

The Ultimate Guide to HPLC

Reversed Phase Selectivity

35% OFF
Your Perfect Column

Expires: 30 November 2011

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*Offer applies to products listed in this brochure and
for columns with ID less than 10 mm.



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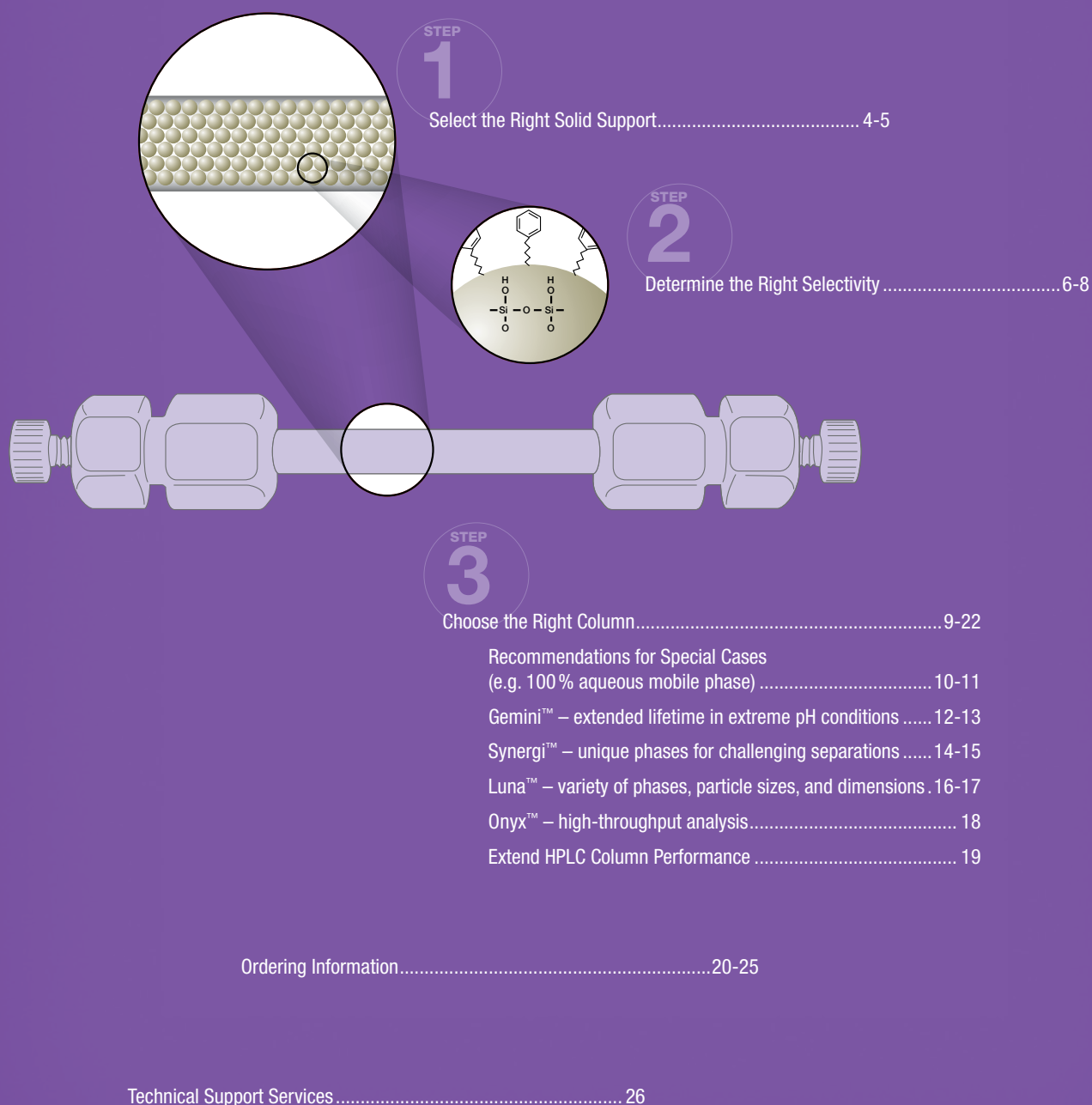


How do you choose a column?

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 this selectivity guide for you to quickly find the perfect column for your method.

Follow this Step-by-step Selectivity Guide

Contained within the following pages is an easy overview of the reversed phase HPLC 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 offers a full range of solid supports including fully porous – traditional and organo silica and monolithic silica rod. The morphology of the solid support has a significant impact on the resulting material characteristics and column performance.

Fully Porous – Traditional Silica

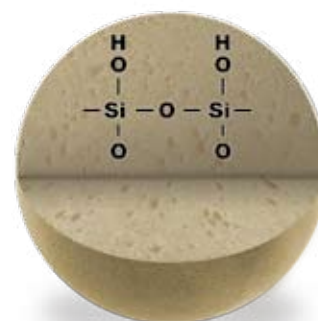
Fully porous silica particles have higher surface area and provide excellent mechanical strength across a wide range of particle sizes and column dimensions.

Well suited for:

- Seamless scale-up from analytical to a preparative or process application
- Direct column equivalent to those used in established Pharmacopeia methods

Scalability						
Capillary	Minibore	Narrow Bore	Analytical	Semi-Prep	Preparative	Bulk Media

Particle Sizes						
2.5 µm	3 µm	4 µm	5 µm	10 µm	15 µm	



Fully Porous – Organo-Silica

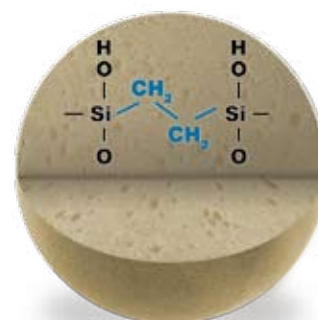
Organic groups are grafted into the layers of the silica particle making it more resistant to silica dissolution at higher pHs.

Well suited for:

- Extended column lifetime for methods run at pH extremes
- Premier bulk material product allowing for caustic washes for repeat use

Scalability						
Capillary	Minibore	Narrow Bore	Analytical	Semi-Prep	Preparative	Bulk Media

Particle Sizes						
2.5 µm	3 µm	4 µm	5 µm	10 µm	15 µm	



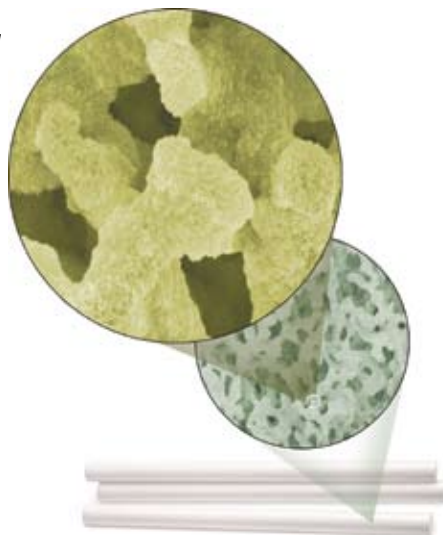
Monolithic Silica Rod

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						

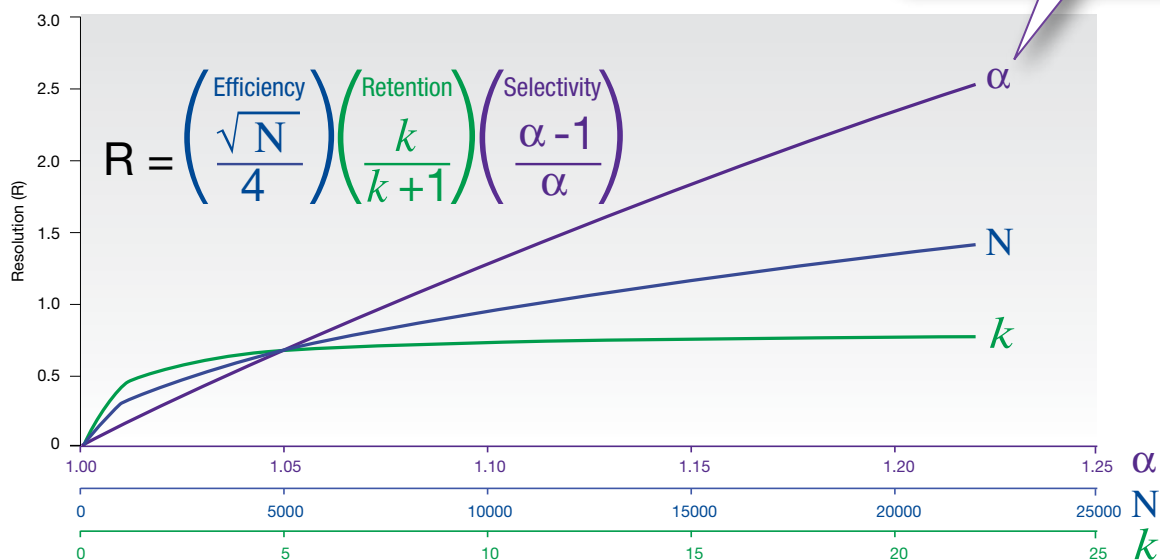


The Importance of Selectivity

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.

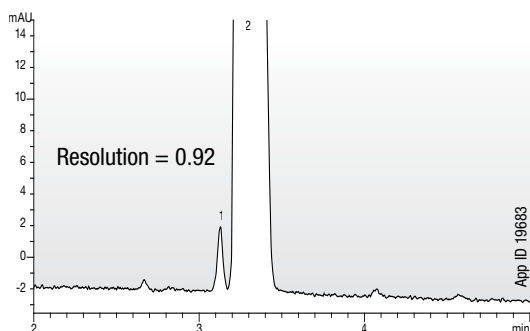
Selectivity is the most important parameter for increasing resolution. Use the selectivity profiles (pp. 12-18) to find the right phase for your sample.

The Impact of Selectivity on Resolution



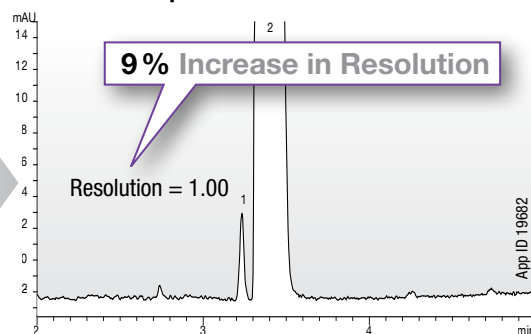
Change Your Selectivity, Dramatically Change Your Results

Gemini-NX 5 μ m C18 110Å



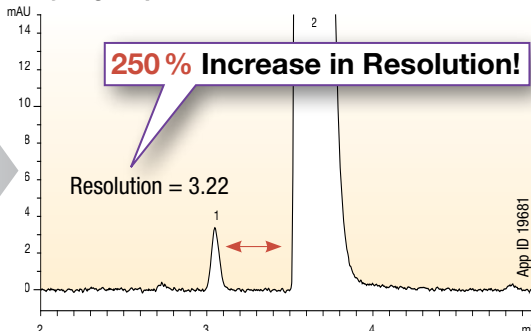
Option 1:
Increase Efficiency
(5 μ m to 3 μ m particle)

Gemini™-NX 3 μ m C18



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

Synergi™ 4 μ m Polar-RP



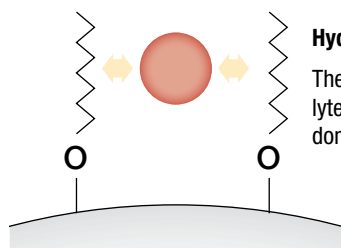
Conditions same for all columns:

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

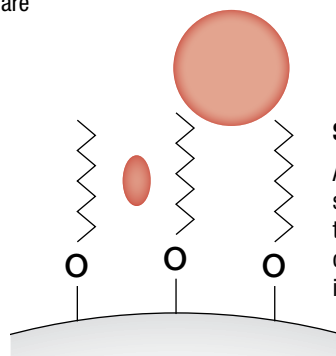
Phenomenex analyzes six different parameters to characterize the selectivity of our HPLC columns. Though hydrophobicity is a dominant retention mechanism in reversed phase chromatography, selectivity is strongly influenced by the other parameters described below.

6 Parameters Influencing Selectivity



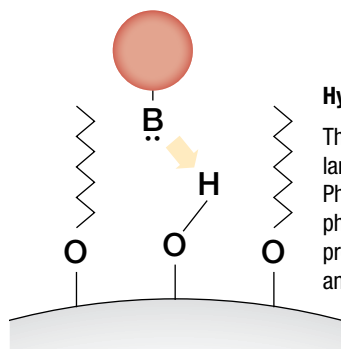
Hydrophobicity

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



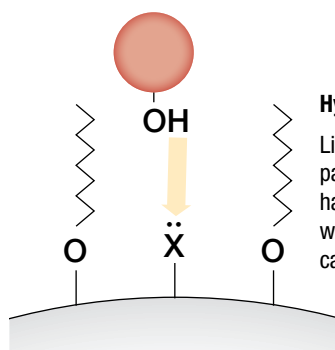
Steric Influences

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.



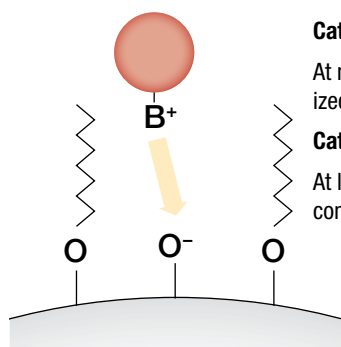
Hydrogen Bond (H-bond) Donating Capacity

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.

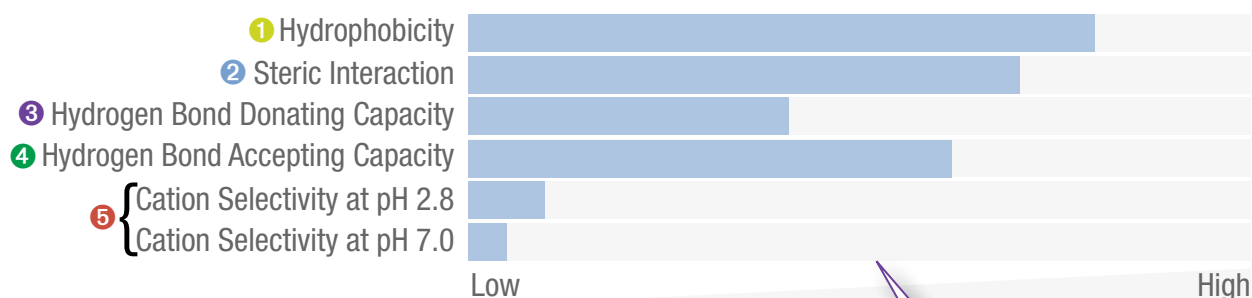
Turn to the next page to see how we've developed unique selectivity profiles for our columns based on these parameters.

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 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: Luna C8(2), Gemini C6-Phenyl, and Synergi Max-RP

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: Gemini C18, Synergi Fusion-RP, and Luna C8(2)

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: Synergi Polar-RP and Luna PFP(2)
- 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 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 12–18, to see how each column can provide you with a truly different selectivity.

Variety of Selectivities and Solid Supports for RP-HPLC Methods

	 LUNA™	 synergi™	 Gemini	 ONYX Monolithic HPLC Columns
	Fully Porous Silica	Fully Porous Silica	Fully Porous Organo-Silica	Monolithic Silica Rod
C18 with nonpolar endcapping	Luna C18(2)		Gemini C18 Gemini-NX C18	Onyx 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	Luna C8(2)			Onyx C8
C5 with nonpolar endcapping	Luna C5			
Phenyl with ether linkage and polar endcapping		Synergi Polar-RP		
Phenyl with nonpolar endcapping	Luna Phenyl-Hexyl		Gemini C6-Phenyl	
PFP with nonpolar endcapping	Luna PFP(2)			
CN with nonpolar endcapping	Luna CN			

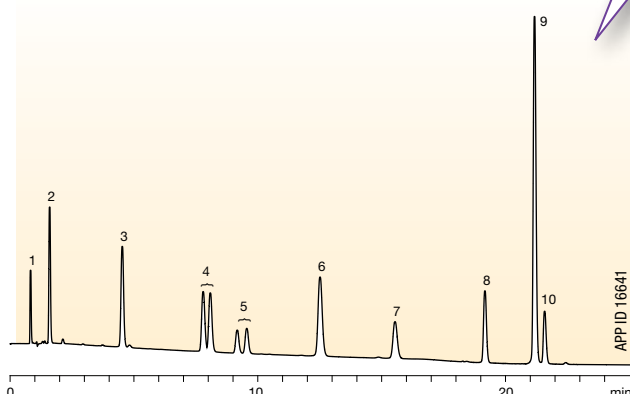
Column Recommendations for Special Cases

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 pH

Recommended Columns: Gemini (all phases)

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



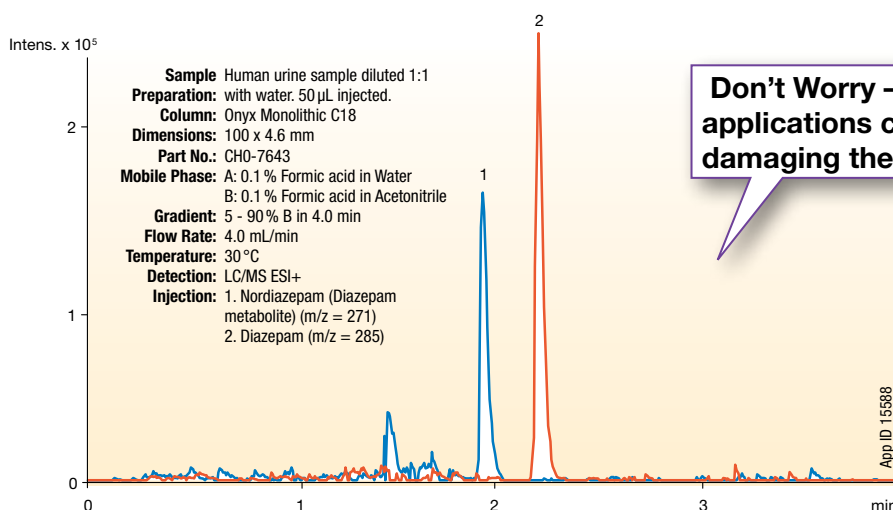
Polar Bases (Beta Blockers) at High pH

Column: Gemini-NX 5 μ m C18
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



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

Recommended Columns: Onyx (all phases)



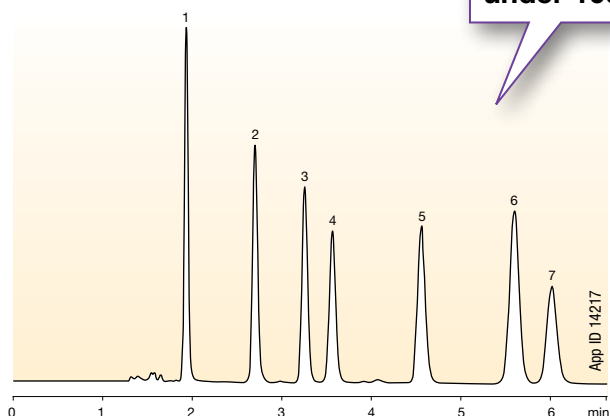
Don't Worry – “dilute-and-shoot” applications can be done without damaging the column

High Aqueous

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

Catecholamines

Greater retention of polar compounds
under 100 % aqueous conditions

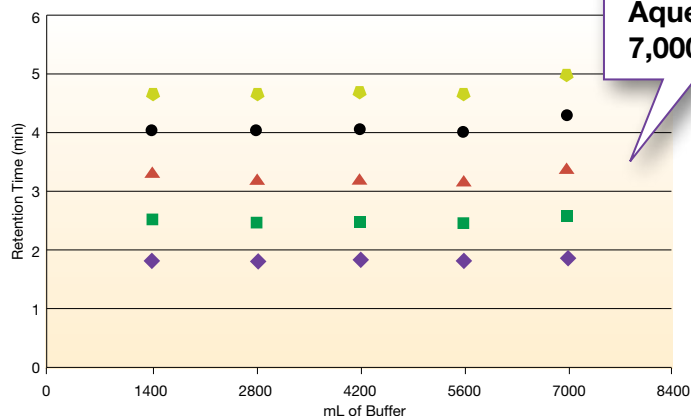


Column: Synergi 4 µm Hydro-RP
Dimensions: 150 x 4.6 mm
Part No.: 00F-4375-E0
Mobile Phase: 20 mM Potassium phosphate, pH 2.5
Flow Rate: 1.0 mL/min
Temperature: 22 °C
Detection: UV @ 210 nm
Sample: 1. Norepinephrine
 2. Epinephrine
 3. 6-Hydroxydopamine
 4. Normetanephrine
 5. Dopamine
 6. L-DOPA
 7.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



Aqueous Stability

Aqueous stable for over
7,000 mL of buffer

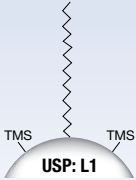
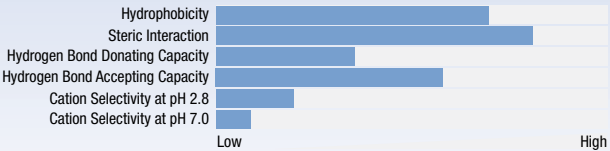
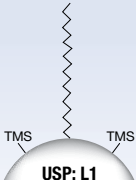
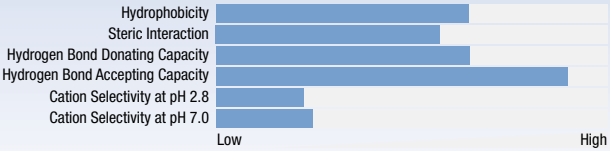
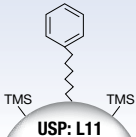
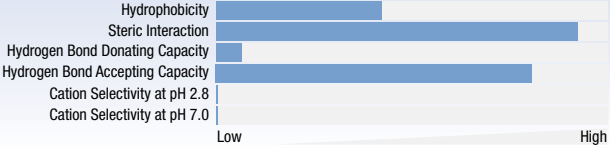


Column: Synergi 4 µm Hydro-RP
Dimensions: 150 x 4.6 mm
Part No.: 00F-4375-E0
Mobile Phase: 20 mM Potassium phosphate, pH 2.5
Flow Rate: 1.0 mL/min
Temperature: 35 °C
Detection: UV @ 210 nm
Injection: 5 µL
Sample: 1. Norepinephrine (0.8 mg/mL)
 2. Epinephrine (0.5 mg/mL)
 3. Normetanephrine (0.6 mg/mL)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



The Standard for pH Method Development

Rugged HPLC columns that offer extended lifetime under extreme pH conditions (pH 1-12) and excellent stability for reproducible, high efficiency separations.

Phases		
Ligand	Description	Selectivity Profile
 Gemini-NX C18 USP: L1	Gemini-NX C18 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.	
 Gemini C18 USP: L1	Gemini C18 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.	
 Gemini C6-Phenyl USP: L11	Gemini C6-Phenyl 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.	

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

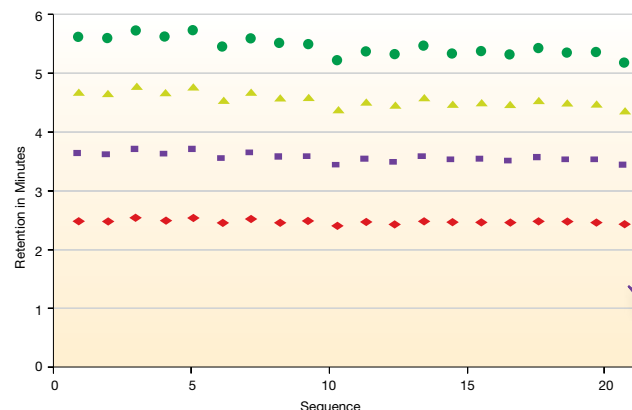
Important!

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.

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



● Acenaphthene ■ Benzene
▲ Toluene ◆ Acetophenone

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

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

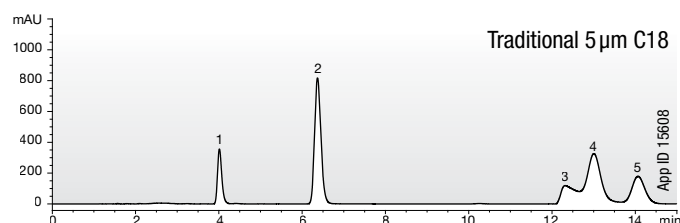
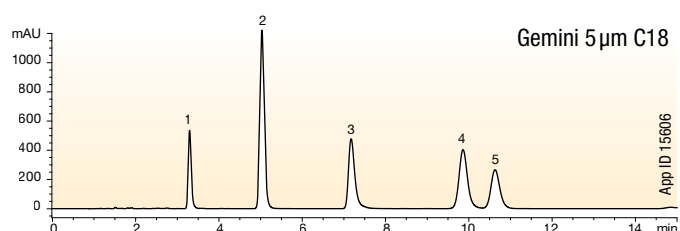
Repeats for 20 Cycles

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

Complementary Selectivities at Extended pHs

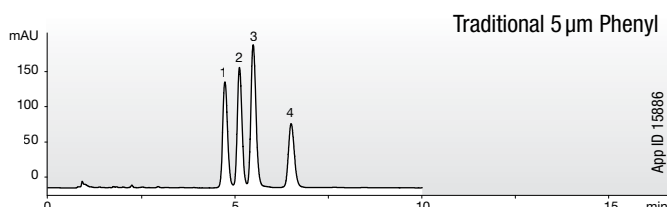
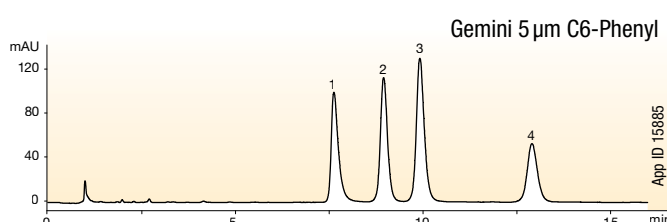
Gemini C18 can provide a different selectivity to your current C18 column for better resolution.



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.

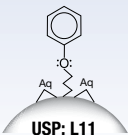
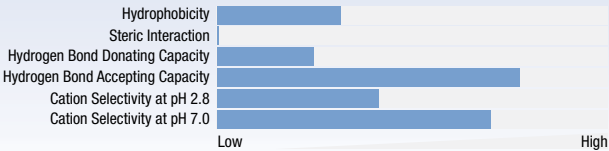
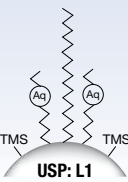
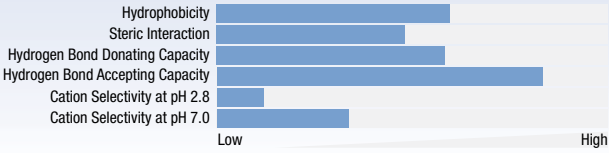
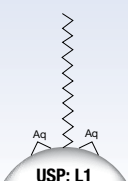
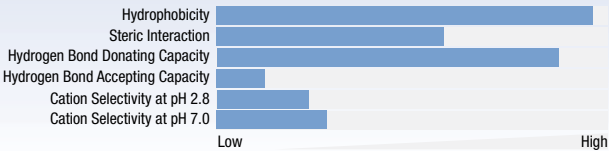
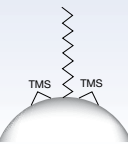
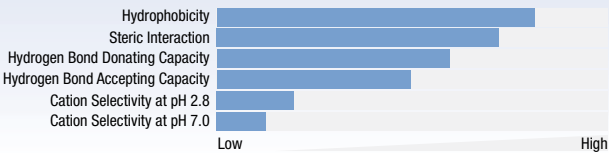
See page 20 for ordering information.



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
	Synergi Polar-RP (100 % Aqueous Stable) This ether linked phenyl column is polar end-capped and offers high cation retention capabilities to improve retention for ionized bases.	
	Synergi Fusion-RP (100 % Aqueous Stable) A low ligand density polar embedded C18, this unique phase contributes to hydrogen bonding and donating. It provides balanced selectivity for acids and bases.	
	Synergi Hydro-RP (100 % Aqueous Stable) Polar endcapped C18 column that provides very high hydrophobic interactions and hydrogen donating capabilities make this column ideal for retaining polar bases.	
	Synergi Max-RP 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.	

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	1.5-10.0*
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	1.5-10.0*
Synergi Max-RP	Spher. 4, 10	80	475	17	TMS	1.5-10.0*
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	1.5-10.0*

*pH range under isocratic conditions. pH range is 2 - 8 under gradient conditions.

Important!

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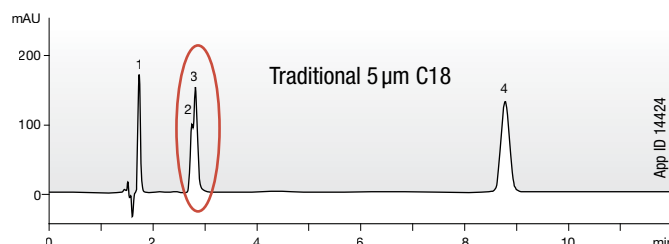
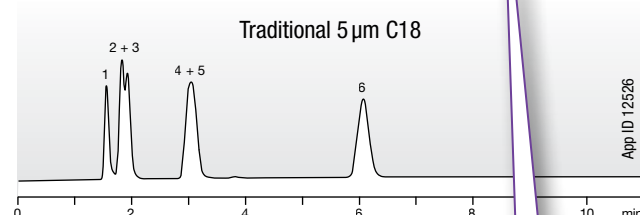
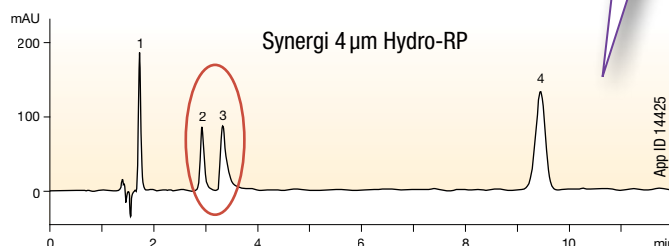
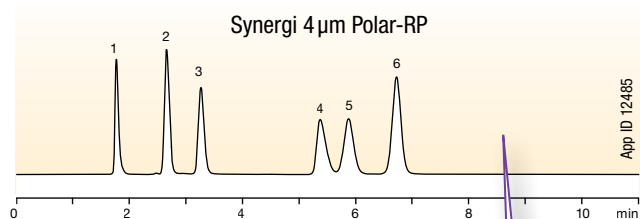
Unique Phases for a Different Separation

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



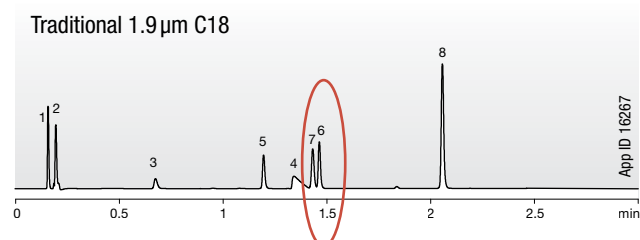
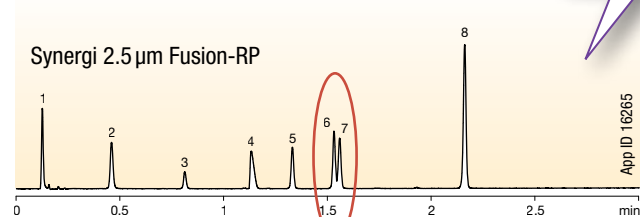
Dimensions: 150 x 4.6 mm
Mobile Phase: 20 mM Potassium phosphate, pH 3 / Methanol (50:50)
Flow Rate: 1.0 mL/min
Temperature: Ambient
Detection: UV @ 230 nm (ambient)
Sample:
 1. Metaproterenol
 2. Pindolol
 3. Metoprolol
 4. Alprenolol
 5. Propranolol
 6. Ethyl paraben

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. Phenylpropanolamine
 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



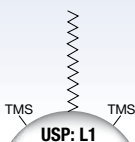
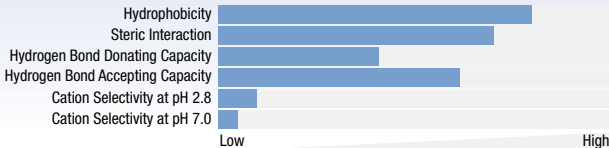
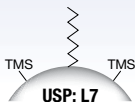
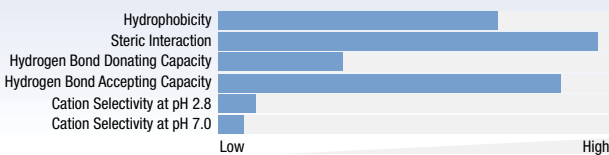
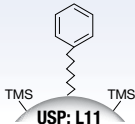
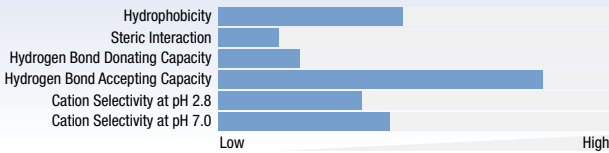
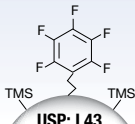
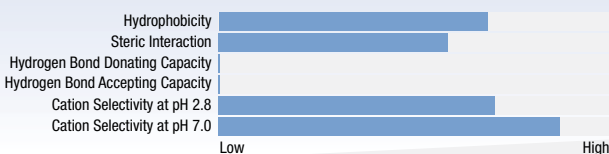
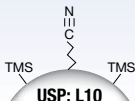
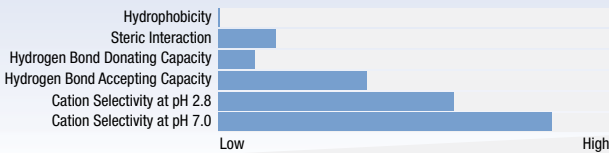
Dimensions: 50 x 2.0 mm
Mobile Phase: A: 0.1 % Formic acid in Water
 B: 0.1 % Formic acid in Acetonitrile
Gradient: A/B (95:5) to (5:95) in 2.9 minutes
Flow Rate: 1.1 mL/min
Temperature: 50 °C
Detection: UV @ 254 nm (ambient)
Instrument: Agilent 1200 SL
Sample:
 1. Pyridine
 2. Acetaminophen
 3. Benzyl 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 21 for ordering information.

World's #1 HPLC Column

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
 USP: L1	Luna C18(2) C18 phase is densely bonded to provide high hydrophobic retention and discriminating steric selectivity. High endcapping reduces electrostatic based selectivity to a minimum.	
 USP: L7	Luna C8(2) 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.	
 USP: L11	Luna Phenyl-Hexyl Our most hydrophobic phenyl column and it will also provide good hydrogen accepting functionality for acidic retention.	
 USP: L43	Luna PFP(2) 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.	
 USP: L10	Luna CN Nitrile groups bound to the silica surface offer a unique polar selectivity under reversed phase or normal phase conditions.	

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 - 10*
Luna C18(2)	Spher. 2.5, 3, 5, 10, 10-PREP, 15	100	400	17.5	1.5 - 10*
Luna Phenyl-Hexyl	Spher. 3, 5, 10, 10-PREP, 15	100	400	17.5	1.5 - 10*
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 - 8.0

* pH range under isocratic conditions. pH range is 2 - 8 under gradient conditions.

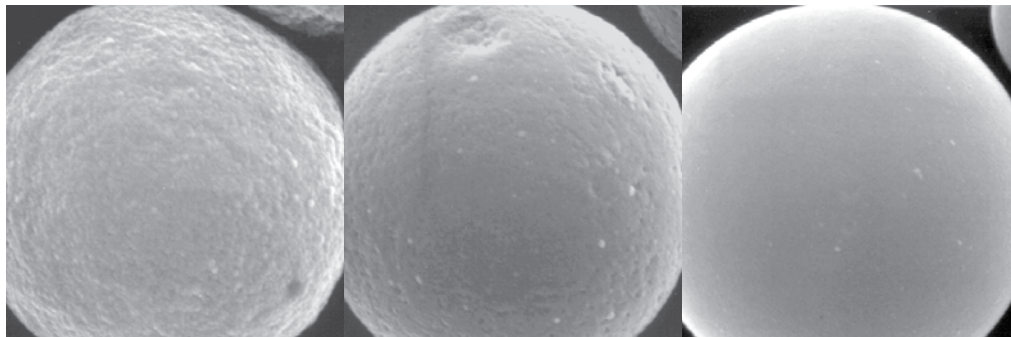
Important!

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.

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



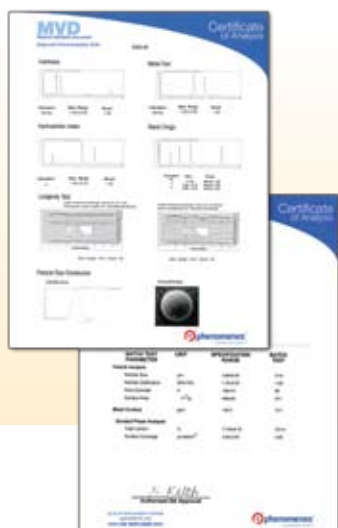
Agilent Technologies ZORBAX® 5 µm
SB-C18

Waters Symmetry® 5 µm C18

Phenomenex Luna 5 µm C18

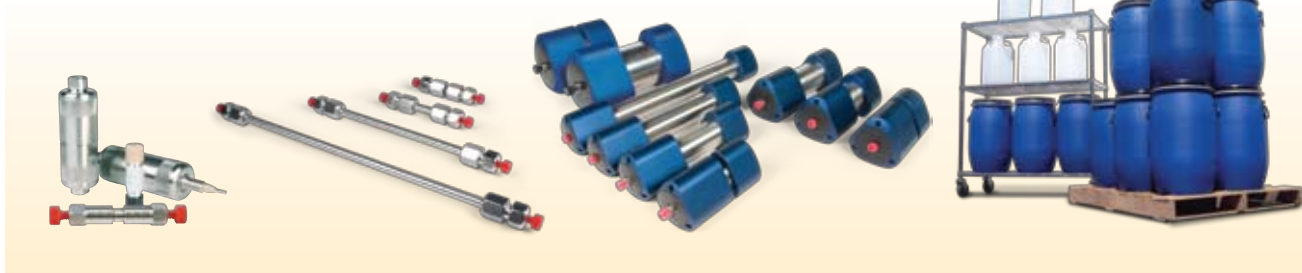
Batch Quality and Reproducibility

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

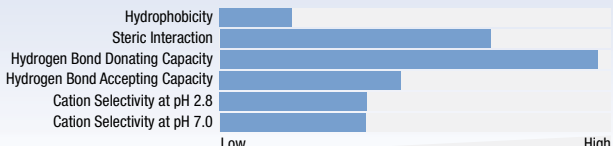
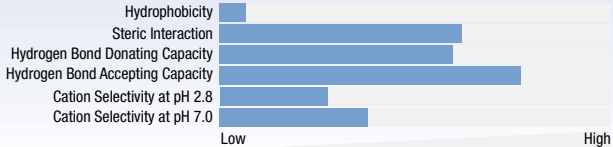


ZORBAX is a registered trademark of Agilent Technologies, Inc. Symmetry is a registered trademark of Waters Corporation. Phenomenex is in no way affiliated with Waters Corporation or Agilent Technologies.

See pages 22-23 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
 Onyx C18 USP: L1	Octadecyl silane ligands are bound to the silica surface for strong hydrophobic selectivity.	
 Onyx C8 USP: L7	Octyl silane groups are bound to the silica surface with nonpolar endcapping to offer moderate hydrophobic selectivity.	

Material Characteristics					
Packing Material	Macropore Size (µm)	Mesopore Size (Å)	Surface Area (m ² /g)	Carbon Load %	Endcapping
Onyx C8	2	130	300	11	Yes
Onyx C18	2	130	300	18	Yes
Onyx C18*	1.5	130	300	18	Yes

Maximum Pressure: 200 Bar; pH Range: 2.0-7.5

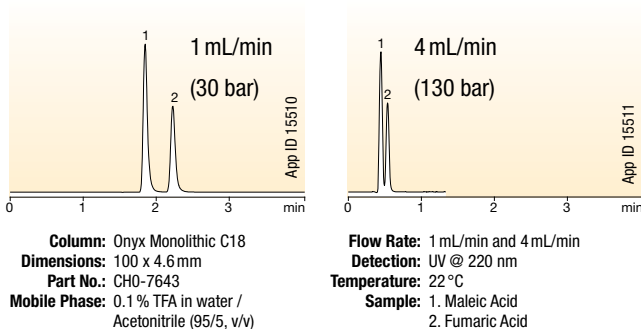
*50 x 2.0 mm ID only; enhanced 1.5 µm macropore size for higher efficiencies

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.



**Traditional Silica
“Fully Porous” Column**



“Monolithic” Column



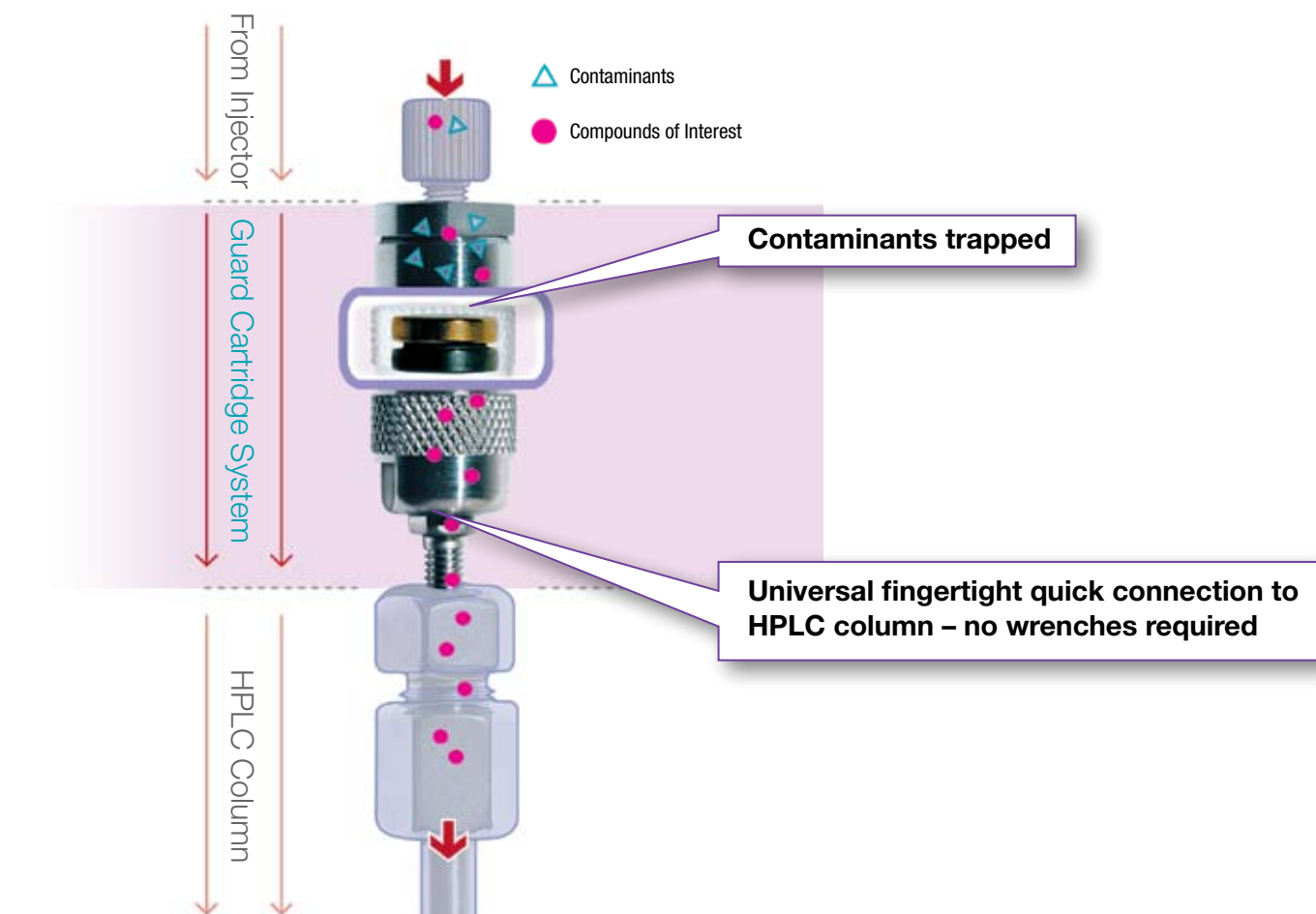
Conditions same for all columns except where noted.

See page 24 for ordering information.

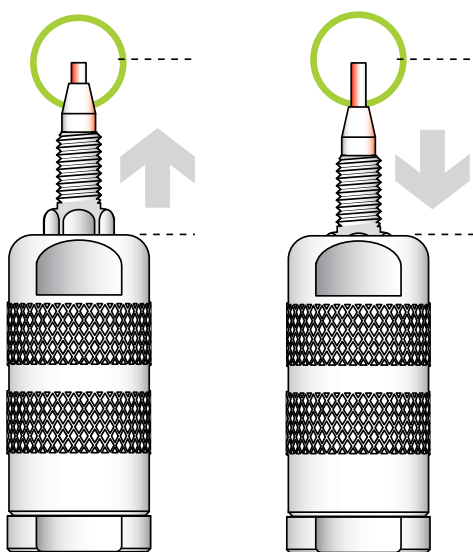


Extend HPLC Column Lifetime

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.



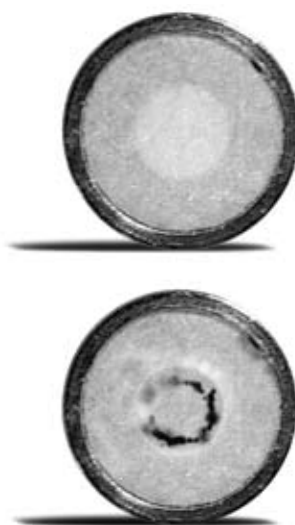
Universal Fit Patented Design



The floating outlet automatically adjust to the precise port depth of virtually any analytical HPLC column. This ensures a low-dead volume, leak-free connection, without the use of unions or adaptors.

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

Can be Easily Inspected for Contaminants



Clean

If it looks clean, the cartridge may be reinserted for further use.

Dirty

If either discoloration or particle build-up is observed, it's time to replace the cartridge.

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

See page 25 for ordering information.

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	AJ0-7596
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		AJ0-7914
	—	—	—	—	—	—	—	—	—	/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	AJ0-7597
C6-Phenyl	—	00A-4443-E0	00B-4443-E0	00D-4443-E0	00F-4443-E0	00G-4443-E0		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	AJ0-7596
C6-Phenyl	00A-4444-B0	00B-4444-B0	00F-4444-B0	—	00B-4444-Y0	—	00F-4444-Y0	00G-4444-Y0		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	AJ0-7597
C6-Phenyl	00A-4444-E0	00B-4444-E0	00D-4444-E0	00F-4444-E0	00G-4444-E0		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	AJ0-7598
C6-Phenyl	—	00G-4444-N0		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								
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								
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								
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								
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								
C18	00D-4435-U0-AX	00F-4435-U0-AX	00G-4435-U0-AX	00B-4435-V0-AX	—	—	—	/ea
C6-Phenyl	00D-4444-U0-AX	—	00G-4444-U0-AX	—	—	—	—	AJ0-8308
5 µm								
NX C18	00D-4454-U0-AX	00F-4454-U0-AX	00G-4454-U0-AX	00B-4454-V0-AX	—	—	—	AJ0-8303
10 µm								
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	/ea
10 µm								
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, return the column with comparative data within 45 days for a FULL REFUND.

*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	00B-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	—	00D-4351-U0-AX	00G-4351-U0-AX	AJ0-8307	
Fusion-RP	—	—	00D-4425-U0-AX	00G-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, return the column with comparative data within 45 days a FULL REFUND.

Luna Ordering Information

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

explore

LUNA™

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

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*
							/10pk
C8(2)	00B-4248-A0	00F-4248-A0	00A-4248-B0	00B-4248-B0	00D-4248-B0	00F-4248-B0	AJO-4289
C18(2)	00B-4251-A0	00F-4251-A0	00A-4251-B0	00B-4251-B0	00D-4251-B0	00F-4251-B0	AJO-4286
CN	—	—	00A-4254-B0	00B-4254-B0	00D-4254-B0	00F-4254-B0	AJO-4304
Phenyl-Hexyl	00B-4256-A0	—	00A-4256-B0	00B-4256-B0	00D-4256-B0	00F-4256-B0	AJO-4350
NH ₂	—	00F-4377-A0	00A-4377-B0	00B-4377-B0	00D-4377-B0	00F-4377-B0	AJO-4301
PFP(2)	—	—	00A-4447-B0	00B-4447-B0	00D-4447-B0	00F-4447-B0	AJO-8326

for ID: 2.0-3.0 mm

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*
									/10pk	/10pk
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	AJO-4289	AJO-4290
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	AJO-4286	AJO-4287
CN	—	00B-4254-Y0	00F-4254-Y0	00A-4254-E0	00B-4254-E0	00C-4254-E0	00D-4254-E0	00F-4254-E0	AJO-4304	AJO-4305
Phenyl-Hexyl	—	00B-4256-Y0	00F-4256-Y0	00A-4256-E0	00B-4256-E0	00C-4256-E0	00D-4256-E0	00F-4256-E0	AJO-4350	AJO-4351
NH ₂	—	00B-4377-Y0	00F-4377-Y0	—	00B-4377-E0	—	00D-4377-E0	00F-4377-E0	AJO-4301	AJO-4302
PFP(2)	—	00B-4447-Y0	00F-4447-Y0	—	00B-4447-E0	—	00D-4447-E0	00F-4447-E0	AJO-8326	AJO-8327

for ID: 2.0-3.0 mm

3.2-8.0 mm

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*
								/10pk
C5	—	—	—	00A-4043-B0	00B-4043-B0	00F-4043-B0	—	AJO-4292
C8(2)	00B-4249-A0	00F-4249-A0	00G-4249-A0	00A-4249-B0	00B-4249-B0	00F-4249-B0	00G-4249-B0	AJO-4289
C18(2)	00B-4252-A0	00F-4252-A0	00G-4252-A0	00A-4252-B0	00B-4252-B0	00F-4252-B0	00G-4252-B0	AJO-4286
CN	—	—	—	00A-4255-B0	00B-4255-B0	00F-4255-B0	00G-4255-B0	AJO-4304
Phenyl-Hexyl	00B-4257-A0	00F-4257-A0	00G-4257-A0	00A-4257-B0	00B-4257-B0	00F-4257-B0	00G-4257-B0	AJO-4350
NH ₂	—	00F-4378-A0	—	00A-4378-B0	00B-4378-B0	00F-4378-B0	00G-4378-B0	AJO-4301
PFP(2)	—	—	—	00A-4448-B0	00B-4448-B0	00F-4448-B0	—	AJO-8326

for ID: 2.0-3.0 mm

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*
								/10pk	/10pk
C5	—	—	00F-4043-Y0	—	—	00B-4043-E0	—	AJO-4292	AJO-4293
C8(2)	—	00B-4249-Y0	00F-4249-Y0	00G-4249-Y0	00A-4249-E0	00B-4249-E0	00C-4249-E0	AJO-4289	AJO-4290
C18(2)	00A-4252-Y0	00B-4252-Y0	00F-4252-Y0	00G-4252-Y0	00A-4252-E0	00B-4252-E0	00C-4252-E0	AJO-4286	AJO-4287
CN	—	00B-4255-Y0	00F-4255-Y0	00G-4255-Y0	00A-4255-E0	00B-4255-E0	00C-4255-E0	AJO-4304	AJO-4305
Phenyl-Hexyl	00A-4257-Y0	00B-4257-Y0	00F-4257-Y0	00G-4257-Y0	00A-4257-E0	00B-4257-E0	00C-4257-E0	AJO-4350	AJO-4351
NH ₂	—	00B-4378-Y0	00F-4378-Y0	00G-4378-Y0	00A-4378-E0	00B-4378-E0	00C-4378-E0	AJO-4301	AJO-4302
PFP(2)	—	00B-4448-Y0	00F-4448-Y0	—	00A-4448-E0	00B-4448-E0	—	AJO-8326	AJO-8327

for ID: 2.0-3.0 mm

3.2-8.0 mm

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
PFP(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	—	—	00G-4378-U0-AX	AJO-8162	AJO-8309
PFP(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-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	00B-4285-V0-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



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, return the column with comparative data within 45 days for a FULL REFUND.

Onyx Ordering Information

Columns

Part No.	Description	Size (mm)	Price
Capillary Columns			
CH0-8388	Onyx Monolithic C18	150 x 0.05	
CH0-7646	Onyx Monolithic C18	150 x 0.1	
CH0-8389	Onyx Monolithic HD-C18	150 x 0.1	
CH0-8390	Onyx Monolithic C18	150 x 0.2	
CH0-8391	Onyx Monolithic HD-C18	150 x 0.2	
CH0-8392	Onyx Monolithic C18 Trapping Column	50 x 0.2	
CH0-8393	Onyx Monolithic C8	150 x 0.1	
Analytical Columns			
CH0-8373	Onyx Monolithic C18	50 x 2.0	
CH0-8467	Onyx Monolithic C18	100 x 2.0	
CH0-8464	Onyx Monolithic C18	25 x 3.0	
CH0-8463	Onyx Monolithic C18	50 x 3.0	
CH0-8158	Onyx Monolithic C18	100 x 3.0	
CH0-7643	Onyx Monolithic C18	100 x 4.6	
CH0-7644	Onyx Monolithic C18	50 x 4.6	
CH0-7645	Onyx Monolithic C18	25 x 4.6	
CH0-7647	Onyx Monolithic C8	100 x 4.6	
SemiPrep Columns			
CH0-7878	Onyx Monolithic C18	100 x 10.0	
Guard Cartridge System			
KJ0-8468	Onyx Monolithic C18 Guard Cartridge Kit (3 pk cartridges + holder + wrench)	5 x 2.0	
CH0-8469	Onyx Monolithic C18 Guard Cartridges (3/pk)	5 x 2.0	
KJ0-8465	Onyx Monolithic C18 Guard Cartridge Kit (3 pk cartridges + holder + wrench)	5 x 3.0	
CH0-8466	Onyx Monolithic C18 Guard Cartridges (3/pk)	5 x 3.0	
KJ0-7651	Onyx Monolithic C18 Guard Cartridge Kit (3 pk cartridges + holder + wrench)	5 x 4.6	
CH0-7649	Onyx Monolithic C18 Guard Cartridges (3/pk)	5 x 4.6	
KJ0-7652	Onyx Monolithic C18 Guard Cartridge Kit (3 pk cartridges + holder + wrench)	10 x 4.6	
CH0-7650	Onyx Monolithic C18 Guard Cartridges (3/pk)	10 x 4.6	
Method Validation Kit			
KH0-7653	Onyx Monolithic C18 Method Validation Kit (3 columns from different batches)	100 x 4.6	
Column Coupler			
AQ0-7654	Onyx Column Coupler		



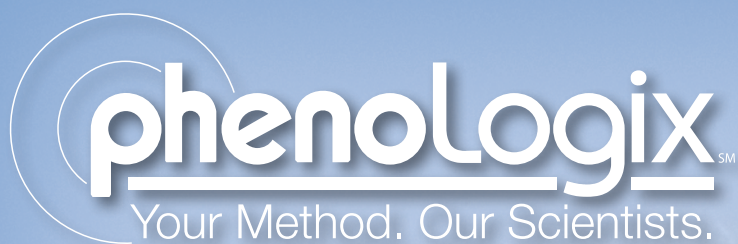
If Onyx analytical columns do not provide at least an equivalent separation as compared to a competing column of the same monolithic characteristics, similar phase, and dimensions, return the column with comparative data within 45 days for a FULL REFUND.



			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					
Cartridges for General Purpose			/10pk	/10 pk	/3 pk	/ea	/ea
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 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 the SecurityGuard Cartridge System does not provide at least an equivalent performance as compared to a competing guard cartridge system, return the product with the comparative data within 45 days for a FULL REFUND.



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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. 5, 863, 428

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

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