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cobas u pack

cobas u pack

REF	CONTENT	SYSTEM
06334601 001	400	**cobas u** 601

English

Caution

Do not open the inner bag prior to use.
Immediately insert cassette into analyzer!

Intended use

The cobas u pack is a cassette with teststrips for the in vitro qualitative or semi-quantitative determination of pH, leukocytes, nitrite, protein, glucose, ketones, urobilinogen, bilirubin, color and erythrocytes in urine with the **cobas u** 601 urine analyzer. These measurements are useful in the evaluation of renal, urinary, hepatic and metabolic disorders.

For professional use only.

Test principle

Reference[1]

pH: The test paper contains the indicators methyl red, phenolphthalein and bromothymol blue and reacts specifically with H^+-ions. The most frequent pH values of fresh urine from healthy subjects lie between 5 and 6.

Leukocytes (LEU): The test reveals the presence of granulocyte esterases. These esterases cleave an indoxyl ester, and the indoxyl so liberated reacts with a diazonium salt to produce a violet dye. Bacteria, trichomonads or erythrocytes present in the urine do not affect the reaction.

Nitrite (NIT): The test is based on the principle of the Griess test and is specific for nitrite. The reaction reveals the presence of nitrite and hence indirectly nitrite-forming bacteria in the urine by a pink-to-red coloration of the test patch. Even a slight pink coloration is indicative of significant bacteriuria.

Protein (PRO): The test is based on the principle of the protein error of a pH indicator. It is particularly sensitive to albumin. An elevated pH (up to 9) does not affect the test.

Glucose (GLU): The glucose determination is based on the specific glucose-oxidase/peroxidase reaction (GOD/POD method). The test is independent of the pH and specific gravity of the urine and is not affected by the presence of ketone bodies.

Ketone bodies (KET): This test is based on the principle of Legal's test and is more sensitive to acetoacetic acid than to acetone.

Urobilinogen (UBG): A stable diazonium salt reacts almost immediately with urobilinogen to give a red azo dye. The test is specific for urobilinogen and is not susceptible to the interfering factors known to affect the Ehrlich's test.

Bilirubin (BIL): The test is based on the coupling of bilirubin with a diazonium salt. Even the slightest pink coloration constitutes a positive, i.e. pathologic, result. Other urinary constituents produce a more or less intense yellow coloration.

Blood (ERY/Hb): The peroxidase-like action of hemoglobin and myoglobin specifically catalyzes the oxidation of the indicator by means of the organic hydroperoxide contained in the test paper to give a blue-green coloration.

Compensation area (COMP): This white area, which is not impregnated with reagents, allows instrumental compensation for the intrinsic color of the urine while testing leukocytes, nitrite, glucose, ketone bodies, urobilinogen, bilirubin, erythrocytes and determination of the urine color (COL).

Reagents

Each test contains per 1 cm^2 test patch area the following:

pH: Bromothymol blue 13.9 µg; methyl red 1.2 µg; phenolphthalein 8.6 µg

Leukocytes: Indoxylcarbonic acid ester 15.5 µg; methoxymorpholinobenzene diazonium salt 5.5 µg

Nitrite: 3-hydroxy-1,2,3,4-tetrahydro-7,8-benzoquinoline 33.5 µg; sulfanilamide 29.1 µg

Protein: 3',3'',5',5''-tetrachlorophenol-3,4,5,6-tetrabromosulfophthalein 13.9 µg

Glucose: 3,3',5,5'-tetramethylbenzidine 103.5 µg; GOD 6 U, POD 35 U

Ketone bodies: Sodium nitroprusside 157.2 µg

Urobilinogen: 4-methoxybenzene-diazonium-tetrafluoroborate 67.7 µg

Bilirubin: 2,6-dichlorobenzene-diazonium-tetrafluoroborate 16.7 µg

Blood: 3,3',5,5'-tetramethylbenzidine 52.8 µg; 2,5-dimethyl-2,5-dihydroperoxyhexane 297.2 µg

Precautions and warnings

For in vitro diagnostic use.

Exercise the normal precautions required for handling all laboratory reagents.

Note: If the cassette has been stored refrigerated, it must be left at room temperature for a mimimum of one hour prior to use.

The cassette contains a non-toxic silicate-based desiccant which must not be removed. If ingested by accident, drink large quantities of water.

Disposal of all waste material should be in accordance with local guidelines.

Safety data sheet available for professional user on request.

Reagent handling

Ready for use.

Storage and stability

Store the cassette at 2-30 °C.

After loading the cassette into the analyzer, the test strips are stable within the tightly closed cassette compartment for 14 days. After this period, the cassette has to be replaced by a new one.

Do not use the cassette after the specified expiry date.

Specimen collection and preparation

Reference[1]

For specimen collection and preparation only use suitable tubes or collection containers.

Use fresh urine that has not been centrifuged. The urine specimen should not stand for more than 2 hours before testing. In case of longer standing, mix before use.

Use only clean, well-rinsed vessels to collect urine.

Do not add preservatives to the urine.

Do not expose urine specimens to sunlight as this induces oxidation of bilirubin and urobilinogen and hence leads to artificially low results for these two parameters.

Materials provided

- REF 06334601001, Cassette with 400 test strips

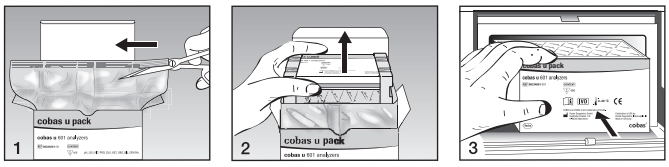
Materials required (but not provided)

- REF 06390498001, **cobas u** 601 urine analyzer
- REF 06390579001, **cobas u** calibration strip
- Controls as indicated below
- General laboratory equipment

Assay

1. Unfold and cut open aluminum bag with scissors (illustration 1).
2. Remove test strip cassette from the packaging and remove the two protection pads (illustration 2).
3. Immediately place test strip cassette into the **cobas u** 601 urine analyzer (illustration 3).

   Follow the instructions in the operator's manual of the instrument for correct insertion and positioning. These instructions also contain information on further handling precautions of the cassette.



Note: If the cassette is stored in the opened bag or exposed to air (humidity, nitrogen oxides) for more than 3 minutes, environmental conditions may cause a color change of the test patches and damage of the reagents.

This has to be avoided. Do not use the cassette if the packaging shows severe damages, or the test strip layers in the cassette are not correctly aligned, or the test strips show unusual coloring.

For optimum performance of the assay follow the directions given in this document for the analyzer concerned. Refer to the appropriate operator's manual for analyzer-specific assay instructions.

Calibration

cobas u calibration strips are used for the calibration of the **cobas u** 601 urine analyzer. For details see the operator's manual of the analyzer.

Quality control

For quality control, use commercially available urine controls, or other suitable control material.

Following quality controls from BIO-RAD are recommended to use:

- qUAntify Plus Control
- Liquichek Urinalysis Control

The control intervals and limits should be adapted to each laboratory's individual requirements. Values obtained should fall within the defined limits. Each laboratory should establish corrective measures to be taken if values fall outside the defined limits.

Follow the applicable government regulations and local guidelines for quality control.

Important note for reporting results:

According to the regulations from the German Medical Association for quality assurance of medical laboratory analyses dated 11/23/2007, the decision to classify a laboratory test result to either part B1 or B2 depends on the way the test results are expressed in the report (scale level).

The specification in the report defines whether a determination is quantitative or qualitative and therefore which legal requirements for quality assurance (B1 for quantitative or B2 for qualitative) need to be followed.

Examples of qualitative characteristics include titer levels, concentrations/color ranges (+ to +++) or a defined range of values. A characteristic of a quantitative value is when the value has a corresponding measured unit value.

Limitations - interference

Therapeutic drugs and endogenous substances were tested for a potential interference to the test parameters of the **cobas u** pack.

All parameters were tested with negative urine samples and samples spiked to the first positive concentration range.

Therapeutic drugs were tested at concentrations in urine occurring under medication with the therapeutic dosage and above.

The following therapeutic drugs and concentrations were tested:

Therapeutic drugs	
Substance	**Maximum tested concentration**
Acetaminophen	3000 mg/L
N-Acetylcystein	200 mg/L
Amoxicillin	10000 mg/L
Amlodipin-besylat	33.3 mg/L
Ascorbic Acid	4000 mg/L
Cefoxitin	12000 mg/L
Cetirizin	66.6 mg/L
Cotrimoxazol	6000 mg/L
Cyclosporin	80 mg/L
Furosemid	3333 mg/L
Gentamycin-sulfat	400 mg/L
Hydrochlorothiazid	333 mg/L
Hydroxychloroquin	1333 mg/L
Ibuprofen	2500 mg/L
Levodopa	1250 mg/L
Levothyroxine	1.0 mg/L
Lisinopril	133.3 mg/L
Methyldopa	2000 mg/L
Ofloxazin	900 mg/L
Phenazopyridin	300 mg/L
Salicyluric Acid	6000 mg/L
Tetracyclin	500 mg/L

For drug testing:

Within this range the following observations were made:

Parameter	Therapeutic drug	No interference up to	Effect above stated concentration
LEU	Cotrimoxazol	500 mg/L	elevated positive results
	Furosemide	1000 mg/L	elevated positive results
	Salicyl Uric Acid	3000 mg/L	false negative results
NIT	Ascorbic Acid	1500 mg/L	false negative results
PRO	Cotrimoxazol	1200 mg/L	false positive results
	Hydrochloroquine	600 mg/L	false positive results
	Phenazopyridine	200 mg/L	false positive results
GLU	Ascorbic Acid	400 mg/L	false normal results
KET	N-Acetylcysteine	30 mg/L	false positive results and elevated positive results
	Levodopa	250 mg/L	elevated positive results
	Methyldopa	700 mg/L	elevated positive results
UBG	Phenazopyridine	200 mg/L	false positive results and elevated positive results
BIL	Cotrimoxazol	5000 mg/L	false negative results
	Phenazopyridine	100 mg/L	false positive results and elevated positive results
ERY	Ascorbic Acid	700 mg/L	false negative results
	Cotrimoxazol	3000 mg/L	false negative results
	Furosemide	1500 mg/L	false negative results
	Hydrochloroquine	200 mg/L	false negative results
	Ibuprofen	800 mg/L	false negative results

Endogenous substances were tested at abnormal high concentrations.

Endogenous substances	
Substance	**Maximum tested concentration**
Ammonium	25000 mg/L
Calcium	3000 mg/L
Creatinin	15000 mg/L
Glucose	50000 mg/L
Hemoglobin	750 mg/L
ß-Hydroxybutyrat	4500 mg/L
Immunglobulin G	5000 mg/L
Nitrit	110 mg/L
Urea	200000 mg/L
Uric acid	1550 mg/L
Urobilinogen	3000 mg/L
pH	4.5 - 9.0

For endogenous substance testing within this range the following observations were made:

Parameter	Endogenous substance	No interference up to	Effect above stated concentration
LEU	Calcium	2200 mg/L	elevated positive results
	Urobilinogen	150 mg/L	false positive results and elevated positive results
NIT	Hemoglobin	259 mg/L	false positive results
	Urobilinogen	120 mg/L	false positive results
PRO	Hemoglobin	false positive and false elevated results due to unspecific protein detection may occur	
	Ammonium	5000 mg/L	false negative results
	Creatinin	7500 mg/L	false positive results and elevated positive results
	Urea	120000 mg/L	false positive results and elevated positive results
	Urobilinogen	1000 mg/L	false positive results
GLU	Ammonium	15000 mg/L	false normal results
	Urea	120000 mg/L	false normal results
	Urobilinogen	2500 mg/L	false normal results
KET	Creatinin	3000 mg/L	elevated positive results
	Hemoglobin	259 mg/L	elevated positive results
	Urobilinogen	1500 mg/L	false negative results
UBG	Nitrite	10 mg/L	false normal results
BIL	Nitrite	20 mg/L	false negative results
ERY	Nitrite	10 mg/L	false negative results
	Urobilinogen	120 mg/L	false positive results

- **Common limitations:**

  NIT:[2] Prolonged urinary retention in the bladder (4-8 hours) is essential in order to obtain an accurate result. Administration of antibiotics or chemical drugs should be discontinued 3 days before the test.

  Attention: Nitrogen oxides present in the atmosphere may have an influence on the stability of the nitrite test pad.[2]

  PRO: False positive readings may be found after infusion of polyvinylpyrrolidone (blood substitute).

  ERY: The result values refer to intact erythrocytes. At concentrations of about 5-50 Ery/µL, significant hemolysis (such as may occur on prolonged standing of the urine) leads to values which are higher than the corresponding concentrations given for intact erythrocytes. In women the test for blood may be falsified from 3 days before to 3 days after menstruation. It is therefore advisable not to perform the test during this time. After physical activity, e.g. strenuous jogging, raised values for erythrocytes and protein may occur without being signs of disease.

Note:

Knowledge of the effects of drugs or their metabolites upon the individual tests is not yet complete. In doubtful cases, it is therefore advisable to repeat the test after discontinuing a particular drug.

For diagnostic purposes, the results should always be assessed in conjunction with the patient's medical history, clinical examination and other findings.

Expected values

Each laboratory should investigate the transferability of the expected values to its own patient population and if necessary determine its own reference ranges.

For the **cobas u** 601 urine analyzer please refer to Appendix 1.

Result values

Please refer to Appendix 1.

Specific performance data

Representative performance data are given below. Results obtained in individual laboratories may differ.

The values for NEG and POS indicate the rate of concordant negative or positive results.

For the **cobas u** 601 urine analyzer please refer to Appendix 2.

Precision

Precision experiments comprised an assessment of repeatability (within-run precision) and intermediate precision.

Repeatability was checked in 2 separate runs with 21 measurements each for the tested controls. In total there were 42 measurements performed per used control.

Intermediate precision was assessed over 21 days with 2 runs per day and duplicate measurements per used control. In total there were 84 measurements performed per used control.

The following results were obtained:

Repeatability			
Parameter	**Control** BIO-RAD Liquichek	**Result**	**Exact agreement**
pH	Level 1	6.5	100 %
	Level 2	7	100 %
LEU	Level 1	NEG	100 %
	Level 2	500 Leu/µL	100 %
NIT	Level 1	NEG	100 %
	Level 2	POS	100 %
PRO	Level 1	NEG	100 %
	Level 2	150 mg/dL	100 %
GLU	Level 1	NORM	100 %
	Level 2	1000 mg/dL	100 %

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Repeatability			
Parameter	**Control** BIO-RAD Liquichek	**Result**	**Exact agreement**
KET	Level 1	NEG	100 %
	Level 2	150 mg/dL	100 %
UBG	Level 1	NORM	100 %
	Level 2	12 mg/dL	100 %
BIL	Level 1	NEG	100 %
	Level 2	6 mg/dL	100 %
ERY	Level 1	NEG	100 %
	Level 2	250 Ery/µL	100 %
COL	Level 1	Yellow	100 %
	Level 2	Brown	100 %

Intermediate precision			
Parameter	**Control** BIO-RAD Liquichek	**Result**	**Exact agreement**
pH	Level 1	6.5	100 %
	Level 2	7	100 %
LEU	Level 1	NEG	100 %
	Level 2	500 Leu/µL	100 %
NIT	Level 1	NEG	100 %
	Level 2	POS	100 %
PRO	Level 1	NEG	100 %
	Level 2	150 mg/dL	100 %
GLU	Level 1	NORM	100 %
	Level 2	1000 mg/dL	100 %
KET	Level 1	NEG	100 %
	Level 2	150 mg/dL	100 %
UBG	Level 1	NORM	100 %
	Level 2	12 mg/dL	100 %
BIL	Level 1	NEG	100 %
	Level 2	6 mg/dL	100 %
ERY	Level 1	NEG	100 %
	Level 2	250 Ery/µL	100 %
COL	Level 1	Yellow	100 %
	Level 2	Brown	100 %

Method comparison

Results of a method comparison of **cobas u** 601 urine analyzer with **cobas u** 411 urine analyzer and **cobas u** 601 urine analyzer with URISYS 2400 Analyzer (for COL) using at least 1348 clinical samples are presented below in Appendix 2.

Method comparison results for specific gravity and clarity are presented in the **cobas u** 601 urine analyzer Operator Manual.

Analytical sensitivity

The values specified for the analytical sensitivity are defined as the concentration of the analyte which leads to a positive result in > 90 % of the examined urines.

Please refer to Appendix 2.

Appendix 1

Parameter	Expected values	Result values
pH	4.8 – 7.4	5, 6, 6.5, 7, 8, 9
LEU	< 10 Leu/µL	NEG, 25, 100, 500 Leu/µL
NIT	–	NEG, POS
PRO	< 10 mg/dL < 0.1 g/L	NEG, 25, 75, 150, 500 mg/dL NEG, 0.25, 0.75, 1.5, 5.0 g/L
GLU	< 30 mg/dL < 1.7 mmol/L	NORM, 50, 100, 300, 1000 mg/dL NORM, 3, 6, 17, 56 mmol/L
KET	< 5 mg/dL < 0.5 mmol/L	NEG, 5, 15, 50, 150 mg/dL NEG, 0.5, 1.5, 5, 15 mmol/L
UBG	< 1 mg/dL < 17 µmol/L	NORM, 1, 4, 8, 12 mg/dL NORM, 17, 68, 135, 203 µmol/L
BIL	< 0.2 mg/dL < 3.4 µmol/L	NEG, 1, 3, 6 mg/dL NEG, 17, 50, 100 µmol/L
ERY/Hb	0 – 5 Ery/µL	NEG, 10, 25, 50, 150, 250 Ery/µL
COL	–	pale yellow, yellow, amber, brown, orange, red, green, others

Appendix 2

Parameter	Analytical sensitivity	Method comparison
pH	N. A.	Ident.: 77 % pH 5+6: 98 % pH 8+9: 88%
LEU	20 - 30 Leu/µL	NEG: 91 % POS: 97 %
NIT	0.05 - 0.06 mg/dL	NEG: 95 % POS: 94 %
PRO	8 - 12 mg/dL albumin	NEG: 96 % POS: 93 %
GLU	30 - 40 mg/dL	NEG: 98 % POS: 100 %
KET	3 - 6 mg/dL	NEG: 94 % POS: 96 %
UBG	1.0 - 1.4 mg/dL	NEG: 96 % POS: 98 %
BIL	0.4 - 0.6 mg/dL	NEG: 93 % POS: 95 %
ERY	5 - 10 Ery/µL	NEG: 95 % POS: 96 %

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Parameter	Analytical sensitivity	Method comparison
COL	N. A.	Pale yellow+yellow: 94 % Amber: 73 % Brown: 92 % Red: 100 %

References

1 REF 1225432001, Compendium of urinalysis

2 European Urinalysis Guidelines

For further information, please refer to the appropriate operator's manual for the relevant analyzer and Method Sheets of all necessary components.

A point (period/stop) is always used in this Method Sheet as the decimal separator to mark the border between the integral and the fractional parts of a decimal numeral. Separators for thousands are not used.

Symbols

Roche Diagnostics uses the following symbols and signs in addition to those listed in the ISO 15223-1 standard.

CONTENT	Contents of kit
SYSTEM	Analyzers/Instruments on which reagents can be used
REAGENT	Reagent
CALIBRATOR	Calibrator
→	Volume after reconstitution or mixing

CE

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