CHROMSYSTEMS

Drugs of Abuse Testing

Target Screening and Quantitative Confirmation

MassTox® Drugs of Abuse Testing in Urine by LC-MS/MS

Target screening and quantitative confirmation of more than 100 drugs and metabolites within the same run

LC-MS/MS Urine Assay for Both: Target Screening and Quantitative Confirmation

- Assay includes 108 drugs and metabolites
- Target screening and quantitative confirmation within the same run
- Run time of 12 minutes
- Simple sample prep combined with high selectivity and sensitivity
- Internal standards for 98 analytes

The LC-MS/MS based assay ***MassTox***® Drugs of Abuse Testing offers the target screening of more than 100 drugs and metabolites with an instrument-dependent analysis time of approximately 12 minutes. A quantitative confirmation can also be performed within the same run. The CE-IVD validated solution includes everything, eliminating the need for developing and maintaining several in-house methods or for preparing QC materials for a multitude of analyte compounds.

It also provides a significantly higher selectivity and sensitivity than current immunoassays and is designed to work below cut-offs defined by GTFCh and EWDTS. The assay can be used for target screening, quantitative confirmation, or both. 98 analytes are safeguarded by isotopically labelled internal standards. The high stability of the 6PLUS1® multilevel urine calibrator set and three ***MassCheck***® urine controls ensure reliable results with highest precision.

Parameter Menu

Amphetamines
Amphetamine
BDB
Butylone
2C-B
2C-I
Cathinone
MBDB
MDA
MDEA
MDMA
MDPV
Mephedrone
Methamphetamine
Methaqualone
Methylone
Methylphenidate
PMA
Ritalinic Acid

Barbiturates
Allobarbital
Amobarbital
Barbital
Butalbital
Hexobarbital
Pentobarbital
Phenobarbital
Secbutabarbital
Secobarbital
Thiopental

Benzodiazepines
Alprazolam
7-Aminoclonazepam
7-Aminoflunitrazepam
7-Aminonitrazepam
Bromazepam
Brotizolam
Chlordiazepoxide
Clobazam
Clonazepam
Demoxepam
Desalkylflurazepam
Desmethylflunitrazepam
Diazepam
Estazolam
Flunitrazepam
Flurazepam
Lorazepam
Lormetazepam
Medazepam
Midazolam
Nitrazepam
Norclobazam
Nordiazepam
α-OH-Alprazolam
3-OH-Bromazepam
α-OH-Midazolam
α-OH-Triazolam
Oxazepam
Prazepam
Temazepam
Triazolam

Booster
Gabapentin
Pregabalin
Promethazine
Quetiapine

Cannabinoids
THC-COOH

Cocaine
Benzoylecgonine
Cocaethylene
Cocaine
Norcocaine

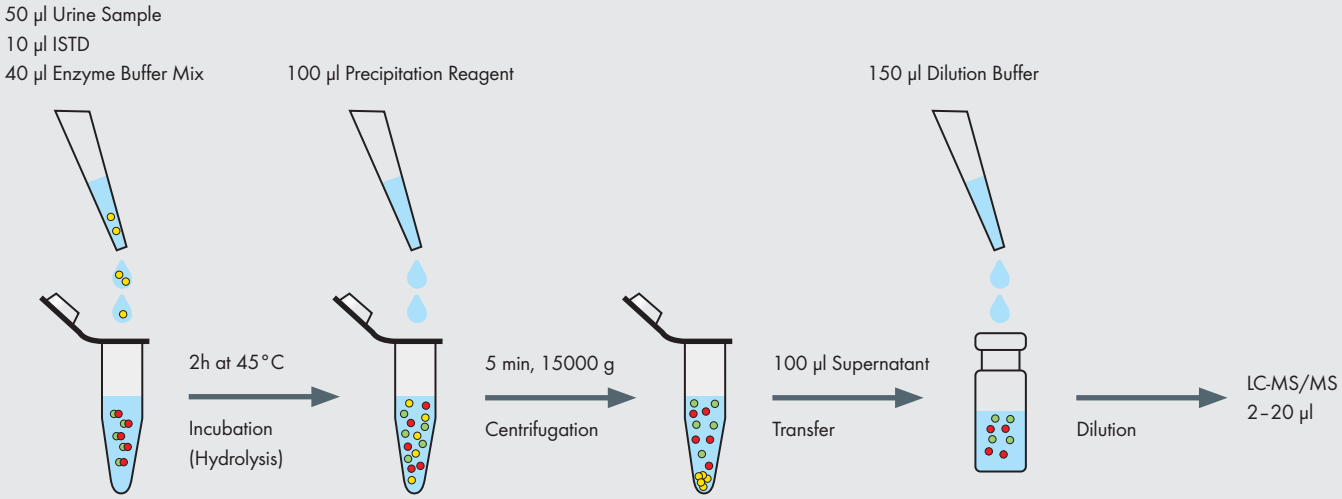
Others
Ketamine
LSD
Mescaline
Norketamine
O-H-LSD
PCP

Z-Drugs
Zaleplon
Zolpidem
Zopiclone

Opiates/Opioids
Acetylcodeine
Buprenorphine
Codeine
Dihydrocodeine
EDDP
Fentanyl
Hydrocodone
Hydromorphone
Meconin
Meperidine
Methadone
6-Monoacetylmorphine
Morphine
Naloxone
Naltrexone
Norbuprenorphine
Norcodeine
Norfentanyl
Normeperidine
Nortapentadol
Nortilidine
O-Desmethyltramadol
Oxycodone
Oxymorphone
Papaverine
Propoxyphene
Sufentanil
Tapentadol
Thebaine
Tilidine
Tramadol

Sample Preparation: Fast and Easy

Sample Preparation in Reaction Vials*



Pre-analytic Treatment

Specimen	urine
Stability	according to the Swiss Guidelines Committee for Drugs of Abuse Testing (SCDAT), samples are stable for seven days at +2 to +8 °C and for six months at -18 °C

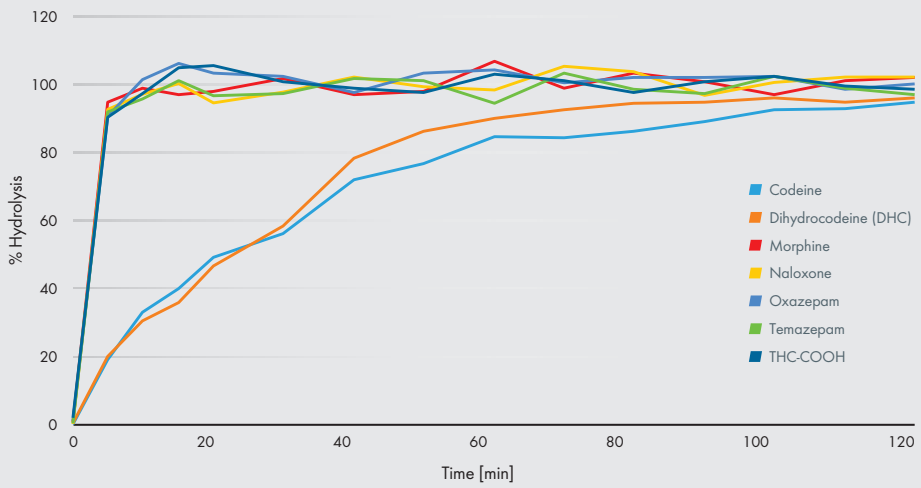
Specifications

Linearity for all analytes	from 0.25 to 30 x of cut-off value
Limit of quantification	down to 13 ng/l
Intraassay	CV = 1–9 %
Interassay	CV = 1–11 %
Recovery	85–115 %
Analysis time	12 min

*Assay also available for 96 Well Plates

100% Hydrolysis – 0% Doubt

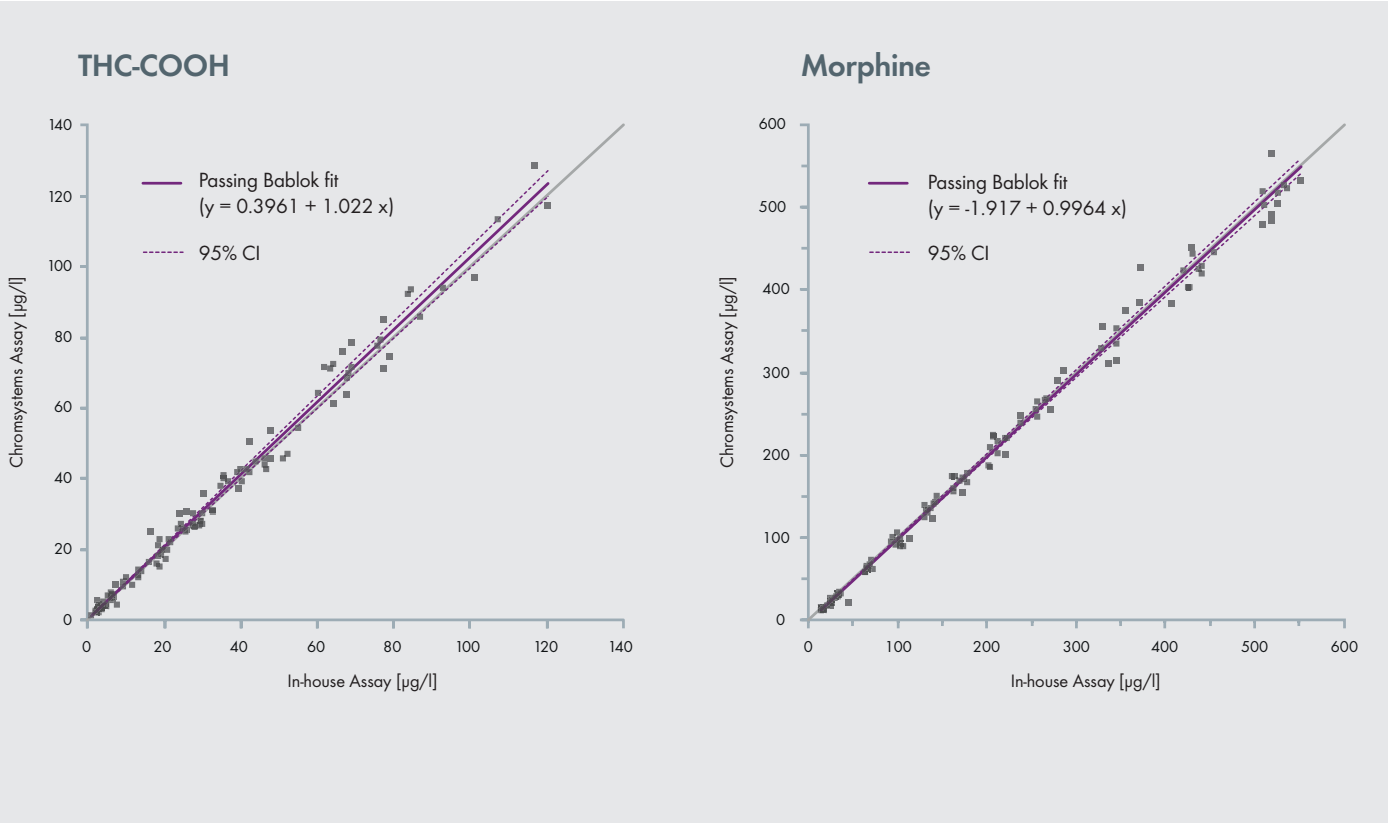
Many drugs undergo glucuronidation prior to excretion, which requires an enzymatic or acidic hydrolysis – a challenge for most assays and in-house methods[1]. In contrast, the ***MassTox***® Drugs of Abuse Testing assay from Chromsystems includes a carefully selected enzyme that has proven to function with all 108 drugs, including codeine and other substances usually difficult to hydrolyse. This ensures a complete and selective hydrolysis of all drugs covered in the assay.



After 2 hrs, 100% of glucuronides are hydrolysed including difficult drugs such as codeine.

Proven Accuracy and Reliability

A lab experienced in routine drugs of abuse testing performed a comparative analysis of the ***MassTox***® assay with an LC-MS/MS based in-house method. Values obtained correspond very well with each other at concentrations within the linearity of the method. This demonstrates the accuracy of data and the suitability of the Chromsystems assay to replace LC-MS/MS based in-house methods in the forensic and clinical laboratory. The ***MassTox***® assay also has been successfully used in proficiency testing schemes of GTFCh, Instand and RfB.

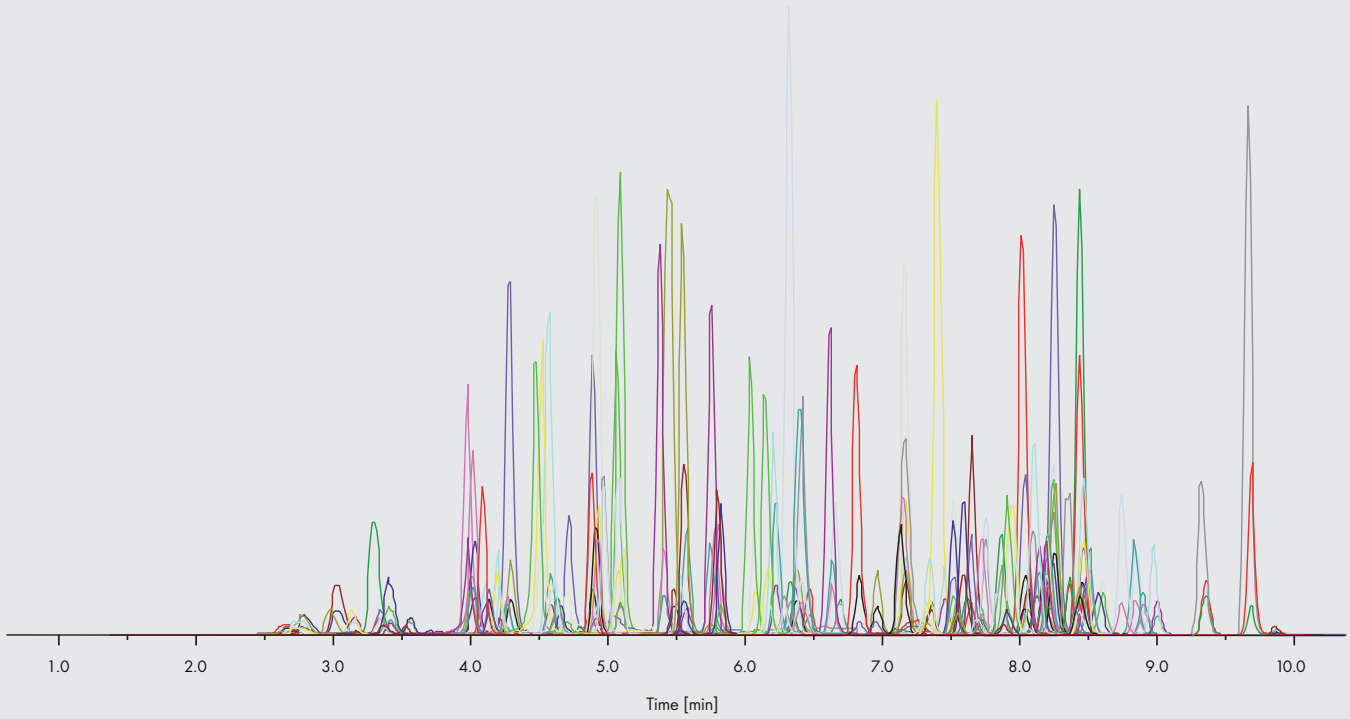


LC-MS/MS: Faster Sample Prep – Lower Workload

A comparison of the utility of the LC-MS/MS assay in the daily routine with GC-MS also has been made. Results not surprisingly demonstrate that LC-MS/MS allows the direct analysis of the specimens and eliminates the need for derivatisation steps. This makes the sample prep much simpler and less time-consuming in comparison to GC-MS. Another advantage is the need for much lower sample volumes. This means: when comparing our LC-MS/MS assay with GC-MS, then it provides comparable data, but with the advantage for LC-MS/MS to offer a faster sample prep and lower sample volumes.

	LC-MS/MS	GC-MS
Total run time	12 min	10–15 min
Sample prep time (excluding hydrolysis)	2 h per day	6 h per day
Sample volume	50 µl	1000–5000 µl

108 Drugs/Metabolites – 1 Analytical Run



HPLC Parameters

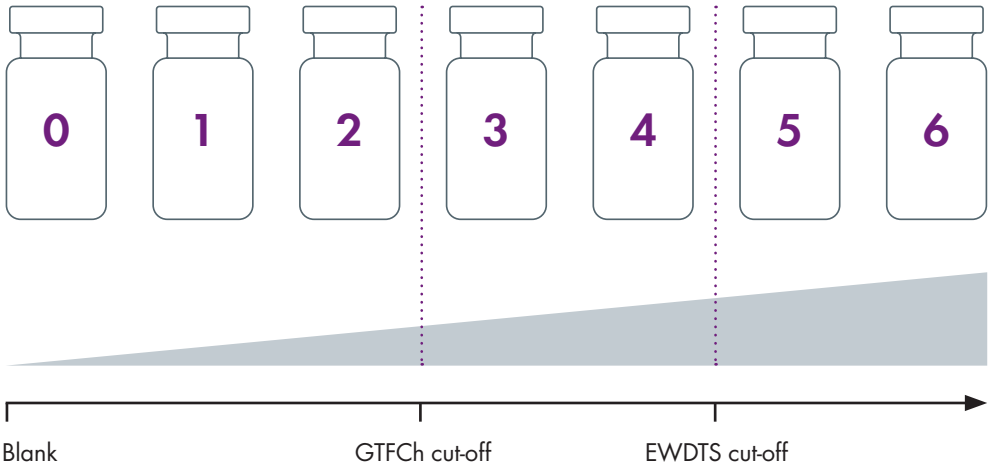
Injection volume	2–20 µl
Column temperature	30°C
Gradient	binary

MS Parameters

Ionisation	ESI positive and negative
MS/MS Mode	MRM

Calibrator and Control Material

The Chromsystems assay is provided with a 6PLUS1® Multilevel Urine Calibrator Set and ***MassCheck***® controls with three levels that cover the relevant concentration range, including cut-off values from GTFCh and EWDTS. The material includes a lyophilised urine matrix that is reconstituted with a buffer. It has been developed to provide highest stability for all 108 analytes. For target screening alone, a Urine Screening Standard Set is also available.



The Chromsystems assay covers the cut-off values defined by GTFCh and EWDTS.

MassTox® Drugs of Abuse Testing

96000 *MassTox*® Drugs of Abuse Testing in Urine (with Reaction Vials) – For 400 tests
96000/WP *MassTox*® Drugs of Abuse Testing in Urine (with 96 Well Plates) – For 400 tests

Components available separately

96001 Mobile Phase A, 700 ml
96002 Mobile Phase B, 700 ml
96005 Precipitation Reagent, 40 ml
96009 Rinsing Solution, 500 ml
96010 Dilution Buffer, 30 ml
96046 Internal Standard Set, consisting of:
Internal Standard Mix (lyoph.), 4 x 1 ml
Reconstitution Buffer, 5 ml
96078 Enzyme Solution Set, consisting of:
Enzyme Reagent (lyoph.) 2 x 8 ml
Hydrolysis Buffer, 20 ml
33006 Reaction Vials, 100 pcs. (for 96000)
96057 96 Well Plates, 5 pcs. (for 96000/WP)
96058 Collection Plates, 5 pcs. (for 96000/WP)
96059 Pierceable Adhesive Seals for 96 Well Plates, 5 pcs. (for 96000/WP)

Startup Accessories

96100 Analytical Column, equilibrated, with test chromatogram, 1 pc.
96033 Urine Screening Standard Set (lyoph.), 4 x 1 ml
96012 System Check Solution, 1 ml
96015 Tuning Mix 1, Analytes and Internal Standards, 1 ml
96016 Tuning Mix 2, Analytes and Internal Standards, 1 ml
96017 Tuning Mix 3, Analytes and Internal Standards, 1 ml
15090 UHPLC Stainless Steel Prefilter Housing, 1 pc.
15091 Stainless Steel Prefilter, 0.2 µm, 3 pcs.

Multilevel Calibrator and Controls

96040 6PLUS1® Multilevel Urine Calibrator Set (lyoph.), 7 x 1 ml
0410 ***MassCheck***® Drugs of Abuse Testing Urine Control Set, Level I (lyoph.), 4 x 1 ml
0420 ***MassCheck***® Drugs of Abuse Testing Urine Control Set, Level II (lyoph.), 4 x 1 ml
0430 ***MassCheck***® Drugs of Abuse Testing Urine Control Set, Level III (lyoph.), 4 x 1 ml

Hydrolysis Products

0470 ***MassCheck***® Drugs of Abuse Testing Urine Hydrolysis Control Set (lyoph.), 4 x 1 ml
96078 Enzyme Solution Set, consisting of:
Enzyme Reagent (lyoph.) 2 x 8 ml
Hydrolysis Buffer, 20 ml

These products are not available in all countries. Please contact your local Chromsystems sales representative for availability in your region.
Please note: The product information provided shows typical values as an example only. Please review the information provided in instruction manual and product information leaflets.
Reference: [1] Wang et al., Incomplete Recovery of Prescription Opioids in Urine using Enzymatic Hydrolysis of Glucuronide Metabolites. J. Analytical Toxicology, (2019), 571-575.

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Management system certified according to:
ISO 9001, ISO 13485 (including MDSAP)

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