A close-up photograph of a white laboratory tray filled with numerous small, blue, cylindrical vials. A metal tool with a black knurled top and a silver body is positioned vertically, resting on one of the vials. The background is a blurred, textured blue surface.

The Ultimate Guide to HPLC/UHPLC Reversed Phase Selectivity

 **phenomenex**[®]
...breaking with traditionSM



How do you choose a column?

Do you reach into a drawer of mystery columns, look to your favorite C18 phase, or borrow one from a colleague? How about choosing the right column based on the right solid support, the right phase selectivity, and the right material characteristics for your method. We have developed multiple tools—ColumnMatch.com™, this selectivity guide, and a handheld reversed phase column screener—for you to quickly find the perfect column for your method.

Use the Online Application ColumnMatch.com™

Finally, a reversed phase column screening application that instantly sorts through the available selectivities and finds the right column for your application.

Convenient Screening Methods

Screen by compound characteristics, pharmacopeia classification, application, or recommended alternative.

Customized Solution

Receive column and running condition recommendations based on parent compound structures and the functionality differences of a critical pair.

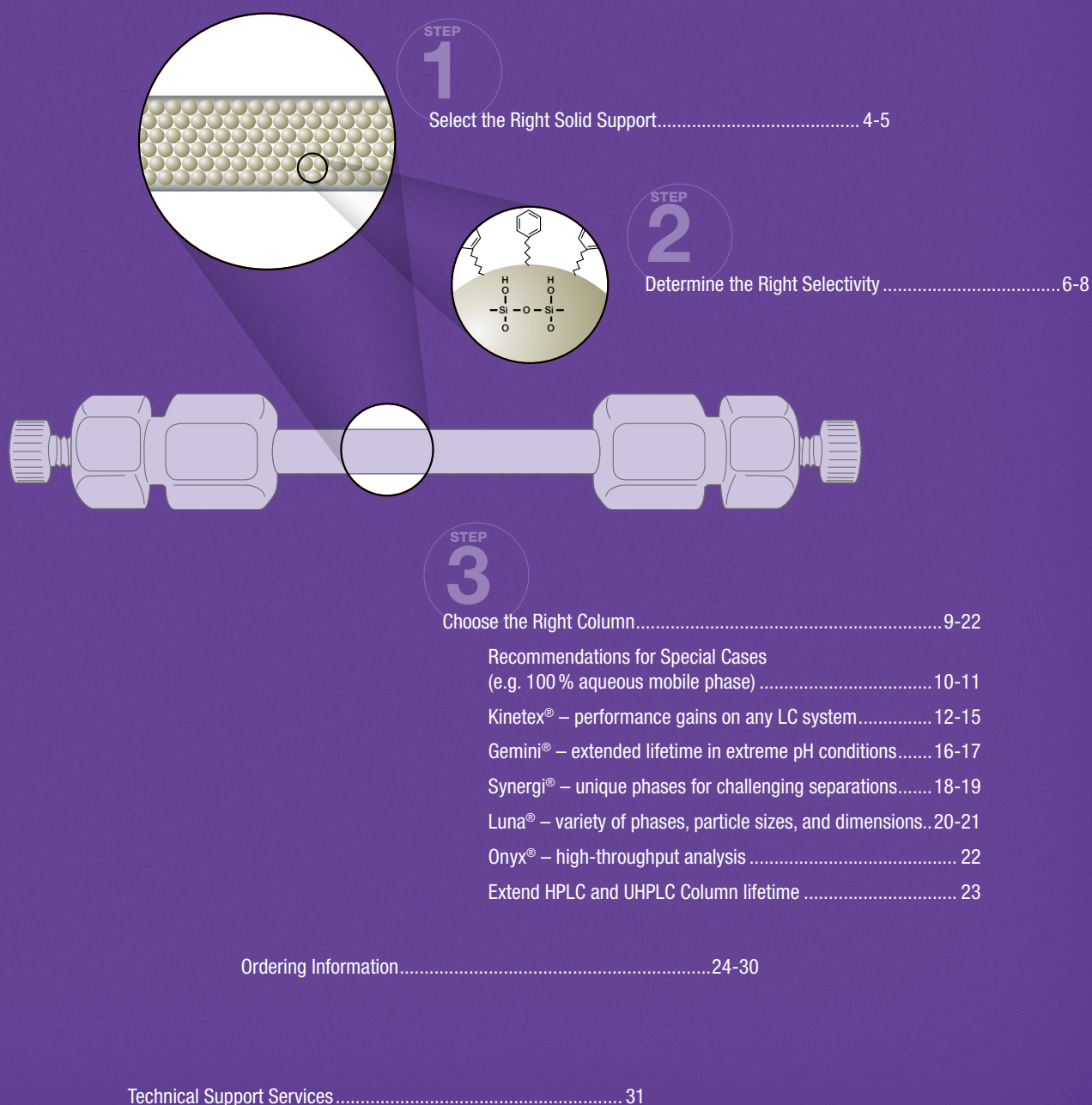
Instantly Access Other Tools

Search through thousands of applications, request the handheld column screening tool, schedule an on-site seminar, and much more.



Follow this Step-by-step Selectivity Guide

Contained within the following pages is an easy overview of the reversed phase HPLC/UHPLC options available to you. At a glance, you'll be able to quickly understand the differences between the columns available and select the right solution for your specific method and goals.



Select the Right Solid Support

Phenomenex is the only column manufacturer to offer a full range of solid supports including core-shell, fully porous and monolithic rod. The morphology of the solid support has a significant impact on the resulting material characteristics and column performance.

Core-Shell

Unique solid silica core and porous shell that results in faster chromatography and higher efficiencies than fully porous particles.

Well suited for:

- Performance gains on ANY LC system
- Easy system-to-system and lab-to-lab method transfer
- Methods where increased sensitivity is required
- Significantly improving the productivity of older, established methods



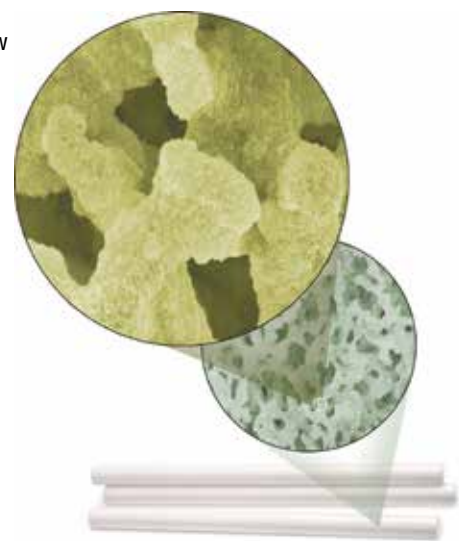
Scalability								
Capillary	Minibore	MidBore™	Analytical	Semi-Prep	Preparative	Bulk Media		
Particle Sizes								
1.3 μm	1.7 μm	2.5 μm	2.6 μm	3 μm	4 μm	5 μm	10 μm	15 μm

Monolithic Silica Rod

Silica monolithic columns contain macropores and mesopores which allow for exceptionally low backpressure at high mobile phase linear velocities or when working with samples or mobile phases with increased viscosity.

Well suited for:

- The direct injection of dirty samples such as plasma or foodstuff extracts
- Dramatically reducing run times by increasing flow rate from 1 mL/min to 9 mL/min



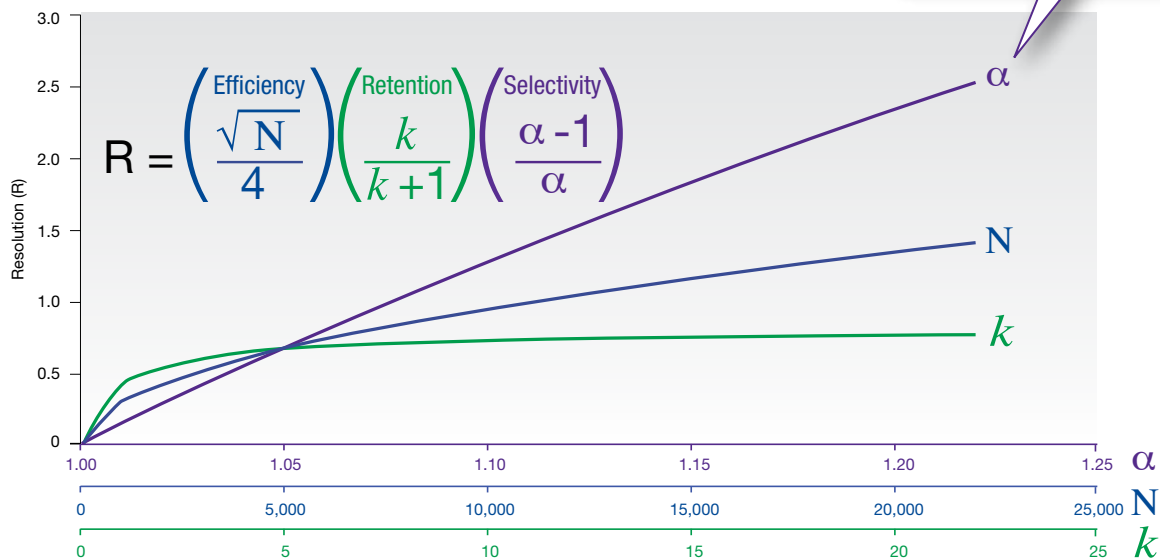
Scalability						
Capillary	Minibore	Narrow Bore	Analytical	Semi-Prep	Preparative	Bulk Media
Particle Sizes						
N/A						

The Importance of Selectivity

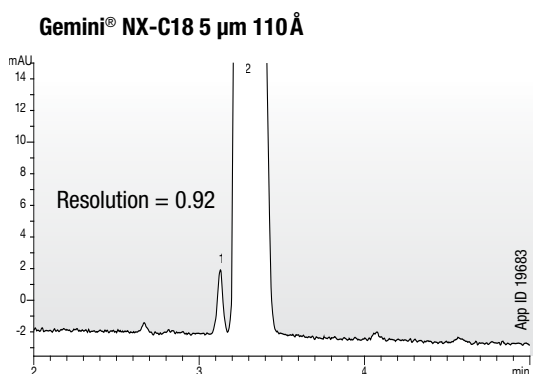
Selectivity (α) has the greatest impact on changing resolution (R), as compared to efficiency (N) and retention (k), and the easiest way to change your chromatographic results is to change your column phase. Phenomenex develops a wide breadth of phase chemistries for easier and faster method development and optimization.

Selectivity is the most important parameter for increasing resolution. Use the selectivity profiles (pp. 12-22) to find the right phase for your sample.

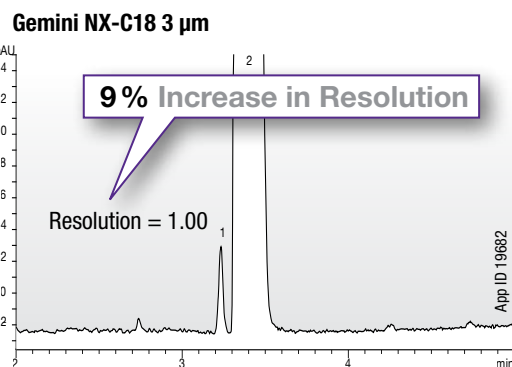
The Impact of Selectivity on Resolution



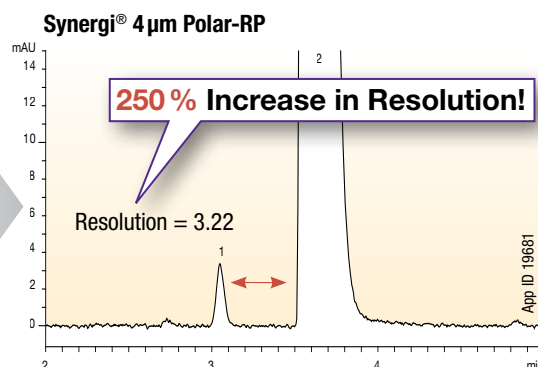
Change Your Selectivity, Dramatically Change Your Results



Option 1:
Increase Efficiency
(5 µm to 3 µm particle)



Option 2:
Change Selectivity
(C18 to ether-linked phenyl)

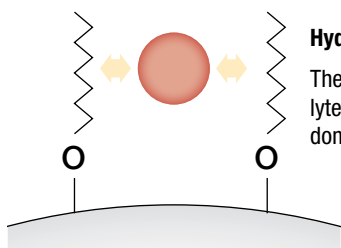


Conditions same for all columns:
Columns: as noted
Dimensions: 150 x 4.6 mm
Mobile Phase: A: 20 mM Potassium phosphate, pH 2.5
 B: Acetonitrile
Gradient: A/B (75:25) to (15:85) in 15 minutes
Flow Rate: 1.5 mL/min
Temperature: Ambient
Detection: UV (ambient)
Sample: 1. Impurity A
 2. Oxymetazoline

Characterizing Selectivity

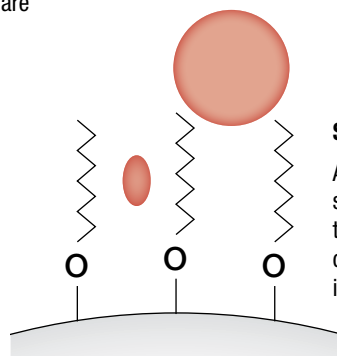
Phenomenex analyzes six different parameters to characterize the selectivity of our HPLC and UHPLC columns. Though hydrophobicity is a dominant retention mechanism in reversed phase chromatography, selectivity is strongly influenced by the other parameters described below.

6 Parameters Influencing Selectivity



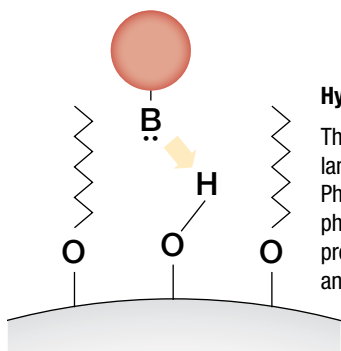
Hydrophobicity

These interactions occur with all analytes. They are always present and are dominant for neutral compounds.



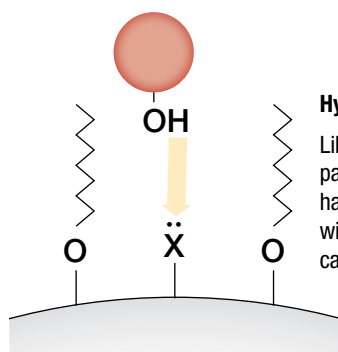
Steric Influences

A measurement of the accessibility of solutes to the stationary phase. Structural differences between compounds can lead to different retention characteristics due to shape selectivity.



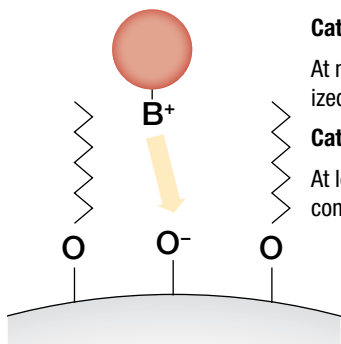
Hydrogen Bond (H-bond) Donating Capacity

This interaction can be attributed to an exposed silanol or an intentionally added polar functional group. Phenomenex employs the latter technique to create phases that have the ability to hydrogen bond with proton accepting groups like weak bases (amines and amides).



Hydrogen Bond (H-bond) Accepting Capacity

Like the hydrogen bond donating capacity parameter, Phenomenex engineers phases that have the ability to hydrogen bond and interact with proton donating acidic groups such as carboxylic acids or alcohols.



Cation Selectivity at pH 7.0

At neutral pH, residual silanols on the silica surface will be largely ionized, increasing the cation exchange component of selectivity.

Cation Selectivity at pH 2.8

At low pH, most residual silanols are neutral and the cation exchange component will be reduced.

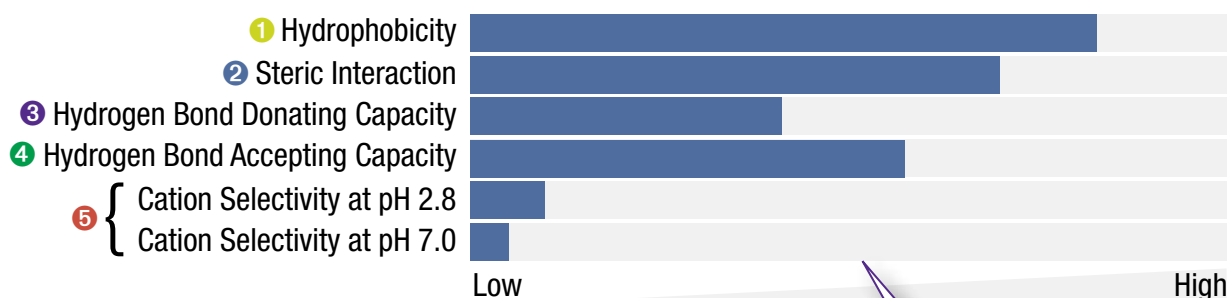
Turn to the next page to see how we've developed unique selectivity profiles for our columns based on these parameters.

Column Selectivity Profiles

Measurements of the parameters described on page 7 were independently derived at the BASi Northwest Laboratory to develop unique selectivity profiles for each of our Kinetex®, Gemini®, Luna®, Synergi®, and Onyx® phases. These profiles were developed so that chromatographers would have a dependable approach for comparing the Phenomenex phases and identifying which phase(s) would provide the best selectivity for their analytes.

Example

Luna C18(2)



Do you need?

1 Maximum retention

- High **hydrophobicity** values indicate strong retention characteristics for any carbon containing analyte
- Highest **hydrophobicity** phases: Synergi Hydro-RP, Luna C18(2), and Synergi Max-RP

2 Separation of isobaric/isomeric compounds

- Stationary phases with high **steric interaction** values are best suited for the analysis of isomers and/or isobaric compounds
- Highest **steric interaction** phases: Kinetex PFP, Luna C8(2), and Gemini C6-Phenyl

3 Retention and/or separation of polar, nitrogen containing compounds

- Bonded phases with high **hydrogen bond donating capacity** may help increase retention and selectivity of bases such as amines and amides
- Highest **H-bond donating capacity** phases: Synergi Hydro-RP, Gemini C18, and Synergi Max-RP

4 Retention and/or separation of polar compounds containing alcohol or carboxylic acid groups

- Bonded phases with high **hydrogen bond accepting capacity** will preferentially interact with oxygen containing compounds, such as phenols and carboxylic acids, and may offer increased retention and selectivity
- Highest **H-bond accepting capacity** phases: Kinetex XB-C18, Gemini C18, and Synergi Fusion-RP

5 Improved peak shape or better retention for charged bases

- Bonded phases with high **cation selectivity** values at low or neutral pH will show higher retention for ionized bases, but may show broad peaks
- Columns that have low **cation selectivity** values at low or neutral pH will have less interaction and less retention for charged bases, but may have very good peak shape
- Highest **cation selectivity** phases: Kinetex PFP, Luna CN, and Synergi Polar-RP
- Lowest **cation selectivity** phases: Gemini C6-Phenyl, Luna C18(2), and Luna C8(2)

Important!

Measurements illustrated here are not absolute, but a relative measurement to other Phenomenex columns. In this display, the individual measurements cannot be compared to each other.

Choose the Right Column

Both the solid support and the bonded phase should be taken into consideration when selecting the most appropriate reversed phase HPLC or UHPLC column. Though the chart below depicts several similar bonded ligand types, no two columns are the same. View the selectivity profiles of each phase, pages 12–22, to see how each column can provide you with a truly different selectivity.

Variety of Selectivities and Solid Supports for RP-HPLC Methods

	 KINETEX	 ONYX Monolithic HPLC Columns	 explore LUNA synergi	 Gemini pH-LC
	Core-Shell	Monolithic Silica Rod	Fully Porous Silica	Fully Porous Organo-Silica
C18 with nonpolar endcapping	Kinetex C18	Onyx C18 Onyx HD-C18	Luna C18(2)	Gemini C18 Gemini NX-C18
C18 with di-isobutyl side chains	Kinetex XB-C18			
C18 with polar embedded groups			Synergi Fusion-RP	
C18 with polar endcapping			Synergi Hydro-RP	
C12 with nonpolar endcapping			Synergi Max-RP	
C8 with nonpolar endcapping	Kinetex C8	Onyx C8	Luna C8(2)	
C5 with nonpolar endcapping			Luna C5	
Phenyl with ether linkage and polar endcapping			Synergi Polar-RP	
Phenyl with nonpolar endcapping	Kinetex Phenyl-Hexyl		Luna Phenyl-Hexyl	Gemini C6-Phenyl
PFP with nonpolar endcapping	Kinetex PFP		Luna PFP(2)	
CN with nonpolar endcapping			Luna CN	



Core-Shell for Proteins/Peptides

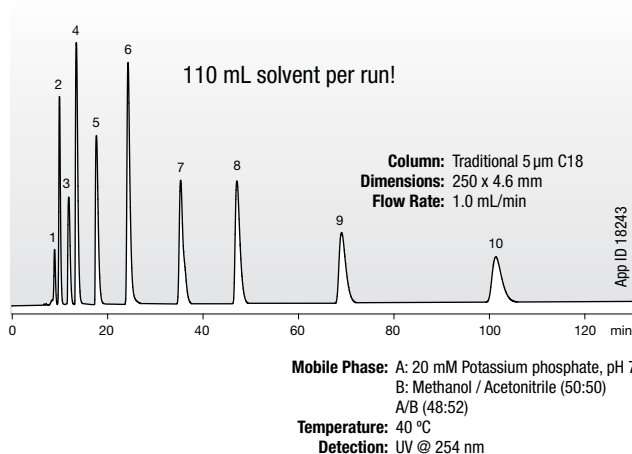
Aeris WIDEPORE and Aeris PEPTIDE columns were specifically developed for the analysis of biomolecules. Find more information on these exclusive 3.6 μm and 1.7 μm core-shell particles in XB-C18, XB-C8, and XB-C4 phases at www.phenomenex.com/aeris

Column Recommendations for Special Cases

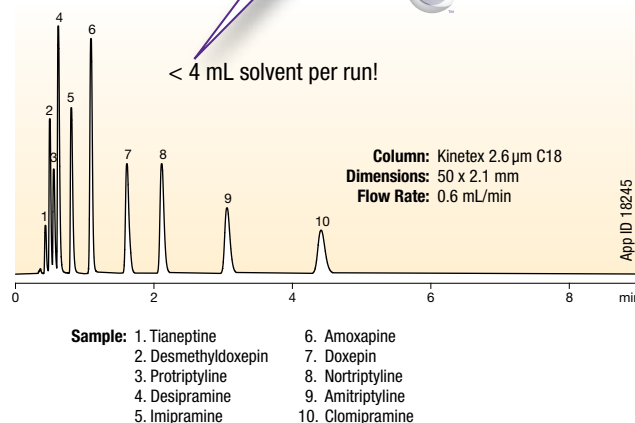
Based on experience and customer feedback, we've found that particular solid support/selectivity combinations work very well for specific application types. We recommend the following columns as starting points for those applications outlined below. The selectivity profiles located in the specific product pages can also be utilized to identify a suitable column based on analyte characteristics.

High Productivity

Recommended Columns: Kinetex (all phases)



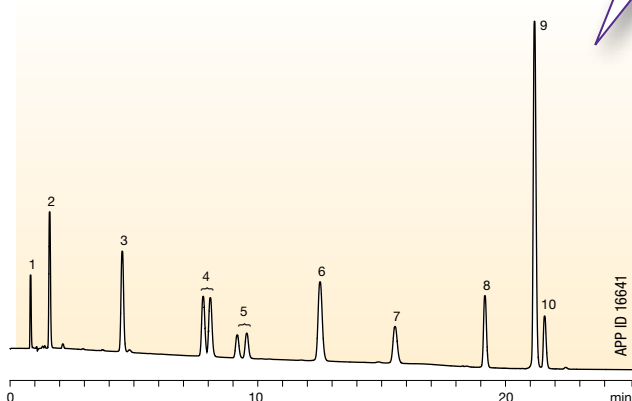
96% Decrease in solvent consumption and 95% decrease in run time



Conditions same for both columns except where noted. Comparative separations may not be representative of all applications.

High pH

Recommended Columns: Gemini (all phases)



Polar bases are neutral at pH 10.5, eliminating secondary ionic interactions

Polar Bases (Beta Blockers) at High pH

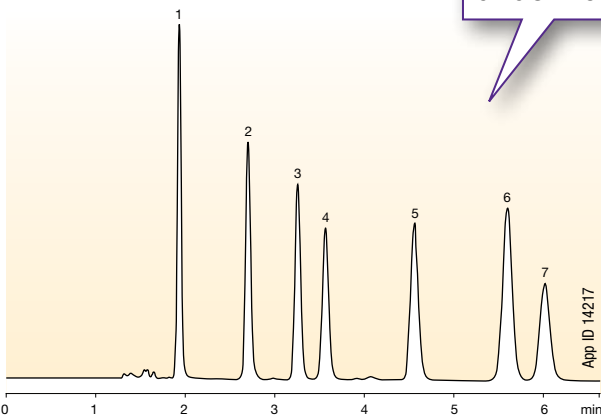
Column: Gemini NX-C18 5 µm
Dimensions: 150 x 4.6 mm
Mobile Phase: A: 10 mM Ammonium Bicarbonate pH 10.5
B: Acetonitrile
Gradient: A/B (85:15) to (70:30) in 15 min to (50:50) in 5 min, Hold for 5 min
Flow Rate: 1.5 mL/min
Temperature: Ambient
Detection: UV @ 230 nm
Sample: 1. Bisoprolol Contaminant
2. Sotalol
3. Atenolol
4. Labetolol (Diastereoisomeric Pair)
5. Nadolol (Diastereoisomeric Pair)
6. Pindolol
7. Metoprolol
8. Bisoprolol
9. Propranolol
10. Alprenalol



High Aqueous

Recommended Columns: Synergi Hydro-RP, Synergi Polar-RP, Synergi Fusion-RP

Catecholamines

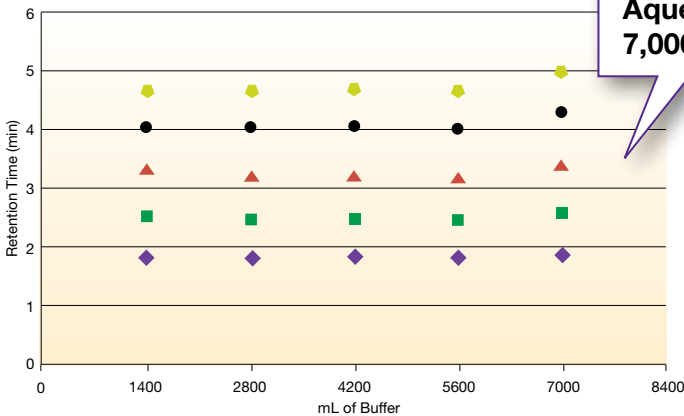


Greater retention of polar compounds under 100% aqueous conditions

Column: Synergi 4 µm Hydro-RP
Dimensions: 150 x 4.6 mm
Part No.: 00F-4375-E0
Mobile Phase: 20 mM Potassium phosphate, pH 2.5
Flow Rate: 1.0 mL/min
Temperature: 22 °C
Detection: UV @ 210 nm
Sample: 1. Norepinephrine
 2. Epinephrine
 3. 6-Hydroxydopamine
 4. Normetanephrine
 5. Dopamine
 6. L-DOPA
 7. Epinine



Aqueous Stability



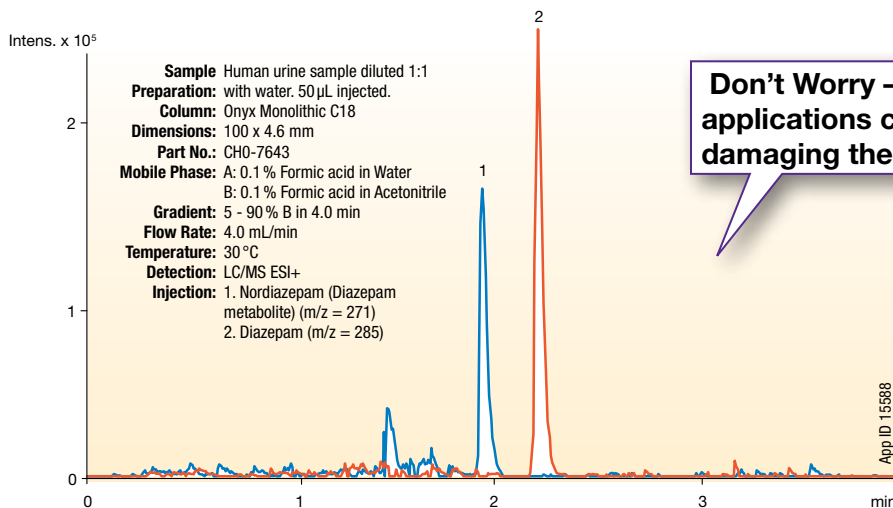
Aqueous stable for over 7,000 mL of buffer

◆ Norepinephrine
 ■ Epinephrine
 ▲ Normetanephrine
 ● Dopamine
 ◆ L-DOPA

Column: Synergi 4 µm Hydro-RP
Dimensions: 150 x 4.6 mm
Part No.: 00F-4375-E0
Mobile Phase: 20 mM Potassium phosphate, pH 2.5
Flow Rate: 1.0 mL/min
Temperature: 35 °C
Detection: UV @ 210 nm
Injection: 5 µL
Sample: 1. Norepinephrine (0.8 mg/mL)
 2. Epinephrine (0.5 mg/mL)
 3. Normetanephrine (0.6 mg/mL)
 4. Dopamine (0.4 mg/mL)
 5. L-DOPA (0.3 mg/mL)

Direct Injection of Dirty Matrices (“Dilute-and-Shoot”)

Recommended Columns: Onyx (all phases)



Don't Worry – “dilute-and-shoot” applications can be done without damaging the column

Sample: Human urine sample diluted 1:1
Preparation: with water. 50 µL injected.
Column: Onyx Monolithic C18
Dimensions: 100 x 4.6 mm
Part No.: CHO-7643
Mobile Phase: A: 0.1% Formic acid in Water
 B: 0.1% Formic acid in Acetonitrile
Gradient: 5 - 90% B in 4.0 min
Flow Rate: 4.0 mL/min
Temperature: 30 °C
Detection: LC/MS ESI+
Injection: 1. Nordiazepam (Diazepam metabolite) (m/z = 271)
 2. Diazepam (m/z = 285)



KINETEX®

Performance Gains on ANY LC System

Kinetex core-shell particles were engineered to make improved results, increased productivity, easy transferrability, and cost savings accessible to everyone. You can leverage the power of Kinetex 5 µm to improve 5 and 3 µm methods. Use Kinetex 2.6 µm as a versatile upgrade for both HPLC and UHPLC methods and get the most performance out of your UHPLC with Kinetex 1.3 µm and 1.7 µm.

Phases

Ligand	Description	Selectivity Profile
<p>USP: L1</p>	<h3>Kinetex XB-C18</h3> <p>Di-isobutyl side chains differentiate this C18 column. Low ligand density and an inactive surface make this column a great hydrogen acceptor. This phase will demonstrate improved peak shape for basic compounds and increased retention of acids.</p>	
<p>USP: L1</p>	<h3>Kinetex C18</h3> <p>Very well balanced column providing some selectivity through steric, hydrogen, and cationic pathways. This is a great starting point for ultra-high efficiency separations.</p>	
<p>USP: L7</p>	<h3>Kinetex C8</h3> <p>Brings the benefits of core-shell technology to USP L7 methods. The phase will provide moderate hydrophobicity and good steric and hydrogen donating selectivity.</p>	
<p>USP: L11</p>	<h3>Kinetex Phenyl-Hexyl</h3> <p>Aromatic and moderate hydrophobic selectivity result in the great retention and separation of aromatic hydrocarbons.</p>	
<p>USP: L43</p>	<h3>Kinetex PFP</h3> <p>This pentafluorophenyl column provides a very high degree of steric selectivity to separate structural isomers. The electronegative fluorine groups offer high selectivity for cationic compounds.</p>	

Important! Measurements illustrated here are not absolute, but a relative measurement to other Phenomenex columns. In this display, the individual measurements cannot be compared to each other.

Material Characteristics

Packing Material	Total Particle Size (µm)	Pore Size (Å)	Effective Surface Area (m ² /g)	Effective Carbon Load %	pH Stability	Pressure Stability
Kinetex C18	1.7, 1.3	100	200	12	1.5 - 8.5**	1000 bar
Kinetex XB-C18	1.7	100	200	10	1.5 - 8.5**	
Kinetex C8	1.7	100	200	8	1.5 - 8.5**	
Kinetex PFP	1.7	100	200	9	1.5 - 8.5**	
Kinetex HILIC	1.7	100	200	0	2.0 - 7.5	
Kinetex Phenyl-Hexyl	1.7	100	200	11	1.5 - 8.5**	1000/600-bar
Kinetex XB-C18	5, 2.6	100	200	10	1.5 - 8.5**	
Kinetex C18	5, 2.6	100	200	12	1.5 - 8.5**	
Kinetex C8	2.6	100	200	8	1.5 - 8.5**	
Kinetex PFP	5, 2.6	100	200	9	1.5 - 8.5**	
Kinetex HILIC	2.6	100	200	0	2.0 - 7.5	
Kinetex Phenyl-Hexyl	5, 2.6	100	200	11	1.5 - 8.5**	

**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.

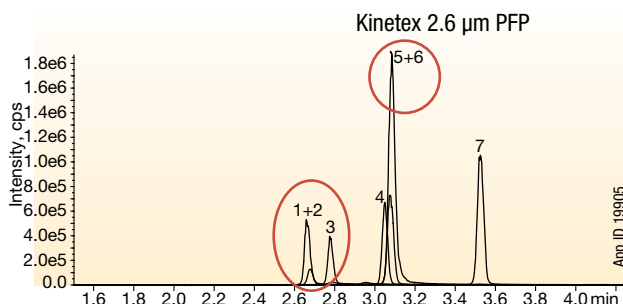
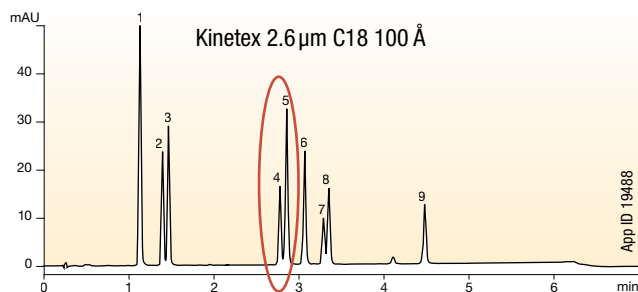
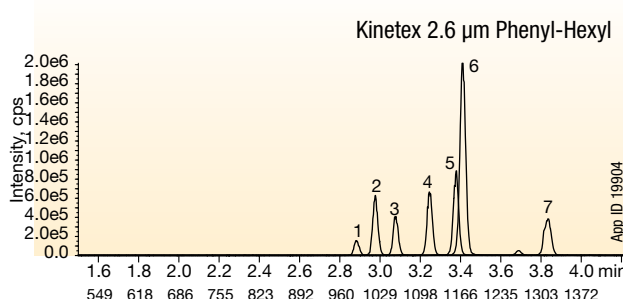
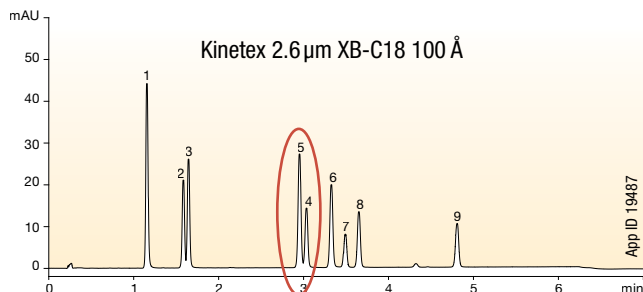
When using Kinetex 1.3 µm or 1.7 µm, increased performance can be achieved, however high pressure-capable instrumentation is required.

Complementary Selectivities Coupled with Ultra-High Efficiencies

Ultra-high performance columns like Kinetex will give you very narrow peaks, but without the right selectivities you are left with very narrow, overlapping peaks. The phases offered in the Kinetex column line are complementary to one another, so the spectrum of selectivity your separations require is covered.

Complementary C18 Phases (C18 vs. XB-C18)

Complementary Phenyl Phases (Phenyl-Hexyl vs. PFP)



Dimensions: 50 x 2.1 mm
Mobile Phase: A: Water
 B: Acetonitrile
Gradient: Time (min) % B
 0 20
 6 60
 6.01 20
 8 20
Flow Rate: 0.5 mL/min
Temperature: 30 °C
Detection: UV @ 220 nm (ambient)

Sample: 1. Estriol
 2. Hydrocortisone
 3. Cortisone
 4. Estradiol
 5. Cortisone-21-acetate
 6. 21-Hydroxyprogesterone
 7. Estrone
 8. 17-Hydroxyprogesterone
 9. Deoxycorticosterone acetate

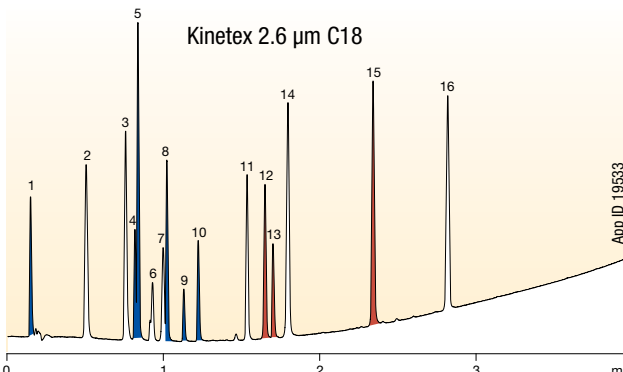
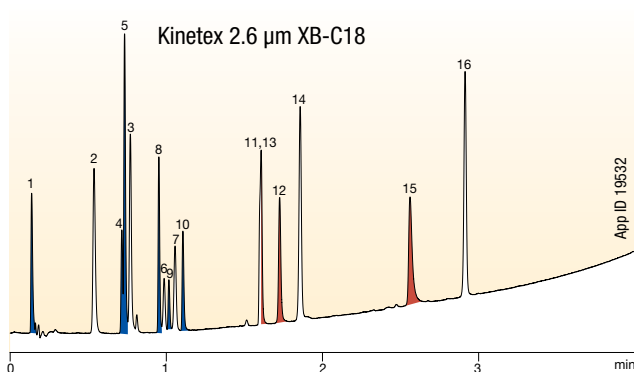
Dimensions: 50 x 2.1 mm
Mobile Phase: A: 10 mM Ammonium formate
 B: Acetonitrile
Gradient: Time (min) % B
 0 15
 4 55
Flow Rate: 0.5 mL/min
Temperature: 22 °C
Detection: Mass Spectrometer (MS)

Sample: 1. α -Hydroxyalprazolam
 2. Oxazepam
 3. Lorazepam
 4. Clonazepam
 5. Nordiazepam
 6. Temazepam
 7. Diazepam

Conditions same for both columns except where noted.

Conditions same for both columns except where noted.

Manipulate Acidic and Basic Compound Retention



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) % A % B
 0 95 5
 0.2 95 5
 4.2 5 95
 4.21 95 5
 5.5 95 5
Flow Rate: 0.8 mL/min
Temperature: 30 °C
Detection: UV @ 245 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

■ Base
 ■ Acid
 □ Neutral

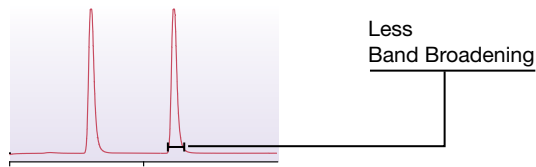
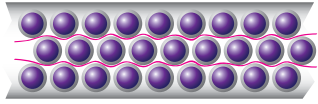
Conditions same for both columns except where noted.

See page 28 for ordering information.

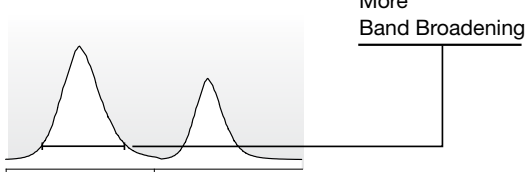
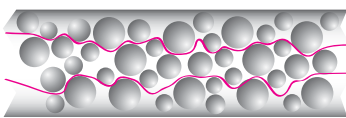
The precise architecture of core-shell particles provides dramatic leaps in performance in two important ways:

- 1 High Density, High Efficiency Particle**
High particle density helps create optimal bed structure which reduces band broadening effects of Eddy Diffusion.

Core-Shell Particles

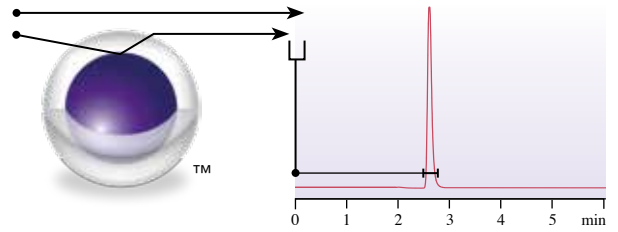


Fully Porous Particles

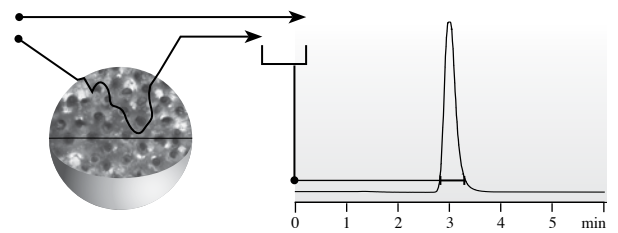


- 2 Faster Mass Transfer, Faster HPLC/UHPLC**
The thin, porous layer, or "shell", decreases the diffusion path length, thus reducing the time it takes for molecules to diffuse into and out of the particle.

Core-Shell Particle

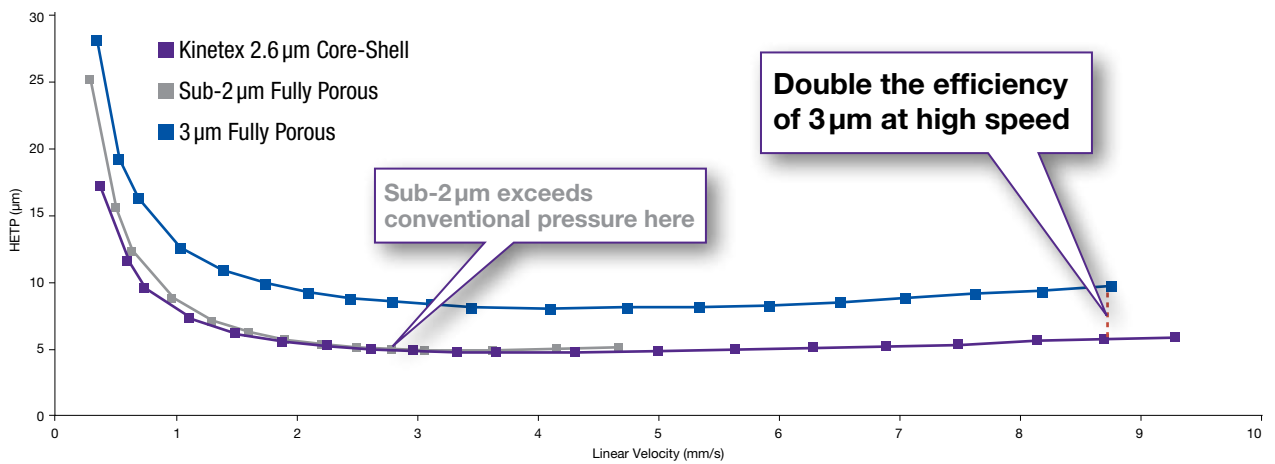


Fully Porous Particle



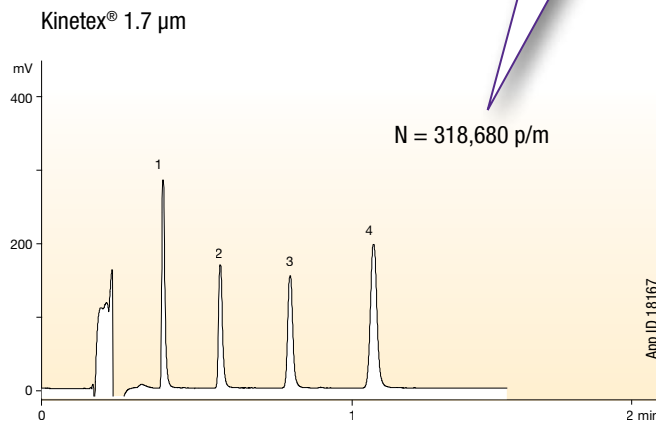
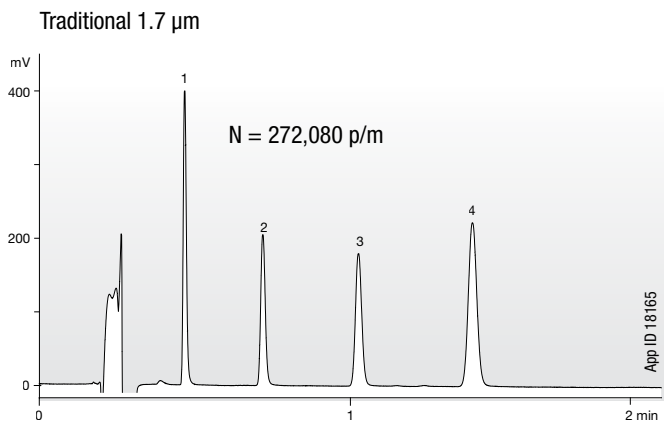
Performance of Kinetex Core-Shell Particles

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



Scaling from Fully Porous to Core-Shell

1.7 µm Fully Porous vs. 1.7 µm Core-Shell



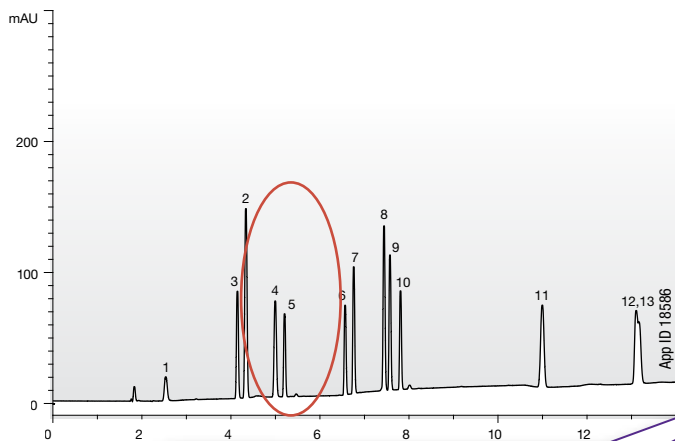
17 % Higher Efficiency

Conditions for both columns:
Column: Kinetex 1.7 µm C18
 Traditional 1.7 µm C18
Dimensions: 50 x 2.1 mm
Mobile Phase: Acetonitrile / Water (50:50)
Flow Rate: 0.6 mL/min
Temperature: 25 °C

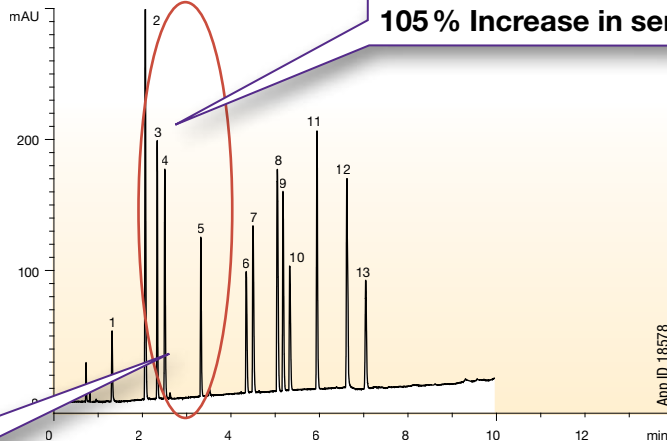
Detection: UV @ 254 nm
Instrument: *Waters® ACQUITY® UPLC®
Sample: 1. Acetophenone
 2. Benzene
 3. Toluene
 4. Naphthalene

Fully Porous vs. Core-Shell

Traditional 5 µm ODS-3 250 x 4.6 mm



Kinetex 2.6 µm C18 150 x 4.6 mm



105 % Increase in sensitivity[◇]

52 % Narrower peak widths for increased resolution^Δ

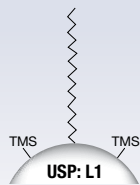
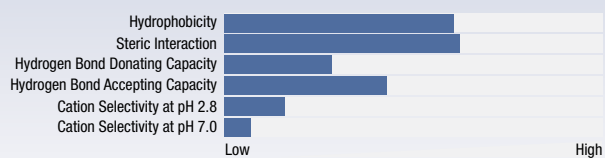
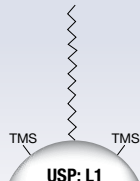

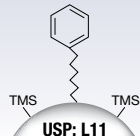
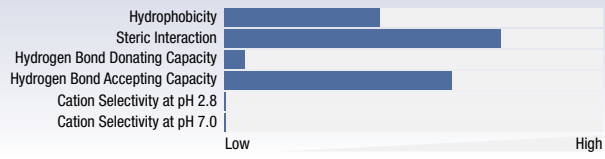
Columns: Kinetex 2.6 µm C18 100 Å
 Traditional 5 µm ODS-3 100 Å
Dimensions: Kinetex: 150 x 4.6 mm
 Traditional: 250 x 4.6 mm
Mobile Phase: A: 0.1 % Phosphoric acid in Water
 B: 0.1 % Phosphoric acid in Acetonitrile
Gradient: 5 % to 95 % B in 9 min (150 x 4.6 mm)
 5 % to 95 % B in 15 min (250 x 4.6 mm)
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. Acetubotol
 6. Dextromethorphan
 7. Diphenhydramine
 8. Propafenone
 9. Amitriptyline
 10. Fluoxetine
 11. Naproxen
 12. Diflunisal
 13. Indomethacin

[◇] Signal-to-noise ratio of peak 2
^Δ Based on average peak widths

*Waters, ACQUITY, and UPLC are registered trademarks of Waters Corporation. Phenomenex is not affiliated with Waters Corporation. Comparative separations may not be representative of all applications. Conditions same for both columns except where noted.

See page 28 for ordering information.

Phases		
Ligand	Description	Selectivity Profile
 <p>Gemini NX-C18 USP: L1</p>	<p>Gemini NX-C18</p> <p>New generation of organo-silane material incorporates ethylene bridges to provide pH stability from 1-12 and 5x the durability of earlier hybrids. The homogenous surface offers some steric selectivity.</p>	
 <p>Gemini C18 USP: L1</p>	<p>Gemini C18</p> <p>This is a high loading, organo-silane particle column with pH stability 1-12. The patented procedure creates a surface that is a strong hydrogen donor and acceptor. It is ideal for acids and bases.</p>	
 <p>Gemini C6-Phenyl USP: L11</p>	<p>Gemini C6-Phenyl</p> <p>This is a very inert phase for great peak shapes of ionized compounds. The planar phenyl rings offer moderate hydrophobic retention and high steric selectivity for structural isomer selectivity.</p>	

Important!

Measurements illustrated here are not absolute, but a relative measurement to other Phenomenex columns. In this display, the individual measurements cannot be compared to each other.

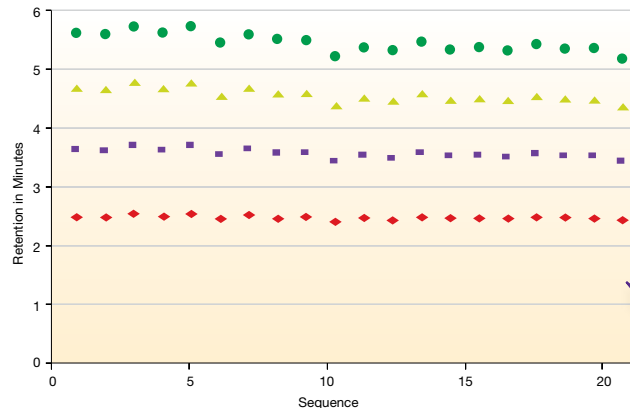
Material Characteristics

Packing Material	Particle Shape/ Size (µm)	Pore Size (Å)	Surface Area (m ² /g)	Carbon Load %	Endcapping	pH Range
Gemini C18	Spherical 3, 5, 10	110	375	14	TMS	1.0 - 12.0
Gemini C6-Phenyl	Spherical 3, 5	110	375	12	TMS	1.0 - 12.0
Gemini NX-C18	Spherical 3, 5, 10	110	375	14	TMS	1.0 - 12.0

Rugged, Dependable Columns Under the Most Extreme Conditions

The harshest conditions for HPLC columns can be found in environments where columns are subjected to constant changes in pH, buffers, and temperature. A Gemini® column's ability to hold up under these challenging conditions is a testament to the long column lifetimes and reproducible performance you can expect.

Extend Column Lifetime Under Harsh pH Conditions



- Step 1**
24x High pH (10.5) Gradient Flush
 - Step 2**
High pH (10.5) Testing
 - Step 3**
1x Neutral Flush Procedure
 - Step 4**
Neutral pH Testing
 - Step 5**
24x Low pH (2.0) Gradient Flush
 - Step 6**
Neutral pH Flush Repeats
- Repeats for 20 Cycles

For full procedure and parameters, visit www.phenomenex.com/gemini

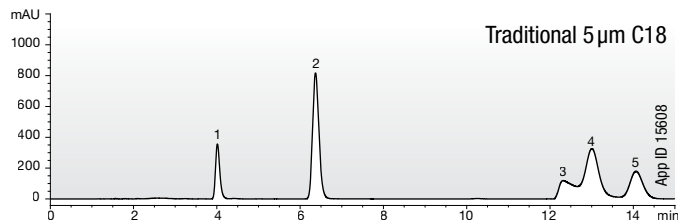
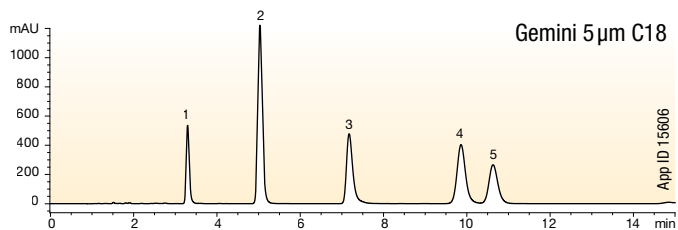
Retention times maintained after exposure to 10,000 column volumes of high and low pH buffers

● Acenaphthene ■ Benzene
▲ Toluene ◆ Acetophenone

Column: Gemini NX-C18 5 µm
Dimensions: 150 x 4.6 mm
Part No.: 00F-4454-E0

Complementary Selectivities at Extended pHs

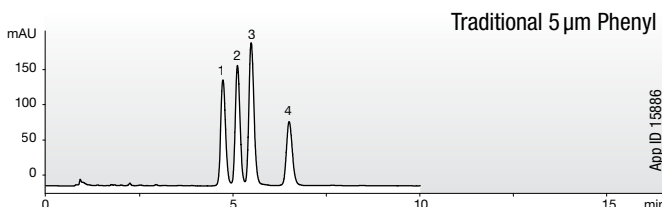
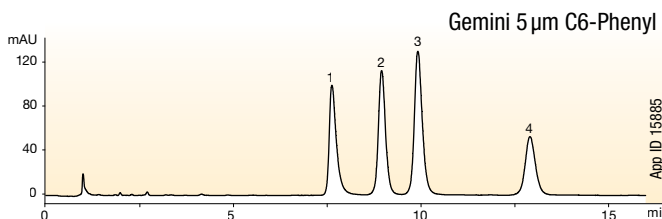
Gemini C18 can provide a different selectivity to your current C18 column for better resolution.



Dimensions: 150 x 4.6 mm
Mobile Phase: 20 mM Phosphate buffer, pH 2.5 / Acetonitrile (50:50)
Flow Rate: 1 mL/min
Temperature: Ambient
Detection: UV @ 230 nm (ambient)

Sample: 1. Ethyl paraben
2. Naproxen
3. Diflunisal
4. Indomethacin
5. Ibuprofen

Greater retention and resolution can be achieved with Gemini C6-Phenyl over your current phenyl column.



Dimensions: 150 x 4.6 mm
Mobile Phase: 10 mM Ammonium bicarbonate, pH 10.5 / Acetonitrile / Methanol (30:35:35)
Flow Rate: 1 mL/min
Temperature: Ambient
Detection: UV @ 254 nm (ambient)

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

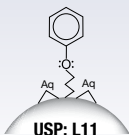
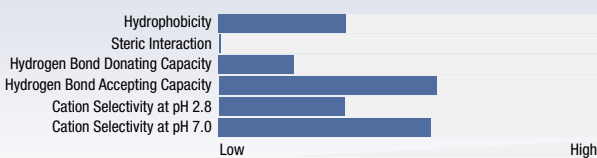
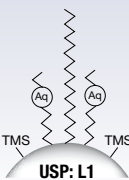
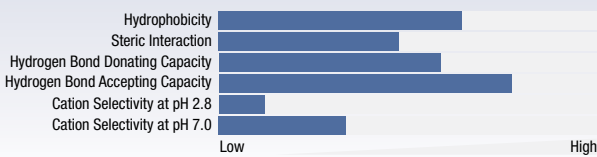
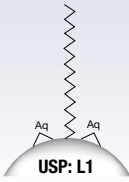
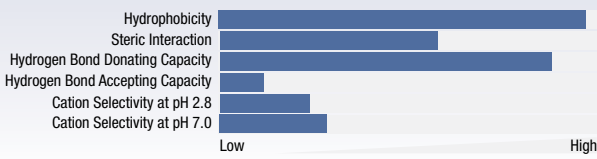
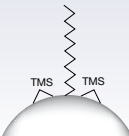
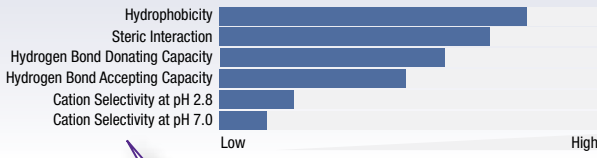
Dimensions and chromatographic conditions are the same for all columns unless otherwise noted. Comparative separations may not be representative of all applications.

See page 24 for ordering information.



synergi® Full Range Selectivity

Four unique phases developed to provide a different selectivity for successful separations of the most complex mixtures and challenging analytes.

Phases		
Ligand	Description	Selectivity Profile
 <p>USP: L11</p>	<p>Synergi Polar-RP (100% Aqueous Stable)</p> <p>This ether linked phenyl column is polar end-capped and offers high cation retention capabilities to improve retention for ionized bases.</p>	
 <p>USP: L1</p>	<p>Synergi Fusion-RP (100% Aqueous Stable)</p> <p>A low ligand density polar embedded C18, this unique phase contributes to hydrogen bonding and donating. It provides balanced selectivity for acids and bases.</p>	
 <p>USP: L1</p>	<p>Synergi Hydro-RP (100% Aqueous Stable)</p> <p>Polar endcapped C18 column that provides very high hydrophobic interactions and hydrogen donating capabilities make this column ideal for retaining polar bases.</p>	
 <p>USP: L1</p>	<p>Synergi Max-RP</p> <p>Densely bonded C12 contributes a lot of hydrophobic retention and steric based selectivity. Combined characteristics of the base silica and the bonded phase will also provide hydrogen bonding benefits.</p>	

Important!

Measurements illustrated here are not absolute, but a relative measurement to other Phenomenex columns. In this display, the individual measurements cannot be compared to each other.

Material Characteristics						
Packing Material	Particle Shape/Size (µm)	Pore Size (Å)	Surface Area (m ² /g)	Carbon Load (%)	Endcapping	pH Range
Synergi Max-RP	Spher. 2.5	100	400	17	TMS	1.5 - 9.0*
Synergi Hydro-RP	Spher. 2.5	100	400	19	Hydrophilic	1.5 - 7.5
Synergi Polar-RP	Spher. 2.5	100	400	11	Hydrophilic	1.5 - 7.0
Synergi Fusion-RP	Spher. 2.5	100	400	12	TMS	1.5 - 9.0*
Synergi Max-RP	Spher. 4, 10	80	475	17	TMS	1.5 - 9.0*
Synergi Hydro-RP	Spher. 4, 10	80	475	19	Hydrophilic	1.5 - 7.5
Synergi Polar-RP	Spher. 4, 10	80	475	11	Hydrophilic	1.5 - 7.0
Synergi Fusion-RP	Spher. 4, 10	80	475	12	TMS	1.5 - 9.0*

*pH range is 1.5 - 10.0 under isocratic conditions. pH range is 1.5 - 9.0 under gradient conditions.

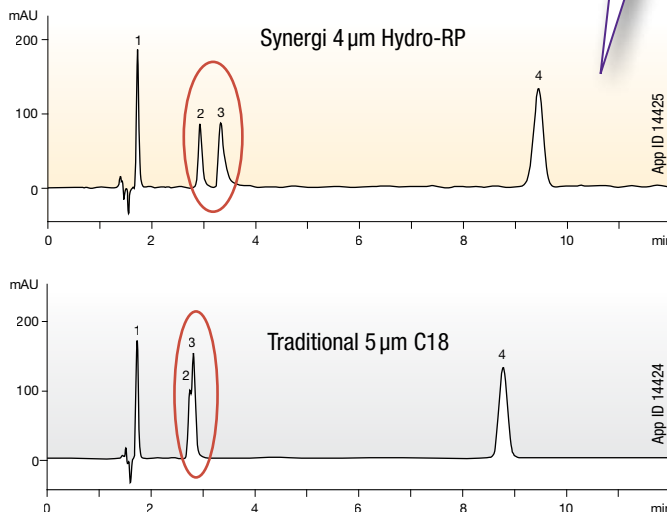
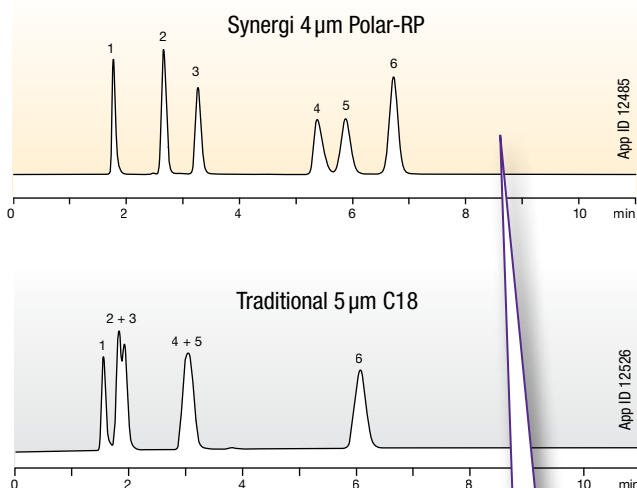
Unique Phases for a Different Separation

The Synergi® phases offer the ability to achieve greater resolution and differing peak elution order while staying in reversed phase mode.

Increase retention and separation of earlier eluting polar compounds with some added polar selectivity

Ether-linked Phenyl vs. C18

Polar Endcapping vs. Nonpolar Endcapping



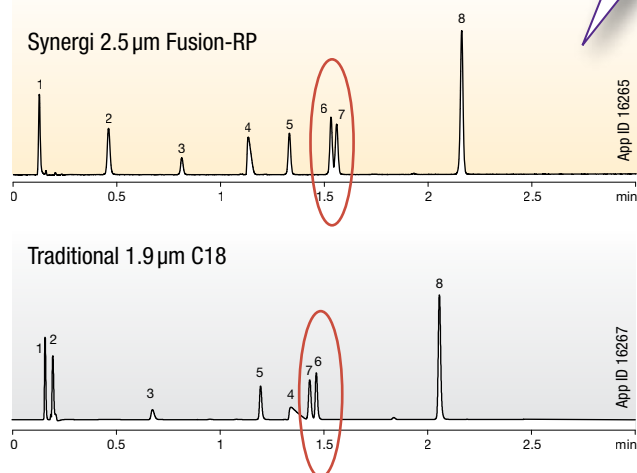
Dimensions: 150 x 4.6 mm
Mobile Phase: 20 mM Potassium phosphate, pH 3 / Methanol (50:50)
Flow Rate: 1.0 mL/min
Temperature: Ambient
Detection: UV @ 230 nm (ambient)
Sample:
 1. Metaproterenol
 2. Pindolol
 3. Metoprolol
 4. Alprenolol
 5. Propranolol
 6. Ethyl paraben

Dimensions: 150 x 4.6 mm
Mobile Phase: 20 mM Potassium phosphate, pH 7 / Methanol (60:40)
Flow Rate: 1.0 mL/min
Temperature: Ambient
Detection: UV @ 210 nm (ambient)
Sample:
 1. Phenylephrine
 2. Phenylpropranolamine
 3. Pseudoephedrine
 4. Methyl paraben

Achieve greater resolution by simply switching column phase

Polar Embedded C18 vs. Traditional C18

Sharper peaks and alternate peak elution order

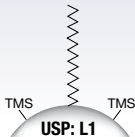
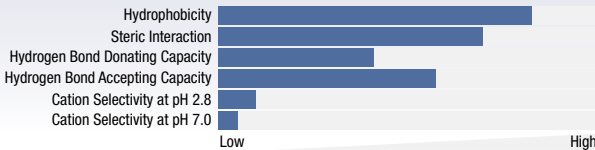
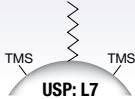
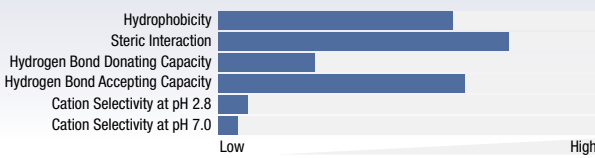
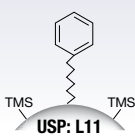
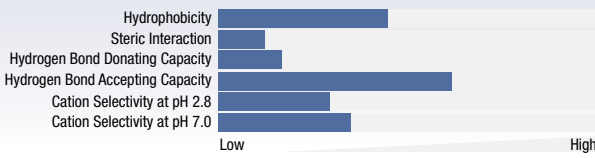
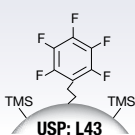
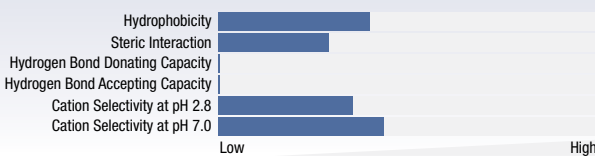
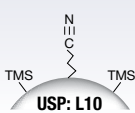



Dimensions: 50 x 2.0 mm
Mobile Phase:
 A: 0.1 % Formic acid in Water
 B: 0.1 % Formic acid in Acetonitrile
Gradient: A/B (95:5) to (5:95) in 2.9 minutes
Flow Rate: 1.1 mL/min
Temperature: 50 °C
Detection: UV @ 254 nm (ambient)
Instrument: Agilent® 1200 SL
Sample:
 1. Pyridine
 2. Acetaminophen
 3. Benzyl Alcohol
 4. Nortriptyline
 5. 3-Methyl-4-Nitrobenzoic Acid
 6. 4-Chlorocinnamic Acid
 7. 3-Hydroxy-3-Methylbenzaldehyde
 8. Hexanophenone

Comparative separations may not be representative of all applications. Conditions are the same for both columns except where noted.

See page 25 for ordering information.

Dependable, ultra-pure silica-based HPLC columns that offer an extensive variety of selectivities which are scalable from micro-bore to preparative and purification scale solutions.

Phases		
Ligand	Description	Selectivity Profile
 <p>USP: L1</p>	<h3>Luna C18(2)</h3> <p>C18 phase is densely bonded to provide high hydrophobic retention and discriminating steric selectivity. High endcapping reduces electrostatic based selectivity to a minimum.</p>	
 <p>USP: L7</p>	<h3>Luna C8(2)</h3> <p>C8 column provides less hydrophobic retention than our C18, but the density of the ligand bonding creates more steric based selectivity. The C8 columns are generally better hydrogen bond acceptors, and better for acidic compounds.</p>	
 <p>USP: L11</p>	<h3>Luna Phenyl-Hexyl</h3> <p>Our most hydrophobic phenyl column and it will also provide good hydrogen accepting functionality for acidic retention.</p>	
 <p>USP: L43</p>	<h3>Luna PFP(2)</h3> <p>Pentafluorophenyl groups provide very little hydrogen bonding abilities, but the strongly electronegative fluorine groups will provide good charge based selectivity for cationic compounds, while the rigid bonded phase is a good steric selector.</p>	
 <p>USP: L10</p>	<h3>Luna CN</h3> <p>Nitrile groups bound to the silica surface offer a unique polar selectivity under reversed phase or normal phase conditions.</p>	

Important!

Measurements illustrated here are not absolute, but a relative measurement to other Phenomenex columns. In this display, the individual measurements cannot be compared to each other.

Material Characteristics

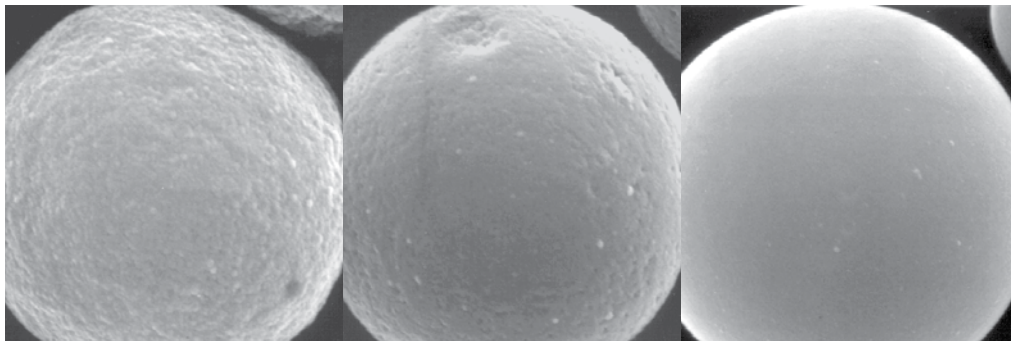
Packing Material	Particle Shape/ Size (µm)	Pore Size (Å)	Surface Area (m ² /g)	Carbon Load %	pH Stability
Luna C8(2)	Spher. 3, 5, 10, 10-PREP, 15	100	400	13.5	1.5 - 9.0*
Luna C18(2)	Spher. 2.5, 3, 5, 10, 10-PREP, 15	100	400	17.5	1.5 - 9.0*
Luna Phenyl-Hexyl	Spher. 3, 5, 10, 10-PREP, 15	100	400	17.5	1.5 - 9.0*
Luna CN	Spher. 3, 5, 10	100	400	7.0	1.5 - 7.0
Luna PFP(2)	Spher. 3, 5	100	400	11.5	1.5 - 9.0*

* pH range is 1.5 - 10.0 under isocratic conditions. pH range is 1.5 - 9.0 under gradient conditions.

Long Column Lifetimes and Excellent Performance

Ultra-pure, metal-free silica (99.99% purity) is the backbone of all Luna[®] material. The resulting high quality particles have a surface smoothness, pore structure, and pore consistency to ensure a more uniform particle shape and greater reproducibility.

Superior Particle Smoothness



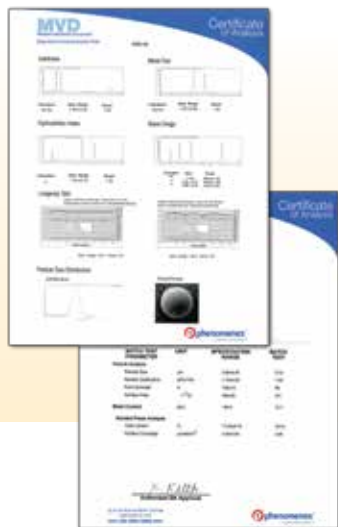
Agilent Technologies ZORBAX[®] 5 µm SB-C18

Waters Symmetry[®] 5 µm C18

Phenomenex Luna 5 µm C18

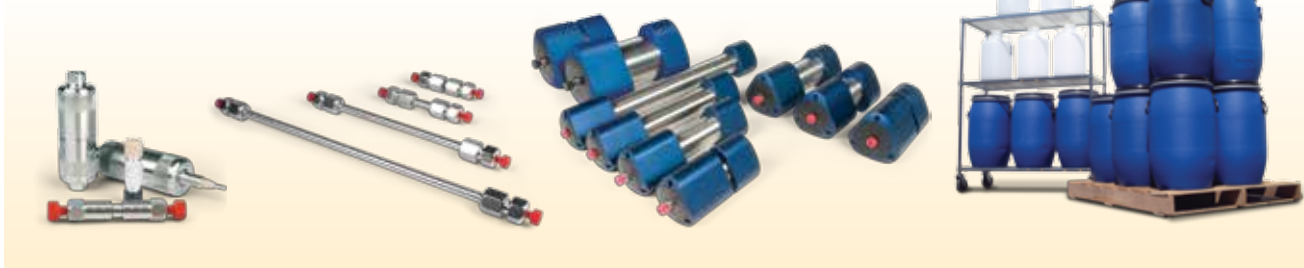
Batch Quality and Reproducibility

For over 15 years, Luna has been manufactured and tested to ensure quality and reproducibility. The Phenomenex Quality Management System is meticulous, validating every batch of material according to 16 different test parameters before it is ever packed into an HPLC column.



QUALITY MANAGEMENT SYSTEM
CERTIFIED BY DNV
== ISO 9001:2008 ==

Breadth of Formats



ZORBAX is a registered trademark of Agilent Technologies, Inc. Symmetry is a registered trademark of Waters Corporation. Phenomenex is in no way affiliated with Waters Corporation or Agilent Technologies.

See pages 26-27 for ordering information.

High Speed, “Dilute-and-Shoot” Analysis

These monolithic, silica-based HPLC columns are designed for high-throughput analysis and the direct injection of dirty or viscous samples. The highly permeable solid support allows you to run at flow rates significantly higher than those used with particle columns, without experiencing the high backpressure.

Phases		
Ligand	Description	Selectivity Profile
<p>Onyx C18 USP: L1</p>	<p>Octadecyl silane ligands are bound to the silica surface for strong hydrophobic selectivity.</p>	<p>Hydrophobicity: High Steric Interaction: Moderate Hydrogen Bond Donating Capacity: High Hydrogen Bond Accepting Capacity: Moderate Cation Selectivity at pH 2.8: Moderate Cation Selectivity at pH 7.0: Moderate</p>
<p>Onyx C8 USP: L7</p>	<p>Octyl silane groups are bound to the silica surface with nonpolar endcapping to offer moderate hydrophobic selectivity.</p>	<p>Hydrophobicity: Moderate Steric Interaction: Moderate Hydrogen Bond Donating Capacity: High Hydrogen Bond Accepting Capacity: High Cation Selectivity at pH 2.8: Moderate Cation Selectivity at pH 7.0: Moderate</p>

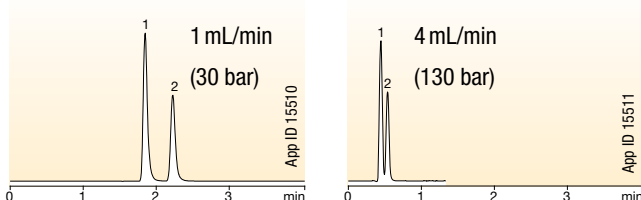
Material Characteristics								
Packing Material	Macropore Size (µm)	Mesopore Size (Å)	Pore Volume (mL/g)	Surface Area (m ² /g)	Carbon Load %	Calculated Bonded Phase Coverage (µmole/m ²)	End Capping	
Onyx Silica	2	130	1.0	300	0	0	No	
Onyx C8	2	130	1.0	300	11	3.8	Yes	
Onyx C18	2	130	1.0	300	18	3.6	Yes	
Onyx C18*	1.5	130	1.0	300	18	3.6	Yes	
Onyx C18-HD	1	130	1.0	300	18	3.6	Yes	

Maximum Pressure: 200 Bar; pH Range: 2.0-7.5
*50 x 2.0 mm ID only; enhanced 1.5 µm macropore size for higher efficiencies

Important!
Measurements illustrated here are not absolute, but a relative measurement to other Phenomenex columns. In this display, the individual measurements cannot be compared to each other.

Resistant to Clogging and High Backpressures

A dense network of macropores allow viscous samples and the mobile phase to flow through the column less restricted in comparison to particle packed columns. This allows you to increase flow rates up to 9 mL/minute and perform worry-free “dilute-and-shoot” injections.



Column: Onyx Monolithic C18
Dimensions: 100 x 4.6 mm
Part No.: CHO-7643
Mobile Phase: 0.1% TFA in water / Acetonitrile (95/5, v/v)

Flow Rate: 1 mL/min and 4 mL/min
Detection: UV @ 220 nm
Temperature: 22°C
Sample: 1. Maleic Acid
2. Fumaric Acid

Traditional Silica “Fully Porous” Column



“Monolithic” Column



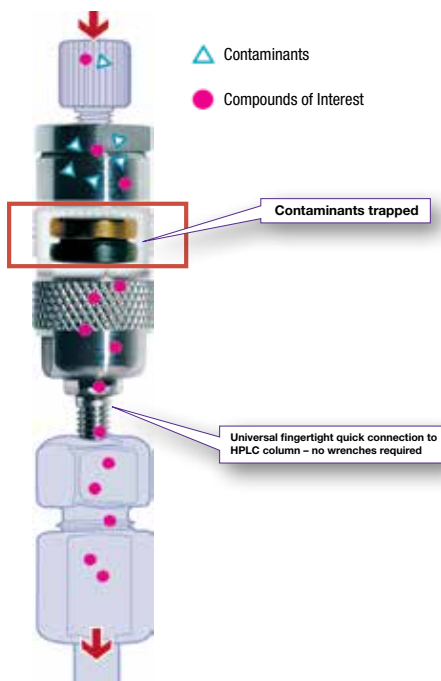
Conditions same for all columns except where noted.

See page 29 for ordering information.

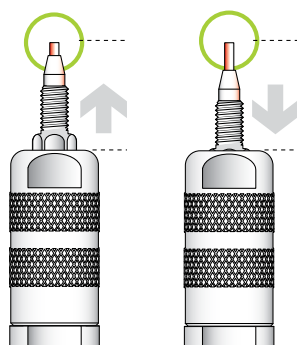


Extend HPLC and UHPLC Column Lifetime

SecurityGuard is a universal HPLC guard cartridge system designed to protect all your valuable analytical and preparative HPLC columns from the damaging effects of chemical contaminants, without altering your chromatographic results. For UHPLC columns there is now SecurityGuard ULTRA.



Universal Fit Patented Design



Feature applies to analytical-sized guard system only, and does not apply to SemiPrep or PREP guard cartridges.

Can be Easily Inspected for Contaminants



If your contaminants are colorless, replace the cartridge as often as needed to maintain chromatographic performance.



UHPLC Column Protection

- Extends HPLC, core-shell, and <math>< 3 \mu\text{m}</math> particle column lifetime
- Virtually no change in chromatography
- Fits virtually all manufacturers' columns 2.1 to 4.6 mm ID
- Pressure rated to 20,000 psi (1,378 bar)
- Simple to use

Universal Fit

Use SecurityGuard ULTRA with virtually all UHPLC columns 2.1 to 4.6 mm ID. The extremely low dead volume of this unique product minimizes sample peak dispersion. It will efficiently remove microparticulates and chemical contaminants from the flow stream without contributing to system backpressure or dead volume (<math>< 0.3 \mu\text{L}</math>).

SecurityGuard ULTRA Increases Column Lifetime, Guaranteed!

When contaminants and particulates build up at the head of your column or on the guard cartridge, 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.

See page 30 for ordering information.

Cartridge

Holder



Holder with cartridge, assembled

2012 R&D 100
Award Recipient



Gemini Ordering Information

For a full list of part numbers and bulk media information, please contact Phenomenex.

Analytical Columns

3 µm Microbore, Minibore and Narrow Bore Columns (mm)										SecurityGuard™ Cartridges (mm)	
Phases	50 x 1.0	20 x 2.0	30 x 2.0	50 x 2.0	100 x 2.0	150 x 2.0	50 x 3.0	100 x 3.0	150 x 3.0	4 x 2.0*	
C18	00B-4439-A0	00M-4439-B0	00A-4439-B0	00B-4439-B0	00D-4439-B0	00F-4439-B0	00B-4439-Y0	00D-4439-Y0	00F-4439-Y0	/10pk	
C6-Phenyl	00B-4443-A0	—	00A-4443-B0	00B-4443-B0	00D-4443-B0	00F-4443-B0	00B-4443-Y0	00D-4443-Y0	00F-4443-Y0	AJ0-7596	
	—	—	—	—	—	—	—	—	—	AJ0-7914	
	—	—	—	—	—	—	—	—	—	/10pk	
NX-C18	—	00M-4453-B0	00A-4453-B0	00B-4453-B0	00D-4453-B0	00F-4453-B0	00B-4453-Y0	00D-4453-Y0	00F-4453-Y0	AJ0-8367	

for ID: 2.0-3.0 mm

3 µm Analytical Columns (mm)							SecurityGuard Cartridges (mm)	
Phases	20 x 4.0	30 x 4.6	50 x 4.6	100 x 4.6	150 x 4.6	250 x 4.6	4 x 3.0*	
C18	00M-4439-D0	00A-4439-E0	00B-4439-E0	00D-4439-E0	00F-4439-E0	00G-4439-E0	/10pk	
C6-Phenyl	—	00A-4443-E0	00B-4443-E0	00D-4443-E0	00F-4443-E0	00G-4443-E0	AJ0-7597	
	—	—	—	—	—	—	AJ0-7915	
	—	—	—	—	—	—	/10pk	
NX-C18	—	—	00B-4453-E0	00D-4453-E0	00F-4453-E0	00G-4453-E0	AJ0-8368	

for ID: 3.2-8.0 mm



5 µm Minibore and Narrow Bore Columns (mm)									SecurityGuard Cartridges (mm)	
Phases	30 x 2.0	50 x 2.0	150 x 2.0	250 x 2.0	50 x 3.0	100 x 3.0	150 x 3.0	250 x 3.0	4 x 2.0*	
C18	00A-4435-B0	00B-4435-B0	00F-4435-B0	00G-4435-B0	00B-4435-Y0	00D-4435-Y0	00F-4435-Y0	00G-4435-Y0	/10pk	
C6-Phenyl	00A-4444-B0	00B-4444-B0	00F-4444-B0	—	00B-4444-Y0	—	00F-4444-Y0	00G-4444-Y0	AJ0-7596	
	—	—	—	—	—	—	—	—	AJ0-7914	
	—	—	—	—	—	—	—	—	/10pk	
NX-C18	00A-4454-B0	00B-4454-B0	00F-4454-B0	—	00B-4454-Y0	00D-4454-Y0	00F-4454-Y0	00G-4454-Y0	AJ0-8367	

for ID: 2.0-3.0 mm

5 µm Analytical Columns (mm)						SecurityGuard Cartridges (mm)	
Phases	30 x 4.6	50 x 4.6	100 x 4.6	150 x 4.6	250 x 4.6	4 x 3.0*	
C18	00A-4435-E0	00B-4435-E0	00D-4435-E0	00F-4435-E0	00G-4435-E0	/10pk	
C6-Phenyl	00A-4444-E0	00B-4444-E0	00D-4444-E0	00F-4444-E0	00G-4444-E0	AJ0-7597	
	—	—	—	—	—	AJ0-7915	
	—	—	—	—	—	/10pk	
NX-C18	—	00B-4454-E0	00D-4454-E0	00F-4454-E0	00G-4454-E0	AJ0-8368	

for ID: 3.2-8.0 mm

5 µm Semi-Prep Columns (mm)			SecurityGuard Cartridges (mm)	
Phases	150 x 10	250 x 10	10 x 10 ⁺	
C18	00F-4435-N0	00G-4435-N0	/3pk	
C6-Phenyl	—	00G-4444-N0	AJ0-7598	
	—	—	AJ0-7314	
	—	—	/3pk	
NX-C18	00F-4454-N0	00G-4454-N0	AJ0-8369	

for ID: 9-16 mm



Preparative Columns

Axia™ Packed Preparative Columns (mm)							SecurityGuard Cartridges (mm)	
Phases	50 x 21.2	100 x 21.2	150 x 21.2	250 x 21.2	50 x 30	75 x 30	15 x 21.2**	15 x 30.0*
5 µm							/ea	/ea
C18	00B-4435-P0-AX	00D-4435-P0-AX	00F-4435-P0-AX	00G-4435-P0-AX	00B-4435-U0-AX	00C-4435-U0-AX	AJ0-7846	AJ0-8308
C6-Phenyl	—	00D-4444-P0-AX	00F-4444-P0-AX	00G-4444-P0-AX	—	00C-4444-U0-AX	AJ0-7841	AJ0-8303
5 µm							/ea	/ea
NX-C18	00B-4454-P0-AX	00D-4454-P0-AX	00F-4454-P0-AX	00G-4454-P0-AX	00B-4454-U0-AX	00C-4454-U0-AX	AJ0-8370	AJ0-8371
10 µm							/ea	/ea
C18	00B-4436-P0-AX	00D-4436-P0-AX	00F-4436-P0-AX	00G-4436-P0-AX	00B-4436-U0-AX	—	AJ0-7846	AJ0-8308
10 µm							/ea	/ea
NX-C18	00B-4455-P0-AX	00D-4455-P0-AX	00F-4455-P0-AX	00G-4455-P0-AX	—	—	AJ0-8370	AJ0-8371

for ID: 18-29 mm 30-49 mm

Axia Packed Preparative Columns (mm) continued							SecurityGuard Cartridges (mm)	
Phases	100 x 30	150 x 30	250 x 30	50 x 50	100 x 50	150 x 50	250 x 50	15 x 30.0*
5 µm							—	/ea
C18	00D-4435-U0-AX	00F-4435-U0-AX	00G-4435-U0-AX	00B-4435-V0-AX	—	—	—	AJ0-8308
C6-Phenyl	00D-4444-U0-AX	—	—	—	—	—	—	AJ0-8303
5 µm							—	/ea
NX-C18	00D-4454-U0-AX	00F-4454-U0-AX	00G-4454-U0-AX	—	—	—	—	AJ0-8371
10 µm							—	/ea
C18	00D-4436-U0-AX	00F-4436-U0-AX	00G-4436-U0-AX	00B-4436-V0-AX	00D-4436-V0-AX	00F-4436-V0-AX	00G-4436-V0-AX	AJ0-8308
10 µm							—	/ea
NX-C18	00D-4455-U0-AX	00F-4455-U0-AX	00G-4455-U0-AX	00B-4455-V0-AX	00D-4455-V0-AX	00F-4455-V0-AX	00G-4455-V0-AX	AJ0-8371

for ID: 30-49 mm



If Gemini analytical columns do not provide at least an equivalent separation as compared to a competing column of similar particle size, similar phase and dimensions, send in your comparative data within 45 days and keep the Gemini column for FREE.

*SecurityGuard Analytical Cartridges require holder, Part No.: KJ0-4282

†SemiPrep SecurityGuard Cartridges require holder, Part No.: AJ0-7220

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

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

Synergi Ordering Information

For a full list of part numbers and bulk media information, please contact Phenomenex.

Analytical Columns

4 µm Microbore and Minibore Columns (mm)								SecurityGuard™ Cartridges (mm)	
Phases	50 x 1.0	150 x 1.0	250 x 1.0	30 x 2.0	50 x 2.0	75 x 2.0	150 x 2.0	250 x 2.0	4 x 2.0*
Max-RP	00B-4337-A0	00F-4337-A0	—	00A-4337-B0	00B-4337-B0	00C-4337-B0	00F-4337-B0	00G-4337-B0	/10pk AJ0-6073
Hydro-RP	00B-4375-A0	00F-4375-A0	00G-4375-A0	00A-4375-B0	00B-4375-B0	00C-4375-B0	00F-4375-B0	00G-4375-B0	AJ0-7510
Polar-RP	00B-4336-A0	00F-4336-A0	—	00A-4336-B0	00B-4336-B0	00C-4336-B0	00F-4336-B0	00G-4336-B0	AJ0-6075
Fusion-RP	00B-4424-A0	00F-4424-A0	—	00A-4424-B0	00B-4424-B0	00C-4424-B0	00F-4424-B0	00G-4424-B0	AJ0-7556

for ID: 2.0-3.0 mm

4 µm Narrow Bore Columns (mm)				SecurityGuard Cartridges (mm)	
Phases	30 x 3.0	50 x 3.0	150 x 3.0	250 x 3.0	4 x 2.0*
Max-RP	00A-4337-Y0	00B-4337-Y0	00F-4337-Y0	00G-4337-Y0	/10pk AJ0-6073
Hydro-RP	00A-4375-Y0	00B-4375-Y0	00F-4375-Y0	00G-4375-Y0	AJ0-7510
Polar-RP	00A-4336-Y0	00B-4336-Y0	00F-4336-Y0	00G-4336-Y0	AJ0-6075
Fusion-RP	00A-4424-Y0	00B-4424-Y0	00F-4424-Y0	00G-4424-Y0	AJ0-7556

for ID: 2.0-3.0 mm



4 µm Analytical Columns (mm)					SecurityGuard Cartridges (mm)	
Phases	30 x 4.6	50 x 4.6	75 x 4.6	150 x 4.6	250 x 4.6	4 x 3.0*
Max-RP	00A-4337-E0	00B-4337-E0	00C-4337-E0	00F-4337-E0	00G-4337-E0	/10pk AJ0-6074
Hydro-RP	00A-4375-E0	00B-4375-E0	00C-4375-E0	00F-4375-E0	00G-4375-E0	AJ0-7511
Polar-RP	00A-4336-E0	00B-4336-E0	00C-4336-E0	00F-4336-E0	00G-4336-E0	AJ0-6076
Fusion-RP	00A-4424-E0	00B-4424-E0	00C-4424-E0	00F-4424-E0	00G-4424-E0	AJ0-7557

for ID: 3.2-8.0 mm

Preparative Columns

Axia™ Packed Preparative Columns (mm)					SecurityGuard Cartridges (mm)	
Phases	50 x 21.2	100 x 21.2	150 x 21.2	250 x 21.2	15 x 21.2**	
4 µm						
Max-RP	00B-4337-P0-AX	00D-4337-P0-AX	00F-4337-P0-AX	00G-4337-P0-AX	/ea AJ0-7842	
Hydro-RP	00B-4375-P0-AX	00D-4375-P0-AX	00F-4375-P0-AX	00G-4375-P0-AX	AJ0-7843	
Polar-RP	00B-4336-P0-AX	00D-4336-P0-AX	00F-4336-P0-AX	00G-4336-P0-AX	AJ0-7845	
Fusion-RP	00B-4424-P0-AX	00D-4424-P0-AX	00F-4424-P0-AX	00G-4424-P0-AX	AJ0-7844	
10 µm						
Max-RP	—	00D-4350-P0-AX	Inquire	00G-4350-P0-AX	/ea AJ0-7842	
Hydro-RP	—	—	Inquire	00G-4376-P0-AX	AJ0-7843	
Polar-RP	—	—	Inquire	00G-4351-P0-AX	AJ0-7845	
Fusion-RP	—	—	Inquire	00G-4425-P0-AX	AJ0-7844	

for ID: 18-29 mm

Axia Packed Preparative Columns (mm) continued					SecurityGuard Cartridges (mm)	
Phases	50 x 30	75 x 30	100 x 30	250 x 30	15 x 30.0*	
4 µm						
Max-RP	00B-4337-U0-AX	00C-4337-U0-AX	00D-4337-U0-AX	00G-4337-U0-AX	/ea AJ0-8304	
Hydro-RP	00B-4375-U0-AX	00C-4375-U0-AX	00D-4375-U0-AX	00G-4375-U0-AX	AJ0-8305	
Polar-RP	00B-4336-U0-AX	00C-4336-U0-AX	00D-4336-U0-AX	00G-4336-U0-AX	AJ0-8307	
Fusion-RP	—	—	00D-4424-U0-AX	00G-4424-U0-AX	AJ0-8306	
10 µm						
Max-RP	00B-4350-U0-AX	—	00D-4350-U0-AX	00G-4350-U0-AX	/ea AJ0-8304	
Hydro-RP	00B-4376-U0-AX	—	—	00G-4376-U0-AX	AJ0-8305	
Polar-RP	00B-4351-U0-AX	—	—	00G-4351-U0-AX	AJ0-8307	
Fusion-RP	—	—	00D-4425-U0-AX	—	AJ0-8306	

for ID: 30-49 mm

4 µm Semi-Prep Columns (mm)		SecurityGuard Cartridges (mm)	
Phases	250 x 10	10 x 10*	
Max-RP	00G-4337-N0	/3pk AJ0-7275	
Hydro-RP	00G-4375-N0	AJ0-7512	
Polar-RP	00G-4336-N0	AJ0-7276	
Fusion-RP	00G-4424-N0	AJ0-7558	

for ID: 9-16 mm



*SecurityGuard Analytical Cartridges require holder, Part No.: KJ0-4282

*SemiPrep SecurityGuard Cartridges require holder, Part No.: AJ0-7220

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

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



If Synergi analytical columns do not provide at least an equivalent separation as compared to a competing column of similar particle size, similar phase and dimensions, send in your comparative data within 45 days and keep the Synergi column for FREE.

Luna Ordering Information

For a full list of part numbers and bulk media information, please contact Phenomenex.

Fast LC Columns

2.5 µm High Speed Technology (HST) Columns (mm)					
Phase	30 x 2.0	50 x 2.0	100 x 2.0	50 x 3.0	100 x 3.0
Luna 2.5 µm C18(2)-HST	00A-4446-B0	00B-4446-B0	00D-4446-B0	00B-4446-Y0	00D-4446-Y0

Analytical Columns

3 µm Microbore and Minibore Columns (mm)							SecurityGuard™ Cartridges (mm)	
Phases	50 x 1.0	150 x 1.0	30 x 2.0	50 x 2.0	100 x 2.0	150 x 2.0	4 x 2.0*	
C8(2)	00B-4248-A0	00F-4248-A0	00A-4248-B0	00B-4248-B0	00D-4248-B0	00F-4248-B0	/10pk	
C18(2)	00B-4251-A0	00F-4251-A0	00A-4251-B0	00B-4251-B0	00D-4251-B0	00F-4251-B0	AJ0-4289	
CN	—	—	00A-4254-B0	00B-4254-B0	00D-4254-B0	00F-4254-B0	AJ0-4286	
Phenyl-Hexyl	00B-4256-A0	—	00A-4256-B0	00B-4256-B0	00D-4256-B0	00F-4256-B0	AJ0-4304	
NH ₂	—	00F-4377-A0	00A-4377-B0	00B-4377-B0	00D-4377-B0	00F-4377-B0	AJ0-4350	
PPFP(2)	—	—	00A-4447-B0	00B-4447-B0	00D-4447-B0	00F-4447-B0	AJ0-4301	
							AJ0-8326	

for ID: 2.0-3.0mm

3 µm Narrow Bore and Analytical Columns (mm)									SecurityGuard Cartridges (mm)	
Phases	30 x 3.0	50 x 3.0	150 x 3.0	30 x 4.6	50 x 4.6	75 x 4.6	100 x 4.6	150 x 4.6	4 x 2.0*	4 x 3.0*
C8(2)	00A-4248-Y0	00B-4248-Y0	00F-4248-Y0	00A-4248-E0	00B-4248-E0	00C-4248-E0	00D-4248-E0	00F-4248-E0	/10pk	
C18(2)	00A-4251-Y0	00B-4251-Y0	00F-4251-Y0	00A-4251-E0	00B-4251-E0	00C-4251-E0	00D-4251-E0	00F-4251-E0	AJ0-4289	AJ0-4290
CN	—	00B-4254-Y0	00F-4254-Y0	00A-4254-E0	00B-4254-E0	00C-4254-E0	00D-4254-E0	00F-4254-E0	AJ0-4286	AJ0-4287
Phenyl-Hexyl	—	00B-4256-Y0	00F-4256-Y0	00A-4256-E0	00B-4256-E0	00C-4256-E0	00D-4256-E0	00F-4256-E0	AJ0-4304	AJ0-4305
NH ₂	—	00B-4377-Y0	00F-4377-Y0	—	00B-4377-E0	—	00D-4377-E0	00F-4377-E0	AJ0-4350	AJ0-4351
PPFP(2)	—	00B-4447-Y0	00F-4447-Y0	—	00B-4447-E0	—	00D-4447-E0	00F-4447-E0	AJ0-4301	AJ0-4302
									AJ0-8326	AJ0-8327

for ID: 2.0-3.0mm 3.2-8.0mm

5 µm Microbore and Minibore Columns (mm)								SecurityGuard Cartridges (mm)	
Phases	50 x 1.0	150 x 1.0	250 x 1.0	30 x 2.0	50 x 2.0	150 x 2.0	250 x 2.0	4 x 2.0*	
C5	—	—	—	00A-4043-B0	00B-4043-B0	00F-4043-B0	—	/10pk	
C8(2)	00B-4249-A0	00F-4249-A0	—	00A-4249-B0	00B-4249-B0	00F-4249-B0	00G-4249-B0	AJ0-4292	
C18(2)	00B-4252-A0	00F-4252-A0	00G-4252-A0	00A-4252-B0	00B-4252-B0	00F-4252-B0	00G-4252-B0	AJ0-4289	
CN	—	—	—	00A-4255-B0	00B-4255-B0	00F-4255-B0	00G-4255-B0	AJ0-4286	
Phenyl-Hexyl	00B-4257-A0	00F-4257-A0	00G-4257-A0	00A-4257-B0	00B-4257-B0	00F-4257-B0	00G-4257-B0	AJ0-4304	
NH ₂	—	00F-4378-A0	—	00A-4378-B0	00B-4378-B0	00F-4378-B0	00G-4378-B0	AJ0-4350	
PPFP(2)	—	—	—	00A-4448-B0	00B-4448-B0	00F-4448-B0	—	AJ0-4301	
								AJ0-8326	

for ID: 2.0-3.0mm

5 µm Narrow Bore and Analytical Columns (mm)								SecurityGuard Cartridges (mm)	
Phases	30 x 3.0	50 x 3.0	150 x 3.0	250 x 3.0	30 x 4.6	50 x 4.6	75 x 4.6	4 x 2.0*	4 x 3.0*
C5	—	—	00F-4043-Y0	—	—	00B-4043-E0	—	/10pk	
C8(2)	—	00B-4249-Y0	00F-4249-Y0	00G-4249-Y0	00A-4249-E0	00B-4249-E0	00C-4249-E0	AJ0-4292	AJ0-4293
C18(2)	00A-4252-Y0	00B-4252-Y0	00F-4252-Y0	00G-4252-Y0	00A-4252-E0	00B-4252-E0	00C-4252-E0	AJ0-4289	AJ0-4290
CN	—	00B-4255-Y0	00F-4255-Y0	00G-4255-Y0	00A-4255-E0	00B-4255-E0	00C-4255-E0	AJ0-4286	AJ0-4287
Phenyl-Hexyl	00A-4257-Y0	00B-4257-Y0	00F-4257-Y0	00G-4257-Y0	00A-4257-E0	00B-4257-E0	00C-4257-E0	AJ0-4304	AJ0-4305
NH ₂	—	00B-4378-Y0	00F-4378-Y0	00G-4378-Y0	00A-4378-E0	00B-4378-E0	00C-4378-E0	AJ0-4350	AJ0-4351
PPFP(2)	—	00B-4448-Y0	00F-4448-Y0	—	00A-4448-E0	00B-4448-E0	—	AJ0-4301	AJ0-4302
								AJ0-8326	AJ0-8327

for ID: 2.0-3.0mm 3.2-8.0mm

Luna® Ordering Information (continued)

Analytical Columns

5 µm Analytical and Semi-Prep Columns (mm)						SecurityGuard™ Cartridges (mm)	
Phases	100 x 4.6	150 x 4.6	250 x 4.6	250 x 10	250 x 15	4 x 3.0*	10 x 10†
						/10pk	/3pk
C5	00D-4043-E0	00F-4043-E0	00G-4043-E0	—	—	AJO-4293	AJO-7372
C8(2)	00D-4249-E0	00F-4249-E0	00G-4249-E0	00G-4249-N0	—	AJO-4290	AJO-7222
C18(2)	00D-4252-E0	00F-4252-E0	00G-4252-E0	00G-4252-N0	00G-4252-AK	AJO-4287	AJO-7221
CN	00D-4255-E0	00F-4255-E0	00G-4255-E0	00G-4255-N0	—	AJO-4305	AJO-7313
Phenyl-Hexyl	00D-4257-E0	00F-4257-E0	00G-4257-E0	00G-4257-N0	—	AJO-4351	AJO-7314
NH ₂	00D-4378-E0	00F-4378-E0	00G-4378-E0	00G-4378-N0	—	AJO-4302	AJO-7364
PPFP(2)	00D-4448-E0	00F-4448-E0	00G-4448-E0	00G-4448-N0	—	AJO-8327	AJO-8376

for ID: 3.2-8.0 mm 9-16 mm



Preparative Columns

Axia™ Packed Preparative Columns (mm)								SecurityGuard Cartridges (mm)	
Phases	50 x 21.2	100 x 21.2	150 x 21.2	250 x 21.2	50 x 30	100 x 30	250 x 30	15 x 21.2**	15 x 30 †
								/ea	£ /ea
5 µm									
C5	—	—	00F-4043-P0-AX	—	—	—	—	—	—
C8(2)	00B-4249-P0-AX	00D-4249-P0-AX	00F-4249-P0-AX	—	00B-4249-U0-AX	00D-4249-U0-AX	—	AJO-7840	AJO-8302
C18(2)	00B-4252-P0-AX	00D-4252-P0-AX	00F-4252-P0-AX	00G-4252-P0-AX	00B-4252-U0-AX	00D-4252-U0-AX	00G-4252-U0-AX	AJO-7839	AJO-8301
CN	00B-4255-P0-AX	—	00F-4255-P0-AX	00G-4255-P0-AX	—	00D-4255-U0-AX	—	AJO-8220	AJO-8311
Phenyl-Hexyl	00B-4257-P0-AX	00D-4257-P0-AX	00F-4257-P0-AX	—	00B-4257-U0-AX	00D-4257-U0-AX	—	AJO-7841	AJO-8303
NH ₂	—	00D-4378-P0-AX	00F-4378-P0-AX	00G-4378-P0-AX	—	—	—	AJO-8162	AJO-8309
PPFP(2)	00B-4448-P0-AX	00D-4448-P0-AX	00F-4448-P0-AX	00G-4448-P0-AX	00B-4448-U0-AX	00D-4448-U0-AX	00G-4448-U0-AX	AJO-8377	AJO-8378

for ID: 18-29 mm 30-49 mm

Axia Packed Preparative Columns (mm) (continued)								SecurityGuard Cartridges (mm)	
Phases	50 x 21.2	100 x 21.2	250 x 21.2	50 x 30	250 x 30	50 x 50	250 x 50	15 x 21.2**	15 x 30 †
								/ea	/ea
10 µm									
C5	—	00D-4092-P0-AX	00G-4092-P0-AX	—	—	—	00G-4092-V0-AX	—	—
C8(2)	00B-4250-P0-AX	—	00G-4250-P0-AX	00B-4250-U0-AX	—	—	00G-4250-V0-AX	AJO-7840	AJO-8302
C18(2)	00B-4253-P0-AX	00D-4253-P0-AX	00G-4253-P0-AX	00B-4253-U0-AX	00G-4253-U0-AX	00B-4253-V0-AX	00G-4253-V0-AX	AJO-7839	AJO-8301
CN	—	—	00G-4300-P0-AX	—	—	—	—	AJO-8220	AJO-8311
Phenyl-Hexyl	—	—	00G-4285-P0-AX	—	00G-4285-U0-AX	—	—	AJO-7841	AJO-8303
NH ₂	—	—	00G-4379-P0-AX	—	—	—	—	AJO-8162	AJO-8309

for ID: 18-29 mm 30-49 mm

*SecurityGuard Analytical Cartridges require holder, Part No.: KJO-4282

†SemiPrep SecurityGuard Cartridges require holder, Part No.: AJO-7220

**PREP SecurityGuard Cartridges require holder, Part No.: AJO-8223

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



guarantee

If Luna analytical columns do not provide at least an equivalent separation as compared to a competing column of the same particle size, similar phase, and dimensions, send in your comparative data within 45 days and keep the Luna column for FREE.

Kinetex Ordering Information

Columns

SecurityGuard™ ULTRA Cartridges†							SecurityGuard ULTRA Cartridges†	
5 µm Columns (mm)		3/pk		50 x 4.6	100 x 4.6	150 x 4.6	250 x 4.6	3/pk
Phases	50 x 2.1							
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
PPF	00B-4602-AN	AJ0-8787		00B-4602-E0	00D-4602-E0	00F-4602-E0	00G-4602-E0	AJ0-8773
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

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**
XB-C18	00B-4605-P0-AX	00D-4605-P0-AX	00F-4605-P0-AX	00G-4605-P0-AX	250 /ea
C18	00B-4601-P0-AX	00D-4601-P0-AX	00F-4601-P0-AX	00G-4601-P0-AX	AJ0-9145
PPF	00B-4602-P0-AX	00D-4602-P0-AX	00F-4602-P0-AX	00G-4602-P0-AX	AJ0-9146
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

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

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	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
PPF	00A-4477-E0	00B-4477-E0	00C-4477-E0	00D-4477-E0	00F-4477-E0	AJ0-8773
HILIC	00A-4461-E0	00B-4461-E0	00C-4461-E0	00D-4461-E0	00F-4461-E0	AJ0-8772
Phenyl-Hexyl	—	00B-4495-E0	—	00D-4495-E0	00F-4495-E0	AJ0-8774

for 4.6 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
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
PPF	00A-4477-Y0	00B-4477-Y0	00C-4477-Y0	00D-4477-Y0	00F-4477-Y0	AJ0-8780
HILIC	00A-4461-Y0	—	—	—	00F-4461-Y0	AJ0-8779
Phenyl-Hexyl	—	—	—	00D-4495-Y0	00F-4495-Y0	AJ0-8781

for 3.0 mm ID

2.6 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
XB-C18	00A-4496-AN	00B-4496-AN	00D-4496-AN	00F-4496-AN	AJ0-8782
C18	00A-4462-AN	00B-4462-AN	00D-4462-AN	00F-4462-AN	AJ0-8782
C8	00A-4497-AN	00B-4497-AN	00D-4497-AN	00F-4497-AN	AJ0-8784
PPF	00A-4477-AN	00B-4477-AN	00D-4477-AN	00F-4477-AN	AJ0-8787
HILIC	00A-4461-AN	00B-4461-AN	00D-4461-AN	00F-4461-AN	AJ0-8786
Phenyl-Hexyl	00A-44495-AN	00B-4495-AN	00D-4495-AN	00F-4495-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
PPF	—	—	00D-4476-Y0	AJ0-8780
HILIC	—	00B-4474-Y0	—	AJ0-8779
Phenyl-Hexyl	—	—	—	AJ0-8781

for 3.0 mm ID

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
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
PPF	00A-4476-AN	00B-4476-AN	00D-4476-AN	00F-4476-AN	AJ0-8787
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

1.3 µm Columns (mm)	
Phase	50 x 2.1
C18	00B-4515-AN



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

SecurityGuard ULTRA
Holder with cartridge



Cartridge Holder



If you are not completely satisfied with Kinetex core-shell columns, send in your comparative data to a similar product within 45 days and KEEP THE COLUMN FOR FREE.

For more information on SecurityGuard ULTRA, see pp. 23, 29 and 30.

Kinetex Ordering Information (continued)

Core-Shell Performance Enhancement Kit

Ordering Information

Part No.	Unit	Price
AQO-8892	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 20000 psi (1378 bar)
- Fits virtually all manufacturers' columns 2.1 to 4.6 mm ID

New High Pressure
Rated Format

SecurityGuard ULTRA Cartridge Holder



Ordering Information

Part No.	Description	Unit	Price
AJO-9000	SecurityGuard ULTRA Cartridge Holder	ea	

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

Ordering Information

Part No.	Description	Unit	Price
AQO-8503	Sure-Lok High Pressure PEEK 1-Pc Nut 10-32, for 1/16 in. Tubing, 12000 psi (827 bar)	10/pk	
AQO-8530	Sure-Lok Fitting Tightening Tool, Aluminum	ea	



Onyx Ordering Information

Columns

Part No.	Description	Size (mm)	Price
Capillary Columns			
CHO-8388	Onyx Monolithic C18	150 x 0.05	
CHO-7646	Onyx Monolithic C18	150 x 0.1	
CHO-8389	Onyx Monolithic HD-C18	150 x 0.1	
CHO-8390	Onyx Monolithic C18	150 x 0.2	
CHO-8391	Onyx Monolithic HD-C18	150 x 0.2	
CHO-8392	Onyx Monolithic C18 Trapping Column	50 x 0.2	
CHO-8393	Onyx Monolithic C8	150 x 0.1	
Analytical Columns			
CHO-8373	Onyx Monolithic C18	50 x 2.0	
CHO-8467	Onyx Monolithic C18	100 x 2.0	
CHO-8464	Onyx Monolithic C18	25 x 3.0	
CHO-8463	Onyx Monolithic C18	50 x 3.0	
CHO-8158	Onyx Monolithic C18	100 x 3.0	
CHO-7643	Onyx Monolithic C18	100 x 4.6	
CHO-7644	Onyx Monolithic C18	50 x 4.6	
CHO-7645	Onyx Monolithic C18	25 x 4.6	
CHO-8611	Onyx Monolithic HD-C18	100 x 4.6	
CHO-8612	Onyx Monolithic HD-C18	50 x 4.6	
CHO-8613	Onyx Monolithic HD-C18	25 x 4.6	
CHO-7647	Onyx Monolithic C8	100 x 4.6	
CHO-7648	Onyx Monolithic Si	100 x 4.6	
SemiPrep Columns			
CHO-7878	Onyx Monolithic C18	100 x 10.0	
Guard Cartridge System			
KJO-8468	Onyx Monolithic C18 Guard Cartridge Kit (3 pk cartridges + holder + wrench)	5 x 2.0	
CHO-8469	Onyx Monolithic C18 Guard Cartridges (3/pk)	5 x 2.0	
KJO-8465	Onyx Monolithic C18 Guard Cartridge Kit (3 pk cartridges + holder + wrench)	5 x 3.0	
CHO-8466	Onyx Monolithic C18 Guard Cartridges (3/pk)	5 x 3.0	
KJO-7651	Onyx Monolithic C18 Guard Cartridge Kit (3 pk cartridges + holder + wrench)	5 x 4.6	
CHO-7649	Onyx Monolithic C18 Guard Cartridges (3/pk)	5 x 4.6	
KJO-8615	Onyx Monolithic HD-C18 Guard Cartridge Kit (3 pk cartridges + holder + wrench)	5 x 4.6	
CHO-8616	Onyx Monolithic HD-C18 Guard Cartridge (3/pk)	5 x 4.6	
KJO-7652	Onyx Monolithic C18 Guard Cartridge Kit (3 pk cartridges + holder + wrench)	10 x 4.6	
CHO-7650	Onyx Monolithic C18 Guard Cartridges (3/pk)	10 x 4.6	
Method Validation Kit			
KHO-7653	Onyx Monolithic C18 Method Validation Kit (3 columns from different batches)	100 x 4.6	
Column Coupler			
AQO-7654	Onyx Column Coupler, 0.020 in. ID		



If Onyx analytical columns do not provide at least an equivalent separation as compared to a competing column of the same monolithic characteristics, similar phase, and dimensions, send in your comparative data within 45 days and keep the Onyx column for FREE.

SecurityGuard Ordering Information



If HPLC Column ID (mm) is:				
Analytical		Semi-Prep	Prep	
2.0 – 3.0	3.2 – 8.0	3.0 – 16.0	18.0 – 29.0	30.0 – 49.0
Use Cartridges (mm):				
4.0 x 2.0	4.0 x 3.0	10.0 x 10.0	15.0 x 21.2	15.0 x 30.0

Material	Description	pH Stability	/10 pk		/3 pk	/ea	/ea
Cartridges for General Purpose							
C18	(ODS, Octadecyl)	1.5 - 10	AJO-4286	AJO-4287	AJO-7221	AJO-7839	AJO-8301
C12	(Dodecyl)	1.5 - 10	AJO-6073	AJO-6074	AJO-7275	AJO-7842	AJO-8304
C8	(MOS, Octyl)	1.5 - 10	AJO-4289	AJO-4290	AJO-7222	AJO-7840	AJO-8302
C5	(Pentyl)	1.5 - 10	AJO-4292	AJO-4293	AJO-7372	—	—
C1	(TMS)	2 - 9	AJO-4298	AJO-4299	AJO-7373	—	—
NH ₂	(Amino, Aminopropyl)	1.5 - 11	AJO-4301	AJO-4302	AJO-7364	AJO-8162	AJO-8309
CN	(Cyano, Cyanopropyl)	2 - 7.5	AJO-4304	AJO-4305	AJO-7313	AJO-8220	AJO-8311
Phenyl	(Phenylhexyl)	1.5 - 10	AJO-4350	AJO-4351	AJO-7314	AJO-7841	AJO-8303
PFP(2)	(Pentafluorophenyl)	1.5 - 8	AJO-8326	AJO-8327	AJO-8376	AJO-8377	AJO-8378
RP-1	(Reversed Phase - Polymer)	0 - 14	AJO-5808	AJO-5809	AJO-7368	AJO-8358	—
Polar-RP	(Ether-linked Phenyl)	1.5 - 7	AJO-6075	AJO-6076	AJO-7276	AJO-7845	AJO-8307
Fusion-RP	(C18 Polar Embedded)	1.5 - 10	AJO-7556	AJO-7557	AJO-7558	AJO-7844	AJO-8306
AQ C18	(Polar Endcapped C18)	1.5 - 7.5	AJO-7510	AJO-7511	AJO-7512	AJO-7843	AJO-8305
Gemini® NX-C18	(C18 TWIN-NX™ Technology)	1 - 12	AJO-8367	AJO-8368	AJO-8369	AJO-8370	AJO-8371
Gemini C18	(C18 TWIN™ Technology)	1 - 12	AJO-7596	AJO-7597	AJO-7598	AJO-7846	AJO-8308
Gemini C6-Phenyl	(C6-Phenyl TWIN Technology)	1 - 12	AJO-7914	AJO-7915	—	—	—

Guard Cartridge Holders	/kit	/holder	/kit	/kit
	KJO-4282	AJO-7220	AJO-8223	AJO-8277



If SecurityGuard cartridge protection system does not perform as well or better than your current guard cartridge system of similar phase and dimensions, send in your comparative data within 45 days and keep the SecurityGuard for FREE.

SecurityGuard ULTRA Ordering Information



SecurityGuard ULTRA Cartridge Holder

Part No.	Description	Unit	Price
AJO-9000	SecurityGuard ULTRA Cartridge Holder	ea	



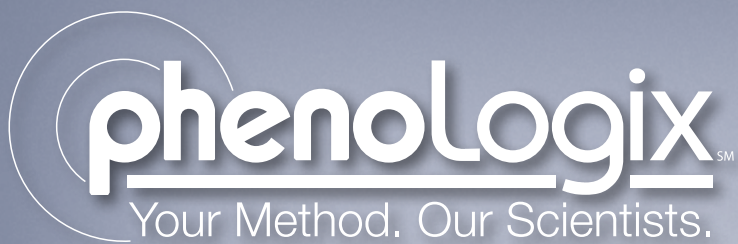
SecurityGuard ULTRA Cartridges

Material	Description	pH Stability	Column ID (mm)		
			2.1 /3pk	3.0 /3pk	4.6 /3pk
C18	(ODS, Octadecyl)	1.5 – 8.5*	AJO-8782	AJO-8775	AJO-8768
C8	(MOS, Octyl)	1.5 – 8.5*	AJO-8784	AJO-8777	AJO-8770
PFP	(Pentafluorophenyl)	1.5 – 8.5*	AJO-8787	AJO-8780	AJO-8773
Phenyl	(Phenyl-Hexyl)	1.5 – 8.5*	AJO-8788	AJO-8781	AJO-8774

*pH stable 1.5-8.5 under gradient conditions. pH stable 1.5-10 under isocratic conditions.



If SecurityGuard ULTRA cartridge protection system does not perform as well or better than your current guard cartridge system of similar phase and dimensions, send in your comparative data within 45 days and keep the SecurityGuard ULTRA for FREE.



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Disclaimer

Phenomenex is in no way affiliated with BASi Lab. Comparative separations may not be representative of all applications.

Axia is patented by Phenomenex. U.S. Patent No. 7, 674, 383

Gemini is patented by Phenomenex. U.S. Patent No. 7, 563,367

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

Onyx is a Phenomenex product based on monolithic technology under license from Merck KGaA, Darmstadt, Germany.

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