# MULTI DrugControlMultiDip
# 008SL406

**Test device for the simultaneous, qualitative detection of any combination of Amphetamine, Benzodiazepines, Cocaine, Marijuana, Opiates/Morphine and Methadone.**
**A rapid screening test for detection of multiple drugs and drug metabolites in human urine.**

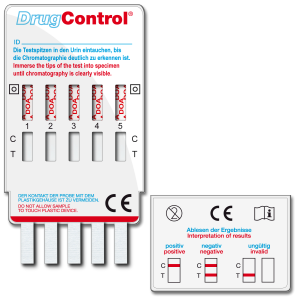
**For professional in vitro diagnostic use only.**

## INTENDED USE

The ulti med *DrugControl* Test is a specific arrangement of different lateral flow chromatographic immunoassays for the detection of following drugs and cut-off concentrations in human urine (other cut-off concentrations according to the recommendation of SAMHSA and NIDA on request):

| Test | Calibrator | Cut-off (ng/mL) |
|---|---|---|
| Amphetamine (AMP 1000) | d-Amphetamine | 1,000 |
| Benzodiazepines (BZD 300) | Oxazepam | 300 |
| Cocaine (COC 300) | Benzoylecgonine | 300 |
| Marijuana (THC 50) | 11-nor-Δ9-THC-9 COOH | 50 |
| Methadone (MTD 300) | Methadone | 300 |
| Morphine (MOR 300) | Morphine | 300 |

This assay provides only a preliminary analytical test result. A more specific alternate chemical method must be used in order to obtain a confirmed analytical result. Gas chromatography/mass spectrometry (GC/MS) is the preferred confirmatory method. Clinical consideration and professional judgment should be applied to any drug of abuse test result, particularly when preliminary positive results are indicated.




**Reproductions may vary from original!**

## PRINCIPLE

During testing, a urine specimen migrates upward by capillary action. A drug, if present in the urine specimen below its cut-off concentration, will not saturate the binding sites of its specific antibody. The antibody will then react with the drug-protein conjugate and a visible colored line will show up in the test region of the specific drug strip. The presence of drug above the cut-off concentration will saturate all the binding sites of the antibody. Therefore, the colored line will not form in the test region.
A drug-positive urine specimen will not generate a colored line in the specific test region of the strip because of drug competition, while a drug-negative urine specimen will generate a line in the test region because of the absence of drug competition.
To serve as a procedural control, a colored line will always appear at the control region, indicating that proper volume of specimen has been added and membrane wicking has occurred.

## PRECAUTIONS

- For healthcare professionals including professionals at point of care sites.
- For professional in vitro diagnostic use only.
- Do not use after the expiration date.
- The test device should remain in the sealed pouch until use.
- Do not moisten nitrocellulose membrane with urine samples.
- Avoid cross-contamination of urine samples by using a new specimen collection container for each urine sample.
- All specimens should be considered potentially hazardous and handled in the same manner as an infectious agent.
- The used test device should be discarded according to federal state and local regulations.

## STORAGE AND STABILITY

Store as packaged in the sealed pouch at 2-30°C. The test is stable through the expiration date printed on the sealed pouch. The test cassettes must remain in the sealed pouch until use. The product is humidity-sensitive and should be used immediately after being opened.

- Do not freeze.
- Do not use beyond the expiration date.

## SPECIMEN COLLECTION AND PREPARATION

**Urine Assay**
The urine specimen should be collected in a clean and dry container. Urine collected at any time of the day may be used. Urine specimens exhibiting visible precipitates should be centrifuged, filtered, or allowed to settle to obtain a clear specimen for testing.

**Specimen Storage**
Urine specimens may be stored at 2-8°C for up to 48 hours prior to testing. For prolonged storage, specimens may be frozen and stored below -20°C. Frozen specimens should be thawed and mixed well before testing.

## MATERIALS PROVIDED

- Multi test device
- Package insert

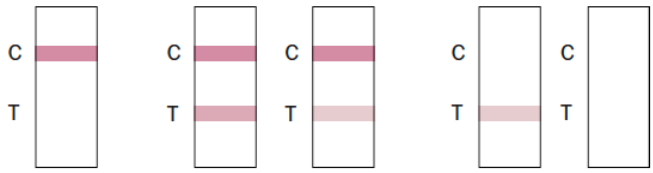
## MATERIALS REQUIRED BUT NOT PROVIDED

- Specimen collection container
- Timer

## DIRECTIONS FOR USE

1. **Allow the urine specimen, test device, and / or controls to reach room temperature (15 – 30 °C) prior to testing.**
2. Bring pouch to room temperature before opening it.
3. Remove the Multi test from the sealed pouch and use it within one hour.
4. Remove the cap.
5. Immerse the tips of the Multi test vertically in the urine specimen for at least 10-15 seconds.
   **Do not pass the red maximum line (dipping line) on the test when immersing the tips of the Multi test.**
6. Replace the cap and place the test panel on a non-absorbent flat surface.
7. Start the timer and wait for the colored line(s) to appear.
8. **Read results at 5 minutes.** Do not interpret the result after 10 minutes.

## INTERPRETATION OF RESULTS




**Positive:** **One red line appears in the control region (C).** No line appears in the test region (T). This positive result indicates that the concentration of at least one of the substances detectable with the corresponding test exceeds the cut-off concentration.

**Negative:*** **Two lines appear in each window.** One red line should be in the control region (C), and another apparent red or pink line should be in the test region (T). This negative result indicates that the concentrations of the substances detectable with the corresponding test are below the cut-off concentration or that they are not present.

**Invalid:** **Control line fails to appear.** Insufficient specimen volume or incorrect procedural techniques are the most likely reasons for control line failure. Review the procedure and repeat the test using a new test device. If the problem persists, discontinue using the lot immediately and contact distributor / manufacturer.

* **Note:** The shade of red in the test line region (T) may vary, but it should be considered negative whenever there is even a faint pink line.

## SUMMARY AND EXPLANATION OF THE TEST

The ulti med *DrugControl* Test is a rapid urine screening test that can be performed without the use of an instrument. The test utilizes monoclonal antibodies to selectively detect elevated levels of specific drugs in urine.

**Amphetamine (AMP):** Amphetamine is a Schedule II controlled substance available by prescription (Dexedrine(R)) and is also available on the illicit market. Amphetamines are a class of potent sympathomimetic agents with therapeutic applications. They are chemically related to the human body's natural catecholamines: epinephrine and norepinephrine. Acute higher doses lead to enhanced stimulation of the central nervous system (CNS) and induce euphoria, alertness, reduced appetite, and a sense of increased energy and power. Cardiovascular responses to amphetamines include increased blood pressure and cardiac arrhythmias. More acute responses produce anxiety, paranoia, hallucinations, and psychotic behavior. The effects of Amphetamines generally last 2-4 hours following use and the drug has a half-life of 4-24 hours in the body. About 30% of amphetamines are excreted in the urine in unchanged form, with the remainder as hydroxylated and deaminated derivatives.

**Benzodiazepines (BZD):** Benzodiazepines are medications that are frequently prescribed for the symptomatic treatment of anxiety and sleep disorders. They produce their effects via specific receptors involving a neurochemical called gamma aminobutyric acid (GABA). Because they are safer and more effective, benzodiazepines have replaced barbiturates in the treatment of both anxiety and insomnia. Benzodiazepines are also used as sedatives before some surgical and medical procedures, and for the treatment of seizure disorders and alcohol withdrawal. Risk of physical dependence increases if benzodiazepines are taken regularly (e.g., daily) for more than a few months, especially at higher than normal doses. Stopping abruptly can bring on such symptoms as trouble sleeping, gastrointestinal upset, feeling unwell, loss of appetite, sweating, trembling, weakness, anxiety and changes in perception. Only trace amounts (less than 1%) of most benzodiazepines are excreted unaltered in the urine; most of the concentration in urine is conjugated drug. The detection period for benzodiazepines in urine is 3-7 days.

**Cocaine (COC):** Cocaine is a potent central nervous system stimulant and a local anesthetic. Initially, it brings about extreme energy and restlessness while gradually resulting in tremors, over-sensitivity and spasms. In large amounts, cocaine causes fever, unresponsiveness, difficulty in breathing and unconsciousness. Cocaine is often self-administered by nasal inhalation, intravenous injection and free-base smoking. It is excreted in the urine in a short time primarily as benzoylecgonine.[3,4] Benzoylecgonine, a major metabolite of cocaine, has a longer biological half-life (5-8 hours) than cocaine (0.5-1.5 hours), and can generally be detected for 24-48 hours after cocaine exposure.[4]

**Marijuana (THC):** THC (Δ9-tetrahydrocannabinol) is the primary active ingredient in cannabis (marijuana). When smoked or orally administered, THC produces euphoric effects. Users have impaired short-term memory and slowed learning. They may also experience transient episodes of confusion and anxiety. Long-term, relatively heavy use may be associated with behavioral disorders. The peak effect of marijuana administered by smoking occurs in 20-30 minutes and the duration is 90-120 minutes after one cigarette. Elevated levels of urinary metabolites are found within hours of exposure and remain detectable for 3-10 days after smoking. The main metabolite excreted in the urine is 11-nor-D9-tetrahydrocannabinol-9-carboxylic acid (THC-COOH).

**Methadone (MTD):** Methadone is a narcotic analgesic prescribed for the management of moderate to severe pain and for the treatment of opiate dependence (heroin, Vicodin, Percocet, morphine). The pharmacology of oral methadone is very different from IV methadone. Oral methadone is partially stored in the liver for later use. IV methadone acts more like heroin. In most states you must go to a pain clinic or a methadone maintenance clinic to beprescribed methadone. Methadone is a long acting pain reliever producing effects that last from twelve to forty-eight hours. Ideally, methadone frees the client from the pressures of obtaining illegal heroin, from the dangers of injection, and from the emotional roller coaster that most opiates produce. Methadone, if taken for long periods and at large doses, can lead to a very long withdrawal period. The withdrawals from methadone are more prolonged and troublesome than those provoked by heroin cessation, yet the substitution and phased removal of methadone is an acceptable method of detoxification for patients and therapists.[7]

**Morphine (MOR):** Opiate refers to any drug that is derived from the opium poppy, including the natural products, morphine and codeine, and the semi-synthetic drugs such as heroin. Opioid is more general, referring to any drug that acts on the opioid receptor. Opioid analgesics comprise a

large group of substances which control pain by depressing the CNS. Large doses of morphine can produce higher tolerance levels, physiological dependency in users, and may lead to substance abuse. Morphine is excreted unmetabolized, and is also the major metabolic product of codeine and heroin. Morphine is detectable in the urine for several days after an opiate dose.[2]

## QUALITY CONTROL

A procedural control is included in the test. A line appearing in the control region (C) is considered an internal procedural control. It confirms sufficient specimen volume, adequate membrane wicking and correct procedural technique.
Control standards are not supplied with this kit. However, it is recommended that positive and negative controls be tested as good laboratory practice to confirm the test procedure and to verify proper test performance.

## LIMITATIONS

1. The ulti med *DrugControl* Test provides only a qualitative, preliminary analytical result. A secondary analytical method must be used to obtain a confirmed result. Gas chromatography/mass spectrometry (GC/MS) is the preferred confirmatory method.[1, 10]
2. There is a possibility that technical or procedural errors, as well as other interfering substances in the urine specimen may cause erroneous results.
3. Adulterants, such as bleach and/or alum, in urine specimens may produce erroneous results regardless of the analytical method used. If adulteration is suspected, the test should be repeated with another urine specimen and a new test device.
4. A Positive result does not indicate intoxication of the donor, the concentration of drug in the urine, or the route of drug administration.
5. A Negative result may not necessarily indicate drug-free urine. Negative results can be obtained when drug is present but below the cut-off level of the test.
6. Test does not distinguish between drugs of abuse and certain medications.
7. A positive test result may be obtained from certain foods or food supplements.
8. The assay is designed for use with human urine only

## EXPECTED VALUES

A negative result indicates that the drug concentration is below the detectable level. Positive result means the concentration of drug is above the detectable level.

## REAGENTS

Each test line contains anti-drug mouse monoclonal antibody and corresponding drug-protein conjugates. The control line contains goat anti-rabbit IgG polyclonal antibodies and rabbit IgG.

## PERFORMANCE CHARACTERISTICS

### Specificity

The following table lists the concentrations of compounds (ng/mL) that are detected as positive in urine by the ulti med *DrugControl* Test at 5 minutes.

| TEST DEVICE | Calibrator / related compounds | Cut-off Limit Value [ng / mL] |
|---|---|---|
| **Amphetamines (AMP 1000)** | **D-Amphetamine** | **1,000** |
| | L-Amphetamine | 25,000 |
| | D,L-Amphetamine sulfate | 300 |
| | Maprotiline | 50,000 |
| | Methoxyphenamine | 6,000 |
| | (±) 3,4-Methylenedioxyamphetamine (MDA) | 500 |
| | Phentermine | 1,000 |
| **Benzodiazepines (BZD 300)** | **Oxazepam** | **300** |
| | Alprazolam | 200 |
| | a-hydroxyalprazolam | 1,250 |
| | Bromazepam | 1,550 |
| | Chlordiazepoxide | 1,550 |
| | Clobazam | 100 |
| | Clonazepam | 800 |
| | Clorazepate dipotassium | 200 |
| | Delorazepam | 1,500 |
| | Desalkylflurazepam | 400 |
| | Diazepam | 200 |
| | Estazolam | 2,500 |
| | Flunitrazepam | 400 |
| | (±) Lorazepam | 1,500 |
| | RS-Lorazepam glucuronide | 150 |
| | Midazolam | 12,500 |
| | Nitrazepam | 100 |
| | Norchlordiazepoxide | 200 |
| | Nordiazepam | 400 |
| | Temazepam | 100 |
| | Triazolam | 2,500 |

| TEST DEVICE | Calibrator / related compounds | Cut-off Limit Value [ng / mL] |
|---|---|---|
| **Marijuana (THC 50)** | **11-nor-△9-THC-9 COOH** | **50** |
| | 11-nor-△8-THC-9 COOH | 30 |
| | Cannabinol | 35,000 |
| | △8-THC | 17,000 |
| | △9-THC | 17,000 |
| **Cocaine (COC 300)** | **Benzoylecgonine** | **300** |
| | Cocaine HCl | 200 |
| | Cocaethylene | 20,000 |
| | Ecgonine | 30,000 |
| **Methadone (MTD 300)** | **Methadone** | **300** |
| | Doxylamine | 100,000 |
| **Morphine (MOR 300)** | **Morphine** | **300** |
| | Codeine | 200 |
| | Ethylmorphine | 6,000 |
| | Hydrocodone | 50,000 |
| | Hydromorphone | 3,000 |
| | Levorphanol | 1,500 |
| | 6-Monoacethylmorphine | 300 |
| | Morphine-3-β-D-Glucuronide | 800 |
| | Norcodeine | 6,000 |
| | Normorphone | 50,000 |
| | Oxycodone | 30,000 |
| | Oxymorphone | 50,000 |
| | Procaine | 15,000 |
| | Thebaine | 6,000 |

## Accuracy

A side-by-side comparison was conducted using the ulti med *DrugControl* Test and commercially available drug rapid tests. Testing was performed on approximately 250 specimens per drug type previously collected from subjects presenting for Drug Screen Testing. Presumptive positive results were confirmed by GC/MS.

| % Agreement with GC/MS | | | | | | |
|---|---|---|---|---|---|---|
| | AMP/ 1000 | BZD/ 300 | COC/ 300 | THC/ 50 | MTD/ 300 | MOR/ 300 |
| Positive Agreement | 98.1 | 97.0 | 98.2 | 97.9 | 98.9 | 95.0 |
| Negative Agreement | 97.9 | 97.4 | 97.8 | 98.1 | 98.8 | 95.3 |

The agreement with the available commercial test kit is >99.9%.

## Analytical Sensitivity

A drug-free urine pool was spiked with drugs at the listed concentrations. The results are summarized below.

| Drug concentration Cut-off Range | n | AMP/ 1000 | | BZD/ 300 | | COC/ 300 | | THC/ 50 | | MTD/ 300 | | MOR/ 300 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | - | + | | - | + | - | | + | - | + | - | + |
| 0 % Cut-off | 30 | 30 | 0 | 30 | 0 | 30 | 0 | 30 | 0 | 30 | 0 | 30 | 0 |
| -50 % Cut-off | 30 | 30 | 0 | 30 | 0 | 30 | 0 | 30 | 0 | 30 | 0 | 30 | 0 |
| -25 % Cut-off | 30 | 26 | 4 | 27 | 3 | 26 | 4 | 26 | 4 | 27 | 3 | 26 | 4 |
| Cut-off | 30 | 15 | 15 | 15 | 15 | 13 | 17 | 14 | 16 | 15 | 15 | 15 | 15 |
| +25 % Cut-off | 30 | 3 | 27 | 3 | 27 | 3 | 27 | 3 | 27 | 3 | 27 | 3 | 27 |
| +50 % Cut-off | 30 | 0 | 30 | 0 | 30 | 0 | 30 | 0 | 30 | 0 | 30 | 0 | 30 |
| 3X Cut-off | 30 | 0 | 30 | 0 | 30 | 0 | 30 | 0 | 30 | 0 | 30 | 0 | 30 |

## Effect of Urinary Specific Gravity

Fifteen (15) urine samples of normal, high, and low specific gravity ranges (1.000-1.037) were spiked with drugs at 50% below and 50% above cut-off levels respectively. The ulti med *DrugControl* Test was tested in duplicate using fifteen drug-free urine and spiked urine samples. The results demonstrate that varying ranges of urinary specific gravity do not affect the test results.

## Effect of Urinary pH

The pH of an aliquoted negative urine pool was adjusted to a pH range of 5 to 9 in 1 pH unit increments and spiked with drugs at 50% below and 50% above cut-off levels. The spiked, pH-adjusted urine was tested with the ulti med *DrugControl* Test. The results demonstrate that varying ranges of pH do not interfere with the performance of the test.

## Cross-Reactivity

A study was conducted to determine the cross-reactivity of the test with compounds in either drug-free urine or drug positive urine containing Amphetamine, Benzodiazepines, Cocaine, Marijuana, Methadone and Morphine. The following compounds show no cross-reactivity when tested with the ulti med *DrugControl* Test at a concentration of 100 µg/mL.

## Non Cross-Reacting Compounds

Acetophenetidin
N-Acetylprocainamide
Acetylsalicylic acid
Aminopyrine
Amoxicillin
Ampicillin
l-Ascorbic acid
Apomorphine
Aspartame
Atropine
Benzilic acid
Benzoic acid
Bilirubin
d,l-Brompheniramine
Caffeine
Cannabidiol
Chloral hydrate
Chloramphenicol
Chlorothiazide
Chlorpromazine
Cholesterol
Cortisone
Creatinine
Deoxycorticosterone
Diclofenac
Diflunisal
Digoxin
Diphenhydramine
Ethyl-p-aminobenzoate
β-Estradiol
Estrone-3-sulfate
Erythromycin
Fenoprofen
Furosemide
Gentisic acid
Hemoglobin
Hydralazine
Hydrochlorothiazide
Hydrocortisone
o-Hydroxyhippuric acid
3-Hydroxytyramine
d,l-Isoproterenol
Isoxsuprine
Ketoprofen
Labetalol
Loperamide
Meprobamate
Methylphenidate
Nalidixic acid
Naproxen
Niacinamide
Nifedipine
Norethindrone
Noscapine
d,l-Octopamine
Oxalic acid
Oxolinic acid
Oxymetazoline
Papaverine
Penicillin-G
Phenelzine
Prednisone
d,l-Propanolol
d-Pseudoephedrine
Quinidine
Quinine
Salicylic acid
Serotonin
Sulfamethazine
Sulindac
Tetracycline
Tetrahydrocortisone, 3-acetate
Tetrahydrocortisone
Thiamine
d,l-Tyrosine
Tolbutamide
Triamterene
Trifluoperazine
Trimethoprim
d,l-Tryptophan
Uric acid
Verapamil
Zomepirac

**LIMITATIONS**

It is impossible to check any and all - other than those drugs mentioned in the product insert - for cross-reactivity or any other influences to the to be detected drug of abuse ( DOA ).
If the patient takes a „cocktail“ of several different drugs or medication cannot be excluded that a non-reproducible cross-reaction can falsified the test result.

**BIBLIOGRAPHY**

1. Hawks RL, CN Chiang. *Urine Testing for Drugs of Abuse*. National Institute for Drug Abuse (NIDA), Research Monograph 73, 1986.
2. *Tietz NW. Textbook of Clinical Chemistry. W.B. Saunders Company. 1986; 1735.*
3. *Stewart DJ, Inaba T, Lucassen M, Kalow W.* Clin. Pharmacol. Ther. *April 1979; 25 ed: 464, 264-8.*
4. *Ambre J.* J. Anal. Toxicol.*1985; 9:241.*
5. Winger, Gail, A Handbook of Drug and Alcohol Abuse, Third Edition, Oxford Press, 1992, page 146.
6. Robert DeCresce. *Drug Testing in the workplace,* 1989 page 114.
7. *Glass, IB. The International Handbook of Addiction Behavior. Routledge Publishing, New York, NY. 1991; 216*
8. B. Cody, J.T., “Specimen Adulteration in drug urinalysis. Forensic Sci. Rev., 1990, 2:63.
9. *C. Tsai, S.C. et.al., J. Anal. Toxicol. 1998; 22 (6): 474*
10. Baselt RC. Disposition of Toxic Drugs and Chemicals in Man. 6th Ed. Biomedical Publ., Foster City, CA 2002.
11. Hardman JG, Limbird LE. Goodman and Gilman’s: The Pharmacological Basis for Therapeutics. 10th Edition. McGraw Hill Medical Publishing, 2001; 208-209.

| | | | |
|---|---|---|---|
| | Manufacturer | | Contents sufficient for <n> tests |
| IVD | For in vitro diagnostic use only | LOT | Lot. no. |
| | For single use only | | Expiration date |
| | Read instructions for use | | Store at |
| | Keep away from direct sunlight | REF | Ordering number |
| | Keep dry | | |

This operating manual conforms to the latest technology / revision. Subject to change without prior notice!

ulti med Products (Deutschland) GmbH
Reeshoop 1 • 22926 Ahrensburg • Germany
Telefon: +49-4102 – 80090
Fax: +49-4102 – 50082
e-mail: info@ultimed.de

Distributor:
ulti med Products (Belgium) BVBA
Honzebroekstraat 137 • 8800 Roeselare
Phone: +32 +51 200 425
Fax: +32 +51 200 449
e-mail: belgium@ultimed.org

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