FORENSICS

UCT

CLEAN SCREEN FASt®

FILTER AND SHOOT

CLEAN SCREEN FASt® SPE COLUMNS

CLEAN SCREEN FASt® SPE COLUMNS

Since the introduction and implementation of LC/MS as a staple analytical tool in forensic laboratories, there have been new approaches to sample preparation. The higher sensitivity of LC/MS and the ability to inject 'aqueous' containing samples directly into the instrument has opened new options for conventional sample preparations. The need for rapid turnaround time for a larger list of drugs has also put pressure on laboratories to find alternatives to traditional methods. The usual liquid -liquid and solid phase extraction processes have seen a growth of 'crash and shoot' or 'dilute and shoot' sample preparation methods. Although these latter methods work most of the time for certain applications (i.e. primarily urine samples), these alternatives have also introduced new shortcomings.

LC/MS analysis is very prone to matrix suppression phenomenon. The 'crash' or 'dilute' methods no longer remove matrix and concentrate samples but instead dilute the final eluate. These methods can raise the LOD and by definition, lower the sensitivity of the method. The diluted samples will still contain unwanted matrix that when introduced into the system can contaminate the instrumentation. In addition, these methods usually require a 10-15 minute centrifugation of the samples prior to injection. This step is done to eliminate any particulates that might get caught in either the guard column or more expensive LC columns. Most LC column packing particle sizes are not greater than 5um and can therefore be subject to clogging by certain samples.

CLEAN SCREEN FASt® employs a process that uses positive pressure and a solid phase sorbent bed built with small pore frits to quickly and efficiently prepare samples for LC/MS analysis. This method eliminates the timely centrifugation, reduces matrix suppression effects and removes particulates greater than ~ 1µm. Samples can be diluted at a ratio as low as 1:1, which is useful for analytes at very low concentrations.

A FASter AND CLEANER SPE ALTERNATIVE TO 'DILUTE AND SHOOT'

PART #: CSFAS203 CLEAN SCREEN FASt® 200mg/3mL
ZSFAS020 CLEAN SCREEN FASt® 200mg/10mL
WSH96FAS11-10LD 96 Deep Well Plate 100mg

I. FASt Method – Opiates

Sample Dilution Ratio	Sample* Volume	Dilution** Volume
1:1	500 µL	500 µL
1:4	200 µL	800 µL
1:9	100 µL	900 µL

* If sample is hydrolyzed add appropriate aliquot volume after hydrolysis is complete.

** Diluent is 50:50 (Methanol: Distilled Water)

1. Sample and diluents are added in an appropriately labeled tube. Add appropriate volume internal standard(s). It is recommended to use an internal standard volume of no more than 200 µL.
2. Set up extraction manifold with FASt cartridges and auto-sampler collection vials.
3. Pour sample into FASt cartridge and elute sample directly into auto-sampler vials.
4. Cap vials and put directly onto LC/MS for analysis.

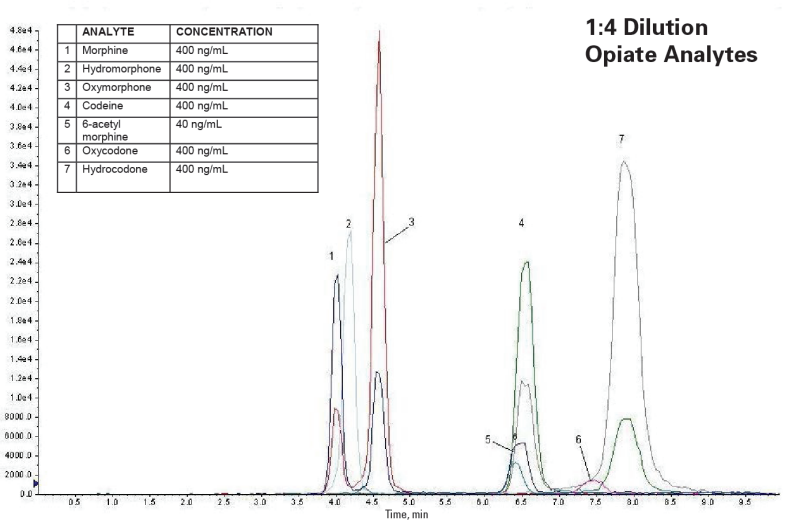
II. FASt Method – Benzodiazepines and Basic Compounds

Sample Dilution Ratio	Sample* Volume	Dilution** Volume
1:1	500 µL	500 µL
1:4	200 µL	800 µL
1:9	100 µL	900 µL

* If sample is hydrolyzed add appropriate aliquot volume after hydrolysis is complete.

** Diluent is 50:50 (Acetonitrile: Distilled Water)

1. Sample and diluents are added in an appropriately labeled tube. Add appropriate volume internal standard(s). It is recommended to use an internal standard volume of no more than 200 µL.
2. Set up extraction manifold with FASt cartridges and auto-sampler collection vials.
3. Pour sample into FASt cartridge and elute sample directly into auto-sampler vials.
4. Cap vials and put directly onto LC/MS for analysis.



	ANALYTE	CONCENTRATION
1	Morphine	400 ng/mL
2	Hydromorphone	400 ng/mL
3	Oxymorphone	400 ng/mL
4	Codeine	400 ng/mL
5	6-acetyl morphine	40 ng/mL
6	Oxycodone	400 ng/mL
7	Hydrocodone	400 ng/mL

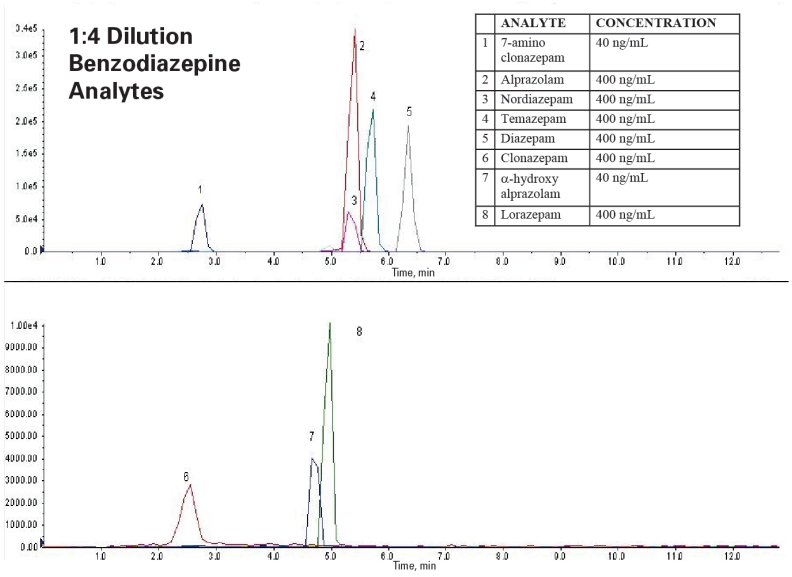
LC Column: Restek Ultra Biphenyl 5 um 100x2.1mm - Catalog# : 9109512

Opiate LC Method

%B	Time (min)	Flow Rate
25	0.00	0.4 mL/min
50	3.00	
50	6.00	
25	6.01	
25	9.00	

Run Time: 9.00 min
Injection Volume: 10µL
Column Oven Temperature: 30°C

Mobile Phase A: 0.1% Formic Acid H2O
Mobile Phase B: 0.1% Formic Acid MeOH



	ANALYTE	CONCENTRATION
1	7-amino clonazepam	40 ng/mL
2	Alprazolam	400 ng/mL
3	Nordiazepam	400 ng/mL
4	Temazepam	400 ng/mL
5	Diazepam	400 ng/mL
6	Clonazepam	400 ng/mL
7	α-hydroxy alprazolam	40 ng/mL
8	Lorazepam	400 ng/mL

Benzodiazepine Method

Isocratic Flow at 0.4 mL/min

0.15% B

0.15% A

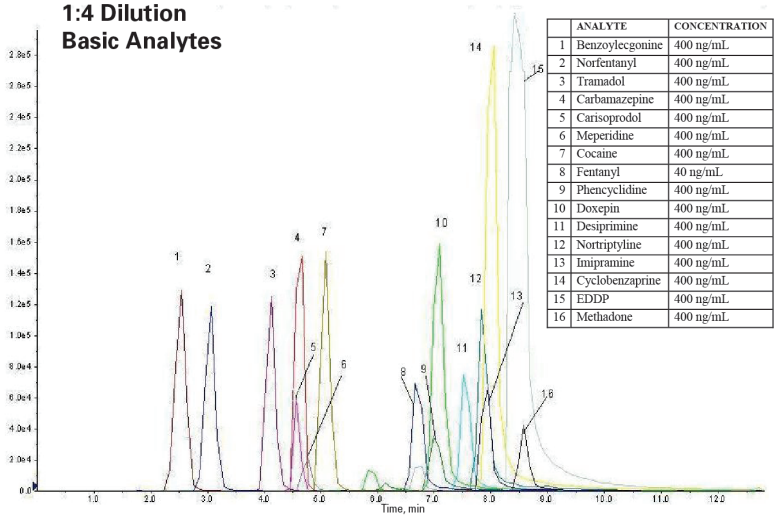
Run Time: 8.50 min

Injection Volume: 10µL

Column Oven Temperature: 40°C

Mobile Phase A: 0.2% Formic Acid / 2mM NH4 Formate in H2O

Mobile Phase B: 0.2% Formic Acid / 2mM NH4 Formate in ACN



	ANALYTE	CONCENTRATION
1	Benzoylecgonine	400 ng/mL
2	Norfentanyl	400 ng/mL
3	Tramadol	400 ng/mL
4	Carbamazepine	400 ng/mL
5	Carisoprodol	400 ng/mL
6	Meperidine	400 ng/mL
7	Cocaine	400 ng/mL
8	Fentanyl	40 ng/mL
9	Phencyclidine	400 ng/mL
10	Doxepin	400 ng/mL
11	Desiprimine	400 ng/mL
12	Nortriptyline	400 ng/mL
13	Imipramine	400 ng/mL
14	Cyclobenzaprine	400 ng/mL
15	EDDP	400 ng/mL
16	Methadone	400 ng/mL

Basic Method

%B	Time (min)	Flow Rate
25	0.00	0.4 mL/min
90		10.50
90		11.00
25		11.01

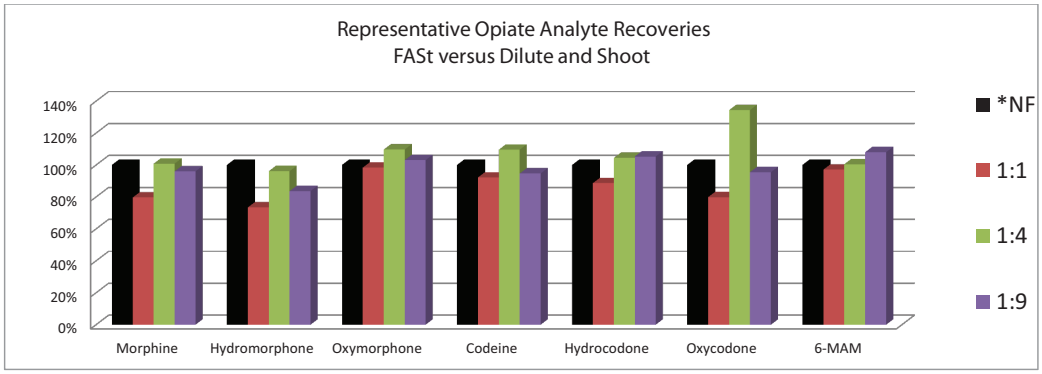
Run Time: 13.00 min

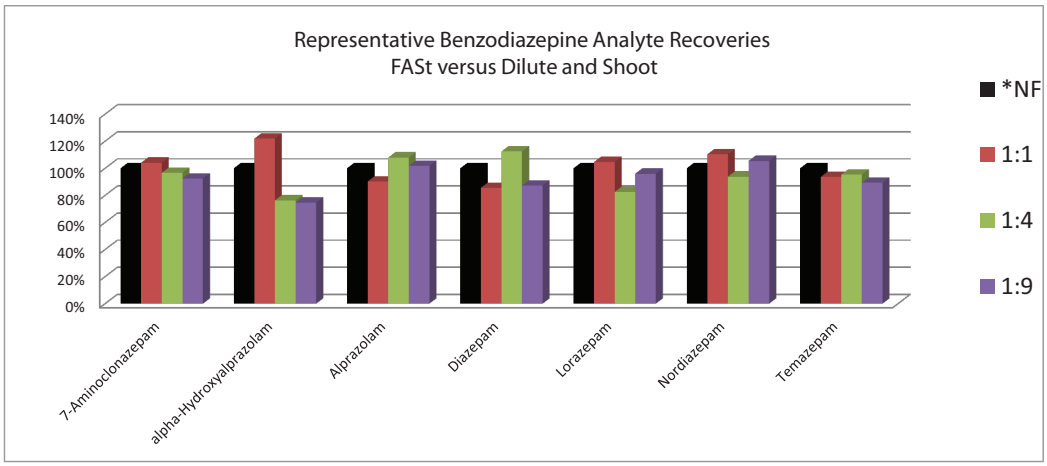
Injection Volume: 10µL

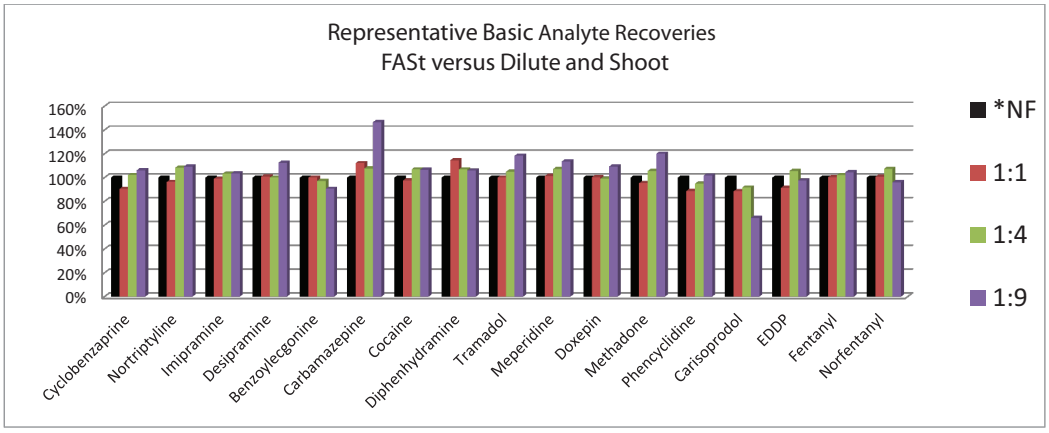
Column Oven Temperature: 40°C

Mobile Phase A: 0.2% Formic Acid / 2mM NH4 Formate in H2O

Mobile Phase B: 0.2% Formic Acid / 2mM NH4 Formate in ACN







*NF refers to the 'dilute and shoot' recovery as a normalized referenced (e.g. 100%) based on calculated peak areas.

This chart represents 1:1, 1:4 and 1:9 signify the dilution ratios and the % recovery compared to the *NF sample based on calculated peak areas of each compound sampled in duplicate.

THC-COOH IN URINE
CLEAN SCREEN FASt® THC

PART#: CSFASTH203 CLEAN SCREEN FASt® THC 200mg/3mL
ZSFASTH020 CLEAN SCREEN FASt® THC 200mg/10mL
WSH96FASTH11-10LD 96 Deep Well Plate 100mg

I. Hydrolysis of Urine Sample for THC-delta-9-COOH:

1. To 2 mL urine add appropriate internal standards prepared.
2. Add 50 µL of 10 N NaOH. Heat for 15 minutes at 60-70 °C
3. Add 50 µL 1:1 acetic acid: DI water. (pH should be 7.0+1.0)
4. Add 200 µL pH 7.0 0.1M Phosphate buffer (The sample is ready to be filtered).

II. Load Sample:

SAMPLE DILUTE RATIO:

***No Centrifugation required prior to loading**

Sample Dilution Ratio	Sample* Volume	Dilution** Volume
Dilution Ratio	**Urine**	**Diluent****
1:1	500 µL	500 µL
1:4	200 µL	800 µL
1:9	100 µL	900 µL

* If sample is hydrolyzed add appropriate aliquot volume after hydrolysis is complete.

** Diluent is 50:50 (ACN: Distilled Water)

1. Sample and diluents are added directly to 96 Well FASt Plate/Columns.
2. Add appropriate volume of internal standard(s). It is recommended to use an internal standard volume of no more than 200 µL.

III. Filtration and Collection:

1. Set up extraction manifold with FASt well plates/columns and auto-sampler collection plates.
2. Pour sample into FASt well plate/columns and elute sample directly into auto-sampler collection vials.

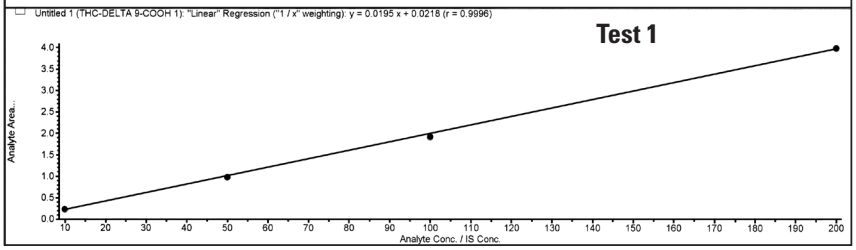
IV. Analysis:

1. Place auto-sampler well plate/vials directly onto LC/MS for analysis.

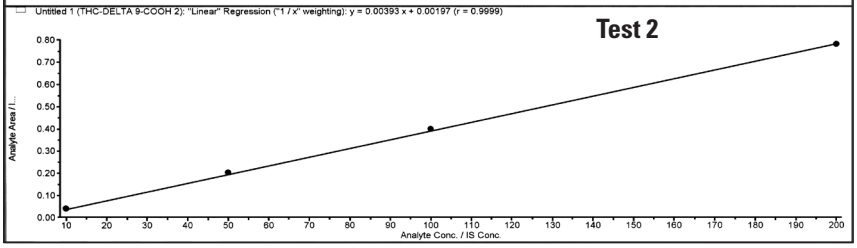
Below are calibration curves, actual sample, and control data from THC-COOH positive urine samples. FASt THC (CSFASTH203) was used with the method found on page 6.

The indicated numbers in red parathenses are results from the same samples run with CSXCE2103 (CLEAN SCREEN XCEL® 2). This shows the accuracy and precision of this technique for THC-COOH analysis.

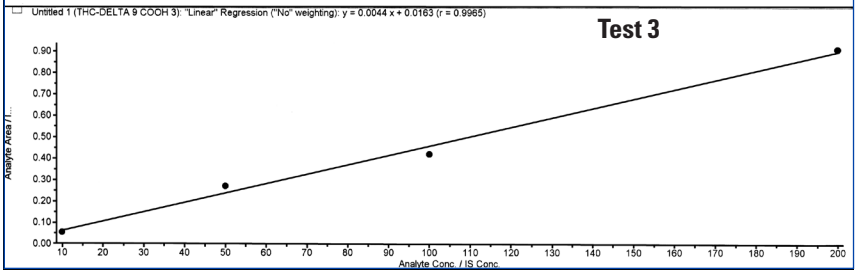
	Sample Name	Sample ID	Sample Type	Analyte Peak Area (counts)	Analyte Concentration (ng/mL)	IS Peak Area (counts)	Calculated Concentration (ng/mL)	Accuracy (%)
1	T 10		Standard	1.79e+003	10.0	8.00e+003	10.3	103.
2	T 50		Standard	9.26e+003	50.0	9.51e+003	48.8	97.6
3	T 100		Standard	1.69e+004	100.	8.82e+003	97.0	97.0
4	T 200		Standard	3.60e+004	200.	9.01e+003	204.	102.
5	T NEG		Unknown	0.00e+000	N/A	7.87e+003	No Peak	N/A
6	T 60 CONTROL		Quality Control	1.19e+004	60.0	8.38e+003	72.0 (60)	120.
7	T 257-2		Unknown	4.48e+003	N/A	9.08e+003	24.2 (19)	N/A
8	T 257-5		Unknown	4.32e+004	N/A	8.08e+003	273. (265)	N/A
9	T 257-29		Unknown	8.80e+003	N/A	8.23e+003	53.7 (43)	N/A
10	T 257-34		Unknown	1.13e+003	N/A	4.72e+003	11.2 (L10)	N/A
11	T 257-53		Unknown	4.05e+003	N/A	8.26e+003	24.0 (16)	N/A
12	T 257-57		Unknown	5.87e+003	N/A	2.36e+003	126. (130)	N/A



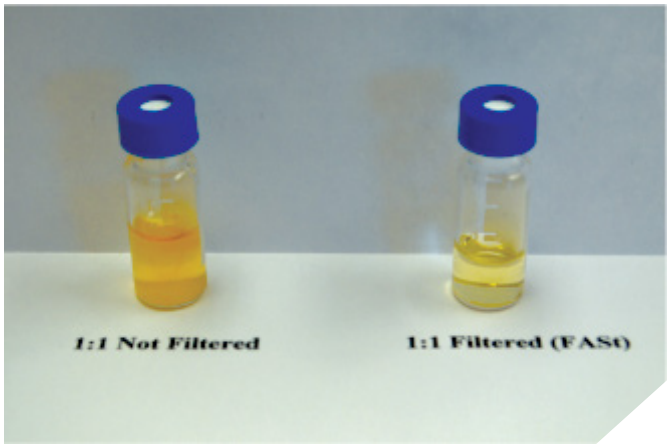
	Sample Name	Sample ID	Sample Type	Analyte Peak Area (counts)	Analyte Concentration (ng/mL)	IS Peak Area (counts)	Calculated Concentration (ng/mL)	Accuracy (%)
1	T 10		Standard	3.23e+002	10.0	8.00e+003	9.76	97.6
2	T 50		Standard	1.93e+003	50.0	9.51e+003	51.2	102.
3	T 100		Standard	3.52e+003	100.	8.82e+003	101.	101.
4	T 200		Standard	7.03e+003	200.	9.01e+003	198.	99.0
5	T NEG		Unknown	0.00e+000	N/A	7.87e+003	No Peak	N/A
6	T 60 CONTROL		Quality Control	2.56e+003	60.0	8.38e+003	77.2 (60)	129.
7	T 257-2		Unknown	7.33e+002	N/A	9.08e+003	20.0 (19)	N/A
8	T 257-5		Unknown	8.73e+003	N/A	8.08e+003	274. (265)	N/A
9	T 257-29		Unknown	1.74e+003	N/A	8.23e+003	53.3 (43)	N/A
10	T 257-34		Unknown	2.61e+002	N/A	4.72e+003	13.6 (L10)	N/A
11	T 257-53		Unknown	8.10e+002	N/A	8.26e+003	24.4 (16)	N/A
12	T 257-57		Unknown	1.27e+003	N/A	2.36e+003	137. (130)	N/A

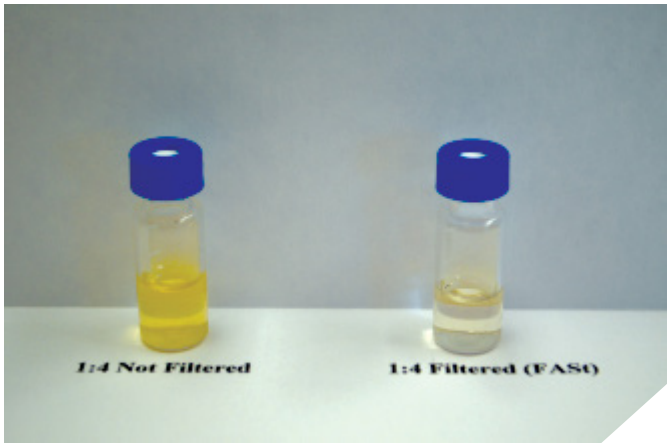


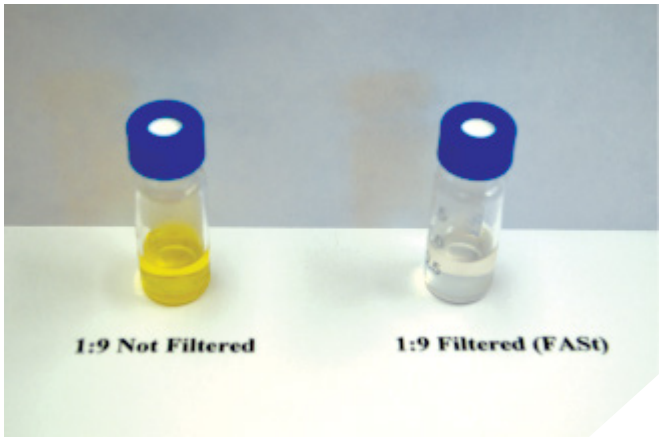
	Sample Name	Sample ID	Sample Type	Analyte Peak Area (counts)	Analyte Concentration (ng/mL)	IS Peak Area (counts)	Calculated Concentration (ng/mL)	Accuracy (%)
1	T 10		Standard	4.36e+002	10.0	8.00e+003	8.65	86.5
2	T 50		Standard	2.56e+003	50.0	9.51e+003	57.5	115.
3	T 100		Standard	3.69e+003	100.	8.82e+003	91.3	91.3
4	T 200		Standard	8.19e+003	200.	9.01e+003	203.	101.
5	T NEG		Unknown	0.00e+000	N/A	7.87e+003	No Peak	N/A
6	T 60 CONTROL		Quality Control	2.27e+003	60.0	8.38e+003	57.9 (60)	96.5
7	T 257-2		Unknown	1.12e+003	N/A	9.08e+003	24.2 (19)	N/A
8	T 257-5		Unknown	1.08e+004	N/A	8.08e+003	300. (265)	N/A
9	T 257-29		Unknown	1.89e+003	N/A	8.23e+003	48.5 (43)	N/A
10	T 257-34		Unknown	3.00e+002	N/A	4.72e+003	10.7 (L10)	N/A
11	T 257-53		Unknown	1.07e+003	N/A	8.26e+003	25.8 (16)	N/A
12	T 257-57		Unknown	1.37e+003	N/A	2.36e+003	128. (130)	N/A



The FASt method outlined is a novel approach to improved sample preparation for LC/MS analysis. The method outlines a simple procedure to prepare urine samples for analysis of multiple drugs and metabolites, by quickly and efficiently reducing the amount of unwanted matrix (through sorbent adsorption) and particulates (filtering through special frits) in the final sample, the analysis can proceed with less chance of matrix suppression and LC column clogging. The FASt method can lengthen the amount of time an LC column can be used for analysis and lower the amount of down time for instrument maintenance. These benefits along with the ability to eliminate the centrifuge and sample transfer steps can lower costs by decreasing turn-around time and reducing instrument and LC column maintenance.







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PRICES AND TERMS

Our prices are subject to change without notice. The price in effect when we receive your order will apply. All prices are in US Dollars and are F.O.B. Lewistown, PA 17044. Terms of payment are net 30 days.

MINIMUM ORDERS

We welcome all orders, therefore, we do not have a minimum order requirement. When ordering, please include your purchase order number, complete "Ship To" and "Bill To" address, catalog number, quantity, and description of product(s). Also include your name and a phone number where you can be reached should we have any questions concerning your order.

SHIPMENTS

Normal processing is within 24 hours after receipt of an order. Unless special shipping requests have been made, our trained staff will send all orders by UPS Ground service. The appropriate shipping charges (freight & insurance costs) will be added to the invoice, unless otherwise instructed by the customer.

SPECIAL PRICING

We offer special pricing for volume purchases and standing orders. These discounts apply to bonded phase extraction column purchases only. Please call a sales representative for more information on special pricing qualifications.

MADE IN USA

Management System ISO 9001:2008 DEKRA Certified DEKRA Certified Accredited by ANAB

4101-08-02

RETURN POLICY

Our Quality Manager will handle all returns. Before returning merchandise, please call to obtain a return authorization number from the quality manager. We will need to know the reason for the return, date of purchase, purchase order number and invoice number in order to issue a return authorization number. Return merchandise must be received before a credit can be issued. Returns will not be accepted after 90 days. A restocking fee of 25% of the price paid, or a minimum of $25.00 (whichever is greater) will be charged on all returns.

WARRANTY

All products manufactured by UCT are guaranteed against defects in materials and workmanship for a period of 90 days after shipment. UCT will replace any items that prove to be defective during this time period. The exclusive remedy requires the end user to first advise UCT of the defective product by phone or in writing and must include order number, the lot number and the shipping date.

To initiate this action, photographs of the product, including packaging and labeling of the containers, must be submitted to the UCT Representative for approval. With approval a return authorization can be initiated, and must be received within 30 days. Once the materials arrive at UCT a further inspection of the materials must be completed and accepted by our Quality Manager prior to further action of credits or replacement. UCT's total liability is limited to the replacement cost of UCT products.

This warranty does not apply to damage resulting from misuse.

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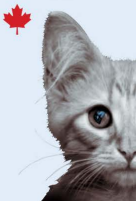

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