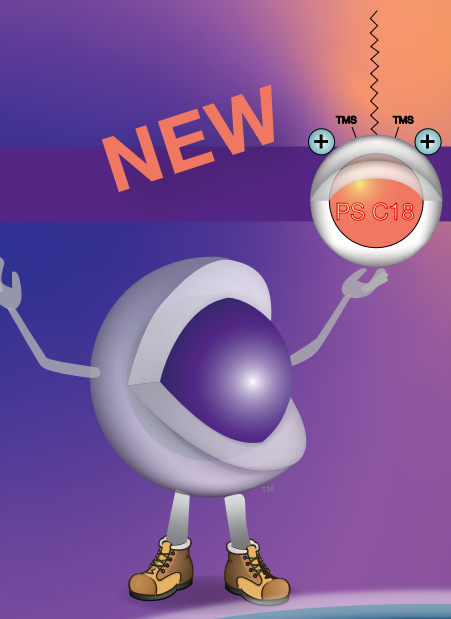
KINETEX®
Core-Shell Technology

The POWER of ULTRA-Performance on Any LC System

- Higher throughput without sacrificing resolution
- Reduce solvent usage with faster analysis
- Lower levels of detection and quantitation

UHPLC

NEW



Kinetex PS C18!

- Enhanced Polar Retention
- Improved Peak Shape for Bases
- Multi-modal Interaction Selectivity

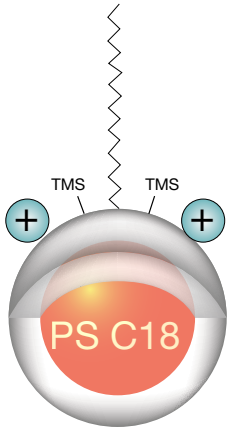
phenomenex®
. . . breaking with tradition℠

www.Phenomenex.com/Kinetex

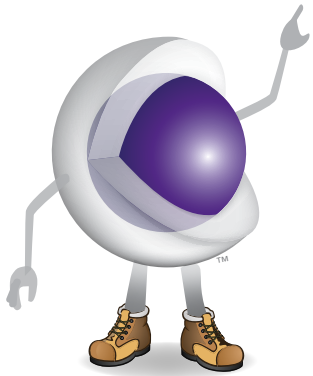
Contents

KINETEX® Core-Shell Technology

The **NEW** Kinetex PS C18!



Find more details on page 14

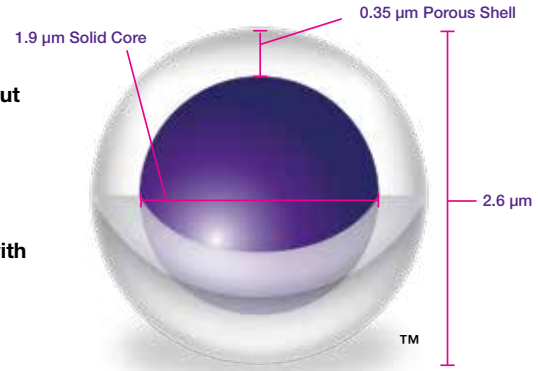


Core-Shell Advantage

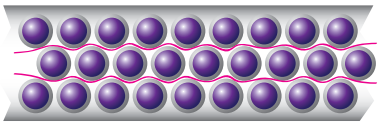
Using sol-gel processing techniques that incorporate nano-structuring technology, a durable, homogeneous porous shell is grown on a solid silica core to create a Kinetex Core-Shell particle. This particle morphology results in less band broadening for all four sources of UHPLC band broadening compared to fully porous particles and thus delivers extremely high efficiencies.

Kinetex 2.6 µm Core-Shell Particle

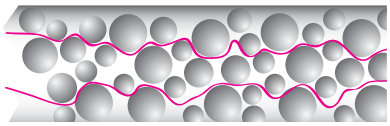
- **Obtain higher throughput without sacrificing resolution**
- **Easy method transfer across LC system platforms**
- **Reduce solvent consumption with faster analysis**
- **Reach lower levels of detection and quantitation**

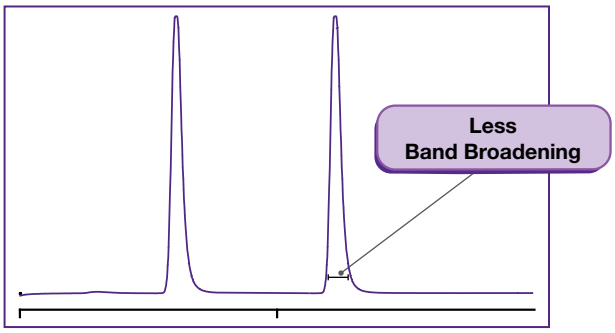


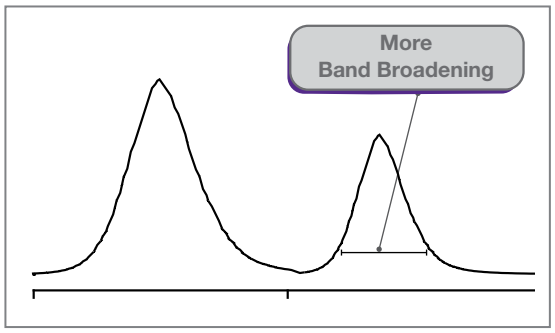
Kinetex Core-Shell



Fully Porous







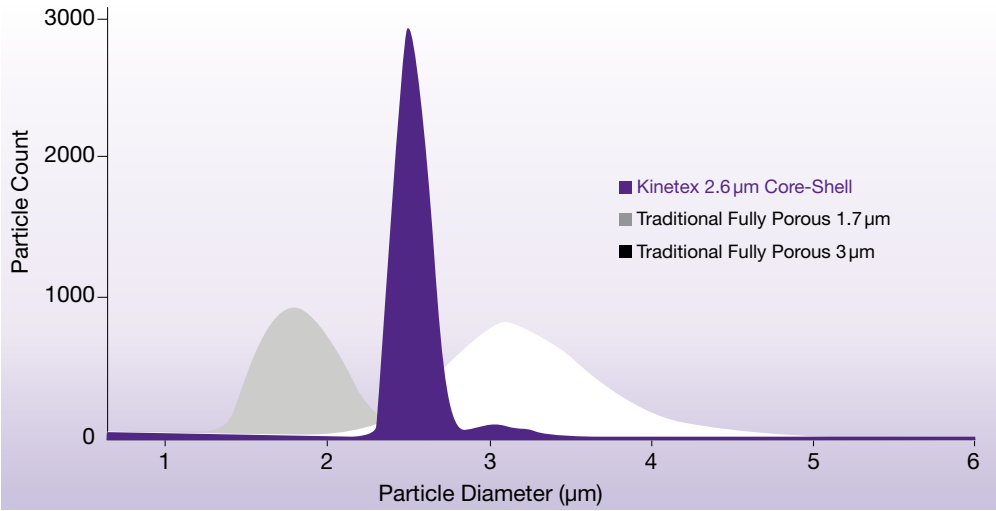
Superior
Core-Shell Quality

KINETEX® Core-Shell Technology

To ensure reproducible, robust, and reliable results, **Kinetex** columns are manufactured with high quality standards. Every step in the manufacturing process of Kinetex columns is tightly controlled for:

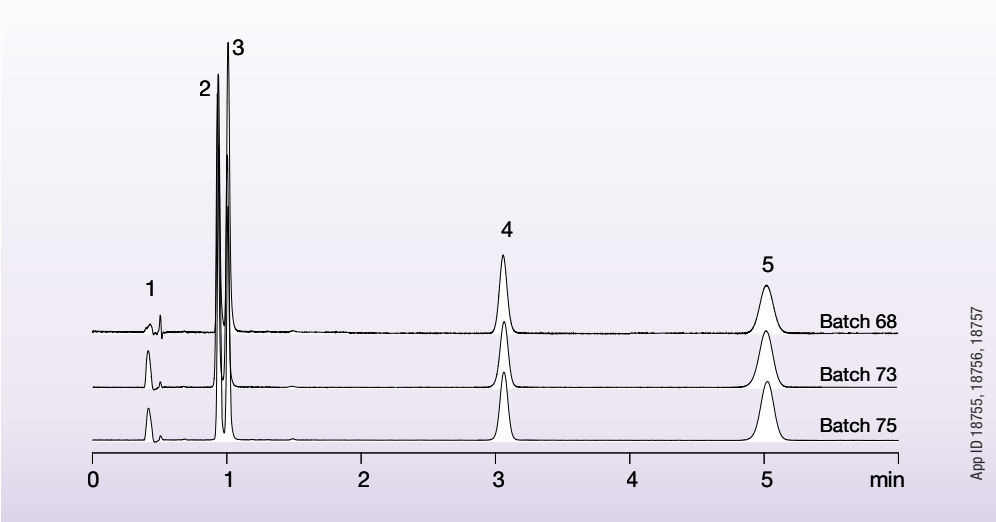
- Particle size distribution
- Surface and bonding homogeneity
- Selectivity quality control testing
- Inertness of the base silica
- Packing quality and consistency

Uniform Particle Size Distribution



Kinetex particles are nearly monodispersed. This extremely narrow particle size distribution results in increased column efficiency and excellent reproducibility.

Batch-to-Batch Reproducibility Overlay



Conditions same for all examples:
Column: Kinetex 2.6 µm C18
Dimensions: 50 x 4.6 mm
Part No.: 00B-4462-E0
Mobile Phase: Water / Acetonitrile (65:35)
Flow Rate: 1.0 mL/min
Detection: UV @ 254 nm
Sample: 1. Uracil
2. Hydrocortisone
3. Cortisone
4. Cortisone acetate
5. 17-Hydroxyprogesterone

Comparative separations may not be representative of all applications.

Get the Most Out of Your Core-Shell Particle

Advancements in core-shell particle morphologies have led to many HPLC or UHPLC performance benefits for the analytical scientist. However, the quality and consistency of each core-shell particle is vital to fully realizing the performance benefits afforded to by core-shell columns. Phenomenex is committed to the highest quality and consistency of our products and continues to strive to provide our customers the excellence in LC columns that they deserve.

From the *Journal of Chromatography A*

"Never had such a low reduced HETP value has been achieved in column manufacturing technology."

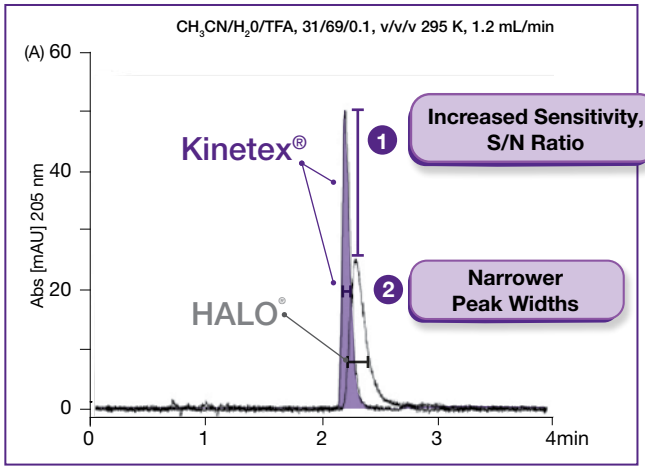
F. Gritti et al. / J. Chromatogr. A 1217 (2010) 1589-1603

From *Talanta*

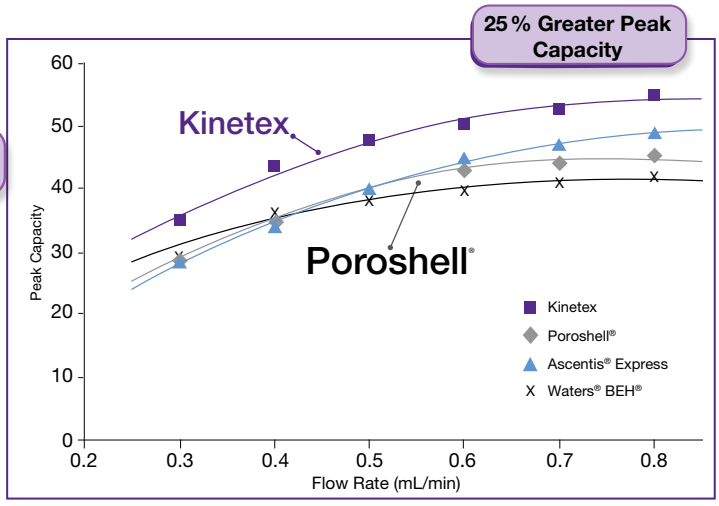
"The highest peak capacity was obtained with the Kinetex column which is in good agreement with the theory."

S. Fekete, J. Fekete / Talanta 84 (2011) 416-423

Comparison of Peak Shape and Capacity



Comparison between the peak shapes of insulin recorded on the Kinetex and HALO columns. Reprinted from *Journal of Chromatography A*, Volume 1217, Issue 10, with permission from Elsevier. "Performance of columns packed with the new shell particles, Kinetex-C18," page 1598, copyright 2010. By Fabrice Gritti, Irene Leonardis, David Shock, Paul Stevenson, Andrew Shalliker, and Georges Guiochon.



Peak capacity plots a function of flow rate at 3 min gradient time. Reprinted from *Talanta*, Volume 84, Issue 2, with permission from Elsevier. "Fast gradient screening of pharmaceuticals with 5 cm long, narrow bore reversed-phase columns packed with sub-3 µm core–shell and sub-2 µm totally porous particles," page 416, copyright 2011. By Szabolcs Fekete and Jenõ Fekete.

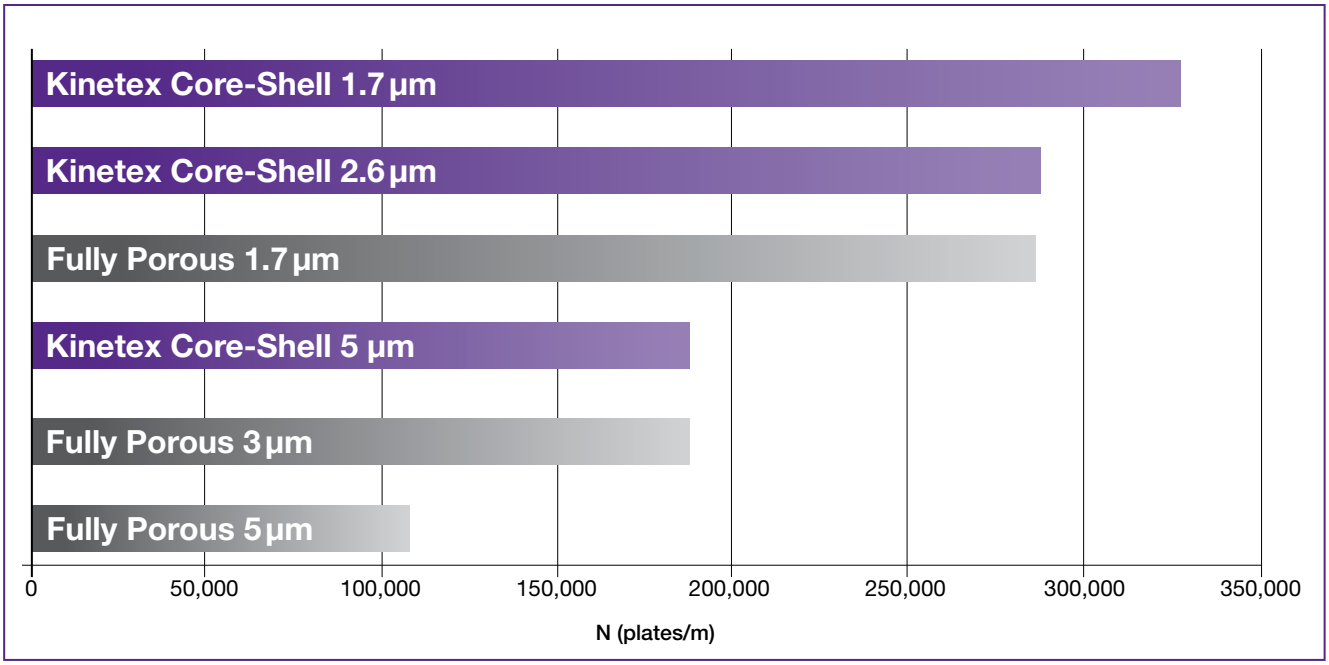
The opinions stated herein are solely those of the speaker and not necessarily those of any company or organization.
Comparative separations may not be representative of all applications.

Ultra-high Performance
on Any LC system

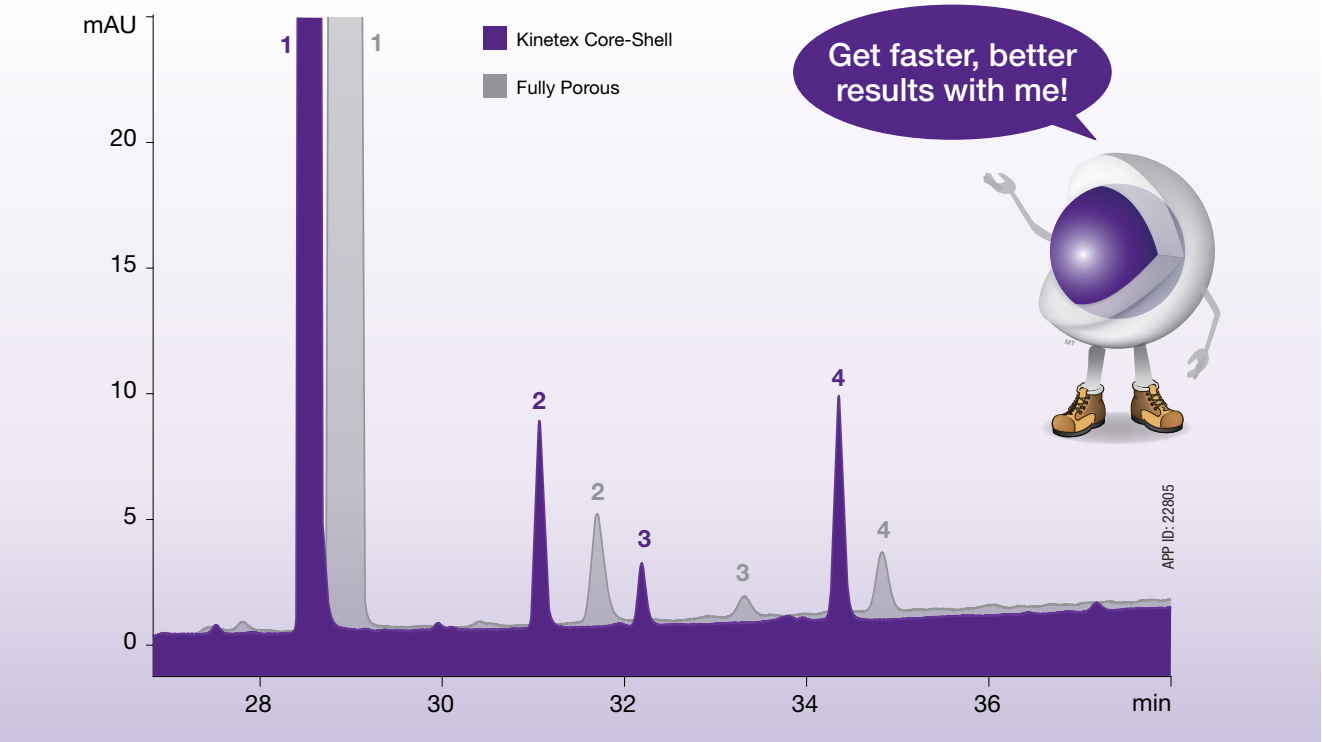
KINETEX® Core-Shell Technology

The band broadening (wide peaks) and lengthy retention times of traditional fully porous products can be limiting your results. Now you can use the incredible efficiency levels of **Kinetex Core-Shell Technology** to achieve shorter run times, higher levels of sensitivity, and overall better HPLC or UHPLC results.

Core-Shell vs. Fully Porous Efficiency Levels (plates/m)



Core-Shell Performance Gains

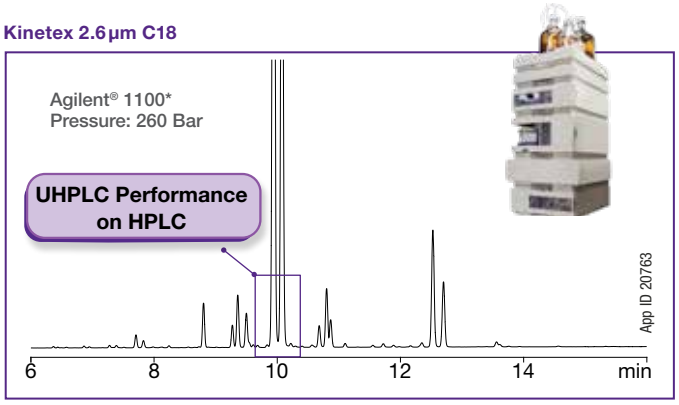


A Versatile Upgrade
for HPLC and UHPLC

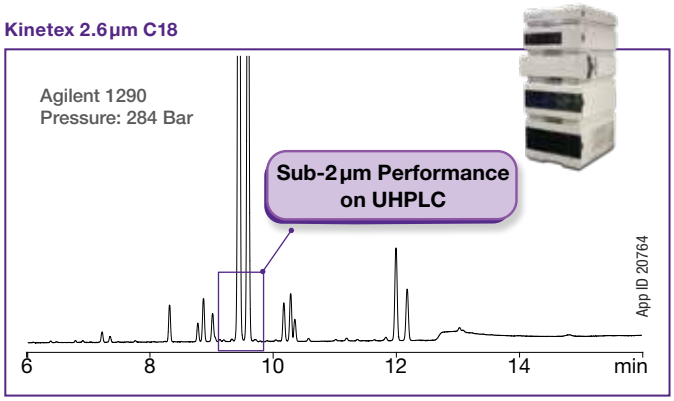
On a low volume HPLC or UHPLC system **Kinetex® 2.6 µm** columns will perform similar to a fully porous sub-2 µm column, providing up to 3x the efficiency of 5 µm and potentially double the efficiency of 3 µm fully porous media. Dramatically improve the productivity and performance of your existing methods with the use of shorter Kinetex columns, all while decreasing your solvent usage!

Performance with Kinetex 2.6 µm on HPLC or UHPLC Systems

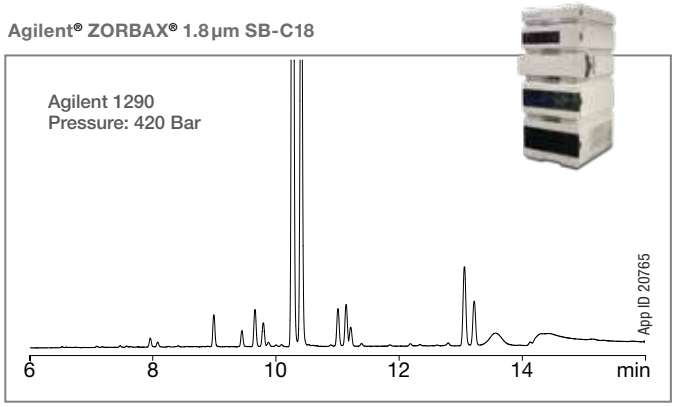
Kinetex 2.6 µm C18



Kinetex 2.6 µm C18



Agilent® ZORBAX® 1.8 µm SB-C18



Conditions for all columns :

Columns:	Kinetex 2.6 µm C18 Kinetex 2.6 µm C18 ZORBAX 1.8 µm SB-C18
Dimensions:	100 x 4.6 mm
Mobile Phase:	A: Water with 0.1% TFA B: Acetonitrile with 0.1% TFA
Gradient:	**Time (min)** **% B** 0 10 20 70
Flow Rate:	1.2 mL/min
Temperature:	Ambient
Detection:	UV @ 210 nm
Sample:	Mupirocin degradants

*Agilent 1100 was optimized with the Core-Shell Performance Enhancement Kit AQ0-8892.
Comparative separations may not be representative of all applications.

SecurityLink Fingertight HPLC and UHPLC Connections in a Click

SecurityLINK
UHPLC Connections in a Click

- No tools required
- Zero dead-volume for better chromatographic results
- Torque limiting technology prevents system and column port damage
- UHPLC and HPLC compatibility: pressure rated to 19,000 psi (1,310 bar)

For more information, see page 23

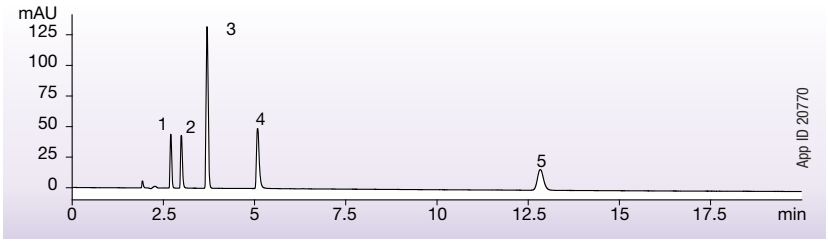
Core-Shell
Scalability and Portability

KINETEX® Core-Shell Technology

With **Kinetex 5 µm**, **2.6 µm**, **1.7 µm**, and **1.3 µm Core-Shell Technology**, you are no longer restricted from developing high-performance LC methods on any system and transferring them anywhere. These four scalable Kinetex particle sizes offer you the ability to develop and transfer your method effortlessly from system to system.

Portability

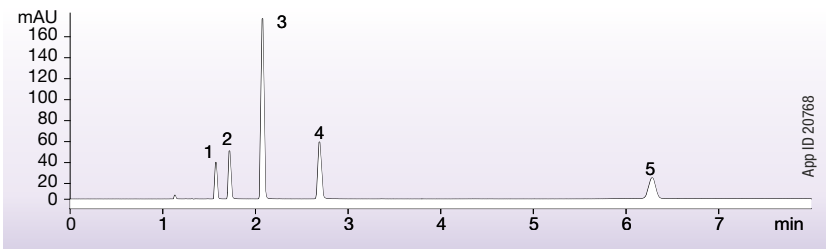
Kinetex 5 µm C18 on Shimadzu® LC-20A



Columns: Kinetex 5 µm C18
Dimension: 250 x 4.6 mm
Part No.: 00G-4601-E0

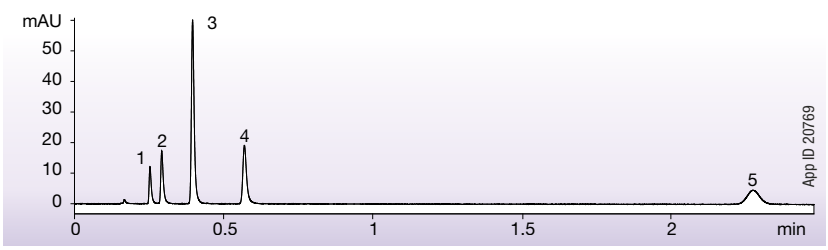
Conditions are the same except as noted:
Mobile Phase: Water/Acetonitrile/ Phosphoric Acid (600:400:2)
Flow Rate: 1 mL/min
Temperature: Ambient
Detection: UV @ 237 nm
Sample: 1. Impurity A
2. Impurity B
3. Impurity C
4. Acetylsalicylic acid
5. Impurity D

Kinetex 2.6 µm C18 on Agilent® 1100



Columns: Kinetex 2.6 µm C18
Dimension: 150 x 4.6 mm
Part No.: 00F-4462-E0

Kinetex 1.7 µm C18 on Agilent 1290

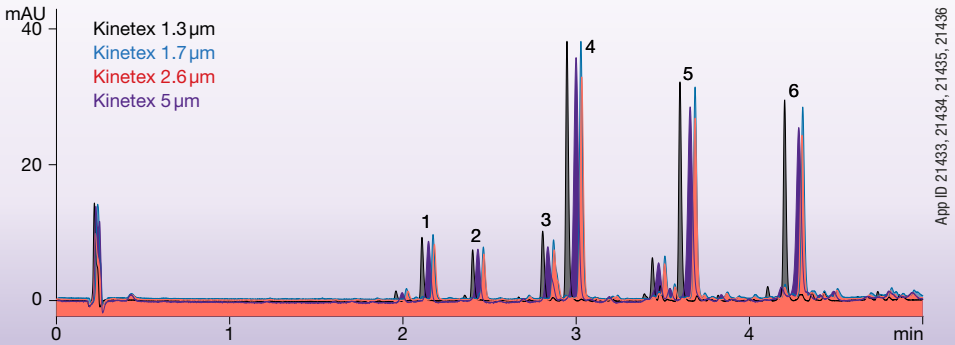


Columns: Kinetex 1.7 µm C18
Dimension: 50 x 3.0 mm
Part No.: 00B-4475-Y0
Mobile Phase: 680:320:2

Scalability

UHPLC/HPLC/PREP LC

Gingerols

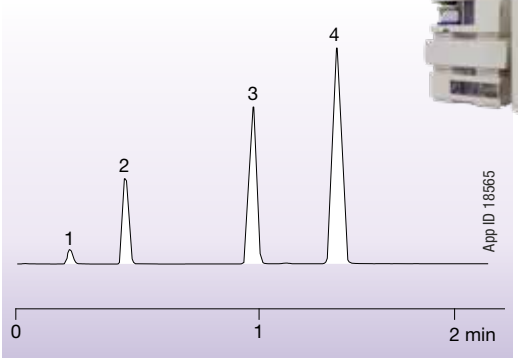


Comparative separations may not be representative of all applications.

Method Transfer to
Any LC System

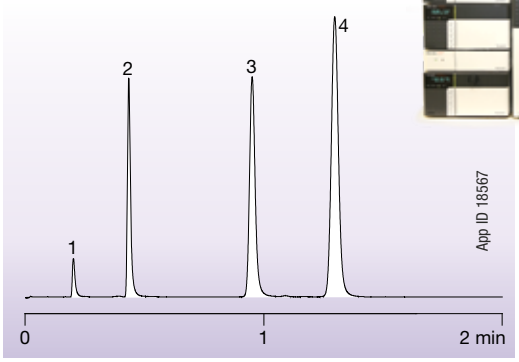
UHPLC methods developed with fully porous sub-2 µm columns often generate higher backpressure that only certain system can run. With the **Kinetex® 2.6** µm particle performance you are no longer restricted by system limitations for your HPLC or UHPLC method development.

Kinetex 4.6 mm ID
on Agilent® 1100



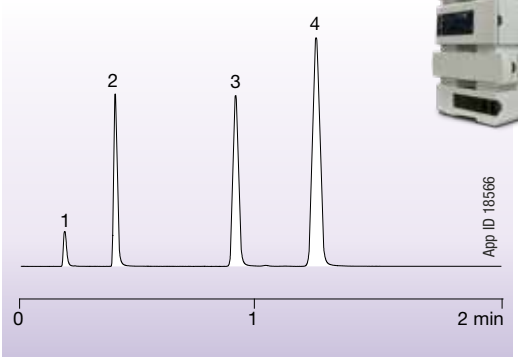
Column: Kinetex 2.6 µm C18
Dimensions: 50 x 4.6 mm
Part No.: 00B-4462-E0
Mobile Phase: Acetonitrile / Water (50:50)
Flow Rate: 2.35 mL/min*
Temperature: Ambient
Detection: UV @ 254 nm
Sample: 1. Uracil
2. Acetophenone
3. Toluene
4. Naphthalene

Kinetex 3.0 mm ID
on Shimadzu Prominence UFPLC™



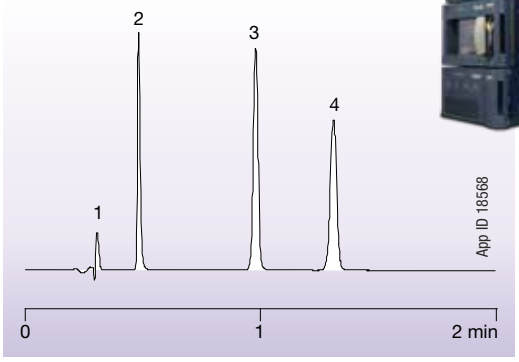
Column: Kinetex 2.6 µm C18
Dimensions: 50 x 3.0 mm
Part No.: 00B-4462-Y0
Mobile Phase: Acetonitrile / Water (50:50)
Flow Rate: 1.0 mL/min*
Temperature: Ambient
Detection: UV @ 254 nm
Sample: 1. Uracil
2. Acetophenone
3. Toluene
4. Naphthalene

Kinetex 2.1 mm ID
on Agilent 1200



Column: Kinetex 2.6 µm C18
Dimensions: 50 x 2.1 mm
Part No.: 00B-4462-AN
Mobile Phase: Acetonitrile / Water (50:50)
Flow Rate: 0.49 mL/min*
Temperature: Ambient
Detection: UV @ 254 nm
Sample: 1. Uracil
2. Acetophenone
3. Toluene
4. Naphthalene

Kinetex 2.1 mm ID
on Waters® ACQUITY® UPLC®



Column: Kinetex 2.6 µm C18
Dimensions: 50 x 2.1 mm
Part No.: 00B-4462-AN
Mobile Phase: Acetonitrile / Water (50:50)
Flow Rate: 0.49 mL/min*
Temperature: Ambient
Detection: UV @ 254 nm
Sample: 1. Uracil
2. Acetophenone
3. Toluene
4. Naphthalene

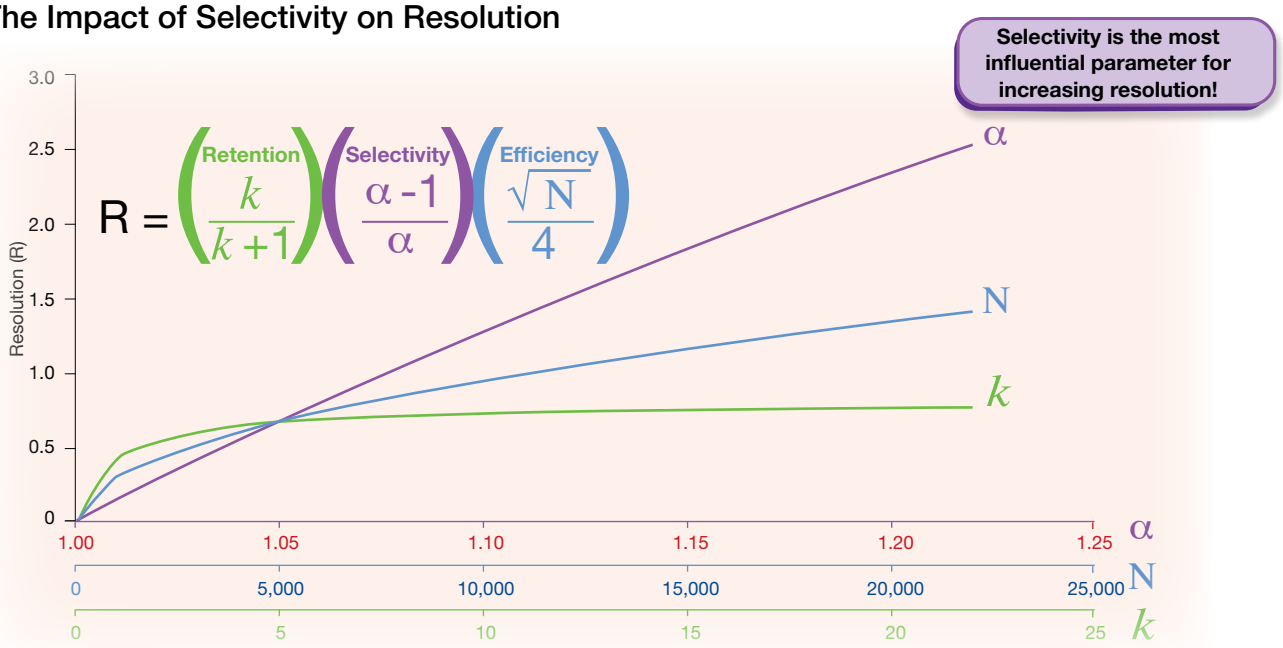
*Please note that the flow rates were scaled to maintain the same linear velocity.

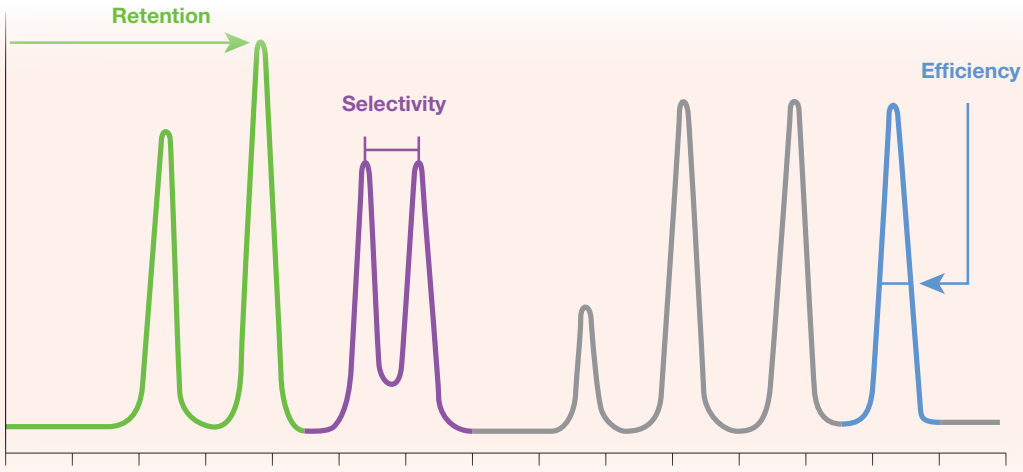
Impact of Selectivity
on Resolution

KINETEX Core-Shell Technology

Selectivity (α) has the greatest impact on observed resolution (R) when compared to other chromatographic parameters. Often the simplest and most effective way to improve your chromatographic results is to change your column's phase or solid support. Phenomenex offers a wide breadth of phase chemistries across multiple solid supports for simplified method development and optimization.

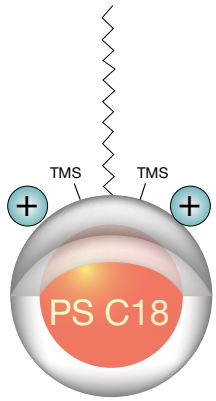
The Impact of Selectivity on Resolution





Expand Your
LC Method Development

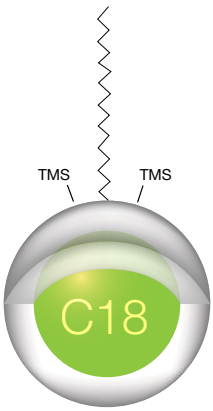
Polar Bases



Kinetex® PS C18
2.6 µm

A multi-modal, 100 % aqueous C18 column with a positive surface modification that demonstrates unique selectivity and improved peak shape for basic compounds.

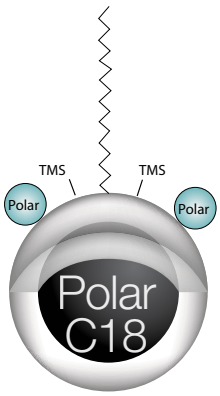
Hydrophobic Compounds



Kinetex C18
1.3, 1.7, 2.6, 5 µm

Balanced C18 phase that provides the highest degree of hydrophobic selectivity relative to other Kinetex phases.

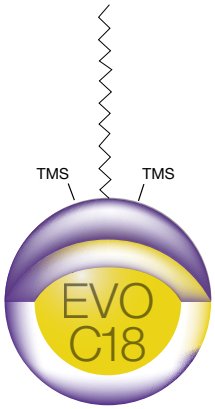
Polar Acids



Kinetex Polar C18
2.6 µm

Combined C18 and polar modified surface that provides polar and non-polar retention alongside 100 % aqueous stability.

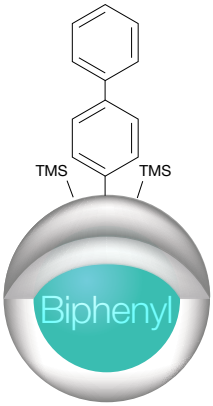
Alkaline Conditions



Kinetex EVO C18
1.7, 2.6, 5 µm

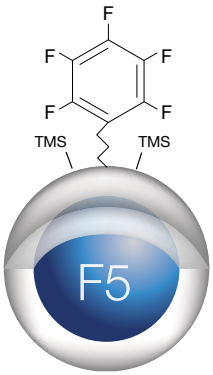
Novel pH 1-12 stable C18 that delivers robust methods and improved peak shape for bases.

Closely Related Compounds



Kinetex Biphenyl
1.7, 2.6, 5 µm

100 % aqueous stable reversed phase chemistry with hydrophobic, aromatic, and enhanced polar selectivity.



Kinetex F5
1.7, 2.6, 5 µm

Highly reproducible pentafluoro-phenylpropyl phase, exceptional for halogenated, conjugated, isomeric, or highly polar compounds.

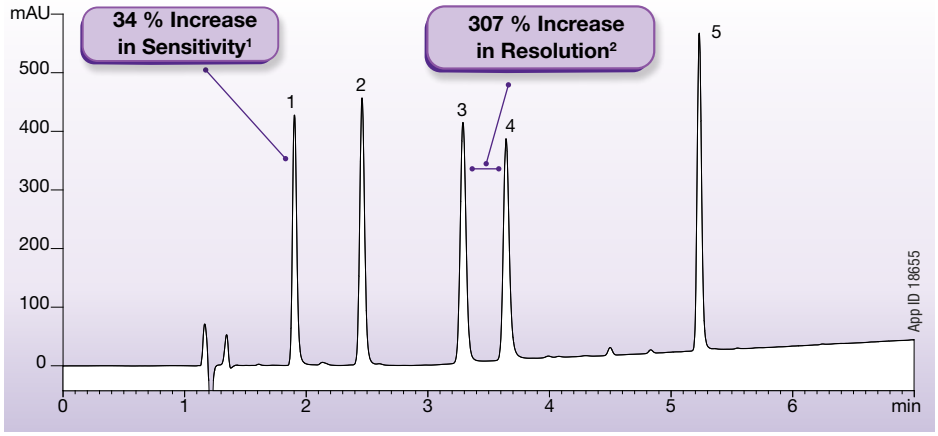
Hydrophobic Compounds

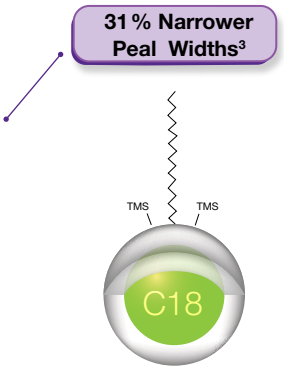
KINETEX® Core-Shell Technology

Kinetex C18 is a well-rounded, all-purpose core-shell column that produces increased efficiencies over traditional fully porous columns. Yielding remarkable chromatographic resolution, higher peak capacities, and greater sensitivity, so labs can get the most out of every HPLC or UHPLC analysis.

Core-Shell vs. Fully Porous

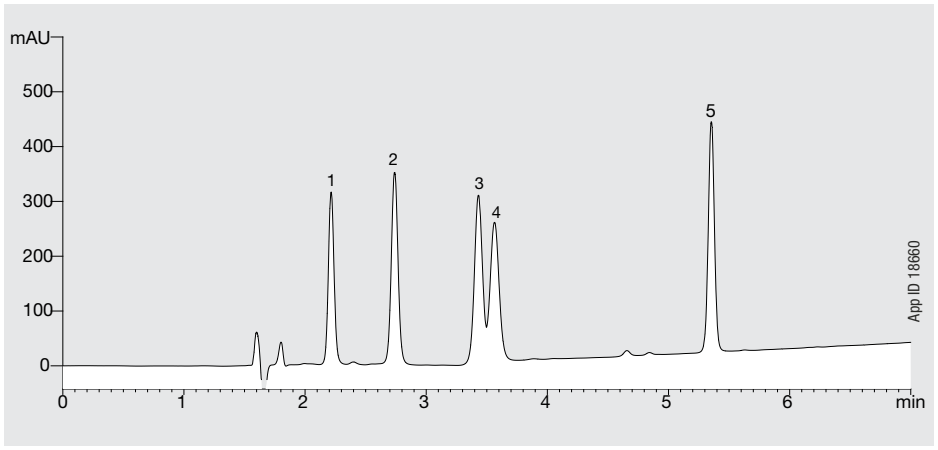
Kinetex 2.6µm C18



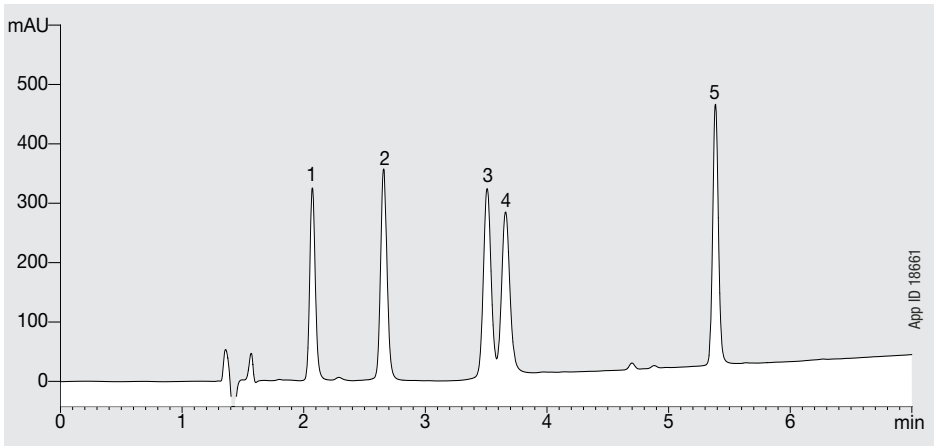


1. Signal-to-noise ratio of peak 1
2. Resolution measured between peaks 3 and 4
3. Based on average peak widths

HYPERSIL GOLD® 3µm C18



Waters® XBridge® 3µm C18



Conditions for all columns:

Column: Kinetex 2.6µm C18
HYPERSIL GOLD 3 µm C18
Waters XBridge 3 µm C18

Dimensions 150 x 4.6 mm

Mobile Phase: A: Water with 0.1 % of Formic Acid
B: Acetonitrile with 0.1 % Formic Acid

Gradient:

Time (min)	% B
0	15
1	15
7	35
7.01	15
11	15

Injection Volume: 5 µL

Flow Rate: 1.2 mL/min

Temperature: 30 °C

Detection: UV @ 230 nm

Analytes: 1. Epigallocatechin
2. Catechin
3. Epicatechin
4. Epigallocatechin gallate
5. Epicatechin gallate

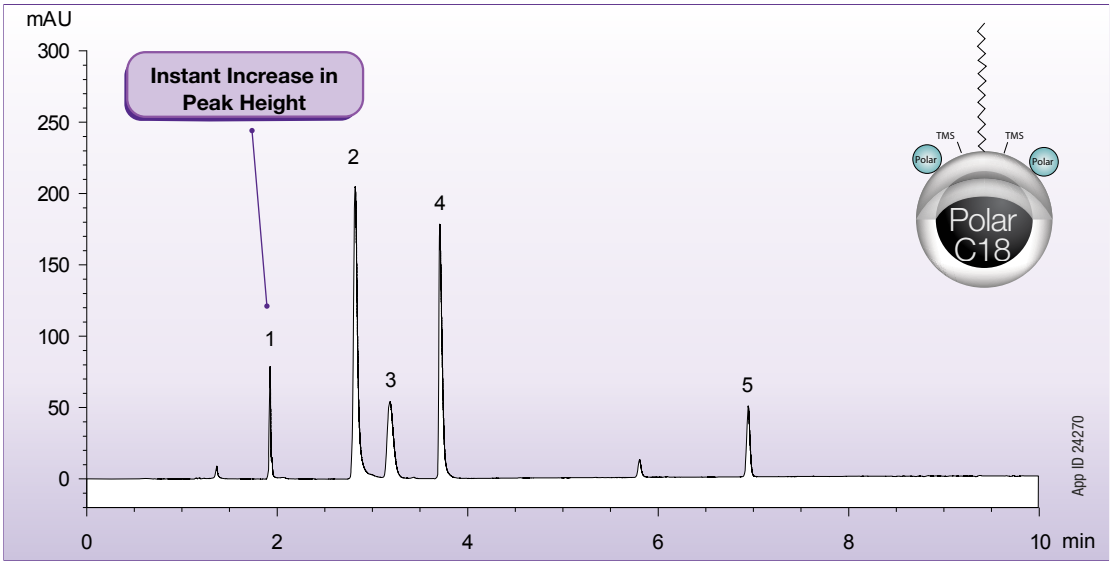
Comparative separations may not be representative of all applications.

Polar Acidic Compounds

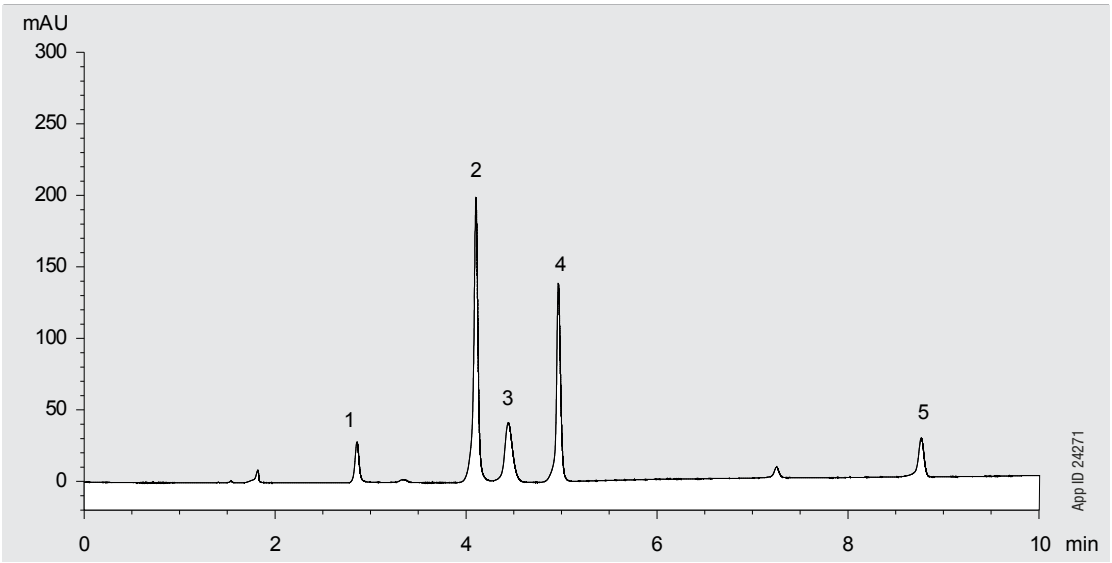
The **Kinetex® 2.6 µm Polar C18** is a core-shell based particle with a polar modified surface and a C18 alkyl phase. This versatile column can easily upgrade existing fully porous 5 µm and 3 µm methods to shorten run runtime, increase sensitivity, and even provide greater resolution with much higher efficiency levels. The **Kinetex Polar C18** is an excellent all-purpose, 100 % aqueous stable phase for use with multi-compound mixes that contain polar and non-polar compounds, or even single class methods that have closely related compounds, impurities, or metabolites.

Water Soluble Vitamins

Kinetex 2.6 µm Polar C18



AQUA™ 3µm C18



Conditions for both columns

Column: Kinetex 2.6 µm Polar C18
AQUA 3 µm C18
Dimensions 150 x 4.6 mm
Mobile Phase: A: 20 mM Potassium Phosphate (pH 1.5)
B: Methanol
Gradient:

Time (min)	% B
0	0
1	30
7	30
7.01	0
14	0

Injection Volume: 5 µL
Flow Rate: 1.2 mL/min
Temperature: 22 °C
Detection: UV @ 210 nm
Analytes: 1. Thiamine
2. Nicotinamide
3. Pyridoxal
4. Pyridoxine
5. Pantothenic Acid

Comparative separations may not be representative of all applications.

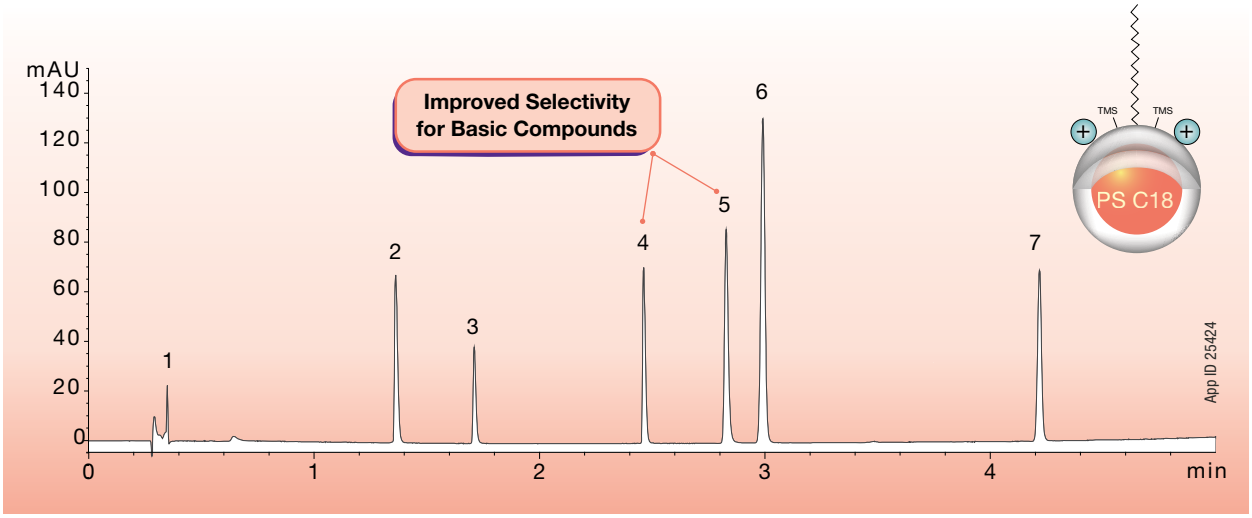
Polar Basic Compounds

KINETEX Core-Shell Technology

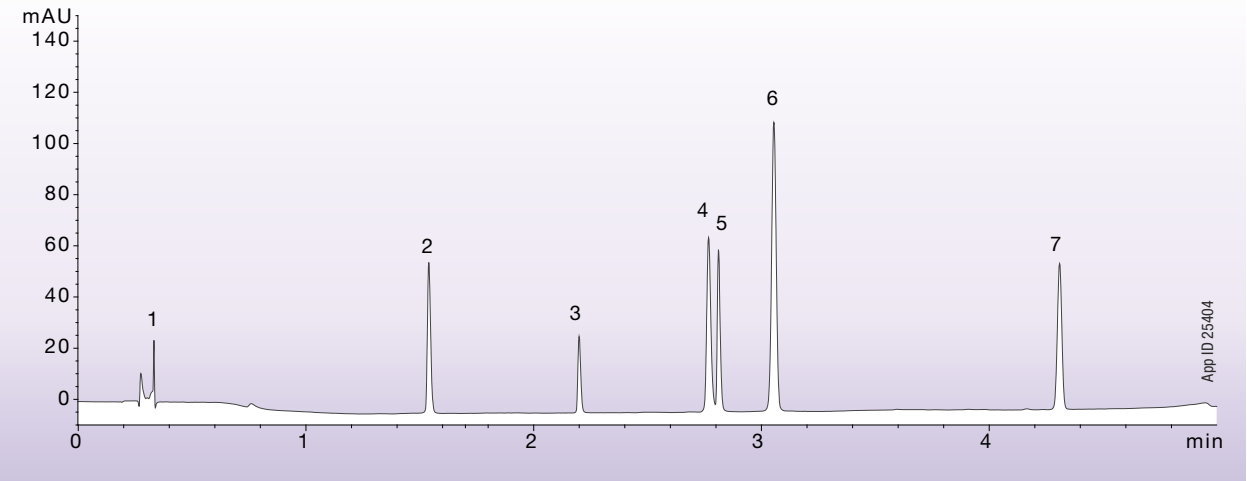
The **Kinetex PS C18** combines a 100 % aqueous stability C18 stationary phase, with a unique positive surface charge, and the core-shell advantage to deliver both excellent performance and reversed phase selectivity. Upgrade your traditional fully porous particle to a Kinetex PS C18 Core-Shell particle to take full polar advantage of your systems analytical capabilities. Under identical running conditions and analytes, the **Kinetex PS C18** column below demonstrates unique polar selectivity with peaks associated with nortriptyline and 3-methyl-4-nitrobenzoic acid.

Polar Basic Selectivity Comparison

Kinetex 2.6µm PS C18



Kinetex 2.6µm XB-C18



Conditions for both columns

Column: Kinetex 2.6µm C18
Kinetex 2.6 µm XB-C18
Dimensions 50 x 4.6 mm
Mobile Phase: A: Water with 0.1 % Formic Acid
B: Acetonitrile with 0.1 % Formic Acid

Gradient:

Time (min)	% B
0	5
5	95
6	95
6.1	5
9	5

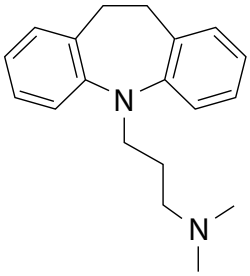
Injection Volume: 1 µL
Flow Rate: 1.85 mL/min
Temperature: 30 °C
Detection: UV @ 254 nm
Sample: 1. Uracil
2. Pindolol
3. Chlorpheniramine
4. Nortriptyline
5. 3-methyl-4-nitrobenzoic Acid
6. 2-hydroxy-5-methylbenzaldehyde
7. Hexanophenone

Comparative separations may not be representative of all applications.

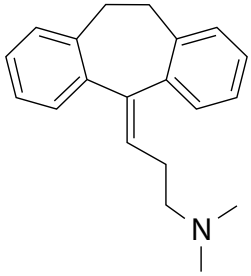
Polar Basic Compounds

While traditional alkyl C18 phases are prone to peak tailing for basic compounds due to of secondary interactions occurring at the silica surface, the surface of the **Kinetex® PS C18** was designed with positive charges that serve to repel basic species and deliver consistently sharper peak shape for basic compounds.

Imipramine
LogP: 4.28

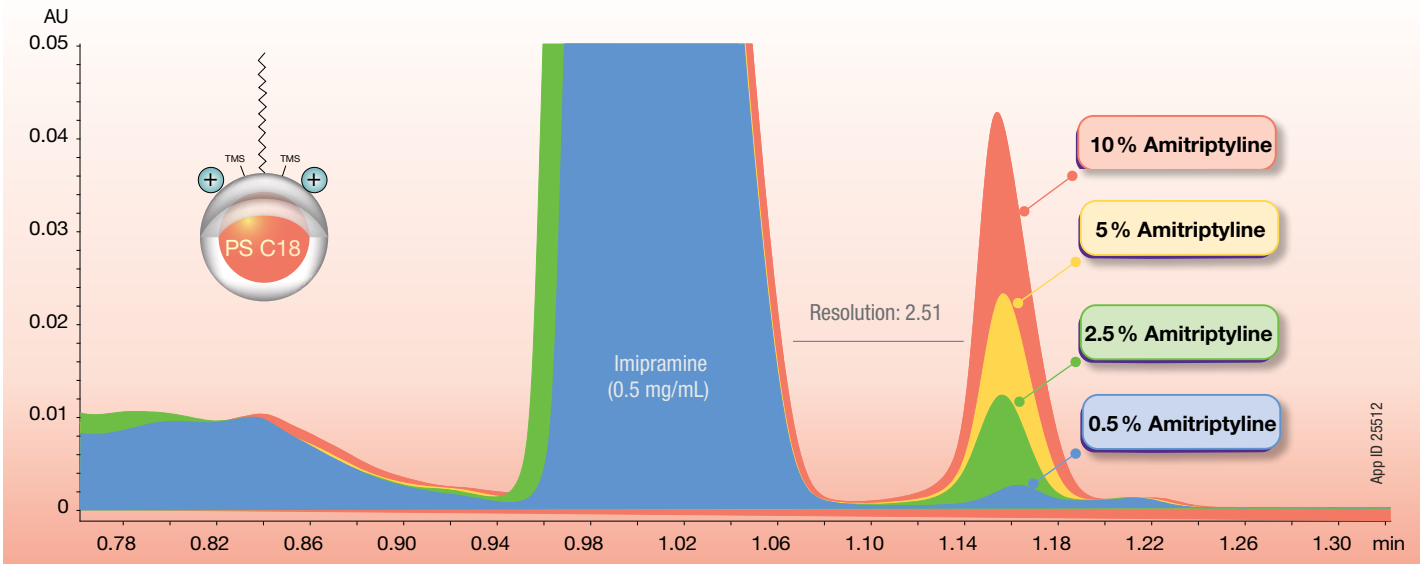


Amitriptyline
LogP: 4.81



Improved Impurity Loading Profiling for Bases

Kinetex 2.6µm PS C18



Column: Kinetex 2.6 µm PS C18
Dimensions 50 x 4.6 mm
Part No.: 00B-4780-E0
Mobile Phase: A: Methanol with 0.1 % Formic Acid
B: Acetonitrile with 0.1 % Formic Acid
Gradient:

Time (min)	% B
0	25
2	35
3	95
3.1	25
5	25

Flow Rate: 1.85 mL/min
Temperature: 30 °C
Detection: UV @ 254 nm
Sample: 1. Imipramine
2. Amitriptyline

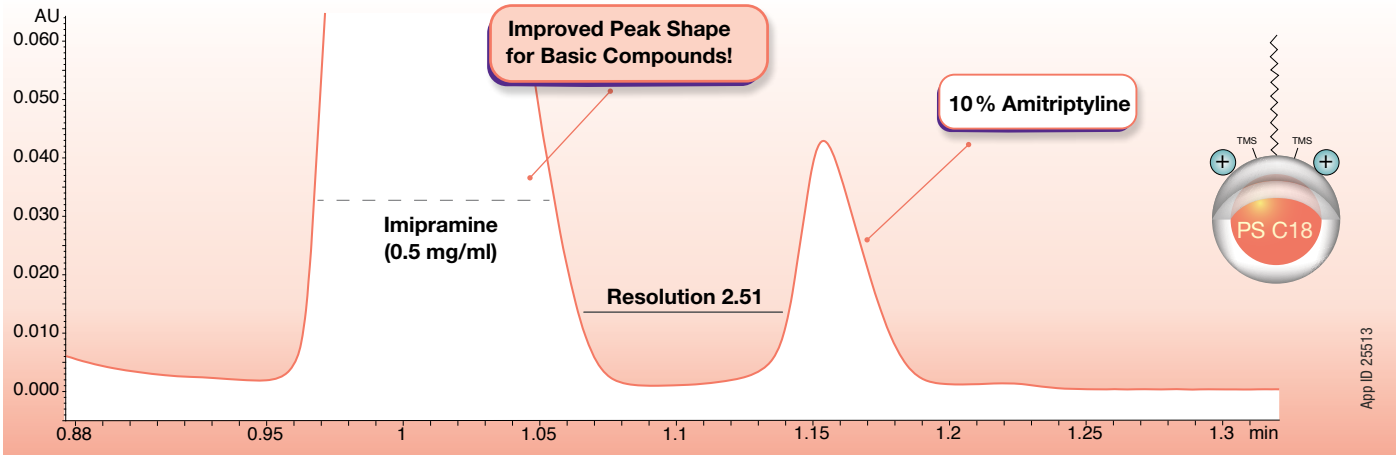
Polar Basic Compounds

KINETEX Core-Shell Technology

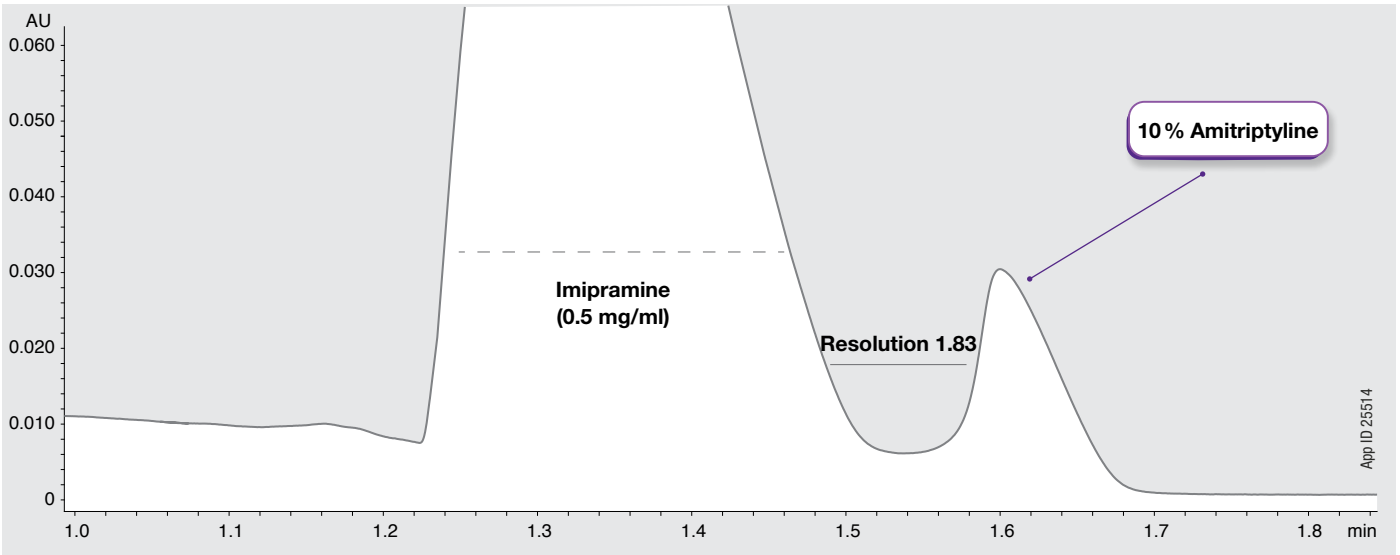
The **Kinetex PS C18** is a high-efficiency, multi-modal interaction selectivity C18 with a positive surface modification. The column demonstrates enhanced selectivity and improved peak shape for basic compounds under typical reversed phase conditions.

Core-Shell Comparison

Kinetex 2.6 µm PS C18



Core-Shell 2.6 µm C18



Conditions for both columns

Column: Kinetex 2.6 µm PS C18
Core-Shell 2.6 µm C18
Dimensions 50 x 4.6 mm
Part No.: 00B-4780-E0
Mobile Phase: A: Water with 0.1 % Formic Acid
B: Acetonitrile with 0.1 % Formic Acid
Gradient:

Time (min)	% B
0	25
2	35
3	95
3.1	25
5	25

Injection Volume: 5 µL
Flow Rate: 1.85 mL/min
Temperature: Ambient
Detection: UV @ 254 nm
Sample: 1. Imipramine
2. Amitriptyline

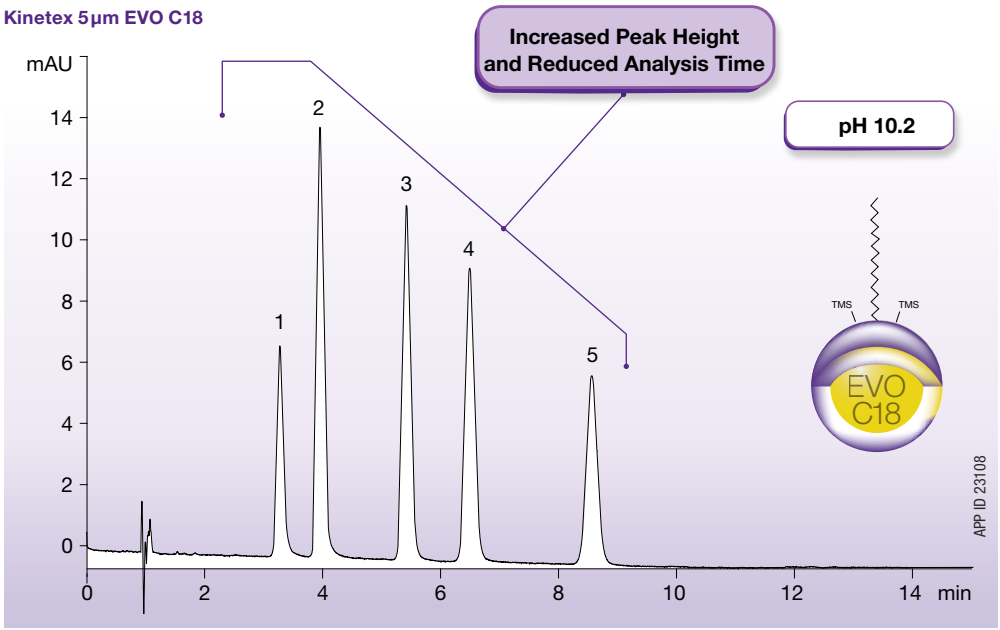
Comparative separations may not be representative of all applications.

Alkaline
Mobile Phases Conditions

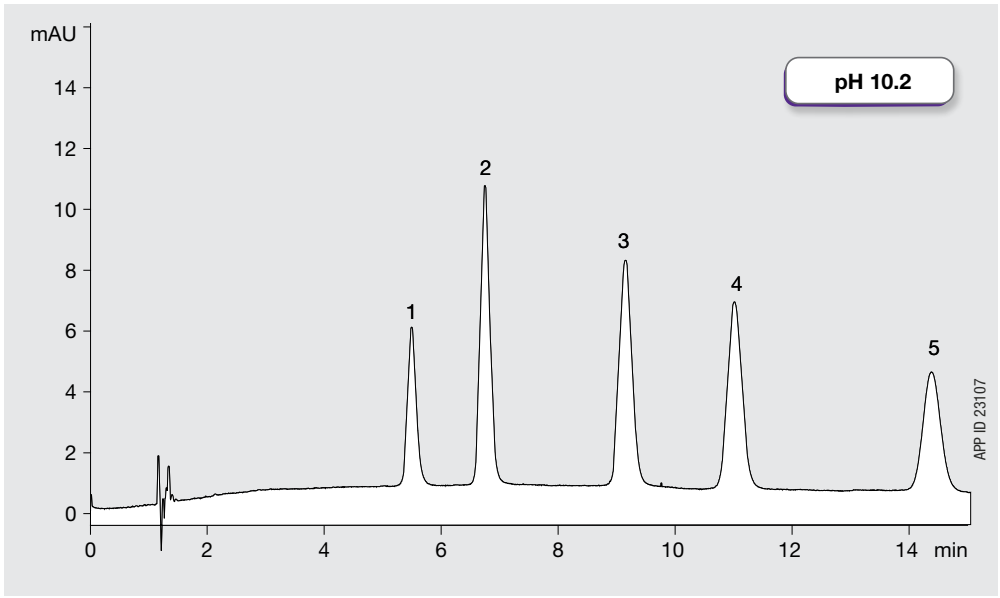
Kinetex® EVO C18 uses a patented organo-silica grafting process which incorporates uniform stabilizing ethane cross-linking to provide resistance to high pH attack while maintaining the mechanical strength of the core-shell particle. Providing both increased peak sensitivity and decreased overall analysis time.

High pH Stable Core-Shell

Kinetex 5µm EVO C18



Waters® XBridge® 5µm C18



Conditions for all columns:

Column: Kinetex 5µm EVO C18
XBridge 5µm C18

Dimensions: 150 x 4.6mm

Mobile Phase: A: 20 mM Sodium Phosphate/
Methanol/Acetonitrile (30:35:35)

Flow Rate: 1.25mL/min

Temperature: 30 ˚C

Detection: UV @ 254 nm

Sample: 1. Protriptyline
2. Nortriptyline
3. Imipramine
4. Amitriptyline
5. Clomipramine

Comparative separations may not be representative of all applications.

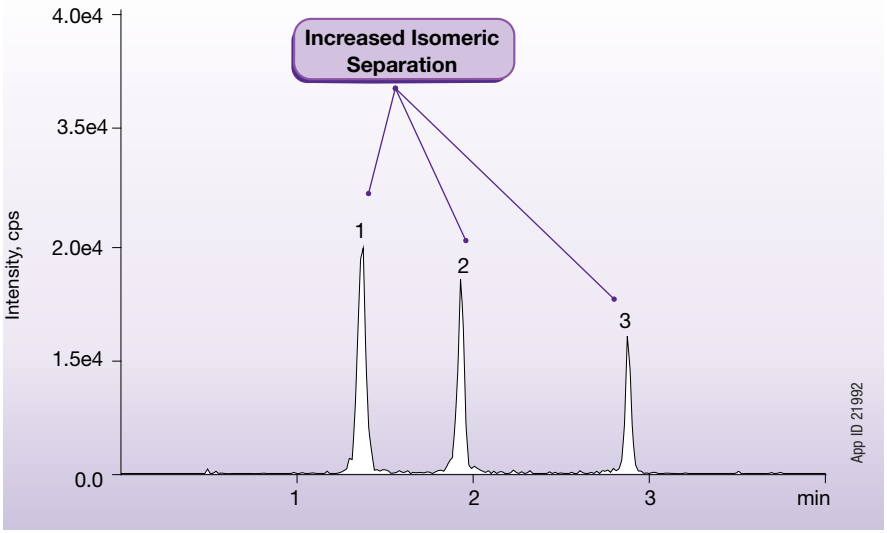
Closely Related Compounds

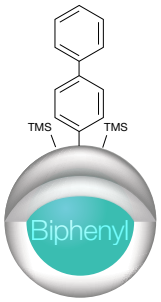
KINETEX® Core-Shell Technology

Kinetex Biphenyl is a high-efficiency core-shell product capable of adding extra separation power to your analysis of non-polar and polar compounds. Take advantage of multiple selectivity interaction mechanisms such as hydrophobic, pi-pi, and dipole-dipole to improve tough separations.

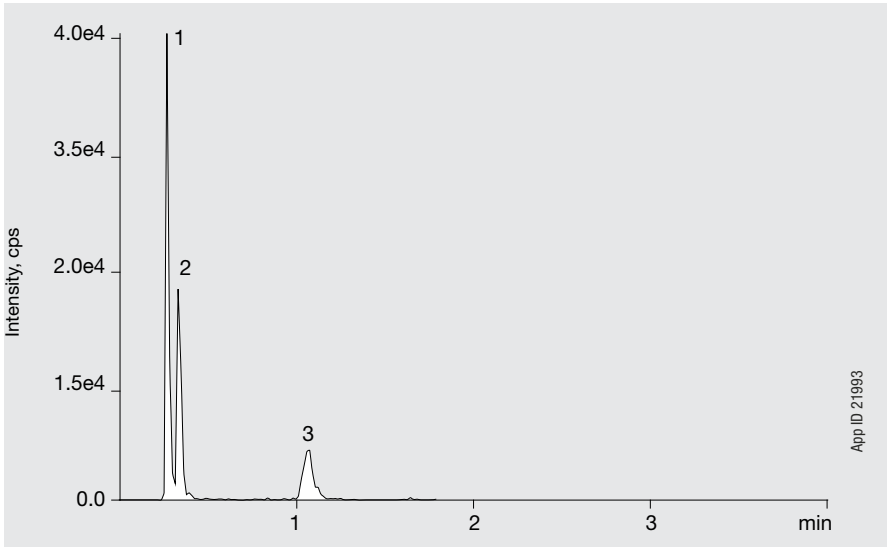
Separation of Closely Related Compounds

Kinetex 2.6µm Biphenyl





HALO® 2.7µm C18



Conditions for all columns:

Column: Kinetex 2.6µm Biphenyl
HALO 2.7µm C18

Dimensions: 50 x 2.1 mm

Mobile Phase: A: Water with 0.1 % Formic Acid
B: Methanol with 0.1 % Formic Acid

Gradient:

Time (min)	%B
0	10
0.5	10
2	25
4.5	80
4.51	85
5.5	85
5.51	10
7	10

Flow Rate: 0.6 mL/min

Temperature: 40 °C

Detection: MS/MS (AB SCIEX™ API 4000™)

Sample: 1. Morphine
2. Hydromorphone
3. Norhydrocodone

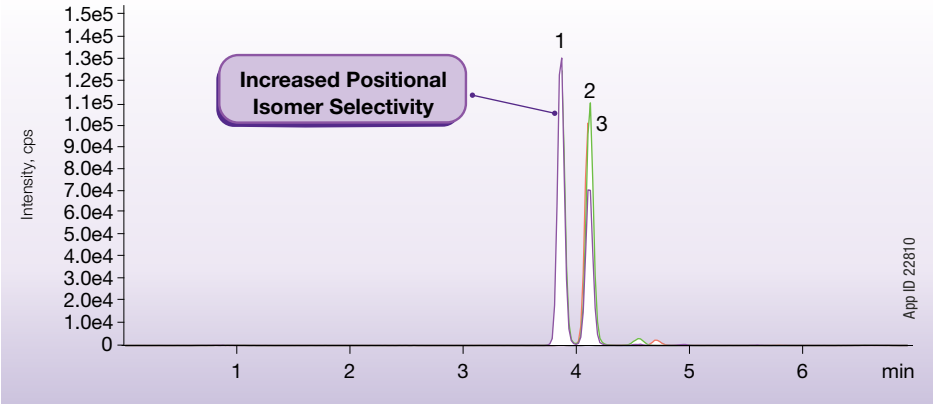
Comparative separations may not be representative of all applications.

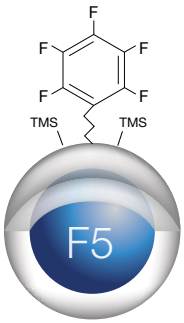
Closely Related Compounds

Combine core-shell performance, multiple retention mechanisms and the **Kinetex® F5** column's ability to be run in a variety of separation modes (reversed phase, HILIC, SFC, 2D-LC, and 100 % aqueous) and you now have an impeccable method development tool at your disposal.

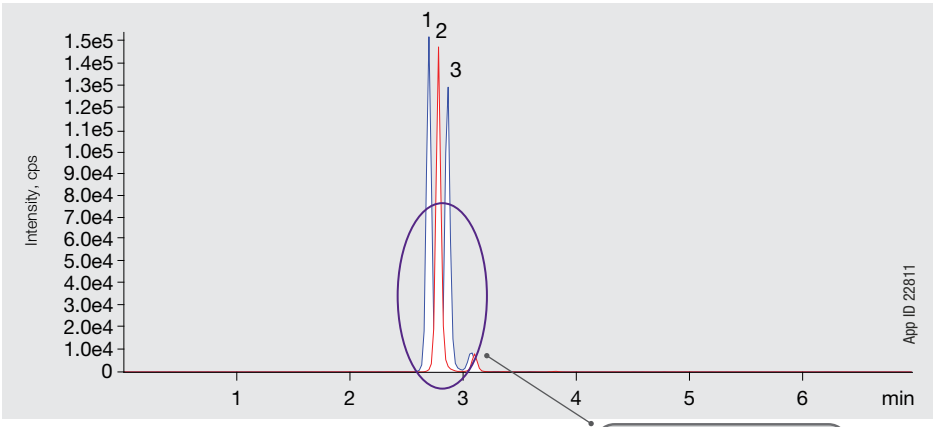
Performance and Selectivity

Kinetex 2.6 µm F5





HALO® 2.7 µm PFP



Conditions for all columns:

Column: Kinetex 2.6 µm F5
HALO 2.7 µm PFP
XSelect HSS 2.5 µm PFP

Dimensions: 100 x 4.6 mm

Mobile Phase: Water with 0.1 % Formic Acid/Methanol with 0.1 % Formic Acid (15:85)

Flow Rate: 0.75 mL/min

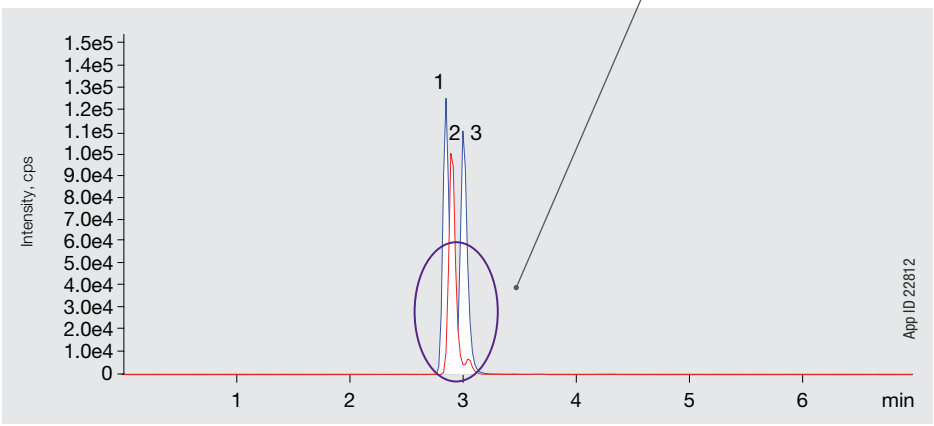
Temperature: Ambient

Detection: MS/MS (SCIEX™ API 4000™)

Sample: 1. 25-OH Vitamin D3
2. 25-OH Vitamin D2
3. 3-epi-25-OH Vitamin D3

Vitamin D3 Epimers are Not Fully Separated

Waters® XSelect® HSS 2.5 µm PFP



Comparative separations may not be representative of all applications.

Phase and Particle Size

Availability

KINETEX® Core-Shell Technology

Choose from an extensive selection of phases for greater flexibility in UHPLC/HPLC method development. Kinetex columns come in a variety of stationary phases to cover a full spectrum of applications ranging from acids and bases, to isomers and extremely polar compounds.

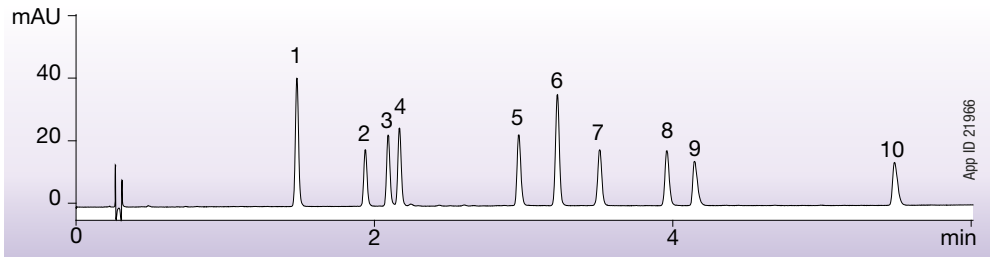
Material Characteristics

Packing Material	Available Particle Size (µm)	Pore Size (Å)	Effective Surface Area (m^2/g)	Effective Carbon Load %	pH Stability	Pressure Stability
PS C18	2.6	100	200	9	1.5 - 8.5*	1,000/600† bar
Polar C18	2.6	100	200	9	1.5 - 8.5*	
EVO C18	1.7, 2.6, 5	100	200	11	1.0 - 12.0*	
C18	1.3, 1.7, 2.6, 5	100	200	12	1.5 - 8.5*	
XB-C18	1.7, 2.6, 3.5, 5	100	200	10	1.5 - 8.5*	
C8	1.7, 2.6, 5	100	200	8	1.5 - 8.5*	
F5	1.7, 2.6, 5	100	200	9	1.5 - 8.5*	
Biphenyl	1.7, 2.6, 5	100	200	11	1.5 - 8.5*	
Phenyl-Hexyl	1.7, 2.6, 5	100	200	11	1.5 - 8.5*	
HILIC	1.7, 2.6, 5	100	200	0	2.0 - 7.5	
PAH	3.5	100	200	12	1.5 - 8.5*	

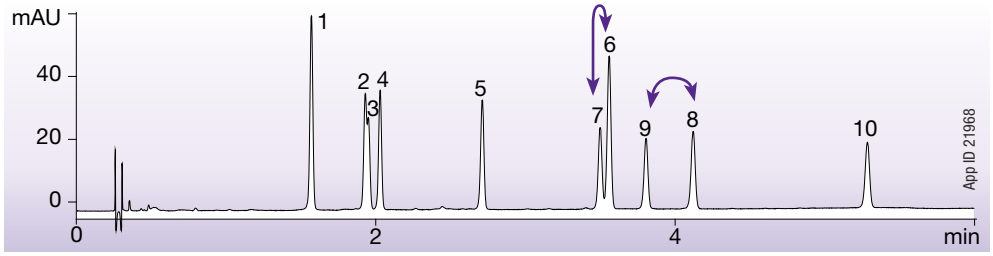
* pH stability under gradient conditions. pH stability is 1.5 - 10 under isocratic conditions.

† 2.1 mm ID Kinetex columns are pressure stable up to 1000 bar.
When using Kinetex 1.3 µm or 1.7 µm, increased performance can be achieved, however high pressure-capable instrumentation is required.

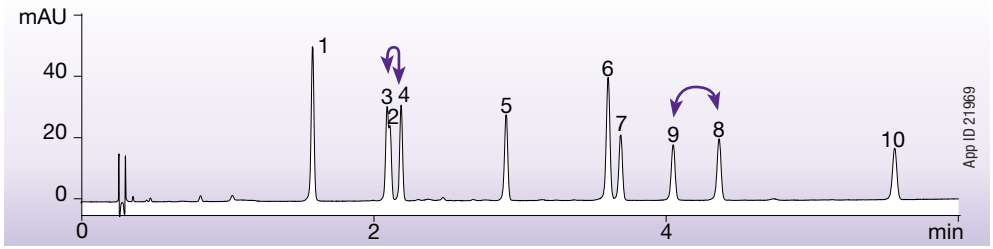
Kinetex 2.6 µm Biphenyl



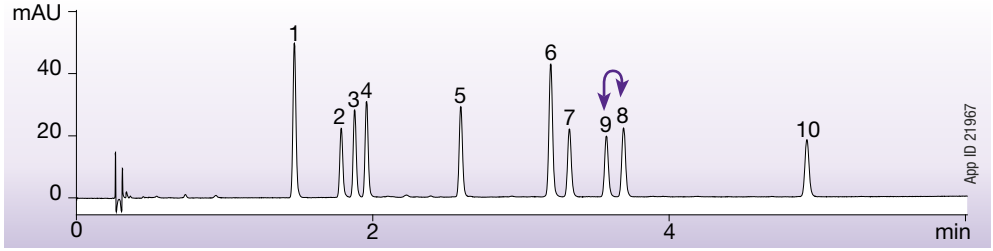
Kinetex 2.6 µm C18



Kinetex 2.6 µm XB-C18



Kinetex 2.6 µm Phenyl-Hexyl



Conditions for all columns:

Column: Kinetex 2.6 µm Biphenyl
Kinetex 2.6 µm C18
Kinetex 2.6 µm XB-C18
Kinetex 2.6 µm Phenyl-Hexyl
Dimensions: 50 x 4.6 mm
Mobile Phase: A: Water
B: Acetonitrile
Gradient: 20 to 60 % B in 6 minutes
Flow Rate: 1.85 mL/min
Temperature: 30 °C
Detection: UV @ 220 nm
Samples:
1. Estriol
2. Hydrocortisone
3. Prednisone
4. Cortisone
5. Corticosterone
6. β-Estradiol
7. Cortisone Acetate
8. 17-Hydroxyprogesterone
9. 21-Hydroxyprogesterone
10. Deoxycorticosterone

Protect Your LC Column

Save Time and Money

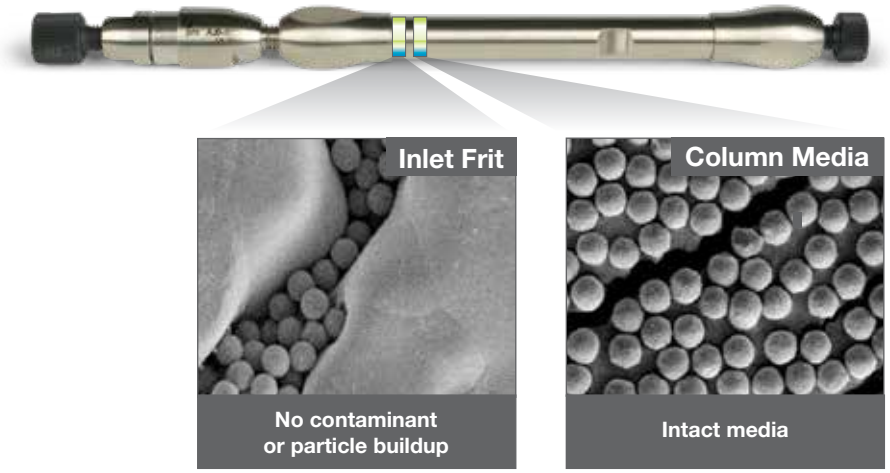
It's a fact! Chemical contaminants and particulates are a natural part of any chromatographic analysis. The easiest way to extend column performance is to remove these contaminants and particulates with the SecurityGuard Cartridge System before they reach your column and degrade your chromatography.

SecurityGuard™ ULTRA
UHPLC Column Protection

With SecurityGuard, you will Experience:

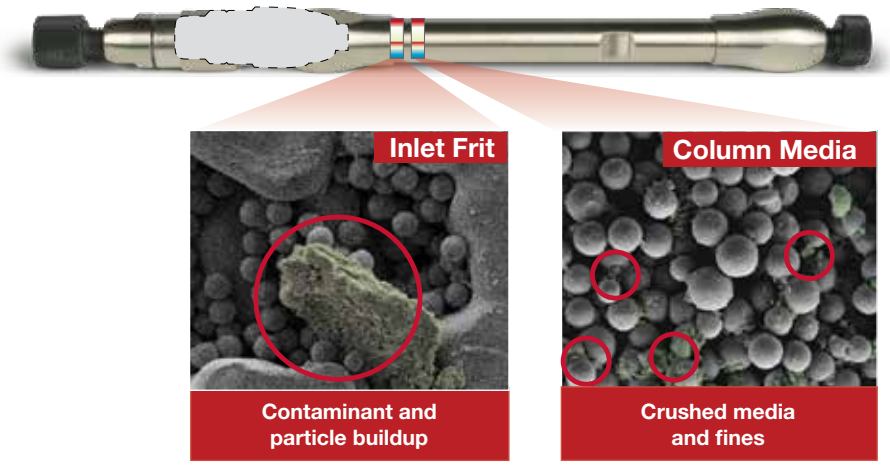
- Increased column lifetime
- Higher column performance
- More reproducible chromatography
- Fewer wasted columns

With SecurityGuard ULTRA



(24,000 times magnification)

Without SecurityGuard ULTRA



(24,000 times magnification)

UHPLC

SecurityGuard ULTRA

All Core-Shell and/or < 3 µm particle columns (< 20,000 psi / 1,378 bar)

"We used to have to change out our columns every 2 to 3 months and ever since we started using the SecurityGuard cartridges we can do at least 6 months before changing a column out."

T. Serviss

The opinions stated herein are solely those of the speaker and not necessarily those of any company or organization.

Protect Your LC Column

SecurityGuard ULTRA
UHPLC Column Protection

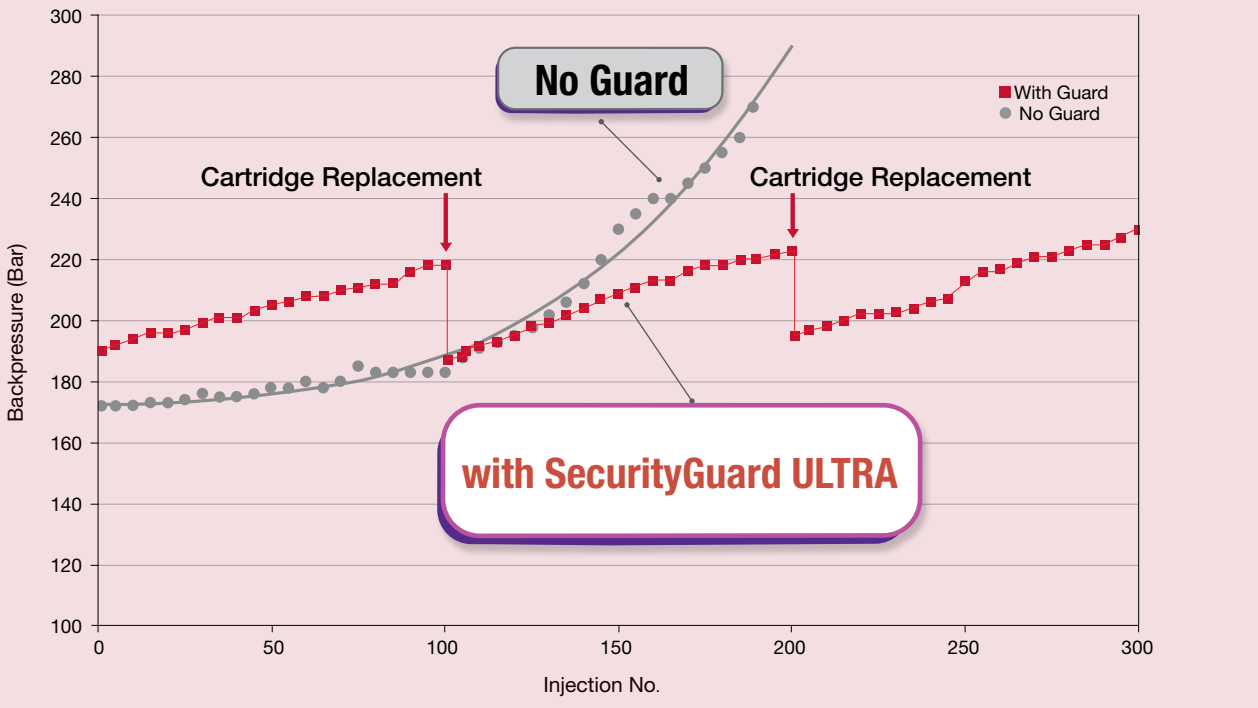
SecurityGuard Keeps Columns Performing at Their Best

When contaminates and particulates build up at the head of the column or on the guard cartridges, system pressures dramatically increase.

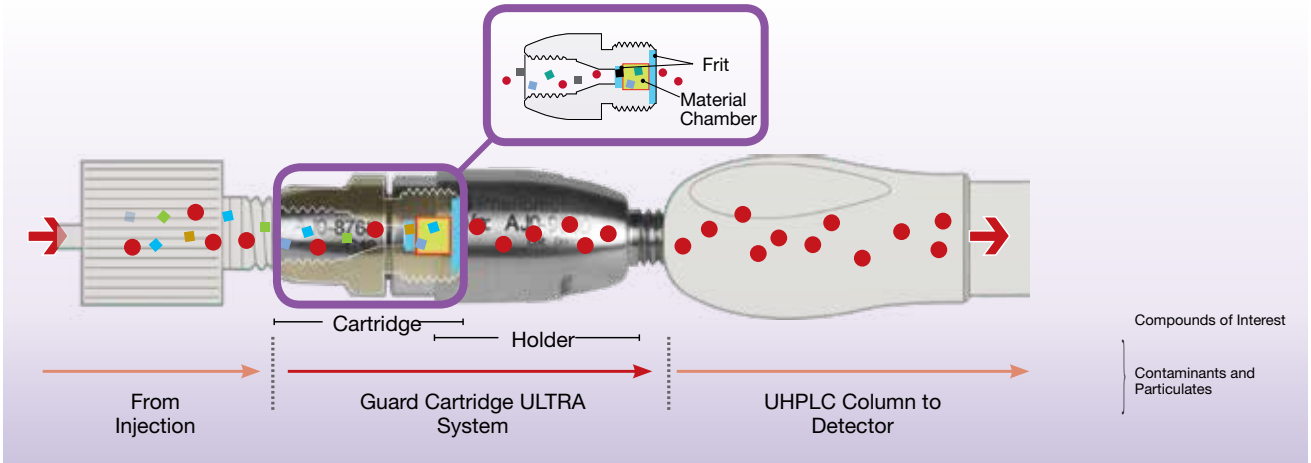
By simply replacing the SecurityGuard ULTRA cartridge instead of your < 3 µm and/or Core-Shell UHPLC column, you are able to regain normal operating conditions and reclaim original column performance.

SecurityGuard ULTRA Performance

Accelerated lifetime test using endogenous biological matrix on Kinetex® 2.6 µm C18 50 x 4.6 mm ID



In this accelerated column lifetime test, the UHPLC column lasts substantially longer with SecurityGuard ULTRA guard Cartridge system.



SecurityLink
Fingertight Connections

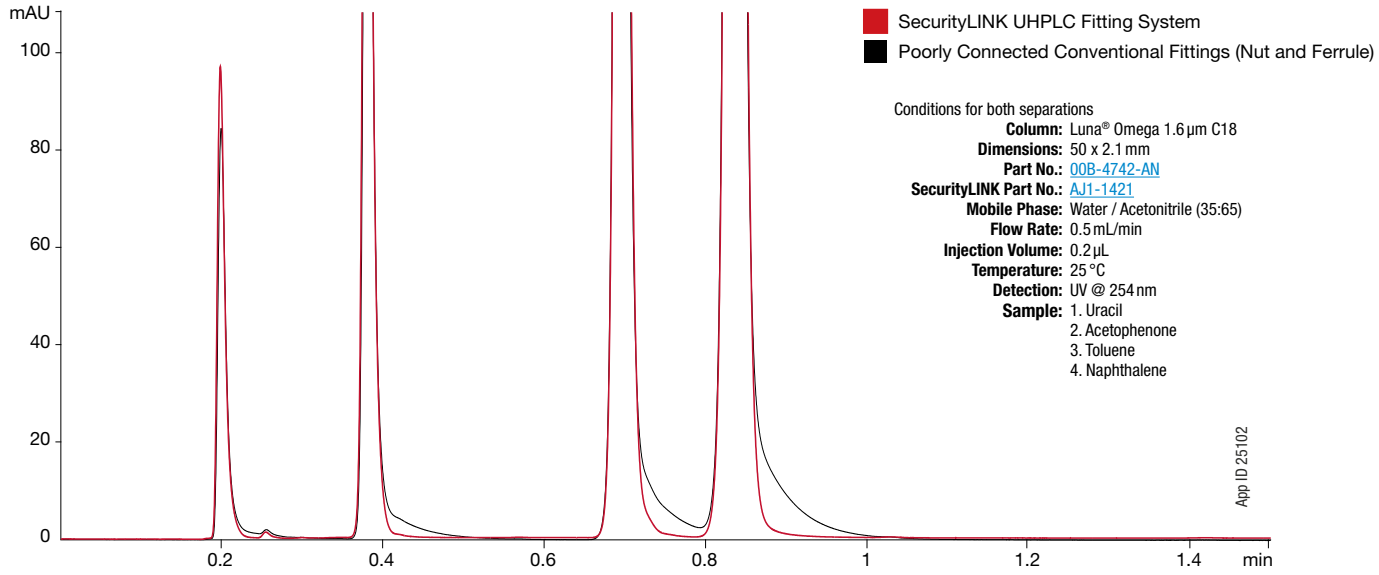
SecurityLINK Fingertight HPLC and UHPLC Connections in a Click

- No tools required for quick and easy installation
- Fitting self-adjusts at column inlet to ensure zero dead-volume for better chromatographic results
- Torque limiting technology prevents system and column port damage
- UHPLC and HPLC compatibility: pressure rated to 19,000 psi (1,310 bar)

SecurityLINK
UHPLC Connections in a Click

SecurityLINK vs. Poorly Connected Conventional Fittings

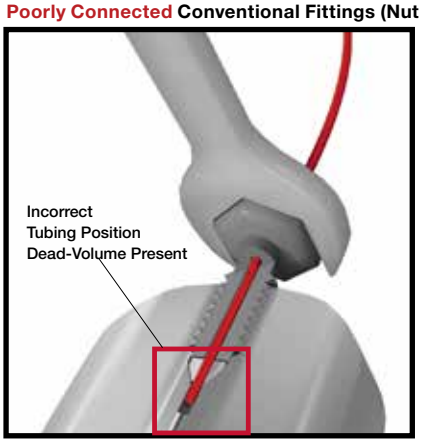
Poorly connected fittings are often the cause of carryover, band broadening, and peak tailing. SecurityLINK offers zero dead-volume connections every time.



SecurityLINK UHPLC Fitting System

VS.

Poorly Connected Conventional Fittings (Nut and Ferrule)



SecurityLINK Ordering Information

SecurityLINK™
UHPLC Connections in a Click

PEEKsil™

PEEKsil Double-Sided 10-32 Fittings with 1/16 in. OD tubing

Part No.	ID (µm)	Length (mm)
AJ1-2111	25	100
AJ1-2121	25	150
AJ1-2141	25	250
AJ1-2151	25	300
AJ1-2171	25	500
AJ1-2191	25	750
AJ1-21A1	25	1000
AJ1-2211	50	100
AJ1-2221	50	150
AJ1-2231	50	200
AJ1-2241	50	250
AJ1-2251	50	300
AJ1-2271	50	500
AJ1-2291	50	750
AJ1-22A1	50	1000
AJ1-2321	75	150
AJ1-2341	75	250
AJ1-2371	75	500
AJ1-23A1	75	1000
AJ1-2411	100	100
AJ1-2421	100	150
AJ1-2441	100	250
AJ1-2471	100	500
AJ1-24A1	100	1000

Stainless Steel

Stainless Steel Double-Sided 10-32 Fittings with 1/16 in. OD tubing

Part No.	ID (µm)	Length (mm)
AJ1-1421	100	150
AJ1-1441	100	250
AJ1-1461	100	350
AJ1-1471	100	500
AJ1-1481	100	600
AJ1-1521	125	150
AJ1-1541	125	250
AJ1-1561	125	350
AJ1-1571	125	500
AJ1-1581	125	600
AJ1-1621	254	150
AJ1-1641	254	250
AJ1-1661	254	350
AJ1-1671	254	500
AJ1-1681	254	600

PEEK-Lined Stainless Steel

PEEK-Lined Stainless Steel Double-Sided 10-32 Fittings with 1/16 in. OD tubing

Part No.	ID (µm)	Length (mm)
AJ1-3121	25	150
AJ1-3141	25	250
AJ1-3161	25	350
AJ1-3171	25	500
AJ1-3181	25	600
AJ1-3221	50	150
AJ1-3241	50	250
AJ1-3261	50	350
AJ1-3271	50	500
AJ1-3281	50	600
AJ1-3321	75	150
AJ1-3341	75	250
AJ1-3361	75	350
AJ1-3371	75	500
AJ1-3381	75	600
AJ1-3421	100	150
AJ1-3441	100	250
AJ1-3461	100	350
AJ1-3471	100	500
AJ1-3481	100	600

PEEKsil

PEEKsil Single-Sided Fittings; 1/32 in. OD PEEKsil Tubing with one 10-32 fitting for 1/16 in. ports, and one side with no fitting.

Part No.	ID (µm)	Length (mm)
AJ1-2224	50	150
AJ1-2274	50	500
AJ1-2294	50	750
AJ1-22A4	50	1000

Phenomenex Column / Tubing ID Recommendation Chart

	Nano	Microbore		Analytical			Semi-Prep	
Column ID	0.05 - 0.1 mm (50 µm-100 µm)	0.3 - 0.5 mm (300 µm-500 µm)	1 mm	2.1 mm	3 mm	4.6 mm	7.8 mm	9.0 - 16.0 mm
Tubing ID	25 µm	50 µm	50 µm - 75 µm	100 µm	100 µm	100 µm	125 µm	254 µm

Kinetex Ordering Information

KINETEX® Core-Shell Technology™

Kinetex UHPLC Columns

1.7 µm Minibore Columns (mm)					SecurityGuard™ ULTRA Cartridges‡
Phases	30 x 2.1	50 x 2.1	100 x 2.1	150 x 2.1	3/pk
EVO C18	—	00B-4726-AN	00D-4726-AN	00F-4726-AN	AJ0-9298
F5	—	00B-4722-AN	00D-4722-AN	00F-4722-AN	AJ0-9322
Biphenyl	—	00B-4628-AN	00D-4628-AN	00F-4628-AN	AJ0-9209
XB-C18	00A-4498-AN	00B-4498-AN	00D-4498-AN	00F-4498-AN	AJ0-8782
C18	00A-4475-AN	00B-4475-AN	00D-4475-AN	00F-4475-AN	AJ0-8782
C8	00A-4499-AN	00B-4499-AN	00D-4499-AN	00F-4499-AN	AJ0-8784
HILIC	00A-4474-AN	00B-4474-AN	00D-4474-AN	—	AJ0-8786
Phenyl-Hexyl	—	00B-4500-AN	00D-4500-AN	00F-4500-AN	AJ0-8788

for 2.1 mm ID

1.7 µm MidBore™ Columns (mm)				SecurityGuard ULTRA Cartridges‡
Phases	30 x 3.0	50 x 3.0	100 x 3.0	3/pk
XB-C18	00A-4498-Y0	00B-4498-Y0	00D-4498-Y0	AJ0-8775
C18	—	00B-4475-Y0	00D-4475-Y0	AJ0-8775
C8	00A-4499-Y0	00B-4499-Y0	00D-4499-Y0	AJ0-8777
HILIC	—	00B-4474-Y0	—	AJ0-8779

for 3.0 mm ID

1.7 µm Microbore Columns (mm)			
Phases	50 x 1.0	100 x 1.0	150 x 1.0
EVO C18	00B-4726-A0	00D-4726-A0	00F-4726-A0
Biphenyl	00B-4628-A0	00D-4628-A0	00F-4628-A0

1.3 µm Minibore Columns (mm)		
Phases	30 x 2.1	50 x 2.1
C18	00A-4515-AN	00B-4515-AN

2.6 µm Minibore Columns (mm)						SecurityGuard ULTRA Cartridges‡
Phases	30 x 2.1	50 x 2.1	75 x 2.1	100 x 2.1	150 x 2.1	3/pk
EVO C18	00A-4725-AN	00B-4725-AN	—	00D-4725-AN	00F-4725-AN	AJ0-9298
PS C18	00A-4780-AN	00B-4780-AN	—	00D-4780-AN	00F-4780-AN	AJ0-8951
Polar C18	00A-4759-AN	00B-4759-AN	—	00D-4759-AN	00F-4759-AN	AJ0-9532
F5	00A-4723-AN	00B-4723-AN	—	00D-4723-AN	00F-4723-AN	AJ0-9322
Biphenyl	00A-4622-AN	00B-4622-AN	—	00D-4622-AN	00F-4622-AN	AJ0-9209
XB-C18	00A-4496-AN	00B-4496-AN	00C-4496-AN	00D-4496-AN	00F-4496-AN	AJ0-8782
C18	00A-4462-AN	00B-4462-AN	00C-4462-AN	00D-4462-AN	00F-4462-AN	AJ0-8782
C8	00A-4497-AN	00B-4497-AN	00C-4497-AN	00D-4497-AN	00F-4497-AN	AJ0-8784
HILIC	00A-4461-AN	00B-4461-AN	00C-4461-AN	00D-4461-AN	00F-4461-AN	AJ0-8786
Phenyl-Hexyl	00A-4495-AN	00B-4495-AN	00C-4495-AN	00D-4495-AN	00F-4495-AN	AJ0-8788

for 2.1 mm ID

2.6 µm MidBore Columns (mm)						SecurityGuard ULTRA Cartridges‡
Phases	30 x 3.0	50 x 3.0	75 x 3.0	100 x 3.0	150 x 3.0	3/pk
EVO C18	—	00B-4725-Y0	—	00D-4725-Y0	00F-4725-Y0	AJ0-9297
PS C18	00B-4780-Y0	00D-4780-Y0	—	00D-4780-Y0	00F-4780-Y0	AJ0-8950
Polar C18	—	00B-4759-Y0	—	00D-4759-Y0	00F-4759-Y0	AJ0-9531
F5	—	00B-4723-Y0	—	00D-4723-Y0	00F-4723-Y0	AJ0-9321
Biphenyl	—	00B-4622-Y0	—	00D-4622-Y0	00F-4622-Y0	AJ0-9208
XB-C18	00A-4496-Y0	00B-4496-Y0	00C-4496-Y0	00D-4496-Y0	00F-4496-Y0	AJ0-8775
C18	00A-4462-Y0	00B-4462-Y0	00C-4462-Y0	00D-4462-Y0	00F-4462-Y0	AJ0-8775
C8	00A-4497-Y0	00B-4497-Y0	00C-4497-Y0	00D-4497-Y0	00F-4497-Y0	AJ0-8777
HILIC	00A-4461-Y0	—	—	—	00F-4461-Y0	AJ0-8779
Phenyl-Hexyl	—	00B-4495-Y0	—	00D-4495-Y0	00F-4495-Y0	AJ0-8781

for 3.0 mm ID

‡SecurityGuard ULTRA Cartridges require holder, Part No.: AJ0-9000

Kinetex Ordering Information

KINETEX® Core-Shell Technology™

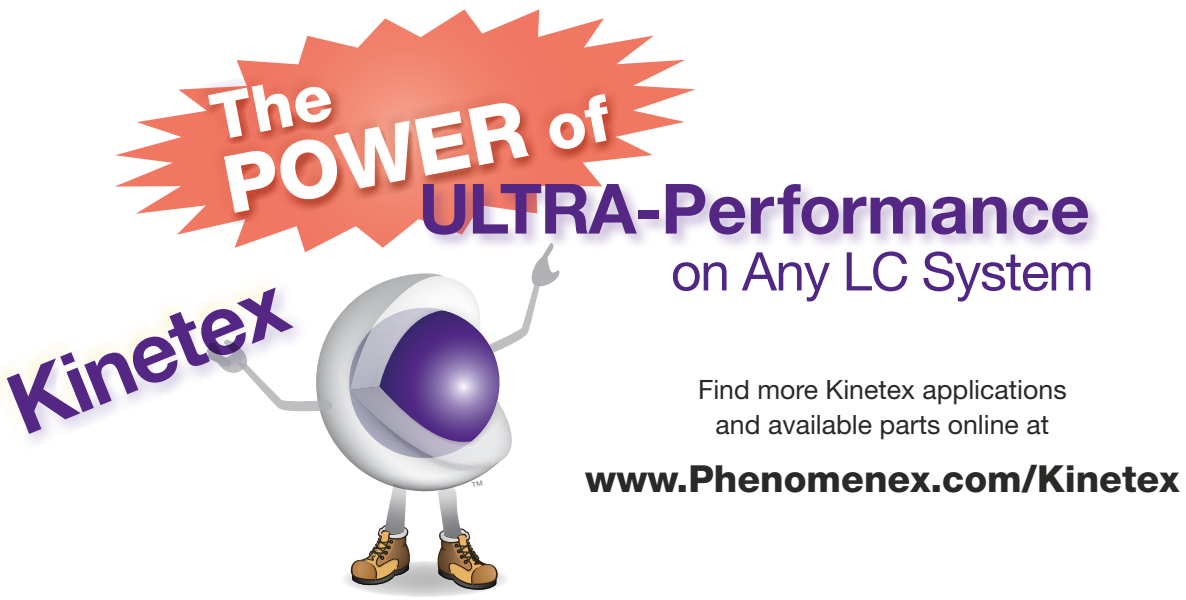
Kinetex Analytical Columns

2.6 µm Analytical Columns (mm)							SecurityGuard ULTRA Cartridges‡
Phases	**30 x 4.6**	**50 x 4.6**	**75 x 4.6**	**100 x 4.6**	**150 x 4.6**	**250 x 4.6**	**3/pk**
EVO C18	—	00B-4725-E0	—	00D-4725-E0	00F-4725-E0	00G-4725-E0	AJ0-9296
PS C18		00B-4780-E0		00D-4780-E0	00F-4780-E0	00G-4780-E0	AJ0-8949
Polar C18	—	00B-4759-E0	—	00D-4759-E0	00F-4759-E0	—	AJ0-9532
F5	—	00B-4723-E0	—	00D-4723-E0	00F-4723-E0	—	AJ0-9320
Biphenyl	—	00B-4622-E0	—	00D-4622-E0	00F-4622-E0	—	AJ0-9207
XB-C18	—	00B-4496-E0	00C-4496-E0	00D-4496-E0	00F-4496-E0	—	AJ0-8768
C18	00A-4462-E0	00B-4462-E0	00C-4462-E0	00D-4462-E0	00F-4462-E0	—	AJ0-8768
C8	—	00B-4497-E0	00C-4497-E0	00D-4497-E0	00F-4497-E0	—	AJ0-8770
HILIC	—	00B-4461-E0	00C-4461-E0	00D-4461-E0	00F-4461-E0	—	AJ0-8772
Phenyl-Hexyl	—	00B-4495-E0	00C-4495-E0	00D-4495-E0	00F-4495-E0	—	AJ0-8774
							for 4.6 mm ID

5 µm MidBore™ Columns (mm)				SecurityGuard ULTRA Cartridges‡
Phases	**50 x 3.0**	**100 x 3.0**	**150 x 3.0**	**3/pk**
EVO C18	00B-4633-Y0	00D-4633-Y0	00F-4633-Y0	AJ0-9297
F5	00B-4724-Y0	00D-4724-Y0	00F-4724-Y0	AJ0-9321
Biphenyl	00B-4627-Y0	00D-4627-Y0	00F-4627-Y0	AJ0-9208
XB-C18	00B-4605-Y0	00D-4605-Y0	00F-4605-Y0	AJ0-8775
C18	00B-4601-Y0	00D-4601-Y0	00F-4601-Y0	AJ0-8775
C8	00B-4608-Y0	00D-4608-Y0	—	AJ0-8777
Phenyl-Hexyl	00B-4603-Y0	00D-4603-Y0	—	AJ0-8781
				for 3.0 mm ID

5 µm Analytical Columns (mm)					SecurityGuard ULTRA Cartridges‡
Phases	**50 x 4.6**	**100 x 4.6**	**150 x 4.6**	**250 x 4.6**	**3/pk**
EVO C18	00B-4633-E0	00D-4633-E0	00F-4633-E0	00G-4633-E0	AJ0-9296
F5	00B-4724-E0	00D-4724-E0	00F-4724-E0	00G-4724-E0	AJ0-9320
Biphenyl	00B-4627-E0	00D-4627-E0	00F-4627-E0	00G-4627-E0	AJ0-9207
XB-C18	00B-4605-E0	00D-4605-E0	00F-4605-E0	00G-4605-E0	AJ0-8768
C18	00B-4601-E0	00D-4601-E0	00F-4601-E0	00G-4601-E0	A J0-8768
C8	00B-4608-E0	00D-4608-E0	00F-4608-E0	00G-4608-E0	AJ0-8770
Phenyl-Hexyl	00B-4603-E0	00D-4603-E0	00F-4603-E0	00G-4603-E0	AJ0-8774
					for 4.6 mm ID

‡ SecurityGuard ULTRA Cartridges require holder, Part No.: AJ0-9000.
* PREP SecurityGuard Cartridges require holder, Part No.: AJ0-8223
** PREP SecurityGuard Cartridges require holder, Part No.: AJ0-8277
*** SemiPrep SecurityGuard Cartridges require holder, Part No.: AJ0-9281



Kinetex Ordering Information

KINETEX® Core-Shell Technology

Kinetex Semi-Preparative and Preparative Columns

5 µm Semi-Preparative Columns (mm)			SecurityGuard™ SemiPrep Cartridges***
Phases	**150 x 10**	**250 x 10**	**10 x 10**
EVO C18	00F-4633-N0	00G-4633-N0	AJ0-9306
F5	—	00G-4724-N0	AJ0-9323
C18	00F-4601-N0	00G-4601-N0	AJ0-9278
Biphenyl	00F-4627-N0	00G-4627-N0	AJ0-9280

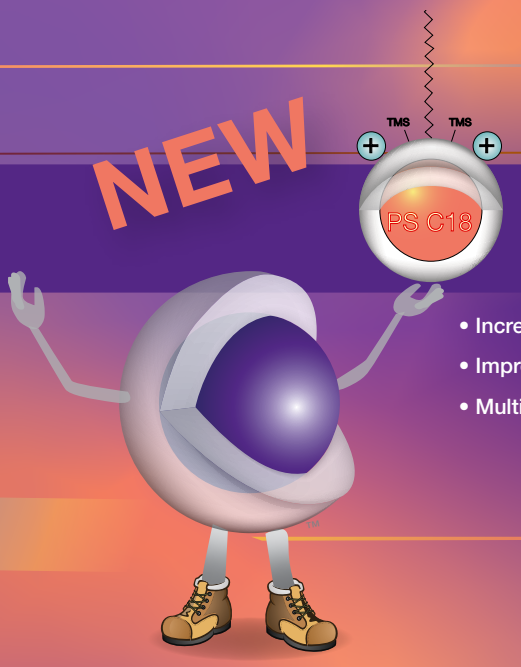
for 10 mm ID

5 µm Axia™ Packed Preparative Columns (mm)					SecurityGuard PREP Cartridges*
Phases	**50 x 21.2**	**100 x 21.2**	**150 x 21.2**	**250 x 21.2**	**15 x 21.2**
EVO C18	00B-4633-P0-AX	00D-4633-P0-AX	00F-4633-P0-AX	00G-4633-P0-AX	AJ0-9304
F5	—	—	00F-4724-P0-AX	00G-4724-P0-AX	AJ0-9324
Biphenyl	00B-4627-P0-AX	00D-4627-P0-AX	00F-4627-P0-AX	00G-4627-P0-AX	AJ0-9272
XB-C18	00B-4605-P0-AX	00D-4605-P0-AX	00F-4605-P0-AX	00G-4605-P0-AX	AJ0-9145
C18	00B-4601-P0-AX	00D-4601-P0-AX	00F-4601-P0-AX	00G-4601-P0-AX	AJ0-9145
C8	00B-4608-P0-AX	00D-4608-P0-AX	00F-4608-P0-AX	00G-4608-P0-AX	AJ0-9205
Phenyl-Hexyl	00B-4603-P0-AX	00D-4603-P0-AX	00F-4603-P0-AX	00G-4603-P0-AX	AJ0-9147
HILIC	—	00D-4606-P0-AX	00F-4606-P0-AX	00G-4606-P0-AX	AJ0-9277

for 21.2 mm ID

5 µm Axia Packed Preparative Columns (mm)					SecurityGuard PREP Cartridges**
Phases	**50 x 30**	**100 x 30**	**150 x 30**	**250 x 30**	**15 x 30**
EVO C18	00B-4633-U0-AX	00D-4633-U0-AX	00F-4633-U0-AX	00G-4633-U0-AX	AJ0-9305
F5	00B-4724-U0-AX	00D-4724-U0-AX	00F-4724-U0-AX	00G-4724-U0-AX	AJ0-9325
Biphenyl	—	—	00F-4627-U0-AX	—	AJ0-9273
XB-C18	00B-4605-U0-AX	00D-4605-U0-AX	00F-4605-U0-AX	00G-4605-U0-AX	AJ0-9204
C18	00B-4601-U0-AX	00D-4601-U0-AX	00F-4601-U0-AX	00G-4601-U0-AX	AJ0-9204
C8	00B-4608-U0-AX	00D-4608-U0-AX	00F-4608-U0-AX	00G-4608-U0-AX	AJ0-9217
Phenyl-Hexyl	00B-4603-U0-AX	00D-4603-U0-AX	00F-4603-U0-AX	00G-4603-U0-AX	AJ0-9216

for 30 mm ID



Kinetex PS C18!

- Increased Polar Retention
- Improved Peak Shape for Bases
- Multi-modal Interaction Selectivity

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