



## Rapid tests for microbiological diagnostics and hygiene assays

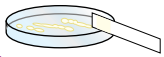
For the following **NANOCOLOR®** tube tests which are based on biochemical principles please see chapter **NANOCOLOR®** – the system for photometric water analysis:

Determination of	NANOCOLOR® tube test	Test no.	Reaction basis	Cat. No.	see page
<b>Alcohol</b> , see Ethanol					
<b>BOD<sub>5</sub></b> (in Winkler bottles in accordance with DIN EN 1899-1-H51)	NANOCOLOR® BOD <sub>5</sub>	8-22	microbial biomass, Winkler method	<b>985 822</b>	<b>91</b>
<b>BOD<sub>5</sub></b> (tube test)	NANOCOLOR® BOD <sub>5</sub> -TT	8-25	microbial biomass, Winkler method	<b>985 825</b>	<b>91</b>
<b>Ethanol</b>	NANOCOLOR® Ethanol 1000	8-38	Alcoholoxidase and peroxidase	<b>985 838</b>	<b>77</b>
<b>Methanol</b>	NANOCOLOR® Methanol 15	8-59	Alcoholoxidase and peroxidase	<b>985 859</b>	<b>79</b>
<b>Peroxide</b>	NANOCOLOR® Peroxide 2	8-71	Peroxidase	<b>985 871</b>	<b>81</b>
<b>Pesticides</b> (screening test)	NANOCOLOR® Pesticides 35	8-73	Acetylcholinesterase	<b>918 873</b>	<b>81</b>
<b>TTC / Sludge activity</b>	NANOCOLOR® TTC / Sludge activity 150	8-90	Dehydrogenase	<b>985 890</b>	<b>95</b>



## Microbiological tests

<b>BioFix®</b> nitrification inhibition tests <i>A-Tox / N-Tox</i>	<b>108 – 109</b>
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### BioFix<sup>®</sup> nitrification inhibition tests *A-Tox* / *N-Tox*

#### Is the biology in your sewage plant working properly?

During aerobic and anaerobic decomposition reactions nitrogen from nitrogen-containing organic substances is first converted to ammonium. **The subsequent two-step microbial oxidation of ammonium to nitrate via nitrite is called nitrification.** In soil as well as in water it is performed by nitrifying bacteria, a fact which is used for the purification of waste water in sewage plants. Nitrification is an important step during waste water purification in order to keep the concentration of ammonium ions in the effluents of the sewage plant as low as possible. Additionally, nitrification is prerequisite for the denitrification for complete nitrogen elimination, which is required for waste water treatment in many countries.

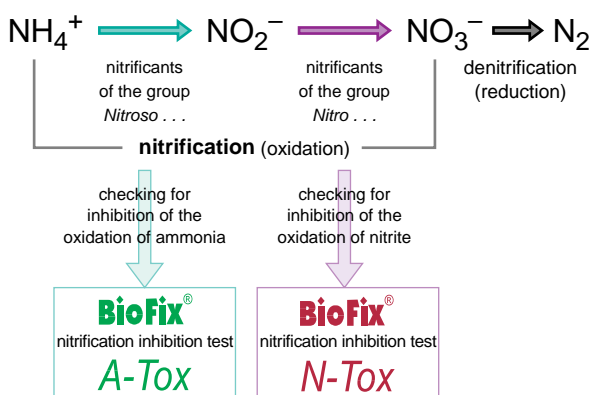
Proper nitrification and denitrification procedures are important for meeting governmental regulations concerning the nitrogen limits of a sewage plant. Nitrification is a very complex process which depends on many factors. Exceeding allowable limits may have drastic consequences on fees for waste water disposal.

Nitrificants or nitrifying bacteria belong to the group of gram-negative, chemolithotrophic, aerobic bacteria. One differentiates between the groups of **ammonia oxidants** and the group of **nitrite oxidants**. In the **first** step of the nitrification process the ammonia oxidants oxidize **ammonium to nitrite** in the presence of oxygen. In the **second** step the nitrite oxidants transform the **nitrite to nitrate**, again in the presence of oxygen.

Nitrifying bacteria are very sensitive to certain environmental influences. It is long known, that a number of substances can selectively inhibit nitrification. These substances can reach the sewage plant with the waste water from different sources and significantly, sometimes irreversibly, damage the population of nitrifying bacteria in the activated sludge.

Standard procedures for determination of the nitrification inhibition (e.g. DIN EN ISO 9509 – L38) are very time-consuming, and require lots of experience and work. For this reason it is seldom used in sewage plants, although knowledge about possible effects of sewage influx to the nitrifying bacteria of a sewage plant may help to maintain a proper cleaning process.

#### Application of BioFix<sup>®</sup> nitrification inhibition tests during nitrogen elimination in a sewage plant



#### The solution for nitrification control: BioFix<sup>®</sup> nitrification inhibition tests *A-Tox* and *N-Tox*

With BioFix<sup>®</sup> nitrification inhibition tests you can now easily determine the nitrification inhibition in waste waters of all kinds as well as nitrification inhibition by individual substances or substance mixtures.

#### → Principle: amperometric measurement of the oxygen consumption

As biomass these tests use nitrifying microorganisms which are typical for sewage plants, preferably *Nitrosomonas* and *Nitrobacter*. The bacterial strains are applied as inoculum for the test preparation in defined composition – concerning the precise bacterial strain as well as their concentration – either as pure cultures or as mixed cultures.

Measurement of the metabolic activity of the test organisms is performed with an apparatus for oxygen determination using a commercial oxygen electrode. The result is obtained as % inhibition of the oxygen consumption of the sample solution compared to a non-inhibited control.

BioFix<sup>®</sup> nitrification inhibition tests allow the following investigations:

- ✓ **BioFix<sup>®</sup> A-Tox:** direct test, whether the **first step of the nitrification**, the **oxidation of ammonium**, is inhibited by sample components.
- ✓ **BioFix<sup>®</sup> N-Tox:** direct test, whether the **second step of the nitrification**, the **oxidation of nitrite**, is inhibited by sample components.

- ✓ Undifferentiated screening test *A/N-Tox* using both BioFix<sup>®</sup> tests (**A-Tox** and **N-Tox**) to determine, whether nitrification in general is inhibited by sample components.

#### Please note: BioFix<sup>®</sup> *A-Tox* and *N-Tox* test kits require cooling during transportation and storage!



Advantages of BioFix<sup>®</sup> nitrification inhibition tests are:

- 💧 **high sensitivity**
- 💧 **very good reproducibility** due to defined bacterial strains used in defined concentrations
- 💧 **easy procedure** (by far less effort than for the DIN procedure)
- 💧 **speed** (considerable time-saving: test time 10 min; 4 hours for the DIN test)
- 💧 **ready-to-use reagents**
- 💧 reagents and preserved bacteria have a shelf life of at least 1 year under the temperatures indicated for storage
- 💧 free-of-charge disposal
- 💧 ability to differentiate between inhibition of the different steps of nitrification (ammonium and/or nitrite oxidation)



## BioFix<sup>®</sup> nitrification inhibition tests A-Tox / N-Tox

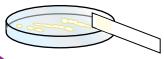
### BioFix<sup>®</sup> nitrification inhibition tests - Ordering information

BioFix <sup>®</sup> nitrification inhibition test	Field of application	Evaluation of the biological conversion of	Number of tests (depending on the number of controls) / pack of	Cat. No.
<b>A-Tox</b>	1st step of nitrification	ammonium to nitrite	10 –19	<b>970 001</b>
<b>N-Tox</b>	2nd step of nitrification	nitrite to nitrate	10 –19	<b>970 002</b>
BioFix <sup>®</sup> nitrification inhibition test, reagent <i>A-Tox</i> R2, enriched nitrificants for oxidation of ammonia			10 x 2 ml	<b>970 903</b>
BioFix <sup>®</sup> nitrification inhibition test, reagent <i>N-Tox</i> R2, enriched nitrificants for oxidation of nitrite			10 x 2 ml	<b>970 902</b>
Starter kit for BioFix <sup>®</sup> nitrification inhibition tests: 1 electrode adaptor which holds the oxygen electrode, 3 x 2 seals for the electrode adaptor, 2 mini-magnets for stirring, 1 micro syringe 100 µl, 1 filtration syringe 20 ml			1 kit	<b>970 101</b>

### Useful accessories

Description	Pack of	Cat. No.
CHROMAFIL <sup>®</sup> membrane filters CA 45/25 S, cellulose acetate, sterilised, individually packed, colour code colourless/red	50	<b>729 025</b>
Electrode adaptor	1	<b>970 111</b>
Seals for the electrode adaptor	5 x 2	<b>970 112</b>
Reaction vessels	50	<b>970 113</b>
Magnetic stirring unit without heater	1	<b>970 115</b>
Mini-magnets for stirring	5	<b>970 114</b>
<b>Digital oxygen meter BioFix<sup>®</sup> OXI 300</b> with automatic temperature compensation and simultaneous temperature display, as complete kit in a case, incl. battery, oxygen probe with 4 m cable and electrolyte solution; measurement as % or ppm (mg/l), calibration programme, memory for measured values, automatic economy mode, correction for salt content and height	1 kit	<b>923 701</b>
Oxygen electrode for BioFix <sup>®</sup> OXI 300, 4 m cable	1	<b>923 703</b>
Oxygen electrode for BioFix <sup>®</sup> OXI 300, 10 m cable	1	<b>923 704</b>
Replacement membrane heads for BioFix <sup>®</sup> OXI 300	5	<b>923 705</b>
Electrolyte solution	30 ml	<b>923 707</b>











## Rapid assays for microbiological diagnostics

### BioFix<sup>®</sup> test sticks and test strips

BioFix<sup>®</sup> is a family of test strips or test sticks belonging to the group of in-vitro diagnostics. They have been developed for the rapid detection of microbial properties or metabolic parameters.

BioFix<sup>®</sup> test sticks and test strips meet the requirements for a modern rapid test:

-  **simplicity**  
only few working steps and ready-to-use reagents
-  **reliability**  
safe results with low effort
-  **clarity**  
clear results by visual evaluation
-  **speed**  
results in a few minutes
-  **convenience**  
no additional accessories necessary
-  **economy**  
low price per test

BioFix<sup>®</sup> test strips are strips of absorbent paper 11 mm wide and 98 mm long, which are either completely impregnated with an indicator reagent or where several indicators have been applied as stripes.

With BioFix<sup>®</sup> test sticks one or several indicator papers are sealed onto the end of a plastic strip which is 0.2 mm thick, 5.5 mm wide and 95 mm long.

The length of the BioFix<sup>®</sup> test sticks and test strips allows a safe and hygienic handling even when testing microorganisms with potential hazard. The plug of the container is filled with a desiccant for increased shelf life of the sticks and strips. Depending on the test the BioFix<sup>®</sup> package may contain additional reagents.



CE mark in accordance with the European In-Vitro Diagnostics Directive 98/79/EC





## BioFix<sup>®</sup> test sticks and test strips

### How is BioFix<sup>®</sup> used?

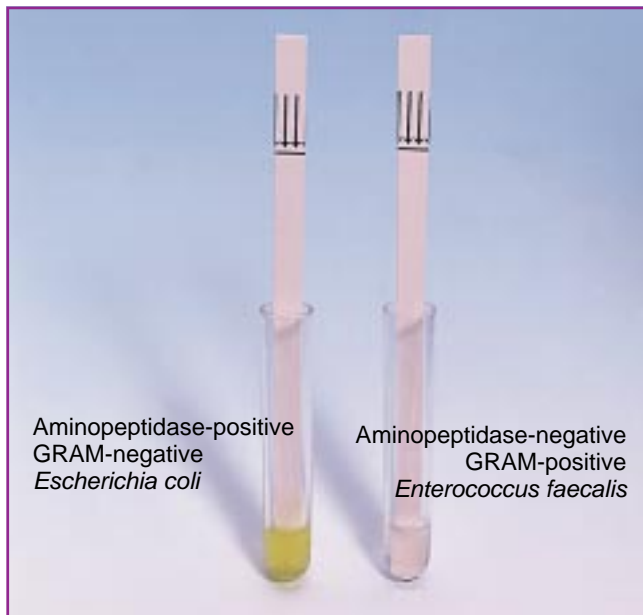
Handling of BioFix<sup>®</sup> test sticks and strips is very easy:

- 💧 apply microorganisms
- 💧 wait several minutes
- 💧 visual evaluation of the colour change of the test field or test strip

### BioFix<sup>®</sup> Aminopeptidase

Cat. No. 960 003

The colony to be diagnosed is suspended in a small volume of distilled water, and the test stick is dipped into this suspension. Yellow colouration indicates aminopeptidase-positive strains (= GRAM-negative microorganisms).

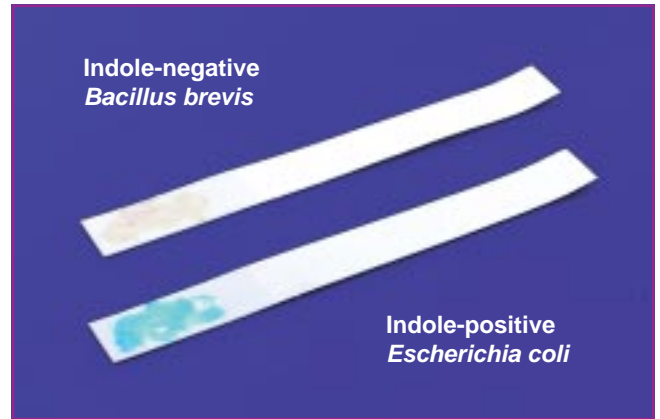


### BioFix<sup>®</sup> Indole

Cat. No. 960 002

With an inoculating loop a well-grown, separate colony of the strain of microorganisms to be diagnosed is taken from the culture medium and applied to the end of the test strip.

A bluish-green colour indicates indole-positive strains.

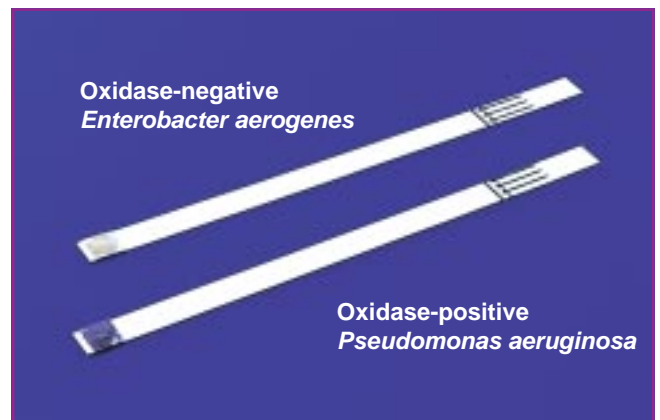


### BioFix<sup>®</sup> Oxidase

Cat. No. 960 001

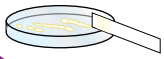
With an inoculating loop a well-grown, separate colony of the strain of microorganisms to be diagnosed is taken from the culture medium and applied to the test field of the stick.

A blue-violet colour indicates oxidase-positive strains.



Designation	Application	Colour change for positive test result	Presentation	Cat. No.
BioFix <sup>®</sup> Oxidase	rapid detection of the enzyme cytochromoxidase in microorganisms	colourless to blue-violet	test sticks 5.5 x 95 mm	<b>960 001</b>
BioFix <sup>®</sup> Indole	rapid detection of indole production by microorganisms	colourless to bluish-green	test strips 11 x 98 mm	<b>960 002</b>
BioFix <sup>®</sup> Aminopeptidase	rapid detection of the enzyme L-alanine-aminopeptidase in microorganisms and evaluation of GRAM properties	colourless to yellow	test sticks 5.5 x 95 mm	<b>960 003</b>
<b>Other BioFix<sup>®</sup> test strips and test sticks are in preparation</b>				
<i>Shelf life:</i> at least 2 years when stored between +2 °C and +8 °C				
<i>Packing unit:</i> Container with <b>50</b> test sticks or test strips and reagents, if required				





## Rapid tests for hygiene control

### BioFix® rapid hygiene assay for beer taps



**Rapid test for detection of microbiological impurities in draught beer due to lactic/acetic acid bacteria, wild/foreign yeasts, fungi or faecal bacteria (e.g. *E. coli*) from soiled beer taps**

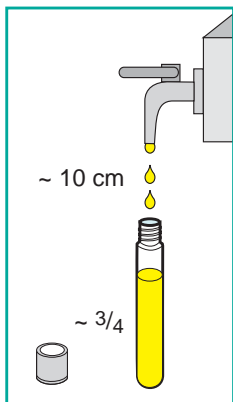
This is a tube test with a polyvalent nutrient medium, which reacts simultaneously to the different groups of microorganisms which are detrimental to beer. However, sensitivity is different for the individual groups listed above.

*Note:* The test can also be used for hygiene control of mineral and table water.

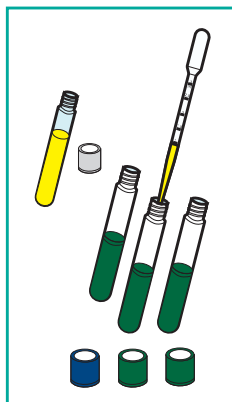
Special applications are available on request.

★ suited for HACCP in accordance with the directive for food hygiene (in effect since 05. August 1998)

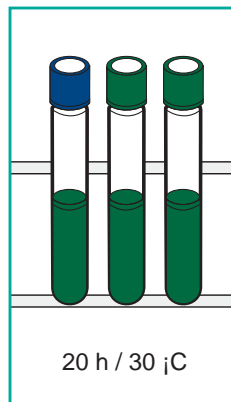
#### Test procedure:



Sampling

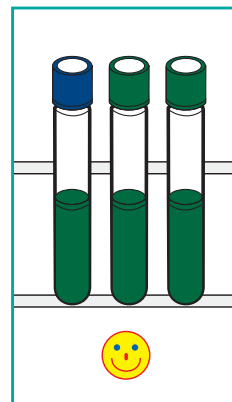


Preparation

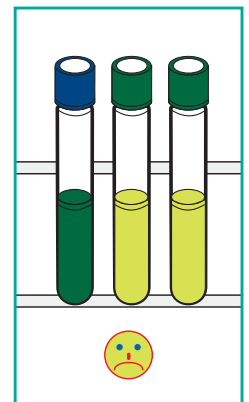


20 h / 30 °C

Incubation



tap hygienically  
infaulless



Evaluation

tap hygienically  
objectionable

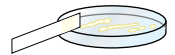
#### Sensitivity of the test:

Legal regulations for hygiene control define different ranges and limiting values depending on the group of microorganisms concerned. If the rapid hygiene assay gives a positive result, one or more of the following limiting values are exceeded:

- lactic/acetic acid bacteria  $\geq 10^5$  germs/ml tap beer
- wild/foreign yeasts  $\geq 10^4$  germs/ml tap beer
- fungi  $\geq 10^3$  germs/ml tap beer
- faecal bacteria (e.g. *E. coli*)  $\geq 1$  germ/ml tap beer

*Shelf life:* at least 2 years when stored between +2 °C and +8 °C





## BioFix® sample collection set for the surface control of beer taps

This test kit is based on the same principle as the rapid hygiene assay for beer taps. Although primarily developed for qualitative detection of microbiological impurities on surfaces of tap equipment (e. g. beer taps, beverage supply lines etc.) with lactic/acetic acid bacteria, wild/foreign yeasts, fungi and faecal bacteria (e.g. *E. coli*), this test can be generally used – noting the given detection limits – for hygiene control of any surface (e. g. in food industry, food preparation).

*Shelf life:* at least 2 years when stored between +2 °C and +8 °C.

★ suited for HACCP in accordance with the directive for food hygiene (in effect since 05. August 1998)

### Mini-incubator BioFix® »CULTURA«

the economical, space-saving alternative for incubation



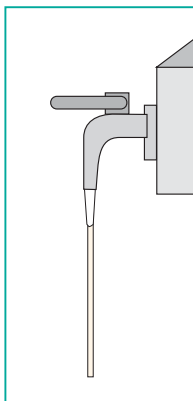
#### Technical data:

temperature range: 5 °C above ambient to +45 °C

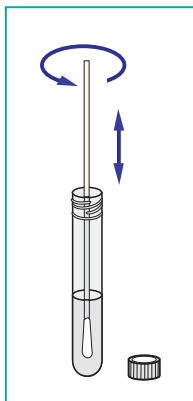
temperature variation: ±1 °C

outer dimensions: width 310, height 155, depth 168 mm

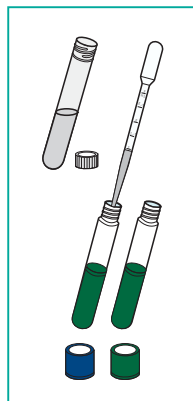
#### Test procedure:



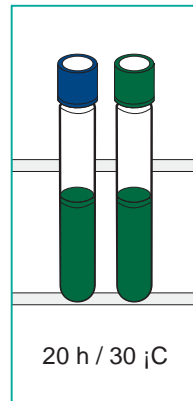
Sampling with cotton pad



Preparation of the sample solution

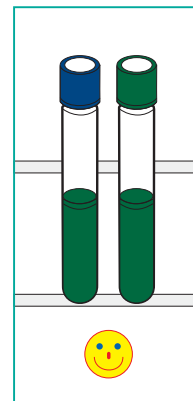


Preparation for incubation

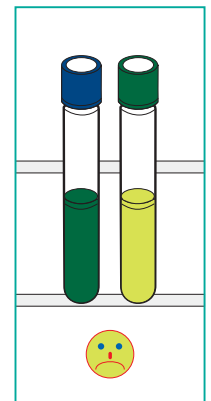


20 h / 30 jC

Incubation



surface hygienically faultless



surface hygienically objectionable

#### Ordering information

Designation	Number of tests	Cat. No.
<b>BioFix® rapid hygiene assay for beer taps</b> <i>Kit contents:</i> 20 tubes with control medium, 40 tubes with detection medium, 20 sterile tubes for sampling, 21 sterile transfer pipettes, 1 evaluation chart for HACCP	20	950 001
<b>BioFix® sample collection set for the surface control of beer taps</b> <i>Kit contents:</i> 20 tubes with control medium, 20 tubes with detection medium and 20 tubes with rinsing solution, 21 sterile cotton pads, 21 sterile transfer pipettes, 1 evaluation chart for HACCP	20	950 002
<b>Special accessories</b>		
<b>Mini-incubator BioFix® »CULTURA«</b> incl. 1 thermometer, 1 rack for 3 x 6 test tubes, the incubator can hold 3 racks		951 001
<b>Rack</b> for mini-incubator BioFix® »CULTURA« with 3 x 6 positions size 18 x 18 mm		951 002