Diacetyl can be determined quickly and easily with the *NANOCOLOR*® Vicinal Diketones tube test. The diketones react with a phenylenediamine derivative to form a quinoxaline derivative. This can be evaluated photometrically at 335 nm.

For the determination of vicinal diketones according to MEBAK or with the tube test *NANOCOLOR*® Vicinal Diketones, steam distillation is necessary as sample preparation. We have compiled the test setup and the required materials in a customer information leaflet.

- Simple and fast determination of vicinal diketonen
- Measurement of up to 40 samples in parallel possible
- Steam distillation as sample preparation necessary – customer information available
- The usual simple tube test

Filter papers for the brewery laboratory

For over 111 years, MACHEREY-NAGEL has had extensive knowledge in the production of filter papers for analytics with very high quality.

Breweries have a wide range of requirements for pleated filters, which is why one paper grade cannot be recommended. Paper grades differ in parameters such as retention capacity, filtration speed and basis weight. Depending on the application MACHEREY-NAGEL always offers the right filter:

- Grained papers are recommended for rapid decarbonization of beer. (MN 616, MN 514, MN 520)
- Nitrogen-free filter papers are recommended for malt analysis. (MN 614)
- Thicker (MN 616 md) or kieselguhr-coated papers (MN 660), as well as syringe filters, are suitable for clarifying yeast-transparent samples.

Ask for a free sample!

Test papers for rapid on-site analysis

QUANTOFIX® test strips are suitable for quick on-site checks in production. They are used to check limit values, for example the chlorine dioxide content at the dosing station. The test strips are also suitable for checking residues of disinfectants in rinse water.

Test strips are also suitable for quick and easy control in production for parameters that cannot be distinguished sensorily. For example, sugar-free soft drinks can be reliably distinguished from those containing sugar. Among others, the following parameters can be examined:

- Chlorine
- Peroxide
- Peracetic acid
- Chlorine dioxide
- Glucose
- Ascorbic acid

Good to know

With our new chlorine dioxide sensitive test strips, you can determine the threshold value of 0.2 mg/L quickly and reliably.

Innovative spectrophotometers

To ensure consistently good quality, various raw materials, products and processes as well as the wastewater must be controlled as part of quality assurance. With the *NANOCOLOR*® *UV/VIS* II spectrophotometer, MACHEREY-NAGEL offers every brewery the perfect instrument for complete analysis of all stages and products in the brewing process.

- Revolutionary user experience through color touch screen display
- Intuitive and fully icon-based menu navigation
- Detection of interfering turbidity (NTU check)
- Test equipment monitoring and printout of certificates directly in the instrument
- Future-proof interface options on our spectrophotometers
- Easy data transfer into Microsoft Excel, to a LIMS or ACRON

Chromatography

More than 4000 different chromatography products and over 3000 application-oriented applications are available to our customers, including the following solutions for your brewery laboratory:

QuEChERS for the extraction of pesticides in hops and beer

- Ready-to-use dSPE mixes for extraction and clean-up

HPLC

- Hop constituents alpha, beta acids, iso acids with Nucleodur 100 - 5 C18 ec (MN-Application 121100)
- Isoalpha acids and the reduced isomers (rho, tetra, hexa) according to EBC method 9.47 with Nucleodur C18 Isis 3 µm (MN application 127820)
- Sugars / organic acids with HPLC/ELSD
- Amino acids in wort with Nucleoshell RP 18 plus 5 µm

LC-MS

- Pesticides in hops with Nucleodur C18 Gravity-SB and Chromabond QuEChERS Mixes
- Glyphosate in beer with Nucleoshell RP 18
- PFAS with Chromabond Wax and Nucleodur PFAS
- Mycotoxins with Chromabond XTR and Nucleodur π2

GC

- Fermentation by-products, diacetyl, DMS with GC column Optima FFAPplus
- Nitrosamine NDMA in malt with Optima FFAP

GC-MS

- Pesticides with Optima 5 MS Accent
- Hop aroma compounds using SPME or headspace GC with Optima Waxplus GC column

For your individual solution, contact our product specialists.

Application database

Our application database can be accessed via the following address:

https://chromaappdb.mn-net.com/

If you have any further questions, please do not hesitate to contact us.

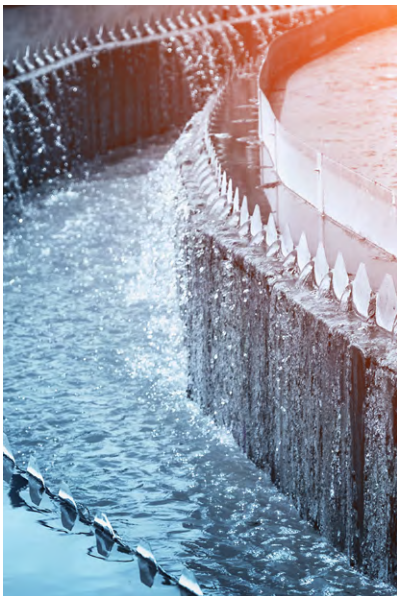
Contact:
+49 2421 969 333
support@mn-net.com

Examination of the sewage

The *NANOCOLOR*® analysis system can be used to quickly and reliably check the limit values for the discharge of brewery wastewater according to Annex 11 of the German Wastewater Ordinance. Furthermore, the test kits are suitable for operational analysis of the wastewater treatment plant. Among others, MACHEREY-NAGEL has seven tube tests for ISO-compliant COD analysis in its portfolio. Our tube tests for ammonium, nitrate and total nitrogen are also ISO-compliant.

The *NANOCOLOR*® analysis system is particularly easy to use and is therefore the first choice for routine analysis, self-monitoring and operational analysis in the brewery. Precisely premeasured reagents in 16 mm tubes and precisely premeasured additional reagents ensure maximum accuracy and precision of the measurement results.

- Flexible photometers
- Heating blocks for fast sample digestion
- User-friendly tube tests
- Analytical quality assurance according to DWA A-704
- Solutions for every sample matrix



Colorimetric test kits for cooling and boiler feed water

VISOCOLOR® tests are colorimetric and titrimetric test kits which determine even low limit values accurately. High accuracy and sensitivity are achieved by precisely dosing individual reagents and the possibility of compensating for both turbidity and coloration.

To avoid corrosion, the systems for cooling and boiler feed water must always be correctly adjusted. This can be reliably checked with the *VISOCOLOR*® test kits.

Order information

Beer analysis

Devices

Device	Type	REF
NANOCOLOR®® UV/VIS II	UV/VIS-Spectrophotometer Incl. 19 pre-programmed methods according to MEBAK and method for measuring beer colour (EBC)	919600.1

Tube tests

Test Kit	Range	REF
Vicinal Diketones	0.015 – 0.600 mg/kg Diacetyl	985010
Bitter units	2.0 – 80.0 BE	918172

Filter papers

Filter	Application	REF
MN 614, Folded filter papers 320 mm	Congress mashing process, nitrogen-free filters for determining the Kjeldahl nitrogen	527032
MN 616, Folded filter papers 320 mm	Removal of carbon dioxide, removal of turbidiyn	532032
MN 616 md, Folded filter papers 320 mm	Removal of turbidity	533032
MN 514, Folded filter papers 320 mm	Removal of carbon dioxide, removal of turbidiyn	522032
MN 660, Folded filter papers 320 mm	Diatomaceous earth filter for removing fine turbidity	547032

Other grades and sizes available, visit our website for more information.

Well water and drinking water

Tube tests

Test	Range		REF
Carbonate hardness 15	1.0 – 15 °d 0.4 – 5.4 mmol/L H^+		985015
Chlorine/Ozone 2	0.05 – 2.50 mg/L Cl_2 0.05 – 2.00 mg/L O_3		985017
Chlorine dioxide 5	0.15 – 5.00 mg/L ClO_2		985018
Chlorine 200	5 – 200 mg/L Cl^- 0.10 – 1.00 g/L Cl^-		985019
Chloride 50	0.5 – 50.0 mg/L Cl^-		985021
Iron 3	0.10 – 3.00 mg/L Fe		985037
Hardness Ca / Mg	1.0 – 20.0 °d / 5 – 50 mg/L Mg^{2+} 0.2 – 3.6 mmol/L / 10 – 100 mg/L Ca^{2+}	5 – 50 mg/L Mg^{2+} 10 – 100 mg/L Ca^{2+}	985044
Manganese 10	0.1 – 10.0 mg/L Mn		985058
Nitrate 8	0.30 – 8.00 mg/L NO_3-N	1.3 – 35.0 mg/L NO_3^-	985065
Nitrate 50	0.3 – 22.0 mg/L NO_3-N	2 – 100 mg/L NO_3^-	985064
Sulfate LR 200	20 – 200 mg/L SO_4^{2-}		985062

Standard tests

Test	Range		REF
Chlorine	0.02 – 10.0 mg/L Cl_2		91816
Chlorine dioxide	0.04 – 4.00 mg/L ClO_2		918163
Chloride	0.2 – 125 mg/L Cl^-		91820
Iron LR	0.005 – 5.00 mg/L Fe		918128
Iron	0.01 – 15.0 mg/L Fe		91836
Manganese LR	0.005 – 3.00 mg/L Mn		918126
Manganese	0.01 – 10.0 mg/L Mn		91860
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

Order information

Wastewater analysis

Tube tests

Test	Range		REF
Ammonium 3	0.04 – 2.30 mg/L NH_4-N	0.05 – 3.00 mg/L NH_4	985003
Ammonium 10	0.2 – 8.0 mg/L NH_4-N	0.2 – 10.0 mg/L NH_4	985004
Ammonium 50	1 – 40 mg/L NH_4	N 1 – 50 mg/L NH_4	985005
Ammonium 100	4 – 80 mg/L NH_4-N	5 – 100 mg/L NH_4	985008
Ammonium 200	30 – 160 mg/L NH_4-N	40 – 200 mg/L NH_4	985006
Ammonium 2000	300 – 1600 mg/L NH_4-N	400 – 2000 mg/L NH_4	985002
BOD5 (in Winkler-bottles)	2 – 3000 mg/L O_2		985822
BOD5-TT	0.5 – 3000 mg/L O_2		985825
Carbonate hardness 15	1.0 – 15 °d	0.4 – 5.4 mmol/L H^+	985015
COD 40	2 – 40 mg/L O_2		985027
COD 60	5 – 60 mg/L O_2		985022
COD 60 in salt water	5 – 60 mg/L O_2		985020
COD 160	15 – 160 mg/L O_2		985026
COD160 Hg-free	15 – 160 mg/L O_2		985026
COD 300	50 – 300 mg/L O_2		985033
COD 600	50 – 600 mg/L O_2		985030
COD 1500	100 – 1500 mg/L O_2		985029
COD 1500 Hg-free	100 – 1500 mg/L O_2		985029
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	3 – 150 mg/L O_2		985036
COD HR 1500	20 – 1500 mg/L O_2		985038
Nitrate 8	0.30 – 8.00 mg/L NO_3-N	1.3 – 35.0 mg/L NO_3^-	985065
Nitrate 50	0.3 – 22.0 mg/L NO_3-N	2 – 100 mg/L NO_3^-	985064
Nitrate 250	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
Organic acids 3000	30 – 3000 mg/L CH_3COOH	0.5 – 50.0 mmol/L CH_3COOH	985050
ortho- und 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- und total-phosphate 5	0.20 – 5.00 mg/L P	0.5 – 15.0 mg/L PO_4^{3-}	985081
ortho- und total-phosphate 15	0.30 – 15.00 mg/L P	1.0 – 45.0 mg/L PO_4^{3-}	985080
ortho- und total-phosphate 45	5.0 – 50.0 mg/L P	15 – 150 mg/L PO_4^{3-}	985055
ortho- und total-phosphate 50	10.0 – 50.0 mg/L P	30 – 150 mg/L PO_4^{3-}	985079
ortho- und total-phosphate LR 1	0.05 – 0.50 mg/L P		985095
total-nitrogen TNb 22	0.5 – 22.0 mg/L N		985083
total-nitrogen TNb 60	3 – 60 mg/L N		985092
total-nitrogen TNb 220	5 – 220 mg/L N		985088
TIC 30	2.0 – 30.0 mg/L C		985075
TIC 300	20 – 300 mg/L C		985078

Devices

Device	Type	REF
NANOCOLOR® Advance	Mobile spectrophotometer	919750
NANOCOLOR® *VIS* II	Spectrophotometer	919650.1
NANOCOLOR® *VARIO 4*	Heating block with 2 × 12 bores	919300
NANOCOLOR® *VARIO C2*	Heating block with 12 bores	919350
NANOCOLOR® TIC-Ex	Device for expelling the TIC	916993

Order information

Cleaning and disinfection

Disinfection control

Test	Range	REF
QUANTOFIX® Peracetic acid 50	0 · 5 · 10 · 20 · 30 · 50 mg/L peracetic acid	91340
QUANTOFIX® Peracetic acid 500	0 · 50 · 100 · 200 · 300 · 400 · 500 mg/L peracetic acid	91341
QUANTOFIX® Peracetic acid 1000	0 · 500 · 1000 · 1500 · 2000 mg/L peracetic acid	91342
QUANTOFIX® Peroxide 25	0 · 0.5 · 2 · 5 · 10 · 25 mg/L H_2O_2	91319
QUANTOFIX® Peroxide 100	0 · 1 · 3 · 10 · 30 · 100 mg/L H_2O_2	91312
QUANTOFIX® Peroxide 1000	0 · 50 · 150 · 300 · 500 · 800 · 1000 mg/L H_2O_2	91333
QUANTOFIX® Chlorine dioxide	0 · 0.05 · 0.1 · 0.2 · 0.4 · 0.8 · 1.2 mg/L ClO_2	91363

COD in cleaning liquors

Test	Range	REF
COD 15000	1.0 – 15.0 g/L O_2	985028
COD 60000	5.0 – 60.0 g/L O_2	985012

Boiler feed water

Visual test kits

Test	Range	REF
DEHA	0 · 0.01 · 0.03 · 0.05 · 0.10 · 0.15 · 0.20 · 0.25 · 0.30 mg/L DEHA	931024
Iron 1	0 · 0.04 · 0.07 · 0.10 · 0.15 · 0.20 · 0.30 · 0.50 · 1.0 mg/L Fe	931025
Iron 2	0 · 0.04 · 0.07 · 0.10 · 0.15 · 0.20 · 0.30 · 0.50 · 1.0 mg/L Fe	931026
Hydrazine	0 · 0.05 · 0.10 · 0.15 · 0.20 · 0.25 · 0.30 · 0.40 mg/L N_2H_2	931030
Silicic acid	0 · 0.2 · 0.4 · 0.6 · 1.0 · 1.5 · 2.0 · 2.5 · 3.0 mg/L SiO_2	931033
Copper	0 · 0.1 · 0.2 · 0.3 · 0.5 · 0.7 · 1.0 · 1.5 mg/L Cu^{2+}	931037
Phosphate	0 · 0.2 · 0.3 · 0.5 · 0.7 · 1 · 2 · 3 · 5 mg/L PO_4-P	931084
Oxygen	0 · 1 · 2 · 3 · 4 · 6 · 8 · 10 mg/L O_2	931088
Total hardness H 2	0.05 – 2.00 °d / 0.01 – 0.36 mmol/L Ca^{2+} (1 syringe filling)	915002

Test papers

Test	Range	REF
QUANTOFIX® Iron sensitive 1	0 · 0.05 · 0.1 · 0.2 · 0.5 · 1.0 mg/L	91359
QUANTOFIX® Copper sensitive 5	0 · 0.1 · 0.5 · 1.0 · 2.0 · 5.0 mg/L	91358
pH-Fix 6.0 – 10.0	6.0 · 6.4 · 6.7 · 7.0 · 7.3 · 7.6 · 7.9 · 8.2 · 8.4 · 8.6 · 8.8 · 9.1 · 9.5 · 10.0	92122

Cooling water

Visual test kits

Test	Range	REF
Chloride	1 · 2 · 4 · 7 · 12 · 20 · 40 · 60 mg/L Cl^-	931018
Nitrate	0 · 1 · 3 · 5 · 10 · 20 · 30 · 50 · 70 · 90 · 120 mg/L NO_3^-	931041
Nitrite	0 · 0.02 · 0.03 · 0.05 · 0.07 · 0.1 · 0.2 · 0.3 · 0.5 · mg/L NO_2^-	931044

Filtration · Rapid tests · *VISOCOLOR*® · *NANOCOLOR*®

Do you have any questions? Just contact us via:
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www.mn-net.com

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