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# Mini π

## Portable Field Toxics-Screening Mass Spectrometer

Solution for Public Security On-site Test Applications

## Anytime

- ✓ No pre-treatment required
- ✓ Suitable for complex matrices
- ✓ Automatic calibration and adaptation to environment



## Anywhere

- ✓ Lightweight and portable with removable internal battery
- ✓ Supports multiple application scenarios
- ✓ Anti-seismic and splash proof



## Anybody

- ✓ Easy operation & maintenance
- ✓ One-click operation with single touch
- ✓ 5G networking



## SPECIFICATIONS

Size	: ≤40×27×18cm
Weight	: 10kg
Operation Temperature	: 10-30°C
Operation Humidity	: 20-85%
Power	: 40-80W

Noise	: <50db
<b>Supply Power</b>	: <b>Built-in battery (&gt;2hrs of continuous operation, transport friendly)/electric supply</b>
Resolution	: FWHM 0.5
Mass Range	: 50-1000m/z
Sensitivity	: 1ppb
Scan Mode	: MS <sup>1</sup> 、MS <sup>2</sup> 、MS <sup>3</sup>

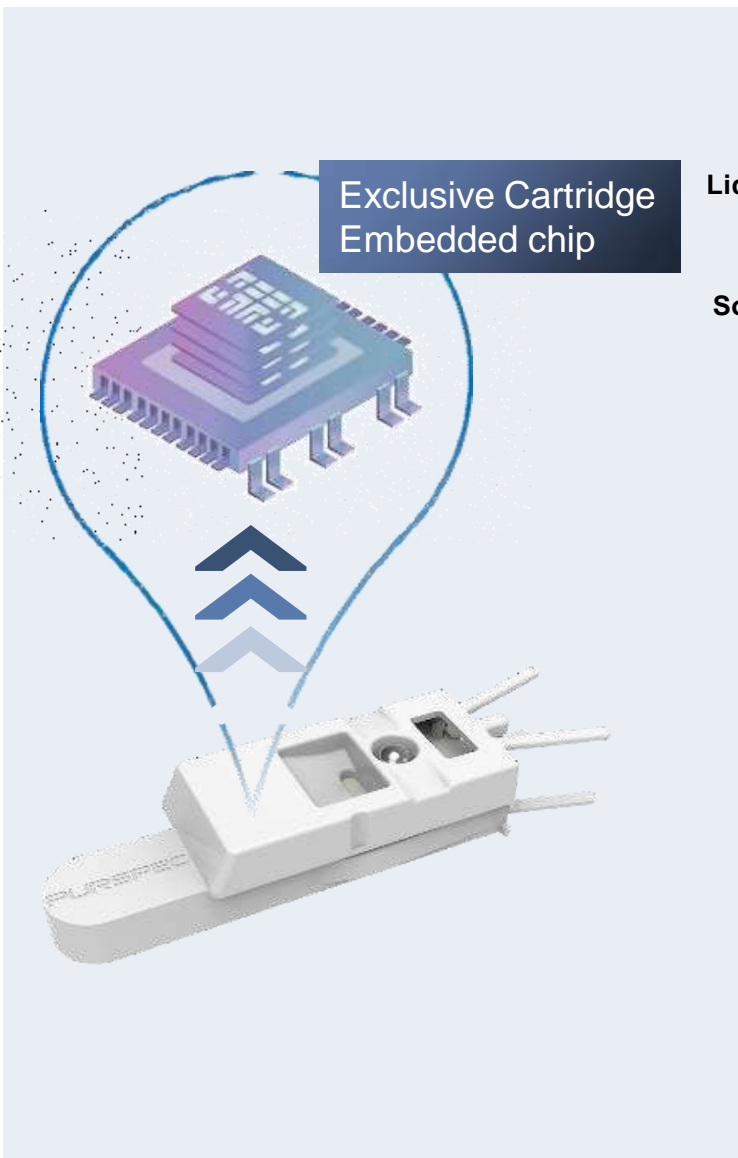
<b>Boot Time</b>	: <b>5min</b>
Gas	: Air, no external air source
Environment Self-adaptation	: Real-time calibration according to environmental changes
Ion Sources	: In-situ ionization detection kits
Sample Type	: Solid powder, seasonings, liquid, food, and biological samples, etc.



**ANYTIME**



# On-site intelligent analysis workflow



- Liquid**
  - drugs
  - medicine
  - suspicious liquid
- Solid**
  - pills
  - leaves
  - suspicious solid



**STEP 01**

## SAMPLE LOADING

- Load sample via the liquid sampler or the solid sampler (5µL/5mg)

**STEP 02**

## SOLVENT LOADING

- Add 4-5 drops (100µL) of solvent

**SAMPLE DRYING (optional)**  
➤ To dry samples, approx. 30s

**STEP 03**



## Mini π Analysis

- One-click analysis

**ANYWHERE**



# Vehicle-mounted / Mobile laboratory



Mobile Laboratory



VS



# Crime scene / Customs





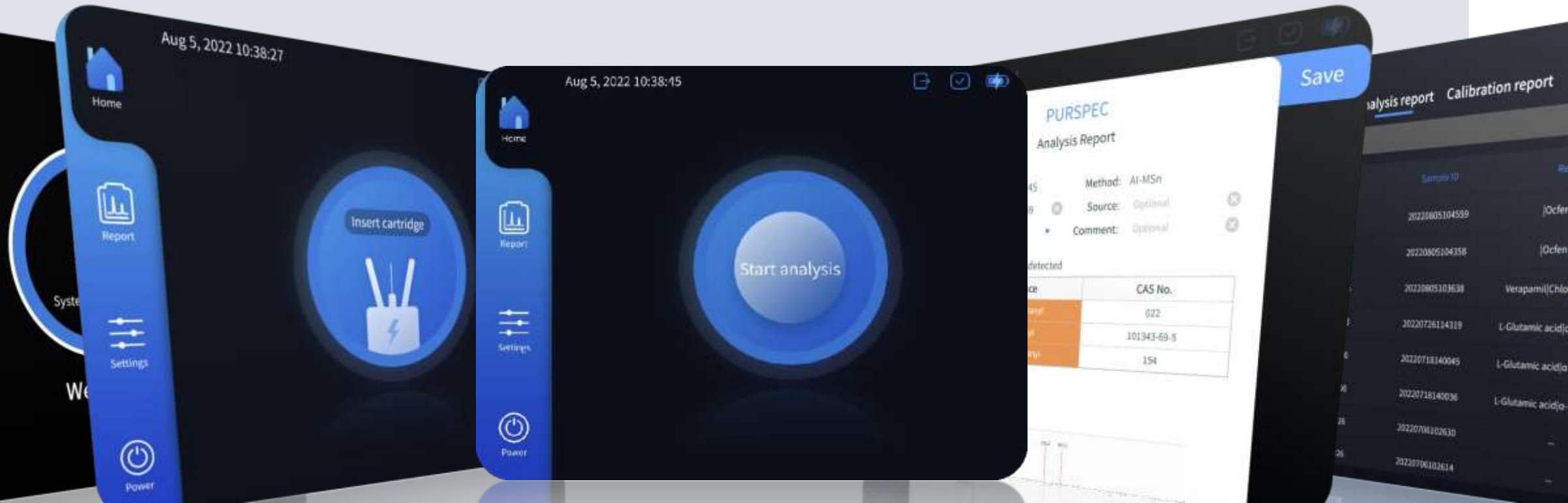


# ANYBODY



# One-click Intelligent Operation

**One-click operation. With a single touch**, the Mini  $\pi$  automatically runs a sample and provides a detailed analysis result. No professional background required.



# 2

# Solutions





## Toxic Substances

Criminal investigation scene, **emergency detection**, **rapid identification** of toxic and harmful substances

## What problems can Mini $\pi$ solve ?

### Drug of Abuse

**Rapid response** to continual update and synthesis of new drugs of abuse.

**Fast & accurate** identification of drugs of abuse in biofluids.

# Toxic Substances

- Our database includes over **200 kinds** of toxic substances.
- Ensures Food Safety at Large-Scale Events



## Test Items:

- **Toxic substances in liquids and solid powder**  
based on our database (more than 200 compounds).
- **Toxic substances in complex matrix**  
Tests for key compounds (pesticides, veterinary drugs, antibiotics, etc.)

## Potential Clients:

- Criminal Investigation
- Public Security
- Food Safety

**PURSPEC**

## Examples of Toxic Substances Database

Category	Substances
organophosphorus insecticides	diazinon, dimethoate, omethoate, trichlorfon, dichlorvos, monocrotophos, methamidophos, chlorpyrifos, acephate, chlorpyrifos, etc.
pyrethroid insecticides	pyrethrin, cypermethrin, beta cypermethrin, and deltamethrin, etc.
carbamate Insecticides	carbaryl, methomyl, carbaryl, carbofuran, methomyl, and Isoprocarb, etc.
<b>Pesticides</b> other Insecticides	acetamiprid, thiazinone, and rotenone, etc.
herbicide	prometryne, paraquat, diquat, glyphosate, glufosinate, acetochlor, atrazine, quizalofop, bensulfuron methyl, difluorosulfonamide, and sulfuron methyl, etc.
rodenticide	rodenticide, bromadiolone, bromadiolone, and chlormurone, etc.
bactericide	carbendazim, imipramine, carbendazim, and pyrimethanil, etc.
<b>Veterinary Drugs</b>	clenbuterol, enrofloxacin, norfloxacin, levofloxacin, sulfadiazine, and salbutamol, etc.
<b>Antibiotics</b>	dexamethasone, erythromycin, lincomycin, oxytetracycline, roxithromycin, and minocycline, etc.
<b>Alkaloid</b>	reserpine, nicotine, strychnine (strychnine), ephedrine, aconitine, hypoaconitine, papaverine, gelsemin, and scopolamine, etc.
<b>Sedative</b>	clonazepam, diazepam, flurazepam, flurazepam, oxazepam, flurazepam, brozepam, flurazolam, alprazolam, estazolam, midazolam, brotezolam, etizolam, barbitol, and phenobarbital, etc.
<b>Narcotic and Psychotropic Drugs</b>	morphine, procaine, pethidine, aripiprazole, methadone, and fentanyl, etc.
<b>Other Clinical Drugs</b>	tetracaine, succinylcholine chloride, glibenclamide, benzene, phentermine, diphenhydramine, sulpiride, chlorphenamine, amitriptyline, ambroxol, metformin, and triptolide, etc.
<b>In Total</b>	200+

# Performance of Toxic Substances Analysis

Applications: suspected substances, rice, flour, meat, seasoning, dishes, blood and urine, etc.

## Sensitivity of highly toxic substances in different matrices



Substances	LOD (µg/mL)
Aquacide	1
Paraquat	1
Glyphosate	5
Bromadiolone	5
Bromadiolone	5
glufosinate-P-ammonium	2.5
Succinylcholine chloride	0.3

Substances	LOD (µg/mL)	Seasoning		Food					Biofluids	
		chilli sauce	vinegar	rice	flour	meat	Cooked rice	Veg. paste	Urine	Blood
triazine herbicides	Atrazine	1	0.5	0.1	0.5	2	0.1	1	0.2	0.1
Sulfonon herbicides	Bensulfuron methyl	0.4	0.4	0.05	0.05	0.2	0.1	0.2	0.5	0.1
organophosphorus insecticide	Dimethoate	/	5	1	1	5	1	1	2	0.5
Alkaloid	Aconitine ethyl	1	2	1	1	1	1	2	2	1
Antipsychotics	clozapine	0.1	1	0.1	0.1	0.5	0.1	1	1	0.1

## Sensitivity of psychotropic drugs in blood

Substances	LOD (µg/mL)	
Lorazepam	0.05	
Zopiclone	0.2	
diazepam	0.2	
Sedative hypnotics	Oxazepam	0.2
	Alprazolam	0.2
	Clonazepam	0.2
	Phenobarbital	30
	Serquin	0.3
Anti-epileptic psychoactive drug	Olanzapine	0.3
	clozapine	1
Narcotic excitant	caffeine	5
Respiratory and digestive drugs	omeprazole	0.02
Anti-allergy	Chlorpheniramine	0.2

# Drugs of Abuse

- Our database contains over **400 kinds** of traditional and synthetic illicit drugs, including more than **200 species** of fentanyl and **40 species** of synthetic cannabinoids.
- Over **8000 types** of synthetic cannabinoids and **120,000** fentanyl and its variants can be tested.

On-stie Detection



Suspicious  
Objects



Blood



Urine



Hair



Saliva

## Test Items:

- **Drugs screening in liquids and solid powder**  
based on our database of more than 400 compounds.
- **Drugs in hair**  
Tests for 12 key compounds (ketamine, morphine, cocaine, Methamphetamine, MDA, MDMA, THC, etc.)
- **Drugs in blood, urine and saliva**  
Tests for 5 key compounds (Cocaine, Heroin, Ketamine, Methamphetamine and MDMA)

## Potential Clients:

- Drug Enforcement Administration
- Criminal Investigations
- Public Security
- Customs Screening



## Examples of Illicit Drugs in the Database

Category	Substances
<b>Traditional Drugs</b>	methamphetamine / magu (methamphetamine), heroin, opium (morphine), k powder (ketamine), cannabis (tetrahydrocannabinol), ecstasy (MDMA), benzene (MDA), cocaine, codeine, chat grass (catharson), and $\gamma$ -Hydroxybutyric acid (GHB), etc., full coverage.
<b>Narcotic and Psychotropic Drugs</b>	"smurfs" (flunitrate Western), "smart drugs" (modafinil), "weight loss drugs" (phentermine), sedative and hypnotic drugs "zolpidem, zopiclone", ergot ethylenediamine, buprenorphine, triazolam, and methadone, etc.
<b>New Psychoactive Substances (NPS)</b>	<p><b>fentanyl</b> 4-fluorobutyryl fentanyl, alfentanil, acryloyl fentanyl, furan fentanyl, valeryl fentanyl, isobutyryl fentanyl, acetyl fentanyl, butyryl fentanyl, carfentanil, 4-fluoroisobutyl fentanyl, tetrahydrofuran fentanyl, fentanyl, p-fluorofentanyl, remifentanil, thiofentanyl, 3-methylthiofentanyl, alpha methylfentanyl, beta-hydroxy-3-methylfentanyl, beta-hydroxy fentanyl, <math>\beta</math>-There are more than 200 kinds of hydroxy thiofentanyl, alfentanil, acetyl Alfa methyl fentanyl, Alfa methyl thiofentanyl, sufentanil, etc. (including 25 kinds and their precursors under national control).</p> <p><b>synthesis cannabinoids</b> "Natasha", "TWIG" AMB-FUBINACA, ADB-FUBINACA, 5F-ADB; JWH018, JWH-081, MAM-2201, and JWH-073, etc.</p> <p><b>cathinones</b> cathinone, methcathinone, 2-fluoromethcathinone (2-fmc), 4-bromomethcathinone (4-bmc), butylone, ethyl, 4-MMC, and 3,4-DMMC, etc.</p> <p><b>phenylethylamines</b> 2,5-dimethoxy foundation base-4-propyl phenylethylamine (2C-P), 2C-H, 2C-disturbed daily variation, 2C-C, 2C-E, and 2C-I, etc.</p> <p><b>tryptamines</b> dimethyl tryptamine (DMT), diethyl tryptamine (DET), "fire fox" (5-MEO-DIP), 5-MEO-DALT, 5MEO DMT, and 5MEO MIPT, etc.</p> <p><b>piperazine</b> benzylpiperazine (BZP), mCPP, TFMPP, DBZP, and MT-45, etc.</p>
<b>In Total</b>	400+, including more than 200 species of fentanyls and 40 species of synthetic cannabinoids. Over 8000 types of synthetic cannabinoids and 120,000 fentanyls and its variants can be tested.

# Performance of drugs analysis

Applications : traditional drugs, NPS, suspected drugs (hidden in food), (suspected) drug addicts' urine, blood, hair, and saliva, etc.



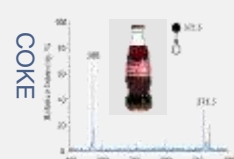
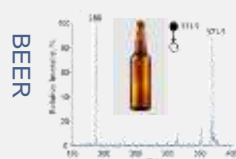
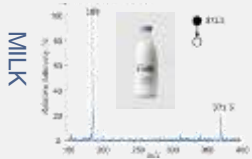
## Sensitivity of traditional drugs or NPS

Sensitivity: 1-10 ppm ( $10^{-6}$ )



## Sensitivity of Hidden drugs

Sensitivity: ocfentanil 10ppb ( $10^{-9}$ )

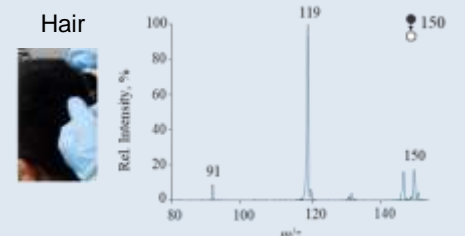
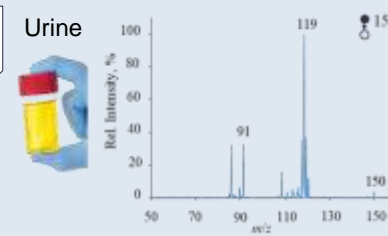


## Sensitivity of (suspected) drug addicts' biofluids

Sensitivity: 10ppb ( $10^{-9}$ ) - 1ppm ( $10^{-6}$ )

Cocaine, meth, MDMA and ketamine in hair samples can reach 0.2ng/mg.

meth



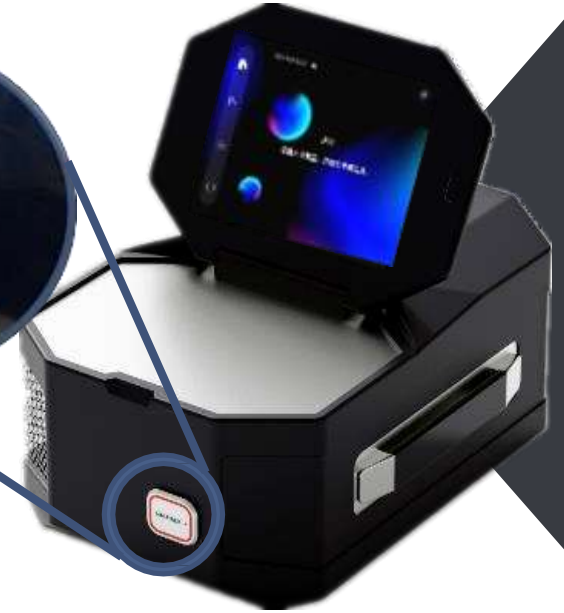
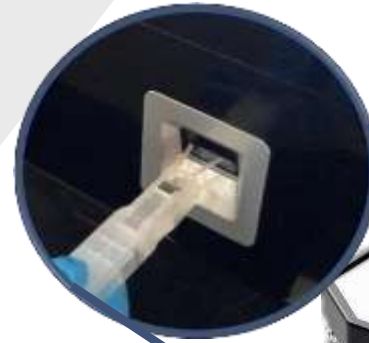
# Performance of drug analysis via wiping

Applications: surface of packages, suitcases, luggage and utensils.

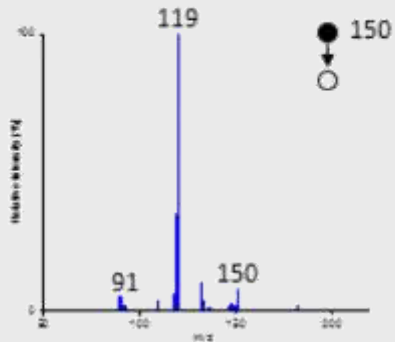
SURFACE SAMPLING



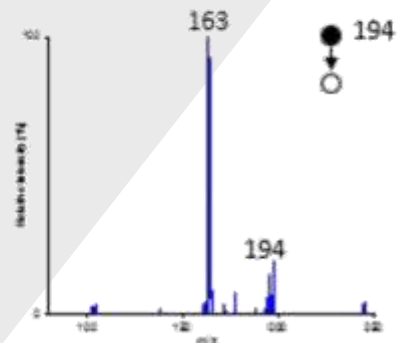
SOLVENT LOADING



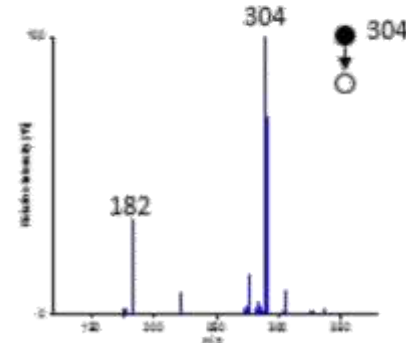
1ng 甲基苯丙胺



1ng MDMA



1ng cocaine



Analysis of fentanyl on the surface of plastic bag

