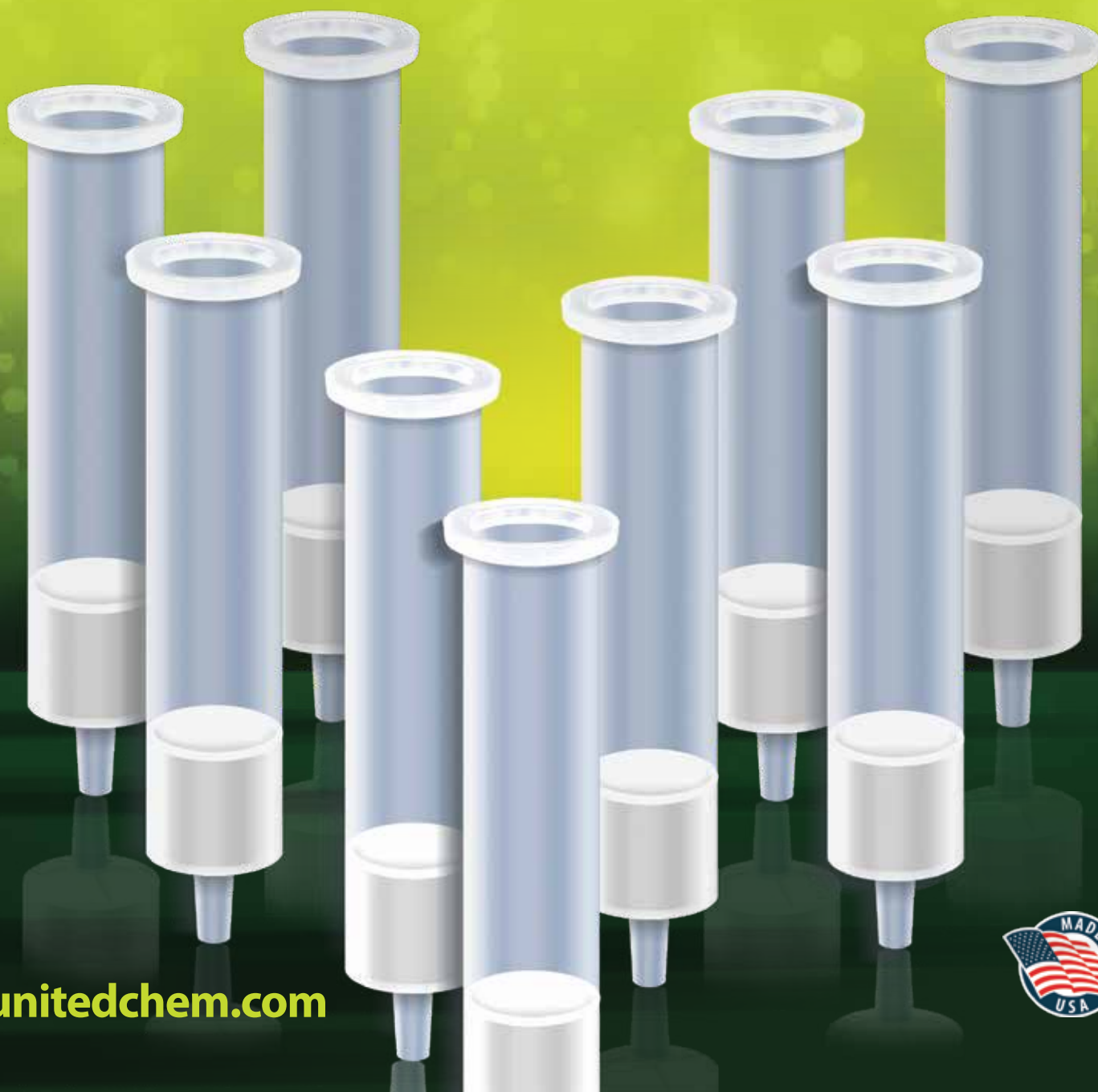




**Simple and Accurate  
Fractionation for EPH Testing.**

# FUSION<sup>®</sup> Ag<sup>+</sup>



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# Fusion® Ag<sup>+</sup> Optimizes Selectivity, Enhances Capacity and Completely Separates Aliphatic and Aromatic Fractions.

Fractionation of aliphatic and aromatic hydrocarbons are routinely assessed to identify the risks posed by petroleum in the environment. Solid Phase Extraction (SPE) with heat-treated silica gel is the traditional approach for the fractionation of aliphatic and aromatic hydrocarbons.

The biggest challenge of this approach is the deactivation of the silica gel due to its hygroscopic nature, which leads to inconsistent results, incomplete separation, and low recoveries. The process to optimize each batch of silica cartridges is time consuming and exhausts copious amounts of hexane solvent.

UCT's Enviro-Clean Fusion® Ag<sup>+</sup> SPE sorbent is designed to help overcome the challenges associated with traditional silica gel fractionation. The new EPH fractionation sorbent consists of silver ions anchored onto a solid support to provide the best selectivity, capacity, and performance.

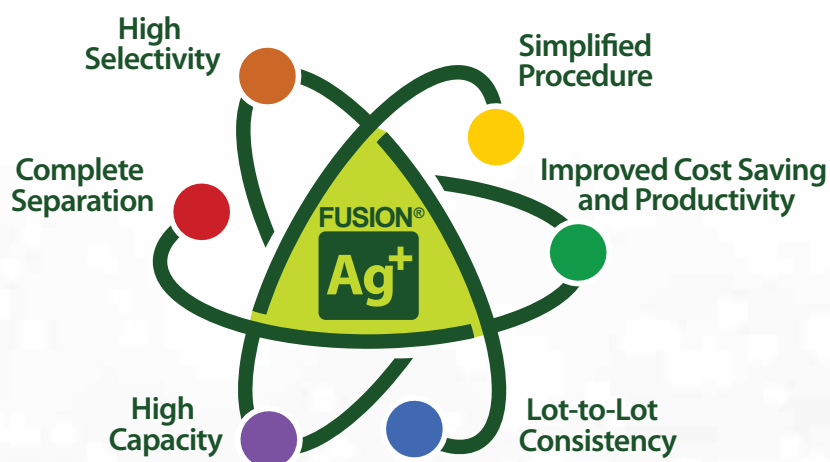
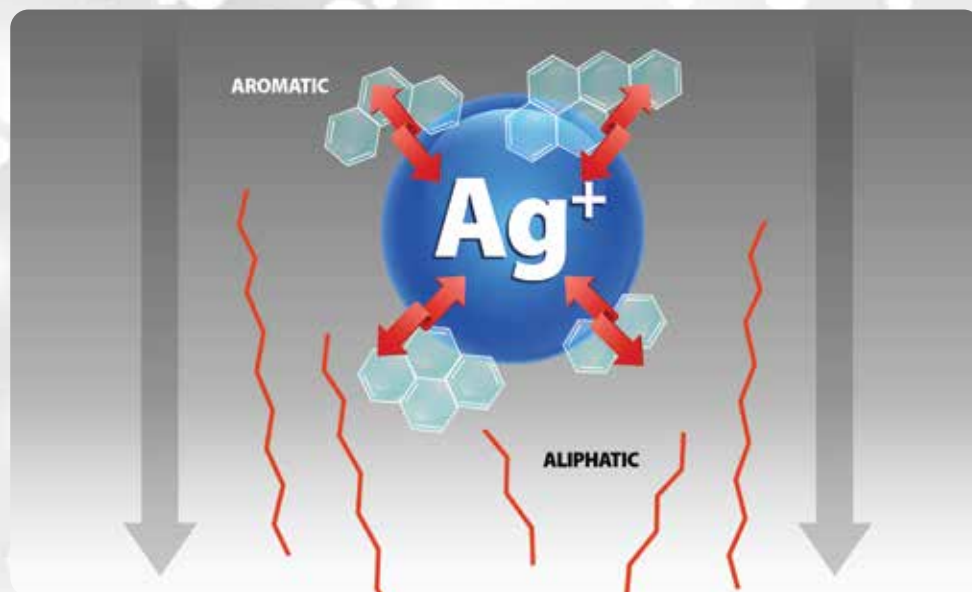


Figure 1 - Features of UCT's new Fusion® Ag<sup>+</sup>

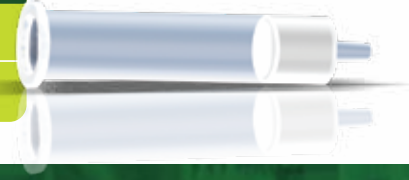


Aromatic hydrocarbons form a charge-transfer complex with silver ions ensuring complete separation of aliphatic from aromatic fractions without breakthrough.

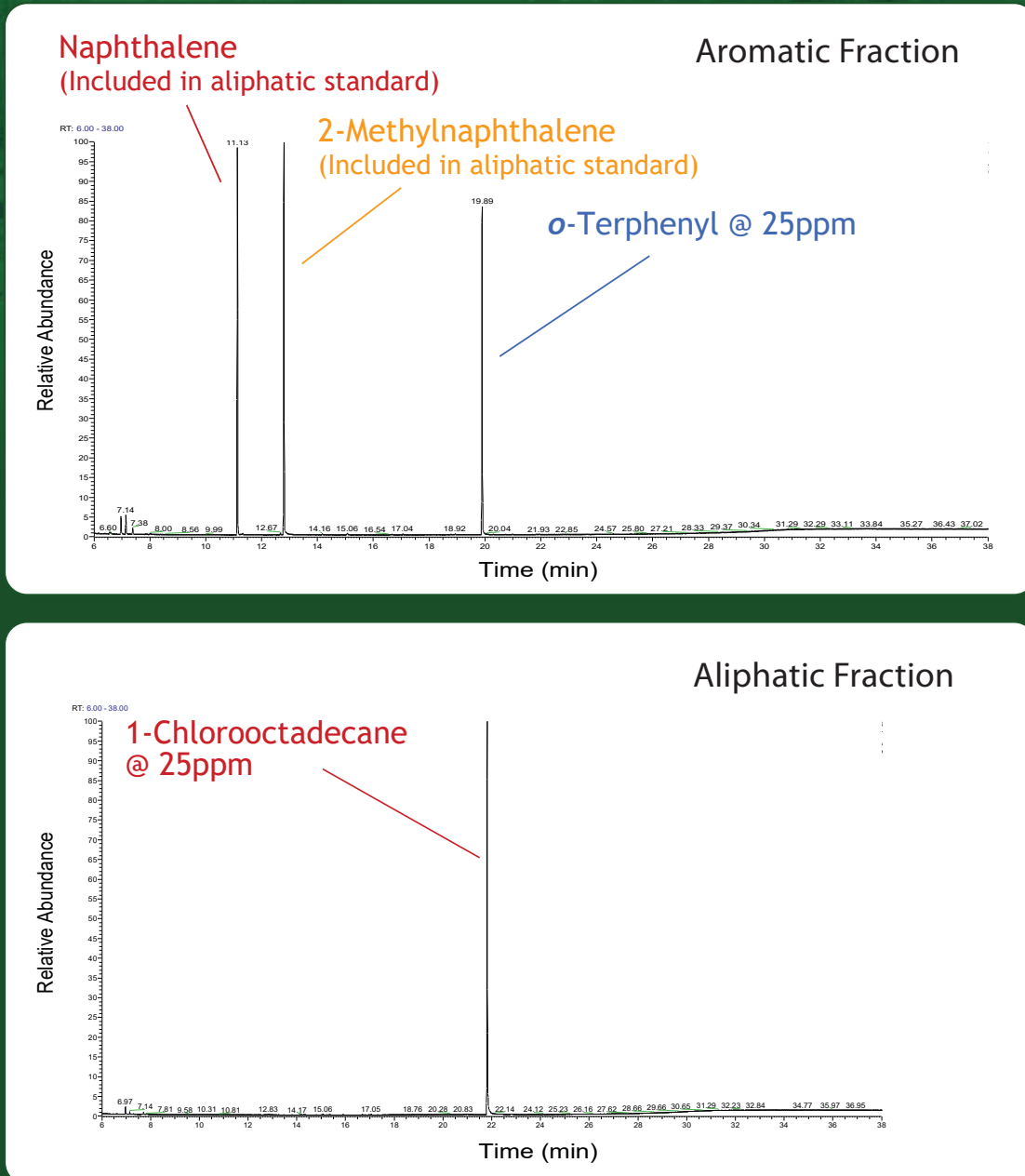
Figure 2 - Illustration of Ag<sup>+</sup> interaction with aromatic and aliphatic hydrocarbons

**Table 1** -Fusion® Ag<sup>+</sup> demonstrates excellent capacity for the aromatic hydrocarbons as compared to heat-treated silica gel

SPE Material	Loading Capacity
Fusion® Ag <sup>+</sup>	20-25 mg/g
Treated - Silica	~5 mg/g



**Figure 3** - Fusion® Ag<sup>+</sup> ensures complete separation without breakthrough



**Experiment conditions:** Fusion® Ag<sup>+</sup> 1g/6mL cartridge; GC-MS system: Thermo Trace 1300 GC & ISQ MS; Restek Rxi®-5sil MS, 30m x 0.25mm, 0.25µm with Integra-Guard; Sample: NJDEP EPH 10/08 Rev.2 aliphatics calibration standard and aromatic calibration standard; Concentration: 200 µg/mL in hexane; Injection volume: 1µL split (1:100) at 300°C; GC liner: 4 mm split liner with deactivated glass wool; Temperature: Transfer line = 275°C; Ion source = 275°C; Oven temp. program: Initial temperature at 50°C, hold for 3 min; ramp at 10°C/min to 320°C, hold for 10 min; Full scan range:35-600amu.

# Streamlined Procedure Reduces Solvent Consumption and Improves Productivity.

Fusion® Ag<sup>+</sup> requires less solvent consumption and reduced extraction times as compared to silica cartridges with a similar configuration (Table 2, 3). Due to the strong ionic interaction of the silver ions with the aromatic hydrocarbon fraction, there is no need to optimize the hexane volume for each lot of silica cartridges. This results in a simplified process procedure.

Fewer solvent requirements and shortened extraction time improves cost efficiencies and laboratory productivity. The small configurations: 0.5g/6mL and 1g/6mL are ideal for automated high throughput analysis. The 2g/6mL configuration is best for higher loading capacity. In addition, using acetone instead of dichloromethane as the elution solvent for the aromatic fraction is environmentally friendly.

**Table 2** - Fusion® Ag<sup>+</sup> reduces solvent consumption

Extraction Steps		Solvent Consumption (mL)	
		Fusion® Ag <sup>+</sup> 1g / 6mL	Heat-treated Silica 2g / 6mL
Conditioning	Acetone	4	
	Dichloromethane		3
	Hexane	4	6
Sample Loading	Hexane	1	1
Aliphatic fraction	Hexane	4	4
Aromatic fraction	Acetone	4	
	Dichloromethane		6
<b>Total solvent consumption (ml)</b>		<b>9</b>	<b>20</b>
<b>Total chlorinated solvent used (mL)</b>		<b>0</b>	<b>9</b>

**Table 3** - Fusion® Ag<sup>+</sup> shortens extraction time

Extraction Steps		Extraction Time (min)	
		Fusion® Ag <sup>+</sup> 1g / 6mL	Heat-treated Silica 2g / 6mL
Conditioning	Acetone	1.8	
	Dichloromethane (5-min hold)		5.8
	Hexane	1.7	1.9
Aliphatic fraction	Hexane	0.5	0.5
Aromatic fraction	Hexane	1.7	1.4
	Acetone	1.5	
	Dichloromethane		2.8
<b>Total extraction time (min)</b>		<b>7.2</b>	<b>12.4</b>

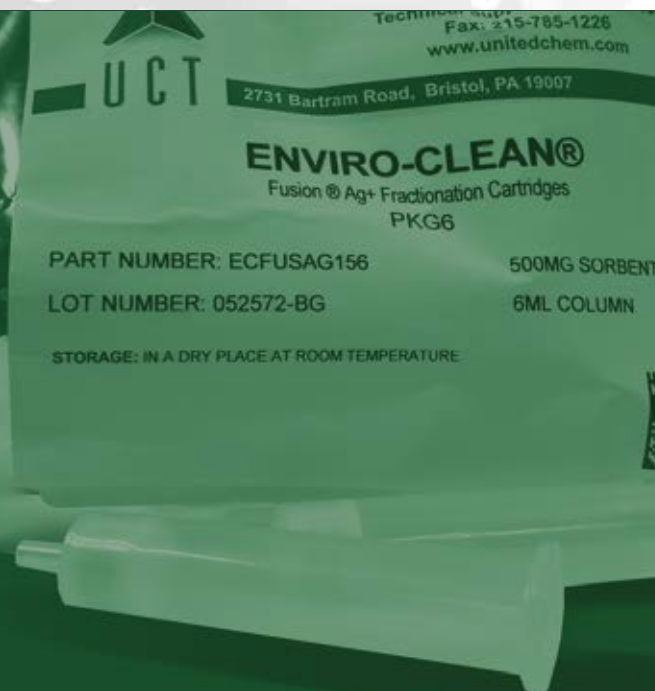
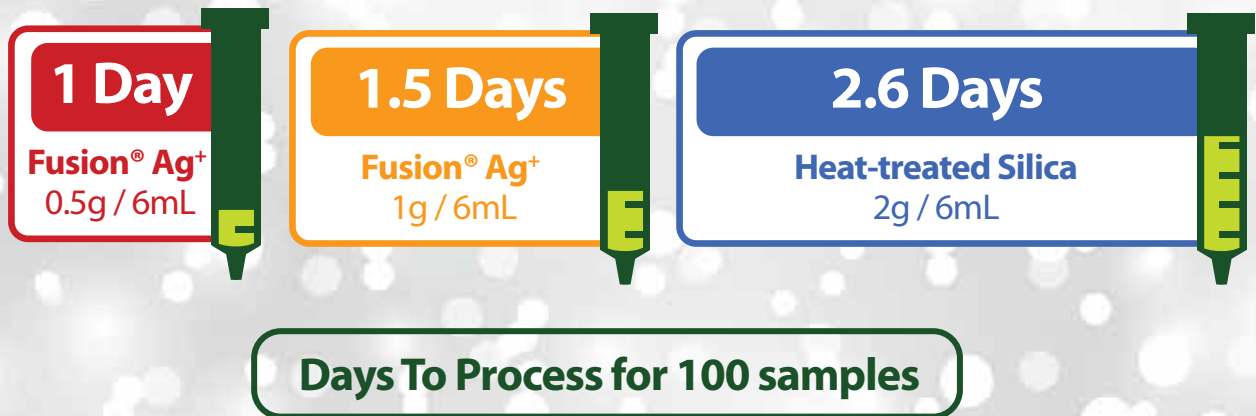


Figure 4- Fusion® Ag+ enhances cost savings



Figure 5 - Fusion® Ag+ improves laboratory productivity

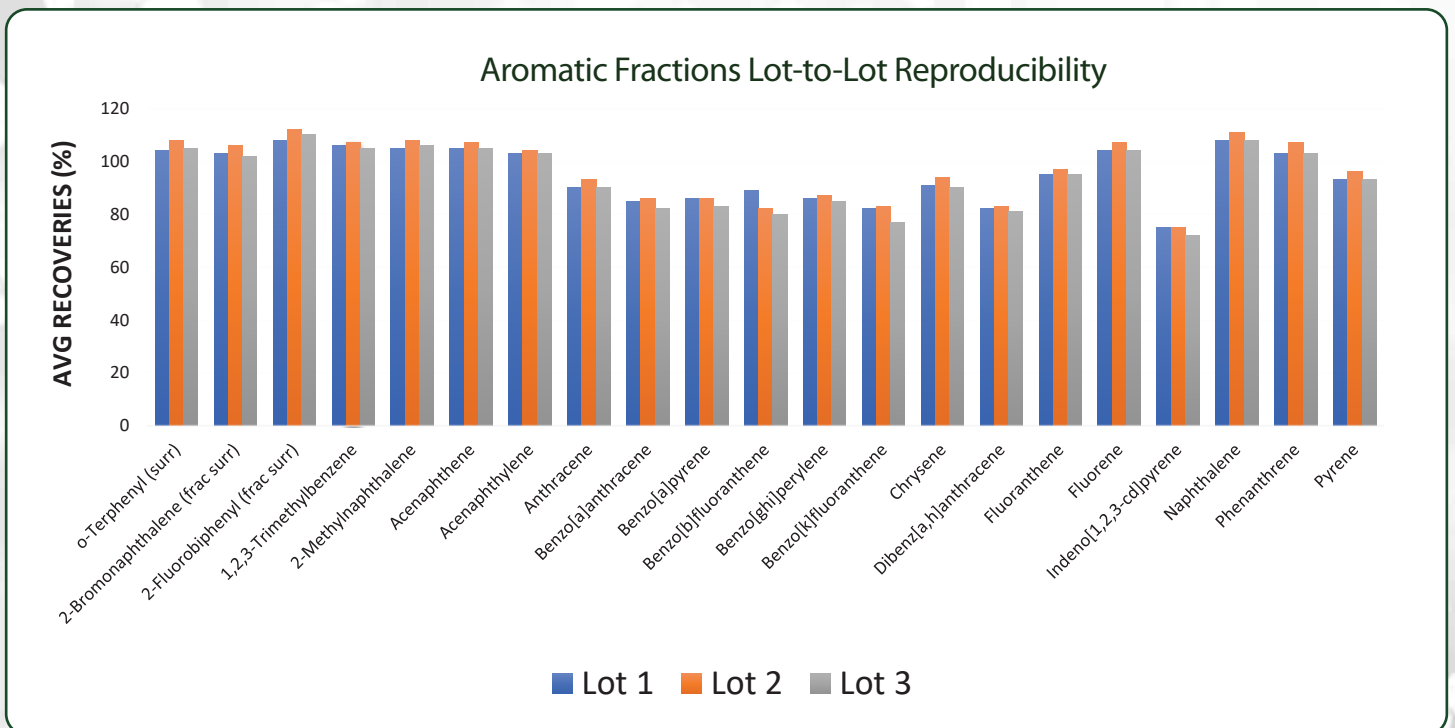
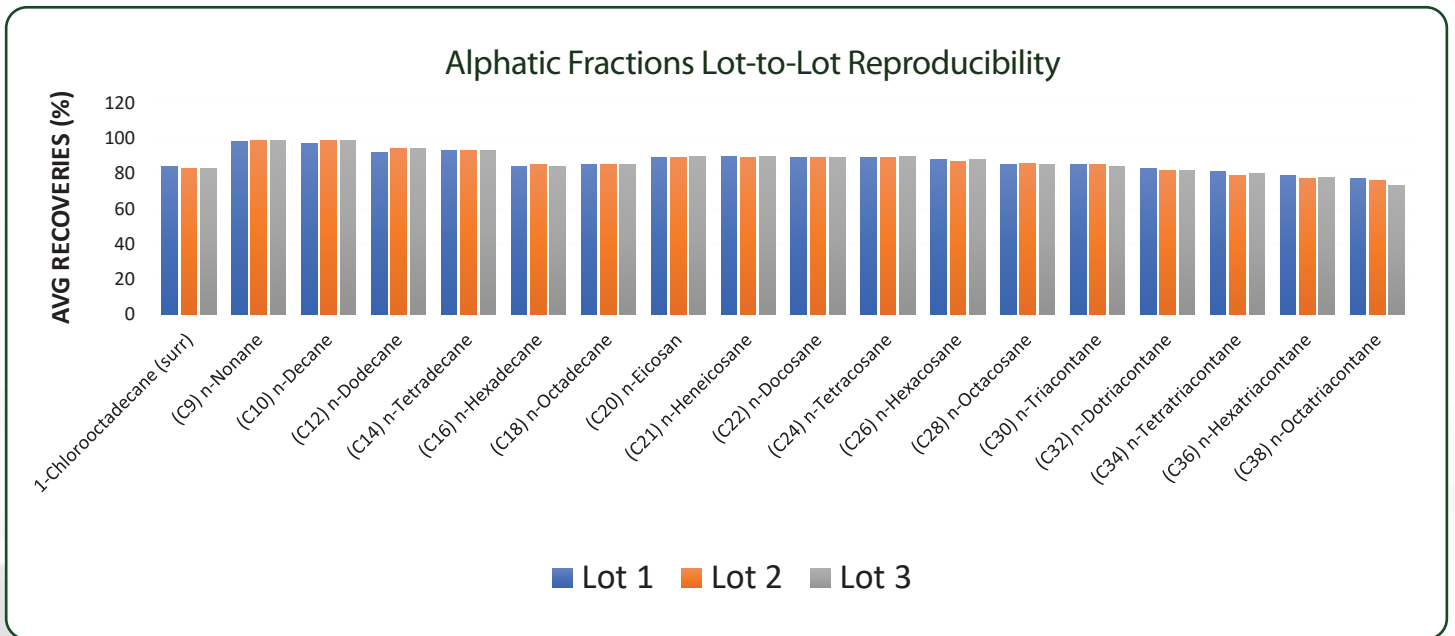


\*Savings based on average lab development, as per 100 extractions. Actual savings may vary according to specific procedure.

# Superior Analytical Performance and Lot-to-Lot Consistency

Fusion® Ag+ provides accurate testing results with superior reproducibility. Recoveries are 80-110% with RSD less than 10%. Sorbent batch-to-batch consistency is ensured by rigorous QC testing (Figure 6). Fusion® Ag+ cartridge empowers your lab for fast, accurate, reliable, and cost-effective EPH testing.

Figure 6 - Lot-to-Lot consistency of aromatic and aliphatic fractions.



Experimental conditions are the same as Figure 3. Three samples were tested from each lot.



## Fusion® Ag+ Order Information

Description	Part Number
Fusion® Ag+ / 0.5 g, 6mL cartridge	ECFUSAG156
Fusion® Ag+ / 1 g, 6mL cartridge	ECFUSAG1M6
Fusion® Ag+ / 2 g, 6mL cartridge	ECFUSAG2M6

## Glass Block Manifold with Accessories

Description	Part Number
Vacuum Manifold System – 16 position	VMF016GL
Vacuum Manifold System – 24 position	VMF024GL
Manifold Lid (16 position)	VMF06120
Manifold Lid (24 position)	VMF04120
Manifold Lid Legs	VMF02120-1
Gasket	VMF04121
Collection Rack (16 position)	VMF06125
Collection Rack (24 position)	VMF04125
Collection Rack Posts	VMF02127
Collection Rack Retaining Clips	VMF02129
Vacuum Gauge and Bleed Valve	VMF02122
20L Waste Trap	ECUCTTRAP20
20L Waste Trap Adaptor	ECUTCTRAP20-ADPT



For more information on Fusion® Ag+ or Glass Block Manifold, please visit [unitedchem.com](http://unitedchem.com)

## 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.

## 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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