

MACHEREY-NAGEL

Medi-Test urine analysis



Easy urine analysis

- Urine analysis with test strips
- URYXXON® Relax
automated urine analysis at the point of care
- URYXXON® 500
high performance urine analysis

MACHEREY-NAGEL

www.mn-net.com



The Company

Welcome to MACHEREY-NAGEL

We are pleased that you are interested in our high-quality medical test strips. This brochure gives you an overview over our different products and applications in the fields of urine analysis.

Since its foundation in 1911, the roots of MACHEREY-NAGEL are the production of high-quality filter papers. Since the fifties, we have developed filter papers into top quality test papers for laboratory use. Today, we offer the world's largest selection of different test papers. Additionally, we offer a versatile program of special products for analytical chemistry including Chromatography, Water Analysis and Bioanalysis.

The production facilities of our test strips, as well as our company headquarter, are located in Düren (Germany). Local sales offices for test strips are found in Switzerland, France and the US.

Medical test strips

In the late seventies, MACHEREY-NAGEL started producing high-quality test strips for urine analysis. At that time, we were the fourth manufacturer of such test strips worldwide. Since then we have continuously developed the chemistry of our test strips. We are proud that today customers in more than 70 countries trust the outstanding quality of our medical test strips.

In addition, many pharmaceutical companies rely on MACHEREY-NAGEL. pH test strips manufactured by MN are used to monitor the dosing of different medications. They are CE-marked according to the IVD Directive 98/79/EC.

Certified quality

Already since 1996, MACHEREY-NAGEL is certified according to EN ISO 9001. Obviously, we are also certified according to EN ISO 13485 and fulfill the requirements of the European Medical Device and IVD Directives. Today we are among the few manufacturers who can offer urine test strips with CE certification not only for professionals, but also for patient self-testing.

MACHEREY-NAGEL meets your needs

If you have any questions concerning the Medi-Test products in this catalog please feel free to contact us:

Technical support and customer service:

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Product Management Medi-Test:

+49 24 21 969-166

Please visit our Medi-Test Pages: www.mn-net.com



▪ Quality made in Germany

▪ Urine analysis for more than 30 years
▪ Special pH papers for the pharmaceutical industry

▪ EN ISO 13485 and
▪ EN ISO 9001 certified

▪ We are pleased to advise you



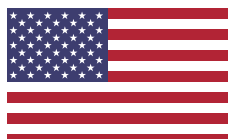
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Urine analysis

Urine analysis with test strips

The use of urine test strips is acknowledged as a modern screening method in medical practice. With these non-invasive tests important information on the health status of patients is rapidly obtained. The urine sample is easily drawn and can be investigated immediately with a test strip. Thus one obtains results within minutes, which facilitates the decision on further diagnostic and therapeutic action.

Only on pathological results for certain parameters, a subsequent, e.g. microscopic, examination of the urine is necessary. If the test strip result is without pathological findings and the patient is not clinically conspicuous, further time- and cost-intensive investigations can often be avoided.

This saves considerable costs for the healthcare system and avoids unnecessary examinations for the patient.

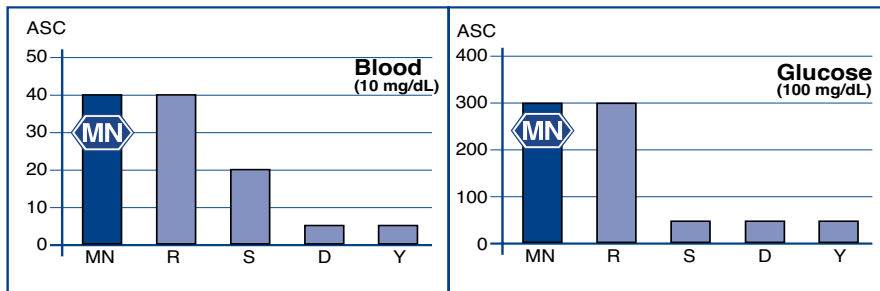
Urine test strips from MACHEREY-NAGEL are especially user-friendly. Due to the high resistance towards ascorbic acid interferences a second testing for sensitive parameters such as blood or glucose is unnecessary in most cases. The optimized, flexible shape of the test strips also allows the examination of very small amounts of urine. This makes urine analysis reliable and easy.

Best available vitamin C protection

The test pads for glucose and blood have the best available protection against interferences caused by vitamin C (ascorbic acid). This ensures correct results even when fruit juice or vitamin tablets are consumed. Eating restrictions do not apply.

The excretion of vitamin C is harmless in itself. However, vitamin C interferes with important oxidation reactions. With many test strips this leads to false negative readings for blood and glucose.

The Medi-Test technology overcomes the influence of vitamin C. This ensures optimal and safe results for all important urine parameters.



- Urine test strips offer a rapid survey of a patient's health status
- Urine chemistry – rapid and reliable
- Flexible strip design for small volume urine samples

- Concentration of vitamin C in the sample, with no effect on the results for blood and glucose in urine (mg/dL)

Safe and easy quality control - Medi-Test Control

In professional use it is recommended to confirm the performance of test strips by use of positive and negative control solutions. Positive and negative controls should be analyzed once a day, whenever a new bottle of strips is opened, whenever a new lot of strips is started, and every 30 days to check storage conditions. Each laboratory should establish its own goals for adequate standards of performance, and should question handling and testing procedures if these standards are not met. Medi-Test Control are specially formulated control reagents to ensure optimal and convenient quality control for Medi-Test urine test strips and URYXXON® strip readers. It is free of biological urine or any other biologically hazardous material and therefore does not need hazardous labelling.

The reagents can be used immediately without any further preparation and the large reagent tubes make working with Medi-Test Control particularly easy.



Automated urine analysis at the point of care

The URYXXON® Relax device provides dependable urine status results to detect early stages of many diseases such as diabetes, kidney disease and urinary tract infections. Instrument-read results have long proven to be advantageous for both busy health care professionals and patients. URYXXON® Relax readings eliminate the subjectivity of visual color interpretation. The comprehensive interface options and the optimized printouts minimize risks associated with manual transcriptions. Reliable results can be obtained immediately at the point of care.

The URYXXON® Relax makes urine analysis easier and more reliable.

Technical specifications

Capacity

- 50 strips/h

Instrument memory

- 200 patient test results including name or patient ID

Interface

- User: Touch-screen display, alphanumeric input, password protection
- Computer: USB interface for connection to PC alternatively RS 232 interface for connection to PC and PS/2 interface for connection of keyboard and/or barcode reader

Power requirements

- 110–240 V AC, automatic
- Battery powered operation (optional) with 6 AA batteries

Dimensions / Weight

- Depth: 20 cm (8 inches)
- Width: 16 cm (6 inches)
- Height: 7.5 cm (3 inches)
- Weight: 710 g (1.90 lb), without batteries and power supply

Operation

- Temperature range: 10 °C - 40 °C (50 F - 104 F)
- Humidity range: 20–80% relative humidity, non condensing
- Calibration: automatic, self-calibrating

- 50 measurements/h
- Autostart
- High precision optics



- Medi-Test URYXXON® Stick 10



URYXXON® 500

High performance urine analysis

The URYXXON® 500 is an automatic reader for URYXXON® Stick 10 urine test strips. With a capacity of 400 strips per hour, it is ideal for use in hospitals and practices. The “easy-to-use-features” allow hygienic operation with hardly any training.

The URYXXON® 500 provides dependable urine status results to detect early stages of many diseases such as urinary tract infection, kidney diseases or diabetes. The device eliminates the subjectivity of visual strip evaluation and minimizes risks associated with manual result transcription.

The URYXXON® 500 makes urine analysis quicker, easier and more reliable.

Technical specifications

Capacity

- 400 strips/h

Instrument memory

- 500 patient test results including name or patient ID

Interface

- User: Touch-screen display, alphanumeric input, password protection
- Computer: 1 x USB and 2 x RS232 interfaces for connection to PC, PS/2 interface- for connection of keyboard and/or barcode reader

Power requirements

- 110–240 V AC, automatic

Dimensions/Weight

- Depth: 24 cm (9.5 inches)
- Width: 28 cm (11 inches)
- Height: 15 cm (5.9 inches)
- Weight: 3.9 kg (10.5 lb), without power supply

Operation

- Temperature range: 10 °C - 40 °C (50 F - 104 F)
- Humidity range: 20–80% relative humidity non-condensing
- Calibration: automatic, self calibrating

- 400 measurements/h
- Easy to use
- Compact design



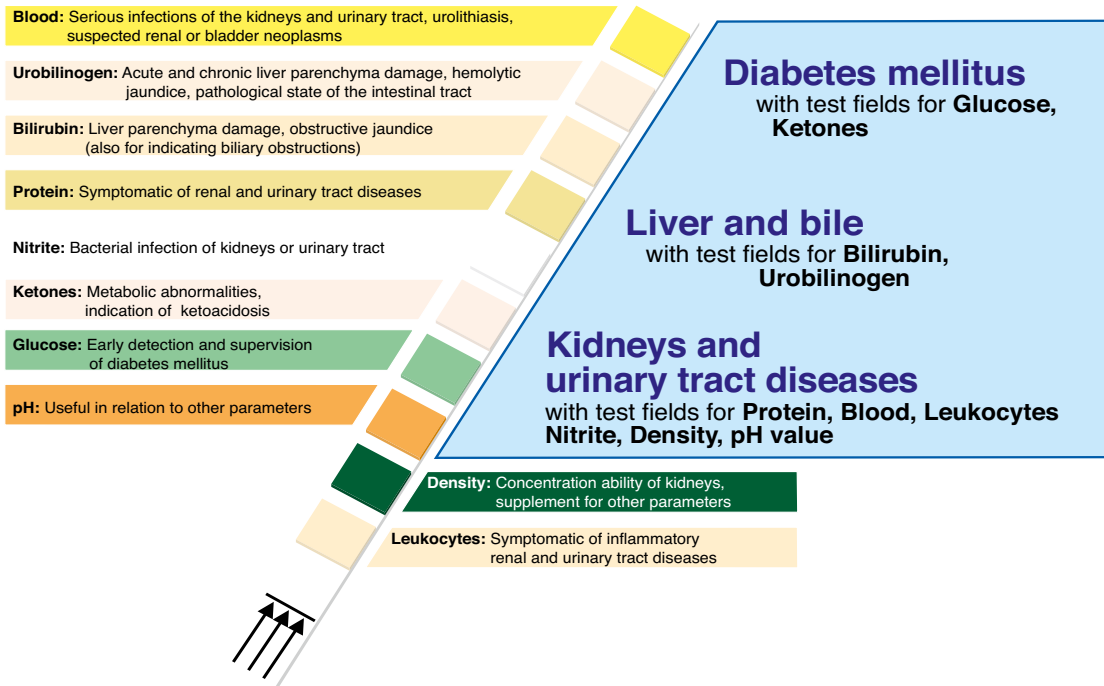
▪ Medi-Test URYXXON® Stick 10



Significance of the parameters

The medical context of urine parameters

Urine test strips are indispensable tools in medical diagnostics to gain a rapid survey of the state of health of a patient.



Easy detection of urine adulteration – Medi-Test Adulteration Stick

Adulteration is the intentional tampering with a urine sample by the donor to avoid detection of illicit drug use. Successful adulteration produces a false-negative drug test result.

An estimated 4 % of all urine samples submitted for drugs-of-abuse testing in the USA is adulterated. With the easy access to information from the internet, the number of adulterated specimens is increasing. Recently, urine adulteration has also become a problem in Europe.

Classic adulterants include many commonly available household substances like water, bleach, baking soda or vinegar. More recently, commercial adulterants became available with names like Urine Luck, Klear etc.

Medi-Test Adulteration sticks reliably detect unusual levels of creatinine, nitrite, glutaraldehyde, pH, density and oxidants generally connected with classic or commercial adulterants. Removing adulterated samples for drugs-of-abuse testing saves money and increases the integrity of the testing program.



- Improves integrity of urine testing

Urine test strips for animals – Combi 10® VET

The examination of the urine of small animals (dogs, cats, rabbits, guinea pigs etc.) provides valuable information for the diagnosis of urinary tract disorders and diseases. Ideally, a urine sample should be obtained through cystocentesis. However, the examination of spontaneous urine is often adequate for an initial diagnosis. First, all urine samples undergo a macroscopic examination. The urine volume, colour, transparency and smell are evaluated.

Using Medi-Test Combi 10® VET the urine status can easily be evaluated. The leaflet describes characteristics of the individual tests for the different species. This makes urine analysis of small animals safe and easy.



- Urine test for animals: rapid and easy

Medical parameters

Rapid detection of albumin and creatinine in urine – Medi-Test Microalbumin

Medi-Test strips Microalbumin

Medi-Test Microalbumin urine test strips are for the rapid and reliable screening for early stages of microalbuminuria. Consequently, they allow for early intervention with the goal to prevent or delay nephropathy. Tests for microalbuminuria are regularly used for risk group patients like diabetics or patients with hypertension.

The easy test strips have two different test pads. One test pad is for creatinine and gives a measure of how concentrated the urine is, the other test detects albumin. The combination of both test pads allows the conclusion whether the results are normal or pathologic. The tests can easily be read using the evaluation chart in the picture that is also on the tube.

Principle:

Albumin: The test is based on the principle of the “protein error” of indicators, i. e. at a constantly buffered pH, albumin reacts with a tetrabromophenol sulphonephthalein derivative resulting in a color change from yellow-green to green-blue.

Creatinine: The detection is based on the reaction of creatinine with dinitrobenzoic acid. The resulting coloration ranges, depending on concentration, from yellow-brown to blue-black.

Evaluation: Following the determination of albumin and creatinine levels, the albumin-creatinine ratio must be ascertained, using the interpretation table printed onto the container label. This method allows use of arbitrary urine samples independent of the concentration of the urine. Thus no 24-hour urine collection is required. Using the table, the results are assigned to the urine classifications of “Normal”, “Abnormal” or “High Abnormal”. The albumin-creatinine ratios classified in the table are based on the following value ranges (mg albumin/g creatinine):²

Normal: < 30 mg/g

Abnormal: 30–299 mg/g (microalbuminuria)

High abnormal: ≥ 300 mg/g (macroalbuminuria or proteinuria)

²⁾ Position Statement: Diabetic Nephropathy. Diabetes Care. 27. S79-S83 (Supplement 1), 2004



Medi-Test Microalbumin

Albumin mg/L	Creatinine mg/dL				
	10	50	100	200	300
10	*				
30					
80					
150					

Normal (top right), Abnormal (middle), High abnormal (bottom left)

Please repeat with a new sample, since it is too strongly diluted.

Principle, evaluation, sources of error, diagnosis of test field parameters

Glucose

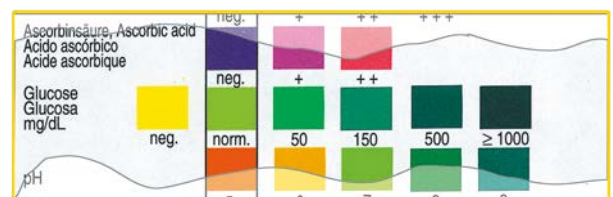
Principle: The detection is based on the glucose oxidase-peroxidase-chromogen reaction. The oxidation of glucose by atmospheric oxygen is catalyzed by glucose oxidase to form gluconic acid lactone and hydrogen peroxide. Peroxidase catalyzes the reaction of hydrogen peroxide with the chromogen. Apart from glucose, no other compound in urine is known to give a positive reaction.

Evaluation: Pathological glucose concentrations are indicated by a color change from green to bluish green. Yellow or greenish test fields should be considered negative or normal. All test fields which have an intensity greater than the greenish negative color field must be considered positive. The color fields correspond to the following ranges of glucose concentrations:

neg. (yellow), neg. or normal (greenish), 50, 150, 500 and ≥ 1000 mg/dL or
neg. (yellow), neg. or normal (greenish), 2.8, 8.3, 27.8 and ≥ 55.5 mmol/L.

An inhibitory effect is produced by gentisic acid. Falsely positive reactions can also be produced by a residue of peroxide-containing cleansing agents. The test is not influenced by vitamin C.

Diagnosis: Because of the clear distinction between physiological and pathological glucosuria, the test is especially suitable for the detection of diabetes mellitus and for supervising (and self-supervising) of diabetes. Apart from diabetes mellitus, renal glucosuria with increased glucose concentrations may be noted during pregnancy, and after a meal with excessive carbohydrates. Every positive test reaction requires further diagnosis.



Early detection of diabetes mellitus
Supervision of type-II-diabetics

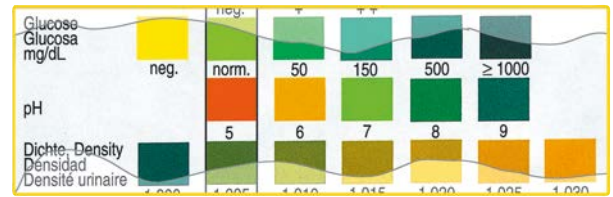
Medical parameters

pH value

Principle: The test paper contains indicators, which clearly change color between pH 5 and pH 9 (from orange to green to turquoise).

Evaluation: The pH value of fresh urine from healthy people varies between pH 5 and pH 6. The color scale gives a clear distinction of pH value between pH 5 and pH 9. The pH should always be measured in fresh urine, since bacterial decomposition may increase the pH of the urine to values >9.

Diagnosis: The pH value is only of significance in relation to other parameters. More acid urine (lower pH values) is found in case of an increased protein metabolism, high fever, serious diarrhoea and metabolic acidosis (serious form of diabetes mellitus). Alkalinity (increased pH value) may be noted in urinary tract infections, respiratory or metabolic alkalosis.



- Diseases of the urogenital tract
- Supplement for other parameters
- Backup for microscopic results

Ketones

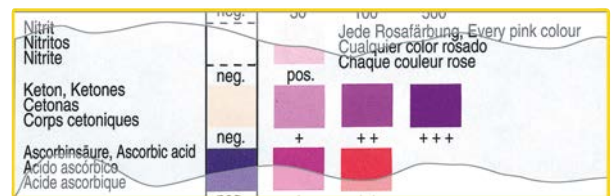
Principle: The test is based on the principle of Legal's test. Acetoacetic acid and acetone form a violet colored complex with sodium nitropruside in alkaline medium.

Evaluation: Acetoacetic acid reacts more sensitively than acetone. Values of 5 mg/dL of acetoacetic acid or 50 mg/dL acetone are indicated. The color fields correspond to the following acetoacetic acid values:

0: (negative) | 25: (+), 100 (++) and 300 (+++) mg/dL or
0: (negative) | 2.5: (+), 10 (++) and 30 (+++) mmol/L.

Phenylketones in higher concentrations interfere with the test, and will produce deviating colors. β-hydroxybutyric acid (not a ketone) is not detected. Phthalein compounds interfere by producing a red coloration.

Diagnosis: Ketone bodies including acetoacetic acid, acetone, and β-hydroxybutyric acid are only produced in the liver. Ketones in the urine are caused by an abnormal carbohydrate metabolism. Frequently, ketonuria is a sign of diabetic ketosis, which in connection with other metabolic abnormalities may cause diabetic coma. Ketonuria may also be noted in case of insulin overdoses, starvation (e.g. slimming diet, calorie free diet), dangerous metabolic abnormalities during pregnancy (hyperemesis gravidarum), acetonemic vomiting of infants and fever caused especially by infections.



- Early detection of ketosis/acidosis
- Control-parameter for Diabetes mellitus

Protein

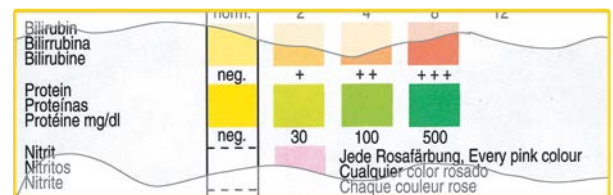
Principle: The test is based on the „protein error“ principle of indicators. The test zone is buffered to a constant pH value and changes color from yellow to greenish blue in the presence of albumin. Other proteins are indicated with less sensitivity.

Evaluation: The test strip detects values above 10 mg protein/dL urine. The color fields correspond to the following ranges of albumin concentrations: negative, 30, 100 and 500 mg/dL or negative, 0.3, 1.0 and 5.0 g/L.

Falsely positive results are possible in strongly alkaline urine samples (pH >9), after infusions with polyvinylpyrrolidone (blood substitute), after intake of medicaments containing quinine, and also by disinfectant residues in the urine sampling vessel. The protein coloration may be masked by the presence of medical dyes (e.g. methylene blue) or beetroot pigments.

Diagnosis: The limit of a physiological proteinuria lies between 10 and 30 mg/dL. It differentiates between:

- 1) Benign proteinuria is observed after physical strain, orthostatic proteinuria, with fever and during pregnancy. In such cases the protein excretion rate is usually normal in the first morning urine, however in the course of the day values can vary greatly.
- 2) Extrarenal proteinuria frequently appears with acute diseases like heart insufficiency, colics, liver cirrhosis, plasmocytoma, and carcinomas.



- Symptomatic of renal and urinary tract diseases

Medical parameters

3) Renal proteinuria is caused by increased permeability of the glomerular filter and may indicate pyelonephritis, glomerulonephritis, tuberculosis of the kidneys, kidneys participation at infections and poisonings, cystic kidneys, gouty kidney. Every positive test reaction requires further diagnostic examinations.

Leukocytes

Principle: The test is based on the esterase activity of granulocytes. This enzyme splits a carboxylic acid ester. The alcohol component formed during this step reacts with a diazonium salt to form a violet dye.

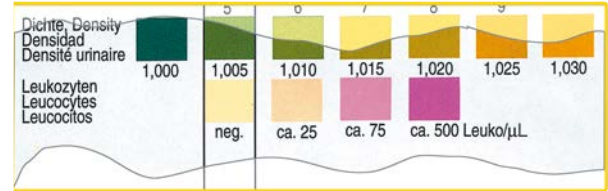
Evaluation: The test detects values from about 10 leukocytes/ μL urine. Discolorations, which can no longer be correlated to the negative test field, and weakly violet discolorations after 120 seconds are to be considered positive. The color fields correspond to the following leukocyte concentrations: negative (normal), 25, 75, 500 leukocytes/ μL

A diminished reaction can result for protein excretion above 500 mg/dL, and a glucose concentration above 2 g/dL as well as during therapy with preparations containing cephalixin or gentamycin. Bacteria, trichomonades and erythrocytes do not give a positive reaction with this test. Formaldehyde (a preservative) can cause falsely positive reactions. Boric acid used as preservative decreases the sensitivity of the reaction.

Excretion of bilirubin, nitrofurantoin, or other strongly colored compounds can cover the reaction color. For samples from female patients vaginal secretion can simulate a falsely positive reaction. In order to avoid falsely positive results, the urine should only be sampled after thorough cleaning of the genitals.

Diagnosis: An increased excretion of leukocytes in urine (leukocyturia) is an important symptom for infectious diseases of the kidneys and/or urinary tract (incl. the prostate).

Leukocyturia is especially important for diagnosis of chronic pyelonephritis. Often it is the only symptom between acute attacks. Other causes for leukocyturia may be: analgetic nephropathia, glomerulopathia and intoxications, cystitis, urethritis, kidney or urogenital tuberculosis, fungus and trichomonade infections, gonorrhoea, urolithiasis, tumors with obstructions.



■ Symptomatic of renal and urinary tract diseases

Blood

Principle: The detection is based on the pseudoperoxidative activity of hemoglobin and myoglobin, which catalyze the oxidation of an indicator by an organic hydroperoxide, producing a green color.

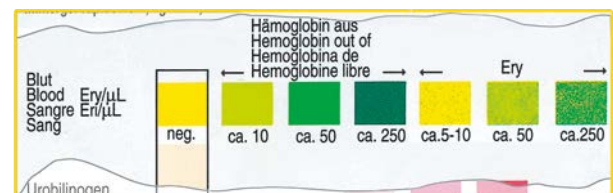
Evaluation: The minimum sensitivity of the test strip is 5 erythrocytes/ μL urine corresponding to approx. 0.015 mg hemoglobin or myoglobin/dL urine. Intact erythrocytes are indicated by flecked discolorations of the test field. The color fields correspond to the following values:

0 (negative), ca. 5–10, ca. 50, ca. 250 Ery/ μL , or a hemoglobin concentration out of ca. 10, ca. 50, ca. 250 Ery/ μL .

The blood test on Medi-Test urine test strips is optimally protected against interferences by ascorbic acid. Normal concentrations of vitamin C (< 40 mg/dL) do not influence the test result. However gentisic acid still shows an inhibitory effect. Falsely positive reactions can be produced by a residue of peroxide-containing cleansing agents.

Diagnosis: Every positive reaction should be taken as a pathological finding requiring further diagnostic examinations. Hematuria (hemolysis of intact erythrocytes occurs on the test field), hemoglobinuria or myoglobinuria are frequently caused by:

Serious infections of the kidneys and urinary tract, kidney and bladder calculi, serious poisonings (e.g. benzene and aniline derivatives, chlorate, bacteria toxins, poisonous mushrooms and snake poison), heart attack, hemolysis after transfusion incident, cold hemoglobinuria or march hemoglobinuria (after strong physical exertion), different paroxysmal hemoglobinurias and serious hemolytic anemias.



■ Indicator for several serious diseases

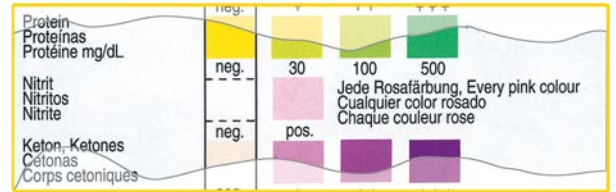
Medical parameters

Nitrite

Principle: Microorganisms, which are able to reduce nitrate to nitrite, are indicated indirectly with this test, which is based on the principle of Griess reagent. The test paper contains an amine and a coupling component. Diazotization and subsequent coupling result in a red colored azo compound. Only nitrite can produce a diazonium salt for coupling reaction, therefore falsely positive results are virtually impossible in this case.

Evaluation: The test detects concentrations from 0.05 mg nitrite/dL urine. Any pink color indicates a bacterial infection of the urinary tract. The color intensity only shows the nitrite concentration, and does therefore not provide information about the extent of the infection. A negative result does not preclude an infection of the urinary tract, if bacteria, which cannot produce nitrite are present. Falsely negative results can be produced by high doses of ascorbic acid, by antibiotics therapy, and by very low nitrate concentrations in urine as the result of low nitrate diet or strong dilution (diuresis). Falsely positive results can be caused by the presence of diagnostic or therapeutic dyes in the urine.

Diagnosis: Bacteria, which cause infections, and can produce nitrite in the urine are e.g. *E. coli* (bacteria which causes most frequently infections), Aerobic Bacteria, Citrobacteria, Klebsiella, Proteus, Salmonellae and in part Enterococci, Pseudomonas and Staphylococci. If the test is positive a microscopic examination and determination of susceptibility of pathogenic bacteria to chemotherapeutic agents should follow.



■ Bacterial infection of the kidneys or urinary tract

Ascorbic acid (Vitamin C)

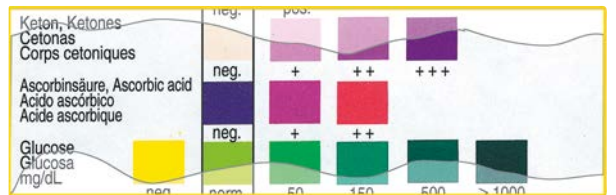
Modern Medi-Test urine test strips have the best available protection against influences of ascorbic acid (vitamin C) in the sample. For historic reasons, many test strips still feature a test pad for ascorbic acid.

Principle: The detection is based on the de-colouration of Tillman's reagent. The blue colored 2,6-dichlorophenol indophenol sodium salt is reduced to the colorless leuco form by ascorbic acid. In the presence of ascorbic acid a color change takes place from blue to red.

Evaluation: The color fields correspond to the following values:

0 (negative), 10 (+) and 20 (++) mg/dL or
0 (negative), 0.6 (+) and 1.1 (++) mmol/L.

Diagnosis: The wide spread intake of ascorbic acid (e.g. in vitamin C therapy, as a therapeutical ingredient and stabilizer of numerous medicaments, oxidation inhibitors and preservatives in food industry) causes a rapid saturation of the organism, and a renal excretion of the excess. Interfering ascorbic acid concentrations may be reached after the ingestion of fruit juice or plenty of fruit. Therefore, the ascorbic acid test zone minimizes falsely negative results. As with glucose detection, blood detection is also disturbed by low concentrations of ascorbic acid, whereas high ascorbic acid concentrations interfere with the nitrite and bilirubin test zones.



■ High concentrations may disturb other test fields

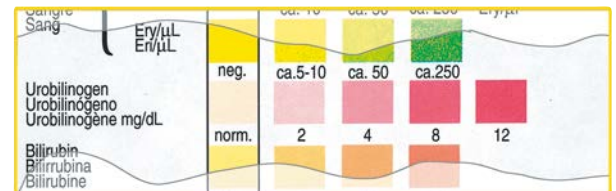
Urobilinogen

Principle: The test paper contains a stable diazonium salt producing a reddish azo compound with urobilinogen.

Evaluation: Depending on the urine color 0.5 to 1 mg urobilinogen/dL urine are indicated. 1 mg/dL is considered to be the normal excretion rate. Higher values are pathological. A complete absence of urobilinogen in the urine, which is likewise pathological, cannot be detected with the strips. The color fields correspond to the following urobilinogen concentrations:

normal (0–1), 2, 4, 8, 12 mg/dL or
normal (0–17), 34, 70, 140, 200 µmol/L.

The test is inhibited by higher concentrations of formaldehyde. Longer exposure of the urine to light leads to lowered or falsely negative results. Higher, or falsely positive results, can be caused by the presence of diagnostic or therapeutic dyes in the urine. Larger amounts of bilirubin produce a yellow coloration.



■ Detection of liver diseases
■ In combination with bilirubin differentiation between different forms of jaundice

Medical parameters

Diagnosis: An increased urobilinogen concentration in urine is a sensitive index of liver dysfunction or hemolytic diseases. Urobilinogenuria is caused by e.g. virus hepatitis, chronic hepatitis, liver cirrhosis, infections, poisonings, congestion or carcinoma of liver, hemolytic, and pernicious anemia, polycythemia and pathological state of the intestinal tract with an increased resorbence.

Bilirubin

Principle: A red azo compound is obtained in the presence of acid by the coupling of bilirubin with a diazonium salt.

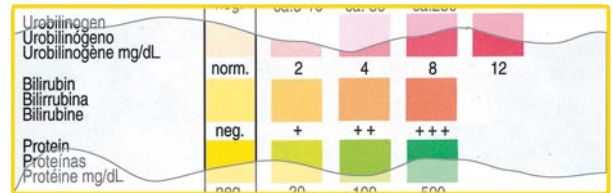
Evaluation: The minimum sensitivity of the test strip is 0.5 to 0.75 mg bilirubin/dL urine. The color fields correspond to the following values:

0 (negative), 1 (+), 2 (++) , 4 (+++) mg/dL or
 0 (negative), 17 (+), 35 (++) , 70 (+++) μmol/L.

Some urine components can produce a yellow coloration of the test strip. Ascorbic acid and nitrite in higher concentrations inhibit the test. Longer exposure of the urine to light leads to lowered, or falsely negative results. Higher, or falsely positive results can be caused by the presence of diagnostic or therapeutic dyes in the urine.

Diagnosis: Only conjugated (water soluble) bilirubin is excreted by the kidneys. Normally bilirubin is undetectable in urine. Bilirubinuria generally indicates liver parenchyma damage (e.g. acute virus hepatitis and other forms of hepatitis, liver cirrhosis, toxic liver cell damage) or biliary obstructions (e.g. cholangitis, obstructive jaundice).

Unconjugated bilirubin, which is detectable in serum, indicating hemolytic jaundice is not excreted by the kidneys and is absent from urine.



- Detection of liver diseases
- In combination with bilirubin differentiation between different forms of jaundice

Density

Principle: The test indicates the ion concentration of urine with good correlation to the refractometric method. Increasing ion concentrations cause a color change from blue-green via green to yellow.

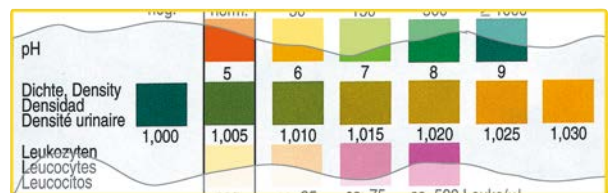
Evaluation: The test allows determination of the urine density between 1.000 and 1.030. The normal value for adults with normal intake of food and liquid is from about 1.015 to 1.025; however, it can vary between 1.000 after extreme liquid intake, and 1.040 after a longer period of thirst. The density measured with test strips can vary slightly from value determined with other methods, since density increases due to glucose concentrations > 1000mg/dL (> 56 mmol/L) are not covered. Increased protein excretion can result in density values, which are too high. Alkaline urines, with high contents of buffer substances, often show results, which are too low.

Diagnosis: In kidney diagnostics determination of the urine concentration is important for checking the function of the kidney parenchyma. If high liquid intake is excluded, a very dilute urine can indicate a substantial insufficiency of the kidneys, and also a lowered ability of the kidneys to concentrate the urine, which may result from diabetes mellitus, diabetes insipidus, hyperaldosteronism or influence of diuretic drugs.

The density of the urine yields valuable supplementary information for the evaluation of other test strip parameters, and thus helps to avoid misinterpretations, especially:

- during lysis of leukocytes and erythrocytes for interpreting possible differences with the sedimentation results
- for evaluation of the test fields for nitrite, protein and glucose

Especially in the intermediate range, between physiological and pathological results, the urine density can have a decisive role.



- Indication of the status of the kidney
- Information about the state of hydration

Medi-Test ordering information

Diagnostic test strips for urine analysis

REF	REF	Type	with test fields for determination of												
			Glucose	Ketones	Ascorbic acid	Protein/Albumin	Blood	Leukozytes	Nitrite	Density	pH value	Bilirubin	Urobilinogen	Creatinine	
50	100														
strips per pack	strips per pack														
930 01	930 24	Glucose ¹⁾	•												
930 25	930 20	Glucose / Keton ¹⁾	•	•											
930 04	930 27	Protein 2 ¹⁾				•					•				
930 05	930 28	Keton ¹⁾		•											
930 06	930 29	Nitrit ¹⁾							•						
930 12	–	Urbi										•	•		
930 15	930 37	Combi 2 ¹⁾	•			•									
930 07	930 30	Combi 3 A [®]	•		•	•					•				
930 09	930 32	Combi 5	•		•	•	•				•				
930 35	930 36	Combi 5 N [®]	•		•	•	•		•		•				
930 55	–	Combi 5 S	•	•		•	•				•				
930 18	930 78	Combi 6	•			•	•	•	•				•		
930 13	930 34	Combi 6 A	•	•	•	•	•				•	•			
930 10	930 22	Combi 7	•	•	•	•	•		•		•				
–	930 21	Combi 8 L	•		•	•	•	•	•	•	•				
930 11	930 23	Combi 9 [®]	•	•	•	•	•		•		•	•	•		
–	930 56	Combi 10 [®]	•	•	•	•	•		•	•	•	•	•		
930 79	930 58	Combi 10 [®] L	•	•	•	•	•	•	•		•	•	•		
930 77	930 67	Combi 10 [®] SGL	•	•		•	•	•	•	•	•	•	•		
–	930 68	URYXXON [®] Stick 10 ^{2) 3)}	•	•		•	•	•	•	•	•	•	•		
930 874 ^{3) 5)}	–	Microalbumin				•								•	

Further Medi-Test urine test strips

Test strips for veterinary applications

–	930 870	Combi 10 [®] VET ⁴⁾	•	•		•	•	•	•	•	•	•	•	
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Test strips for detection of urine adulteration

930 19	–	Medi-Test Adulteration Stick ⁴⁾ for the detection of urine adulteration prior to drugs-of-abuse tests with test fields for Creatinine, Glutaraldehyde, Nitrite, pH, Oxidants and Density
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All products (except ⁴⁾ are CE-marked according to the directive 98/79/EC

¹⁾ suitable for patient self-testing ²⁾ for evaluation with reflectometer URYXXON[®] 500 ³⁾ for evaluation with reflectometer URYXXON[®] Relax ⁴⁾ not an IVD product (no CE-mark) ⁵⁾ pack of 24 test strips

Instruments for urine test strips

930 88	URYXXON [®] Relax, automated urine analysis at the point of care
930 080	URYXXON [®] 500, high performance automated urine analysis

Accessories and spare parts

930 38	Medi-Test Control, solution to check Medi-Test urine test strips and URYXXON [®] instruments
930 65	Printer paper for URYXXON [®] Relax, pack of 5 rolls
930 890	Strip adaptor for URYXXON [®] Relax
930 71	Printer paper for URYXXON [®] 300 and URYXXON [®] 500, pack of 5 rolls
930 74	Barcode scanner for URYXXON [®] instruments

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