

Accucore HPLC and UHPLC Columns

Ultimate Core Performance – Speed and Selectivity Combined

Thermo Scientific™ Accucore™ HPLC and UHPLC columns are a family of high speed, high resolution columns based on Core Enhanced Technology™.

- **Next-Generation Accucore Vanquish UHPLC Columns**

Combines the benefits of a solid core material and the increased chromatographic efficiency of a sub-2µm particle



- **Solid Core Particles**

With a solid central core and porous outer layer, these particles generate high speed, high resolution separations without excessive backpressure

- **Tight Control of Particle Diameter**

Enhanced selection process keeps particle size distribution to a minimum and produces high efficiency columns

The Accucore web page contains the latest news, applications and downloads for the Accucore HPLC and UHPLC column range. Visit www.thermoscientific.com/accucore

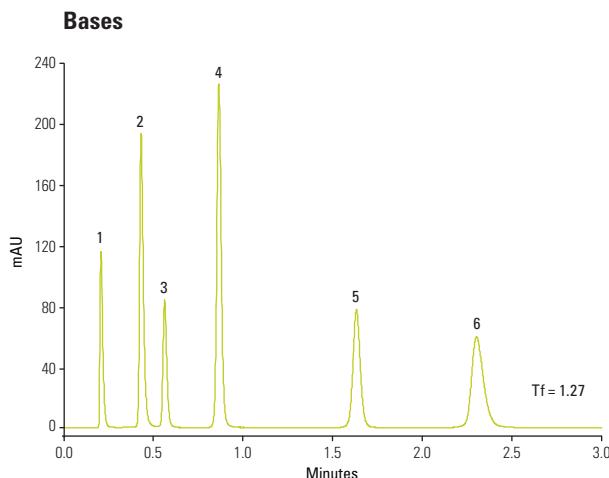
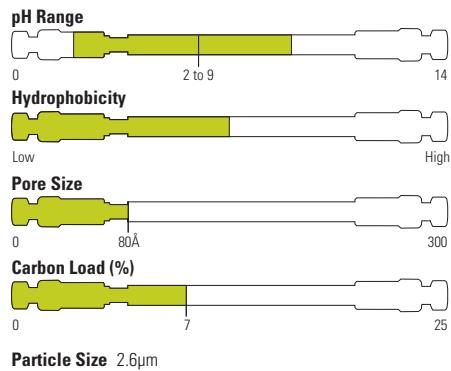
Accucore RP-MS

- Optimized for MS detection
- Excellent peak shapes
- Excellent combination of speed and efficiency

Accucore RP-MS uses an optimized alkyl chain length for more effective coverage of the silica surface. This coverage results in a significant reduction in non-hydrophobic interactions and thus highly efficient peaks with very low tailing.

RP-MS offers slightly lower retention than C18 and this combined with high efficiencies and low peak tailing make this the phase of choice for use with MS detection.

The selectivity offered by Accucore RP-MS matches that of C18 columns.



Accucore RP-MS 2.6 μm , 50mm x 2.1mm

Mobile Phase:	65% Methanol / 35% 25mM Potassium Phosphate pH7.0
Temperature:	30°C
Flow Rate:	500 $\mu\text{L}/\text{min}$
Injection Volume:	1 μL
Backpressure:	232 bar
Detection:	UV, 215nm
Analytes:	1. Uracil 2. Propranolol 3. Butylparaben 4. Naphthalene 5. Acenaphthene 6. Amitriptyline

Accucore RP-MS

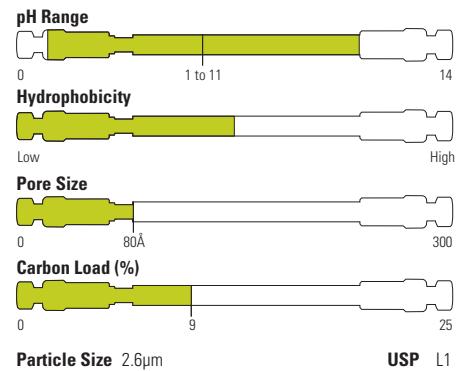
Particle Size (μm)	Format	Length (mm)	2.1mm ID	3.0mm ID	4.6mm ID
2.6	Defender Guard (4/pk)	10	17626-012105	17626-013005	17626-014005
	HPLC Column	30	17626-032130	-	-
		50	17626-052130	17626-053030	17626-054630
		100	17626-102130	17626-103030	17626-104630
		150	17626-152130	17626-153030	17626-154630
	UNIGUARD Drop-in Guard Cartridge Holder	10	852-00	852-00	850-00

Accucore C18

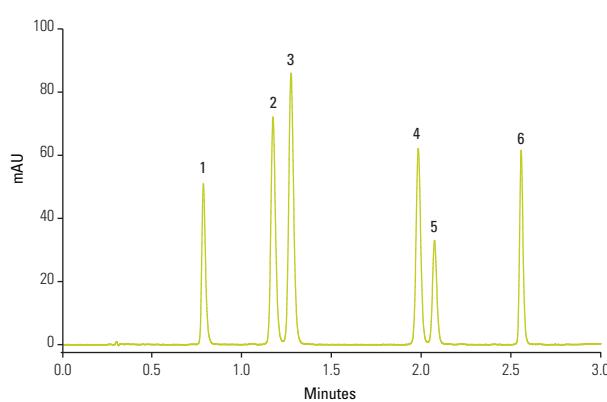
- Optimum retention of non-polar compounds
- Hydrophobic interaction mechanism
- Separates a broad range of analytes

The carbon loading of Accucore C18 phase provides high retention of non-polar analytes via a predominantly hydrophobic interaction mechanism.

The highly retentive nature of Accucore C18 phase means that it can be used to separate a broad range of analytes.



Triazines



Accucore C18 2.6 µm, 50mm x 2.1mm

Mobile Phase A:	Water
Mobile Phase B:	Acetonitrile
Gradient:	Time (min) %B
1.0	35
2.5	70
Temperature:	25°C
Flow Rate:	600 µL/min
Injection Volume:	2 µL
Backpressure:	298 bar
Detection:	UV, 280nm
Analytes:	<ol style="list-style-type: none"> 1. Simazine 2. Simetryn 3. Atrazine 4. Ametryn 5. Propazine 6. Prometryn

Accucore C18

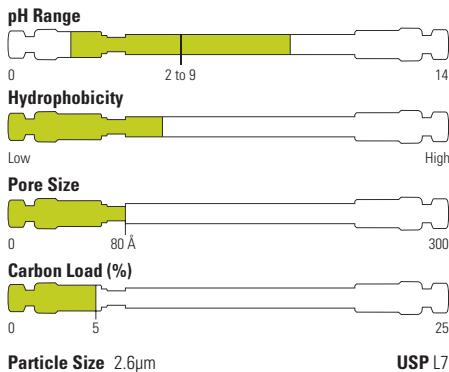
Particle Size (µm)	Format	Length (mm)	2.1mm ID	3.0mm ID	4.6mm ID
2.6	Defender Guard (4/pk)	10	17126-012105	17126-013005	17126-014005
	HPLC Column	30	17126-032130	-	-
		50	17126-052130	17126-053030	17126-054630
		100	17126-102130	17126-103030	17126-104630
		150	17126-152130	17126-153030	17126-154630
4	Drop-in Guard (4/pk)	10	74104-012101	74104-013001	74104-014001
	HPLC Column	50	74104-052130	74104-053030	74104-054630
		100	74104-102130	74104-103030	74104-104630
		150	74104-152130	74104-153030	74104-154630
		250	74104-252130	74104-253030	74104-254630
	UNIGUARD Drop-in Guard Cartridge Holder	10	852-00	852-00	850-00

Accucore C8

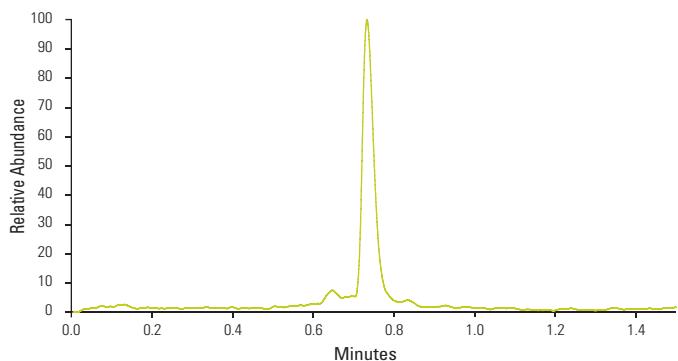
- Lower hydrophobic retention
- Complementary steric selectivity to C18
- Low levels of secondary interactions
- Recommended for moderately polar analytes

Accucore C8 HPLC columns offer lower hydrophobic retention than columns packed with longer alkyl chain length material, such as C18, and are therefore recommended for analytes with medium hydrophobicity or when a less hydrophobic phase provides optimum retention.

The low levels of secondary interactions demonstrated in the phase characterization are the result of excellent bonded phase coverage and allow users of Accucore C8 HPLC columns to benefit from excellent peak shapes.



Testosterone



Accucore C8 2.6 μ m, 50 x 2.1mm

Mobile Phase A:	Water + 0.1% formic acid
Mobile Phase B:	Acetonitrile + 0.1% formic acid
Gradient:	5–95 % B in 0.8 minutes
Temperature:	60°C
Flow Rate:	1500 μ L/min
Injection Volume:	5 μ L
Detection:	ESI-MS/MS

Retention time (tR / min)	0.73
%RSD tR	0.22
%RSD Area	3.01

Data from six injections.

Accucore C8

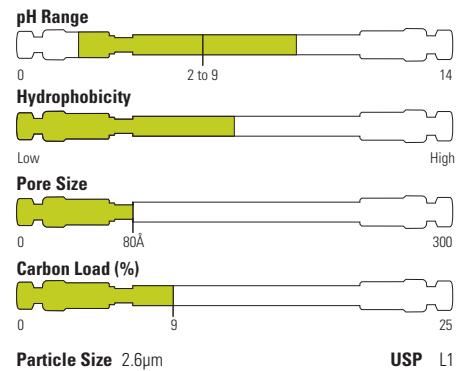
Particle Size (μ m)	Format	Length (mm)	2.1mm ID	3.0mm ID	4.6mm ID
2.6	Defender Guard (4/pk)	10	17226-012105	17226-013005	17226-014005
	HPLC Column	30	17226-032130	-	-
		50	17226-052130	17226-053030	17226-054630
		100	17226-102130	17226-103030	17226-104630
		150	17226-152130	17226-153030	17226-154630
4	Drop-in Guard (4/pk)	10	74204-012101	74204-013001	74204-014001
	HPLC Column	50	74204-052130	74204-053030	74204-054630
		100	74204-102130	74204-103030	74204-104630
		150	74204-152130	74204-153030	74204-154630
		250	74204-252130	74204-253030	74204-254630
	UNIGUARD Drop-in Guard Cartridge Holder	10	852-00	852-00	850-00

Accucore aQ

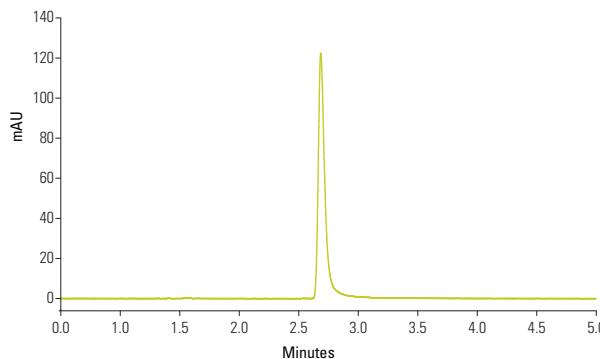
- Retention and resolution of polar analytes
- Polar endcapped C18 stationary phase for alternative selectivity
- Ideal for highly aqueous mobile phases

The polar functional group used to endcap Accucore aQ phase provides an additional controlled interaction mechanism by which polar compounds can be retained and resolved, making the Accucore aQ phase ideal for the quantitative analysis of trace levels of polar analytes.

The wettability of reversed phase media can be increased by the introduction of polar functional groups. The polar endcapping of Accucore aQ media also makes it usable in 100% aqueous mobile phases without the risk of loss of performance or poor stability.



Lamivudine (USP)



Accucore aQ 2.6µm, 50mm x 2.1mm

Mobile Phase:	95.5 (v/v) Ammonium Acetate, pH 3.80 / Methanol
Temperature:	35°C
Flow Rate:	200µL/min
Injection Volume:	1µL
Detection:	UV, 277nm
Analytes:	Lamivudine
Asymmetry	1.36
%RSD t_{r}	0.00
%RSD Peak area	1.72
(%RSD calculated from 6 replicate injections)	
USP acceptance criteria: % RSD (t_{r} , Peak Area)	<2.0

Accucore aQ

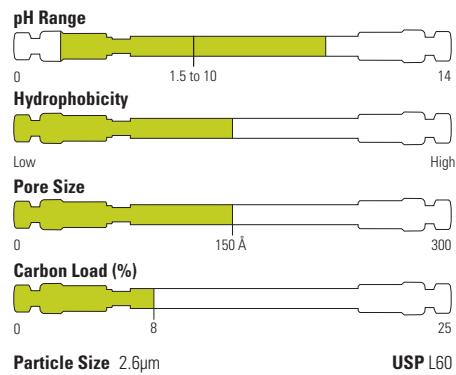
Particle Size (µm)	Format	Length (mm)	2.1mm ID	3.0mm ID	4.6mm ID
2.6	Defender Guard (4/pk)	10	17326-012105	17326-013005	17326-014005
	HPLC Column	30	17326-032130	-	-
		50	17326-052130	17326-053030	17326-054630
		100	17326-102130	17326-103030	17326-104630
		150	17326-152130	17326-153030	17326-154630
	UNIGUARD Drop-in Guard Cartridge Holder	10	852-00	852-00	850-00

Accucore Polar Premium

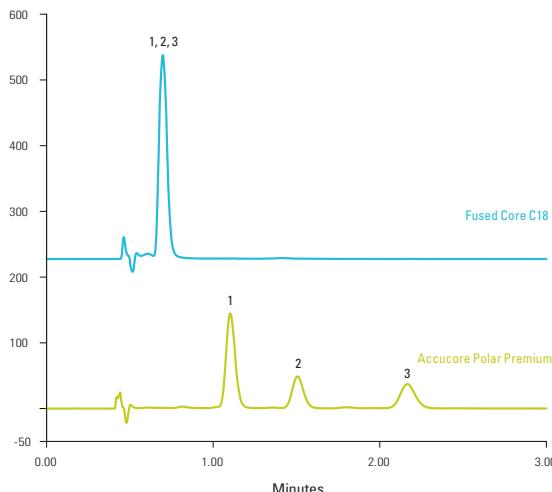
- Rugged amide-embedded C18 phase
- Selectivity complementary to conventional C18 phases
- Stable over a wide pH range and compatible with 100% aqueous mobile phase

Accucore Polar Premium is an exceptionally rugged polar embedded reverse phase material that offers high efficiency, wider operating pH range and unique selectivity complementary to standard C18 phases.

The specially designed bonded phase is stable from pH 1.5 to 10.5 and will not undergo phase collapse in 100% aqueous mobile phase.



Curcuminoids (Turmeric)



Accucore Polar Premium 2.6µm, 100 x 3.0mm

Fused Core C18, 100 x 3.0mm

Mobile Phase:	Methanol : 10mM Phosphoric Acid, 80 : 20
Temperature:	40°C
Flow Rate:	800µL/min
Injection Volume:	6µL
Detection:	UV, 428nm
Analytes:	1. Curcumin 2. Desmethoxycurcumin 3. Bis-desmethoxycurcumin

The Accucore Polar Premium HPLC column provides desirable selectivity that resolves the major and minor component under simple isocratic conditions in less than three minutes, while the C18 columns fail to separate these components.

Accucore Polar Premium

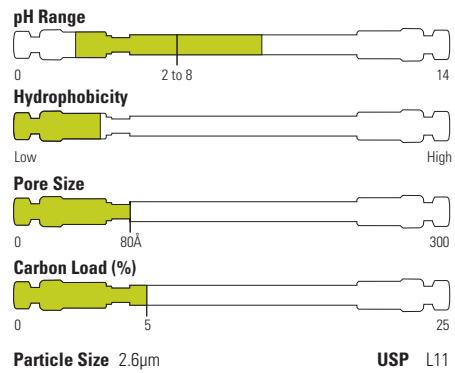
Particle Size (µm)	Format	Length (mm)	2.1mm ID	3.0mm ID	4.6mm ID
2.6	Defender Guard (4/pk)	10	28026-012105	-	-
	HPLC Column	50	28026-052130	28026-053030	28026-054630
		100	28026-102130	28026-103030	28026-104630
		150	28026-152130	28026-153030	28026-154630
		250	28026-252130	-	-
	UNIGUARD Drop-in Guard Cartridge Holder	10	852-00	852-00	850-00

Accucore Phenyl-Hexyl

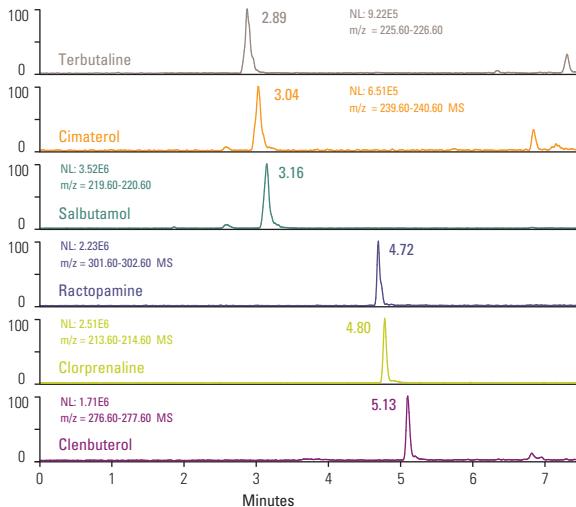
- Mixed-mode selectivity for aromatic and moderately polar analytes
- Enhanced pi-pi interactions with aromatics
- Moderate hydrophobicity

The C6 chain in Accucore Phenyl-Hexyl phase exhibits classical RP retention and selectivity, while the phenyl ring can add special selectivity by interacting with polar groups within the solutes. This results in a mixed-mode separation mechanism. The reduced hydrophobicity of this phase makes it ideal for the separation of very non-polar compounds.

The Phenyl-Hexyl phase should be selected for complex samples where some peaks are well resolved on a conventional alkyl phases, but are not well resolved on a conventional phenyl phase, or when other peaks are well resolved on a phenyl phase, but not well resolved on a conventional alkyl phase.



Beta-agonists



Accucore Phenyl-Hexyl 2.6µm, 100mm x 2.1mm

Mobile Phase A:	Ammonium Acetate 5mM, pH 4	
Mobile Phase B:	Acetonitrile	
Gradient:	Time (min)	%B
	0	5
	1	5
	10	100
Temperature:	40°C	
Flow Rate:	0.25mL/min	
Injection Volume:	1µL	
Backpressure:	120 bar (at t0)	
Detection:	+ESI-MS (45°C, 4.5kV, 60V, scan 150 – 350)	

Accucore Phenyl-Hexyl

Particle Size (µm)	Format	Length (mm)	2.1mm ID	3.0mm ID	4.6mm ID
2.6	Defender Guard (4/pk)	10	17926-012105	17926-013005	17926-014005
	HPLC Column	30	17926-032130	-	-
		50	17926-052130	17926-053030	17926-054630
		100	17926-102130	17926-103030	17926-104630
		150	17926-152130	17926-153030	17926-154630
	UNIGUARD Drop-in Guard Cartridge Holder	10	852-00	852-00	850-00

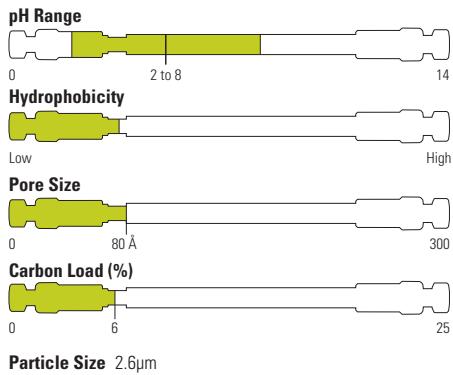
Accucore Phenyl-X

- Unique reversed-phase shape selectivity
- Enhanced selectivity for aromatic compounds
- Compatible with highly aqueous mobile phases
- Robust, high-efficiency, low column bleed

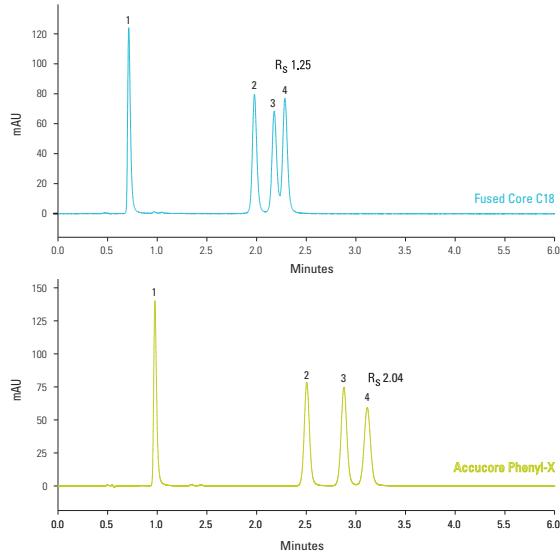
The proprietary Accucore Phenyl-X alkyl aromatic bonded phase provides a unique selectivity when compared to other reversed phase materials such as C18 or Phenyl.

The advanced design of the bonded phase makes it compatible with highly aqueous mobile phases and robust, demonstrating very low bleed.

Phenyl-X exhibits particularly high aromatic selectivity.



Estrogens

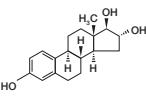


Accucore Phenyl-X 2.6µm, 100 x 2.1mm

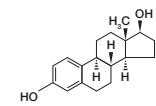
Fused Core C18, 100 x 2.1mm

Mobile Phase: 15:40:45 (v/v) Acetonitrile:Methanol:Water
 Temperature: 40°C
 Flow Rate: 400µL/min
 Injection Volume: 1µL
 Detection: UV, 220nm

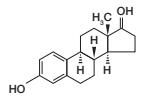
1. Estradiol (E3)



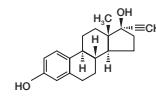
2. Estradiol (E2)



3. Estrone (E1)



4. Ethynodiol (E4)



Accucore Phenyl-X

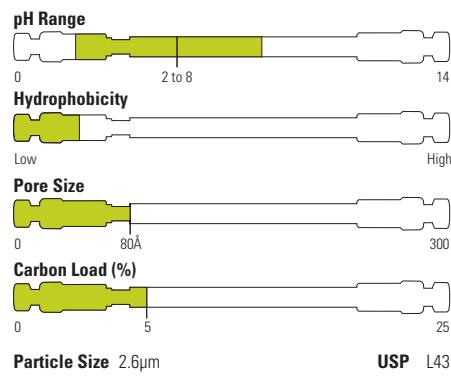
Particle Size (µm)	Format	Length (mm)	2.1mm ID	3.0mm ID	4.6mm ID
2.6	Defender Guard (4/pk)	10	27926-012105	-	-
	HPLC Column	50	27926-052130	27926-053030	27926-054630
		100	27926-102130	27926-103030	27926-104630
		150	27926-152130	27926-153030	27926-154630
		250	27926-252130	-	-
	UNIGUARD Drop-in Guard Cartridge Holder	10	852-00	852-00	850-00

Accucore PFP

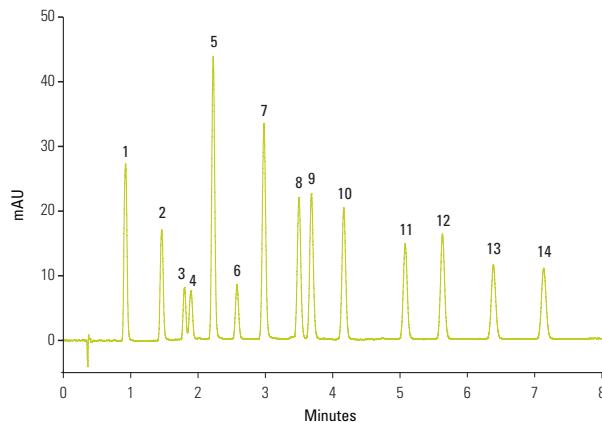
- Alternative selectivity to C18
- Extra retention for halogenated species
- Unique selectivity for non-halogenated polar compounds

The introduction of fluorine groups into the Accucore PFP (pentafluorophenyl) stationary phase causes significant changes in solute-stationary phase interactions. This can lead to extra retention and selectivity for positional isomers of halogenated compounds.

PFP Columns are also well suited to the selective analysis of non-halogenated compounds, in particular polar compounds containing hydroxyl, carboxyl, nitro, or other polar groups. High selectivity is often most apparent when the functional groups are located on an aromatic or other rigid ring system.



Positional isomers



Accucore PFP 2.6µm, 50mm x 2.1mm

Mobile Phase A:	0.1% Formic Acid in Water
Mobile Phase B:	0.1% Formic Acid in Acetonitrile
Gradient:	15-30% B in 7 minutes
Temperature:	50°C
Flow Rate:	600 µL/min
Injection Volume:	2 µL
Detection:	UV, 270nm
Analytes:	1. 3,4 – Dimethoxyphenol 2. 2,6 – Dimethoxyphenol 3. 2,6 – Difluorophenol 4. 3,5 – Dimethoxyphenol 5. 2,4 – Difluorophenol 6. 2,3 – Difluorophenol 7. 3,4 – Difluorophenol 8. 3,5 – Dimethylphenol 9. 2,6 – Dimethylphenol 10. 2,6 – Dichlorophenol 11. 4 – Chloro-3-Methylphenol 12. 4 – Chloro-2-Methylphenol 13. 3,4 – Dichlorophenol 14. 3,5 – Dichlorophenol

Accucore PFP

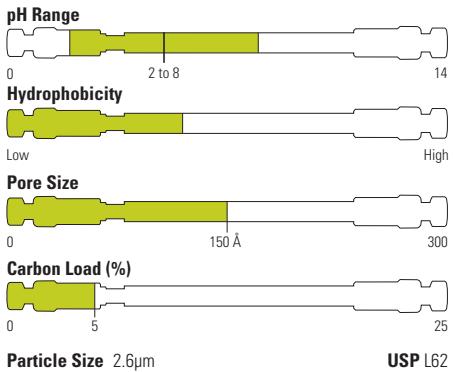
Particle Size (µm)	Format	Length (mm)	2.1mm ID	3.0mm ID	4.6mm ID
2.6	Defender Guard (4/pk)	10	17426-012105	17426-013005	17426-014005
	HPLC Column	30	17426-032130	-	-
		50	17426-052130	17426-053030	17426-054630
		100	17426-102130	17426-103030	17426-104630
		150	17426-152130	17426-153030	17426-154630
	UNIGUARD Drop-in Guard Cartridge Holder	10	852-00	852-00	850-00

Accucore C30

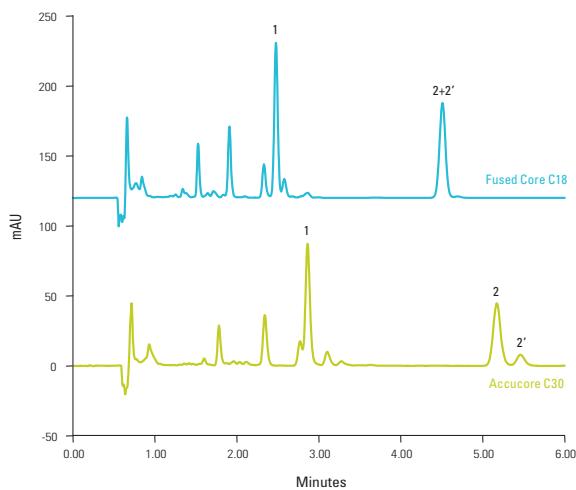
- Ideal for separation of hydrophobic, long alkyl chain compounds
- High shape selectivity for structurally related isomers
- Excellent aqueous-compatibility

Accucore C30 offers high shape selectivity for hydrophobic, long chain, structurally related isomers, for example carotenoids and steroids. This is a different form of shape selectivity from that measured in the steric selectivity phase characterisation test.

It is also an excellent alternative to normal-phase columns for lipid analysis. The optimized bonding density of the long alkyl chains facilitated by a wider pore diameter particle result in a phase that is stable even in highly aqueous mobile phases.



Vitamin K isomers



**Accucore C30 2.6µm, 100 x 3.0mm
Fused Core C18, 100 x 3.0mm**

Mobile Phase: Methanol: 2mM Ammonium Acetate, 98:2
Temperature: 20°C
Flow Rate: 650µL/min
Injection Volume: 5µL
Detection: UV, 250nm

Accucore C30 shows better separation for vitamin K1 isomers than the C18 column.

Chromatogram showing the separation of Vitamin K compounds
Minutes 1-Vitamin K2, 2-Vitamin K1 (trans isomer), 2'-Vitamin K1 (cis isomer)

Accucore C30

Particle Size (µm)	Format	Length (mm)	2.1mm ID	3.0mm ID	4.6mm ID
2.6	Defender Guard (4/pk)	10	27826-012105	-	-
	HPLC Column	50	27826-052130	27826-053030	27826-054630
		100	27826-102130	27826-103030	27826-104630
		150	27826-152130	27826-153030	27826-154630
		250	27826-252130	-	-
	UNIGUARD Drop-in Guard Cartridge Holder	10	852-00	852-00	850-00

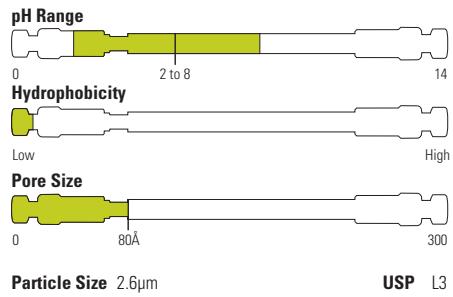
Accucore HILIC

- Enhanced retention of polar and hydrophilic analytes
- Alternative selectivity to C18 without ion-pair or derivatization

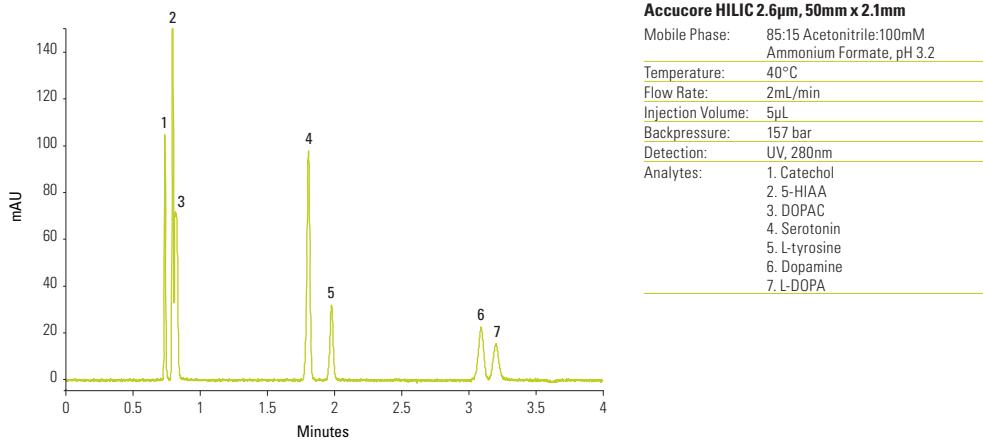
In HILIC mode the separation occurs through two mechanisms. The primary mechanism is a partitioning effect due to the enriched water layer around the polar or charged substrate material. The secondary mechanism involves interaction between the analyte and the active surface moiety.

Analyte properties that govern retention with HILIC phases are acidity/basicity, which determines hydrogen bonding, and polarizability which determines dipole-dipole interactions.

The highly organic mobile phases used with Accucore HILIC phase ensure efficient desolvation in ESI MS detection, which in turn leads to improved sensitivity.



Catecholamines



Accucore HILIC

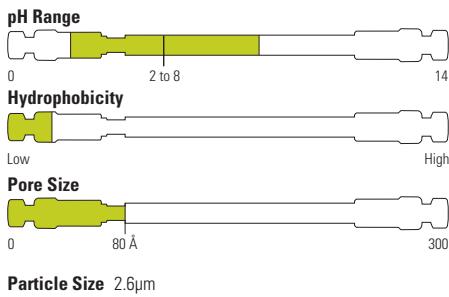
Particle Size (μm)	Format	Length (mm)	2.1mm ID	3.0mm ID	4.6mm ID
2.6	Defender Guard (4/pk)	10	17526-012105	17526-013005	17526-014005
	HPLC Column	30	17526-032130	-	-
		50	17526-052130	17526-053030	17526-054630
		100	17526-102130	17526-103030	17526-104630
		150	17526-152130	17526-153030	17526-154630
	UNIGUARD Drop-in Guard Cartridge Holder	10	852-00	852-00	850-00

Accucore Urea-HILIC

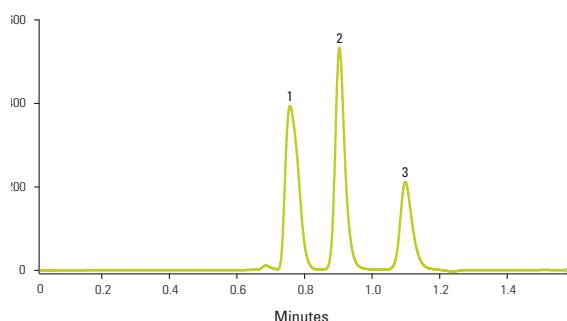
- Bonded hydrophilic stationary phase
- Unique selectivity compared to other HILIC phases
- Low ion exchange activity

Accucore Urea-HILIC has an alternative selectivity and lower ion exchange activity than other HILIC phases.

The bonded hydrophilic stationary phase provides retention of a broad range of polar analytes using up to 20% aqueous mobile phase.



Analgesic compounds



Accucore Urea-HILIC 2.6μm, 100 x 2.1mm

Mobile Phase:	Composition 10:80:10, A : B : C
A:	Water
B:	Acetonitrile
C:	100 mM Ammonium Acetate adjusted to pH 4.9
Temperature:	35°C
Flow Rate:	300μL/min
Injection Volume:	2μL into 10μL partial loop mode.
Backpressure:	71 bar
Detection:	UV, 230nm

	1. Acetaminophen		2. Salicylic acid			3. Aspirin		
	t _r	A _s	t _r	A _s	R _s	t _r	A _s	R _s
Mean	0.760	1.474	0.908	1.303	2.359	1.100	1.318	3.264
CV %	0.00	1.17	0.48	0.92	0.49	0.00	0.63	0.48

Data from eight replicate analyses of a mixture of acetaminophen, salicylic acid and aspirin
 Retention time (t_r), peak asymmetry (A_s), peak resolution (R_s)

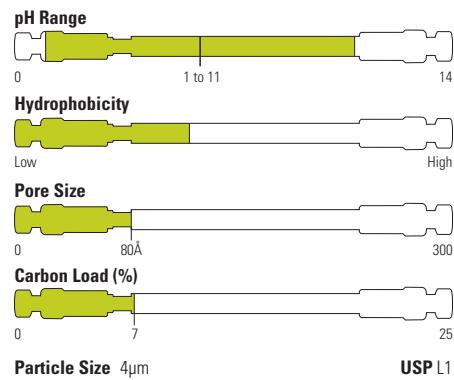
Accucore Urea-HILIC

Particle Size (μm)	Format	Length (mm)	2.1mm ID	3.0mm ID	4.6mm ID
2.6	Defender Guard (4/pk)	10	27726-012105	-	-
	HPLC Column	50	27726-052130	27726-053030	27726-054630
		100	27726-102130	27726-103030	27726-104630
		150	27726-152130	27726-153030	27726-154630
		250	27726-252130	-	-
	UNIGUARD Drop-in Guard Cartridge Holder	10	852-00	852-00	850-00

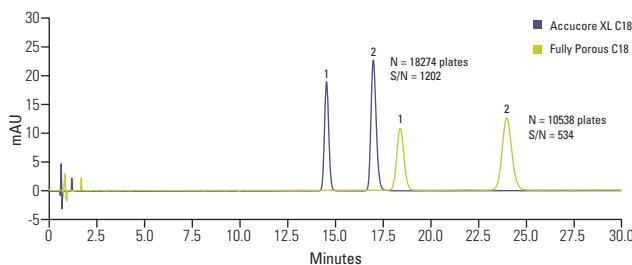
Accucore XL C18

- Optimum retention of non-polar compounds
- Hydrophobic interaction mechanism
- Separates a broad range of analytes

The carbon loading of Accucore XL C18 provides high retention of non-polar analytes via a predominantly hydrophobic interaction mechanism.



Ibuprofen and Valerophenone (USP)



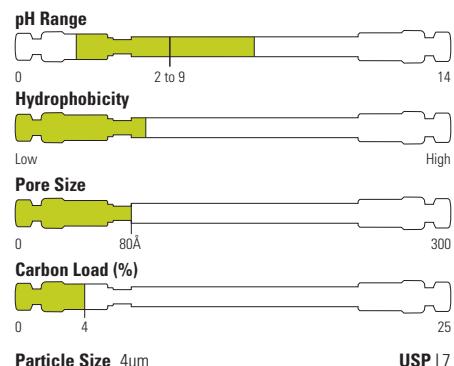
Accucore XL C18 4µm, 150 x 4.6mm

Fully porous C18 5µm, 150 x 4.6mm
Mobile Phase: 66.3:33.7 (v/v) Water with Phosphoric Acid, pH 2.5:MeOH
Temperature: 30°C
Flow Rate: 2mL/min
Injection Volume: 5µL
Detection: UV, 214nm
Analytes: 1. Valerophenone
2. Ibuprofen

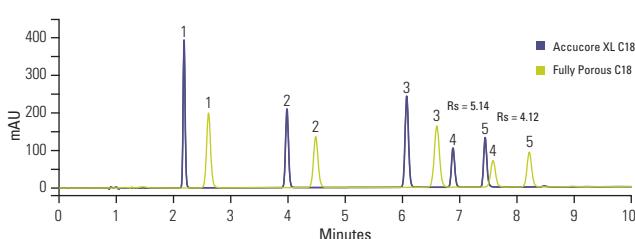
Accucore XL C8

- Similar selectivity to C18 with lower retention
- Recommended for analytes with moderate hydrophobicity

Accucore XL C8 is recommended for analytes with moderate hydrophobicity, or when a less hydrophobic phase provides optimum retention.



Endocrine Disruptors



Accucore XL C8 4µm, 150 x 4.6mm

Fully porous C8 5µm, 150 x 4.6mm
Mobile Phase A: Water
Mobile Phase B: Acetonitrile
Gradient: Time (min) % B
0.0 25
20.0 70
20.1 75
25.0 25
Flow rate: 1.5mL/min
Temperature: 25°C
Detection: UV at 220nm
Injection volume: 5µL
Analytes: 1. Desethyl Atrazine 3. Atrazine
2. Simazine 4. Diuron 5. Bisphenol A

Accucore XL

Particle Size (µm)	Format	Chemistry	Length (mm)	2.1mm ID	3.0mm ID	4.6mm ID
4	Drop-in Guard (4/pk)	C18	10	74104-012101	74104-013001	74104-014001
		HPLC Column	50	74104-052130	74104-053030	74104-054630
			100	74104-102130	74104-103030	74104-104630
			150	74104-152130	74104-153030	74104-154630
			250	74104-252130	74104-253030	74104-254630
	Drop-in Guard (4/pk)	C8	10	74204-012101	74204-013001	74204-014001
		HPLC Column	50	74204-052130	74204-053030	74204-054630
			100	74204-102130	74204-103030	74204-104630
			150	74204-152130	74204-153030	74204-154630
			250	74204-252130	74204-253030	74204-254630