

Simply rapid.

Merckoquant® – the mobile analysis system



Merckoquant®

COMBINING ULTIMATE SIMPLICITY WITH SPEED

Test strips are true high-tech products – a mobile laboratory on just a few square millimeters of backing. Merckoquant® test strips are suitable for the semiquantitative detection of ions and of inorganic and organic substances. They can be used to measure concentrations from as low as 1 or 10 mg/l as the case may be right up to the g per liter range. Used for screening they give the user a quick summary of substance concentrations present in the sample and, by providing a means of pre-selection, can contribute significantly to reducing the time and costs associated with laboratory analyses. Quality checks and in-process controls can be performed much more quickly. Used test strips are easily disposed of thanks to the minute amount of reagents they contain and the use of polyethylene terephthalate (PET) film as backing material.



PRODUCT RANGE

Merckoquant® test strips allow more than 30 different identification tests and semiquantitative determinations to be performed. For some substances we even provide several different test strips to cover various detection ranges, so that in all our range consists of more than 40 different Merckoquant® tests. The standard pack contains 100 test strips in an aluminium tube fitted with a desiccant-filled stopper. User information is provided in 4 languages.

We also offer this products in packaging specific to the application and customer requirements.

Strips that are individually sealed to improve their keeping properties are available on request. Individually sealed test strips are ideal for promotional purposes, e.g. for placement in books and journals or as giveaways to support product promotions. Please ask about our special offers.

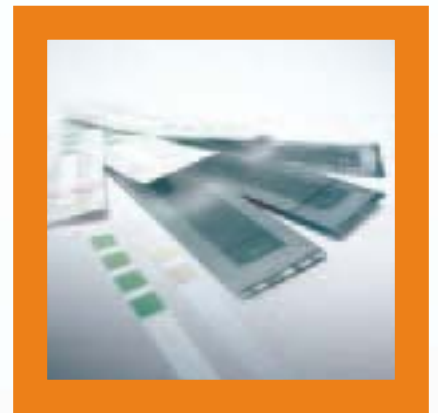
We are constantly adding new tests to this product range. If you are looking for a test strip for a quite specific application, please call us.



Merckoquant® test strips



Merckoquant® reagent tests



Merckoquant® individually sealed test strips



APPLICATIONS

The applications listed in this publication and also the potential uses mentioned are intended to illustrate the many uses to which Merckoquant® test strips may be put. The list is not exhaustive.

POINTS TO OBSERVE WHEN HANDLING MERCKOQUANT® PRODUCTS



1. Thoroughly wet the reaction zones on the strip by briefly (1 sec) dipping them in the solution being tested. Remove excess liquid by stroking the edge of the strip against the rim of the sample vessel, or using an absorbent paper towel.



2. After the prescribed reaction time (10 sec to max. 2 min) has elapsed, compare the color of the reaction zone with the color scale printed on the pack, and read off the concentration.

Some tests may require the sample to be specially treated prior to testing. To simplify matters, the pack contains all the reagents that will be required. Simply add a few drops or a micro-spoonful of reagent(s) to the sample solution as described in the directions for use, mix and test with the test strip.

SHELF-LIFE AND STORAGE

Packs of test strips kept in a cool (15–25°C), dry place can be used at least up to the date printed on the pack. Some packs need to be kept refrigerated (2–8°C) to assure their longevity. To protect the test strips in the tube against moisture and light, be sure to close it again immediately after removing a strip. The drying agent incorporated in the stopper prevents moisture from affecting the contents.



INTERFERENCES

Most of the test strips respond selectively to a given ion or substance owing to the fact that masking agents are added to the reaction zone to eliminate or suppress various interferences. Interferences cannot, however, be avoided in every case. A large number of ions have been tested for their possible interfering effects. These are listed in the interference tables compiled for the various substances being tested. Where several interfering ions are present in a sample, they may exercise a cumulative effect. Before a test strip is used in an unknown matrix, we recommend checking for potential interferences or comparing against known added concentrations. This also allows the precision of the method to be established.

QUALITY ASSURANCE

Merck uses certified standard solutions to adjust and check the tests and the faithfulness of the reference colors. These standard solutions are directly traceable to primary reference standards from NIST and PTB, a factor instrumental in assuring the high quality of Merckoquant® test strips.

RISK AND SAFETY PHRASES

Please read the risk (R) and safety (S) phrases printed on reagent packs. Keep Merckoquant® test strips out of reach of children.



REFLECTOQUANT® SYSTEM

The Reflectoquant® system is designed to provide more precise results from test strips. Reflectoquant® test strips are evaluated quantitatively using a compact reflectometer.

► Further information in our Reflectoquant brochure (W 240111)



OTHER RAPID TESTS

Other test kits are available in the Aquamerck®, Microquant® and Aquaquant® product ranges. These cover other concentrations and substances, and are designed for wet-chemical analyses, being evaluated by titrimetry or colorimetry.

► Further information in our "Food and Environmental Analytics" catalog (W 285102)

APPLICATIONS FOR MERCKOQUANT® TESTS

	Waste water	Aquaristics (sea water)	Aquaristics (fresh water)	Construction materials	Biotechnology, fermenter control	Landfill seepage	Disinfection control	Electroplating, surface refinement	Drinks (beer)	Drinks (fruit juices)	Drinks (wine)	Ground water, surface water	Boiler water, cooling water	Agriculture	Food	Seawater	Milk, dairy products	Mineral water, natural spring water	Swimming pools	Drinking water	Environment
Aluminium	■						■	■	■	■				■	■			■			■
Ammonium	■		■	■	■					■	■	■	■	■	■		■		■	■	■
Arsenic	■				■							■			■		■		■	■	■
Arsenic	■				■							■			■		■		■	■	■
Ascorbic acid								■	■	■				■		■					
Blank test strips									■	■				■							
Calcium				■				■	■	■	■	■	■	■	■	■	■		■		■
Carbonate hardness	■	■		■				■				■	■			■		■		■	
Chloride	■	■		■	■		■			■	■	■	■	■	■	■	■		■	■	■
Chlorine	■					■								■					■	■	
Chlorine	■					■								■						■	
Chromate	■				■		■														■
Cobalt	■				■		■									■					■
Copper	■				■		■			■						■				■	■
Cyanide	■				■		■									■					■
Fixing bath Ag/pH	■																				
Formaldehyde						■	■							■							■
Iron	■				■		■			■	■			■	■		■		■	■	■
Lead	■				■		■														■
Manganese	■				■		■				■	■				■				■	■
Molybdenum	■				■		■					■									■
Nickel	■				■		■									■					■
Nitrate	■		■	■			■	■	■	■	■	■	■	■	■	■	■		■	■	■
Nitrite	■	■	■		■		■					■	■	■	■	■	■				■
Nitrite	■					■	■					■		■							
Peracetic acid						■	■	■						■							
Peracetic acid						■	■	■						■							
Peracetic acid						■	■	■						■							
Peroxide	■					■	■	■						■	■	■					
Peroxide	■					■	■	■						■	■	■					
Peroxide	■					■	■	■						■							
pH	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Phosphate	■	■	■	■					■	■	■	■	■	■	■	■	■				■
Potassium									■	■				■	■			■		■	
Quaternary ammonium compounds	■					■															
Sulfate	■		■				■				■										
Sulfite	■				■			■	■	■		■		■			■				■
Tin	■				■		■							■	■						■
Total hardness		■	■	■				■	■		■	■			■		■	■	■	■	■
Total hardness		■	■	■				■	■		■	■			■		■	■	■	■	■
Zinc	■				■		■														■

Measuring range	Method	Ord. No.	Page	
10 - 250 mg/l	Aurin tricarboxylic acid	1.10015.0001	8	Aluminium
10 - 400 mg/l	Nessler	1.10024.0001	8	Ammonium
0.02 - 3 mg/l	Modified Gutzeit method	1.17926.0001	8	Arsenic
0.005 - 0.5 mg/l	Modified Gutzeit method	1.17927.0001	8	Arsenic
50 - 2000 mg/l	Phosphomolybdenum blue	1.10023.0001	9	Ascorbic acid
		1.11860.0001	9	Blank test strips
10 - 100 mg/l	Glyoxalbishydroxyanil	1.10083.0001	9	Calcium
4 - 24 °d	Mixed indicator	1.10648.0001	9	Carbonate hardness
500 - 3000 mg/l	Silver chromate	1.10079.0001	10	Chloride
0.5 - 20 mg/l	Redox reaction	1.17925.0001	10	Chlorine
25 - 500 mg/l	Redox reaction	1.17924.0001	10	Chlorine
3 - 100 mg/l	Diphenylcarbazine	1.10012.0001	11	Chromate
10 - 1000 mg/l	Rhodanide	1.10002.0001	11	Cobalt
10 - 300 mg/l	Cuproine	1.10003.0001	11	Copper
1 - 30 mg/l	Barbituric acid derivative	1.10044.0001	11	Cyanide
0.5 - 10 g/l /4-8	Cadmium sulfide/Mixed indicator Triazole	1.10008.0001	12	Fixing bath Ag/pH
10 - 100 mg/l	Triazole	1.10036.0001	12	Formaldehyde
3 - 500 mg/l	2,2'-Bipyridine	1.10004.0001	12	Iron
20 - 500 mg/l	Rhodizonic acid	1.10077.0001	13	Lead
2 - 100 mg/l	Oxidation/Redox indicator	1.10080.0001	13	Manganese
5 - 250 mg/l	Toluene-3,4-dithiol	1.10049.0001	13	Molybdenum
10 - 500 mg/l	Diacetyldioxime	1.10006.0001	13	Nickel
10 - 500 mg/l	Modified Griess reaction	1.10020.0001	14	Nitrate
100 - 3000 mg/l	Aromatic amine	1.10022.0001	14	Nitrite
2 - 80 mg/l	Griess reaction	1.10007.0001	15	Nitrite
5 - 50 mg/l	Redox reaction	1.10084.0001	15	Peracetic acid
100 - 500 mg/l	Redox reaction	1.10001.0001	15	Peracetic acid
500 - 2000 mg/l	Redox reaction	1.17922.0001	15	Peracetic acid
0.5 - 25 mg/l	Enzymatic reaction	1.10011.0001	16	Peroxide
1 - 100 mg/l	Enzymatic reaction	1.10081.0001	16	Peroxide
100 - 1000 mg/l	Enzymatic reaction	1.10337.0001	16	Peroxide
0 - 14 pH	Reactive dyes	1.09535.0001	16	pH
10 - 500 mg/l	Phosphomolybdenum blue	1.10428.0001	17	Phosphate
250 - 1500 mg/l	Dipicrylamine	1.10042.0001	17	Potassium
10 - 500 mg/l	Indicator	1.17920.0001	17	Quaternary ammonium compounds
200 - 1600 mg/l	Ba-thorin complex	1.10019.0001	18	Sulfate
10 - 400 mg/l	Nitroprusside/Zn-hexacyanoferrate	1.10013.0001	18	Sulfite
10 - 200 mg/l	Toluene-3,4 dithiol	1.10028.0001	18	Tin
3 - 21 °d	EDTA, Eriochrome Black	1.10025.0001	19	Total hardness
5 - 25 °d	EDTA, Eriochrome Black	1.10046.0001	19	Total hardness
10 - 250 mg/l	Dithizone	1.10038.0001	19	Zinc

Al³⁺ ALUMINIUM **Ord. No. 1.10015.0001****Merckoquant® Aluminium Test**

Presentation 100 test strips and reagents
Graduation 0 – 10 – 25 – 50 – 100 – 250 mg/l Al³⁺

Aluminium compounds are used as flocculating agents in water works, in swimming pools, paper mills, etc. The test, which is largely interference-free, can be directly used to check the integrity and efficiency of filtering systems as part of a general plan of in-process controls.

Wastewater discharged from aluminium smelting and processing plants requires regular monitoring, as aluminium does great harm to fish and other aquatic organisms. The test is also useful in the food and drinks industry, as a means of checking for damaged casks and pipes; also as a way of monitoring concentrations of aluminium-containing additives.

The following concentrations of foreign ions (in mg/l) do not interfere with the determination.

Ag ⁺	1,000	Fe ^{2+/3+}	50	PO ₄ ³⁻	100
Ca ²⁺	1,000	[Fe(CN) ₆] ^{3-/4-}	1,000	S ²⁻	100
Cd ²⁺	1,000	Hg ^{+/2+}	1,000	SCN ⁻	1,000
Cl ⁻	1,000	Mg ²⁺	1,000	Sn ²⁺	1,000
CN ⁻	500	Mn ²⁺	1,000	SO ₃ ²⁻	100
Co ²⁺	1,000	MnO ₄ ⁻	100	SO ₄ ²⁻	1,000
Cr ³⁺	1,000	NH ₄ ⁺	1,000	S ₂ O ₃ ²⁻	1,000
CrO ₄ ²⁻	500	NO ₂ ⁻	1,000	VO ₃ ⁻	500
Cu ²⁺	10	NO ₃ ⁻	1,000	WO ₄ ²⁻	250
F	250	OCN ⁻	500	Zn ²⁺	1,000

NH₄⁺ AMMONIUM **Ord. No. 1.10024.0001****Merckoquant® Ammonium Test**

Presentation 100 test strips and reagent
Graduation 0 – 10 – 30 – 60 – 100 – 200 – 400 mg/l NH₄⁺

The presence of ammonium ions in surface and ground water is indicative of potentially harmful pollution. In agriculture the test can be used to measure the ammonium nitrogen content of various types of manure and compost.

It can also be used directly to check for ammonium compounds employed in various industries including tanning, the photographic industry, plastics, textiles, etc.

The following concentrations of foreign ions (in mg/l) do not interfere with the determination.

Al ³⁺	1,000	Cu ²⁺	1,000	Ni ²⁺	100
Ca ²⁺	100	Fe ²⁺	10	NO ₂ ⁻	1,000
Cl ⁻	1,000	Fe ³⁺	1,000	NO ₃ ⁻	1,000
CN ⁻	10	K ⁺	1,000	PO ₄ ³⁻	1,000
Cr ³⁺	100	Mg ²⁺	1,000	S ₂ O ₃ ²⁻	1,000
CrO ₄ ²⁻	1,000	Mn ²⁺	10		

As^{3+/5+} ARSENIC **Ord. No. 1.17926.0001****Merckoquant® Arsenic Test**

Presentation 100 test strips and reagents
Graduations 0 – 0.02 – 0.05 – 0.1 – 0.2 – 0.5 mg/l As^{3+/5+}
 0 – 0.1 – 0.5 – 1.0 – 1.7 – 3 mg/l As^{3+/5+}

The Arsenic Test is suitable for measuring arsenic in water, soil extracts, pharmaceutical products, prepared biological specimens and liquid foods.

It can also be used in various production processes in order to monitor levels of arsenic compounds and to check the limits in electrical components, catalysts, special types of glass and certain electroplating baths.

The following concentrations of foreign ions (in mg/l) do not interfere with the determination.

Ag ⁺	1	Fe ^{2+/3+}	1,000	NO ₃	100
Al ³⁺	100	Hg ²⁺	5	PO ₄ ³⁻	100
Ca ²⁺	1,000	K ⁺	1,000	S ²⁻	0.5
CN ⁻	1,000	Mg ²⁺	1,000	Sn ²⁺	100
Co ²⁺	5	MnO ₄ ⁻	500	SO ₃ ²⁻	1
CrO ₄ ²⁻	1,000	Na ⁺	1,000	SO ₄ ²⁻	1,000
Cu ²⁺	0.5	Ni ²⁺	10	S ₂ O ₃ ²⁻	0.5
F ⁻	500	NO ₂ ⁻	100	EDTA	1,000

As^{3+/5+} ARSENIC **Ord. No. 1.17927.0001****Merckoquant® Arsenic Test**

Presentation 100 test strips and reagents
Graduation 0 – 0.005 – 0.01 – 0.025 – 0.05 – 0.1 – 0.2 5–0.5 mg/l As^{3+/5+}

As a result of its high sensitivity and robustness, this Arsenic Test, used along with the Arsenic Test described above, is ideal for screening ground water to see whether it is of drinking quality. Various geological factors mean that arsenic is leached from rocks under certain circumstances and finds its way into ground water in toxic concentrations.

The following concentrations of foreign ions (in mg/l) do not interfere with the determination.

Ag ⁺	0.5	Fe ^{2+/3+}	500	PO ₄ ³⁻	100
Al ³⁺	100	K ⁺	1,000	S ²⁻	2
Ca ²⁺	1,000	Mg ²⁺	1,000	Sb ³⁺	1
CN ⁻	500	MnO ₄ ⁻	500	SeO ₃ ²⁻	1
CO ₃ ²⁻	100	Na ⁺	1,000	SO ₃ ²⁻	2
CrO ₄ ²⁻	250	Ni ²⁺	1	SO ₄ ²⁻	1,000
Cu ²⁺	0.5	NO ₂ ⁻	100	EDTA	1,000
F ⁻	100	NO ₃ ⁻	100	NaCl	20 %

The following concentrations of foreign ions (in mg/l) do not interfere with the determination.

Citrate	1,000	Oxalate	1,000	Fe ²⁺	50
Fe ³⁺	1	SO ₃ ²⁻	100	Tartrate	1,000

Since the basis of the test is a reduction reaction, reducing agents similar to ascorbic acid may yield "false-positives".

The following concentrations of foreign ions (in mg/l) do not interfere with the determination.

Ag ⁺	400	Cu ²⁺	10	Ni ²⁺	50
Al ³⁺	1,000	Fe ^{2+/3+}	100	NO ₂ ⁻	1,000
B ²⁺	500	Hg ^{+/2+}	100	NO ₃ ⁻	1,000
Cd ²⁺	10	Mg ²⁺	1,000	Pb ²⁺	1,000
Cl ⁻	1,000	Mn ²⁺	50	PO ₄ ³⁻	1,000
Co ²⁺	50	MnO ₄ ⁻	200	Sn ²⁺	200
Cr ³⁺	350	NH ₄ ⁺	1,000	Zn ²⁺	25

The presence of strong alkalis or other acid binding substances will falsify results.

ASCORBIC ACID

Ord. No. 1.10023.0001

Merckoquant® Ascorbic acid Test

Presentation 100 test strips

Graduation 0-50-100-200-300-500-700-1000-2000 mg/l Ascorbic acid

The Ascorbic Acid Test can be used both for quickly measuring levels of natural ascorbic acid (vitamin C) in foods such as fruit and vegetable juices, soft drinks, beer and wine, and also to check how much ascorbic acid has been added to certain foods as a preservative or antioxidant. It can also be used to measure vitamin C loss in foods following storage, processing and cooking.

Direct determinations can be conducted in liquid samples as well as on the freshly cut surfaces of fruit, potatoes and other vegetables.

BLANK TEST STRIPS

Ord. No. 1.11860.0001

Merckoquant® Blank Test Strips

Presentation 100 test strips

The blank test strips incorporate a paper zone not impregnated with reagent. They are used to perform tests to see whether sample solutions turn the blank zone a different color. A difference in color can indicate that the intrinsic color of the sample may affect results obtained with other Merckoquant® test strips. Allowance can then be made for the difference in color.

The blank strips can also be used to prepare test strips for use in other determinations

Ca²⁺ CALCIUM

Ord. No. 1.10083.0001

Merckoquant® Calcium Test

Presentation 60 test strips and reagents

Graduation 0 - 10 - 25 - 50 - 100 mg/l Ca²⁺

The Calcium Test is suitable not only for rapid determination of calcium in aqueous media but also for measuring levels of calcium compounds incorporated into fertilizers and animal feeds, or used as cleaners or polishes, or whiteners in enamels, glassware and porcelain.

CARBONATE HARDNESS

Ord. No. 1.10648.0001

Merckoquant® Carbonate Hardness Test

Presentation 100 test strips

Graduation 0 - 4 - 8 - 12 - 16 - 24 °d ≙ 0 - 5 - 10 - 15 - 20 - 30 °e

Carbonate hardness is part of the total hardness of water and is defined as that portion of alkaline earth ions present in the water for which there exists an equivalent amount of hydrogen carbonate ions and carbonate ions originating from dissolved carbonic acid.

Under heat, the carbonates and hydrogen carbonates of the hardening constituents precipitate as carbonates; for this reason, carbonate hardness was formerly termed "temporary hardness." It is this precipitation that leads to furring in heating systems, boilers and washing machines. The test can also be used to check the integrity of domestic filtering systems, water dehardeners and coffee machines.

Cl⁻ CHLORIDE Ord. No. 1.10079.0001

Merckoquant® Chloride Test

Presentation 100 test strips
Graduation 0 – 500 – 1000 – 1500 – 2000 – 3000 mg/l Cl⁻

Chloride ions occur in all natural waters. Their concentration depends on geological factors and the general local situation. In forced irrigation systems, for example, regularly monitoring chloride concentrations in ground water stops the soil becoming too saline.

Also, prior to COD measurements the chloride content of the sample should be known as this has a bearing on the method used and hence on the results obtained.

In the food industry chloride (common salt) is used in vast quantities as a preservative. Here, too, the test strip can be used for monitoring purposes.

The following concentrations of foreign ions (in mg/l) do not interfere with the determination.

Ag ⁺	75	Hg ²⁺	75	PO ₄ ³⁻	1,000
Al ³⁺	1,000	I ⁻	100	S ²⁻	20
Ascorbate	10	K ⁺	1,000	SCN ⁻	100
Br ⁻	75	Mg ²⁺	1,000	Sn ²⁺	1,000
Ca ²⁺	1,000	Na ⁺	1,000	SO ₃ ²⁻	1,000
CN ⁻	20	NH ₄ ⁺	1,000	SO ₄ ²⁻	1,000
CrO ₄ ²⁻	1,000	Ni ²⁺	1,000	S ₂ O ₃ ²⁻	75
Cu ²⁺	1,000	NO ₂ ⁻	1,000	Zn ²⁺	1,000
Fe ^{2+/3+}	1,000	NO ₃ ⁻	1,000	EDTA	1,000



Cl₂ CHLORINE Ord. No. 1.17925.0001

Merckoquant® Chlorine Test

Presentation 75 test strips
Graduation 0 – 0.5 – 1 – 2 – 5 – 10 – 20 mg/l Cl₂

The Chlorine Test is a rapid exploratory test for chlorine and is intended primarily for checking the use of chlorinated disinfectants. Chlorinated disinfectants are still in common use all over the world, their major applications being in the chlorination of drinking water and swimming pools. Unlike chlorine additions the purpose of which is to raise the concentration to several mg/l above normal, lower-concentration chlorination calls for maintenance of a prescribed concentration requiring regular chlorine monitoring. Chlorine must then be continually added to make up for decomposition and reduction losses.

The following concentrations of foreign ions (in mg/l) do not interfere with the determination.

Al ³⁺	500	Cr ₂ O ₇ ²⁻	100	NO ₂ ⁻	0.5
Br ₂	0.05	Cu ²⁺	250	S ²⁻	0.1
Ca ²⁺	1,000	Fe ³⁺	1,000	NaCl	2.5%
CN ⁻	0.2	H ₂ O ₂	0.5	NaNO ₃	0.1%
Cr ³⁺	1,000	I ₂	0.5	Na ₂ SO ₄	10%

Cl₂ CHLORINE Ord. No. 1.17924.0001

Merckoquant® Chlorine Test

Presentation 100 test strips
Graduation 0 – 25 – 50 – 100 – 200 – 500 mg/l Cl₂

Higher concentrations of chlorinated disinfectants are added primarily to raise the chlorine concentration to several mg/l above normal. In this type of chlorination the test is used to monitor chlorine concentrations at various points within the apparatus or pipework in order to ensure that the prescribed concentration is reached everywhere within the system. Where this concentration is not reached, adequate disinfection is not assured.

The following concentrations of foreign ions (in mg/l) do not interfere with the determine.

Al ³⁺	1,000	Cr ₂ O ₇ ²⁻	1	NO ₂ ⁻	5
Br ₂	10	Cu ²⁺	250	S ²⁻	5
Ca ²⁺	1,000	Fe ³⁺	250	NaCl	10%
CN ⁻	5	H ₂ O ₂	10	NaNO ₃	10%
Cr ³⁺	1,000	I ₂	5	Na ₂ SO ₄	5%

The following concentrations of foreign ions (in mg/l) do not interfere with the determination.

Ag ⁺	1,000	F ⁻	1,000	NO ₂ ⁻	1,000
Al ³⁺	1,000	Fe ²⁺	1	NO ₃ ⁻	1,000
Ba ²⁺	1,000	Fe ³⁺	25	PO ₄ ³⁻	1,000
Ca ²⁺	1,000	Hg ⁺	25	S ²⁻	1
Cl ⁻	1,000	Hg ²⁺	100	Sn ²⁺	1
CN ⁻	1,000	Mg ²⁺	1,000	SO ₃ ²⁻	1
Co ²⁺	1,000	MnO ₄ ⁻	10	SO ₄ ²⁻	1,000
Cu ²⁺	100	MoO ₄ ²⁻	25	S ₂ O ₃ ²⁻	1

The following concentrations of foreign ions (in mg/l) do not interfere with the determination.

Al ³⁺	1,000	Fe ^{2+/3+}	1,000	NO ₂ ⁻	250
Ca ²⁺	1,000	[Fe(CN) ₆] ^{3-/4-}	10	NO ₃ ⁻	1,000
Cd ²⁺	1,000	Hg ⁺	300	PO ₄ ³⁻	1,000
Cl ⁻	1,000	K ⁺	1,000	Sn ²⁺	1,000
CN ⁻	1	Mg ²⁺	1,000	SO ₃ ²⁻	1,000
CrO ₄ ²⁻	1,000	Na ⁺	1,000	SO ₄ ²⁻	1,000
Cu ²⁺	1,000	Ni ²⁺	1,000	Zn ²⁺	1,000

The following concentrations of foreign ions (in mg/l) do not interfere with the determination.

Ag ⁺	1,000	Fe ^{2+/3+}	1,000	NO ₂ ⁻	1,000
Al ³⁺	1,000	[Fe(CN) ₆] ^{3-/4-}	1	NO ₃ ⁻	1,000
Ca ²⁺	1,000	I ⁻	250	Pb ²⁺	1,000
Cd ²⁺	1,000	K ⁺	1,000	PO ₄ ³⁻	1,000
Cl ⁻	1,000	Mg ²⁺	1,000	SO ₃ ²⁻	1,000
CN ⁻	1	Na ⁺	1,000	SO ₄ ²⁻	1,000
Co ²⁺	1,000	NH ₄ ⁺	1,000	Zn ²⁺	1,000
CrO ₄ ²⁻	500	Ni ²⁺	1,000		

The following concentrations of foreign ions (in mg/l) do not interfere with the determination.

Ag ⁺	1	Cu ²⁺	1	Ni ²⁺	1,000
Al ³⁺	1,000	Fe ^{2+/3+}	1,000	NO ₂ ⁻	50
Br ⁻	5	Hg ^{+/2+}	1	NO ₃ ⁻	1,000
Ca ²⁺	1,000	I ⁻	5	PO ₄ ³⁻	1,000
Cd ²⁺	1,000	K ⁺	1,000	S ²⁻	100
Cl ⁻	1,000	Mg ²⁺	1,000	SCN ⁻	1
Co ²⁺	1,000	MnO ₄ ⁻	50	SO ₄ ²⁻	1,000
CrO ₄ ²⁻	50	Na ⁺	1,000	Zn ²⁺	1,000

Merckoquant® Chromate Test

Presentation 100 test strips and reagent

Graduation 0 – 3 – 10 – 30 – 100 mg/l CrO₄²⁻

The Chromate Test can be used to monitor waste water discharged from electroplating and pickling plants, tanneries, etc. and for rapidly and reliably determining chromium salts in many industrial processes. In-process controls in the tanning and chrome-plating industries can also be performed using this test, either directly or following dilution.

Like in other cation detection tests (Fe, Ni, Cu), this test strip is suitable for non-destructive surface testing in order to identify certain types of steel, for instance.

Co²⁺ COBALT

Merckoquant® Cobalt Test

Presentation 100 test strips

Graduation 0 – 10 – 30 – 100 – 300 – 1000 mg/l Co²⁺

Interesting applications for the Cobalt Test are to be found in the testing of waste water, electroplating baths, in the electronics industry, metal industry, in the assaying and refining of ores, and for checking pigments and other colorants in the glass and ceramic industries.

Like in other cation detection tests (Fe, Ni, Cu), this test strip is suitable for non-destructive surface testing for cobalt.

Cu^{1+/2+} COPPER

Merckoquant® Copper Test

Presentation 100 test strips

Graduation 0 – 10 – 30 – 100 – 300 mg/l Cu^{1+/2+}

The test is suitable, for instance, for monitoring and testing waste water, electroplating solutions, and copper etching baths used in the manufacture of printing plates and printed circuits. Copper compounds are used as anti-corrosive agents, wood preservers, cutting fluids and lubricants. They are also used in tanning processes, in paint manufacture and as oxidizing agents. In some cases the sample may need pre-treatment while in others the test can be applied directly.

Like in other cation detection tests (Fe, Ni, Cr), this test strip is suitable for non-destructive surface testing.

CN⁻ CYANIDE

Merckoquant® Cyanide Test

Presentation 100 test strips and reagents

Graduation 0 – 1 – 3 – 10 – 30 mg/l CN⁻

The effluent from electroplating works must be monitored for cyanide to ensure that none of this bacteriotoxic substance finds its way into treatment works. The test may also be used to monitor cyanide waste treatment plant. Only readily dissociable cyanides are detected.

Ag⁺ FIXING BATH (SILVER and pH) Ord. No. 1.10008.0001**Merckoquant® Fixing bath Test**

Presentation 100 test strips

Graduation 0 – 0.5 – 1 – 1.7 – 3 – 5 – 7 – 10 g/l Ag⁺
pH 4 – 5 – 6 – 7 – 8

The Fixing Bath Test provides a rapid method for establishing whether a fixing bath is still fresh enough to fix films and prints properly. Performing a simultaneous pH determination provides an additional benefit in that a change in the pH value also signals that the bath is stale. Furthermore, the test can be used to monitor the recovery of silver from fixing baths.

The following concentrations of foreign ions (in mg/l) do not interfere with the determination.

Al ³⁺	1,000	Fe ^{2+/3+}	250	Ni ²⁺	1,000
Co ²⁺	250	Hg ²⁺	250	Sn ²⁺	1,000
Cu ²⁺	1,000	Mn ²⁺	1,000	Zn ²⁺	1,000

HCHO FORMALDEHYDE Ord. No. 1.10036.0001**Merckoquant® Formaldehyde Test**

Presentation 100 test strips and reagent

Graduation 0 – 10 – 20 – 40 – 60 – 100 mg/l Formaldehyde

Formaldehyde is used as a disinfectant for surfaces and medical equipment, and also as a raw material for binders and fixing agents, and as a preservative. Formaldehyde is also a naturally occurring breakdown and intermediate product in foods, and may give some hint of the age and condition of the product.

The test also responds to other aldehydes such as acetaldehyde or glutaraldehyde, though only at higher concentrations, when the color produced is different from that of the color scale.

Ketones, esters, amides, hydrazines, hydroxylamines, quinones, aminophenol, uric acid and formic acid prevent the proper color reactions from taking place, while strong oxidizing and reducing agents interfere by reducing the detection sensitivity.

**Fe²⁺ IRON Ord. No. 1.10004.0001****Merckoquant® Iron Test**

Presentation 100 test strips

Graduation 0 – 3 – 10 – 25 – 50 – 100 – 250 – 500 mg/l Fe²⁺

The test strips offer a very simple means of determining iron in all aqueous media and on metal surfaces. They can thus be used to distinguish between ferrous and non-ferrous metals. Applications of interest include the analysis of foodstuffs and checking the use (control and optimization) of iron compounds as flocculating agents in waste water treatment.

The following concentrations of foreign ions (in mg/l) do not interfere with the determination.

Ag ⁺	1,000	Cu ²⁺	500	NO ₂ ⁻	1,000
Al ³⁺	1,000	[Fe(CN) ₆] ^{3-/4-}	5	NO ₃ ⁻	1,000
Ba ²⁺	1,000	Hg ^{+/2+}	1,000	PO ₄ ³⁻	1,000
Ca ²⁺	1,000	K ⁺	1,000	Sn ²⁺	1,000
Cd ²⁺	1,000	Mg ²⁺	1,000	SO ₃ ²⁻	1,000
Cl ⁻	1,000	Na ⁺	1,000	SO ₄ ²⁻	1,000
CN ⁻	1,000	NH ₄ ⁺	1,000	VO ₃ ⁻	250
Co ²⁺	250	Ni ²⁺	1,000	Zn ²⁺	1,000

The following concentrations of foreign ions (in mg/l) do not interfere with the determination.

Ag ⁺	300	Cu ²⁺	100	NO ₃ ⁻	1,000
Al ³⁺	1,000	Fe ²⁺	300	PO ₄ ³⁻	1,000
Ba ²⁺	10	Fe ³⁺	100	S ²⁻	10
Ca ²⁺	1,000	K ⁺	1,000	Sn ²⁺	300
Cd ²⁺	1,000	Mg ²⁺	1,000	SO ₃ ²⁻	10
Cl ⁻	1,000	Na ⁺	1,000	SO ₄ ²⁻	1,000
CN ⁻	1,000	Ni ²⁺	1,000	Sr ²⁺	100
Co ²⁺	1,000	NO ₂ ⁻	1,000	Zn ²⁺	1,000

The following concentrations of foreign ions (in mg/l) do not interfere with the determination.

Ag ⁺	25	Cu ²⁺	100	NO ₃ ⁻	1,000
Al ³⁺	1,000	Fe ²⁺	25	Pb ²⁺	1,000
Ca ²⁺	1,000	Fe ³⁺	10	PO ₄ ³⁻	1,000
Cl ⁻	1,000	K ⁺	1,000	S ²⁻	10
CN ⁻	1,000	Mg ²⁺	1,000	Sn ²⁺	25
Co ²⁺	50	Ni ²⁺	1,000	SO ₃ ²⁻	100
Cr ³⁺	0.05	Na ⁺	1,000	SO ₄ ²⁻	1,000
CrO ₄ ²⁻	10	NO ₂ ⁻	10	Zn ²⁺	1,000

The following concentrations of foreign ions (in mg/l) do not interfere with the determination.

Ag ⁺	100	CrO ₄ ²⁻	100	Ni ²⁺	1,000
Al ³⁺	1,000	Cu ²⁺	10	NO ₂ ⁻	1,000
Ca ²⁺	1,000	Fe ^{2+/3+}	1,000	NO ₃ ⁻	1,000
Cd ²⁺	1,000	Hg ²⁺	100	Pb ²⁺	1,000
Cl ⁻	1,000	K ⁺	1,000	PO ₄ ³⁻	1,000
CN ⁻	1,000	Mg ²⁺	1,000	S ²⁻	10
Co ²⁺	1,000	MnO ₄ ⁻	1,000	Sn ²⁺	10
Cr ³⁺	1,000	Na ⁺	1,000	Zn ²⁺	1,000

The following concentrations of foreign ions (in mg/l) do not interfere with the determination.

Ag ⁺	1,000	CrO ₄ ²⁻	1,000	Na ⁺	1,000
Al ³⁺	1,000	Cu ²⁺	1,000	NH ₄ ⁺	1,000
Ca ²⁺	1,000	Fe ^{2+/3+}	50	NO ₂ ⁻	1,000
Cd ²⁺	1,000	[Fe(CN) ₆] ^{3-/4-}	10	NO ₃ ⁻	1,000
Cl ⁻	1,000	Hg ⁺	220	Pb ²⁺	1,000
CN ⁻	50	Hg ²⁺	750	PO ₄ ³⁻	1,000
Co ²⁺	50	K ⁺	1,000	SO ₄ ²⁻	1,000
Cr ³⁺	1,000	Mg ²⁺	1,000	Zn ²⁺	1,000

Pb²⁺ LEAD

Ord. No. 1.10077.0001

Merckoquant® Lead Test

Presentation 100 test strips and reagent

Graduation 0 – 20 – 40 – 100 – 200 – 500 mg/l Pb²⁺

Despite being toxic, lead is a very versatile material that is still used, for instance, for cable sheathing, for protecting against x-ray and gamma radiation, in batteries, for manufacturing tubes and containers, and as a surface coating (red lead).

The test is only able to detect ionic lead; it cannot detect tetraethyllead as formerly used in leaded gasoline.

It can, however, detect lead and lead oxide deposited as combustion products in exhaust systems, on catalytic converters and on surfaces.

Mn²⁺ MANGANESE

Ord. No. 1.10080.0001

Merckoquant® Manganese Test

Presentation 100 test strips and reagents

Graduation 0 – 2 – 5 – 20 – 50 – 100 mg/l Mn²⁺

The Manganese Test can be used for routine testing of ground water, industrial water and effluent.

It can also be used for quality control purposes wherever manganese compounds are used in the manufacture of pigments, paints and anti-corrosives, in tanneries, and within the textile industry.

Mo⁶⁺ MOLYBDENUM

Ord. No. 1.10049.0001

Merckoquant® Molybdenum Test

Presentation 100 test strips and reagent

Graduation 0 – 5 – 20 – 50 – 100 – 250 mg/l Mo⁶⁺

The Molybdenum Test is chiefly used in the analysis of boiler water and cooling water as a means of measuring levels of molybdenum or molybdate added to inhibit corrosion.

The test can also be used to determine molybdenum on metallic surfaces, e.g. in order to differentiate between stainless steels with and without molybdenum (V 4A and V 2A, respectively).

Ni²⁺ NICKEL

Ord. No. 1.10006.0001

Merckoquant® Nickel Test

Presentation 100 test strips

Graduation 0 – 10 – 25 – 100 – 250 – 500 mg/l Ni²⁺

Typical applications for the Nickel Test include the testing of waste water and electroplating solutions. It also has various applications in the glass and ceramics industry, in the testing of catalysts and of mordants used for textile printing. It is a simple way of detecting metallic nickel in alloys and electroplated objects.

NO₃⁻ NITRATE**Ord. No.**

Merckoquant® Nitrate Test	1.10020.0001
Presentation	100 test strips
Graduation	0 – 10 – 25 – 50 – 100 – 250 – 500 mg/l NO ₃ ⁻

Merckoquant® Nitrate Test	1.10020.0002
Presentation	25 test strips
Graduation	0 – 10 – 25 – 50 – 100 – 250 – 500 mg/l NO ₃ ⁻

Nitrate must be closely monitored in drinking water, process water and waste water, as well as in aquarium water where limits can quickly be exceeded. Farm produce and fruit juices often contain excessive amounts of nitrate because too much fertilizer has been applied to the crop. Apart from affecting quality and keeping properties, high concentrations of nitrate in foods can damage health.

A common cause of limits being exceeded is overdressing with fertilizer in agriculture and horticulture. Here, too, the test can be used to test nitrogen levels in soil samples and so control and optimize the application of fertilizer.

Individually sealed test strips are also available in bulk packs for special actions.

Examples:

Content	Ord. No.
1,000 test strips	1.10092.0022
25,000 test strips	1.10092.0023

With 2 reaction zones: nitrate reaction zone and additional nitrite warning zone

5,000 test strips, individually sealed	1.10091.0022
25,000 test strips, individually sealed	1.10091.0023

With just nitrate reaction zone

The following concentrations of foreign ions (in mg/l) do not interfere with the determination.

Ag ⁺	50	Fe ³⁺	250	NO ₂ ⁻	0,5
Al ³⁺	1,000	[Fe(CN) ₆] ^{3-/4-}	100	PO ₄ ³⁻	1,000
Ca ²⁺	1,000	Hg ⁺	50	S ²⁻	25
Cl ⁻	1,000	Hg ²⁺	100	SCN ⁻	100
CN ⁻	1,000	K ⁺	1,000	SO ₃ ²⁻	500
Co ²⁺	1,000	Mg ²⁺	1,000	SO ₄ ²⁻	1,000
CrO ₄ ²⁻	20	Mn ²⁺	1,000	S ₂ O ₃ ²⁻	250
Cu ²⁺	1,000	MnO ₄ ⁻	10	Zn ²⁺	1,000
Fe ²⁺	500	Ni ²⁺	1,000		

NO₂⁻ NITRITE**Ord. No. 1.10022.0001**

Merckoquant® Nitrite Test	
Presentation	100 test strips
Graduation	0 – 0.1 – 0.3 – 0.6 – 1 – 2 – 3 g/l NO ₂ ⁻

Agents containing high levels of nitrite are used as corrosion inhibitors in the cooling systems of cars, trucks and ships' engines. They are also found in the heat transfer media used in solar powered systems. Regular testing avoids problems and provides the necessary protection against corrosion.

The following concentrations of foreign ions (in mg/l) do not interfere with the determination.

Ag ⁺	1,000	Cu ²⁺	1,000	NO ₃ ⁻	1,000
Al ³⁺	1,000	Fe ^{2+/3+}	500	PO ₄ ³⁻	1,000
Ca ²⁺	1,000	Hg ^{+/2+}	500	S ²⁻	100
Cd ²⁺	1,000	K ⁺	500	Sn ²⁺	100
Cl ⁻	1,000	Mg ²⁺	1,000	SO ₃ ²⁻	1,000
CN ⁻	1,000	Mn ²⁺	1,000	SO ₄ ²⁻	1,000
Co ²⁺	1,000	MnO ₄ ⁻	500	S ₂ O ₃ ²⁻	500
Cr ³⁺	1,000	NH ₄ ⁺	1,000	Zn ²⁺	1,000
CrO ₄ ²⁻	500	Ni ²⁺	1,000	EDTA	500



The following concentrations of foreign ions (in mg/l) do not interfere with the determination.

Ag ⁺	1,000	Fe ²⁺	1,000	Pb ²⁺	1,000
Al ³⁺	1,000	Fe ³⁺	100	PO ₄ ³⁻	1,000
Ba ²⁺	1,000	[Fe(CN) ₆] ³⁻	25	S ²⁻	25
Cd ²⁺	1,000	[Fe(CN) ₆] ⁴⁻	100	SCN ⁻	100
Cl ⁻	1,000	K ⁺	1,000	SO ₃ ²⁻	500
CN ⁻	1,000	Mg ²⁺	1,000	SO ₄ ²⁻	1,000
Co ²⁺	1,000	Mn ²⁺	1,000	S ₂ O ₃ ²⁻	250
Cr ³⁺	1,000	MnO ₄ ⁻	5	Zn ²⁺	1,000
CrO ₄ ²⁻	10	Ni ²⁺	1,000		
Cu ²⁺	1,000	NO ₃ ⁻	1,000		

The following concentrations of foreign ions (in mg/l) do not interfere with the determination.

Ascorbate	10	Fe ²⁺ /Fe ³⁺	10	SO ₃ ²⁻	100
Free Cl ₂	10	Formaldehyde	1,000	NO ₃ ⁻	1,000
Bound Cl ₂	5	H ₂ O ₂	1,000	Total hardness	38°d (1°d=10 mg/l CaO)

NO₂⁻ NITRITE

Ord. No.

Merckoquant® Nitrite Test		1.10007.0001
Presentation	100 test strips	
Graduation	0 - 2 - 5 - 10 - 20 - 40 - 80 mg/l NO ₂ ⁻	

Merckoquant® Nitrite Test		1.10007.0002
Presentation	25 test strips	
Graduation	0 - 2 - 5 - 10 - 20 - 40 - 80 mg/l NO ₂ ⁻	

Nitrite is a pollution indicator. The test therefore has interesting application possibilities in the analysis of drinking water, waste water and aquarium water, and of cutting oils, in which nitrite may occur as a decomposition product. Nitrite compounds are also used as additives in various foods and, as a consequence, the test is useful for determining nitrite in meat products, pickling solutions, brine and deep frozen spinach, as well as in milk and dairy products.

PERACETIC ACID

Ord. No.

Merckoquant® Peracetic acid Test		1.10084.0001
Presentation	100 test strips	
Graduation	0 - 5 - 10 - 20 - 30 - 50 mg/l peracetic acid	

Merckoquant® Peracetic acid Test		1.10001.0001
Presentation	100 test strips	
Graduation	0 - 100 - 150 - 200 - 250 - 300 - 400 - 500 mg/l peracetic acid	

Merckoquant® Peracetic acid Test		1.17922.0001
Presentation	100 test strips	
Graduation	0 - 500 - 1000 - 1500 - 2000 mg/l peracetic acid	

Peracetic acid is a commonly used disinfectant. The test is suited for the selective determination of peracetic acid traces in aqueous solutions and for checks for the absence of peracetic acid after rinsing processes, also in cases in which hydrogen peroxide is present.

The Peracetic Acid Tests for higher concentrations of peracetic acid are eminently suitable for checking that the prescribed end concentrations of peracetic acid-based detergents are being maintained. Regular monitoring is recommended as peracetic acid solutions are very unstable.

Strong oxidizing agents such as halogens (chlorine, bromine, iodine) and hypochlorite can produce "false-positives".

O ₂ ²	PEROXIDE	Ord. No.
Merckoquant® Peroxide Test		1.10011.0001
Presentation	100 test strips	
Graduation	0 – 0.5 – 2 – 5 – 10 – 25 mg/l H ₂ O ₂	
Merckoquant® Peroxide Test		1.10011.0002
Presentation	25 test strips	
Graduation	0 – 0.5 – 2 – 5 – 10 – 25 mg/l H ₂ O ₂	
Merckoquant® Peroxide Test		1.10081.0001
Presentation	100 test strips	
Graduation	0 – 1 – 3 – 10 – 30 – 100 mg/l H ₂ O ₂	

The Peroxide Test detects inorganic and organic compounds that contain a peroxide or hydroperoxide group. It is ideal, therefore, for the routine checking of simple ethers. Polymeric peroxides, on the other hand, are only detected with reduced sensitivity, if at all.

Peroxide is an all purpose disinfectant which, due to its excellent antiviral, bactericidal and fungicidal action, is widely used in the food industry. Here, the test is ideal for testing for residues on equipment or the product itself following cleaning and rinsing. The Peroxide Test with the higher measuring range is especially suitable for monitoring prescribed cleaning agent concentrations. With it, the sample does not need to be diluted. Regular monitoring is recommended as peroxide solutions are very unstable.

O ₂ ²	PEROXIDE	Ord. No. 1.10337.0001
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Merckoquant® Peroxide Test	
Presentation	100 test strips
Graduation	0 – 100 – 200 – 400 – 600 – 800 – 1000 mg/l H ₂ O ₂

This Peroxide Test covers very high substance concentrations and is thus eminently suitable for checking high-strength cleaning solutions without the need to dilute the samples. Regular monitoring is recommended as peroxide solutions are very unstable. This applications for this test are the same as for the two other tests, the only difference being that the use of a different detection method means that the interfering ions also differ.

pH	Ord. No. 1.09535.0001
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pH Indicator Strips, non-bleeding	
Presentation	100 test strips
Graduation	0 – 1 – 2 – 3 – 4 – 5 – 6 – 7 – 8 – 9 – 10 – 11 – 12 – 13 – 14 pH

These pH Indicator Strips contain special indicators or reactive dyes that are covalently bound to the cellulose of the reagent paper. The production process gives the pH Indicator Strips significant benefits over simple indicator papers in that they have universal applications. As the indicator does not bleed, the test strips can be left in weakly buffered solutions without causing contamination of the medium being tested.

The following concentrations of foreign ions (in mg/l) do not interfere with the determination.

CrO ₄ ²⁻	10	IO ₄ ⁻	40	VO ₃ ⁻	5
[Fe(CN) ₆] ^{3-/4-}	10	MnO ₄ ⁻	2		
Hg ⁺	250	S ₂ O ₈ ²⁻	20		

The following concentrations of foreign ions (in mg/l) do not interfere with the determination.

Ascorbate	100	Fe ²⁺	5	NO ₃ ⁻	500
Free Cl ₂	100	Fe ³⁺	5	SO ₃ ²⁻	5
Bound Cl ₂	100	Formaldehyde	1,000	Total hardness	70 °d
				(1 °d = 10 mg/l CaO)	

► The "pH Tests at a glance" brochure lists the full range of pH indicator strips and pH indicator papers.

The following concentrations of foreign ions (in mg/l) do not interfere with the determination.

Ag ⁺	100	Fe ²⁺ /Fe ³⁺	250	NO ₂ ⁻	10
Al ³⁺	1,000	H ₂ O ₂	100	NO ₃ ⁻	1,000
Ca ²⁺	1,000	K ⁺	500	SO ₃ ²⁻	1,000
Cl ⁻	1,000	Mg ²⁺	1,000	Anionic surfactants	500
Cr ³⁺	250	Mn ²⁺	1,000	Cationic surfactants	100
CrO ₄ ²⁻	250	NH ₄ ⁺	1,000	Non-ionic surfactants	100
Cu ²⁺	250	Ni ²⁺	1,000		

The following concentrations of foreign ions (in mg/l) do not interfere with the determination.

Al ³⁺	1,000	Fe ^{2+/3+}	1,000	NH ₄ ⁺	200
Ba ²⁺	1,000	Hg ⁺	200	NO ₂ ⁻	1,000
Ca ²⁺	1,000	Li ⁺	500	NO ₃ ⁻	1,000
Cl ⁻	1,000	Mg ²⁺	1,000	PO ₄ ³⁻	1,000
CN ⁻	1,000	MnO ₄ ⁻	1	S ²⁻	20
Cu ²⁺	1,000	Na ⁺	1,000	SO ₄ ²⁻	1,000

The following concentrations of foreign ions (in mg/l) do not interfere with the determination.

Formaldehyde	1,000	Glyoxal	1,000	Protein (BSA)	100
Glutaraldehyde	1,000	H ₂ O ₂	1,000		

No interference is caused by protein concentrations below 1 g/l.

PO₄³⁻ PHOSPHATE

Ord. No. 1.10428.0001

Merckoquant® Phosphate Test

Presentation 100 test strips and reagent

Graduation 0 – 10 – 25 – 50 – 100 – 250 – 500 mg/l PO₄³⁻

The Phosphate Test is suitable for determining ortho-phosphate in waste water, soil samples, fertilizers and suitably prepared food samples.

Phosphate detergents present in waste water are responsible for producing environmentally damaging algal bloom. Plants on the other hand need phosphorus in the form of phosphate particularly during growth and ripening. Regular monitoring of phosphate levels in soil is needed to prevent a deficit or surfeit of phosphate. Phosphate occurs naturally in food. The body needs it for proper bone growth. At higher concentrations, however, phosphate can have a damaging effect.

K⁺ POTASSIUM

Ord. No. 1.10042.0001

Merckoquant® Potassium Test

Presentation 100 test strips and reagent

Graduation 0 – 250 – 450 – 700 – 1000 – 1500 mg/l K⁺

The test is suitable for determining the amount of potassium in drinking water, mineral water, process and waste waters, extracts of soil samples, wine, beer, fruit juice and other substances.

The test has the particular advantage that potassium can still be determined even when 10 times the amount of sodium is present.

QUATERNARY AMMONIUM COMPOUNDS

Ord. No. 1.17920.0001

Merckoquant® Quaternary Ammonium Compounds

Presentation 100 test strips

0 – 10 – 25 – 50 – 100 – 250 – 500 mg/l (as benzalkonium chloride)

Quaternary ammonium compounds have microbicidal properties and are mainly used in surface cleaners. The test strips can be used to check and maintain the surface cleaner at the correct strength following dilution.



SO₄²⁻ SULFATE Ord. No. 1.10019.0001

Merckoquant® Sulfate Test

Presentation 100 test strips
Graduation 0 – 200 – 400 – 800 – 1200 – 1600 mg/l SO₄²⁻

The Sulfate Test is a rapid exploratory test. It can be used to give a rough estimation of the sulfate ion content of drinking and industrial water, as well as of effluent discharged, for instance, from electroplating works and leather goods manufacturers. In food testing, too, the test strips can be used to test for relevant food additives.

The following concentrations of foreign ions (in mg/l) do not interfere with the determination.

Al ³⁺	100	CrO ₄ ²⁻	400	S ²⁻	25
CN ⁻	50	Cu ²⁺	10	SO ₃ ²⁻	25
Cr ³⁺	100	[Fe(CN) ₆] ^{3-/4-}	400		

SO₃²⁻ SULFITE Ord. No. 1.10013.0001

Merckoquant® Sulfite Test

Presentation 100 test strips
Graduation 0 – 10 – 40 – 80 – 180 – 400 mg/l SO₃²⁻

The Sulfite Test has useful applications in food analysis, particularly in the testing of wine and fruit juices, sulfurated foods (e.g. fresh and dried fruit), fish, shellfish, crustaceans and minced meat products. Excessive concentrations of sulfite can provoke allergic reactions in sensitive persons.

Sulfite is sometimes used as reducing agent in process water. In this type of application, too, levels of sulfite can be monitored to prevent harmful discharges.

The following concentrations of foreign ions (in mg/l) do not interfere with the determination.

Ag ⁺	25	Cu ²⁺	10	NH ₄ ⁺	1,000
Al ³⁺	1,000	Fe ²⁺	1,000	Ni ²⁺	1,000
Ascorbate	100	Fe ³⁺	10	NO ₂ ⁻	1,000
Ba ²⁺	25	[Fe(CN) ₆] ³⁻	50	NO ₃ ⁻	1,000
Ca ²⁺	1,000	[Fe(CN) ₆] ⁴⁻	1,000	Pb ²⁺	25
Cd ²⁺	1,000	Mg ²⁺	1,000	PO ₄ ³⁻	1,000
Cl ⁻	1,000	Mn ²⁺	1,000	S ²⁻	50
CN ⁻	1,000	MnO ₄ ⁻	10	SO ₄ ²⁻	1,000
CrO ₄ ²⁻	10	Na ⁺	1,000	Zn ²⁺	1,000

Sn²⁺ TIN Ord. No. 1.10028.0001

Merckoquant® Tin Test

Presentation 50 test strips and reagent
Graduation 0 – 10 – 25 – 50 – 100 – 200 mg/l Sn²⁺

The Tin Test can be used to test for tin and tin compounds in electroplating baths, reducing agents, stabilizers, catalysts, disinfectants, fungicides and mordants used in the textile industry and, more especially, in liquid foods such as canned juices and preserves. Depending on the quality of the tin plating, the storage temperature and whether the can has been opened, significant quantities of tin may be absorbed by the product.

The following concentrations of foreign ions (in mg/l) do not interfere with the determination.

Ag ⁺	25	Cu ²⁺	25	NO ₃ ⁻	1,000
Al ³⁺	1,000	Fe ^{2+/3+}	100	Pb ²⁺	25
Ca ²⁺	1,000	Hg ^{+/2+}	25	PO ₄ ³⁻	1,000
Cd ²⁺	500	K ⁺	1,000	S ²⁻	500
Cl ⁻	1,000	Mg ²⁺	1,000	SO ₃ ²⁻	1,000
CN ⁻	1,000	Mn ²⁺	1,000	SO ₄ ²⁻	1,000
Co ²⁺	1,000	Na ⁺	1,000	S ₂ O ₃ ²⁻	1,000
Cr ³⁺	1,000	Ni ²⁺	500	Zn ²⁺	1,000
CrO ₄ ²⁻	500	NO ₂ ⁻	500	EDTA	1,000



Knowing how hard the water is in a particular area enables detergents to be used more economically, thereby cutting down on pollution. The test can also be used to check the efficiency of domestic or industrial water softeners. Coffee machines used in the catering industry use ion exchangers to soften water, as do dishwashers. The test strips may be used to obtain fast results that are precise enough for performing in-process controls in industrial water treatment plants.

Individually sealed test strips are also available in bulk packs for special actions. Examples:

Content	Ord. No.:
5,000 test strips, individual (not sealed)	1.10029.0001
1,000 test strips, individual sealed	1.10032.0001
25,000 test strips, individual sealed	1.10032.0013

With 4 reaction zones: graduation 4-5-9-18-26 °e

25,000 test strips, individually sealed	1.10047.0013
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With 5 reaction zones: graduation 6-12-19-25-30 °e

The following concentrations of foreign ions (in mg/l) do not interfere with the determination.

Ag ⁺ 1,000	Cu ²⁺ 5	NO ₂ ⁻ 1,000
Al ³⁺ 1,000	Fe ^{2+/3+} 1,000	NO ₃ ⁻ 1,000
Ca ²⁺ 500	Hg ^{+/2+} 5	Pb ²⁺ 1,000
Cd ²⁺ 1,000	Mg ²⁺ 500	PO ₄ ³⁻ 1,000
Cl ⁻ 1,000	Mn ²⁺ 100	S ²⁻ 25
CN ⁻ 200	MnO ₄ ⁻ 25	SO ₃ ²⁻ 1,000
Co ²⁺ 1,000	NH ₄ ⁺ 500	SO ₄ ²⁻ 1,000
Cr ³⁺ 100	Ni ²⁺ 25	

In addition to its test strip ranges Merck sells an assortment of reagent papers in roll form. Packaged in this way, the papers are protected from external factors such as moisture, light, acidic and alkaline gases, etc. They give just a yes/no result, based on evaluation using one negative and two positive reference colors. No concentrations are listed.

The reagent papers have been used for a good number of years now and still feature in various monographs (e.g. in Reag. Ph Eur).

TOTAL HARDNESS (SUM OF ALKALINE EARTH IONS)		Ord. No.
Merckoquant® Total hardness Test		1.10025.0001
Presentation	100 test strips	
Graduation	3 - 4 - 7 - 14 - 21 °d* ± 4 - 5 - 9 - 18 - 26 °e	

Merckoquant® Total hardness Test		1.10046.0001
Presentation	100 test strips	
Graduation	5 - 10 - 15 - 20 - 25 °d* ± 6 - 12 - 19 - 25 - 30 °e	

* The so-called "German degree" is frequently used as a practical measurement unit for hardness; this degree is defined as follows: 1 °d = 10 mg/l CaO ± 17.8 mg/l CaCO₃ ± 1.25 °e ± 1.78 °f

Water hardness is caused by the presence of alkaline earths, primarily calcium and magnesium. Total hardness is measured as the sum of all calcium and magnesium ions.

Zn²⁺ ZINC Ord. No. 1.10038.0001

Merckoquant® Zinc Test	
Presentation	100 test strips and reagent
Graduation	0 - 10 - 40 - 100 - 250 mg/l Zn ²⁺ ± 4 - 5 - 9 - 18 - 26 °e

Zinc and zinc compounds are used in galvanizing plants, in zinc paints, as mordant in the textile industry, as preservatives, as additives in glass, enamel and ceramic ware and also, because of their antiseptic properties, in cosmetic preparations. Zinc is a trace element which plays a vital role in human, animal and plant organisms. Small quantities of zinc are found in many types of meats and vegetables. Excessive concentrations of zinc, on the other hand, can have a damaging effect.

REAGENT PAPERS	Ord. No.
Lead acetate paper	1.09511.0003
Presentation	3 rolls of 4.8 meter length
Lead acetate paper is used to check for sulfide and hydrogen sulfide.	
Potassium iodide starch paper, Reag. Ph Eur	1.09512.0003
Presentation	3 rolls of 4.8 meter length
Potassium iodide starch paper is used to check for oxidizing agents.	
Potassium iodate starch paper, Reag. Ph Eur	1.59225.0003
Presentation	3 rolls of 4.8 meter length
Potassium iodate starch paper is used to check for reducing agents.	
Chlorine test paper	1.17923.0001
Graduation	0 - 25 - 50 - 100 - 200 - 500 mg/l Cl ₂
Presentation	3 rolls of 4 meter length
Chlorine test paper is used to check for free chlorine, and is ideal for supervising the use of chlorinated disinfectants.	

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