" We were thinking about you all along in our creation of Kinetex®
Core-Shell Technology! We know your methods are challenging and
economic constraints are burdening, but what if you could do more
with what you currently have? Our team has pushed the boundaries
to develop the amazing Kinetex product line and we did it with you
in mind. Now with four scalable particle sizes that cover UHPLC to
HPLC to Preparative methods, you truly can get the most out of any
of your instrumentation on any method. Don't believe us, take a look
at what your colleagues are saying! "

1.3 µm   1.7 µm   2.6 µm   5 µm

EASY TRANSFERABILITY

" The Kinetex column has worked great for our validated assays. We easily converted our HPLC methods to UPLC® methods using the Kinetex column and have enjoyed being [able] to run fast UPLC® chromatography… "

Dr. Jeff Layne, PhenoLogix

SIGNIFICANT COST SAVINGS

" The 1.7 µm Kinetex 100 x 2.1 mm column was capable of resolving 16 different chemical entities with a 6 minute run time. This new analytical method will be used to replace 16 older methods thereby facilitating an annualised cost saving for the site of €320,000 ($ 460,000 USD). "

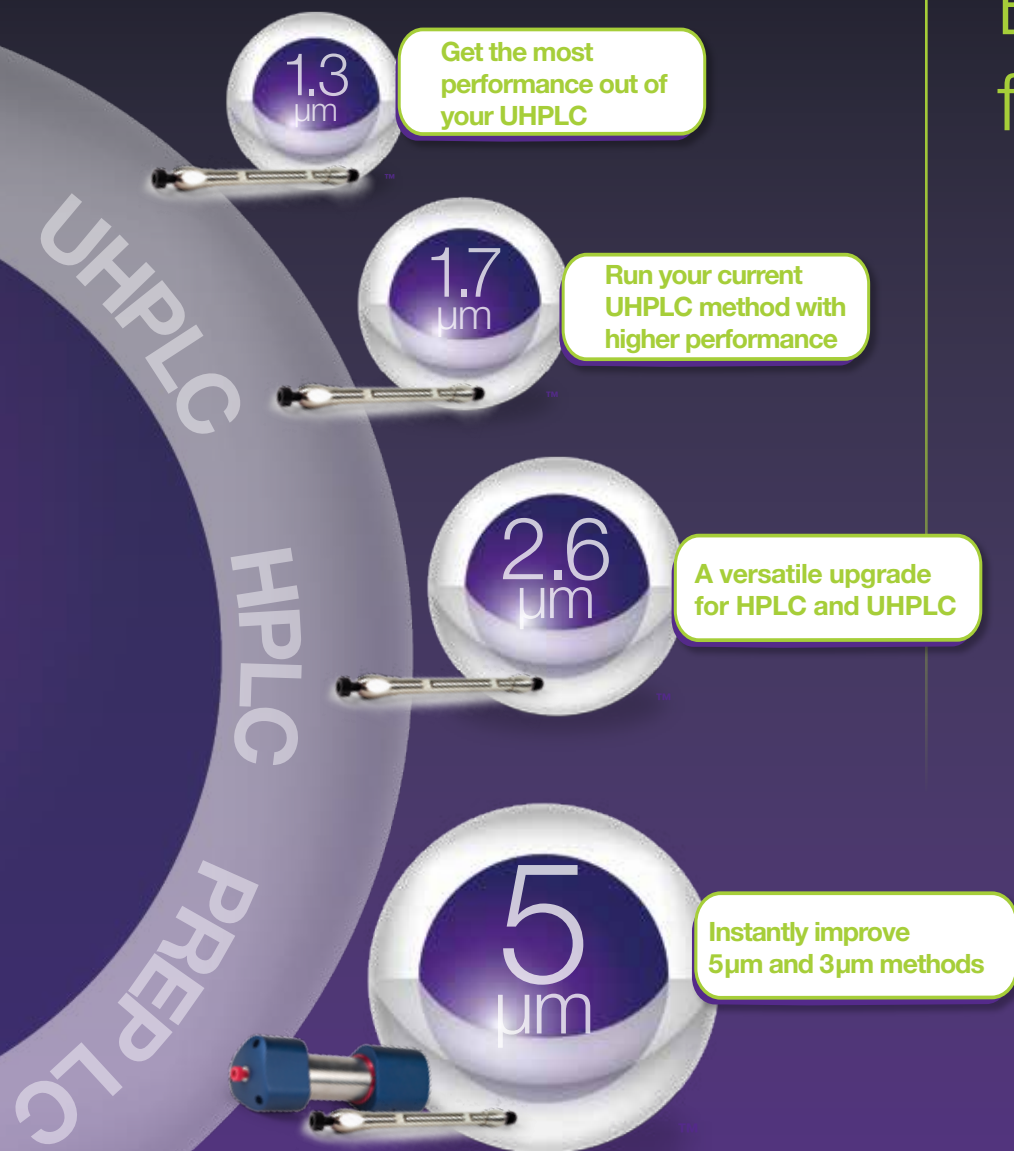**Andrew Charles, Pfizer**

IMPROVED RESULTS

" I was able to reduce my analysis time from 150 minutes to 60 minutes (including equilibration time) with the use of Kinetex! "

Erika Schweiger, DSM Nutritional Products

INCREASED PRODUCTIVITY

" Simple, efficient, and amazing resolution! Implementation of the Kinetex columns has allowed me to significantly increase production time while reducing solvent usage nearly tenfold… "

Stacey Garza, Bold Formulators

CLINICAL PHARMACEUTICAL FOOD AND BEVERAGE ENVIRONMENTAL

1.3 μm — Get the most performance out of your UHPLC

1.7 μm — Run your current UHPLC method with higher performance

2.6 μm — A versatile upgrade for HPLC and UHPLC

5 μm — Instantly improve 5μm and 3μm methods

UHPLC
HPLC
PREP LC

Expect more from a Core!

6 > Optimized for Performance Gains from UHPLC to HPLC to PREP LC

7 > Innovation in Particle Technology

8 > High Density, High Efficiency Particle

9 > Faster, Better HPLC/UHPLC

10-11 > A Superior Core-Shell Particle with More Options

12 > Reproducible Batch-to-Batch, Column-to-Column

Complete Core-Shell Solution from UHPLC to HPLC to PREP LC

Introducing Kinetex® - the current standard in column particle technology that will allow you to get the most out of your UHPLC, HPLC, or PREP LC. You can immediately improve resolution, throughput, and sensitivity as well as reduce solvent consumption.

www.phenomenex.com/Kinetex

Better HPLC/UHPLC Performance Starts Now!

Selectivities for All Types of Applications

Optimized for Performance Gains from UHPLC to HPLC to PREP LC

Continuous improvement in particle technology means greater performance and productivity for all your methods. Traditional fully porous particles leave much to be desired when compared to current core-shell particles. 5 µm and 3 µm fully porous particles give typical HPLC backpressures however, their efficiencies and ability to hold performance drastically decreases at higher flow rates. Newer fully porous sub-2 µm particles offer improved performance, but at the cost of the need for high-pressure capable instrumentation.

Phenomenex has always strived to make sure that you have all the available solutions to get the most out of your current system and method. With Kinetex®, this is no different. The 5 µm Kinetex core-shell particle gives 3 µm efficiencies at 5 µm HPLC pressures, the 2.6 µm core-shell particle allows for the potential of sub-2 µm performance on HPLC or UHPLC systems, and the 1.7 and 1.3 µm particles offer incredible efficiency and performance gains on UHPLC systems. **Isn't it time you tried this complete core-shell solution in your lab?**

Better Performance than Fully Porous Particles

| Fully Porous		Kinetex Core-Shell	Average Efficiency Gain with Kinetex*
5 µm	vs	5 µm	90% Higher
3 µm	vs	2.6 µm	85% Higher
1.7 µm	vs	1.7 µm	20% Higher
1.7 µm	vs	1.3 µm	50% Higher

* May not be representative of all separations.

Innovation in Particle Technology

Using sol-gel processing techniques that incorporate nano structuring technology, a durable, homogeneous porous shell is grown on a solid silica core. This highly optimized process combined with industry leading column packing technology produces highly reproducible columns that generate extremely high plate counts.

Traditional Fully Porous Particle

- Less homogenuous bed structure leads to performance loss
- Ultra-high performance limited to sub-2 µm particles on UHPLC systems
- Diffusion path limits efficiencies
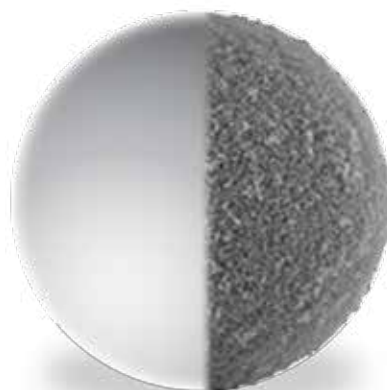
Kinetex Core-Shell Particle

- High particle density helps create optimal bed structure which reduces band broadening effects of Eddy Diffusion
- Ultra-high performance on HPLC and UHPLC systems alike
- Reduced diffusion path improves efficiency

Solid Core   Porous Shell
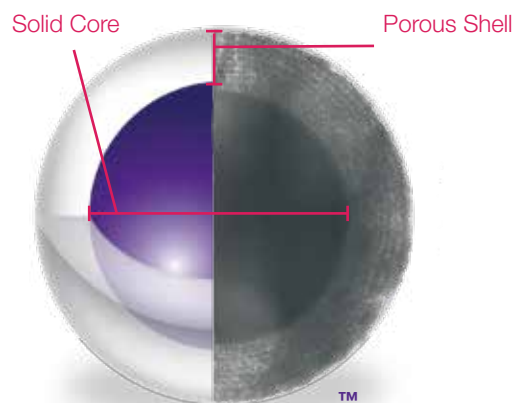
**Everyone likes a good story.
Learn how Kinetex came to be at**

www.phenomenex.com/kinetex

High Density, High Efficiency Particle

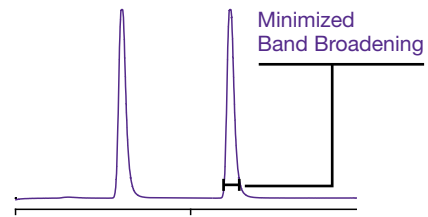Kinetex® particles are built with a solid high density core that promotes settling into an optimum bed structure. This reduces the band broadening effects of Eddy Diffusion since the interstitial space between the particles is virtually homogeneous and results in ultra-high column efficiency and excellent reproducibility.

Less Band Broadening with Kinetex Columns

Core-Shell

Minimized Band Broadening

Fully Porous

Increased Band Broadening
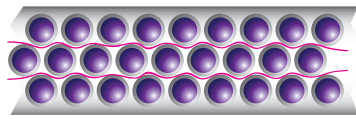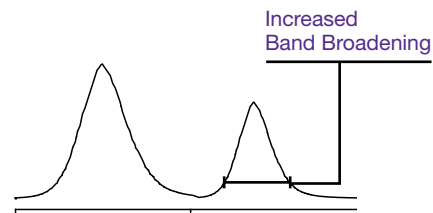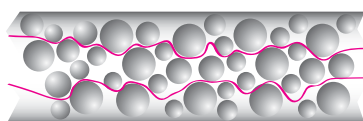
Uniform Particle Size Distribution

Particle Count

- Kinetex 2.6 µm Core-Shell
- Kinetex 1.7 µm Core-Shell
- Traditional Fully Porous 1.7 µm
- Traditional Fully Porous 3 µm

Particle Diameter (µm)
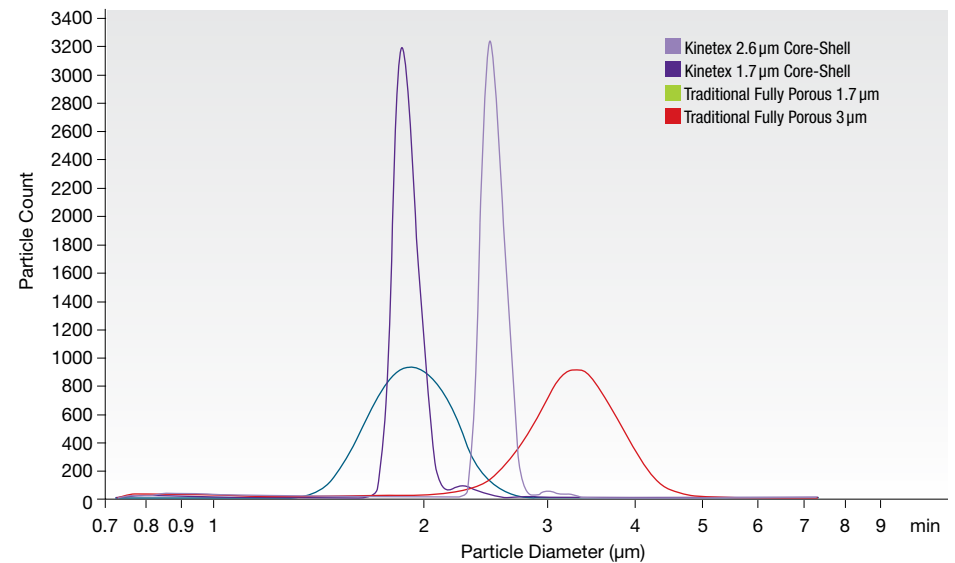
Faster, Better HPLC/UHPLC

Since the Kinetex particle is not fully porous, analytes spend less time diffusing into and out of the porous layer of each particle as they travel through the column. This shorter diffusion path allows for you to take advantage of faster mass transfer at higher mobile phase velocities and faster chromatography.

Core-Shell
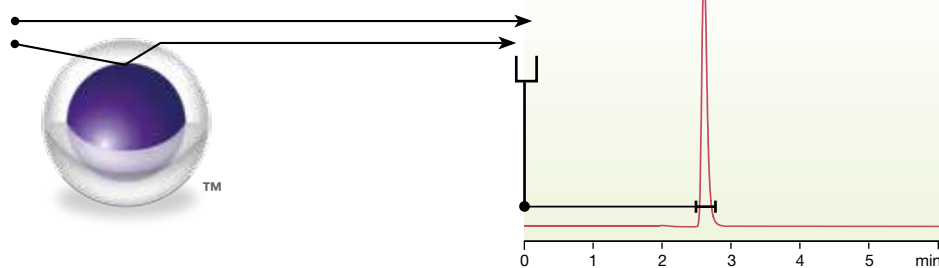
Fully Porous
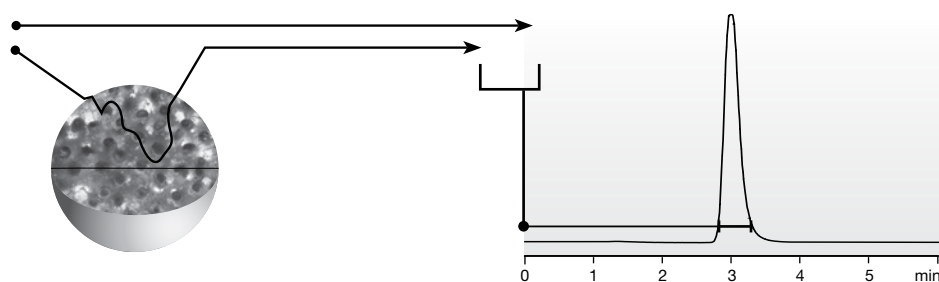
Performance of Kinetex Core-Shell Particles

Compared to Fully Porous Sub-2 µm and 3 µm Particles

Legend:
- Kinetex 1.7 µm Core-Shell
- Kinetex 2.6 µm Core-Shell
- Sub-2 µm Fully Porous
- 3 µm Fully Porous

Plate Height (µm) vs Linear Velocity (mm/s)

A Superior Quality
Core-Shell Particle with MORE Options

	Phenomenex **Kinetex®**	Advanced Materials Technology **HALO®**	Agilent Technologies® **Poroshell® 120**

Is that a fully porous particle?!

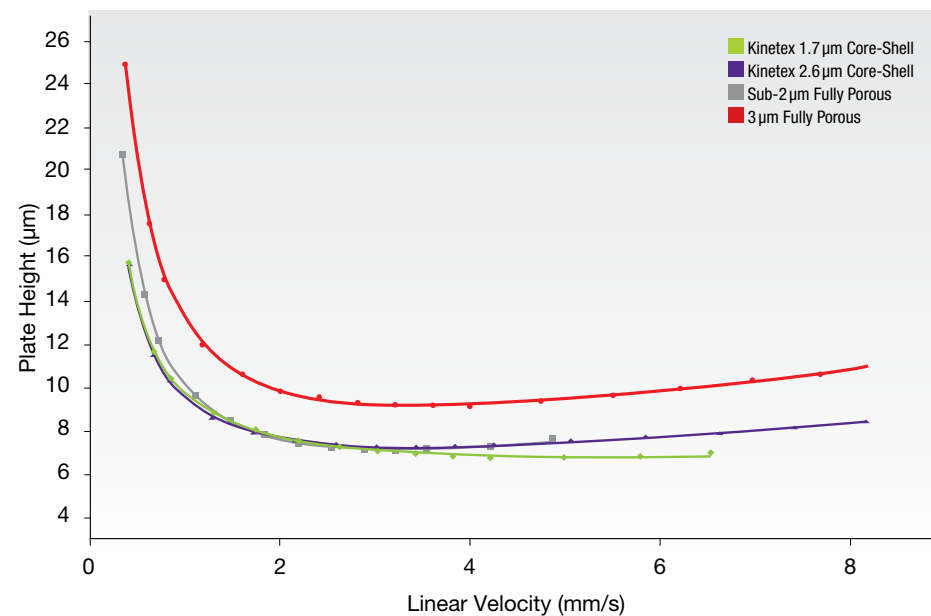|	Phenomenex **Kinetex**	Advanced Materials Technology **HALO**	Agilent Technologies **Poroshell 120**
5 µm Particle			
Total Particle Size	5 µm	5 µm	*PRODUCT DOES NOT EXIST*
Pressure Limit	1000/600 bar*	600 bar	
Pore Size	100 Å	90 Å	
pH Range	1.5 - 10**	2 - 9	
Sub-3 µm Particle			
Total Particle Size	2.6 µm	2.7 µm	2.7 µm
Pressure Limit	1000/600 bar*	600 bar	600 bar
Pore Size	100 Å	90 Å	120 Å
pH Range	1.5 – 10**	2 – 9	2 – 8
Sub-2 µm Particle			
Total Particle Size	1.7 µm	*PRODUCT DOES NOT EXIST*	*PRODUCT DOES NOT EXIST*
Pressure Limit	1000 bar		
Pore Size	100 Å		
pH Range	1.5 – 10**		
Sub-1.5 µm Particle			
Total Particle Size	1.3 µm	*PRODUCT DOES NOT EXIST*	*PRODUCT DOES NOT EXIST*
Pressure Limit	1000 bar		
Pore Size	100 Å		
pH Range	1.5 - 10**		

* 2.1 mm ID Kinetex columns are pressure stable up to 1000 bar.
** Columns are pH stable from 1.5 - 10 under isocratic conditions. Columns are pH stable from 1.5 - 8.5 under gradient conditions.
Kinetex HILIC 2.6 and 1.7 µm are pH stable from 2.0 - 7.5 under isocratic and gradient conditions.
HALO is a registered trademark of Advanced Materials Technology, Inc. Poroshell is a registered trademark of Agilent Technologies, Inc. Phenomenex is not affiliated with any of the above listed companies. Comparative images may not be representative of all particles.

A Superior Performing Core-Shell with MORE Options
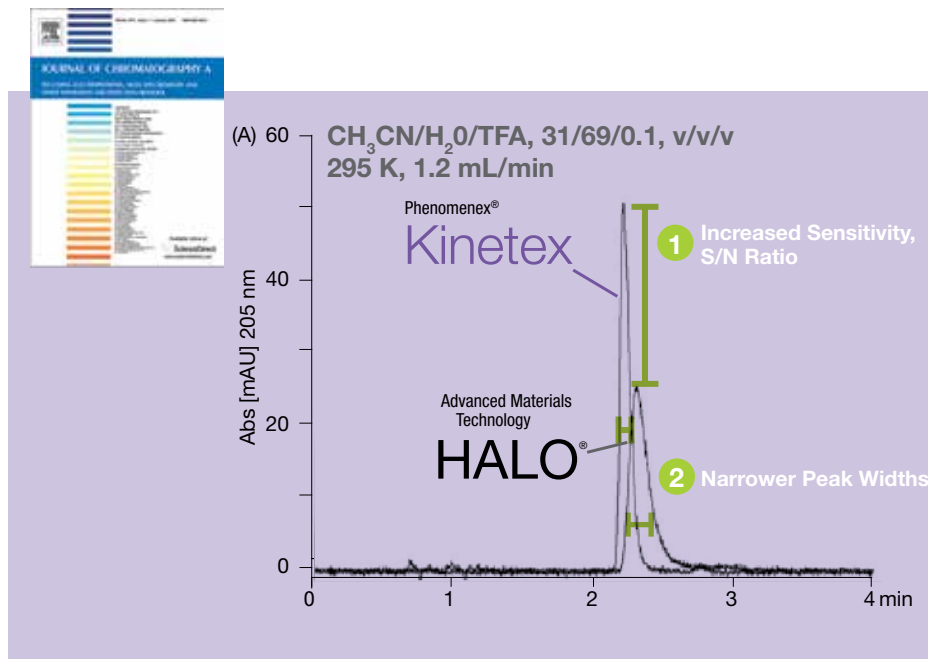
From the *Journal of Chromatography A*

" Never had such a low reduced HETP value been achieved in column manufacturing technology. "
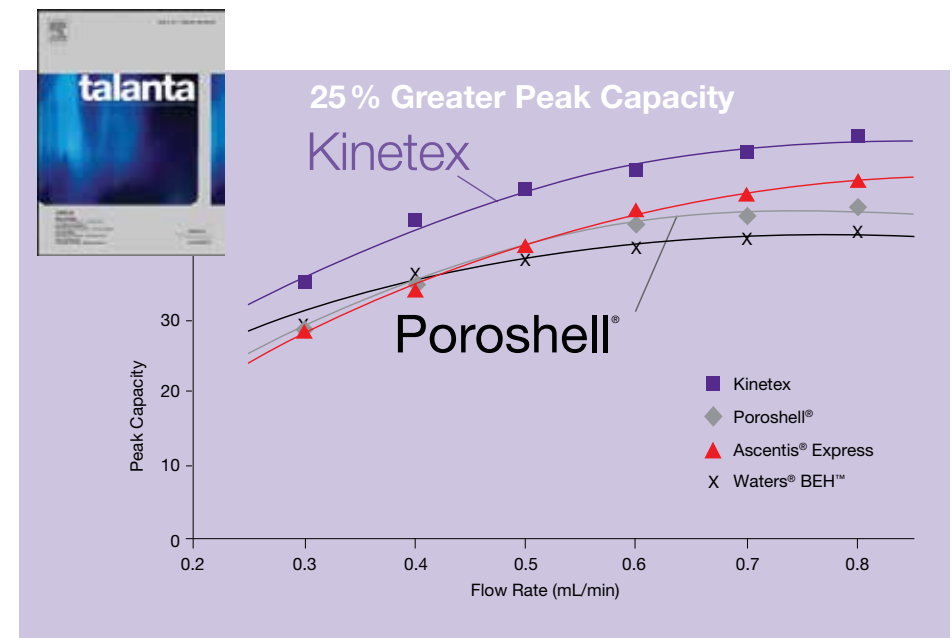
F. Gritti et al. / J. Chromatogr. A 1217 (2010) 1589-1603

(A)

CH$_3$CN/H$_2$0/TFA, 31/69/0.1, v/v/v
295 K, 1.2 mL/min

Phenomenex®
Kinetex

1 Increased Sensitivity, S/N Ratio

Advanced Materials Technology
HALO®

2 Narrower Peak Widths

Abs [mAU] 205 nm

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.

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

25 % Greater Peak Capacity
Kinetex

Poroshell®

Peak Capacity

Flow Rate (mL/min)

- ■ Kinetex
- ◆ Poroshell®
- ▲ Ascentis® Express
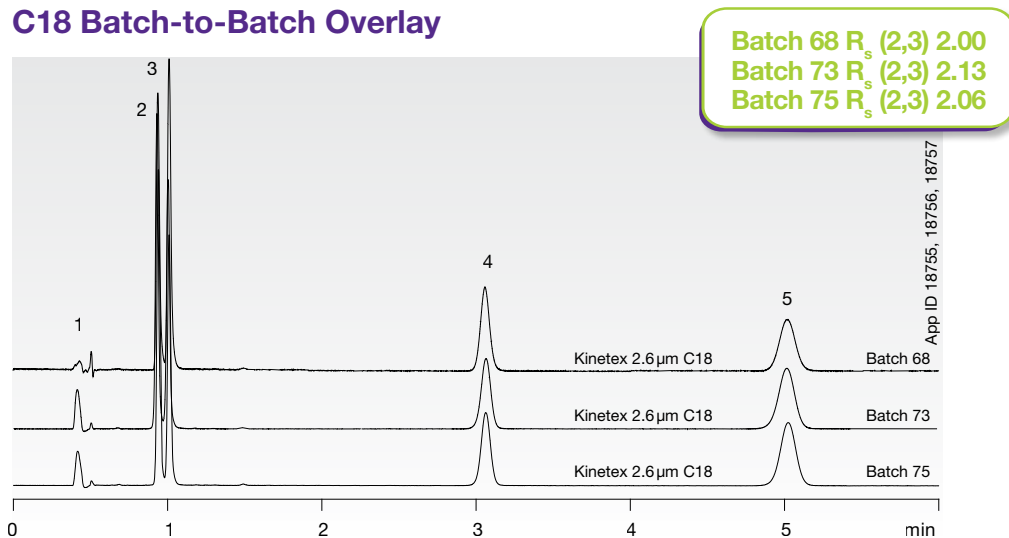- X Waters® BEH™

Peak capacity plots as 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 Jenő Fekete.

Reproducible
Batch-to-Batch, Column-to-Column

Every single Kinetex® column and Kinetex batch of media undergoes an incredible battery of quality assurance tests to ensure that you are getting the best column every time. Such tests incude particle size distribution (both solid core and shell thickness), surface coverage, carbon load, pore diameter distribution, and many other parameters to ensure exceptional reproducibility.

C18 Batch-to-Batch Overlay

Batch 68 R$_s$ (2,3) 2.00
Batch 73 R$_s$ (2,3) 2.13
Batch 75 R$_s$ (2,3) 2.06

App ID 18755, 18756, 18757

Kinetex 2.6 µm C18 — Batch 68
Kinetex 2.6 µm C18 — Batch 73
Kinetex 2.6 µm C18 — Batch 75

Conditions same for all batches:
Columns: 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
Temperature: Ambient
Detection: UV @ 254 nm
Sample: 1. Uracil
2. Hydroxycortisone
3. Cortisone
4. Cortisone acetate
5. 17-Hydroxyprogesterone

" Does your current column manufacturer give you the same assurances or results? "

$ 460,000

Savings for a cleaning validation method*

2,650%

Decrease in solvent usage*

90%

Average efficiency increase over fully porous 5 µm*

5

Selectivities
C18, XB-C18, C8,
Phenyl-Hexyl, and HILIC

23

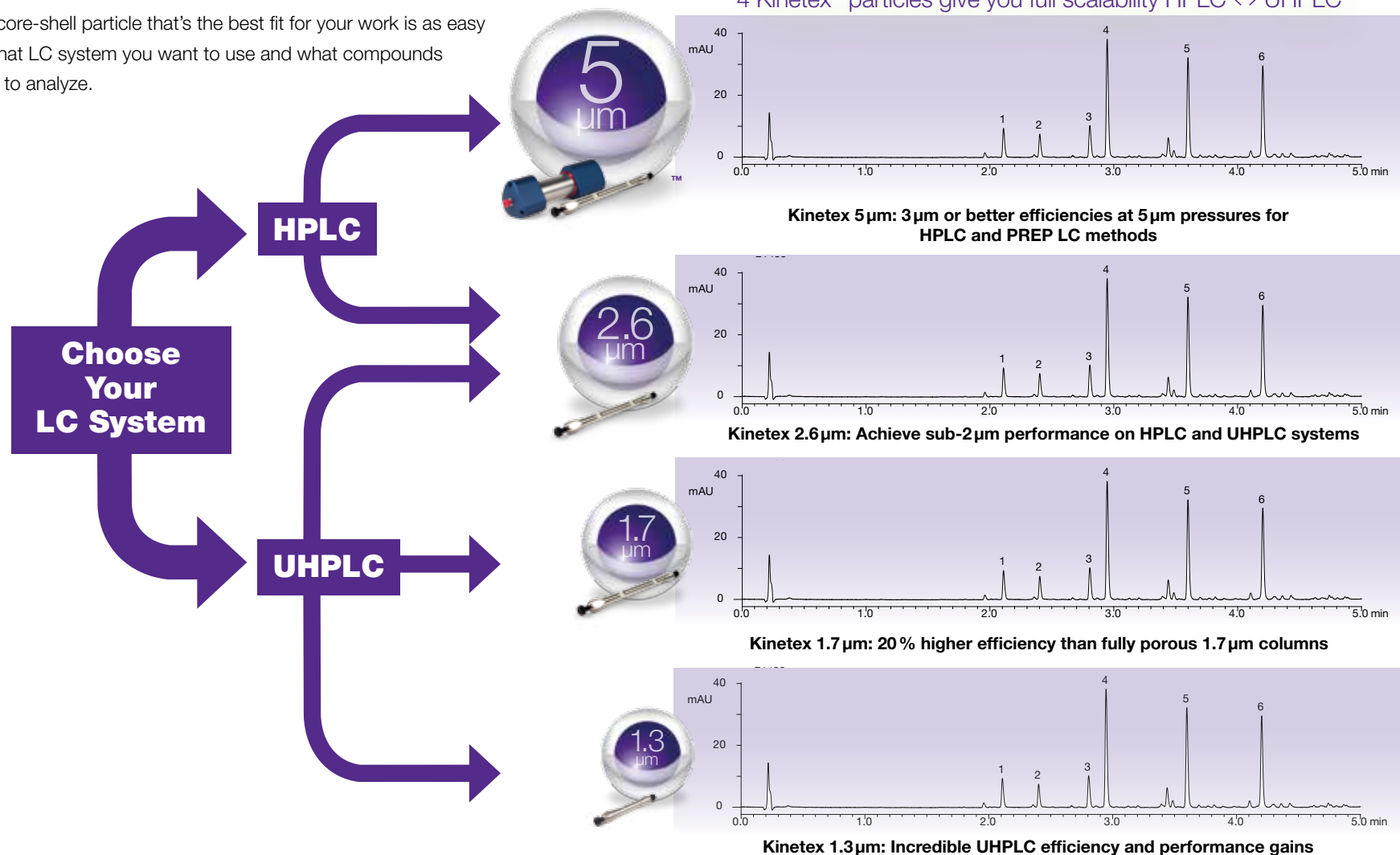Hours saved converting to Kinetex*

Shockingly
Better Performance

than your current HPLC/UHPLC column. **Guaranteed!**

1.3 µm

1.7 µm

2.6 µm

5 µm

*Results may not be representative of all applications. See www.phenomenex.com/kinetex for details.

Selecting the Optimal Core-Shell Particle For
Small Molecules

Selecting the core-shell particle that's the best fit for your work is as easy as knowing what LC system you want to use and what compounds you're looking to analyze.

Choose Your LC System

HPLC

UHPLC

5 µm

2.6 µm

1.7 µm

1.3 µm

4 Kinetex® particles give you full scalability HPLC ↔ UHPLC

Kinetex 5 µm: 3 µm or better efficiencies at 5 µm pressures for HPLC and PREP LC methods

Kinetex 2.6 µm: Achieve sub-2 µm performance on HPLC and UHPLC systems

Kinetex 1.7 µm: 20 % higher efficiency than fully porous 1.7 µm columns

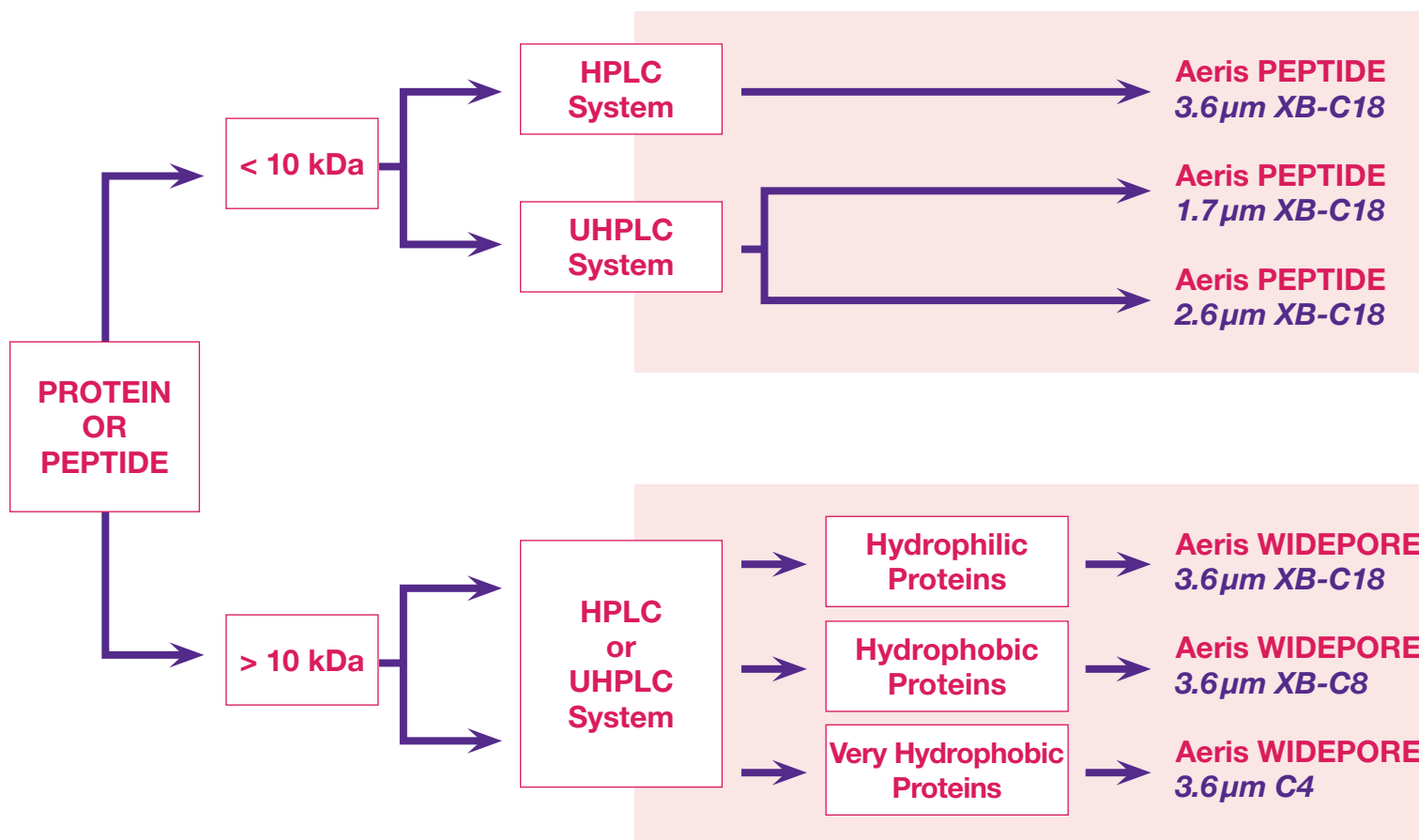**Kinetex 1.3 µm: Incredible UHPLC efficiency and performance gains**

*Gingerols analyzed on 50 x 2.1 mm columns

# Selecting the Optimal Core-Shell Particle For
Proteins/Peptides

Working with synthetic RNA/DNA?
Our Core-Shell Clarity® Oligo-MS™ columns were specifically engineered for this type of application.
Find more info at: www.phenomenex.com/clarity

PROTEIN OR PEPTIDE

< 10 kDa

HPLC System → **Aeris PEPTIDE 3.6 µm XB-C18**

UHPLC System → **Aeris PEPTIDE 1.7 µm XB-C18**

Aeris PEPTIDE 2.6 µm XB-C18

> 10 kDa

HPLC or UHPLC System

Hydrophilic Proteins → **Aeris WIDEPORE 3.6 µm XB-C18**

Hydrophobic Proteins → **Aeris WIDEPORE 3.6 µm XB-C8**

Very Hydrophobic Proteins → **Aeris WIDEPORE 3.6 µm C4**

Aeris™ PEPTIDE

Recommended for the separation of low molecular weight peptides and peptide mapping

3.6 µm
2.6 µm
1.7 µm
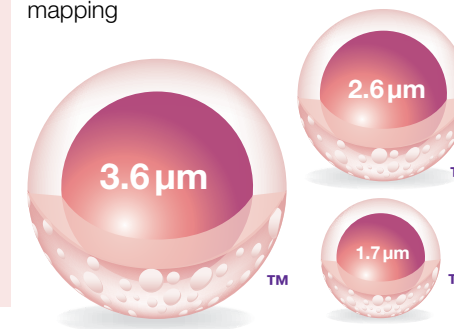
Aeris WIDEPORE

Recommended for the separation of intact proteins and polypeptides

3.6 µm

Find more Aeris information online at: www.phenomenex.com/Aeris

Better Performance than 5 µm and 3 µm Fully Porous Columns with **Kinetex® 5 µm**

Isocratic – Kinetex 5 µm columns have clear efficiency gains over both 5 and 3 µm fully porous columns at 5 µm pressure

Gradient – Kinetex 5 µm columns have 3 µm or better peak capacities at 5 µm pressure

Up to 90 % higher average efficiency

Up to 20 % higher average efficiency at half the pressure

5 µm   VS.   5 µm   5 µm   VS.   3 µm

Kinetex Core-Shell   **Fully Porous**   **Kinetex Core-Shell**   **Fully Porous**

Critical advantages of low HPLC system backpressures with Kinetex 5 µm columns

- Longer column lifetime
- Higher throughput
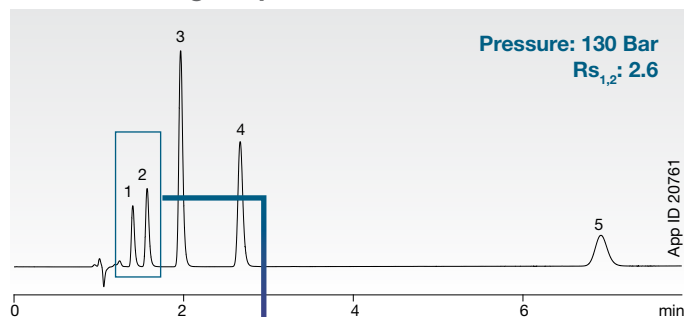- Increased system compatibility and method transferability
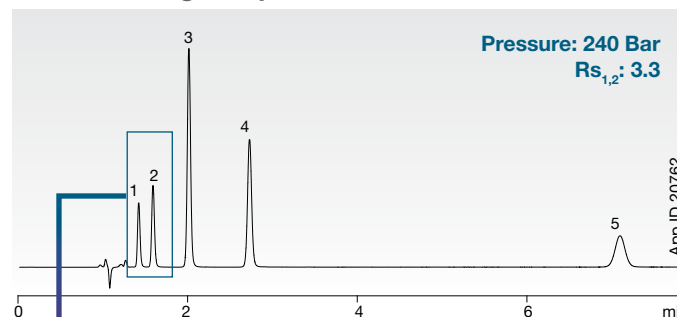
Instantly Improve
5 µm and 3 µm Methods

Immediately improve resolution, productivity, and sensitivity of your current 3 µm and 5 µm HPLC methods with **Kinetex 5 µm** core-shell technology. This core-shell particle was specifically developed for use on standard or older model HPLC systems that may have low pressure limitations.
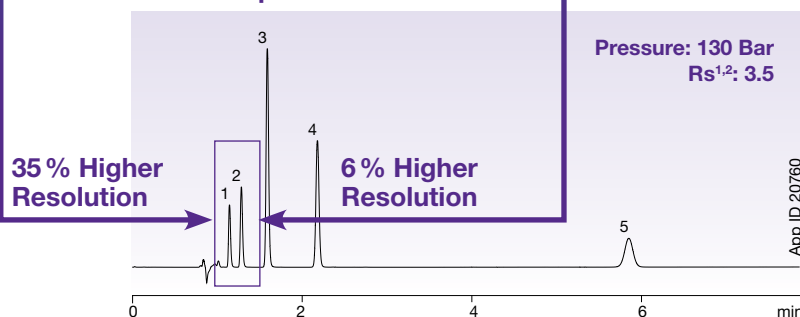
Higher Resolution with No Pressure Increase

Waters® XBridge® 5 µm C18

Pressure: 130 Bar
$Rs_{1,2}$: 2.6

App ID 20761

Waters XBridge 3.5 µm C18

Pressure: 240 Bar
$Rs_{1,2}$: 3.3

App ID 20762

Kinetex 5 µm C18

Pressure: 130 Bar
$Rs^{1,2}$: 3.5

35 % Higher Resolution

6 % Higher Resolution

App ID 20760

Conditions for all columns:
Columns: Kinetex 5 µm C18
XBridge 5 µm C18
XBridge 3.5 µm C18
Dimension: 150 x 4.6 mm
Mobile Phase: Water/Acetonitrile/Phosphoric acid (600:400:2)
Flow Rate: 1.5 mL/min
Temperature: Ambient
Detection: UV @ 235 nm
Sample: 1. Impurity A
2. Impurity B
3. Acetylsalicylic acid
4. Salicylic acid
5. Impurity D
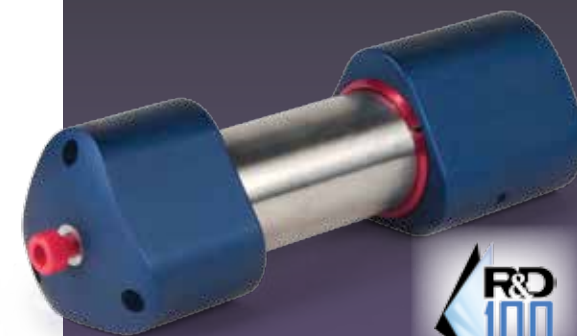
Award Recipient

First and Only
Core-Shell Material for Axia™
Preparative Purifications

The new Axia packed Kinetex 5 µm will provide incredible gains in efficiency and performance for any of your Prep LC methods. Learn more online at:
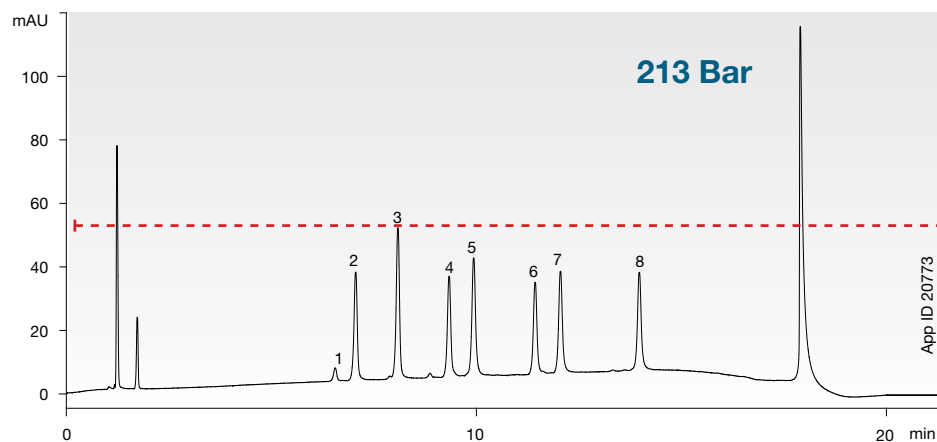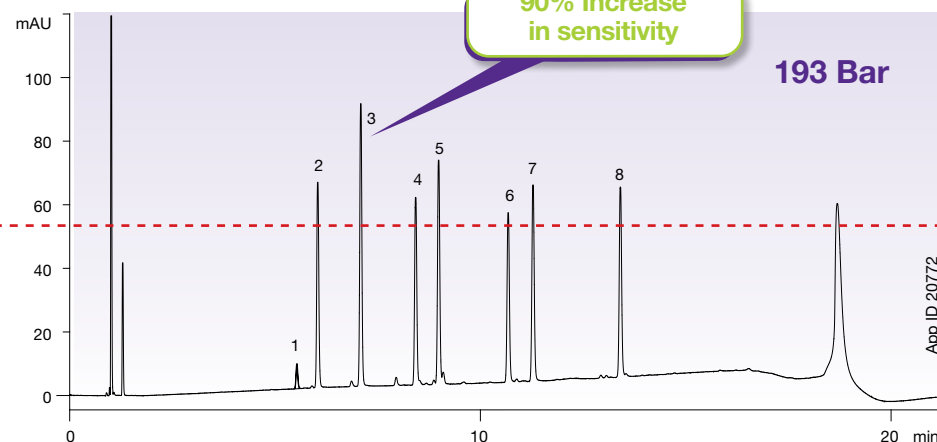
www.phenomenex.com/kinetexprep

Enhanced Sensitivity without Pressure Increase

Kinetex 5 µm core-shell columns easily provide enhanced sensitivity on any HPLC system without an increase in backpressure.

Macherey Nagel NUCLEOSIL® 5 µm C18

213 Bar

App ID 20773

Kinetex® 5 µm C18

90% Increase in sensitivity

193 Bar

App ID 20772

Conditions for both columns:

Columns:	Kinetex 5 µm C18	
	NUCLEOSIL 5 µm C18	
Dimension:	150 x 4.6 mm	
Mobile Phase:	A: Milli-Q® Water	
	B: Acetonitrile	

Gradient:	Time (min)	% B
	0	30
	15	95
	16	95
	17	30
	20	30

Flow Rate:	1.5 mL/min
Temperature:	Ambient
Detection:	UV @ 205 nm

Sample:

1. 6-Gingerol (1)	5. 6-Shogaol
2. 6-Gingerol (2)	6. 10-Gingerol
3. Capsaicin	7. 8-Shogaol
4. 8-Gingerol	8. 10-Shogaol

Increased Resolution
at a Fraction of the Pressure

Alongside LC/UV analyses, the high performance and low pressure of the **Kinetex 5 µm** make it an excellent tool for LC/MS and LC/MS/MS. Pull out isobaric ions with the high efficiency of Kinetex 5 µm, all at low 5 µm backpressures that promote longer column lifetime and less system strain.
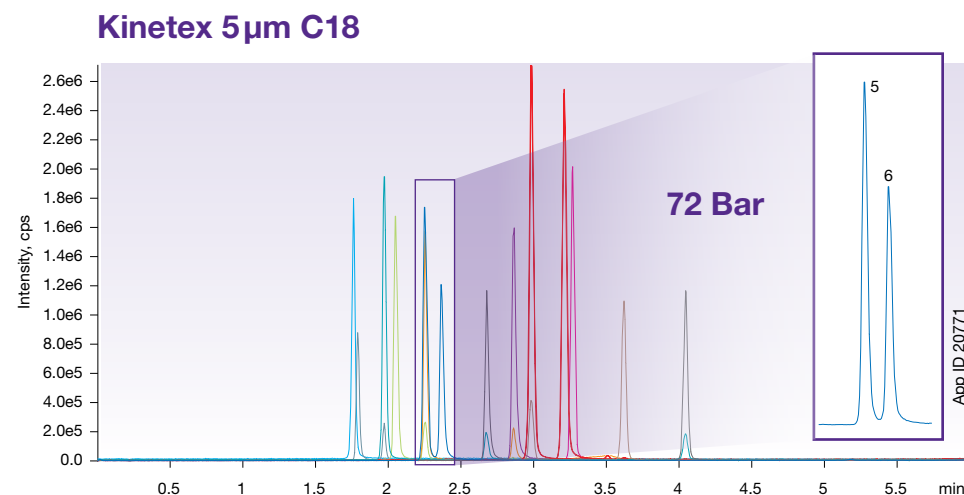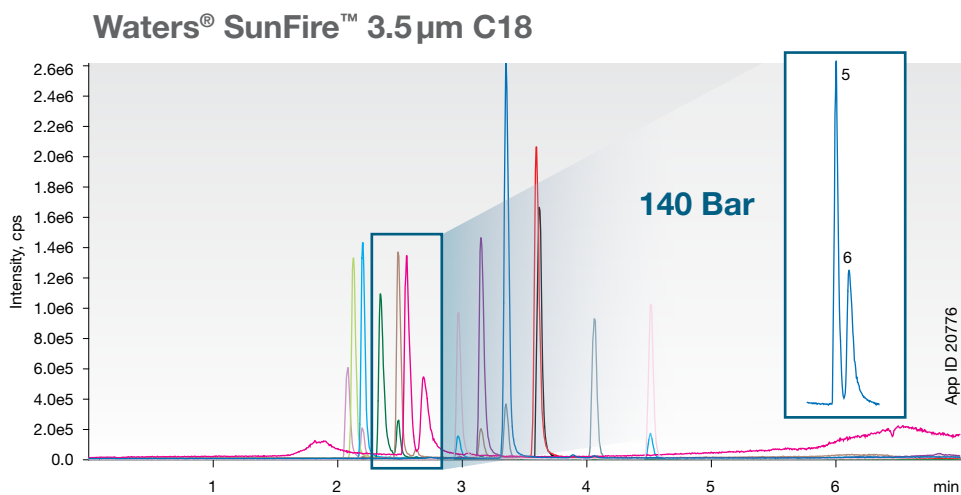
Waters® SunFire™ 3.5 µm C18

140 Bar

App ID 20776

Kinetex 5 µm C18

72 Bar

App ID 20771

Conditions for both columns:

Columns:	Kinetex 5 µm C18
	SunFire 3.5 µm C18
Dimension:	50 x 2.1 mm
Mobile Phase:	A: 30 mM Ammonium formate
	B: Acetonitrile

Gradient:

Time (min)	% B
0	5
5	60
5.1	100
6	100
7	5

Flow Rate:	0.5 mL/min
Temperature:	Ambient
Detection:	MS/MS (API 4000™)

Sample:

1. DMIP
2. IQx
3. IQ
4. 8-MeIQ
5. 4,8-DiMe-IQx
6. 7,8-DiMe-IQx
7. Trp-P-2
8. Harman
9. Norharman
10. PhIP
11. AaC
12. MeAaC
13. MeIQ

Increased Resolution and Sensitivity

By simply dropping in a **Kinetex 5 µm** for this paroxetine stability-indicating assay you get an impressive enhancement in resolution and sensitivity. Now imagine what this column can do for your other 3 and 5 µm methods.

Agilent® ZORBAX® 5 µm XDB-C18

Height = 120 mAU

$R_S = 0.98$

App ID 20766

Kinetex® 5 µm XB-C18

Height = 165 mAU

$R_S = 2.23$

App ID 20767
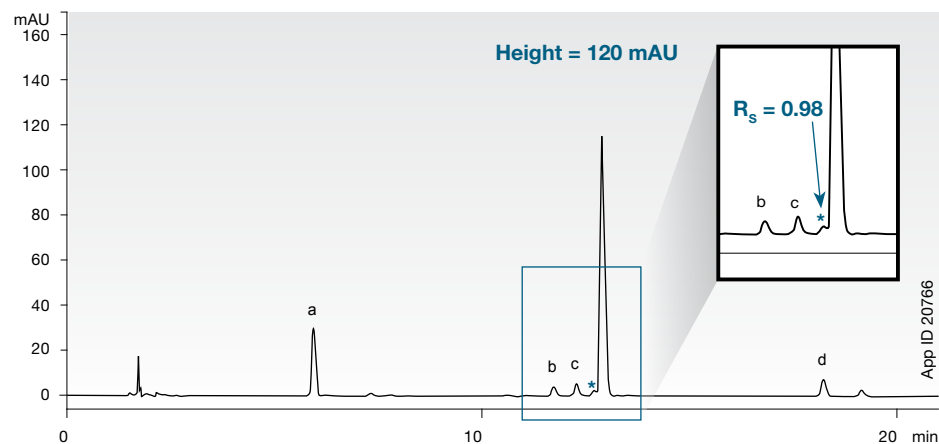
Conditons for both columns

Column:	Kinetex 5 µm C18
	ZORBAX 5 µm XDB-C18
Dimensions:	250 x 4.6 mm
Mobile Phase:	A: TFA/Water/THF (5:900:100)
	B: TFA/Acetonitrile/THF (5:900:100)

Gradient:	**Time (min)**	**% B**
	0	10
	40	80

Flow Rate: 1.5 mL/min

Temperature:	40 °C
Detection:	UV @ 295 nm
Sample:	1. Impurity A
	2. Impurity B
	3. Impurity C
	4. Unidentified
	5. Paroxetine
	6. Impurity D
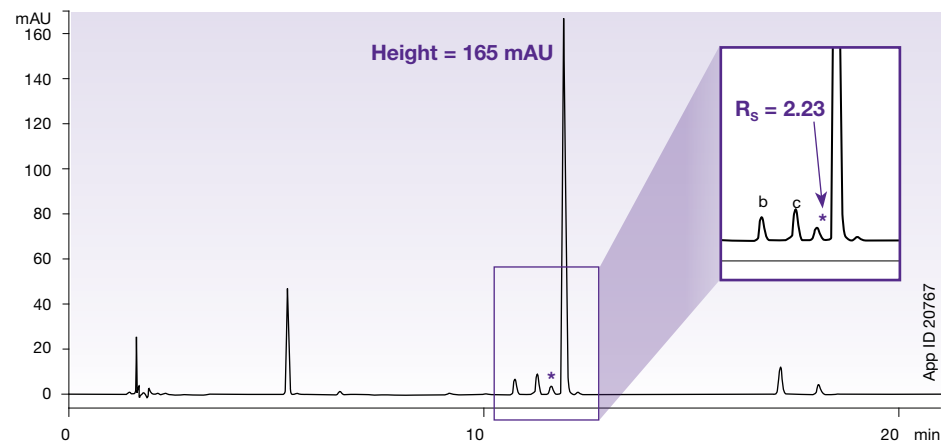
First and Only Core-Shell Material for Axia™ PREP Purifications

In addition to being completely scalable with the Kinetex 1.3 µm, 1.7 µm, and 2.6 µm particles, the **Kinetex 5 µm** column is now available in 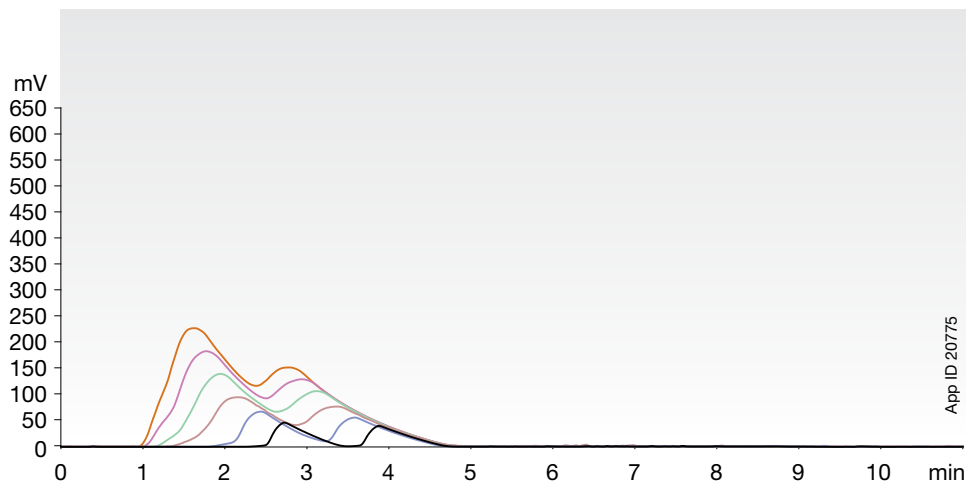the revolutionary Axia preparative format. Axia packed Kinetex 5 µm columns will provide incredible gains in efficiency and performance for all your reversed phase preparative chromatography methods.

Waters® XBridge® 5 µm C18 Prep OBD™ 50 x 19 mm

App ID 20775

Kinetex 5 µm C18 Axia 50 x 21.2 mm

Excellent loadability!

App ID 20774

Conditions for both columns:
Columns: Kinetex 5 µm C18 Axia-packed
XBridge 5 µm Prep OBD
Dimension: 50 x 21.2 mm
50 x 19 mm
Mobile Phase: A: Water with 0.5 % Formic acid
B: Acetonitrile with 0.5 % Formic acid
Gradient:

Time (min)	% B
0	20
8	50
11	50

Flow Rate: 30 mL/min
Temperature: Ambient
Detection: UV @ 254 nm
Sample: 1. Doxepin
2. Amitriptyline
Sample concentration: 200 mg/mL in DMSO

OBD is a trademark, Waters and XBridge are registered trademarks of Waters Corporation (Milford, MA, USA). Phenomenex is not affiliated with Waters Corporation. Comparative separations may not be representative of all applications.

A Versatile Upgrade for HPLC and UHPLC

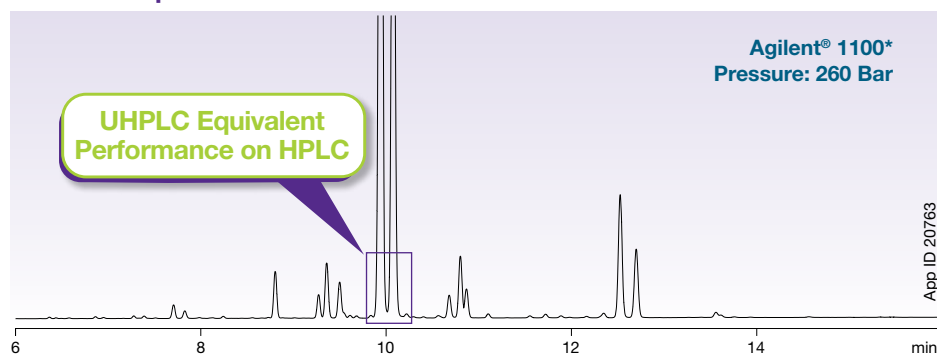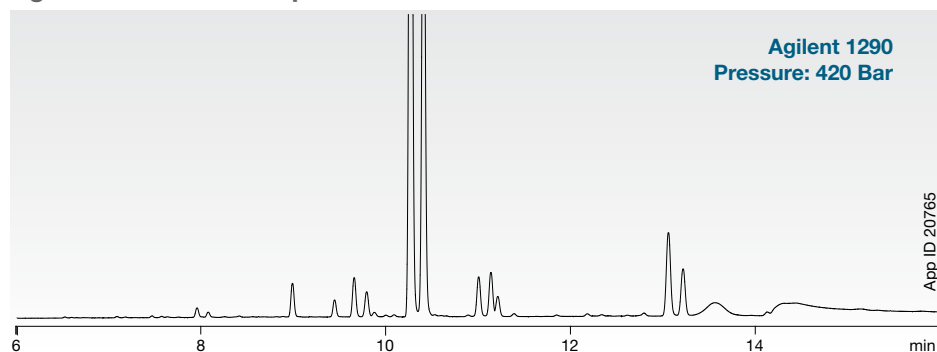On a low volume HPLC or UHPLC system **Kinetex® 2.6 µm** columns will perform like a fully porous sub-2 µm column, providing up to 3x the efficiency of 5 µm and double the efficiency of 3 µm fully porous media. Dramatically improve the productivity and performance of your existing methods with the use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

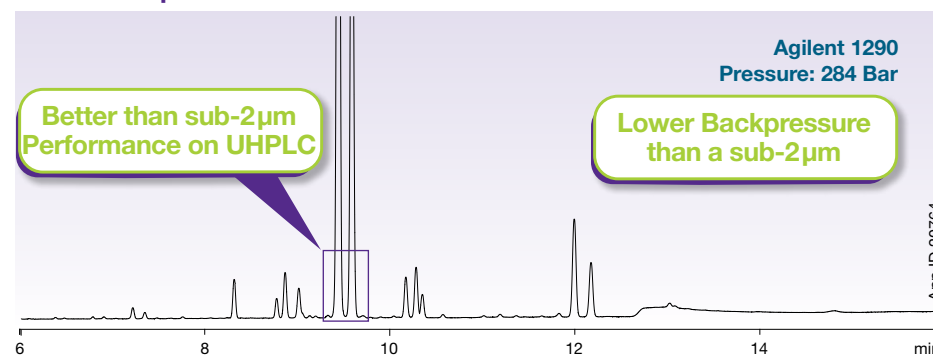## Sub-2 µm Performance with Kinetex 2.6 µm on HPLC and UHPLC Systems

Kinetex 2.6 µm C18

Agilent® 1100*
Pressure: 260 Bar

UHPLC Equivalent Performance on HPLC

App ID 20763

Agilent® ZORBAX® 1.8 µm SB-C18

Agilent 1290
Pressure: 420 Bar

App ID 20765

Kinetex 2.6 µm C18

Agilent 1290
Pressure: 284 Bar

Better than sub-2µm Performance on UHPLC

Lower Backpressure than a sub-2µm

App ID 20764

Conditions for all columns same except where noted:

Columns:	Kinetex 2.6 µm C18 (Agilent 1100*)
	Kinetex 2.6 µm C18 (Agilent 1290)
	ZORBAX 1.8 µm SB-C18 (Agilent 1290)
Dimension:	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.
Agilent and ZORBAX are registered trademarks of Agilent Technologies, Inc. Phenomenex is not affiliated with Agilent Technologies. Comparative separations may not be representative of all applications.

Replace 3 µm and 5 µm Columns.
For Improved Speed, Resolution, and Sensitivity

Generating much lower backpressure (< 400 bar) at optimal linear velocities, you can now achieve 2-3x's the column efficiencies of traditional fully porous 3 µm and 5 µm columns on any LC instrument.
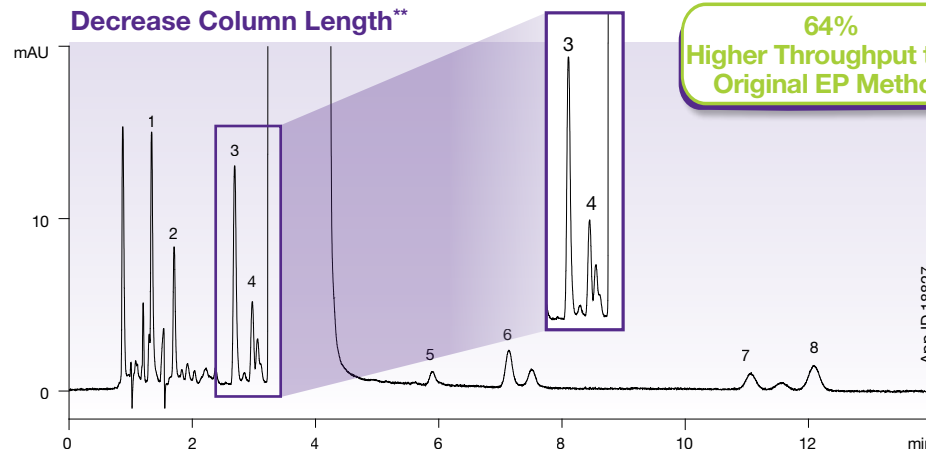
*Ph. Eur. Specified 5 µm C18 Column

Waters® Symmetry® 5 µm C18

App ID 18514
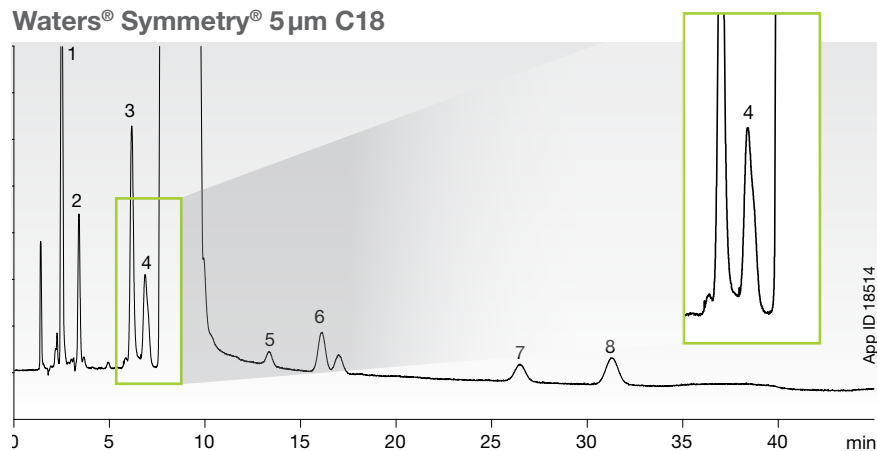
Dimensions:	150 x 3.9 mm
Mobile Phase:	12.5 mM Phosphoric acid in Water, pH 3.0 + 2.0 g Sodium octanesulfonate + 0.8 g Tetrabutyl ammonium hydrogen sulfate / Methanol / THF (80:18:2)
Flow Rate:	0.6 mL/min
Temperature:	22 ºC
Detection:	UV @ 226 nm
Sample:	Atenolol Related Substance

1. Impurity B	5. Impurities D and E
2. Impurity A	6. Impurity F
3. Impurity J	7. Impurity G
4. Impurity I	8. Impurity H

Decrease Column Length**

64% Higher Throughput than Original EP Method

App ID 18827

Column:	Kinetex 2.6 µm C18
Dimensions:	100 x 4.6 mm
Part No.:	00D-4462-E0
Mobile Phase:	12.5 mM Phosphoric acid in Water, pH 3.0 + 2.0 g Sodium octanesulfonate + 0.8 g Tetrabutyl ammonium hydrogen sulfate / Methanol / THF (80:18:2)
Flow Rate:	0.9 mL/min
Temperature:	22 ºC
Detection:	UV @ 226 nm
Sample:	Atenolol Related Substance

1. Impurity B	5. Impurities D and E
2. Impurity A	6. Impurity F
3. Impurity J	7. Impurity G
4. Impurity I	8. Impurity H

* European Pharmacopeia *(Ph. Eur.)*
   Waters and Symmetry are registered trademarks of Waters Corporation. Phenomenex is not affiliated with Waters Corporation.
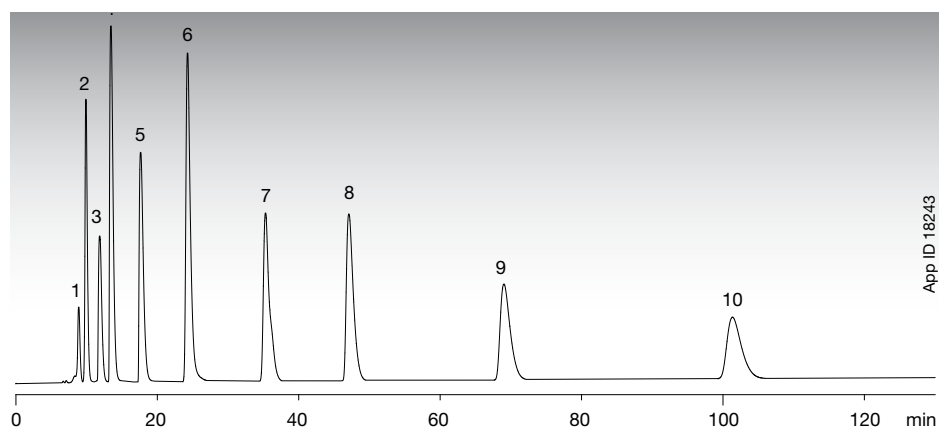   Comparative separations may not be representative of all applications.

* Decrease in column particle within allowable Ph. Eur. and USP pharma particles size change (+- 50 %)
** Decrease in column length within allowable Ph. Eur. and USP column length change (+- 70 %)
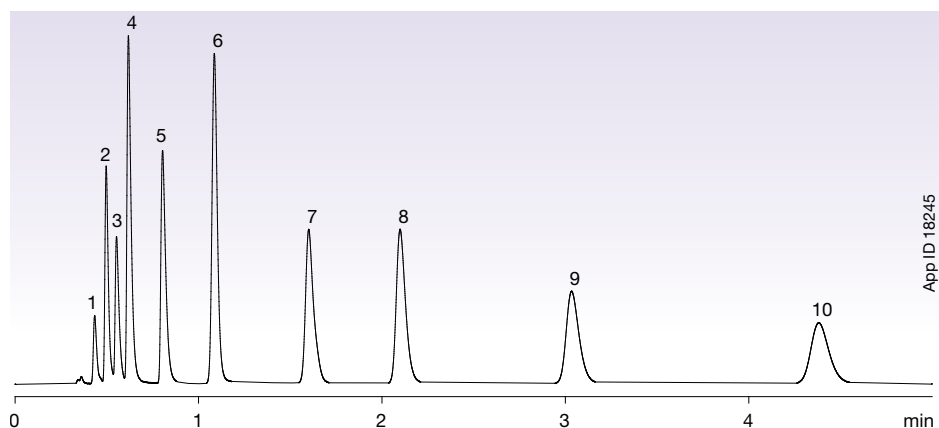
Improve Performance, Save Solvent

When chromatographic column performance improves you can decrease your analysis time and also decrease your overall solvent consumption without compromising your separations. Use Kinetex® Core-Shell Technology to dramatically decrease the solvent consumption in your laboratory and increase sample throughput.

Example Method Consumption

App ID 18243

110 mL solvent per run!

Column: Traditional 5 µm C18
Dimensions: 250 x 4.6 mm
Flow Rate: 1.0 mL/min

Less Solvent Consumption with Kinetex Column

App ID 18245

< 4 mL solvent per run!

Column: Kinetex 2.6 µm C18
Dimensions: 50 x 2.1 mm
Flow Rate: 1.0 mL/min

Conditions for both columns:
Mobile Phase: A: 20 mM Potassium phosphate pH 7
B: Methanol / Acetonitrile (50:50)
A/B (48:52)
Temperature: 40 ºC
Detection: UV @ 254 nm
**Sample:**
1. Tianeptine
2. Desmethyldoxepin
3. Protriptyline
4. Desipramine
5. Imipramine
6. Amoxapine
7. Doxepin
8. Nortriptyline
9. Amitriptyline
10. Clomipramine

Comparative separations may not be representative of all applications.

Increased Sensitivity

The combination of the uniform particle shape, narrow particle size distribution, and the significantly shorter diffusion path results in much higher column efficiencies and increased chromatographic resolution. The increased efficiencies provide an immediate benefit in sensitivity since higher chromatographic efficiencies translate into significantly narrower and taller peaks, making it easier to detect low level impurities.

GL Sciences Inertsil® 5 µm ODS-3 250 x 4.6 mm

App ID 18586
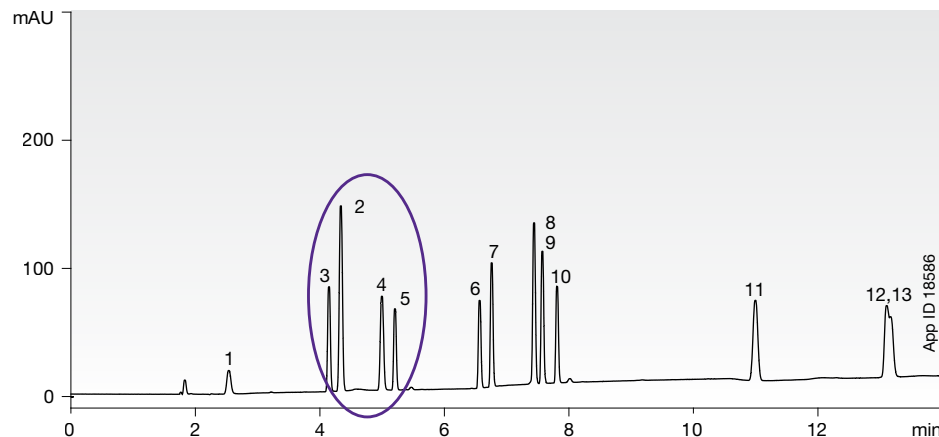
Kinetex 2.6 µm C18 150 x 4.6 mm

App ID 18578

**105%
Increase in Sensitivity◊**
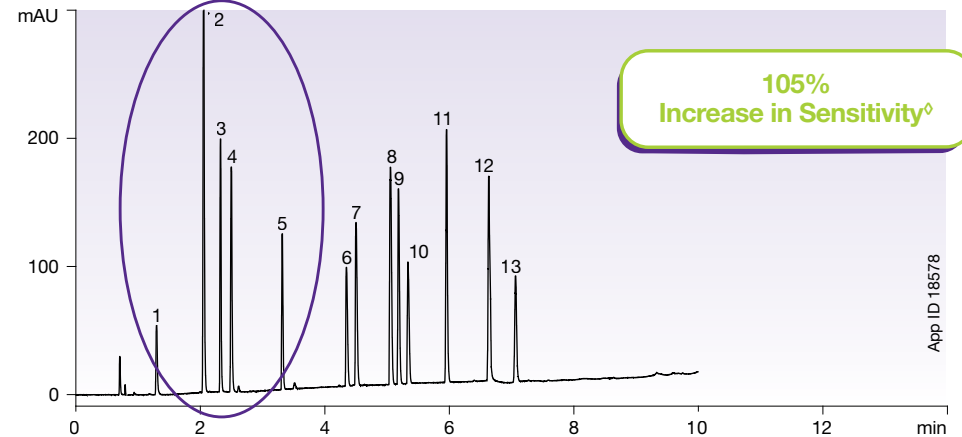
Conditions same for both columns except where noted:

Columns:	Kinetex 2.6 µm C18 100 Å
	Inertsil 5 µm ODS-3 100 Å
Dimensions:	Kinetex: 150 x 4.6 mm
	Inertsil: 250 x 4.6 mm
Mobile Phase:	A: 0.1 % Phosphoric acid in Water
	B: 0.1 % Phosphoric acid in Acetonitrile
Gradient:	5 % to 95 % B in 9 min (150 x 4.6 mm)
	5 % to 95 % B in 15 min (250 x 4.6 mm)
Flow Rate:	1.8 mL/min
Temperature:	50 °C

Detection: UV @ 215 nm (22 °C)

Sample:
1. Procainamide
2. Acetaminophen
3. Folic acid
4. Sulfathiazole
5. Acebutolol
6. Dextromethorphan
7. Diphenhydramine
8. Propafenone
9. Amitriptyline
10. Fluoxetine
11. Naproxen
12. Diflunisal
13. Indomethacin

◊ Signal-to-noise ratio of peak 2
Inertsil is a registered trademark of GL Sciences Inc. Phenomenex is in no way affiliated with GL Sciences Inc. Comparative separations may not be representative of all applications.
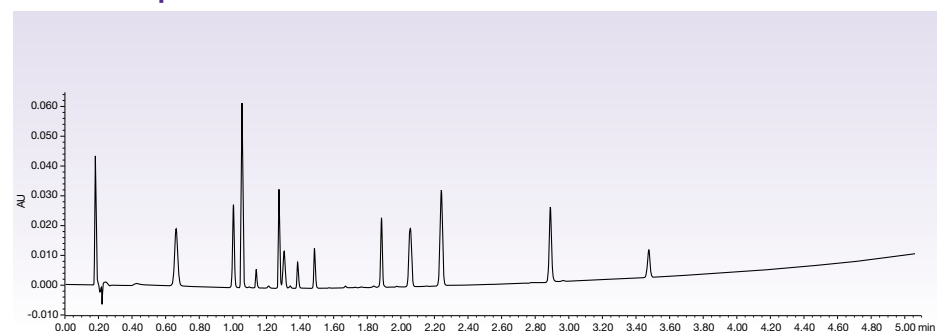
Higher Peak Capacities than Traditional Sub-2 µm Columns

With higher peak capacities than traditional sub-2 µm fully porous columns, **Kinetex® 2.6 µm** columns give you the ability to use different size columns depending on your ultimate needs.

Waters® ACQUITY® BEH™ 1.7 µm C18

App ID 20849

Kinetex 2.6 µm C18

App ID 20848
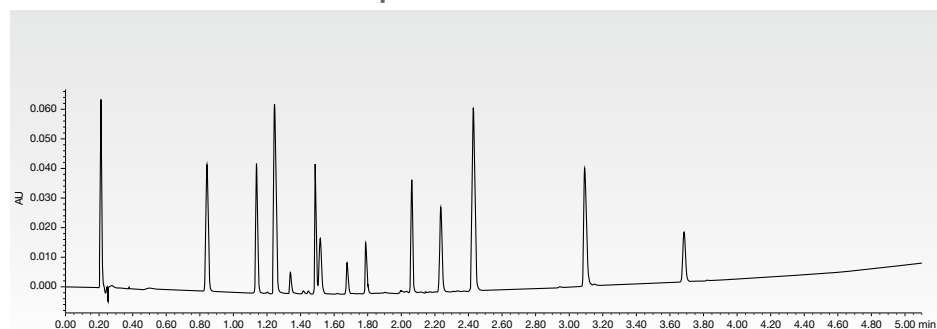
Conditions for both columns:

Dimension:	50 x 21.2 mm
Mobile Phase:	A: Water with 0.1 % Formic acid
	B: Acetonitrile with 0.1 % Formic acid
Gradient:	5 % to 95 % B in 5 min
Flow Rate:	0.6 mL/min
Temperature:	22 °C
Detection:	UV @ 254 nm

Sample:

1. Pyridine
2. Acetaminophen
3. Sulfathiazole
4. Pindolol + Quinidine
5. Benzyl Alcohol
6. Phenol
7. Acebutolol
8. Chlorpheniramine
9. Triprolidine
10. Prednisolone
11. 3-Methyl, 4-nitrobenzoic Acid
12. Nortriptyline
13. 2-Hydroxy, 5-methyl benzaldehyde
14. Diflunisal
15. Hexanophenone

Kinetex 2.6 µm Advantage On Your UHPLC System

Increased peak capacity is achieved with **Kinetex 2.6 µm** when compared to sub-2 µm columns at the same pressure. Take full advantage of your UHPLC system with Kinetex 2.6 µm columns.

Traditional 1.7 µm C18
Peak Capacity: 34.4 @ 7700 psi (531 bar)*

App ID 19861
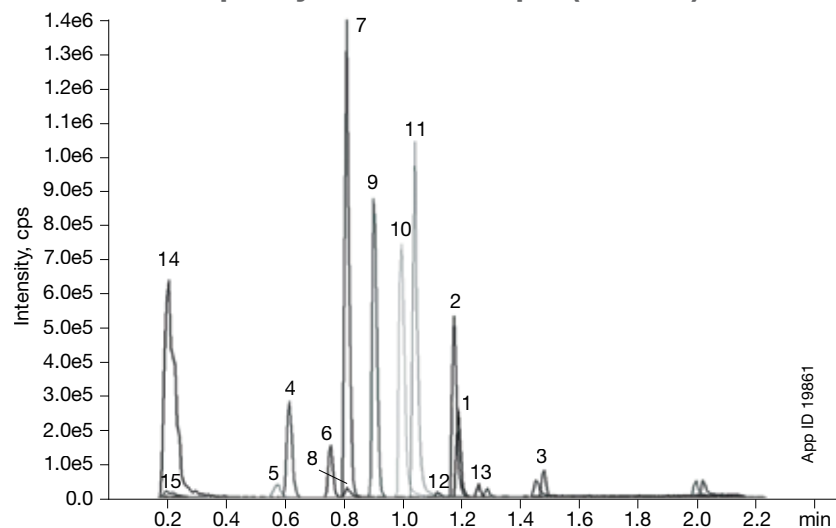
Kinetex 2.6 µm C18
Peak Capacity: 43.5 @ 7700 psi (531 bar)*

App ID 19862

26 % Increase in Peak Capacity*

Conditions for both columns:

Dimensions:	50 x 2.1 mm	
Mobile Phase:	A: 0.1 % Formic acid in Acetonitrile	
	B: 0.1 % Formic acid (aq)	

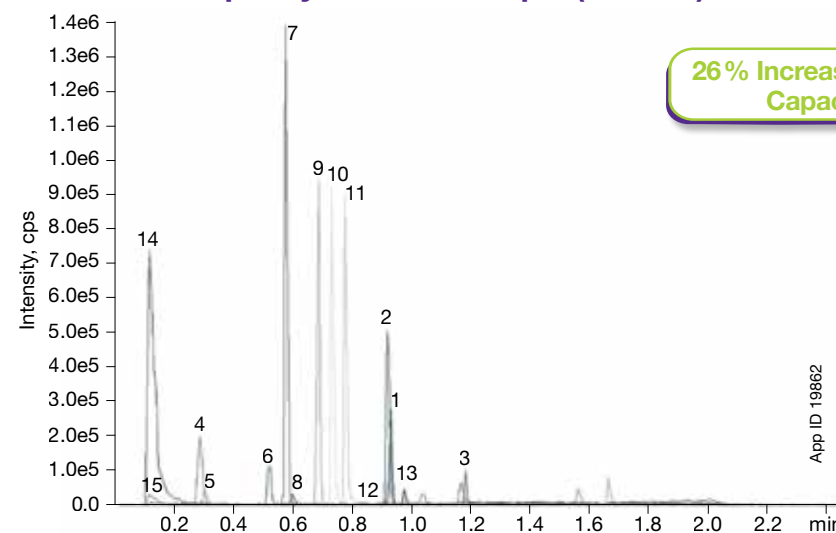| **Gradient:**	**Time (min)**	**% B**
	0.00	95
	0.25	95
	1.80	10
	1.90	10
	1.91	95
	2.50	95

Temperature:	40 ºC
Detection:	MS
Instrument:	**Waters ACQUITY® Binary UPLC®
	**API 5000™ QQQ
Flow Rate:	Kinetex: 1.4 mL/min
	Traditional: 0.8 mL/min

Sample:

1.	Haloperidol	9.	Acebutolol
2.	Diltiazem	10.	Chlorpheniramine
3.	Terfenadine	11.	Tripolidine
4.	Cimetidine	12.	Prednisolone
5.	Acetaminophen	13.	Nortriptyline
6.	Sulfathiazole	14.	2-hydroxy-5-methyl benzaldehyde
7.	Pindolol	15.	Hexanophenone
8.	Quinidine		

It Doesn't Stop Here!
34 % increase in peak capacity and a 3.5 x's increase in sensitivity was achieved! Download technical note TN-1104 at www.phenomenex.com/kinetex (technical resource/technical library) to learn how.

Data generated by Quotient Bioresearch, U.K.
** ACQUITY and UPLC are registered trademarks of Waters Corporation. API 5000 is a trademark of AB SCIEX.
Phenomenex is not affiliated with Waters Corporation.
*Comparative separations may not be representative of all applications.

Get the Most Performance Out of Your UHPLC System

Kinetex® 1.3 and 1.7 µm Core-Shell Technology produces increased efficiencies over traditional sub-2µm columns on the market, yielding remarkable chromatographic resolution, higher peak capacities, and greater sensitivity, so you can get the most out of every UHPLC analysis.

Incredible Efficiency Gains

Waters® ACQUITY® UPLC® BEH™ 1.7 µm C18
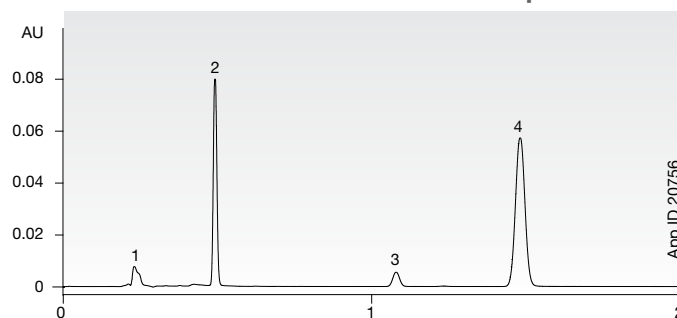
App ID 20756

Kinetex 1.7 µm C18

App ID 20757
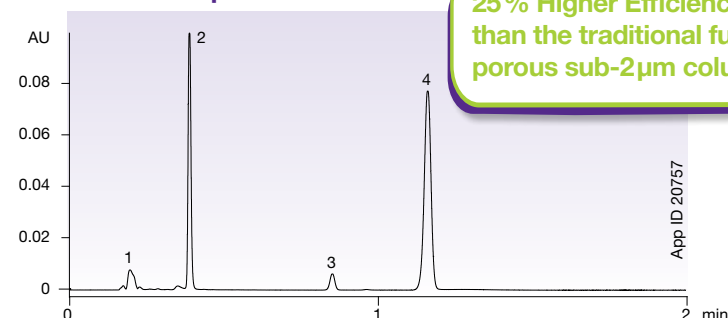
> **25% Higher Efficiency than the traditional fully porous sub-2µm column**

Easy Installation on UHPLC Systems

www.phenomenex.com/kinetex

Kinetex 1.3 µm C18

App ID 20758
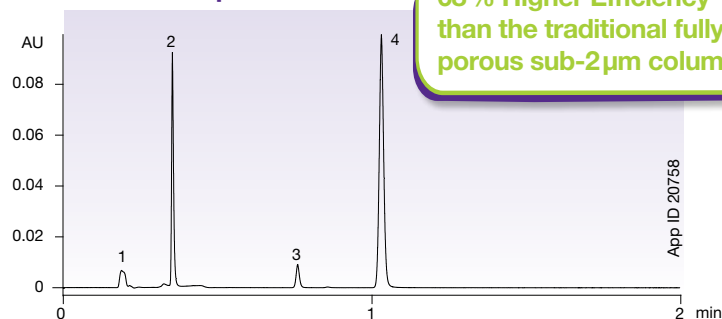
> **68% Higher Efficiency than the traditional fully porous sub-2µm column**

Conditions for all columns:

Columns:	Kinetex 1.7 µm C18
	Kinetex 1.3 µm C18
	ACQUITY UPLC BEH 1.7 µm C18
Dimension:	50 x 2.1 mm
Mobile Phase:	Acetonitrile / Water (50:50)
Flow Rate:	0.5 mL/min
Temperature:	Ambient
Detection:	UV @ 254 nm
Instrument:	Waters® ACQUITY® UPLC®
Sample:	1. Acetophenone
	2. Benzene
	3. Toluene
	4. Naphthalene

Efficiency calculated from peak 4 in each chromatogram. Waters, ACQUITY, and UPLC are registered trademarks, and BEH Technology is a trademark of Waters Corporation. Phenomenex is not affiliated with Waters Corporation. Comparative separations may not be representative of all applications.

Better Sensitivity, Resolution, and Peak Capacity

Waters® ACQUITY® UPLC® BEH™ 1.7 µm C18

Peak Capacity = 170

App ID 20843

Kinetex 1.3 µm C18

Peak Capacity = 234

App ID 20842

Higher Sensitivity

5*

Greater Resolution of Impurities

■ Kinetex 1.3 µm
■ BEH 1.7 µm
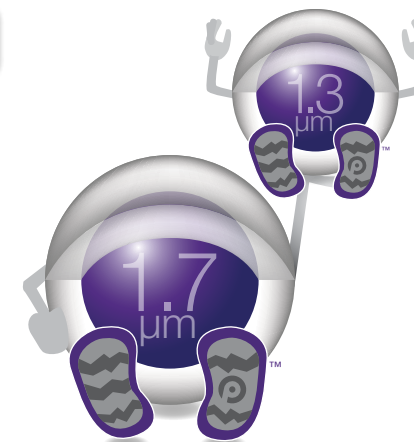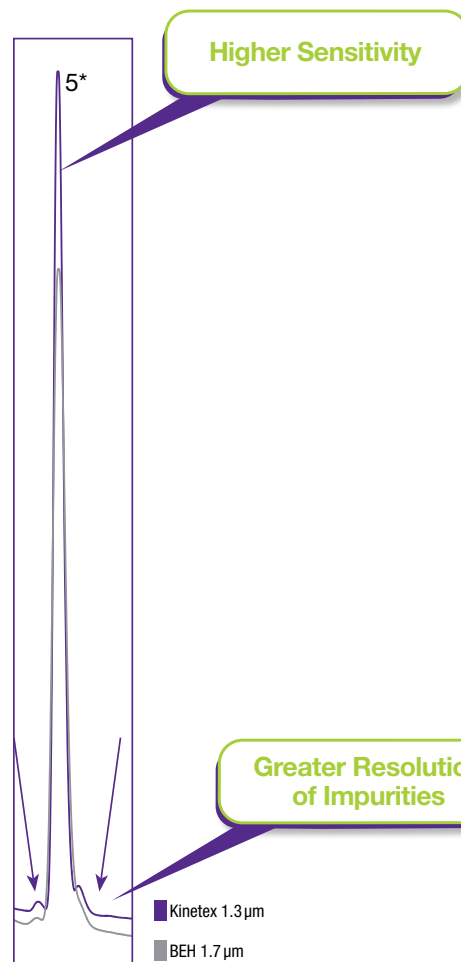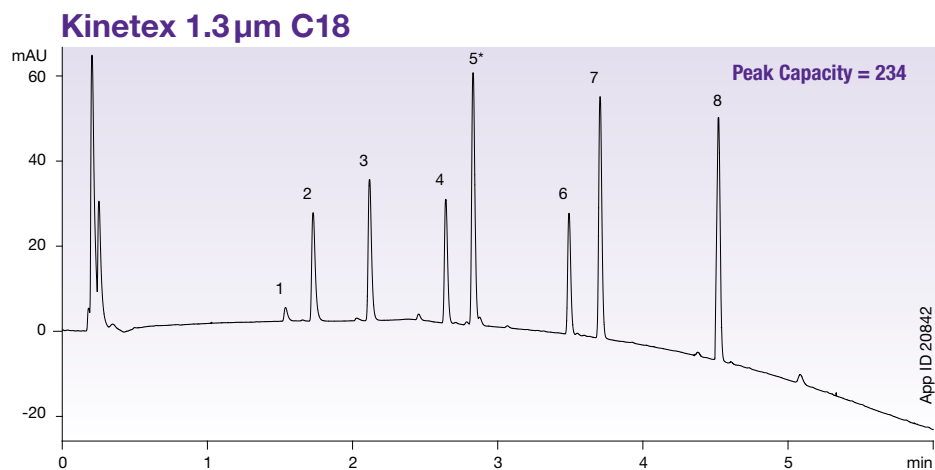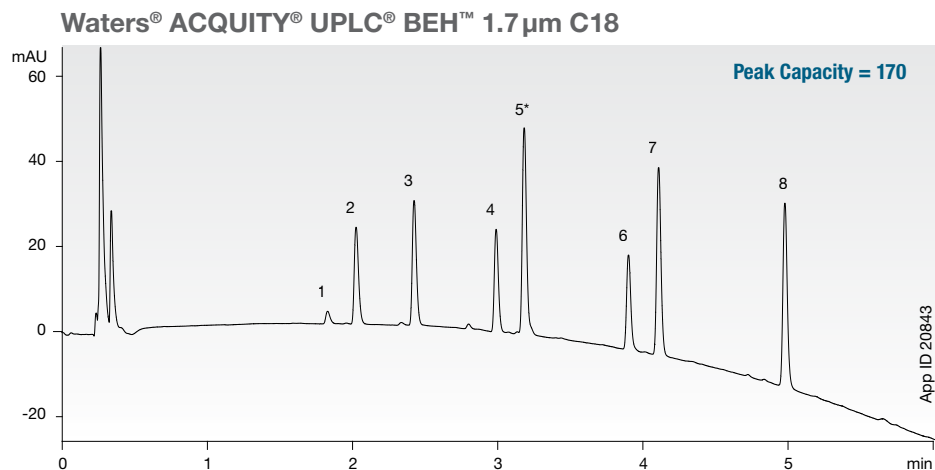
Conditions for both columns:

Column:	Kinetex 1.3 µm C18
	ACQUITY UPLC BEH 1.7 µm C18
Dimensions:	50 x 2.1 mm
Mobile Phase:	Acetonitrile / Water (50:50)

Gradient:

Time (min)	% B
0	30
5	95

Flow Rate:	0.5 mL/min
Temperature:	Ambient
Detection:	UV @ 214 nm
Instrument:	Waters ACQUITY UPLC
Sample:	1. 6-Gingerol (1)
	2. 6-Gingerol (2)
	3. Capsaicin
	4. 8-Gingerol
	5. 6-Shogal
	6. 10-Gingerol
	7. 8-Shogal
	8. 10-Shogal

Kinetex® 1.7 µm for Higher Resolution

Do everything you can to make sure you are achieving the resolution needed by using a powerful Kinetex Core-Shell sub-2 µm column.

Waters® ACQUITY® BEH™ 1.7 µm

App ID 19805

Phenomenex® Kinetex 1.7 µm

138 %
Higher Resolution
(between peaks 5 and 6)

66 %
Higher Resolution
(between peaks 1 and 2)

21 %
Higher Resolution
(between peaks 7 and 8)

App ID 19804
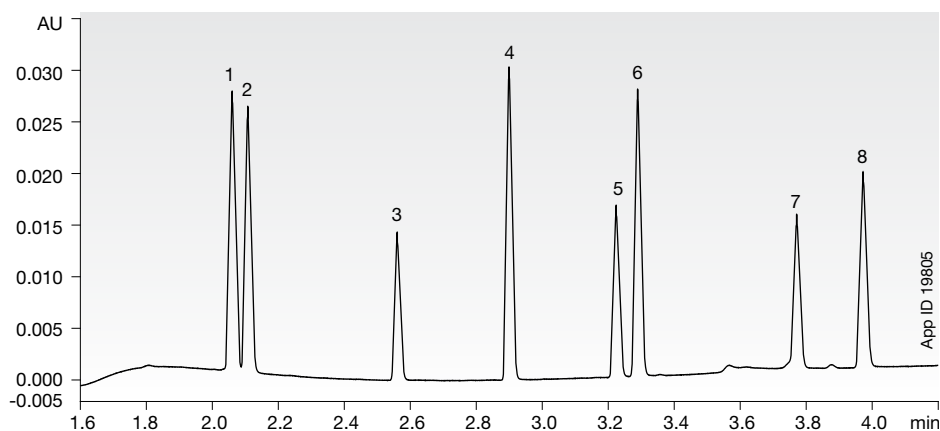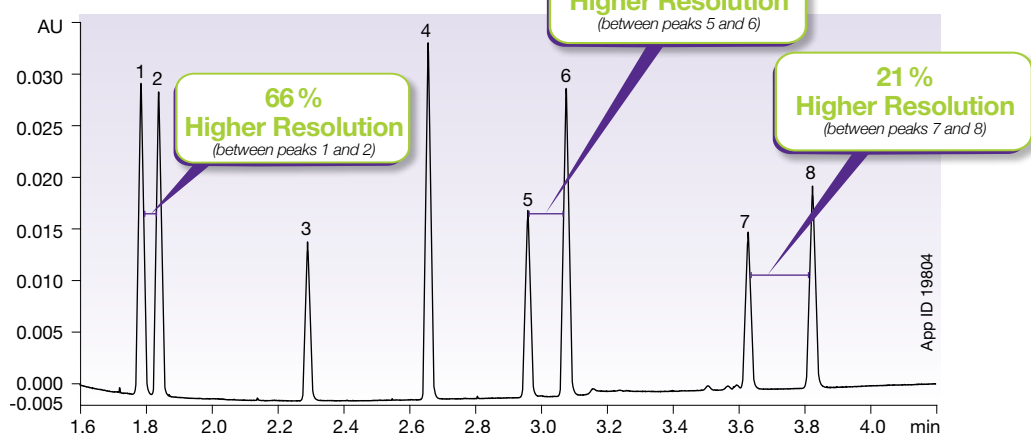
Conditions for both columns:

Column:	Kinetex 1.7 µm XB-C18
	ACQUITY UPLC BEH 1.7 µm C18
Dimensions:	150 x 2.1 mm
Mobile Phase:	A: Milli-Q® Water
	B: Acetonitrile

Gradient:	**Time (min)**	**% B**
	0	30
	5	100

Flow Rate:	0.5 mL/min
Temperature:	Ambient
Detection:	UV @ 210 nm (ambient)

Backpressure:	981 bar (Kinetex)
	935 bar (ACQUITY)
Instrument:	Waters ACQUITY UPLC
Sample:	1. Hydrocortisone
	2. Cortisone
	3. Corticosterone
	4. Cortisone-21-Acetate
	5. DHEA (Dehydroepiandrosterone)
	6. 17-Hydroxprogesterone
	7. Deoxycorticosterone
	8. Progesterone

Column	Resolution between Hydrocortisone and Cortisone	Resolution between DHEA (Dehydroepiandrosterone) and 17-Hydroxyprogesterone	Resolution between Deoxycorticosterone and Progesterone
Kinetex 1.7 µm XB-C18 150 x 2.1 mm	2.5 (66 % increase)	5.0 (138 % increase)	7.4 (21 % increase)
ACQUITY® 1.7 µm BEH™ C18 150 x 2.1 mm	1.5	2.1	6.1

Significant Cost Savings with Kinetex 1.7 µm

App ID 19794

Column:	Kinetex 1.7 µm C18
Dimensions:	100 x 2.1 mm
Part No.:	00D-4475-AN
Mobile Phase:	A: 5 mM Ammonium formate pH 3.25 / Acetonitrile (95:5)
	B: 5 mM Ammonium formate pH 3.25 / Acetonitrile (10:90)

Gradient:

Time (min)	% B
0.0	30
1.5	50
3.0	56.3
5.0	95
6.0	95
6.1	30

Flow Rate:	0.4 mL/min
Temperature:	50 °C
Detection:	PDA 210-300 nm, extracted channel 280 nm
Instrument:	Waters® ACQUITY® equipped with PDA

Sample:
1. Antidepressant drug (containing an HCl salt)
2. Hormone therapy #1 (containing a salt)
3. SERM drug (containing basic functional group)
4. CNS drug (containing basic functional group)
5. PPI drug (containing basic functional group)
6. CNS drug (containing basic functional group)
7. CNS drug (containing basic functional group)
8. Hormone therapy #2 (neutral)
9. Oral contraceptive hormone #1 (neutral)
10. Hormone therapy #3 (neutral)
11. Oral contraceptive hormone #2 (neutral)
12. Hormone therapy #4 (neutral)
13. Oral contraceptive hormone (neutral)
14. Hormone therapy #5 (neutral)
15. Hormone therapy #6 (acetate salt of 14)
16. Immunosuppressant drug (macromolecule, containing basic functional group)

> It has been shown that the **1.7 µm Kinetex 100 x 2.1 mm column** was capable of resolving 16 different chemical entities with a 6 minute run time. This new analytical method will be used to replace 16 older methods thereby facilitating an **annualised cost saving for the site of €320,000**

A. Charles, et. al., Pfizer Grange Castle, Grange Castle Business Park, Clondalkin, Dublin Republic of Ireland

Kinetex® Columns are Compatible with All <u>HPLC Instruments</u>

Watch our quick and easy column installation videos at:

http://www.phenomenex.com/ Kinetex/TechnicalResources

Verify that you are getting the highest performance with your new Kinetex column @ www.phenomenex.com/kinetexverify

Kinetex Columns are Compatible with All UHPLC Instruments

No matter which UHPLC system you have in your lab, it is easy to harness the power of Kinetex Core-Shell Technology.

Agilent® 1290	Shimadzu® Nexera®	JASCO® X-LC	Waters® ACQUITY® UPLC®

Kinetex on Agilent 1290

Kinetex on Shimadzu Nexera

Kinetex on JASCO X-LC

Kinetex on ACQUITY UPLC

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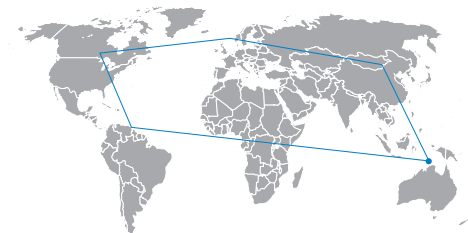
With **Kinetex® 5 µm, 2.6 µm, 1.7 µm, and 1.3 µm** Core-Shell Technology, you are no longer restricted from developing high performance LC methods on any system and transferring them anywhere. These four scalable Kinetex particle sizes offer you the ability to develop and transfer your method effortlessly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

Portability

Kinetex 5 µm C18 on Shimadzu® LC-20A

App ID 20770
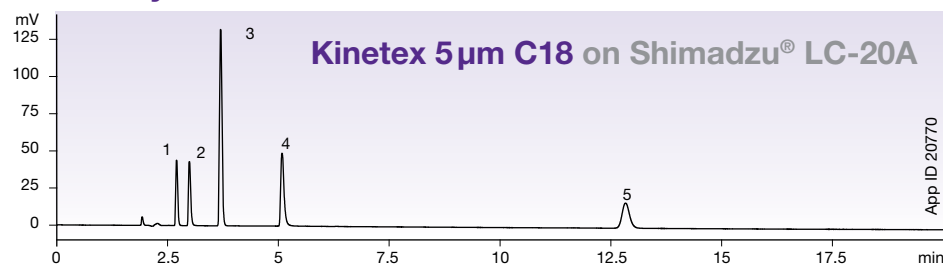
Columns: Kinetex 5 µm C18
Dimension: 250 x 4.6 mm
Part No.: 00G-4601-E0

Kinetex 2.6 µm C18 on Agilent® 1100

App ID 20768
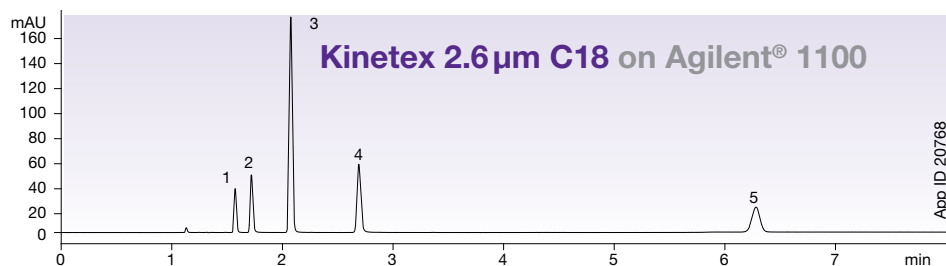
Columns: Kinetex 2.6 µm C18
Dimension: 150 x 4.6 mm
Part No.: 00F-4462-E0

Kinetex 1.7 µm C18 on Agilent 1290

App ID 20769

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

Conditions are 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

Agilent is a registered trademark of Agilent Technologies, Inc. Shimadzu is a registered trademark of Shimadzu Corporation. Phenomenex is not affiliated with Agilent Technologies. Comparative separations may not be representative of all applications.

4 Kinetex Particles Give You Full Scalability from HPLC ↔ UHPLC
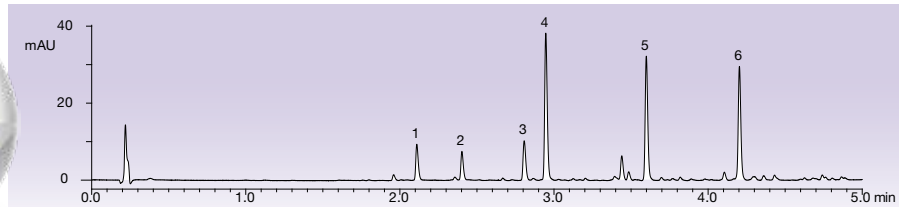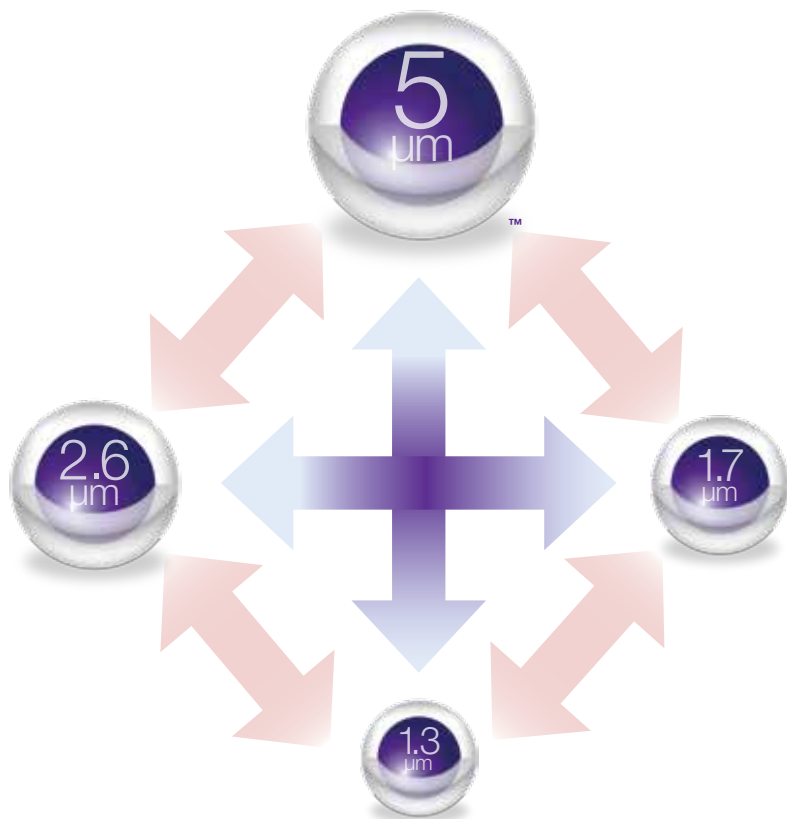
Kinetex 5 µm: 3 µm or better efficiencies at 5 µm pressures for HPLC and PREP LC methods
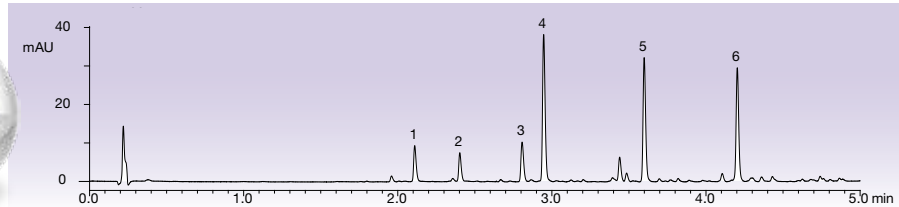
Kinetex 2.6 µm: Achieve sub-2 µm performance on HPLC and UHPLC systems
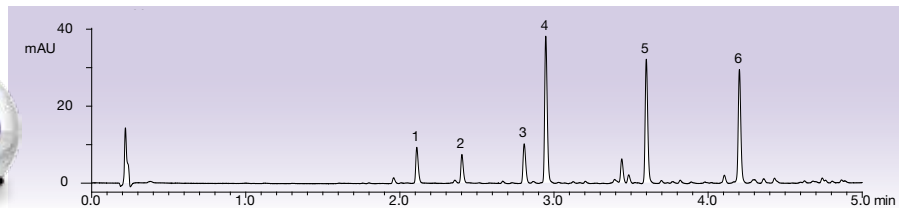
Kinetex 1.7 µm: 20 % higher efficiency than fully porous 1.7 µm columns
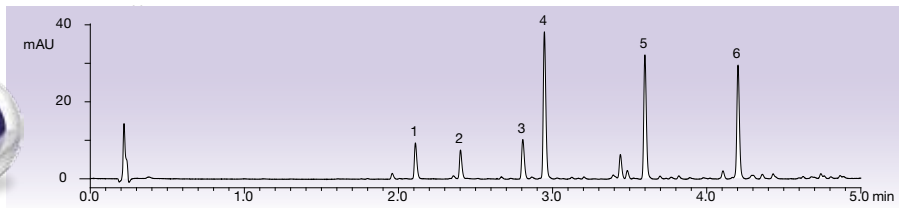
Kinetex 1.3 µm: Incredible UHPLC efficiency and performance gains

*Gingerols analyzed on 50 x 2.1 mm columns

SecurityGuard™ ULTRA

UHPLC Column Protection System for Any Sub-2 µm or Kinetex® Column

Protects with No Loss of Column Performance!

With SecurityGuard ULTRA, contaminants and microparticulates are trapped within the guard cartridge instead of in your expensive UHPLC column. The extremely low dead volume (<0.3 µL) of this unique guard design minimizes sample peak dispersion to maintain column performance without altering your chromatography results.

- Increases column lifetime of virtually all manufacturers' UHPLC columns
- Offers more reproducible chromatography
- For pressures up to 20,000 psi

Cartridge with Holder   Cartridge   Holder

Kinetex 1.7 µm column with and without the SecurityGuard ULTRA cartridge system

WITH SecurityGuard ULTRA

App ID 19860

WITHOUT SecurityGuard ULTRA

App ID 19859
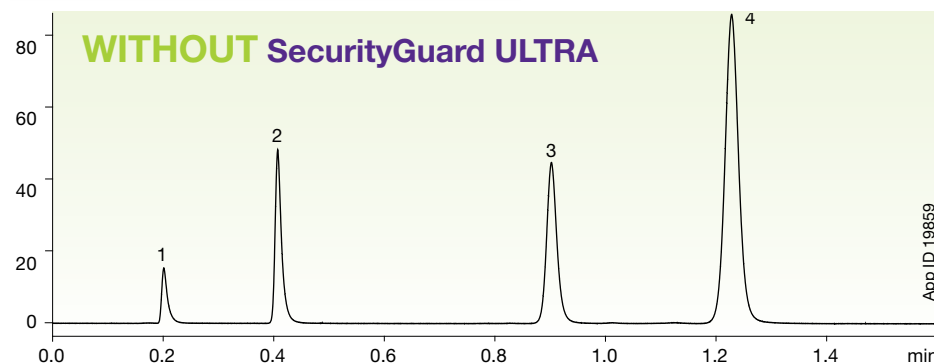
Conditions for both columns:

Column:	Kinetex 1.7 µm XB-C18
Dimensions:	50 x 2.1 mm
Guard Cartridge:	SecurityGuard ULTRA C18 (ODS) 2.1 mm ID Part No.: AJ0-8768
Mobile Phase:	Acetonitrile / Water (50:50)
Flow Rate:	0.5 mL/min
Detection:	UV @ 254 nm

Sample: 1. Uracil
2. Acetophenone
3. Toluene
4. Naphthalene

Parameters	With SecurityGuard ULTRA	Without SecurityGuard ULTRA	Difference
Selectivity	1.36	1.35	-0.99%
Efficiency (Plates/Meter)	237,220	246,080	-3.60%
Backpressure	360	348	3.45%

SecurityGuard™ ULTRA
Guard Cartridge System for Your Ultra-High Performance Columns

Protect Your Investment

When contaminants and particulates build up at the head of your column, system backpressures can increase dramatically. By simply replacing the SecurityGuard ULTRA cartridge, instead of your column, you are able to regain normal operating conditions and reclaim original column performance.

- Extends column lifetimes
- Virtually no change in chromatography
- Easy to use on virtually all manufacturers' UHPLC columns

Cartridge with Holder

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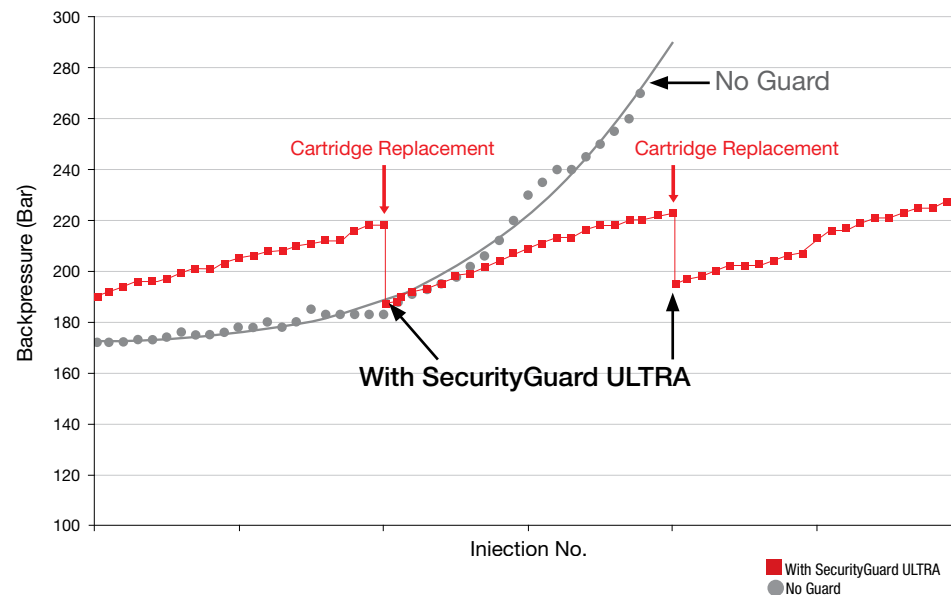
Accelerated lifetime test using endogenous biological matrix on Kinetex 2.6 µm C18 50 x 4.6 mm ID

USP and Ph. Eur. Kinetex® Column Selection

With 4 particle sizes and multiple selectivities, the Kinetex core-shell product line offers an incredible range of options for pharmacopeia methods both old and new!

Want to stick with a 5 µm for your method? No problem! Drop in a Kinetex 5 µm for better performance at low pressures!

| USP Classification & Description		Phase	Particle Sizes
L1	Octadecyl silane chemically bonded to porous or non-porous silica or ceramic microparticles, 1.5 to 10 µm in diameter, or a monolithic silica rod.	Kinetex C18 Kinetex XB-C18	1.3 µm◊, 1.7 µm, 2.6 µm, 5 µm 1.7 µm, 2.6 µm, 5 µm
L3	Porous silica particles, 1.5 to 10 µm in diameter, or a monolithic silica rod	Kinetex HILIC	1.7 µm, 2.6 µm
L7	Octyl silane chemically bonded to totally or superficially porous silica particles, 1.5 to 10 µm in diameter, or a monolithic silica rod.	Kinetex C8	1.7 µm, 2.6 µm, 5 µm
L11	Phenyl groups chemically bonded to porous silica particles, 1.5 to 10 µm in diameter.	Kinetex Phenyl-Hexyl	1.7 µm, 2.6 µm, 5 µm

◊ Available particle sizes that may be used if within the allowable USP adjustments.

Ph. Eur. Number & Description**		Phase	Particle Sizes
1160200	Silica gel for chromatography, alkyl bonded for use with highly aqueous mobile phases.	Kinetex C18 Kinetex XB-C18	1.3 µm*, 1.7*µm, 2.6*µm, 5 µm 1.7*µm, 2.6 µm*, 5 µm
1176900	Silica gel for chromatography, alkyl bonded for use with highly aqueous mobile phases, endcapped.	Kinetex C18 Kinetex XB-C18	1.3 µm*, 1.7 µm*, 2.6*µm, 5 µm 1.7 µm*, 2.6 µm*, 5 µm
1140000	Silica gel for chromatography, di-isobutyloctadecylsilyl.	Kinetex XB-C18	1.7 µm*, 2.6 µm*, 5 µm
1077500	Silica gel for chromatography, octadecylsilyl.	Kinetex C18 Kinetex XB-C18	1.3 µm*, 1.7 µm*, 2.6 µm*, 5 µm 1.7 µm*, 2.6 µm*, 5 µm
1110100	Silica gel for chromatography, octadecylsilyl R1 ultrapure silica (<20 ppm metals), pore size and C-load are indicated in the method.	Kinetex C18 Kinetex XB-C18	1.3 µm*, 1.7 µm*, 2.6 µm*, 5 µm
1077600	Silica gel for chromatography, octadecylsilyl, base-deactivated pretreated before the bonding by careful washing and hydrolyzing most of the superficial siloxane bridges to minimize the interaction with basic components.	Kinetex C18 Kinetex XB-C18	1.3 µm*, 1.7 µm*, 2.6 µm*, 5 µm 1.7 µm*, 2.6 µm*, 5 µm
1115400	Silica gel for chromatography, octadecylsilyl, endcapped. To minimize any interaction with basic compounds it's carefully endcapped to cover most of the remaining silanol groups.	Kinetex C18 Kinetex XB-C18	1.3 µm*, 1.7 µm*, 2.6 µm*, 5 µm
1162600	Silica gel for chromatography, octadecylsilyl, endcapped, base-deactivated R1; pretreated before the bonding by careful washing and hydrolyzing most of the superficial siloxane bridges. To further minimize any interaction with basic compounds it's carefully endcapped to cover most of the remaining silanol groups.	Kinetex C18 Kinetex XB-C18	1.3 µm*, 1.7 µm*, 2.6 µm*, 5 µm
1077700	Silica gel for chromatography, octylsilyl.	Kinetex C8	1.7 µm*, 2.6 µm*, 5 µm

Ph. Eur. Number & Description**		Phase	Particle Sizes
1077701	Silica gel for chromatography, octylsilyl R1. Bonding of octylsilyl and methyl groups (double bonded phase).	Kinetex C8	1.7 µm*, 2.6 µm*, 5 µm
1131600	Silica gel for chromatography, octylsilyl, base-deactivated pretreated before the bonding by careful washing and hydrolyzing most of the superficial siloxane bridges to minimize the interaction with basic components.	Kinetex C8	1.7 µm*, 2.6 µm*, 5 µm
1119600	Silica gel for chromatography, octylsilyl, endcapped. To minimize any interaction with basic compounds it's carefully endcapped to cover most of the remaining silanol groups.	Kinetex C8	1.7 µm*, 2.6 µm*, 5 µm
1148800	Silica gel for chromatography, octylsilyl, endcapped, base-deactivated pretreated before the bonding by careful washing and hydrolyzing most of the superficial siloxane bridges to minimize the interaction with basic components. To further minimize any interaction with basic compounds it's carefully endcapped to cover most of the remaining silanols.	Kinetex C8	1.7 µm*, 2.6 µm*, 5 µm
1153900	Silica gel for chromatography, phenylhexylsilyl.	Kinetex Phenyl-Hexyl	1.7 µm*, 2.6 µm*, 5 µm
1170600	Silica gel for chromatography, phenylhexylsilyl, endcapped. 3 µm; To minimize any interaction with basic compounds it's carefully endcapped to cover most of the remaining silanol groups.	Kinetex Phenyl-Hexyl	1.7 µm*, 2.6 µm*, 5 µm*
1110200	Silica gel for chromatography, phenylsilyl.	Kinetex Phenyl-Hexyl	1.7 µm*, 2.6 µm*, 5 µm
1154900	Silica gel for chromatography, phenylsilyl, endcapped. To minimize any interaction with basic compounds it's carefully endcapped to cover most of the remaining silanol groups.	Kinetex Phenyl-Hexyl	1.7 µm*, 2.6 µm*, 5 µm

* Available particle sizes that may be used if within allowable Ph. Eur. adjustments
**According to European Pharmacopeia (Ph. Eur.) Chapter 4.1.1.

Easy Pharmacopeia Method Optimization

Some of the greatest laboratory cost savings can be realized when an older method is optimized to increase throughput and decrease solvent consumption. With the increased efficiency of Kinetex core-shell technology, Ph. Eur. or USP methods can yield dramatic performance improvements while staying within the allowable adjustments.

Find more details on the allowable adjustments for USP and Ph. Eur. methods at: www.phenomenex.com/kinetex/technicalresources

USP Monograph for the Assay of Ibuprofen

The monograph specifies using a 250 x 4.6 mm column packed with 5 µm media containing a C18 bonded phase under the isocratic conditions shown below. Using a Kinetex 2.6 µm 100 x 4.6 mm column, you can stay within the allowable adjustments specified in USP General Chapter <621>, and still maintain the system suitability of resolution between peaks of no less than 2.5 and a tailing factor for all peaks of no more than 2.5.
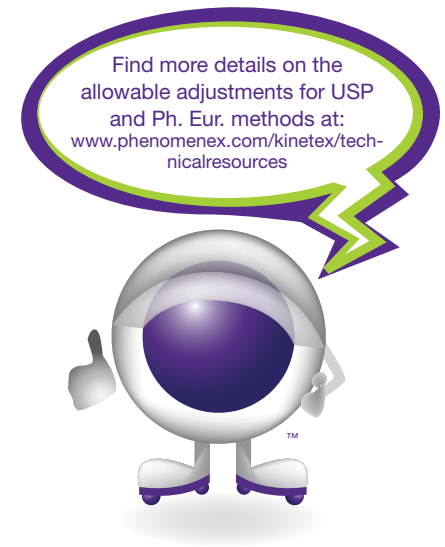
Traditional 5 µm C18

App ID 19612

Kinetex 2.6 µm XB-C18

App ID 19613
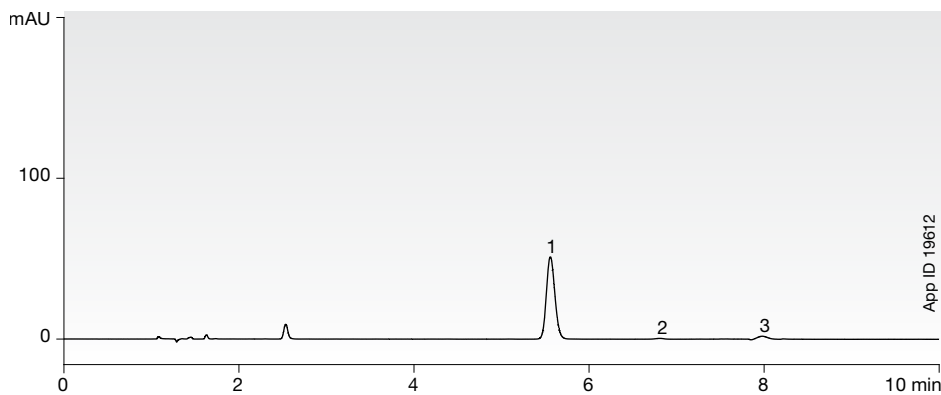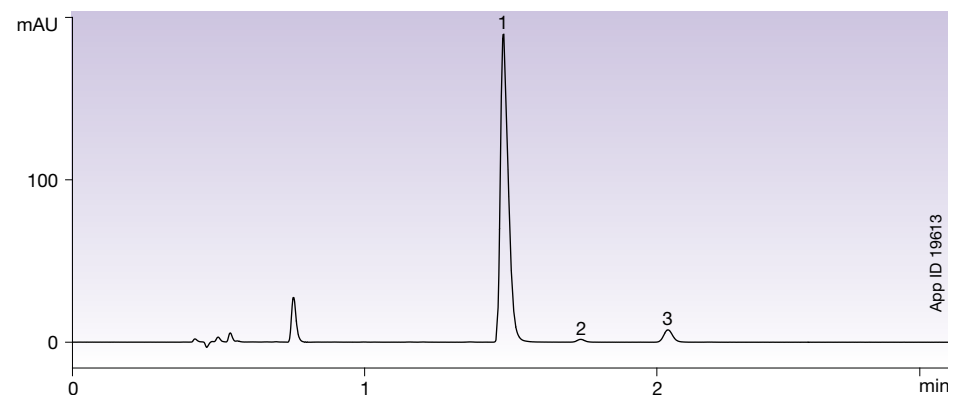
Conditions for both columns:

Column: Kinetex 2.6 µm XB-C18, 100 x 4.6 mm
Traditional 5 µm C18, 250 x 4.6 mm
Mobile Phase: Acetonitrile/Water with 4 g Chloroacetic acid adjusted to pH 3.0 with Ammonium hydroxide (60:40)
Flow Rate: 2.0 mL/min

Temperature: 30 ºC
Detection: UV @ 254 nm
Sample: 1. Ibuprofen
2. Valerophenone
3. Ibuprofen related compound C

Comparative separations may not be representative of all applications.

The In-Lab Core-Shell Technology Demo

The Answer to

Faster
Better
Cheaper

HPLC and UHPLC System Performance

phenomenex®
...breaking with tradition™

Request a FREE on-site demonstration or seminar to see first hand the power of Kinetex Core-Shell Technology:

www.phenomenex.com/kinetexdeminar

We're here to help!

We know that sometimes you don't have the time to pick up the phone, but that doesn't mean we can't answer your questions. Introducing our Kinetex digital tutorial series, where one of our scientists gives first-hand experience and knowledge regarding HPLC/UHPLC topics that are important to you.

www.phenomenex.com/kinetexdigitaltutorials
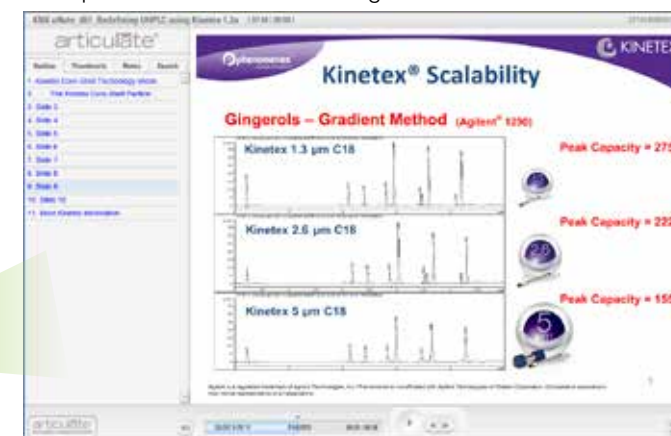
Have an idea for a new digital tutorial or is there a particular topic you are really interested in? Tell us today at:
www.phenomenex.com/wearelistening

Achieve the Best Resolution with the Right Selectivity

Combining the high efficiency of Kinetex Core-Shell Technology with an excellent range of surface chemistries gives you the best opportunity for increased resolution.
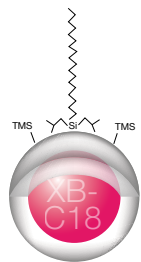
This unique C18 phase yields increased hydrogen bonding with hydrophobic selectivity, resulting in improved peak shape for basic compounds and increased retention of acidic compounds
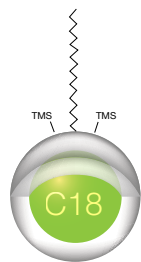
Balanced C18 phase that provides the highest degree of hydrophobic selectivity relative to the other Kinetex phases
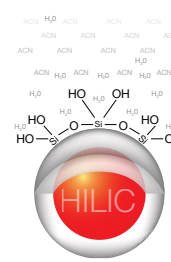
Used under HILIC running conditions, this phase provides the highest polar selectivity for retention and separation of hydrophilic compounds
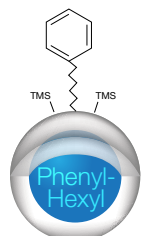
Aromatic and moderate hydrophobic selectivity result in the great retention and separation of aromatic hydrocarbons
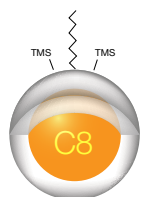
Moderate hydrophobic and steric selectivity is offered, bringing ultra-high performance to USP L7 and other octyl silane methods

Meet the team and see them in action at

www.phenomenex.com/kinetex

Complementary Selectivities

With complementary reversed phases selectivities you can screen for optimal resolution of complex sample mixtures. Manipulate acidic and basic compound elution by simply switching between column chemistries.

Change your peak elution profile
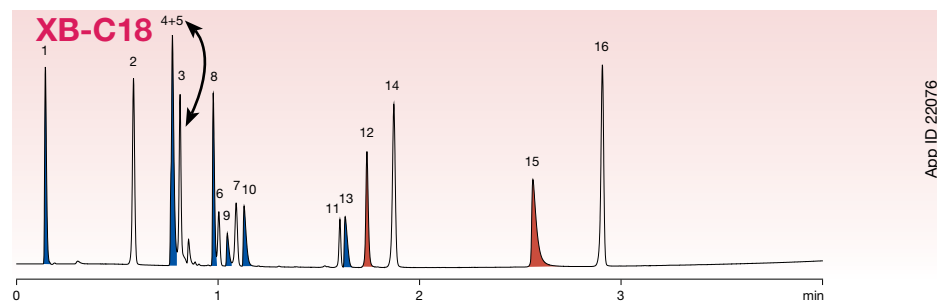
App ID 22076
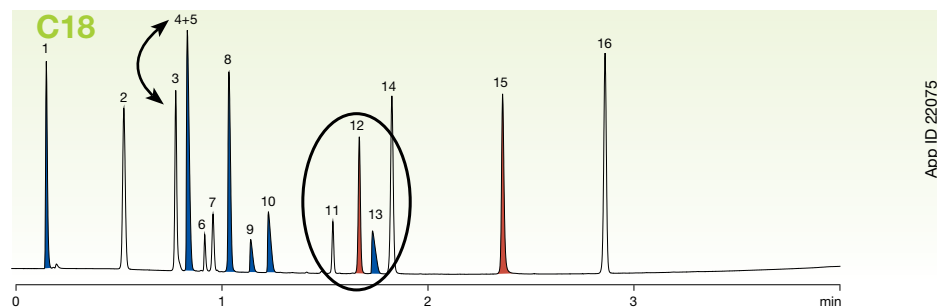
App ID 22075

Conditions for both columns:

Column:	Kinetex® 2.6 µm XB-C18
	Kinetex 2.6 µm C18
Dimensions:	50 x 2.1 mm
Mobile Phase:	A: 0.1% Formic acid in Water
	B: 0.1% Formic acid in Acetonitrile

Gradient:	Time (min)	% B
	0.0	5
	0.2	5
	4.2	95
	4.21	5
	5.5	5

Flow Rate: 0.8 mL/min

Temperature: 30 ºC
Detection: UV @ 254 nm (ambient)
Sample:
1. Pyridine
2. Acetaminophen
3. Pindolol
4. Quinidine
5. Sulfathiazole
6. Acebutolol
7. Benzyl alcohol
8. Chlorpheniramine
9. Phenol
10. Triprolidine
11. Nortriptyline
12. Prednisolone
13. 3-Methyl-4-nitrobenzoic acid
14. 2-Hydroxy-5-methylbenzaldehyde
15. Diflunisal
16. Hexanophenone

Comparative separations may not be representative of all applications.

Increase resolution between compounds
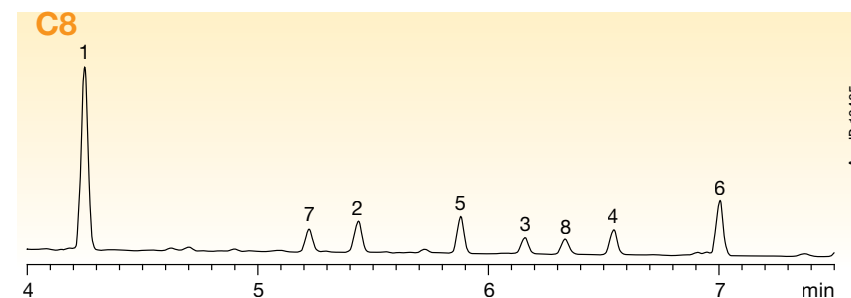
App ID 19465
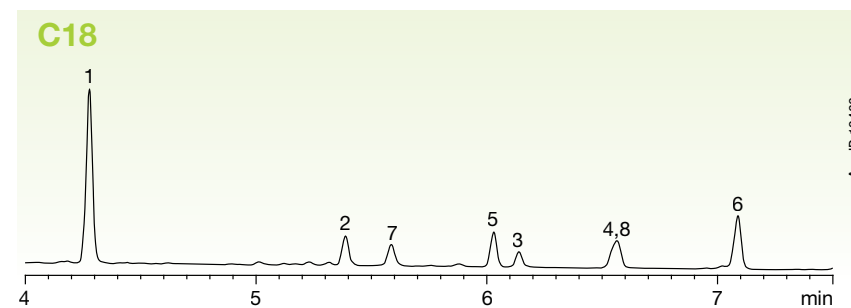
App ID 19466

Conditions for both columns:

Column:	Kinetex 2.6 µm C8
	Kinetex 2.6 µm C18
Dimensions:	100 x 4.6 mm
Mobile Phase:	A: 0.1% Phosphoric acid in Water
	B: 0.1% Phosporic acid in Acetonitrile

Gradient:	Time (min)	% B	Time (min)	% B
	0	30	9	95
	4	50	10	30
	7.5	70		

Flow Rate: 1.5 mL/min
Temperature: 25 ºC
Detection: UV @ 230 nm
Sample:
1. Naproxen
2. Fenoprofen
3. Ibuprofen
4. Phenylbutazone
5. Indomethacin
6. Meclofenamic acid
7. Matrix impurity
8. Matrix impurity

Orthogonal Chemistries

Whether you are looking for a confirmation column or an orthogonal selectivity, both the Kinetex Phenyl-Hexyl and HILIC stationary phases offer excellent solutions for you.

C18

App ID 22075

Phenyl-Hexyl

App ID 22078
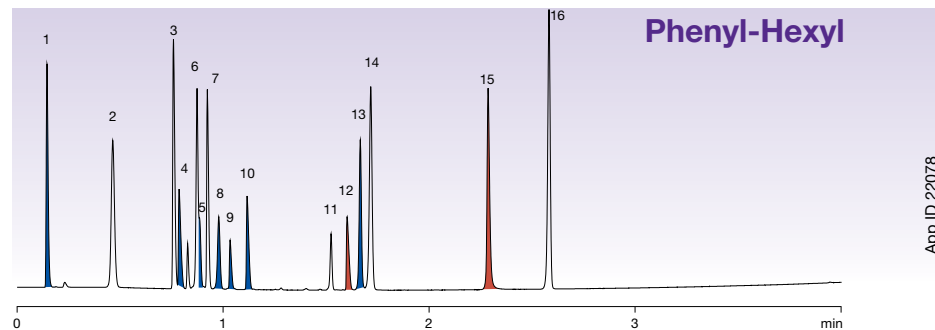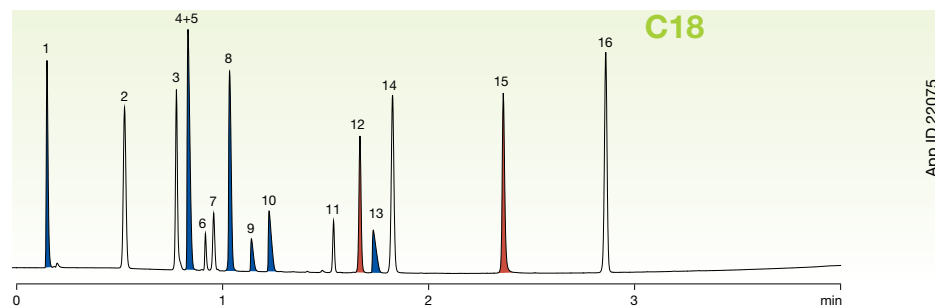
Conditions for both columns:
Column: Kinetex 2.6 µm C18
Kinetex 2.6 µm Phenyl-Hexyl
Dimensions: 50 x 2.1 mm
Mobile Phase: A: 0.1% Formic acid in Water
B: 0.1% Formic acid in Acetonitrile

Gradient:

Time (min)	% B
0.0	5
0.2	5
4.2	95
4.21	5
5.5	5

Flow Rate: 0.8 mL/min

Temperature: 30 °C
Detection: UV @ 254 nm (ambient)
Sample:
1. Pyridine
2. Acetaminophen
3. Sulfathiazole
4. Pindolol
5. Quinidine
6. Benzyl alcohol
7. Phenol
8. Acebutolol
9. Chlorpheniramine
10. Triprolidine
11. Prednisolone
12. 3-Methyl-4-nitrobenzoic acid
13. Nortriptyline
14. 2-Hydroxy-5-methylbenzaldehyde
15. Diflunisal
16. Hexanophenone

Comparative separations may not be representative of all applications.

Norepinephrine and Epinephrine

HILIC

App ID 18605

C18

App ID 18604

Conditions for both columns:
Columns: Kinetex 2.6 µm HILIC
Kinetex 2.6 µm C18
Dimensions: 50 x 2.1 mm
Mobile Phase (HILIC): Acetonitrile / 100 mM Ammonium formate pH 3.2 (92:8)
Mobile Phase (C18): 5 mM Ammonium formate pH 3.2 / Methanol (97:3)
Flow Rate: 0.4 mL/min

Temperature: 30 °C
Detection: UV @ 210 nm (ambient)
Sample: 1. Norepinephrine
2. Epinephrine

Wide Applicability Across Many Industries For Food Analysis

With complementary C18 and Phenyl phases you can screen for optimal resolution of complex sample mixtures. Manipulate acidic and basic compound elution by simply switching between the two column chemistries.

Water Soluble Vitamins

App ID 18842
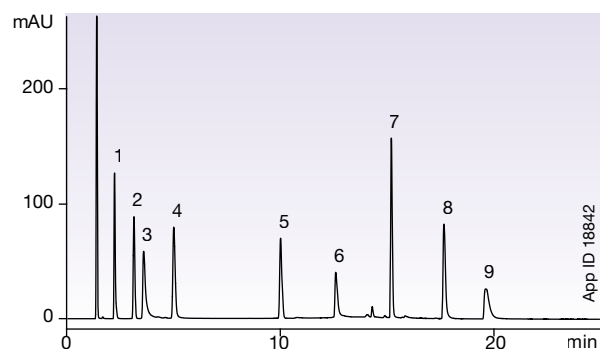
Column:	Kinetex® 2.6 µm HILIC			
Dimensions:	150 x 4.6 mm			
Part No.:	00F-4461-E0			
Mobile Phase:	A: Acetonitrile			
	B: 100 mM Ammonium formate, pH 3.2			
	C: Water			
Gradient:	Time (min)	% A	% B	% C
	0	90	10	0
	5	90	10	0
	20	50	10	40
Flow Rate:	1 mL/min			
Temperature:	Ambient			
Detection:	UV @ 260 nm			

Sample:
1. Nicotinamide
2. PABA
3. Pyridoxine
4. Riboflavin
5. Nicotinic Acid
6. Ascorbic Acid
7. Folic Acid
8. Vitamin B12
9. Thiamine

Melamine and Cyanuric Acid

App ID 18723
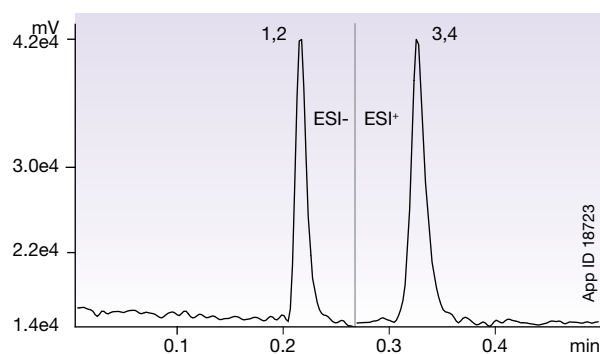
Column:	Kinetex 2.6 µm HILIC
Dimensions:	50 x 2.1 mm
Part No.:	00B-4461-AN
Mobile Phase:	Acetonitrile / 100 mM Ammonium acetate, pH 5.8 (90:10)
Flow Rate:	1.0 mL/min
Temperature:	25 ºC
Detection:	API 3000™ MS
Backpressure:	190 bar
Instrument:	Waters® ACQUITY® UPLC® MS/MS
Sample :	1. Cyanuric acid 128-85.0
	(quant ion),128.0-42.0 (qualifier ion)
	2. Cyanuric acid-13C3 ISTD 131.1-87.0
	3. Melamine 127.1-85 (quant ion), 127.1-68 (qualifier ion)
	4. Melamine-13C3.15N3 ISTD 133.2-89.1

Antibiotic Screen
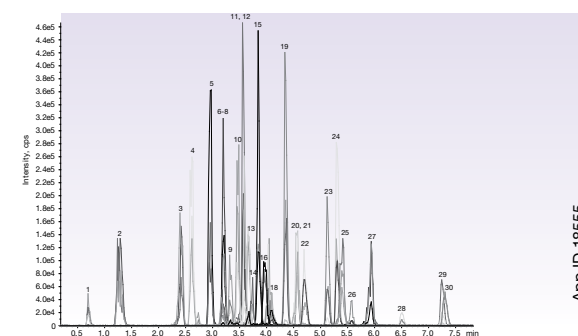
App ID 18555

Column:	Kinetex 2.6 µm C18
Dimensions:	50 x 2.1 mm
Part No.:	00B-4462-AN
Mobile Phase:	A: 0.1 % Formic Acid in Water
	B: 0.1 % Formic Acid in Methanol
Inj. Volume:	10 µL
Flow Rate:	0.5 mL/min
Temperature:	40 ºC
Detection:	Mass spectrometer (MS)

Sample :
1. Sulfanilamide
2. Amoxicillin
3. Lincomycin
4. Sulfadiazine
5. Sulfathiazole
6. Ampicillin
7. Thiamphenicol
8. Sulfamerazine
9. Tetracycline
10. Ciprofloxacin
11. Enrofloxacin
12. Danofloxacin
13. Sulfamethazine
14. Sarafloxacin
15. Sulfamethoxypyridazine
16. Florfenicol
17. Spiramycin
18. Chlorotetracycline
19. Sulfadoxine
20. Clindamycin
21. Tilmicosin
22. Chloramphenicol
23. Sulfadimethoxine
24. Sulfaquinoloxaline
25. Erythromycin
26. Tylosin
27. Josamycin
28. Penicillin G
29. Cloxacillin
30. Flunixin

Wide Applicability Across Many Industries For Environmental Analysis

Polyaromatic Hydrocarbons (PAHs): EPA Method 610

App ID 18552
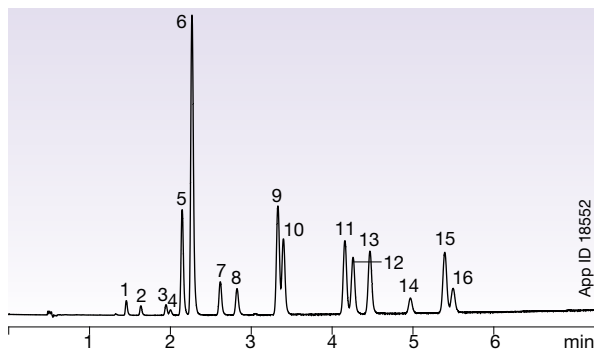
Column:	Kinetex 2.6 µm C18
Dimensions:	100 x 4.6 mm
Part No.:	00D-4462-E0
Mobile Phase:	A: Water
	B: Acetonitrile
Gradient:	(30:70) A/B to (0:100) A/B over 10 min
Flow Rate:	1.5 mL/min
Temperature:	30 °C
Detection:	UV @ 254 nm

Sample:
1. Naphthalene
2. Acenaphthylene
3. Fluorene
4. Acenaphthene
5. Phenanthrene
6. Anthracene
7. Fluoranthene
8. Pyrene
9. Chrysene
10. Benz[a]anthracene
11. Benzo[b]fluoranthene
12. Benzo[k]fluoranthene
13. Benzo[a]pyrene
14. Dibenz[a,h]anthracene
15. Indeno[1,2,3-cd]pyrene
16. Benzo[g,h,i]perylene

Estrone, Estradiol, and Estriol from Water

App ID 19680
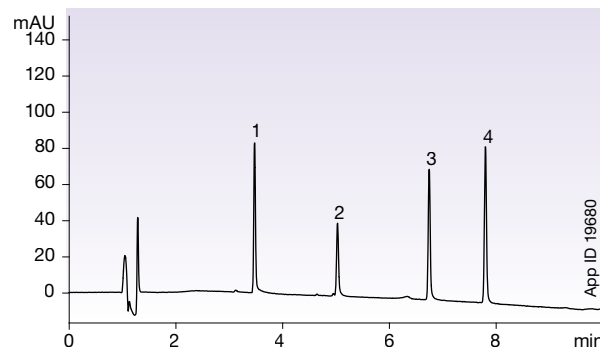
Column:	Kinetex 2.6 µm XB-C18
Dimensions:	150 x 4.6 mm
Part No.:	00F-4496-E0
Mobile Phase:	A: 6.9 mM Ammonium acetate pH 4.0 with 25 % Acetonitrile (v/v)
	B: Acetonitrile

Gradient:	Time (min)	% B
	0	0
	10	65

Flow Rate:	1.2 mL/min
Temperature:	22 ºC
Detection:	UV @ 230 nm

Sample:
1. Estriol
2. Ethyl Paraben (ISS)
3. 17B Estradiol
4. Estrone

Access hundreds of Kinetex applications at

www.phenomenex.com/kinetex

Wide Applicability Across Many Industries
For Clinical Analysis

25-OH Vitamin D2 and D3 from Serum
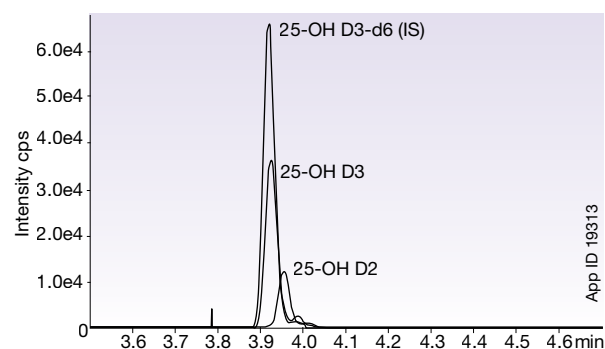
Column: Kinetex® 2.6 µm C18
Dimensions: 50 x 4.6 mm
Part No.: 00B-4462-E0
Mobile Phase: A: 0.05 % Formic acid
B: 5 mM Ammonium acetate + 0.1 % Formic acid in Methanol

Gradient:

Time (sec)	% B
0	8
5	8
205	100
290	100
360	8

Flow Rate: 1 mL/min
Temperature: 35 ºC
Detection: MS (ambient)
Sample : 1. 25-hydroxyvitamin D3 (25-OH D3)
2. 25-hydroxyvitamin D3-d6 (25-OH D3-d6)
3. 25-hydroxyvitamin D2 (25-OH D2)

Ethyl Sulfate and Ethyl Glucuronide
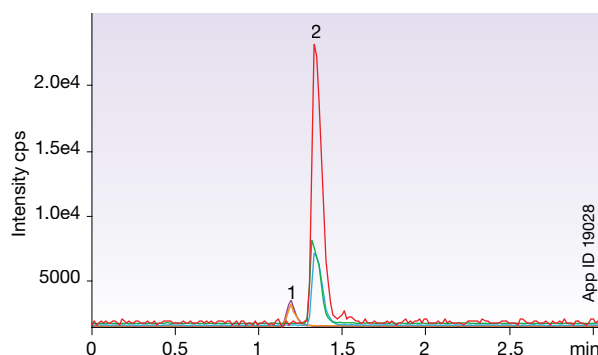
Column: Kinetex 2.6 µm C18
Dimensions: 100 x 2.1 mm
Part No.: 00D-4462-AN
Mobile Phase: A: 5 mM Ammonium formate
B: Methanol

Gradient:

Time (min)	% B
0	5
3	10
4	95
4.01	5

Flow Rate: 0.2 mL/min
Temperature: 25 ºC
Detection: MS (ambient)
Sample : 1. Ethyl Glucuronide (EtG) + IS (EtG-d5)
2. Ethyl Sulfate (EtS) + IS (EtS-d5)

Testosterone from Male Plasma
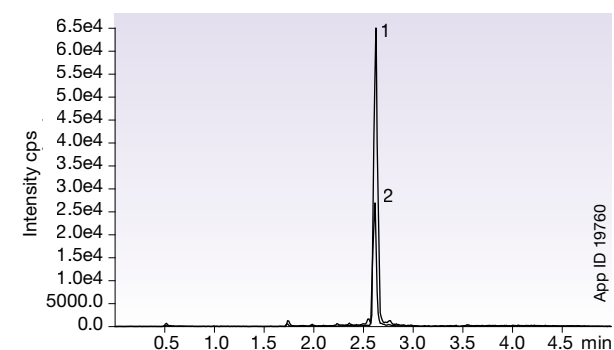
Column: Kinetex 1.7 µm C18
Dimensions: 30 x 2.1 mm
Part No.: 00A-4475-AN
Mobile Phase: A: 0.1 % Formic acid + 1 mM Ammonium Formate in Water
B: 0.1 % Formic acid + 1 mM Ammonium Formate in Acetonitrile

Gradient:

Time (min)	% B
0	10
2.5	90
3.5	90
3.6	10

Flow Rate: 0.4 mL/min
Temperature: 55 ºC
Detection: MS (ambient)
Sample : 1. Testosterone
2. Testosterone-d3

Wide Applicability Across Many Industries For Clinical Analysis

Digoxin and Digitoxin in Plasma

App ID 19691
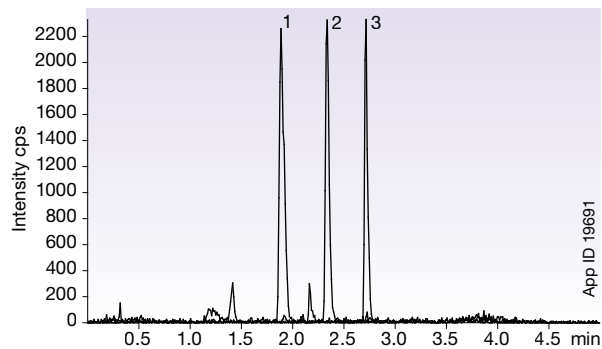
Column:	Kinetex 2.6 µm C18	
Dimensions:	50 x 2.1 mm	
Part No.:	00B-4497-AN	
Mobile Phase:	A: 10 mM Ammonium acetate	
	B: 10 mM Ammonium acetate in Methanol	

Gradient:	Time (min)	% B
	0	50
	2.5	100
	2.51	50
	5	50

Flow Rate:	0.4 mL/min
Temperature:	30 ºC
Detection:	MS @ 350 ℃
Sample :	Concentration 0.25 mg/mL each
	1. Digoxin
	2. Oleandrin (IS)
	3. Digitoxin

Steroids
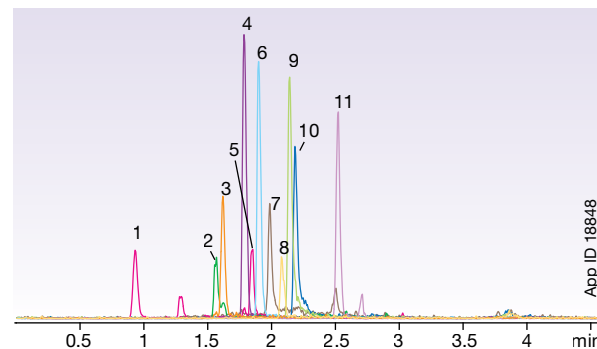
App ID 18848

Column:	Kinetex 2.6 µm C18	
Dimensions:	50 x 2.1 mm	
Part No.:	00B-4462-AN	
Mobile Phase:	A: 0.1 % Formic acid in Water	
	B: 0.1 % Formic acid in Acetonitrile	

Gradient:	Time (min)	% B	Time (min)	% B
	0	20	2.8	95
	2.5	80	2.81	20
	2.51	95	4.6	20

Flow Rate:	450 µL/min
Temperature:	25 ℃
Detection:	MS (ambient)

Sample:
1. Triamcinolone
2. Prednisolone
3. Cortisone
4. Betamethasone
5. Corticosterone
6. Triamcinolone acetonide
7. 11-α-Hydroxyprogesterone
8. Cortisone acetate
9. Testosterone
10. 11-Ketoprogesterone
11. Betamethasone 17-valerate

Preview your current method enhanced with Kinetex Core-Shell Technology

www.phenomenex.com/tools/kinetexcalculator

Wide Applicability Across Many Industries
For Pharmaceutical Analysis

Forced Degradation of Ranitidine

Undegraded Sample

App ID 18599

App ID 18600
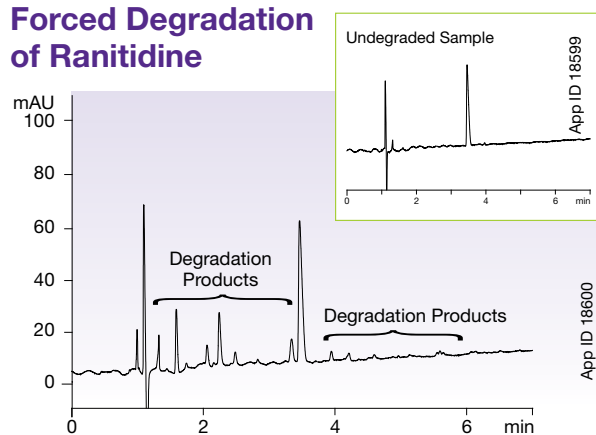
Column:	Kinetex® 2.6 µm C18
Dimensions:	150 x 4.6 mm
Part No.:	00F-4462-E0
Mobile Phase:	A: 0.1 % Formic acid in Water
	B: 0.1 % Formic acid in Acetonitrile
Gradient:	5 % to 20 % B in 7 min. 20 % to 95 % in 2 min
Flow Rate:	1.4 mL/min
Temperature:	30 ºC
Detection:	UV @ 230 nm (22 ºC)
Sample:	Ranitidine 1 mg/mL in Methanol. Heated at 65 ºC for 4 days.

Tricyclic Antidepressants

App ID 19306
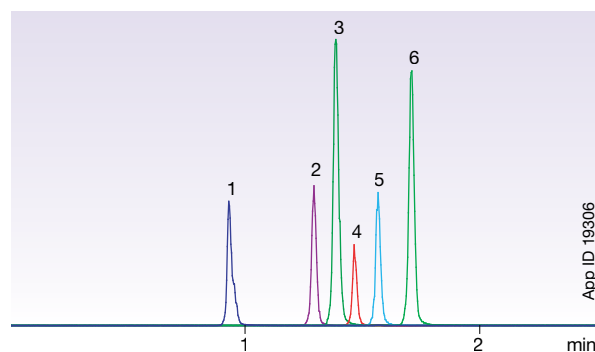
Column:	Kinetex 1.7 µm C18
Dimensions:	50 x 2.1 mm
Part No.:	00B-4475-AN
Mobile Phase:	A: Water with 0.05 % Formic acid
	B: Acetonitrile with 0.05 % Formic acid

Gradient:	Time (min)	% B
	0	30
	2	40
	3	95
	3.1	30
	4.5	30

Flow Rate:	0.6 mL/min
Temperature:	40 ºC
Detection:	MS (ambient)
Sample :	1. Doxepin
	2. Desipramine
	3. Imipramine
	4. Nortriptyline
	5. Amitriptyline
	6. Trimipramine

Pharmaceutical Mixture

App ID 19476

Column:	Kinetex 2.6 µm C8
Dimensions:	50 x 2.1 mm
Part No.:	00B-4497-AN
Mobile Phase:	A: 0.1 % Formic acid in Water
	B: 0.1 % Formic acid in Acetonitrile

Gradient:	Time (min)	% B
	0	5
	0.2	5
	4	95

Flow Rate:	0.8 mL/min
Temperature:	22 ºC
Detection:	UV @ 254 nm (ambient)

Sample :

1. Pyridine	10. Triprolidine
2. Acetaminophen	11. Prednisolone
3. Sulfathiazole	12. 3-Methyl-4-nitrobenzoic acid
4. Pindolol	13. Nortriptyline
5. Quinidine	14. 2-Hydroxy-5-methylbenzaldehyde
6. Benzyl Alcohol	15. Diflunisal
7. Phenol	16. Hexanophenone
8. Acebutolol	
9. Chlorpheniramine	

Wide Applicability Across Many Industries For Forensic Analysis

Barbiturates in Urine

App ID 19724

	Column:	Kinetex 2.6 μm C18
	Dimensions:	100 x 2.1 mm
	Part No.:	00D-4462-AN
	Mobile Phase:	A: 5 mM Ammonium acetate
		B: Acetonitrile

Gradient:	Time (min)	% B
	0	10
	10	45
	10.01	90
	12	90
	12.01	10
	16	10

	Flow Rate:	0.4 mL/min
	Temperature:	22 ºC
	Detection:	MS
	Sample :	1. Phenobarbital-D5
		2. Phenobarbital
		3. Butalbital-D5
		4. Butalbital
		5. Pentobarbital
		6. Amobarbital
		7. Secobarbital

Amphetamines

App ID 19492
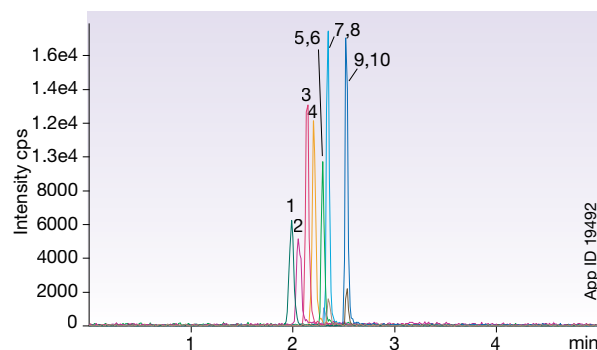
	Column:	Kinetex 2.6 μm XB-C18
	Dimensions:	50 x 2.1 mm
	Part No.:	00B-4496-AN
	Mobile Phase:	A: 5 mM Ammonium formate with 0.1 % Formic acid
		B: Methanol with 0.1 % Formic acid

Gradient:	Time (min)	% B
	0	10
	1	70
	3	70

	Flow Rate:	0.4 mL/min
	Temperature:	22 ºC
	Detection:	MS
	Sample :	1. Amphetamine-D11
		2. Amphetamine
		3. Methamphetamine-D14
		4. Methamphetamine
		5. MDA-D5
		6. MDA
		7. MDMA-D5
		8. MDMA
		9. MDEA-D5
		10. MDEA
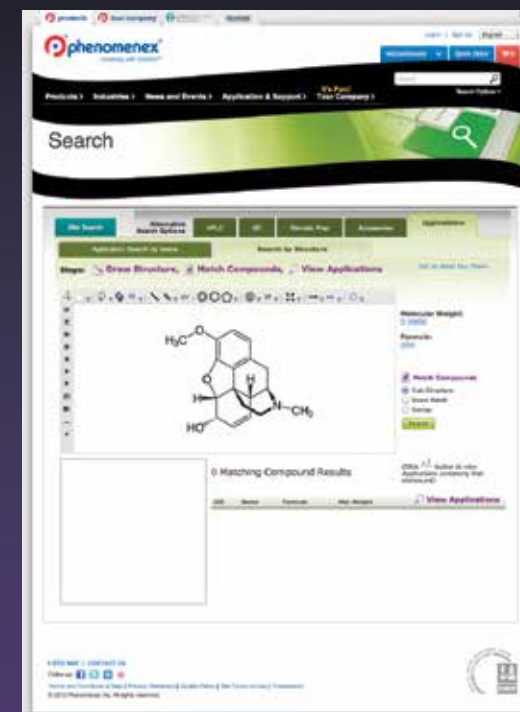
Draw it. Find it.

Application search by compound structure!

www.phenomenex.com/application/structuresearch

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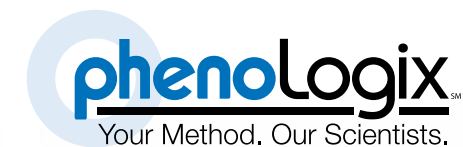
Trust your samples in the hands of our experts!

LEVEL **1** **Phase Screening**

Identify the correct column stationary phase, particle type, and dimensions to give optimum performance.

LEVEL **2** **Pre-Validation**

Perform ICH validation parameters to demonstrate method accuracy, precision, and robustness.

LEVEL **3** **On-site Method Transfer**

A PhenoLogix representative will assist with method transfer and demonstrate that the method works in your laboratory. They will also provide training for your staff on important details of the new method.

For more information or to begin a project today,
please contact your local Phenomenex representative.
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You can also visit us online at
www.phenomenex.com/PhenoLogix

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Your Method. Our Scientists.

Don't Mask Ultra-High Performance

Tips and Tricks for Using Core-shell Columns on HPLC Instruments

Minimize the extra-column volume from the injector to the column

- Use a low-volume injection system if you are not using an autosampler
- Use 0.12 mm ID (0.005 in.) or 0.17 mm ID (0.007 in.) tubing whenever possible
- Minimize the length of all connection tubing
- Ensure tubing is seated properly at every connection
- Use extremely low dead-volume fittings (see page 53)
- Use an extremely low dead-volume in-line filter (see SecurityGuard™ ULTRA on pages 36, 37, 53, and 55)

Minimize peak dispersion and detector contribution after the column

- To avoid extra column band broadening effects, check the flow cell volume to verify that it is no more than $1/3$ the peak volume
- Standard flow cells on conventional LC systems can be > 10 µL. For best results, replace standard flow cells with < 3 µL flow cells (< 2 µL when using 2.1 mm ID columns).
- Increase the detector scan rate. 0.1 seconds to 0.15 seconds is recommended for increased data collection.

Watch simple system optimization videos at
www.phenomenex.com/enhancement

Maximize Performance with Kinetex 2.6 µm

www.phenomenex.com/enhancement

Choosing the Best Kinetex® Column

Upgrade Your 3µm or 5µm Column

Fully Porous	Kinetex Core-Shell	Kinetex Core-Shell
If Presently Using: **(Length, Particle Size)**	**For Equivalent Resolving Power and Faster** **Analysis* Use: (Length, Particle Size)**	**For Greater Resolving Power** **Use: (Length, Particle Size)**
250 mm, 5 µm	150 mm, 5 µm or 75 mm, 2.6 µm	250 mm, 5 µm or 150 mm, 2.6 µm
150 mm, 5 µm	100 mm, 5 µm or 50 mm, 2.6 µm	150 mm, 5 µm or 100 mm, 2.6 µm
150 mm, 3 µm	150 mm, 5 µm or 75 mm, 2.6 µm	250 mm, 5 µm or 150 mm, 2.6 µm
100 mm, 3 µm	100 mm, 5 µm or 50 mm, 2.6 µm	150 mm, 5 µm or 100 mm, 2.6 µm
50 mm, 3 µm	50 mm, 5 µm or 30 mm, 2.6 µm	100 mm, 5 µm or 50 mm, 2.6 µm

*Faster analysis via potential increase in linear velocity.

Upgrade Your Sub-2µm Column

Fully Porous	Kinetex Core-Shell	Kinetex Core-Shell
If Presently Using: **(Length, Particle Size)**	**For Equivalent Resolving Power and Faster** **Analysis* Use: (Length, Particle Size)**	**For Greater Resolving Power Use:** **(Length, Particle Size)**
150 mm, sub-2 µm	150 mm, 2.6 µm	150 mm, 1.7 µm
100 mm, sub-2 µm	100 mm, 2.6 µm	100 mm, 1.7 µm or 150 mm, 2.6 µm
50 mm, sub-2 µm	50 mm, 2.6 µm	50 mm, 1.7 µm or 100 mm, 2.6 µm

Try the Kinetex 1.3 µm for incredible UHPLC efficiency gains!

- ○ Kinetex 100 x 2.1 mm, 1.7 µm
- ● Kinetex 50 x 2.1 mm, 1.7 µm
- ✳ Kinetex 150 x 2.1 mm, 2.6 µm
- ✛ Kinetex 100 x 2.1 mm, 2.6 µm
- ✕ Kinetex 50 x 2.1 mm, 2.6 µm
- △ Kinetex 150 x 4.6 mm, 2.6 µm
- ▪ Kinetex 100 x 4.6 mm, 2.6 µm
- ◆ Kinetex 50 x 4.6 mm, 2.6 µm

Expected Backpressure at Different Flow Rates**

There is an optimal Kinetex column for your system and operating conditions. Use these graphs to determine the starting Kinetex particle size and dimension for your method.

50:50 (Acetonitrile / Water)

60:40 (Methanol / Water)
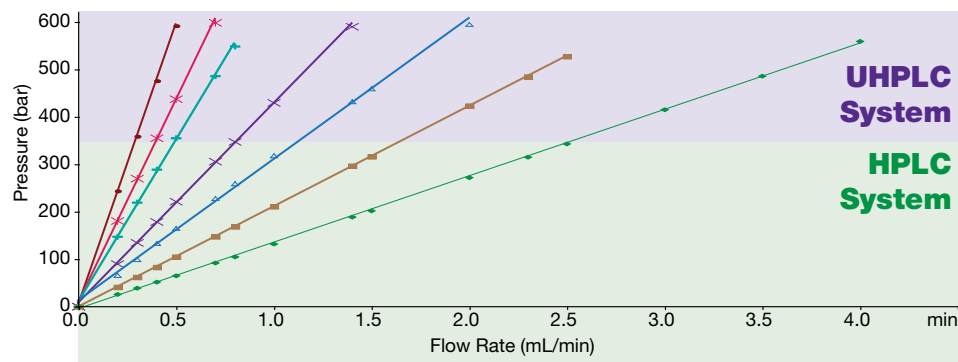
Backpressures for Kinetex 5 µm columns will be approximately half that of a traditional fully porous 3 µm of the same dimension and equal backpressure to a fully porous 5 µm of the same dimension.

Backpressures for the Kinetex 1.3 µm will be approximately double that of a core-shell or traditional fully porous 1.7 µm of an equivalent column dimension.

** Due to variation in system, sample and method parameters, graphs provided may not be representative of all applications. Data generated on Agilent® 1200 SL.

Ordering Information

Phenex™ RC (Regenerated Cellulose) Syringe Filters

- Rapid filtration of HPLC and GC samples prior to analysis
- Particulated, PVC, and extractable-free filters
- Universal filter compatible with both aqueous and mixed organic solutions

Choose filter diameter based on sample volume

Tip:
When using particle sizes equal to or smaller than 3 µm, we recommend the use of 0.20 µm Phenex syringe filters.

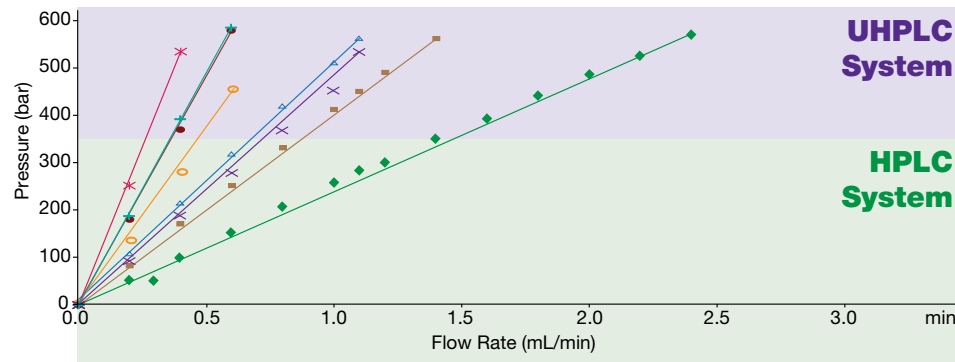|	4 mm Diameter for ≤ 2 mL sample volumes			15 mm Diameter for 2 - 10 mL sample volumes			25 - 28 mm Diameter for 10 - 100 mL sample volumes		
Membrane Type/Size	Part No.	Unit	Price	Part No.	Unit	Price	Part No.	Unit	Price
0.20 µm									
Phenex-RC (Regenerated Cellulose)	AF0-3203-12	100/ pk		AF0-2203-12	100/ pk		AF0-8203-12[1]	100/ pk	
	AF0-3203-52	500/ pk		AF0-2203-52	500/ pk		AF0-8203-52[1]	500/ pk	
0.45 µm									
Phenex-RC (Regenerated Cellulose)	AF0-3103-12	100/ pk		AF0-2103-12	100/ pk		AF0-8103-12[1]	100/ pk	
	AF0-3103-52	500/ pk		AF0-2103-52	500/ pk		AF0-8103-52[1]	500/ pk	

Footnote:
1. 26 mm diameter.
Additional dimensions and membrane types are available. Please contact your local Phenomenex technical consultant or distributor for availability or assistance.
Larger quantity purchases at significant savings are available.

UHPLC / HPLC Sure-Lok™ High Pressure PEEK Male Nut Fittings

- UHPLC / HPLC Sure-Lok High Pressure PEEK male nut fittings are recommended for installation of Kinetex columns
- Convenient one-piece design (AQ0-8503) is pressure rated to 12,000 psi (827 bar)
- A handy fitting tightening tool (AQ0-8530) is available to facilitate achievement of a leak-free connection

Part No.	Description	Unit	Price
AQ0-8503	Sure-Lok High Pressure PEEK 1-Pc Nut, 10-32, for 1/16 in. Tubing, 12,000 psi (827 bar)	10/pk	
AQ0-8530	Sure-Lok Fitting Tightening Tool, Aluminum	ea	

SecurityGuard™ ULTRA Cartridge System*

The SecurityGuard ULTRA cartridge system protects ultra-high performance columns, like Kinetex, from damaging contaminants and microparticulates.

- Extend Kinetex column lifetime
- Simple to use
- Pressure rated to 20,000 psi (1,378 bar)
- Fits virtually all manufacturers' columns (2.1 to 4.6 mm ID)

SecurityGuard ULTRA Guard Cartridge Holder	ea	Price
AJ0-9000		

Core-Shell Performance Enhancement Kit

The Core-Shell Performance Enhancement Kit comes complete with all the tubing and fittings that is needed to decrease the system dwell volume of your HPLC instrument, instantly improving the observed performance of your Kinetex® core-shell column.

Core-Shell Performance Enhancement Kit			
Part No.	Description	Unit	Price
AQ0-8892	Core-Shell Performance Enhancement Kit, Includes: PEEKsil™ Tubing, Fittings and Tool	ea	
Core-Shell Performance Enhancement Kit AQ0-8892 includes:		**Kit Quantity**	
	PEEKsil Tubing 0.100 mm ID x 1/16 in. OD x 20 cm L, Red	2/pk	
	PEEKsil Tubing 0.100 mm ID x 1/16 in. OD x 10 cm L, Red	ea	
	Sure-Lok™ High Pressure PEEK 1-Pc Nut, 10-32, for 1/16 in. Tubing	10/pk	
	Sure-Lok Fitting Tightening Tool, Aluminum	ea	
Accessories and Replacement Parts			
Part No.	Description	Unit	Price
AT0-8896	PEEKsil Tubing 0.100 mm ID x 1/16 in. OD x 20 cm L, Red	5/pk	
AT0-8897	PEEKsil Tubing 0.100 mm ID x 1/16 in. OD x 10 cm L, Red	5/pk	
AQ0-8503	Sure-Lok High Pressure PEEK 1-Pc Nut, 10-32, for 1/16 in. Tubing	10/pk	
AQ0-8530	Sure-Lok Fitting Tightening Tool, Aluminum	ea	

Material Characteristics

Material Characteristics

Packing Material	Total Particle Size (μm)	Pore Size (Å)	Effective Surface Area (m²/g)	Effective Carbon Load %	pH Stability	Pressure Stability
Kinetex XB-C18	5	100	200	10	1.5 - 8.5**	
Kinetex C18	5	100	200	12	1.5 - 8.5**	1000/600▴ bar
Kinetex C8	5	100	200	8	1.5 - 8.5**	
Kinetex Phenyl-Hexyl	5	100	200	11	1.5 - 8.5**	
Kinetex XB-C18	2.6	100	200	10	1.5 - 8.5**	
Kinetex C18	2.6	100	200	12	1.5 - 8.5**	
Kinetex C8	2.6	100	200	8	1.5 - 8.5**	1000/600▴ bar
Kinetex HILIC	2.6	100	200	0	2.0 - 7.5	
Kinetex Phenyl-Hexyl	2.6	100	200	11	1.5 - 8.5**	
Kinetex XB-C18	1.7	100	200	10	1.5 - 8.5**	
Kinetex C18	1.7	100	200	12	1.5 - 8.5**	
Kinetex C8	1.7	100	200	8	1.5 - 8.5**	1000 bar
Kinetex HILIC	1.7	100	200	0	2.0 - 7.5	
Kinetex Phenyl-Hexyl	1.7	100	200	11	1.5 - 8.5**	
Kinetex C18	1.3	100	200	12	1.5 - 8.5**	1000 bar

**Columns are pH stable from 1.5-10 under isocratic conditions. Columns are pH stable 1.5-8.5 under gradient 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 Particle

	1.3 μm	1.7 μm	2.6 μm	5 μm
System Compatibility	UHPLC	UHPLC	UHPLC & HPLC	HPLC & PREP LC
Typical Efficiency (p/m)	> 400,000	~320,000	~280,000	~180,000
Typical Backpressure (bar)	> 400	> 400	200-350	< 250 bar

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Comparative separations may not be representative of all applications.

SecurityGuard is patented by Phenomenex. U.S. Patent No. 6,162,362. CAUTION: this patent only applies to the analytical-sized guard cartridge holder, and does not apply to SemiPrep, PREP or ULTRA holders, or to any cartridges.

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

Verify that your getting the best performance out of your Kinetex column!

www.phenomenex.com/verify

Ordering Information

5µm Columns (mm)

	50 x 2.1	SecurityGuard™ ULTRA Cartridges* 3/pk	50 x 4.6	100 x 4.6	150 x 4.6	250 x 4.6	SecurityGuard ULTRA Cartridges* 3/pk
XB-C18	00B-4605-AN	AJ0-8782	00B-4605-E0	00D-4605-E0	00F-4605-E0	00G-4605-E0	AJ0-8768
C18	00B-4601-AN	AJ0-8782	00B-4601-E0	00D-4601-E0	00F-4601-E0	00G-4601-E0	AJ0-8768
C8	00B-4608-AN	AJ0-8784	00B-4608-E0	00D-4608-E0	00F-4608-E0	00G-4608-E0	AJ0-8770
Phenyl-Hexyl	00B-4603-AN	AJ0-8788	00B-4603-E0	00D-4603-E0	00F-4603-E0	00G-4603-E0	AJ0-8774
		for 2.1 mm ID					for 4.6 mm ID

* SecurityGuard ULTRA cartridges require holder, Part No. AJ0-9000.

5µm Axia™ Packed Preparative Columns (mm)

	50 x 21.2	100 x 21.2	150 x 21.2	250 x 21.2	SecurityGuard PREP Cartridges** 15 x 21.2 /ea
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
					for 18-29 mm ID

** SecurityGuard PREP cartridges require holder, Part No. AJ0-8223.

5 µm Axia Packed Preparative Columns (mm)

	50 x 30.0	100 x 30.0	150 x 30.0	250 x 30.0	SecurityGuard PREP Cartridges*** 15 x 30.0 /ea
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-4608-U0-AX	AJ0-9216
					for 30.0 mm ID

***PREP SecurityGuard Cartridges require holder, Part No.: AJ0-8277.

1.3µm Columns (mm)

	50 x 2.1
C18	00B-4515-AN

SecurityGuard ULTRA Cartridge Holder

Part No.	Unit
AJ0-9000	ea

1.7µm MidBore Columns (mm)

	30 x 3.0	50 x 3.0	100 x 3.0	SecurityGuard ULTRA Cartridges* 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
Phenyl-Hexyl	—	—	—	AJ0-8781
				for 3.0 mm ID

1.7µm Minibore Columns (mm)

	30 x 2.1	50 x 2.1	100 x 2.1	150 x 2.1	SecurityGuard ULTRA Cartridges* 3/pk
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

2.6µm Analytical Columns (mm)

	30 x 4.6	50 x 4.6	75 x 4.6	100 x 4.6	150 x 4.6	SecurityGuard ULTRA Cartridges* 3/pk
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

2.6µm MidBore™ Columns (mm)

	30 x 3.0	50 x 3.0	75 x 3.0	100 x 3.0	150 x 3.0	SecurityGuard ULTRA Cartridges* 3/pk
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	—	—	—	00D-4495-Y0	00F-4495-Y0	AJ0-8781
						for 3.0 mm ID

2.6µm Minibore Columns (mm)

	30 x 2.1	50 x 2.1	75 x 2.1	100 x 2.1	150 x 2.1	SecurityGuard ULTRA Cartridges* 3/pk
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

* SecurityGuard ULTRA cartridges require holder, Part No. AJ0-9000.

R&D 100 Award Recipient

guarantee

If you are not completely satisfied with Kinetex core-shell columns, return the column with comparative data within 45 days for a FULL REFUND.

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