

## Orawei<sup>®</sup> Oral Fluid Drug Screen Device AMP50/BZO10/COC20/MET50/MOR40/THC40

The Orawei<sup>®</sup> Oral Fluid Drug Screen Device is a rapid, one-step immunoassay for the qualitative detection of Amphetamine, Benzodiazepines, Cocaine, Methamphetamine, Morphine, Tetrahydrocannabinol, with or without alcohol at the following cut-off concentration in human oral fluid.

AMP	d-Amphetamine	50 ng/ml
BZO	Oxazepam	10 ng/ml
COC	Cocaine	20 ng/ml
MET	d-Methamphetamine	50 ng/ml
OPI	Morphine	40 ng/ml
THC	Delta-9-Tetrahydrocannabinol	40 ng/ml
	Alcohol	0.02% B.A.C.

This device provides only preliminary drug test results. To obtain a quantitative result or a confirmation of a presumptive positive result, a more specific alternative method must be used. GC/MS or LC/MS is the preferred confirmatory method. Professional judgment should be applied to any drug of abuse test results, particularly when preliminary positive results are indicated.

### Technology and Explanation

**AMP:** Amphetamine is a potent sympathomimetic amine related to the human body's natural catecholamine, epinephrine, and norepinephrine. Depending on the route of administration, amphetamine can be detected in oral fluid as early as 10 minutes and up to 72 hours<sup>1</sup>.

**BZO:** Benzodiazepines are frequently prescribed sedative and hypnotic drug for treatment of anxiety, insomnia, sleep and seizure disorders. It can be detected in oral fluid up to 24 hours.

**COC:** Cocaine is a potent central nervous system stimulant, a local anesthetic derived from the leaves of the coca plant (*Erythroxylum coca*). Depending on the route of administration, cocaine and its metabolites benzoylecgonine can be detected in oral fluid as early as 10 minutes and up to 24 hours.

**MET:** Methamphetamine is a potent sympathomimetic agent with therapeutic applications. Methamphetamine use in acute higher doses lead to enhanced stimulation of the central nervous system and induce euphoria, alertness, and a sense of increased energy and power.

**OPI:** Heroin, morphine, and codeine are opiates that are derived from the resin of the opium poppy. Heroin is quickly metabolized to 6-acetyl morphine and morphine.

**THC:** Tetrahydrocannabinol, the active ingredient in marijuana plant is detectable in saliva shortly after use mainly due to the direct exposure of the drug via smoking. The window of detection for THC in saliva is up to 14 hours after use.

### Test principle

Orawei<sup>®</sup> Oral Fluid Drug Screen Device is a rapid lateral fluid immunoassay utilizing monoclonal antibodies to selectively detect specific drug at above cutoff levels in human saliva. The sample collection and immunoassay testing was integrated into one step. The assay is based on competitive immunoassay procedure in which the drug conjugates immobilized on nitrocellulose membrane compete with the drugs if present in specimen for the limited amount of antibody on colloidal gold conjugates. If there is no drug present or the drug concentration in the specimen is below cutoff level, the red colloidal gold conjugate will bind to the drug

conjugate at the specific test region, to form a visible band which indicated a negative result. If there is drug present in the specimen at above cutoff level, the drug will bind to the limited antibodies on colloidal gold, leaving no antibody available for binding to the drug conjugates on membrane. Thus, the absence of a test line band present at specific test region indicate a presumptive positive result for that particular drug.

**Alcohol Test** is an enzyme assay which a pad coated with highly specific enzymes, turns to color shades of green and blue on contact with alcohol in the oral fluids.

When oral fluid is collected has no alcohol present, the alcohol pad remains colorless. If alcohol is present in the oral fluid, the alcohol reacts with alcohol oxidase to produce Alde Hyde and peroxide. The peroxide reacts with peroxidase in the presence of hydrogen donor to produce a blue color. Therefore, the presence of green to blue color at the alcohol pads window indicates a presumptive positive result for alcohol.

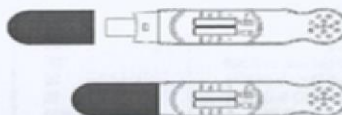


Fig. a

### Reagents

The Orawei<sup>®</sup> Oral Fluid Drug Screen Device contains two membrane strips and a collection pad. Each strip consists of a membrane, a colloidal gold conjugate pad, a sample pad and an absorbent pad.

**COC/OPI/MET test strip:** Cocaine, Morphine and Methamphetamine protein conjugates are coated onto specific region on the membrane known as the "Test Region". And the colloidal gold conjugate pad contains anti-cocaine, anti-morphine and anti-methamphetamine antibody colloidal gold conjugates coated onto a fibrous pad.

**BZO/THC/AMP test strip:** Benzodiazepine, THC and Amphetamine protein conjugates are coated onto the test region of the membrane. And the colloidal gold conjugate pad contains anti-benzodiazepine, anti-THC and anti-amphetamine antibody colloidal gold conjugates coated onto a fibrous pad.

**Alcohol test:** a cellulose pad coated with highly specific oxidase, tetra methyl benzidine, and peroxidase.

**Collection Pad:** The collection pad consists of an absorbent material.

### Precautions

- For Forensic Use only
- The test device is for single use and should remain in its original sealed pouch until ready for use.
- Do not use after the expiration date indicated on the kit.
- Handle all oral specimens as potentially infectious. The used device should be discarded according federal, state and local regulation.

### Materials Provided

1. 1 Package Insert
2. Test devices packaged individually in a foil pouch with desiccant.

### Storage and Stability

1. Store at 4°C-30°C. Do not open pouch until ready to perform the assay.
2. Keep away from direct sunlight moisture and heat.

### Test Procedure

Allow the test device to reach room temperature 15 - 30°C, and instruct the donor not to eat, drink, smoke or chew tobacco products for at least 10 minutes prior to collection of fluid specimen.

1. Remove the test device from the sealed pouch and use the device as soon as possible.
2. Pull the blue cap off gently by holding the sides to expose the collection pad.
3. Hold the top portion of the device and place the collection pad into the mouth.
4. Rub the collection pad against the cheek and tongue gently in a circular motion about 10 times. And then place the collection pad underneath the tongue for about one minutes

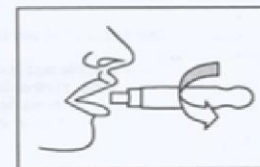


Fig. b Gently rub the collection pad against each cheek several times.



Fig. c Gently rub the collection pad of the tongue.

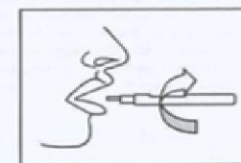


Fig. d Place the collection pad on top underneath.

5. Instruct the donor to hold the device with their hand until the red color liquid show up in window. This should take less than 5 minutes.
6. Remove the device from mouth as soon as the red color liquid moving at both test windows.
7. Place the cap onto the device; lay it on a flat surface.
8. Read results at 5 minutes after removing device from mouth. Do not read results after 15 minutes.

### Interpreting Test Results

#### Negative Results

A red colored band should be observed in control region (C), and specific drug test region.

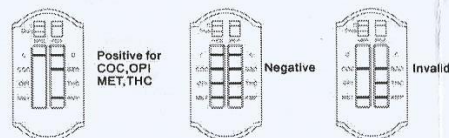
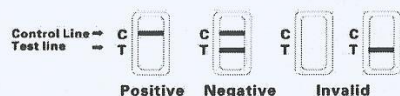
The color and density of the test band may vary for control and drug test region.

#### Presumptive Positive Results

When the control band is visible in the control region (C) and no band appears at the specific test region, the result is a **presumptive positive** for that particular drug.

#### Invalid

When no band appears in the control (C) region, the test is invalid regardless of the results in the test region. If the test is invalid, check testing procedures. **Repeat the test using a new device.**



**Important: Do not compare color intensity of one test band to another. Read each test independently.**

Any darker or light red band for a specific test is observed in the test region along with the presence of the control line (C), the sample should be considered negative. For confirmation of a presumptive positive result, a more specific quantitative method (GC/MS or LC/MS/MS) must be used.

### Quality Control

The device has built-in control band in each window at the control regions (C) to indicate that the test has performed properly. If the control bands do not appear, the test device should be discarded. The use of external controls is strongly recommended as good laboratory testing practice to verify test performance. Negative and positive controls should give the expected results when tested by pipetting 0.5 ml of the controls onto the collection pad.

Laboratories should comply with all federal, state, and local laws, guidelines and regulations.

### Limitations of Procedure

- The assay is designed for human oral fluid use only.
- The test only provides a qualitative, preliminary result. Positive results only indicate the presumptive presence of drugs and do not indicate or measure intoxication. A more specific analytical method like LC/MS/MS is preferred to confirm the results.
- Technical or procedural errors as well as substances in certain foods and certain medications may interfere with the test and cause false results.

### Performance Characteristics

**Analytical sensitivity** For each specific drug test, pooled oral fluid solution was spiked with a drug standard at various concentrations (0%, 25%, 50%, 75%, 100%, 125%, 150%, 175% and 200%). The results for each drug of the Orawell® Oral Fluid Drug Screen Device Tests are summarized below:

Cut-off level	Drug Test											
	COC		OPI		MET		BZO		THC		AMP	
	-	+	-	+	-	+	-	+	-	+	-	+
0%	60	0	60	0	60	0	60	0	60	0	60	0
-50%	30	0	30	0	30	0	30	0	30	0	30	0
-25%	26	4	28	2	30	0	25	5	27	3	29	1
100%	20	10	15	15	17	13	12	18	13	17	15	15
+125%	5	25	3	27	4	26	3	27	6	24	1	29
+150%	0	30	0	30	0	30	0	43	1	44	2	43
+300%	0	30	0	30	0	30	0	30	0	30	0	60

### Specificity

The specificity of each drug test was evaluated by adding its structurally related compounds to pooled oral fluid sample. The results are expressed as the lowest concentration of the compound, in ng/ml, that produced a positive result.

Drug Test	Approximate Concentration (ng/ml)	Approximate % Cross Reactivity
<b>Amphetamine (AMP)</b>		
d-Amphetamine	50	100%
l-Amphetamine	2,000	2.5%
d,l-p-Chloramphetamine	400	12.5%
MDA	400	12.5%
Phentermine	100	50%
β-Phenylethylamine	10,000	0.5%
Tyramine	10,000	0.5%
<b>Marijuana (THC)</b>		
Δ-9-Tetrahydrocannabinol	40	100%
Cannabinol	100	40%
Δ-8-Tetrahydrocannabinol	100	40%
11-nor-Δ-8-THC-9-COOH	20	200%
11-nor-Δ-9-THC-9-COOH	10	400%
11-Hydroxy-Δ-9-THC	400	10%
<b>Cocaine (COC)</b>		
Cocaine	20	100%
Benzoylcegonine	100	20%
Ecgonine HCl	800	2.5%
Ecgonine methylester	200	10%
<b>Benzodiazepine (BZO)</b>		
Oxazepam	10	100%
Alprazolam	20	50%
a-Hydroxyalprazolam	100	10%
Bromazepam	20	50%
Clobazam	10	100%
Clonazepam	400	2.5%
Delorazepam	25	40%
Chlordiazepoxide	500	2%
<b>Opiates (OPI)</b>		
Morphine	40	100%
6-Acetylcodeine	40	100%
6-Acetylmorphine	100	40%
Codeine	75	53%
Dihydrocodeine	250	16%
Ethyl morphine	100	40%
Heroin	50	80%
Hydrocodone	250	16%
Hydromorphone	400	10%
<b>Methamphetamine (MET)</b>		
d-Methamphetamine	50	100%
d,l-Ephedrine	10,000	0.5%
1R, 2S l-Ephedrine	6,000	0.8%
p-Hydroxymethamphetamine	2,000	2.5%
MDEA	2,000	2.5%
MDMA	150	33.3%
d,l-Methamphetamine	100	50%
l-Methamphetamine	1500	3.4%
Methoxyphenamine	10,000	0.5%

### Interference

The Orawell® Oral Fluid Drug Screen Test performance at ±50% cut-off levels is not affected by oral fluid samples with pH range of 2.0 to 8.5. The following compounds were tested no interfering with assay performance when tested at concentration of 10 µg/ml (10,000ng/ml).

Acetaminophen	Hemoglobin
Albumin from human serum	Human IgA
l-Ascorbic Acid	Human IgG
Aspartame	Human IgM
Benzocaine	Ibuprofen
Benzoic acid	Ketamine
Bilirubin	Lidocaine
Caffeine	Naloxone
d-Chlorpheniramine	Naltrexone hydrochloride
Cholesterol	d-Naproxen
Dextromethorphan	Pentazocine
Diphenhydramine	Promazine
Doxylamine	Promethazine
1R, 2S l-Ephedrine (except MET assay)	Ranitidine
1S, 2R d-Ephedrine	Riboflavin
l-Epinephrine	Salicylic acid
Erythromycin	Serotonin
Ethanol	Tetracycline
Glutethimide	Thiamine
	Tryptamine

### Food/Beverage/Hygiene Products Interference

Foods, drinks and hygiene products were spiked at 1% concentration in ±50% oral fluid controls to evaluate the interference with Orawell® test results. For interference of cigarette, oral fluid samples were collected from 6 subjects within 15 minutes after consuming a cigarette and then spiked with drug standards (MET, THC, COC, AMP, OPI, PCP). The following substances were found not to interfere with Orawell® Oral Fluid Drug Screen Test performance.

Mouth Wash	Orange Juice	Alcohol
MSG	Apple Juice	Tea
Toothpaste	Food color: Red	Carbonated Cola
Gum	Food color: Green	Baking Soda
Coffee	Food color: Blue	Cigarette
Cough Syrup	Sugar	Salt

### Bibliography of Suggested Reading

- Moolchan, E., et al, "Saliva and Plasma Testing for Drugs of Abuse: Comparison of the Disposition and Pharmacological Effects of Cocaine", Addiction Research Center, IRP, NIDA, NIH, Baltimore, MD. As presented at the SOFT-TIAFT meeting October 1998.
- Caplan, Y. and Goldberger, B., Alternative Specimens for Workplace Drug Testing, J. Analytical Toxicology, vol. 25, p. 396-399, 2001.
- Schramm, W., Smith, R. and Craig, P., Drugs of Abuse in Saliva: A Review, J. Analytical Toxicology, vol. 16, p. 1-9, 1992.
- Kim, I, et al, "Plasma and oral fluid pharmacokinetics and pharmacodynamics after oral codeine administration", Clin Chem, 2002 Sept.; 48 (9), pp 1486-96

Manufactured By: Jiangsu Well Biotech Co., Ltd  
126 Huaxing Rd  
Jintan, Jiangsu 213200  
China  
01186 519-80191660