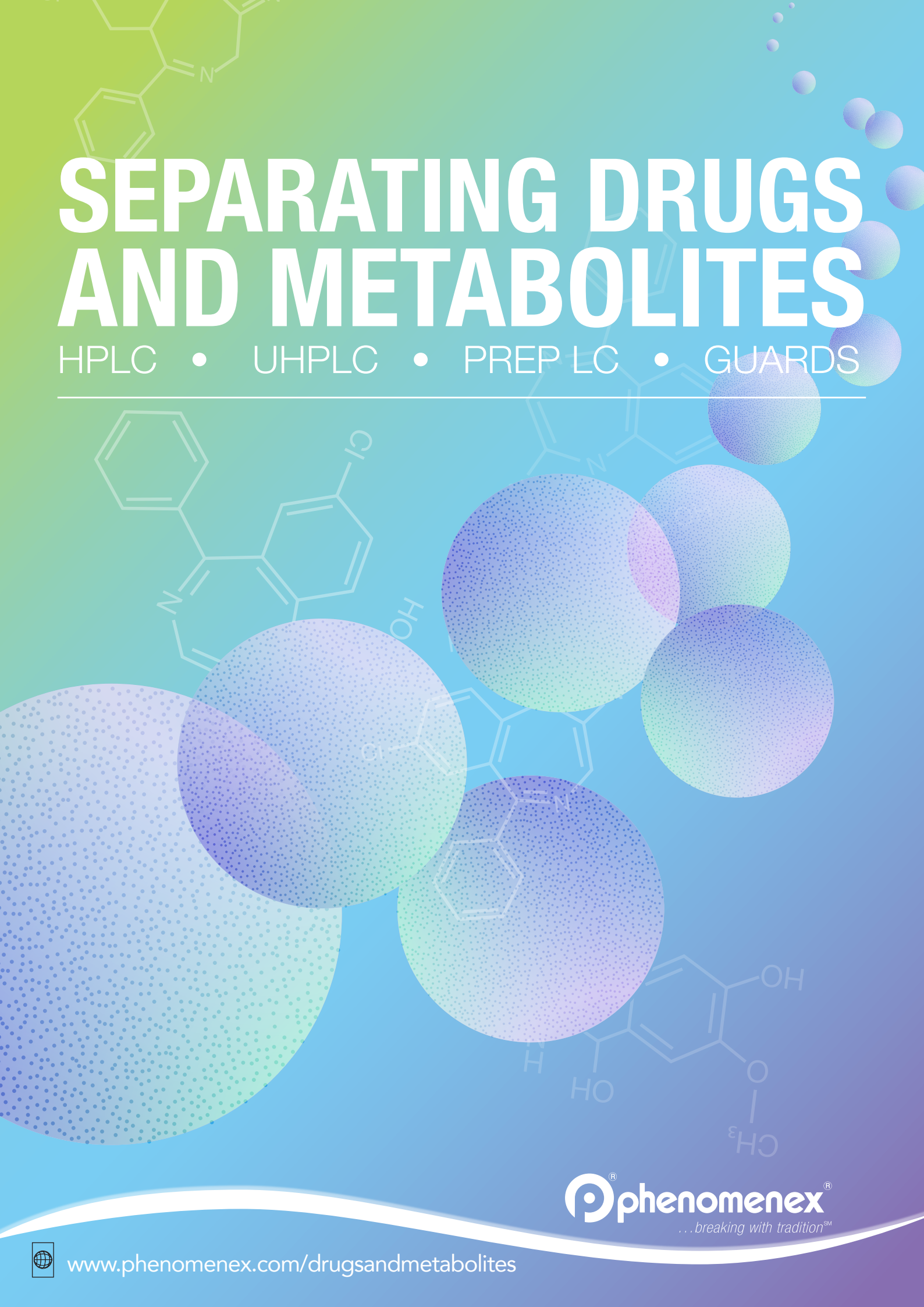
# SEPARATING DRUGS AND METABOLITES

HPLC • UHPLC • PREP LC • GUARDS



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. . . breaking with tradition℠

www.phenomenex.com/drugsandmetabolites

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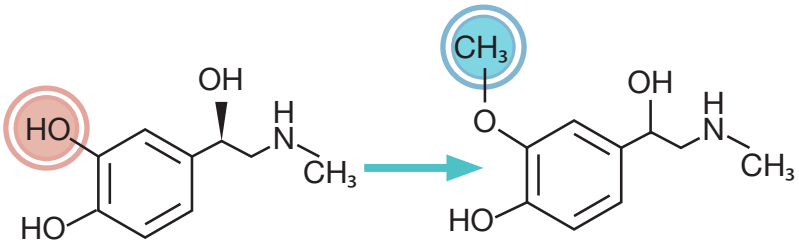
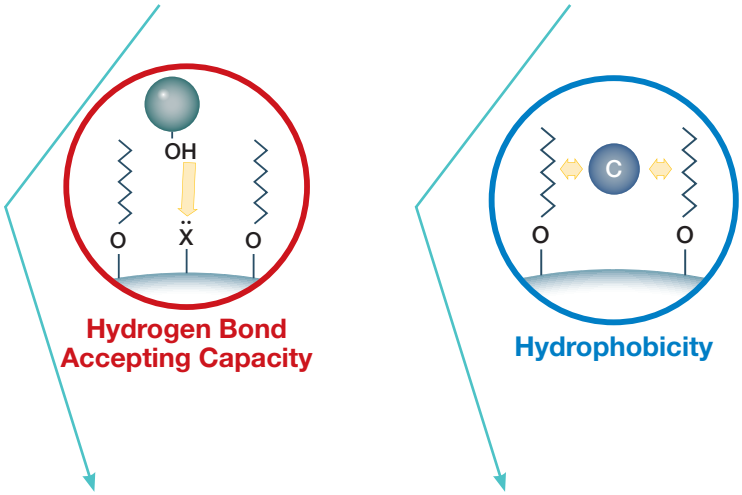
# Quantifing Drug Compounds from Metabolites

Effective separation of closely related analytes of interest can be a difficult task to achieve. A helpful strategy for effective HPLC/UHPLC column selection is to identify the differences in chemical functionality between the analytes of interest, relate the differences into categories, and then select an HPLC/UHPLC stationary phase with the appropriate selectivity profile.

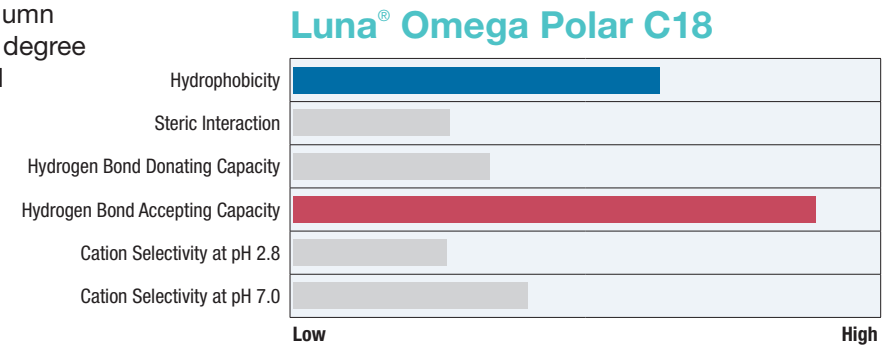
**STEP 1** **Identify:** Determine chemical difference between critical analyte pairs

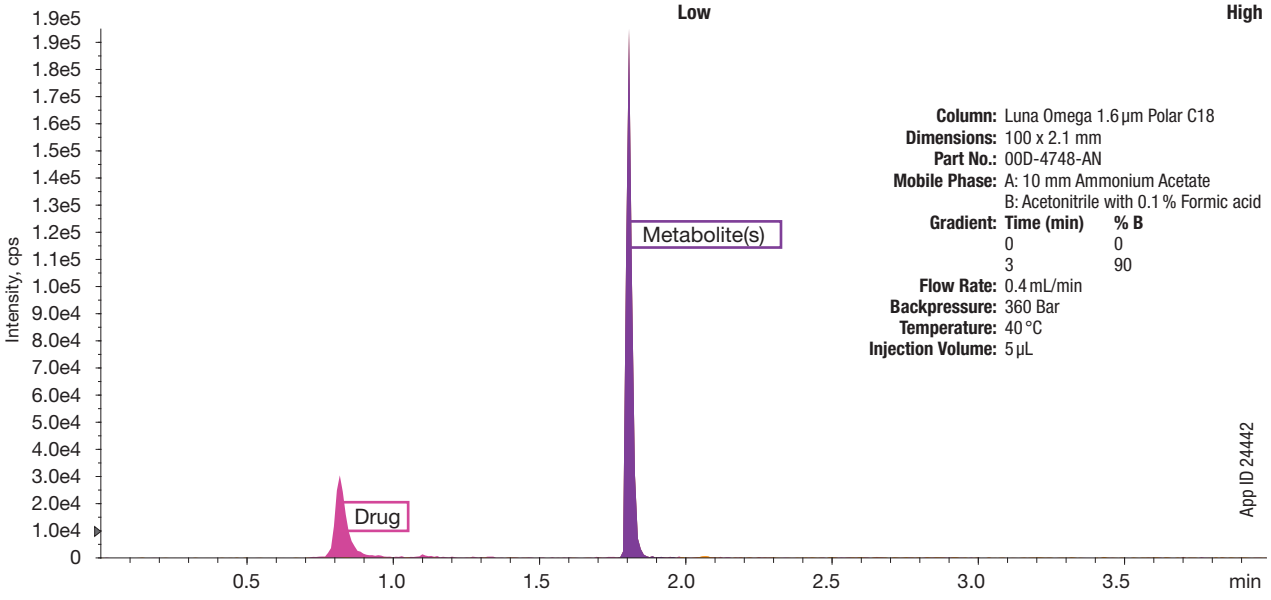



**STEP 2** **Relate:** Correlate the analytes differences to a selectivity category



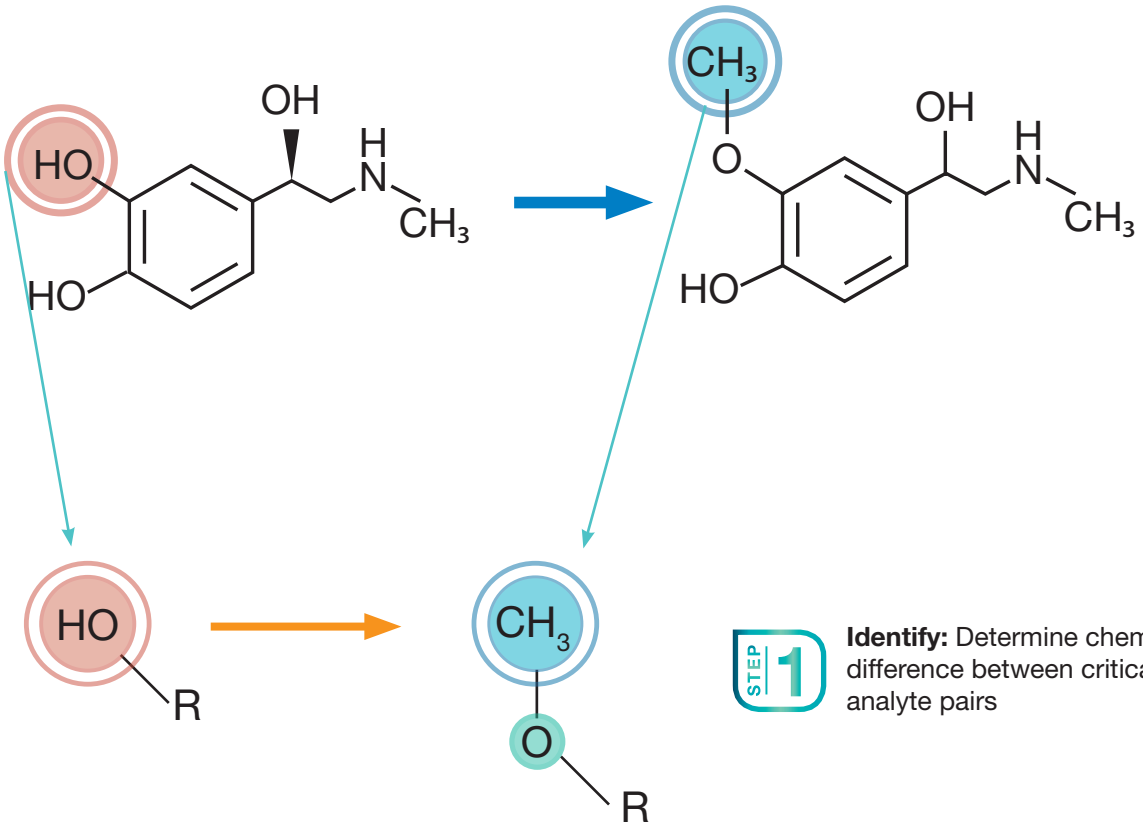

**STEP 3** **Select:** Choose the column phase with the highest degree of selectivity for related categories



# STEP 1 Identify the Chemical Difference

The first step in selecting the best stationary phase for a given separation is identification of the chemical difference(s) between the analytes of interest. By determining how the compounds differ in hydrophobicity, conformation, hydrogen bond capability, or cation groups, a stationary phase with relevant selectivity can be chosen.

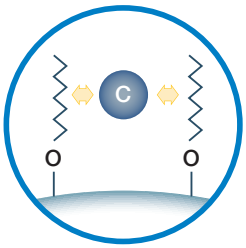



STEP 1 **Identify:** Determine chemical difference between critical analyte pairs

**2° alcohol is metabolized to an ether**

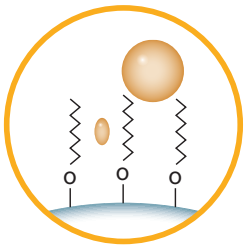
# STEP 2 Relate Chemical Difference to Type of Interaction

After identifying the chemical difference(s), we can now categorize them by interaction type. This information provides us with the properties of the ideal HPLC/UHPLC stationary phase needed to achieve a successful separation of these analytes.



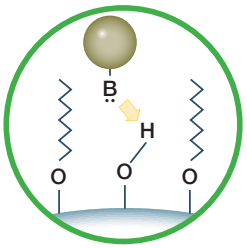

**Hydrophobicity**

The ability of a phase to hydrophobically interact with carbon groups



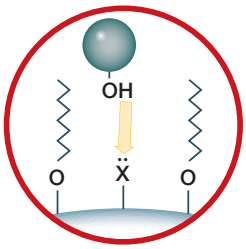

**Steric Interaction**

The ability of a phase to separate compounds based on structural differences



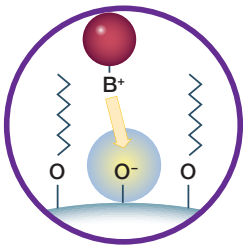

**Hydrogen Bond Donating Capacity**

The ability of a phase to hydrogen bond with proton accepting groups




**Hydrogen Bond Accepting Capacity**

The ability of a phase to hydrogen bond with proton donating groups



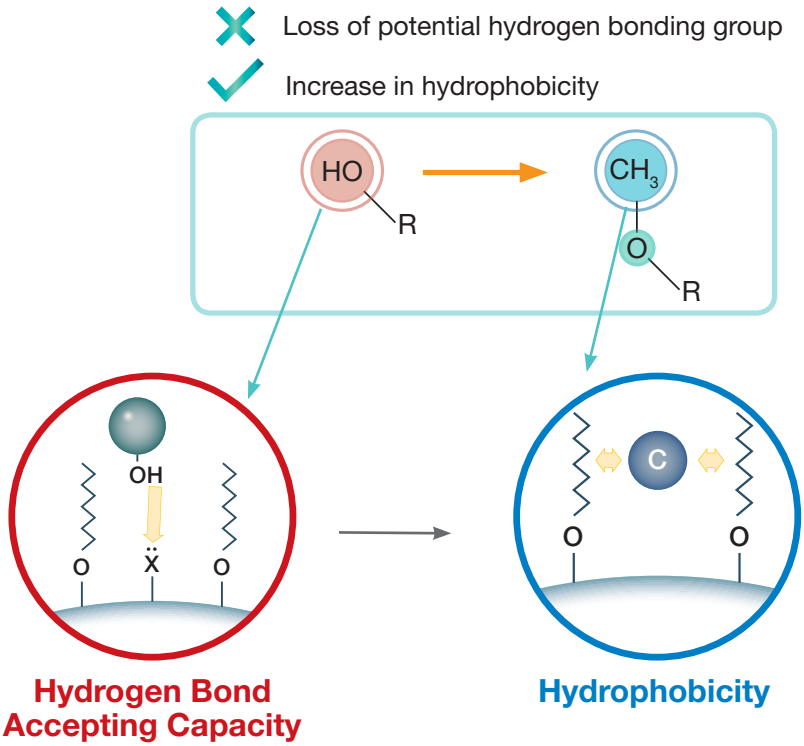

**Cation Selectivity at pH 2.8**

The ability of a phase to interact with cation groups at acidic pH

**Cation Selectivity at pH 7.0**

The ability of a phase to interact with cation groups at neutral pH

**Relate:** Correlate differences between analytes to selectivity category



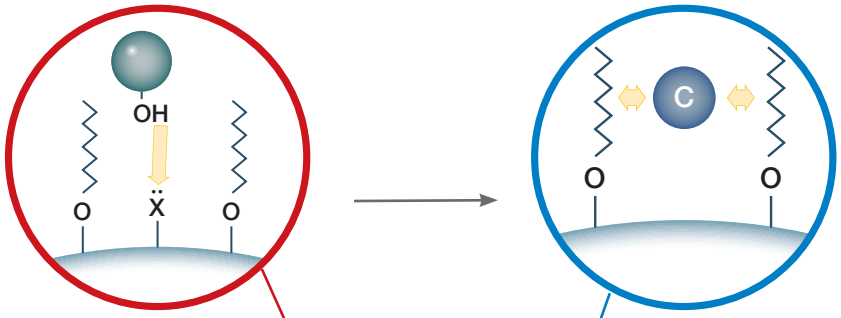

**Hydrogen Bond Accepting Capacity**

**Hydrophobicity**

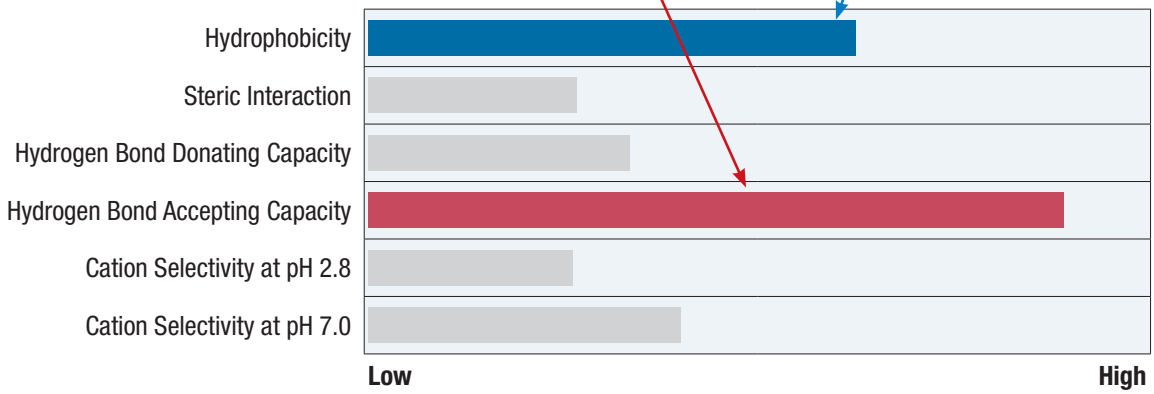
# Select a Column Selectivity Profile

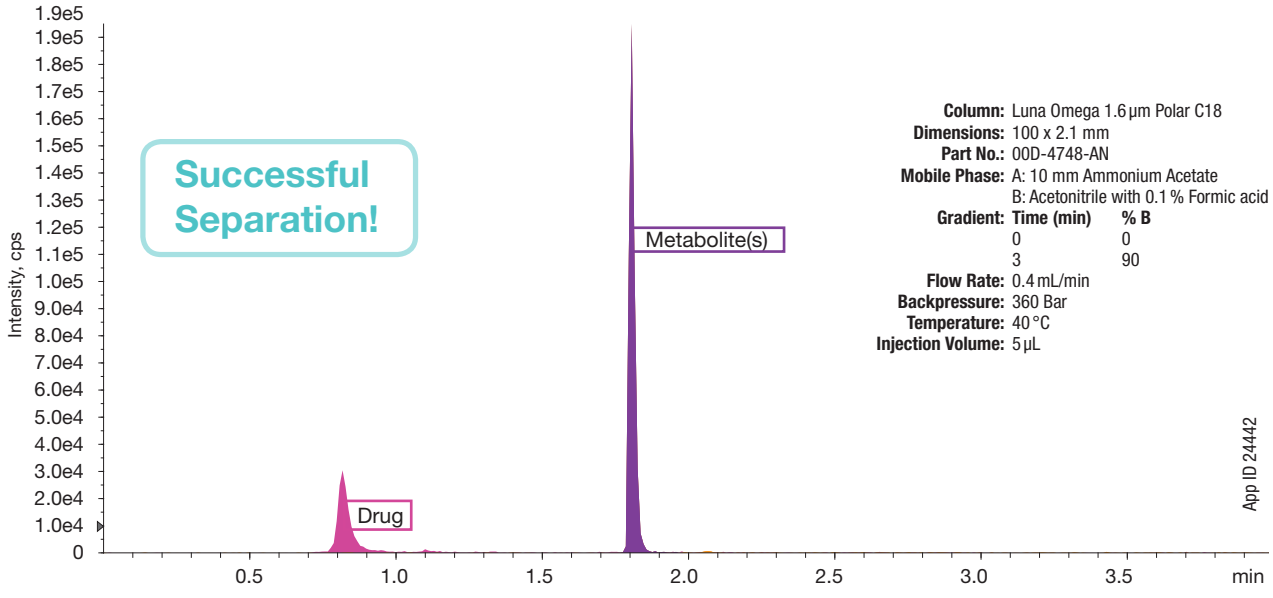
Once the ideal HPLC/UHPLC stationary phase properties to achieve your separation has been established, the information found in this guide can be utilized to identify column stationary phases with the most appropriate selectivity properties. By selecting a column with a high degree of selectivity for the correlated interaction, it will greatly improve the separation success rate.

**Select:** Choose column phase with selectivity for related categories



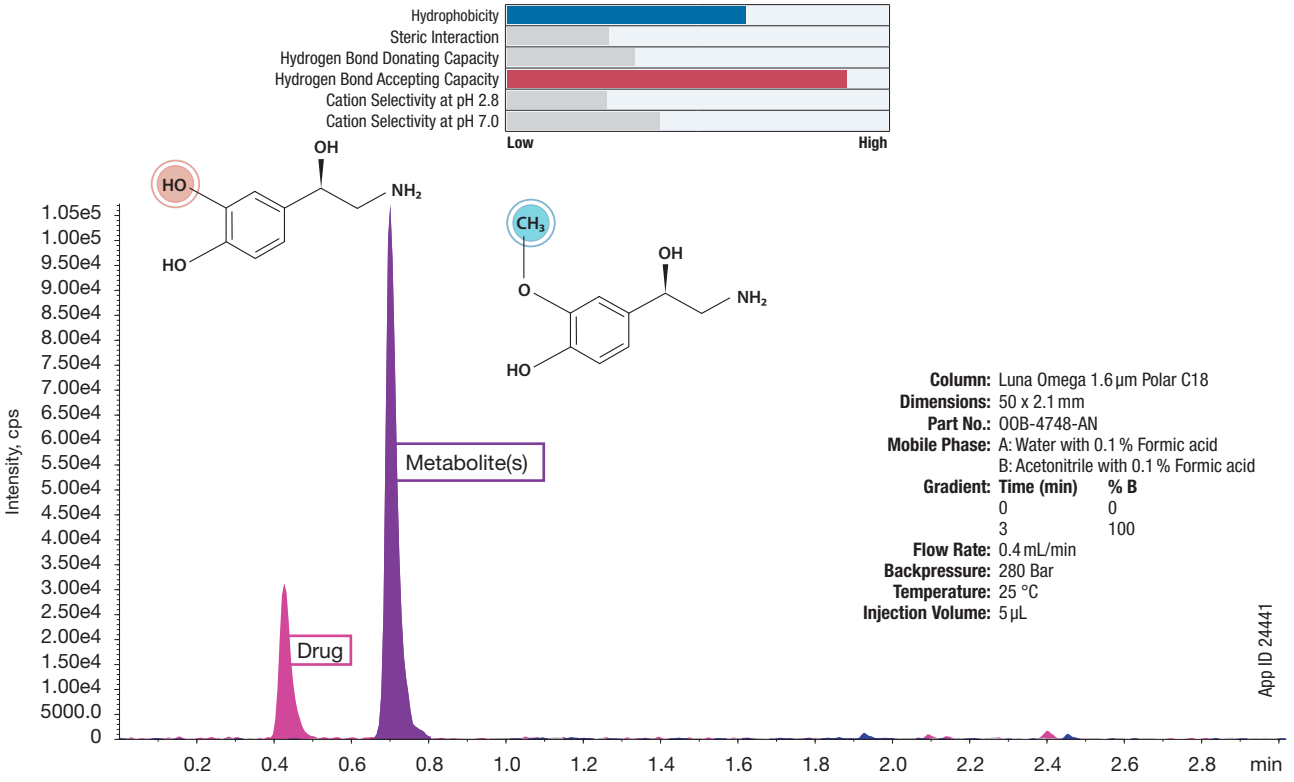

## Luna® Omega Polar C18 Selectivity Profile



# Polar Compounds

## Luna® Omega Polar C18



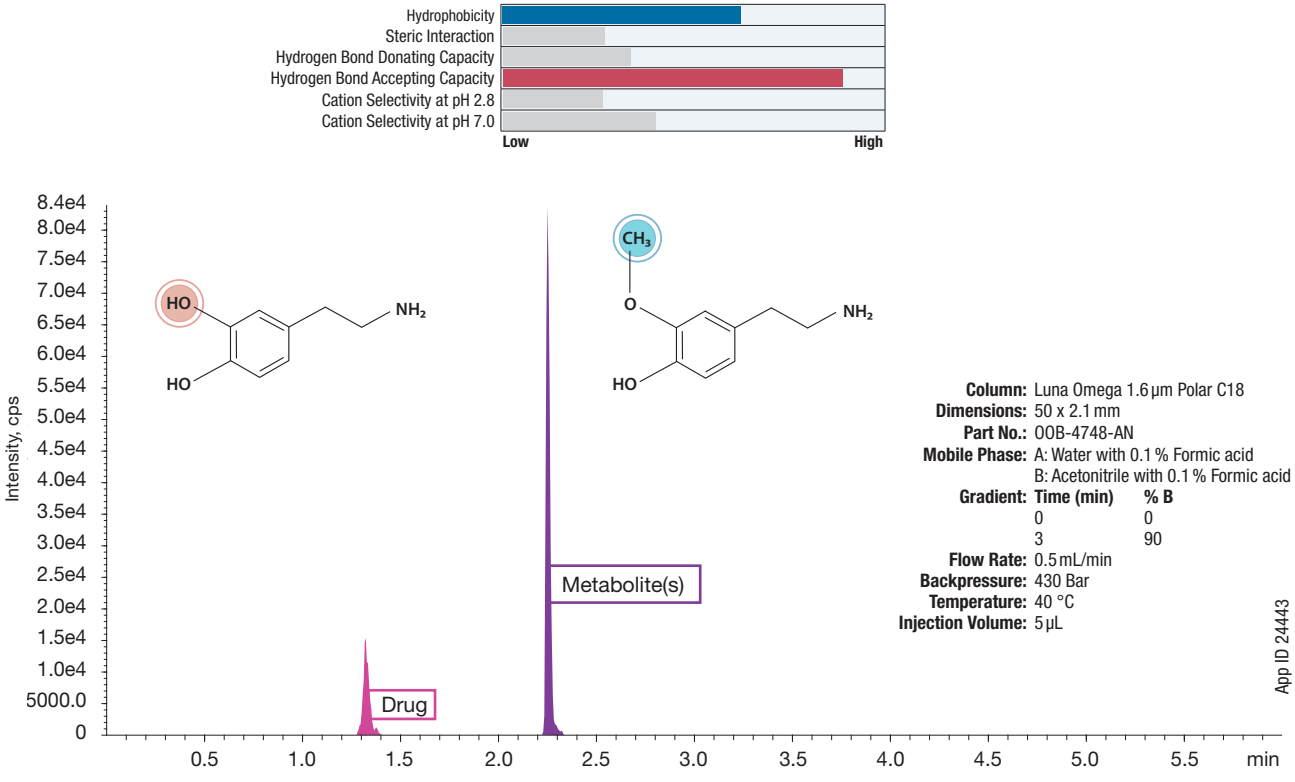

**Column:** Luna Omega 1.6 µm Polar C18
**Dimensions:** 50 x 2.1 mm
**Part No.:** 00B-4748-AN
**Mobile Phase:** A: Water with 0.1 % Formic acid
B: Acetonitrile with 0.1 % Formic acid

| **Gradient:** | **Time (min)** | **% B** |
|---|---|---|
| | 0 | 0 |
| | 3 | 100 |

**Flow Rate:** 0.4 mL/min
**Backpressure:** 280 Bar
**Temperature:** 25 °C
**Injection Volume:** 5 µL

App ID 24441

## Luna Omega Polar C18




**Column:** Luna Omega 1.6 µm Polar C18
**Dimensions:** 50 x 2.1 mm
**Part No.:** 00B-4748-AN
**Mobile Phase:** A: Water with 0.1 % Formic acid
B: Acetonitrile with 0.1 % Formic acid

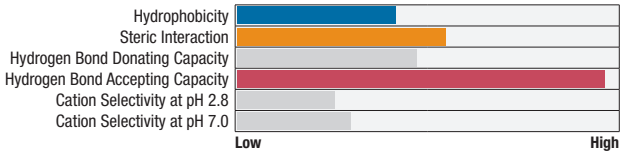
| **Gradient:** | **Time (min)** | **% B** |
|---|---|---|
| | 0 | 0 |
| | 3 | 90 |

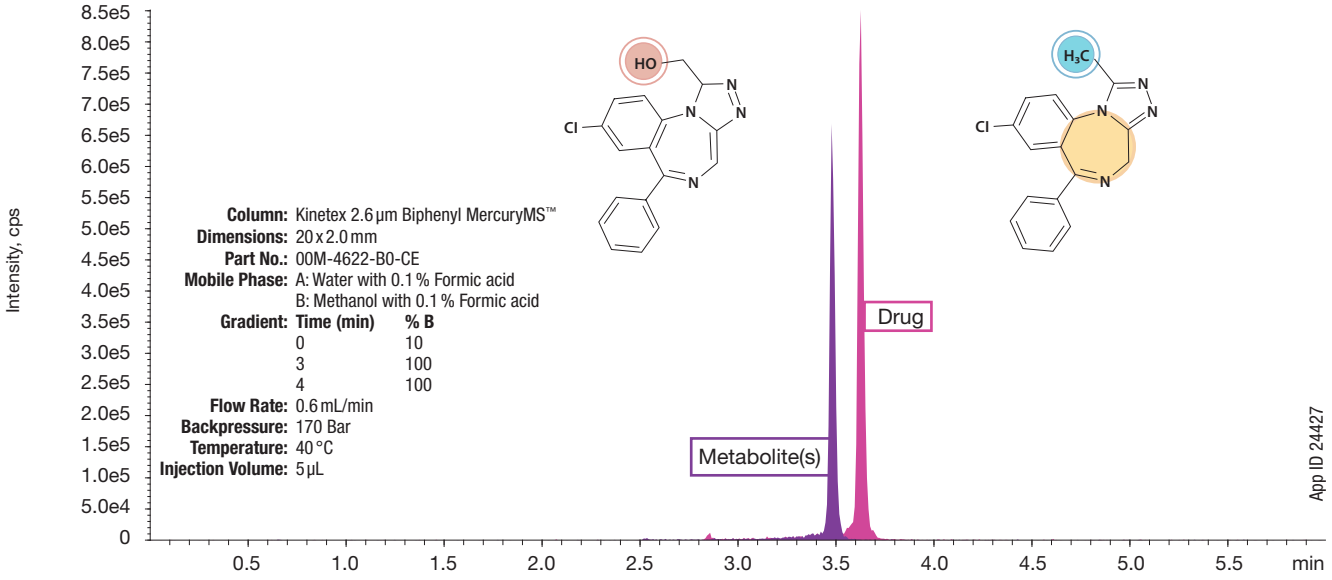
**Flow Rate:** 0.5 mL/min
**Backpressure:** 430 Bar
**Temperature:** 40 °C
**Injection Volume:** 5 µL

App ID 24443

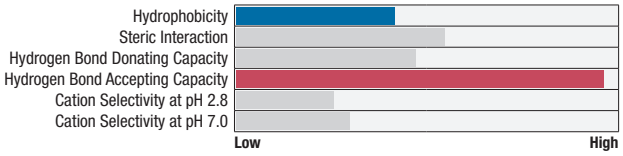
# Mid-Polarity Compounds

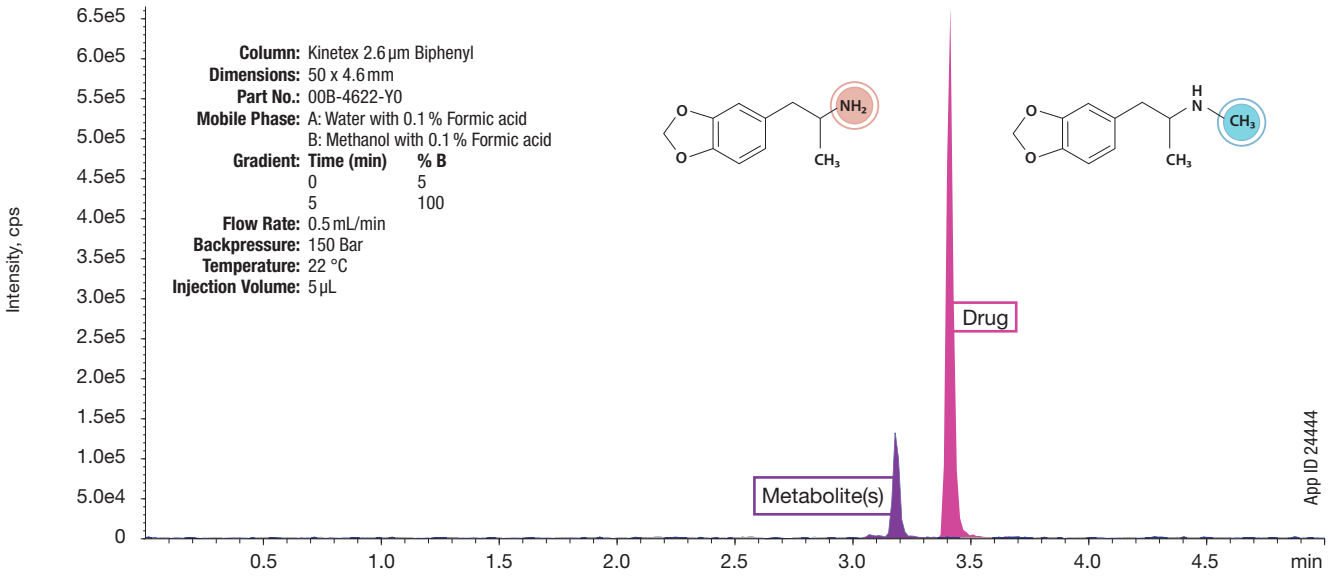
## Kinetex® Biphenyl



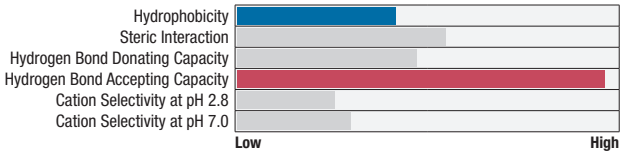

## Kinetex Biphenyl

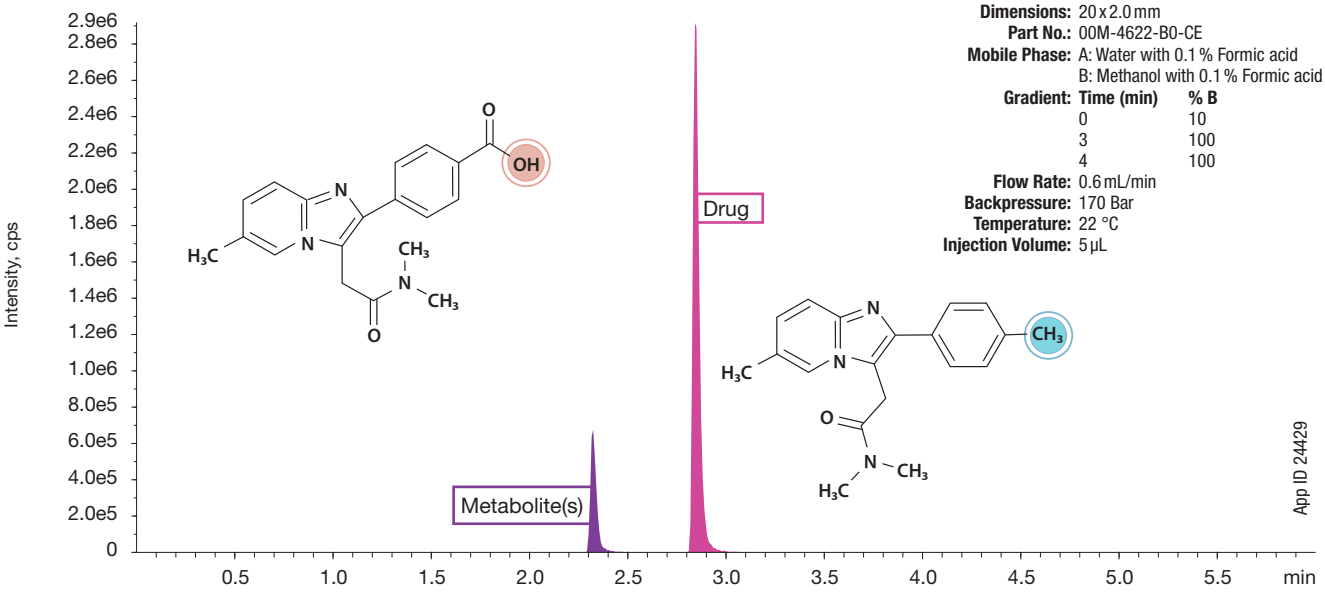


# Mid-Polarity Compounds

## Kinetex® Biphenyl



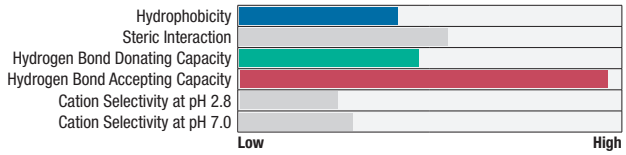



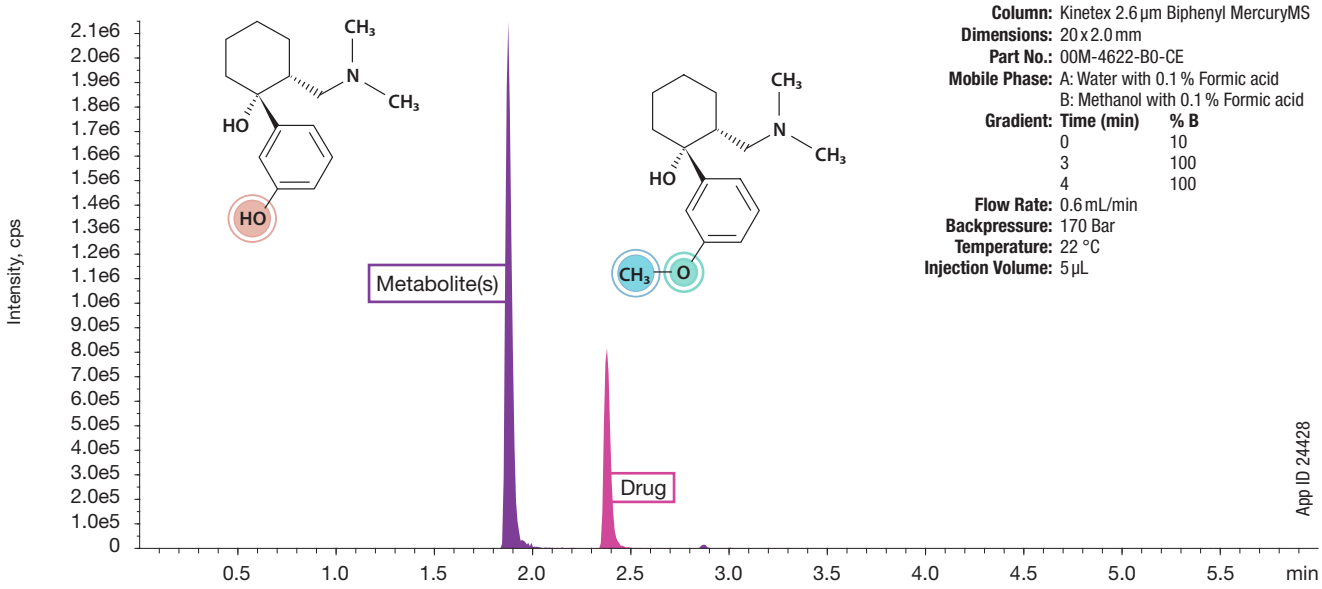

**Column:** Kinetex 2.6 µm Biphenyl MercuryMS™
**Dimensions:** 20 x 2.0 mm
**Part No.:** 00M-4622-B0-CE
**Mobile Phase:** A: Water with 0.1 % Formic acid
B: Methanol with 0.1 % Formic acid

| Gradient: | Time (min) | % B |
|---|---|---|
| | 0 | 10 |
| | 3 | 100 |
| | 4 | 100 |

**Flow Rate:** 0.6 mL/min
**Backpressure:** 170 Bar
**Temperature:** 22 °C
**Injection Volume:** 5 µL

## Kinetex Biphenyl



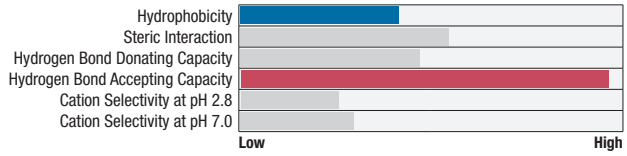

**Column:** Kinetex 2.6 µm Biphenyl MercuryMS
**Dimensions:** 20 x 2.0 mm
**Part No.:** 00M-4622-B0-CE
**Mobile Phase:** A: Water with 0.1 % Formic acid
B: Methanol with 0.1 % Formic acid

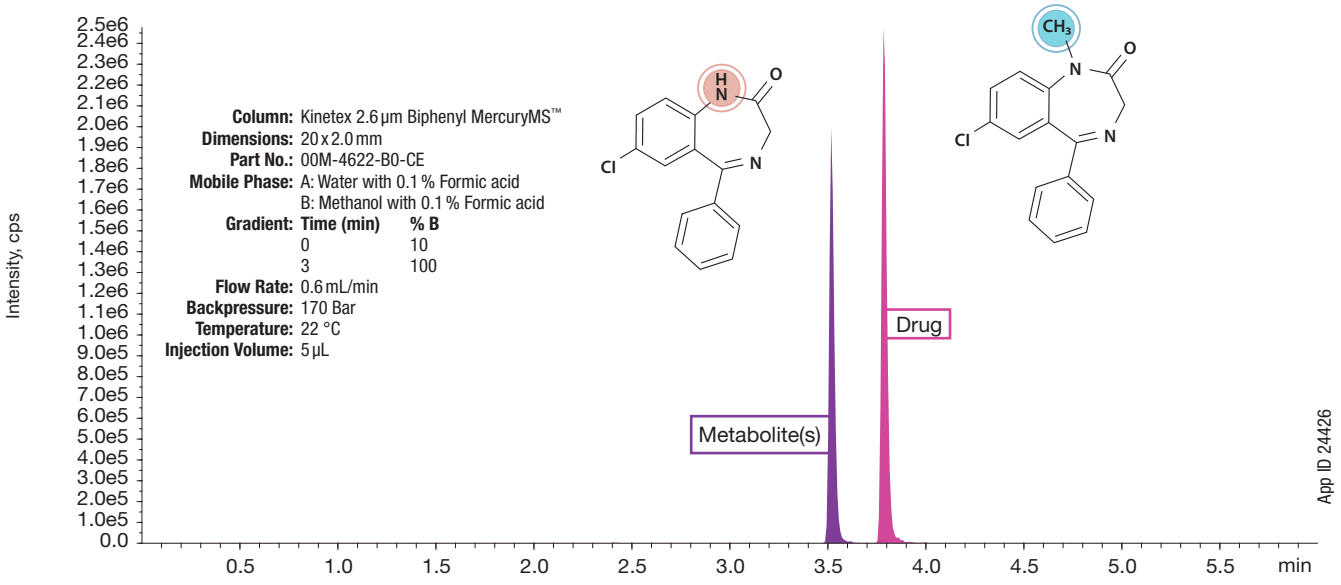
| Gradient: | Time (min) | % B |
|---|---|---|
| | 0 | 10 |
| | 3 | 100 |
| | 4 | 100 |

**Flow Rate:** 0.6 mL/min
**Backpressure:** 170 Bar
**Temperature:** 22 °C
**Injection Volume:** 5 µL

# Mid-Polarity Compounds

## Kinetex® Biphenyl



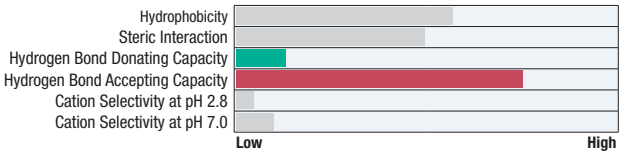



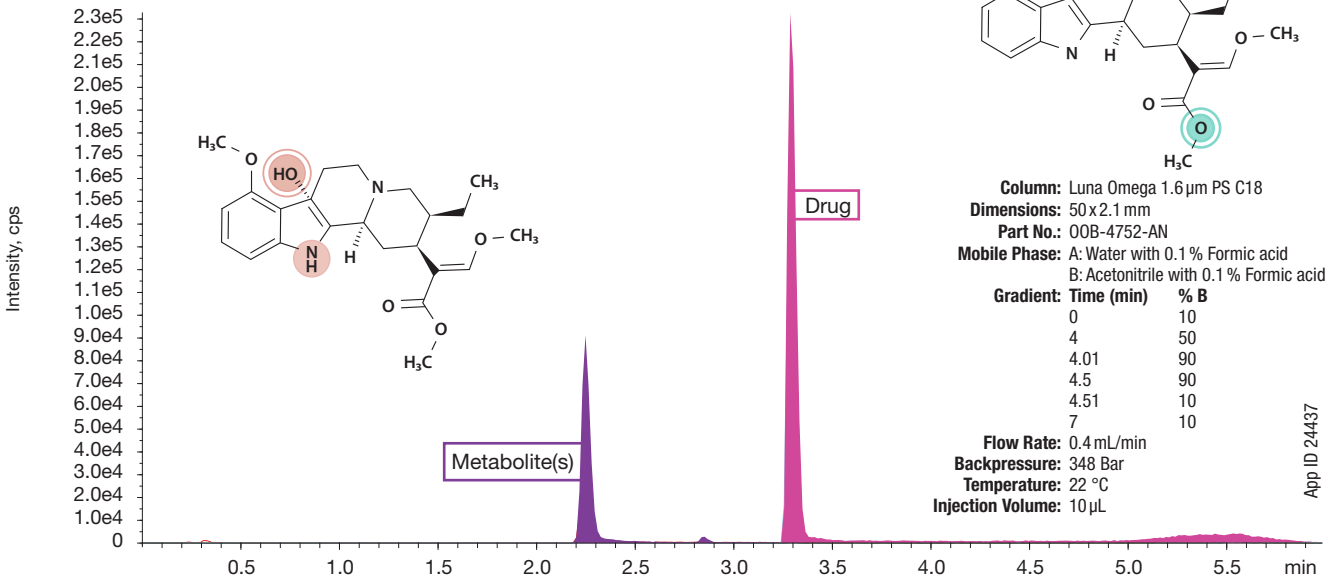

**Column:** Kinetex 2.6 µm Biphenyl MercuryMS™
**Dimensions:** 20 x 2.0 mm
**Part No.:** 00M-4622-B0-CE
**Mobile Phase:** A: Water with 0.1 % Formic acid
B: Methanol with 0.1 % Formic acid

| **Gradient:** | **Time (min)** | **% B** |
|---|---|---|
| | 0 | 10 |
| | 3 | 100 |

**Flow Rate:** 0.6 mL/min
**Backpressure:** 170 Bar
**Temperature:** 22 °C
**Injection Volume:** 5 µL

## Luna® Omega PS C18



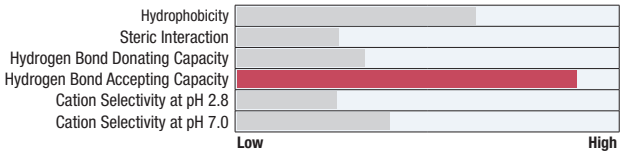

**Column:** Luna Omega 1.6 µm PS C18
**Dimensions:** 50 x 2.1 mm
**Part No.:** 00B-4752-AN
**Mobile Phase:** A: Water with 0.1 % Formic acid
B: Acetonitrile with 0.1 % Formic acid

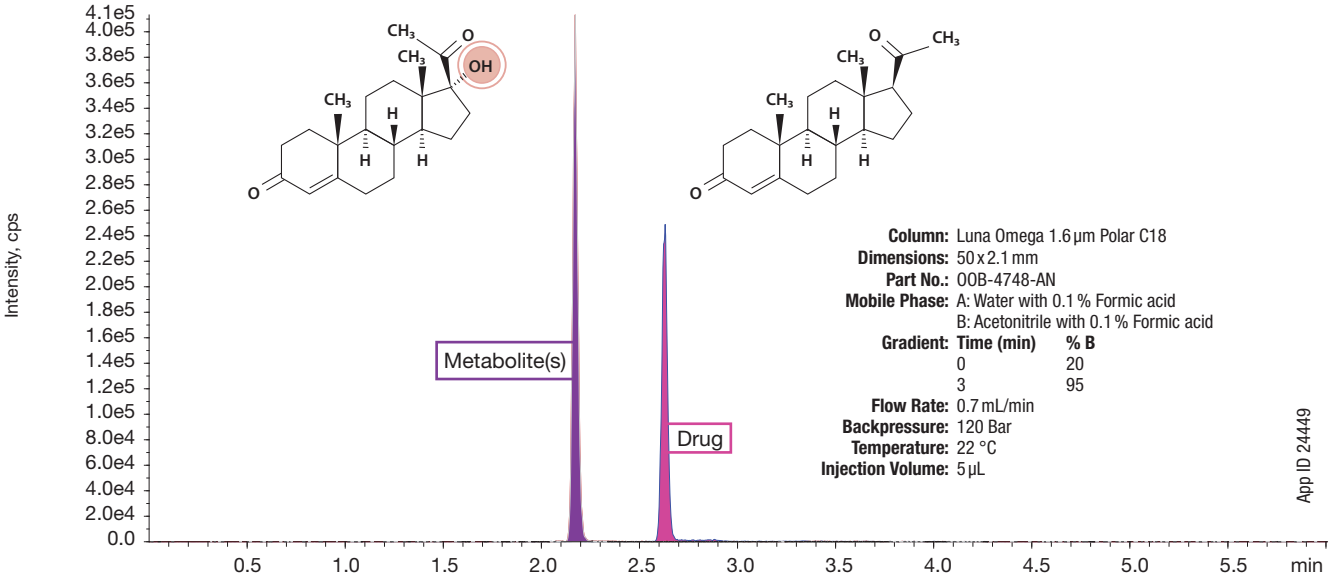
| **Gradient:** | **Time (min)** | **% B** |
|---|---|---|
| | 0 | 10 |
| | 4 | 50 |
| | 4.01 | 90 |
| | 4.5 | 90 |
| | 4.51 | 10 |
| | 7 | 10 |

**Flow Rate:** 0.4 mL/min
**Backpressure:** 348 Bar
**Temperature:** 22 °C
**Injection Volume:** 10 µL

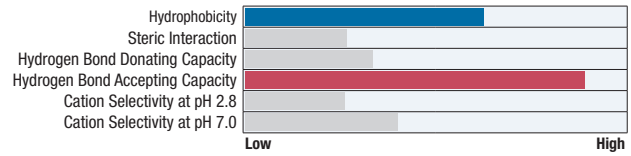
# Non-Polar Compounds

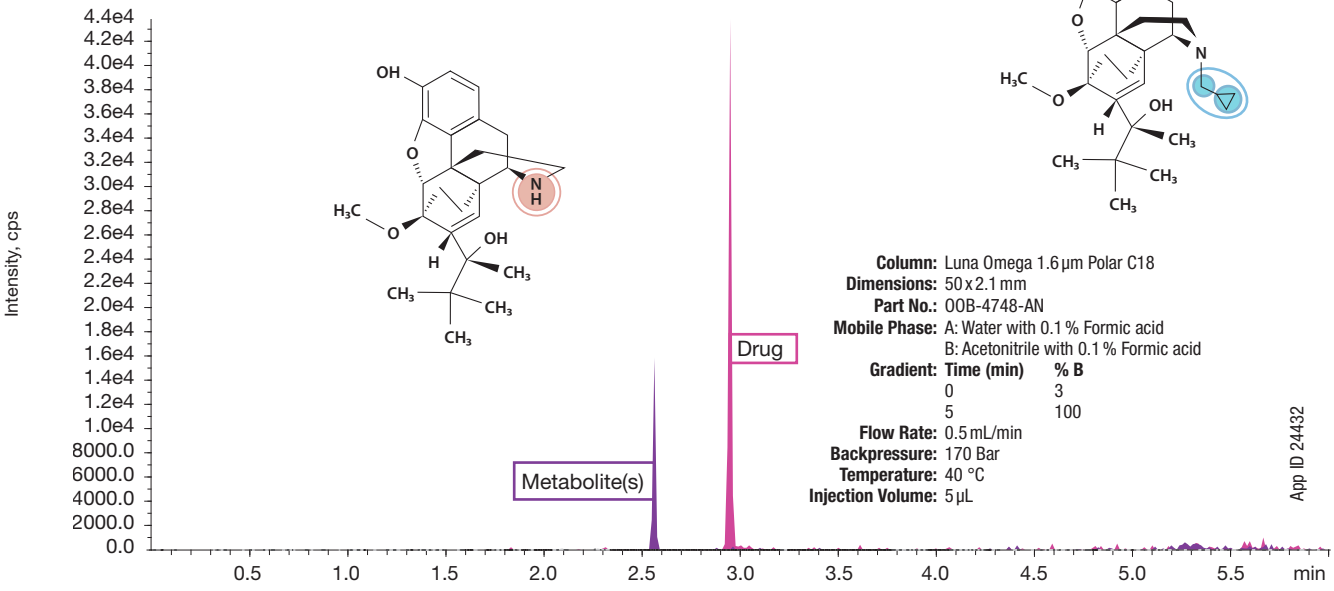
## Luna® Omega Polar C18



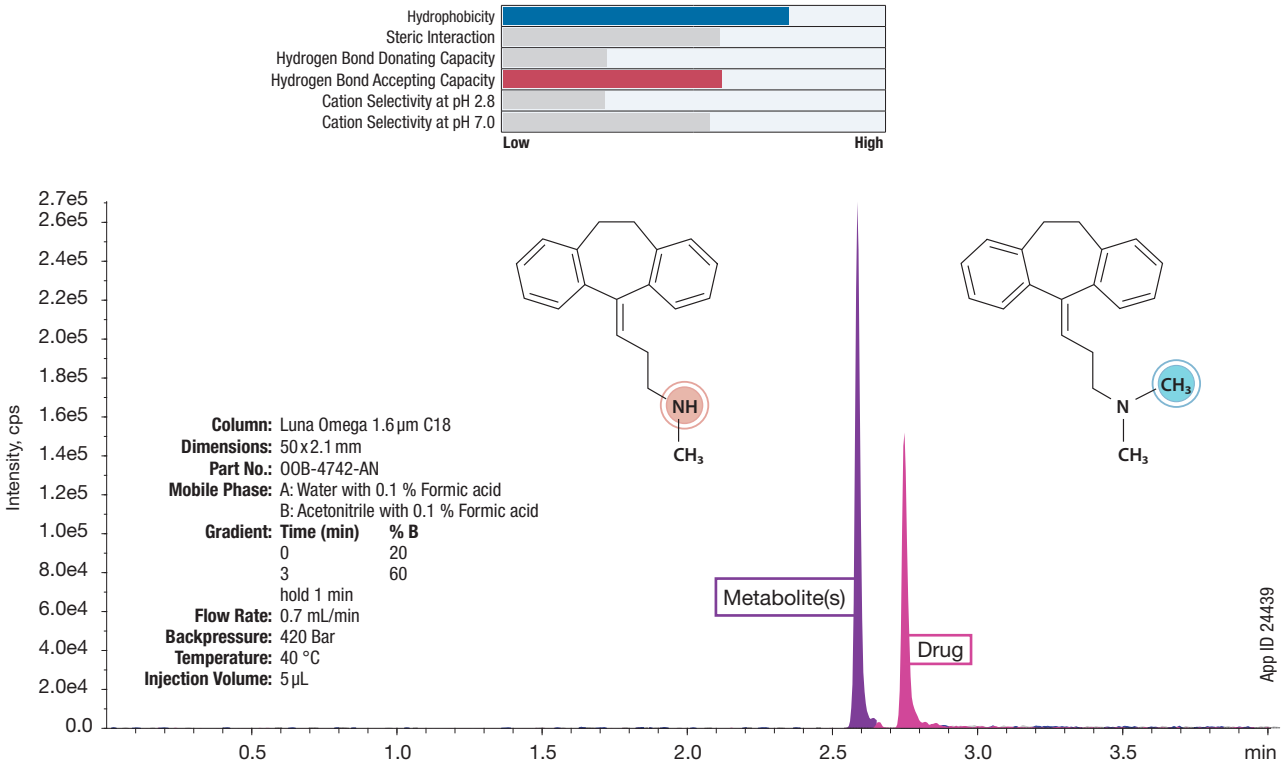

## Luna Omega Polar C18



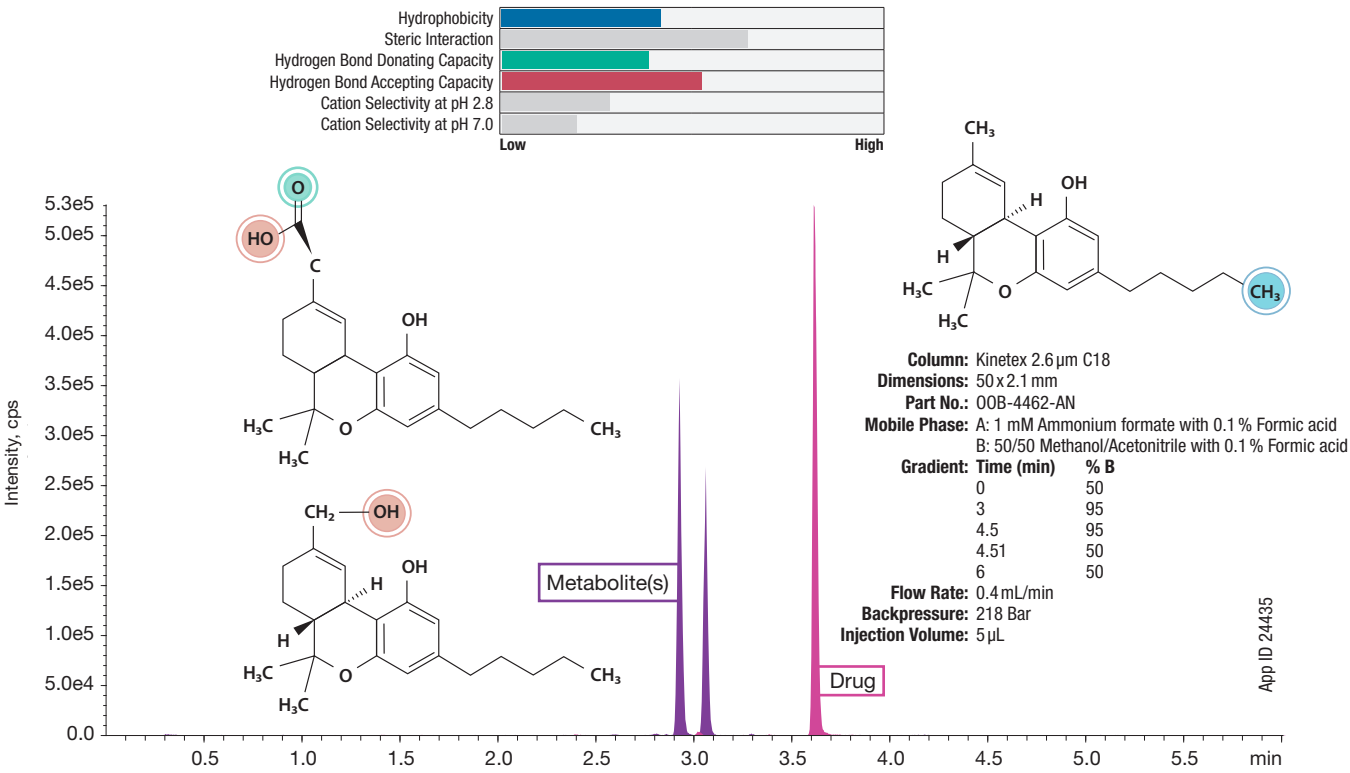



# Non-Polar Compounds

## Luna® Omega C18




## Kinetex® C18

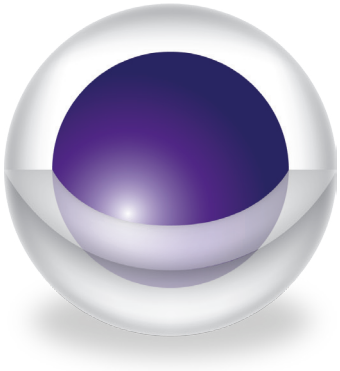


# Two Particle Platforms

Phenomenex offers a range of solid supports including core-shell particle technology, and thermally modified fully porous. 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 outer shell that results in faster chromatography and higher efficiencies than conventional fully porous particles.

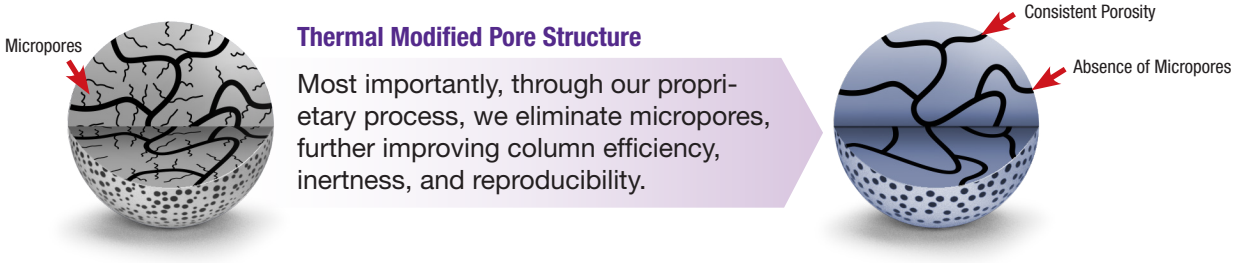


**Well suited for:**

- 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

## Fully Porous–Thermally Modified Silica

Unique high efficiency and extremely robust fully porous silica that offers astounding performance and inertness alongside versatile selectivities.



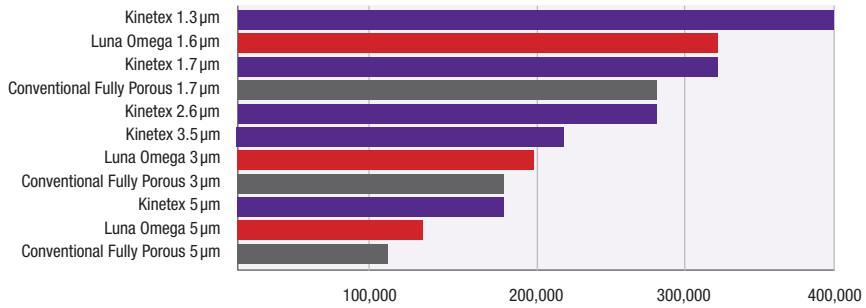

**Well suited for:**

- Astounding UHPLC, HPLC, and Preparative HPLC performance and efficiencies
- Greater separation muscle
- Better peak shape through an inert foundation
- Extreme ruggedness and dependability

# Gain Incredible Performance with Kinetex® and Luna® Omega

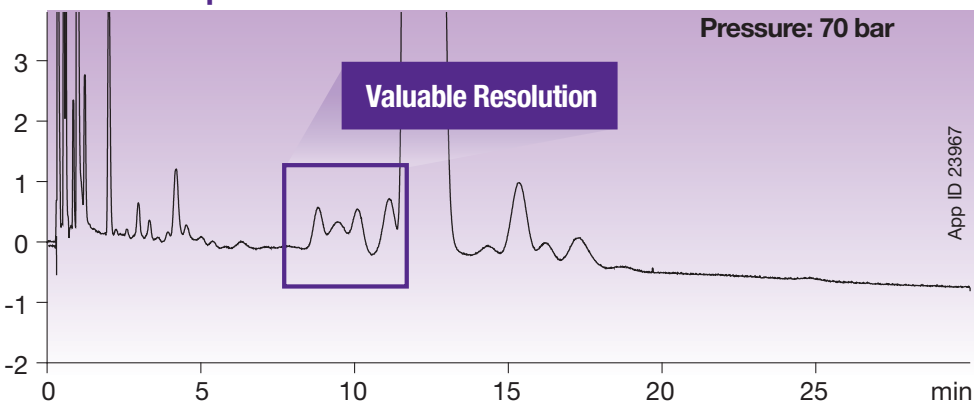
The undeniably high efficiency levels found in each Luna Omega and Kinetex column provides you with the potential of huge gains in method performance. While traditional silica and hybrid fully porous particles may claim high performance, when compared to Luna Omega or Kinetex, they may fall short and prevent HPLC/UHPLC scientists from reaching their goals.

## UHPLC and HPLC Efficiency Levels (plates/m)

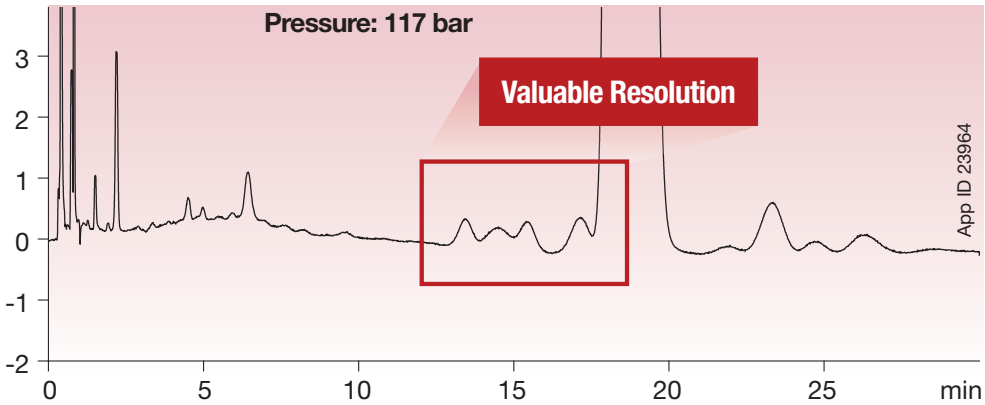



## Cyclosporine Impurity Profile

### Kinetex 2.6µm Polar C18




### Luna Omega 1.6µm Polar C18



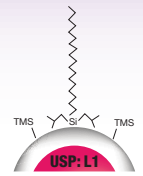
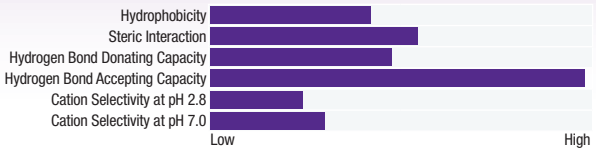
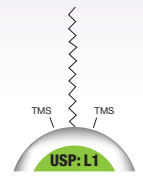
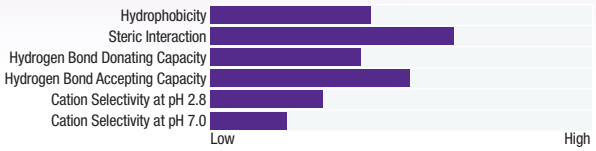
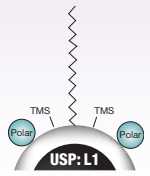
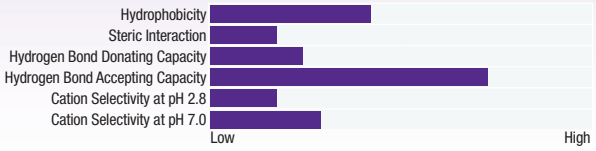
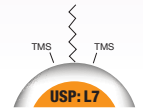
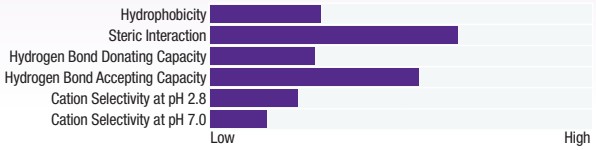
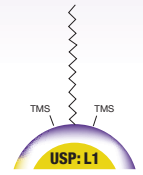
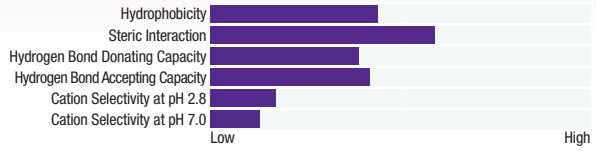
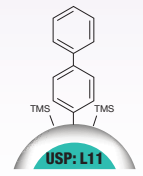
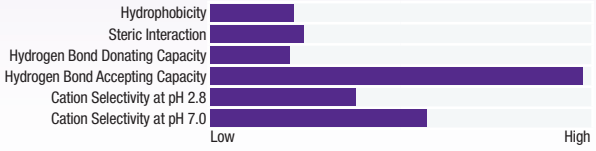
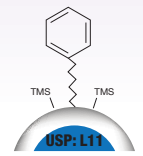
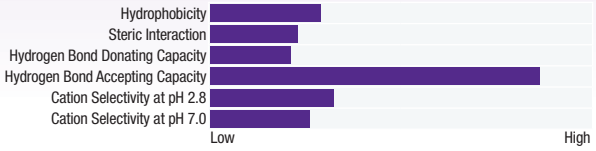
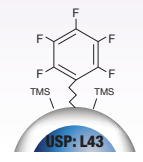
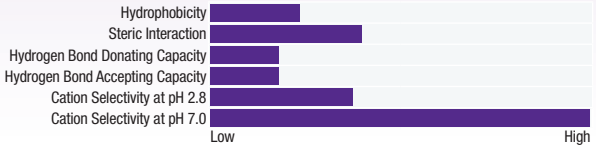

**Conditions for all columns same except where noted:**

**Columns:** Kinetex 2.6 µm Polar C18
Luna Omega 1.6 µm Polar C18
**Dimensions:** 50 x 2.1 mm
**Mobile Phase:** Acetonitrile/Tert-butyl methyl ether/Water/Phosphoric acid (430:50:520:1)
**Flow Rate:** 0.30 mL/min
**Temperature:** 80 °C
**Detection:** UV @ 210 nm
**Sample:** Cyclosporine

# Core-Shell Silica Kinetex® Phase Portfolio

Kinetex core-shell particles were engineered for 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.

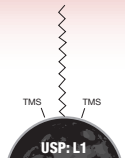
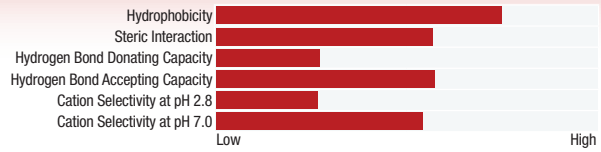
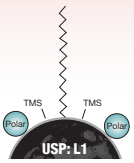
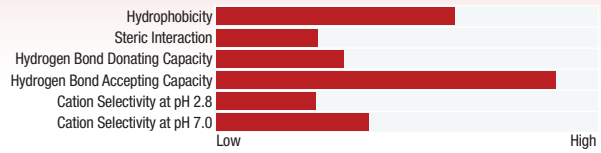
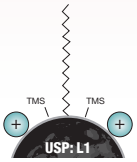
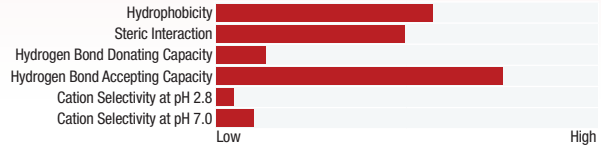
**Phases**

| Ligand | Description | Selectivity Profile |
|---|---|---|
|  | **Kinetex XB-C18**<br>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. |  |
|  | **Kinetex C18**<br>Very well balanced column providing some selectivity through steric, hydrogen, and cationic pathways. This is a great starting point for ultra-high efficiency separations. |  |
|  | **Kinetex Polar C18**<br>Combined C18 and polar modified surface that provide polar and non-polar retention alongside 100 % aqueous stability. |  |
|  | **Kinetex C8**<br>Brings the benefits of core-shell technology to USP L7 methods. The phase will provide moderate hydrophobicity and good steric and hydrogen donating selectivity. |  |
|  | **Kinetex EVO C18**<br>Novel pH 1-12 stable C18 that delivers robust methods and improved peak shape for bases. |  |
|  | **Kinetex Biphenyl**<br>100% aqueous stable reversed phase chemistry with hydrophobic, aromatic, and enhanced polar selectivity. |  |
|  | **Kinetex Phenyl-Hexyl**<br>Aromatic and moderate hydrophobic selectivity result in the great retention and separation of aromatic hydrocarbons. |  |
|  | **Kinetex F5**<br>This pentafluorophenyl propyl column provides a very high degree of steric selectivity to separate structural isomers. The electronegative fluorine groups offer high selectivity for cationic compounds. |  |

# Fully Porous-Thermally Modified Silica Luna® Omega Phase Portfolio

Luna Omega columns build upon the Luna legacy to provide enhanced and incredible HPLC and UHPLC performance and selectivity. With the unique Luna Omega fully porous, thermally modified silica particles you gain outstanding performance and efficiencies with better peak shapes through an inert foundation.

**Phases**

| Ligand | Description | Selectivity Profile |
|---|---|---|
|  | **Luna Omega C18**<br>Rugged and highly efficient C18 with strong focus on hydrophobic retention of non-polar and polar compounds |  |
|  | **Luna Omega Polar C18**<br>100 % aqueous stability and enhanced selectivity/ retention for polar analytes without diminishing useful non-polar retention. The C18 ligand provides general hydrophobic interactions while a polar modified particle surface provides enhanced polar compound retention. |  |
|  | **Luna Omega PS C18**<br>Unique, 100 % aqueous stable mixed-mode phase that provides both polar and non-polar retention. The surface contains a positive charged ligand which aids in the retention of acidic compounds through ionic interactions, while the C18 ligand promotes general reversed phase hydrophobic retention. The positively charged surface also improves basic compound peaks shape through ionic repulsion. |  |

## Material Characteristics

| Packing Material | Total Particle Size (µm) | Pore Size (Å) | Effective Surface Area ($m^2/g$) | Effective Carbon Load % | pH Stability | Pressure Stability |
|---|---|---|---|---|---|---|
| **Luna Omega Phases** | | | | | | |
| C18 | 1.6 | 100 | 260 | 11 | 1.5 - 8.5* | 1,000/600† bar |
| Polar C18 | 1.6, 3, 5 | 100 | 260 | 9 | 1.5 - 8.5* | |
| PS C18 | 1.6, 3, 5 | 100 | 260 | 9 | 1.5 - 8.5* | |
| **Kinetex Phases** | | | | | | |
| Polar C18 | 2.6 | 100 | 200 | 9 | 1.5-8.5* | 1,000/600† bar |
| EVO C18 | 1.7, 2.6, 5 | 100 | 200 | 11 | 1.0-12.0 | |
| C18 | 1.3, 1.7, 2.6, 5 | 100 | 200 | 12 | 1.5-8.5* | |
| XB-C18 | 1.7, 2.6, 3.5, 5 | 100 | 200 | 10 | 1.5-8.5* | |
| C8 | 1.7, 2.6, 5 | 100 | 200 | 8 | 1.5-8.5* | |
| F5 | 1.7, 2.6, 5 | 100 | 200 | 9 | 1.5-8.5 | |
| Biphenyl | 1.7, 2.6, 5 | 100 | 200 | 11 | 1.5-8.5* | |
| Phenyl-Hexyl | 1.7, 2.6, 5 | 100 | 200 | 11 | 1.5-8.5* | |
| HILIC | 1.7, 2.6, 5 | 100 | 200 | 0 | 2.0-7.5 | |

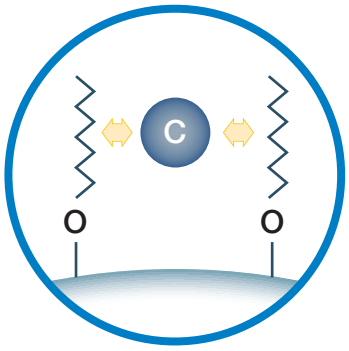
* pH stability under gradient conditions. pH stability is 1.5 - 10 under isocratic conditions.

† 2.1 mm ID Kinetex columns are pressure stable up to 1000 bar.

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

# Columns for Hydrocarbon Compounds

Find the right amount of hydrophobicity for your separations. Our large assortment of HPLC and UHPLC columns that are best suited for the analysis of hydrocarbon compounds are listed in order of hydrophobicity with the highest hydrophobicity columns at the top of the list.




## Hydrophobicity

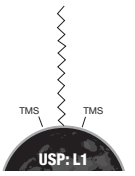
The ability of a phase to hydrophobically interact with carbon groups

## Selectivity Tip:

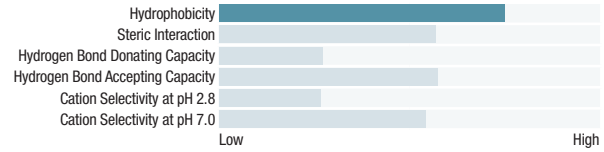
The Partition Coefficient or LogP measures a compounds lipophilicity & can help predict a analytes potential to interact hydrophobically.

☑ = Available in UHPLC

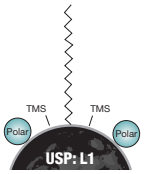
☑



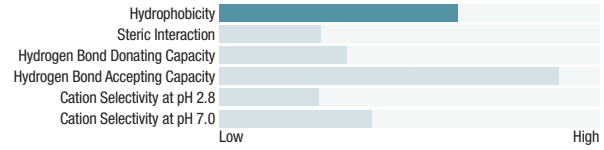

### Luna® Omega C18



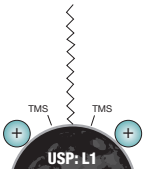

☑



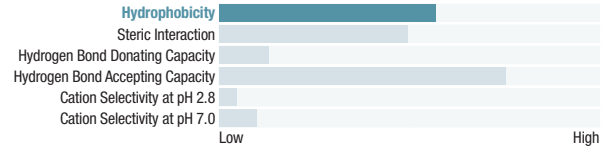

### Luna Omega Polar C18



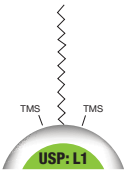

☑



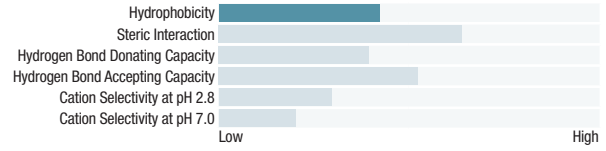

### Luna Omega PS C18



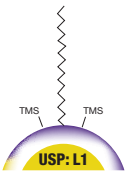

☑



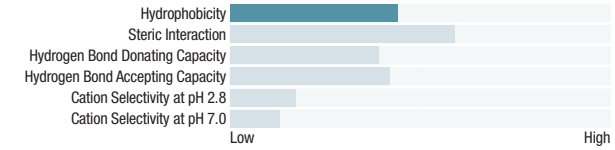

### Kinetex® C18

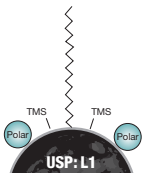



☑

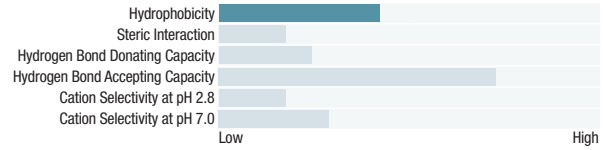



### Kinetex EVO C18

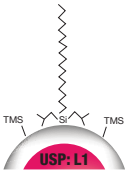


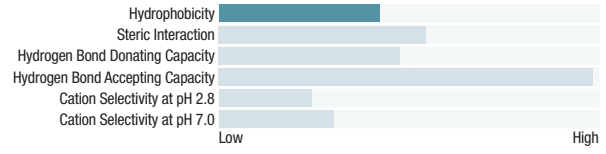

### Kinetex Polar C18




☑

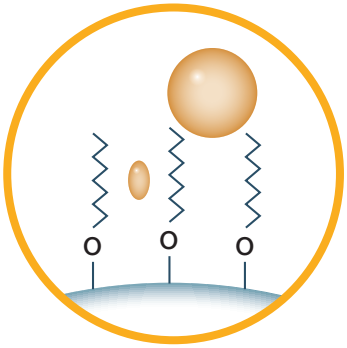



### Kinetex XB-C18



# Columns for Isomers and Isobaric Compounds

Phenomenex has developed HPLC and UHPLC columns for the successful high resolution separation of compounds based on size and shape. These columns have either high steric interaction values or multiple interaction mechanisms which are best suited for the analysis of isomers and isobaric compounds.

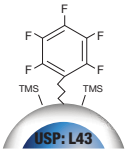


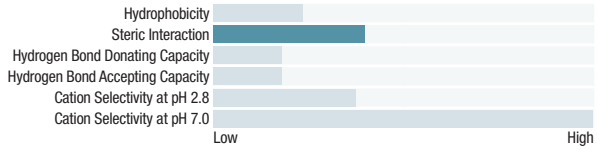

## Steric Interaction

The ability of a phase to separate compounds based on structural differences

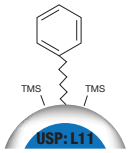
## Positional Isomers - Polar/Neutral Functionalities

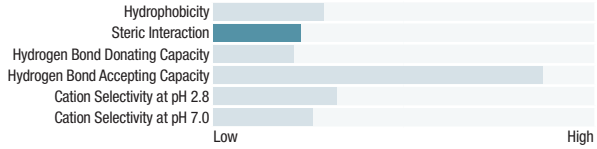
### Kinetex® F5



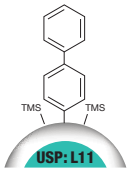



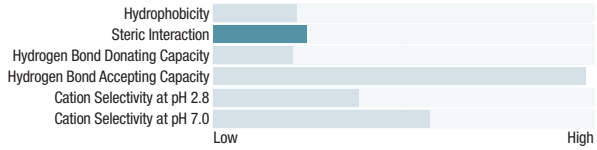

### Kinetex Phenyl-Hexyl




### Kinetex Biphenyl



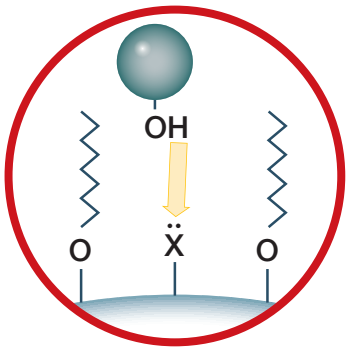

### Selectivity Tip:

Try using methanol for the organic portion of the mobile phase. It can help promote pi-pi bond interaction.

☑ = Available in UHPLC

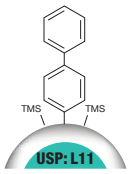
# Columns for Hydroxyl- or Amine-Containing Compounds

Our HPLC and UHPLC column recommendations for the analysis of hydroxyl- or amine-containing compounds are listed by hydrogen bond accepting capacity (below) and aromaticity (pg. 22).

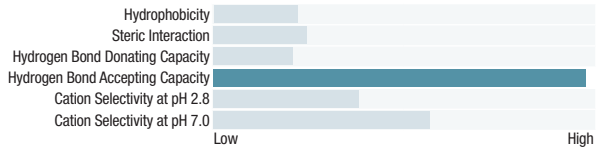


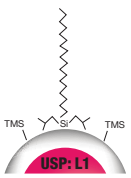

## Hydrogen Bond Accepting Capacity

The ability of a phase to hydrogen-bond with proton donating groups

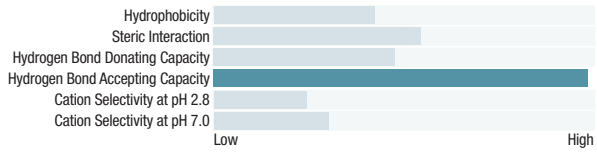
☑ 

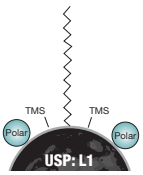

### Kinetex® Biphenyl



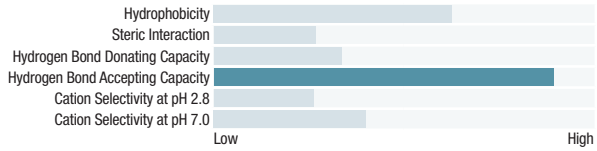

☑ 

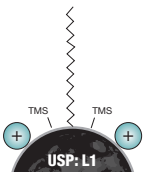

### Kinetex XB-C18



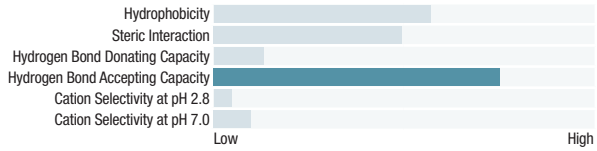

☑ 


### Luna® Omega Polar C18




☑ 


### Luna Omega PS C18



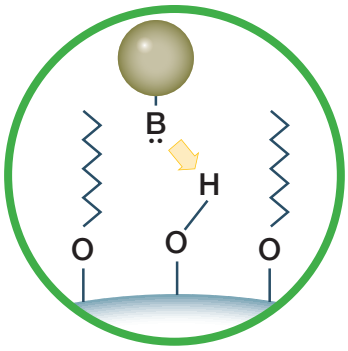

### Selectivity Tip:

Hydrogen bonding can occurs when a hydrogen atom is bonded to a electronegative atom that is adjacent to a accessible lone pair of electrons of another atom.

☑ = Available in UHPLC

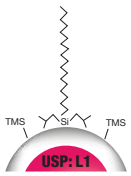
# Columns for Non-ionized Bases and Oxygen- or Halogen-Containing Compounds

We recommend the following columns for the separation of non-ionized bases and oxygen- or halogen-containing compounds. Use the charts below to compare the hydrogen bond donating capacity, keeping in mind that a higher hydrogen bond donating capacity will result in greater retention of non-ionized bases and oxygen- or halogen-containing compounds.

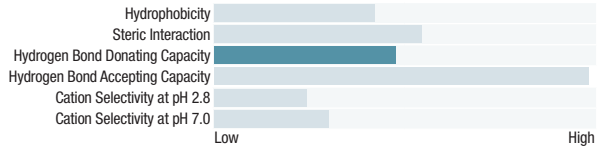


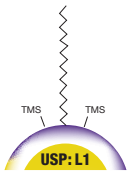

## Hydrogen Bond Donating Capacity

The ability of a phase to hydrogen-bond with proton accepting groups

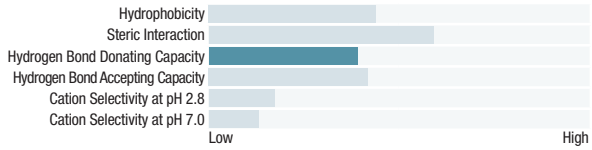


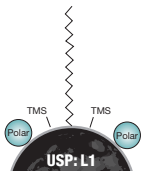

### Kinetex® XB-C18



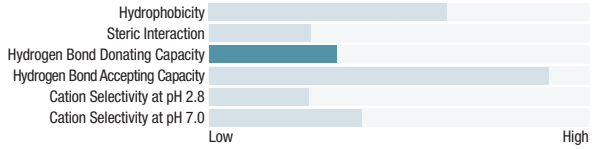




### Kinetex EVO C18




### Luna Omega Polar C18




## Selectivity Tip:

### Solvent Polarity Chart

| Relative Polarity | Compound Formula | Group | Representative Solvent Compounds |
|---|---|---|---|
| Nonpolar | R - H | Alkanes | Petroleum ethers, ligroin, hexanes |
| | Ar - H | Aromatics | Toluene, benzene |
| | R - O - R | Ethers | Diethyl ether |
| | R - X | Alkyl halides | Tetrachloromethane, chloroform |
| | R - COOR | Esters | Ethyl acetate |
| | R - CO - R | Aldehydes and ketones | Acetone, methyl ethyl ketone |
| | R - $NH_2$ | Amines | Pyridine, triethylamine |
| | R - OH | Alcohols | Methanol, ethanol, isopropanol, butanol |
| | R - $COHN_2$ | Amides | Dimethylformamide |
| | R - COOH | Carboxylic acids | Ethanoic acid |
| Polar | H - OH | Water | Water |

*Increasing Polarity*

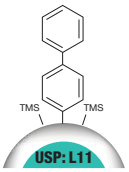
= Available in UHPLC

# Columns for Aromatic or Ring Containing Compounds

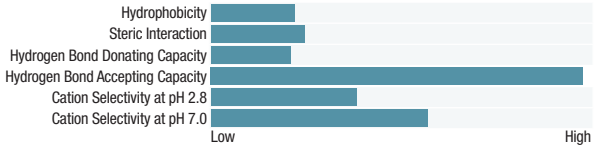
Our selection of HPLC and UHPLC columns that promote pi-pi interactions are listed by aromaticity.

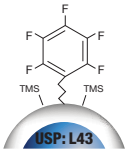

## Aromaticity

Column chemistries that contain ring structures interact with aromatic or ring containing compounds via pi-pi interactions (π stacking)

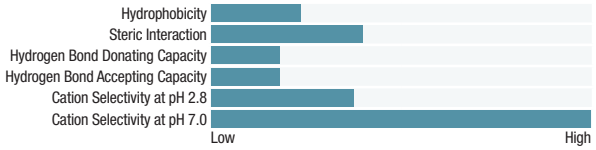
☑ 

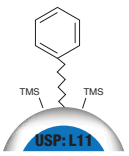

### Kinetex® Biphenyl



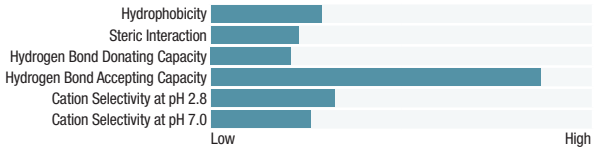

☑ 


### Kinetex F5




☑ 


### Kinetex Phenyl-Hexyl



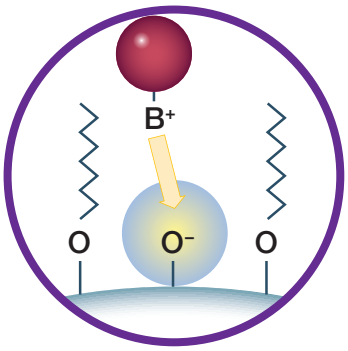

### Selectivity Tip:

Aromaticity is a transient attraction between two aromatic rings. Resulting from the subsequent alignment of the positive and negative electrostatic potentials of the aromatic rings.

☑ = Available in UHPLC

# Columns for Analysis of Polar Basic Compounds

Columns with high cation selectivity values will show higher retention for ionized bases while columns with low cation selectivity values will have less interaction and retention for ionized bases, but may have very good peak shape for bases. We've organized our recommendations for polar basic compounds by increased retention and improved peak shape.



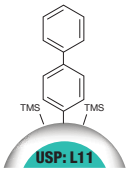

## Cation Selectivity

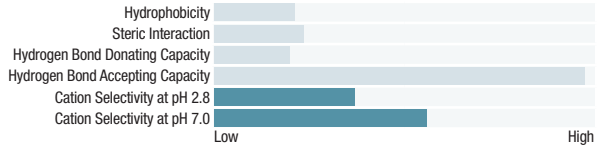
High column cation selectivity values will show higher retention for ionized bases.

Low column cation selectivity values will have less interaction and retention for ionized bases, but may have very good peak shape.

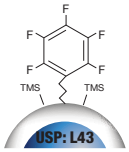
## Increased Retention of Polar Bases

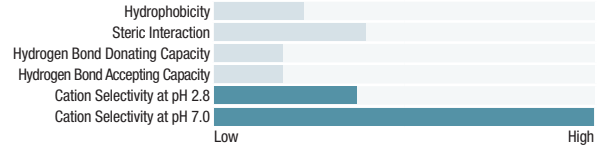
### Kinetex® Biphenyl



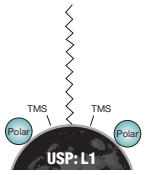



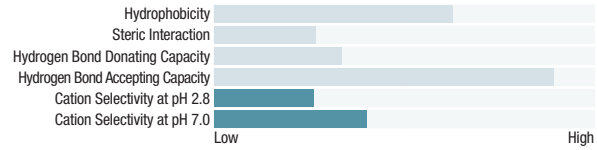

### Kinetex F5



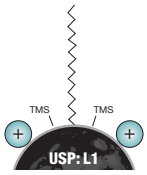

### Luna® Omega Polar C18

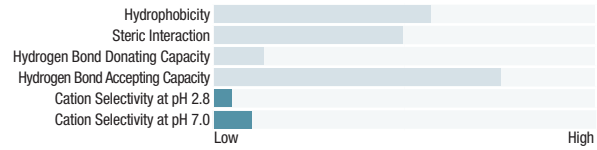


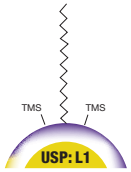

## Improved Peak Shape for Bases

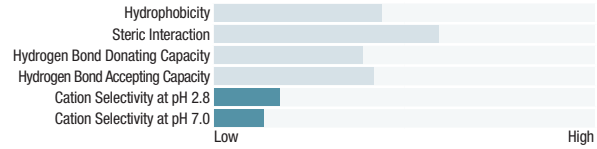
### Luna Omega PS C18




### Kinetex EVO C18

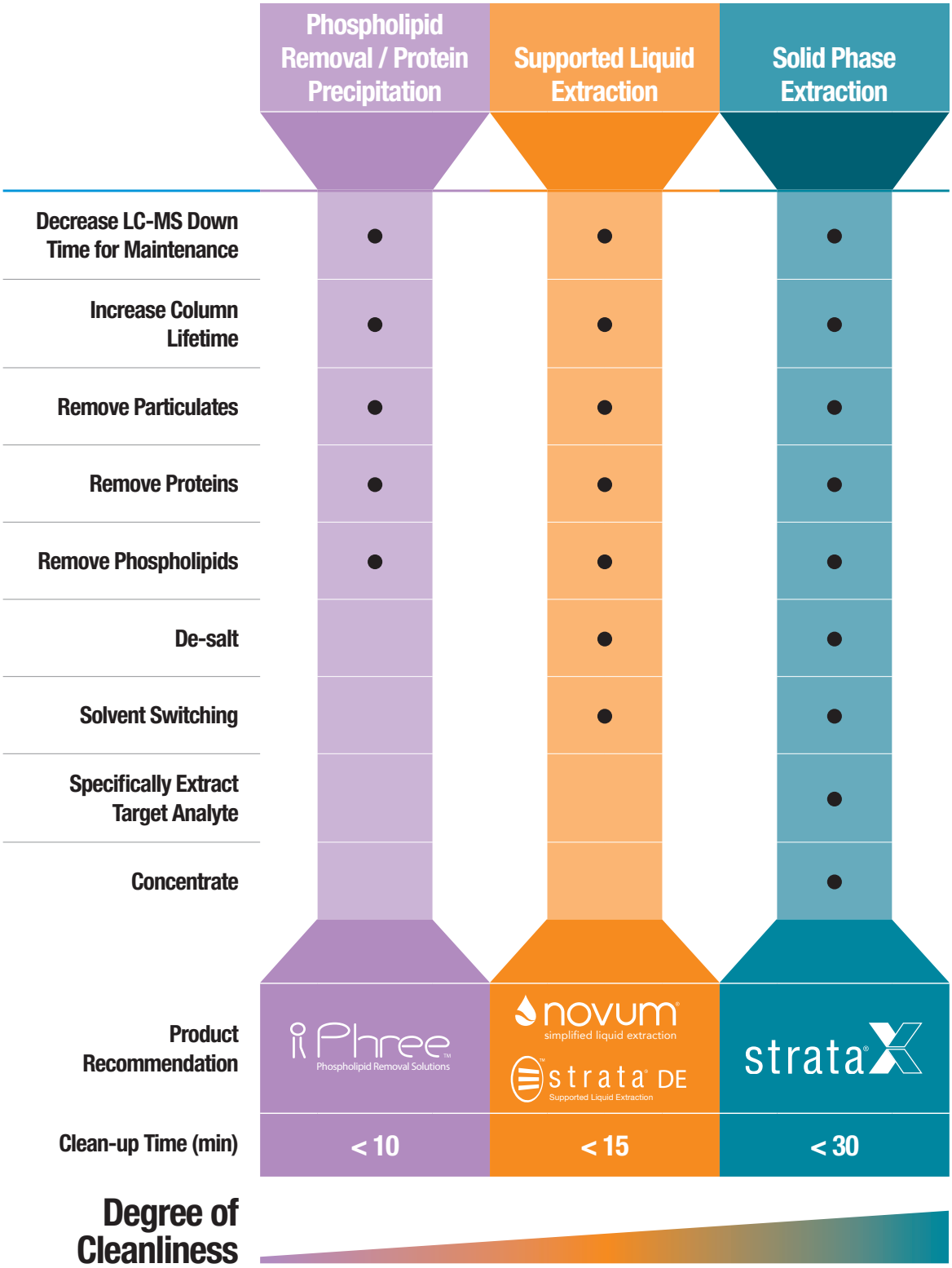



= Available in UHPLC

# Unwanted Matrix Effects and Contaminants

Select the appropriate sample preparation technique for your key requirements.

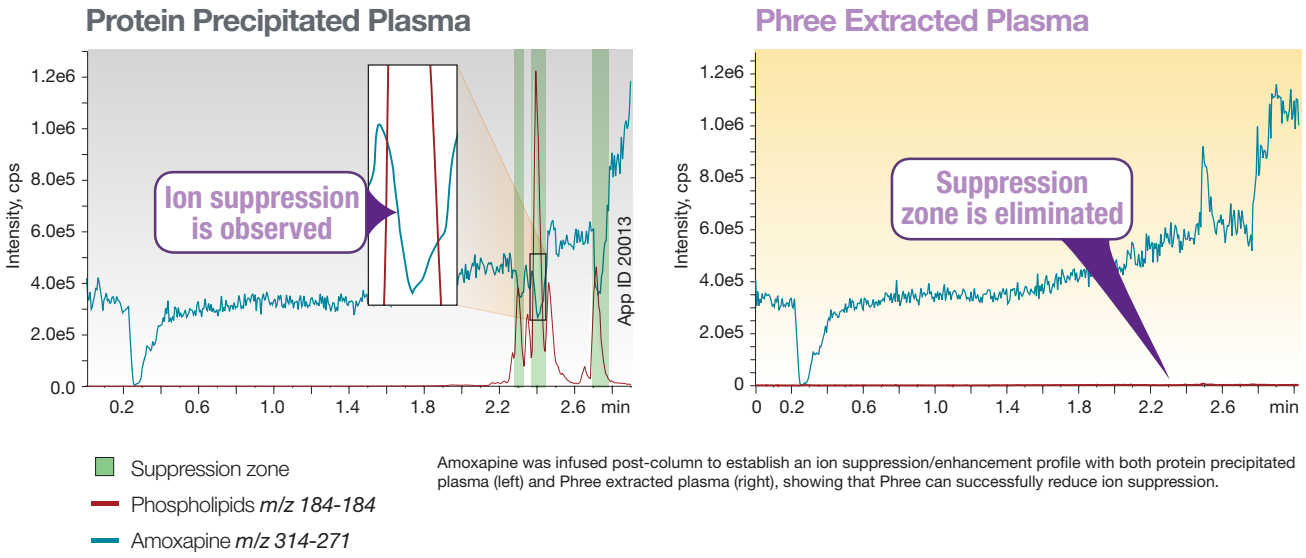



For more information, please visit
***www.phenomenex.com/SamplePrep***

# Reduce Ion Suppression with Phospholipid Removal

Phree™ Phospholipid Removal Solutions

The presence of phospholipids in plasma samples produces zones of ion suppression that correlate exactly with the phospholipid elution profile when analyzed via mass spectrometer (MS).




Amoxapine was infused post-column to establish an ion suppression/enhancement profile with both protein precipitated plasma (left) and Phree extracted plasma (right), showing that Phree can successfully reduce ion suppression.

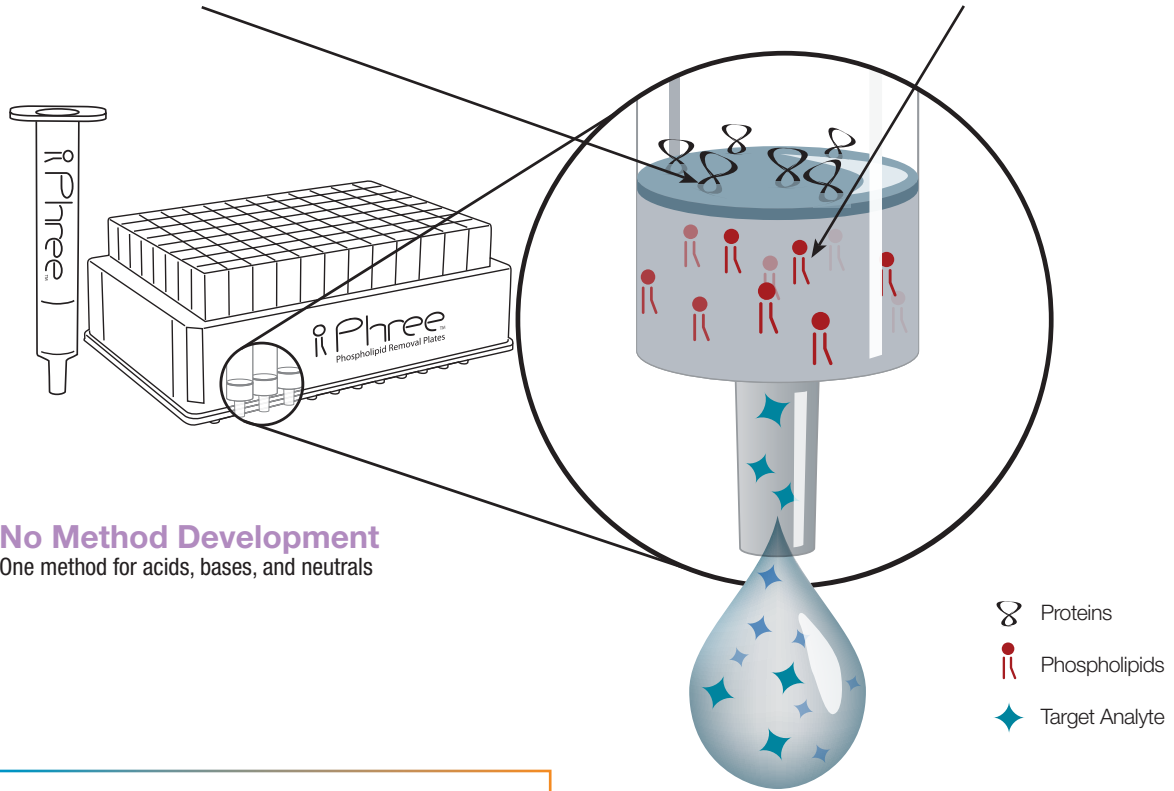
## How Phree Works: Three Big Advantages

### 1 Remove Proteins

Solvent Shielding Technology™ prevents dripping of organic solvent, allowing for protein precipitation within the Phree Phospholipid Removal Product.

### 2 Eliminate Phospholipids

The Phree sorbent selectively removes phospholipids from precipitated plasma samples.




### 3 No Method Development

One method for acids, bases, and neutrals

See how Phree Phospholipid Removal Plates Work:
***www.phenomenex.com/Phree***

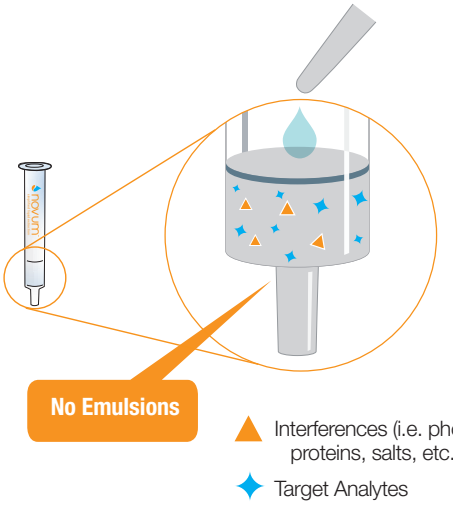
# Rapid Clean-Up with Supported Liquid Extraction (SLE)

## SLE is a faster, easier, and more reliable way to perform liquid-liquid extractions

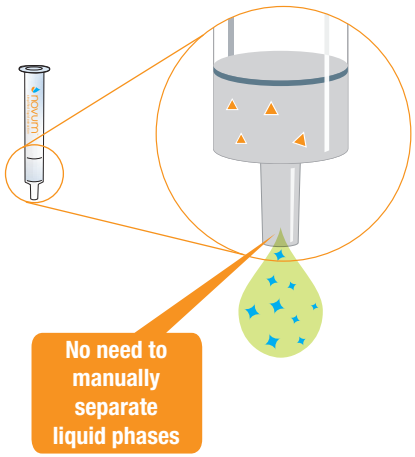
- Eliminates interferences from your analysis, such as proteins and phospholipids, without performing extensive method development
- Novum™ synthetic SLE provides consistent, reliable results lot-to-lot
- Strata® DE diatomaceous earth SLE is a cost effective alternative to other diatomaceous earth SLE products

## An Easy, Automatable Procedure

**STEP 01** **Load Your Sample in Aqueous Solvent**




**STEP 02** **Collect Your Target Analytes in Water Immiscible Solvent**




## Determine Which SLE Sorbent is Right for Your Extraction

| novum™ simplified liquid extraction | | strata® DE Supported Liquid Extraction |
|---|---|---|
| Synthetic | Sorbent | Diatomaceous Earth |
| Lot-to-lot consistency and reproducibility | Advantages | Cost effective and large volume capabilities |
| Ethyl Acetate, Methyl Tert-Butyl Ether (MTBE) | Extraction Solvents | Dichloromethane (DCM), Hexane, MTBE, Ethyl Acetate |
| MINI 96-Well Plates, MAX 96-Well Plates | Plate Formats | 200 µL 96-Well Plates, 400 µL 96-Well Plates |
| 1 cc, 3 cc, 6 cc, 12 cc | Tube Formats | 12 cc and 60 cc |

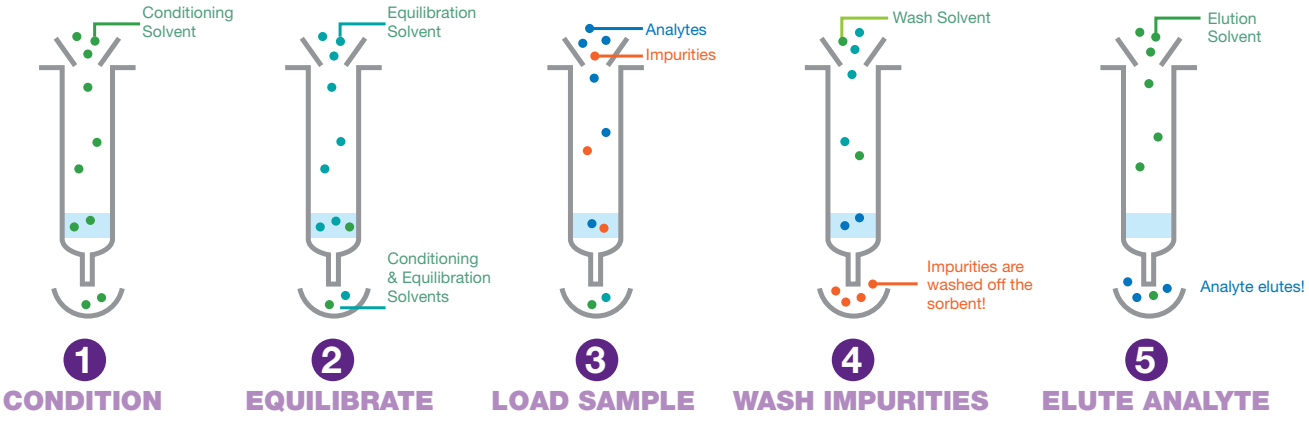
Contact your Phenomenex representative to learn which SLE product is right for you!

# Cleaner Samples and Improved Recovery Using SPE

Solid Phase Extraction (SPE) is a very targeted form of sample preparation that allows you to isolate your analyte of interest while removing any interfering compounds that may be in your sample.

- Targeted analyte extraction for cleaner analysis
- Concentration of samples for better chromatographic results
- Solvent switching for GC or LC compatibility

## Solid Phase Extraction General Protocol

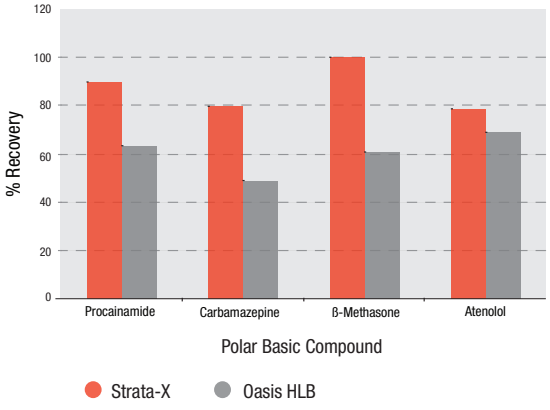



## Higher Recoveries with a Stronger Wash Compared to Waters® Oasis® HLB

Strata-X polymeric SPE offers the use of stronger wash solvents for cleaner samples and higher recoveries. Use up to 60% organic without sacrificing recovery!

strataX

Polar Compound Recoveries at 60% MeOH Wash




**Condition:** 800 µL methanol followed by 800 µL water
**Load:** 500 µL plasma diluted with 1 mL water (spiked conc. ULOQ = 500 ng/mL; LLOQ=5 ng/mL)
**Wash 1:** 800 µL water
**Wash 2:** 800 µL 60 % MeOH/water
**Dry:** 1-2 mins at 10" of Hg
**Elute:** 2 x 200 µL 100 % MeOH

Comparative separations may not be representative of all applications.
* Contact Phenomenex for method details.

Develop SPE methods in under one minute and request a free sample:
***www.phenomenex.com/MDTool***

# Protect Your Column's Selectivity

## Save Time and Money

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

## With SecurityGuard, you will experience:

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

### UHPLC

**SecurityGuard ULTRA**

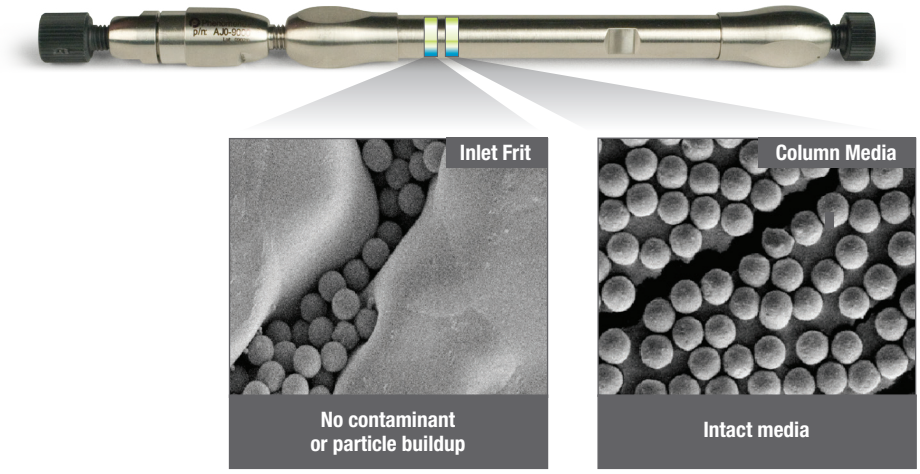
All core-shell and/or
< 3 µm particle columns
(< 20,000 psi / 1,378 bar)

### HPLC

**SecurityGuard Standard**

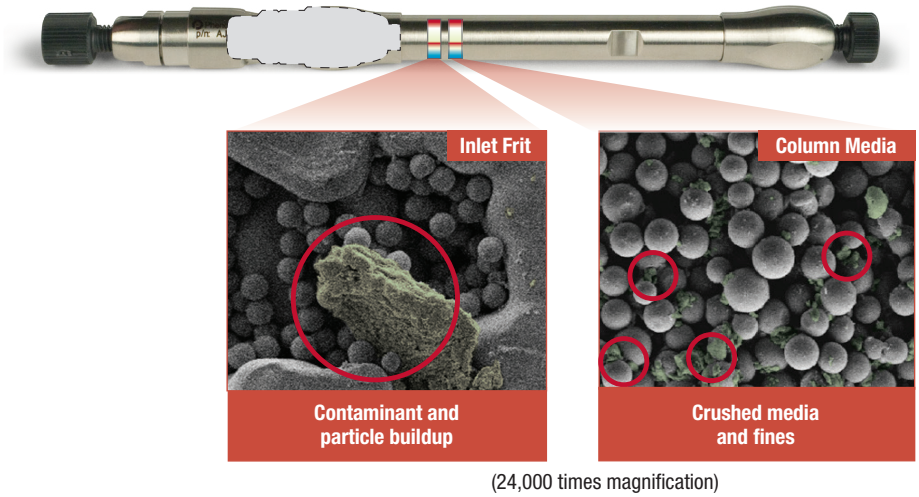
All non core-shell and
≥ 3 µm particle columns
(< 3,500 psi / 241 bar)

***With* SecurityGuard ULTRA**




(24,000 times magnification)

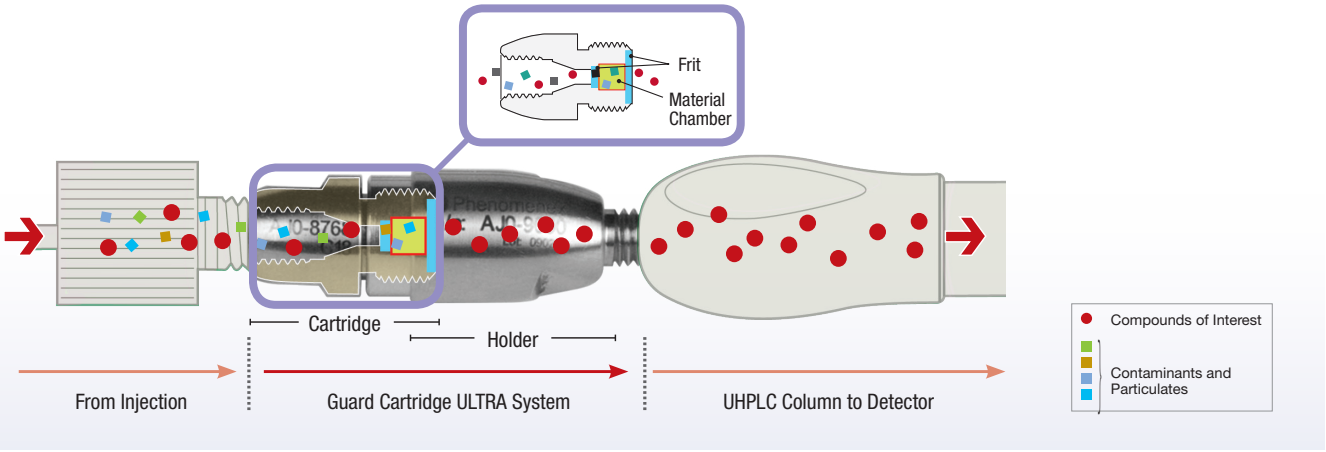
***Without* SecurityGuard ULTRA**

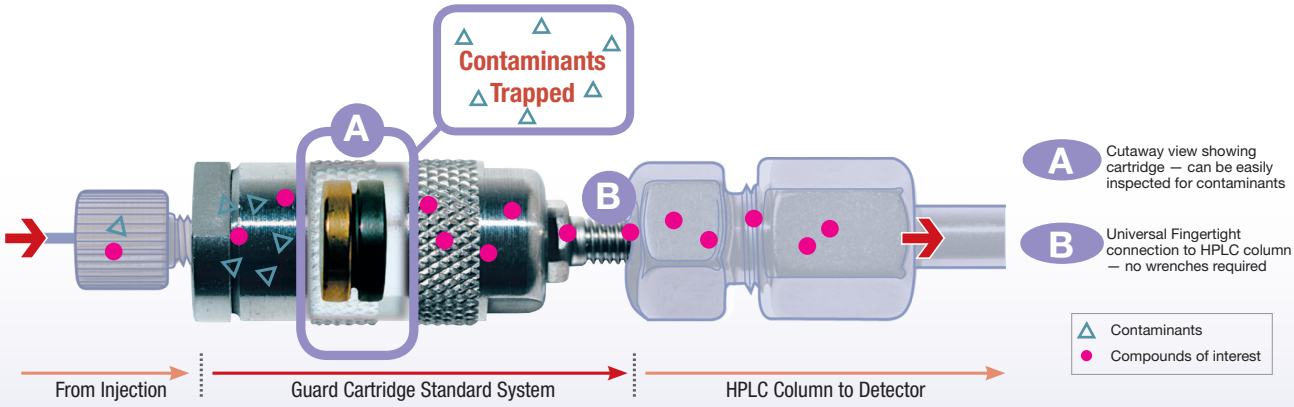



(24,000 times magnification)

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

# Total Column Protection



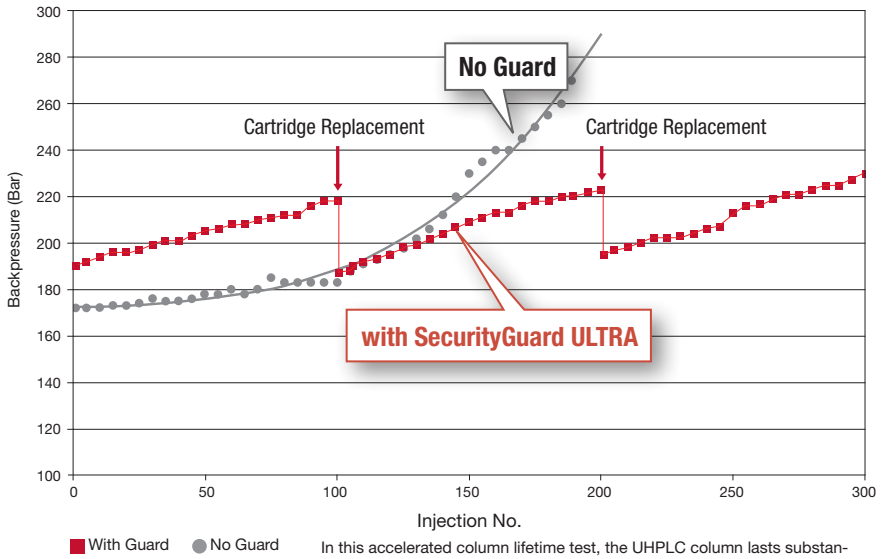

## SecurityGuard™ Keeps Columns Performing at Their Best

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

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

### SecurityGuard ULTRA Performance

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




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

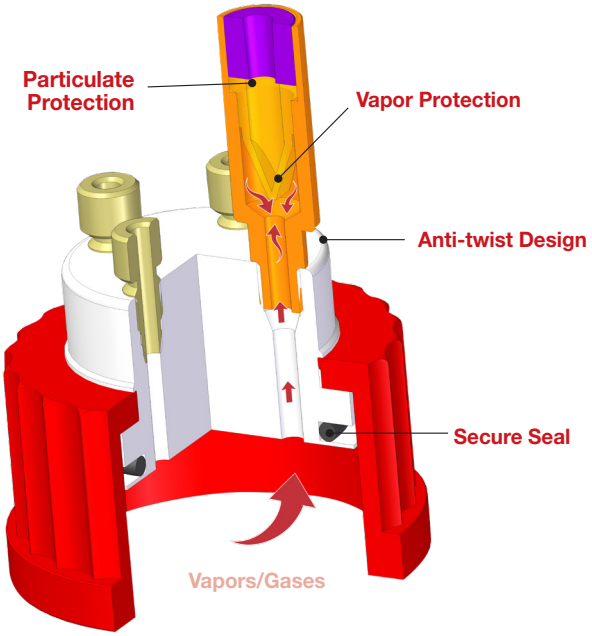
# HPLC/UHPLC Solvent Protection SecurityCAPs™

## Limit Your Exposure

The SecurityCAP mobile phase and solvent waste safety caps prevent dangerous vapors and gases from leaving HPLC/UHPLC solvent reservoirs. Over time, these chemicals can have a negative impact on the health of all employees and visitors in the lab. When lab safety and dependable results are a priority, you need SecurityCAPs!

## Mobile Phase Safety Filter and Cap

- **Increases Health and Worker Safety**
  An integrated one-way valve protects lab air quality by preventing hazardous vapors and gases from leaving the solvent container. The valve allows air to flow into the vessel to compensate for the pressure during solvent removal
- **Protects HPLC/UHPLC Results**
  PTFE filter membrane prevents contaminants and dust from entering your solvent
- **Confidence During Quality and Safety Audits**
  Eliminate aluminum foil or Parafilm® covering solvent bottles





## Waste Exhaust Filter and Cap

- **Safer Laboratory Work Environment**
  Harmful chemical vapors are safely collected and air quality is protected
- **Large Capacity Waste Safety Filter**
  High surface area (560 $m^2/g$) multi-compound adsorbent captures evaporated solvents
- **Easy to Use**
  Freely rotating cap body prevents twisting tubes during waste container exchange

For more information, visit
***www.phenomenex.com/SecurityCAP***

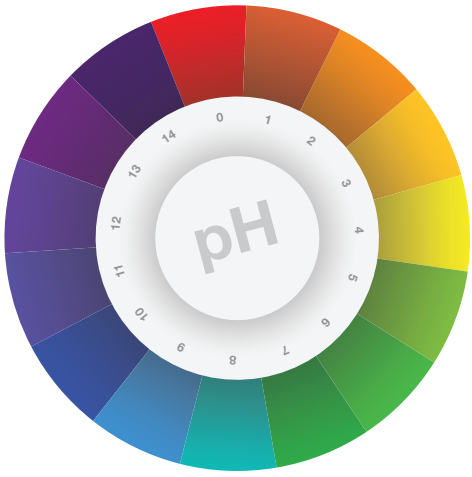
## Avoid Solvent Evaporation

SecurityCAP™ offers several advantages over insufficient non-sealed tops/caps which can lead to both hazardous lab conditions and poor chromatographic results. When it comes to lab safety, saving money on expensive solvents and ensuring solvent protection, there is no comparison to SecurityCAP.

| | Open Top | Aluminum foil wrapped bottle top | Cap with two 10 mm holes in the plastic | SecurityCAP |
|---|---|---|---|---|
| |  |  |  |  |
| Protects staff and visitors from volatile organic compounds released into lab | No | No | No | Yes |
| Ensures confidence during quality and safety audits | No | No | No | Yes |
| Protects solvents from both atmospheric particulates and contaminants | No | No | No | Yes |
| Saves money by preventing solvent evaporation | No | No | No | Yes |
| Prevents chemical spills/splashes | No | No | No | Yes |
| Time monitor device for protection | No | No | No | Yes |
| 100 % Sealable | No | No | No | Yes |
| Easy to use | Yes | No | Yes | Yes |
| **Improves lab safety** | **No** | **No** | **No** | **Yes** |

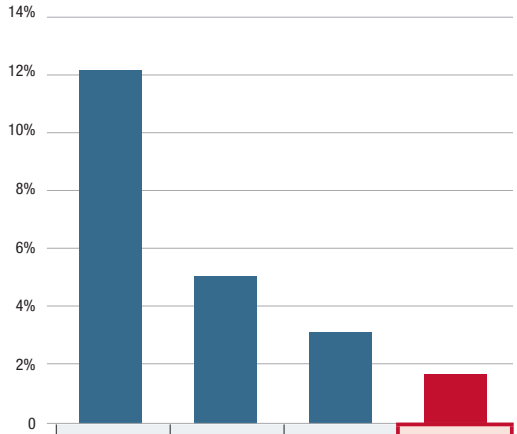
## Prevent Unwanted Changes in Mobile Phase pH

As every chromatographer knows, the pH of the mobile phase can have dramatic effects on selectivity, capacity factor (retention factor), peak shape, resolution, and reproducibility of your HPLC/UHPLC analysis. Because slight variations in pH can have a dramatic impact on the separation, careful mobile phase preparation and protection are essential. When compared to other mobile phase solvent tops, SecurityCAP offers the superior solution to ensure the mobile phase pH will stay constant during use. This ensures reliable solvent conditions for results you can trust!




*A 1L solution of 4 mM ammonium bicarbonate buffer at pH 11 was made for each bottle and left in a hood for 7 days. The pH was checked before and after the experiment and the percent difference was calculated.*

**Change in pH over 7 days**




| | Open Top | Aluminum foil wrapped bottle top | Cap with two 10 mm holes in the plastic | SecurityCAP |
|---|---|---|---|---|
| **% Change in pH** | **12.1** | **5** | **3.1** | **1.7** |
| |  |  |  |  |

# Prevent costly rework, and reduce system downtime

PHENEX™ SYRINGE FILTERS

Phenex syringe filters increase column lifetime and improve chromatographic reproducibility. Phenex offers a variety of chemically compatible syringe filter membranes that are ideal for any application. Proper membrane and size selection are the keys to choosing the best product matched to your sample while protecting your UHPLC, HPLC, or GC column system from particulate contamination.


## Select your filter in three EASY steps:

### 1. Select filter diameter based on sample volume

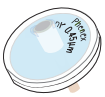
| If your sample volume is: | | |
|---|---|---|
| ≤ 2 mL Sample Volume | 2 to 10 mL Sample Volume | 10 to 100 mL Sample Volume |
| 4 mm Diameter | 15 mm Diameter | 25 - 28 mm Diameter |
|  |  |  |

### 2. Select pore size based on the nature of your sample and chromatographic method

| Sample Description | Recommended Filter Pore Size |
|---|---|
| General aqueous or mixed organic samples prior to HPLC analysis with column packed with > 3 µm particles. General clarification of GC, SFC, CE, and GPC samples. | 0.45 µm  |
| Viscous samples or samples containing high levels of particulate matter. | |
| General aqueous or mixed organic samples prior to HPLC analysis with columns packed with ≤ 3 µm particles. Removal of fine particulate matter prior to GC, SFC, CE, and GPC samples. | 0.20 µm  |
| Liquid samples prior to UHPLC or LC/MS. Other particulate-sensitive methods. | |
| Viscous samples such as serum, plasma, or other biological matrices. Solutions with high particulate load (e.g., some environmental or food and beverage applications). | Glass Fiber Filter with 0.45 µm filter membrane |

### 3. Select filter membrane according to the characteristics of your sample and filtering objective

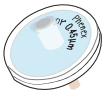
#### Aqueous

| Sample Characteristic | Membrane Type |
|---|---|
| Solvent Mixtures | **RC** (Regenerated Cellulose) |
| Tissue Culture Media, Buffers | **CA** (Cellulose Acetate) |
| Protein Analysis /Biological Samples | **PES or PVDF** (Polyethersulfone or Polyvinylidene Fluoride) |

Particulate-laden samples may require pre-filtration

#### Solvents

| Sample Characteristic | Membrane Type |
|---|---|
| Non-Aqueous / Hydrophobic | **PTFE** (Polytetrafluoroethylene) |
| Aqueous Mixtures / Hydrophilic | **RC or PVDF** (Regenerated Cellulose or Polyvinylidene Fluoride) |

## All-Plastic Disposable Syringes

- Use for all syringe filter applications
- Luer-lock outlet makes connection easy
- Capacities ranging from 3 to 20 mL
- Made of ultra-clean, high-purity plastic

# Luna Omega

explore LUNA® OMEGA

| 1.6 µm Microbore Columns (mm) | | | |
|---|---|---|---|
| **Phases** | **50 x 1.0** | **100 x 1.0** | **150 x 1.0** |
| **Polar C18** | 00B-4748-A0 | 00D-4748-A0 | 00F-4748-A0 |
| **C18** | 00B-4742-A0 | 00D-4742-A0 | 00F-4742-A0 |
| **PS C18** | 00B-4752-A0 | 00D-4752-A0 | - |

| 1.6 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‡** |
| **Polar C18** | 00A-4748-AN | 00B-4748-AN | 00D-4748-AN | 00F-4748-AN | AJ0-9505 |
| **PS C18** | 00A-4752-AN | 00B-4752-AN | 00D-4752-AN | 00F-4752-AN | AJ0-9508 |
| **C18** | 00A-4742-AN | 00B-4742-AN | 00D-4742-AN | 00F-4742-AN | AJ0-9502 |
| | | | | | for 2.1 mm ID |

| 3 µm Minibore and MidBore™ Columns (mm) | | | | | | | | SecurityGuard Cartridges (mm) |
|---|---|---|---|---|---|---|---|---|
| **Phases** | **30 x 2.1** | **50 x 2.1** | **100 x 2.1** | **150 x 2.1** | **50 x 3.0** | **100 x 3.0** | **150 x 3.0** | **4 x 2.0*** |
| | | | | | | | | /10 pk |
| **Polar C18** | 00A-4760-AN | 00B-4760-AN | 00D-4760-AN | 00F-4760-AN | 00B-4760-Y0 | 00D-4760-Y0 | 00F-4760-Y0 | AJ0-7600 |
| **PS C18** | 00A-4758-AN | 00B-4758-AN | 00D-4758-AN | 00F-4758-AN | 00B-4758-Y0 | 00D-4758-Y0 | 00F-4758-Y0 | AJ0-7605 |
| | | | | | | | | for ID: 2.0-3.0 mm |

| 3 µm Analytical Columns (mm) | | | | | SecurityGuard Cartridges (mm) |
|---|---|---|---|---|---|
| **Phases** | **50 x 4.6** | **100 x 4.6** | **150 x 4.6** | **250 x 4.6** | **4 x 3.0*** |
| | | | | | /10 pk |
| **Polar C18** | 00B-4760-E0 | 00D-4760-E0 | 00F-4760-E0 | 00G-4760-E0 | AJ0-7601 |
| **PS C18** | 00B-4758-E0 | 00D-4758-E0 | 00F-4758-E0 | 00G-4758-E0 | AJ0-7606 |
| | | | | | for ID: 3.1-8.0 mm |

| 5 µm Minibore and MidBore™ Columns (mm) | | | | | | | | SecurityGuard Cartridges (mm) |
|---|---|---|---|---|---|---|---|---|
| **Phases** | **30 x 2.1** | **50 x 2.1** | **100 x 2.1** | **150 x 2.1** | **50 x 3.0** | **100 x 3.0** | **150 x 3.0** | **4 x 2.0*** |
| | | | | | | | | /10 pk |
| **Polar C18** | 00A-4754-AN | 00B-4754-AN | 00D-4754-AN | 00F-4754-AN | 00B-4754-Y0 | 00D-4754-Y0 | 00F-4754-Y0 | AJ0-7600 |
| **PS C18** | 00A-4753-AN | 00B-4753-AN | 00D-4753-AN | 00F-4753-AN | 00B-4753-Y0 | 00D-4753-Y0 | 00F-4753-Y0 | AJ0-7605 |
| | | | | | | | | for ID: 2.0 - 3.0 mm |

| 5 µm Analytical Columns (mm) | | | | | SecurityGuard Cartridges (mm) |
|---|---|---|---|---|---|
| **Phases** | **50 x 4.6** | **100 x 4.6** | **150 x 4.6** | **250 x 4.6** | **4 x 3.0*** |
| | | | | | /10 pk |
| **Polar C18** | 00B-4754-E0 | 00D-4754-E0 | 00F-4754-E0 | 00G-4754-E0 | AJ0-7601 |
| **PS C18** | 00B-4753-E0 | 00D-4753-E0 | 00F-4753-E0 | 00G-4753-E0 | AJ0-7606 |
| | | | | | for ID: 3.1-8.0 mm |

‡ SecurityGuard ULTRA Cartridges require holder, Part No.: AJ0-9000
* SecurityGuard Standard Analytical Cartridges require holder, Part No.: KJ0-4282

guarantee

If Phenomenex 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 Phenomenex column with comparative data within 45 days for a FULL REFUND.

# Kinetex

KINETEX® Core-Shell Technology™

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

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

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

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

| 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** |
| **EVO C18** | — | 00B-4725-E0 | — | 00D-4725-E0 | 00F-4725-E0 | AJ0-9296 |
| **Polar C18** | — | 00B-4759-E0 | — | 00D-4759-E0 | 00F-4759-E0 | AJ0-9532 |
| **F5** | — | 00B-4723-E0 | — | 00D-4723-E0 | 00F-4723-E0 | AJ0-9320 |
| **Biphenyl** | — | 00B-4622-E0 | — | 00D-4622-E0 | 00F-4622-E0 | AJ0-9207 |
| **XB-C18** | — | 00B-4496-E0 | 00C-4496-E0 | 00D-4496-E0 | 00F-4496-E0 | AJ0-8768 |
| **C18** | 00A-4462-E0 | 00B-4462-E0 | 00C-4462-E0 | 00D-4462-E0 | 00F-4462-E0 | AJ0-8768 |
| **C8** | — | 00B-4497-E0 | 00C-4497-E0 | 00D-4497-E0 | 00F-4497-E0 | AJ0-8770 |
| **HILIC** | — | 00B-4461-E0 | 00C-4461-E0 | 00D-4461-E0 | 00F-4461-E0 | AJ0-8772 |
| **Phenyl-Hexyl** | — | 00B-4495-E0 | 00C-4495-E0 | 00D-4495-E0 | 00F-4495-E0 | AJ0-8774 |
| | | | | | | for 4.6 mm ID |

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



If Phenomenex 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 Phenomenex column with comparative data within 45 days for a FULL REFUND.

# Kinetex

KINETEX® Core-Shell Technology™

| 2.6 µm Microbore Columns (mm) | | | |
|---|---|---|---|
| **Phases** | **50 x 1.0** | **100 x 1.0** | **150 x 1.0** |
| **XB-C18** | 00B-4496-A0 | 00D-4496-A0 | 00F-4496-A0 |

| 2.6 µm Minibore Columns (mm) | | | | | | SecurityGuard™ ULTRA Cartridges‡ |
|---|---|---|---|---|---|---|
| **Phases** | **30 x 2.1** | **50 x 2.1** | **75 x 2.1** | **100 x 2.1** | **150 x 2.1** | **3/pk** |
| **EVO C18** | 00A-4725-AN | 00B-4725-AN | — | 00D-4725-AN | 00F-4725-AN | AJ0-9298 |
| **Polar C18** | 00A-4759-AN | 00B-4759-AN | — | 00D-4759-AN | 00F-4759-AN | AJ0-9530 |
| **F5** | 00A-4723-AN | 00B-4723-AN | — | 00D-4723-AN | 00F-4723-AN | AJ0-9322 |
| **Biphenyl** | 00A-4622-AN | 00B-4622-AN | — | 00D-4622-AN | 00F-4622-AN | AJ0-9209 |
| **XB-C18** | 00A-4496-AN | 00B-4496-AN | 00C-4496-AN | 00D-4496-AN | 00F-4496-AN | AJ0-8782 |
| **C18** | 00A-4462-AN | 00B-4462-AN | 00C-4462-AN | 00D-4462-AN | 00F-4462-AN | AJ0-8782 |
| **C8** | 00A-4497-AN | 00B-4497-AN | 00C-4497-AN | 00D-4497-AN | 00F-4497-AN | AJ0-8784 |
| **HILIC** | 00A-4461-AN | 00B-4461-AN | 00C-4461-AN | 00D-4461-AN | 00F-4461-AN | AJ0-8786 |
| **Phenyl-Hexyl** | 00A-4495-AN | 00B-4495-AN | 00C-4495-AN | 00D-4495-AN | 00F-4495-AN | AJ0-8788 |
| | | | | | | for 2.1 mm ID |

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

| 3.5 µm Analytical Columns (mm) | | | SecurityGuard ULTRA Cartridges‡ |
|---|---|---|---|
| **Phases** | **100 x 4.6** | **150 x 4.6** | **3/pk** |
| **XB-C18** | 00D-4744-E0 | 00F-4744-E0 | AJ0-8768 |
| | | | for 4.6 mm ID |

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

# MercuryMS™ Cartridge System

## Cartridge

| Kinetex 2.6 µm Biphenyl Mercury | |
|---|---|
| **Part No.** | **Description** |
| 00M-4622-B0-CE | Cartridge 20 x 2.0 mm* |

* Mercury 20 x 2.0 mm cartridges require 20mm direct-connect cartridge holder or standard cartridge holder

Cartridges

## Cartridge Holder

| Direct-Connect Cartridge Holders | |
|---|---|
| **Part No.** | **Description** |
| CH0-7188 | 20 mm direct-connect holder |

Direct-Connect Holder

| Standard Cartridge Holders | |
|---|---|
| **Part No.** | **Description** |
| CH0-5845 | 20 mm standard holder |

Standard Holder

guarantee

If Phenomenex 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 Phenomenex column with comparative data within 45 days for a FULL REFUND.

# Kinetex

KINETEX® Core-Shell Technology™

| 5 µm Minibore Columns (mm) | | | | | SecurityGuard™ ULTRA Cartridges‡ |
|---|---|---|---|---|---|
| **Phases** | **30 x 2.1** | **50 x 2.1** | **100 x 2.1** | **150 x 2.1** | **3/pk** |
| **EVO C18** | 00A-4633-AN | 00B-4633-AN | 00D-4633-AN | 00F-4633-AN | AJ0-9298 |
| **F5** | 00A-4724-AN | 00B-4724-AN | 00D-4724-AN | 00F-4724-AN | AJ0-9322 |
| **Biphenyl** | 00A-4627-AN | 00B-4627-AN | 00D-4627-AN | — | AJ0-9209 |
| **XB-C18** | 00A-4605-AN | 00B-4605-AN | 00D-4605-AN | — | AJ0-8782 |
| **C18** | 00A-4601-AN | 00B-4601-AN | 00D-4601-AN | 00F-4601-AN | AJ0-8782 |
| **C8** | — | 00B-4608-AN | 00D-4608-AN | — | AJ0-8784 |
| **Phenyl-Hexyl** | — | 00B-4603-AN | 00D-4603-AN | — | AJ0-8788 |
| | | | | | for 2.1 mm ID |

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

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

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

guarantee

If Phenomenex 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 Phenomenex column with comparative data within 45 days for a FULL REFUND.

# Sample Prep Solutions

## Diatomaceous Earth SLE

| Strata® DE Diatomaceous Earth SLE Well Plates | | |
|---|---|---|
| **Part No.** | **Description** | **Unit** |
| 8E-S325-FGB | Strata DE SLE 200 µL 96-Well Plate | 2/pk |
| 8E-S325-5GB | Strata DE SLE 400 µL 96-Well Plate | 2/pk |

| Strata DE Diatomaceous Earth SLE Tubes | | |
|---|---|---|
| **Part No.** | **Description** | **Unit** |
| 8B-S325-KDG | Strata DE SLE 12 cc Tubes | 20/pk |
| 8B-S325-VFF | Strata DE SLE 60 cc Tubes | 16/pk |

## Synthetic SLE

| Novum™ Simplified Liquid Extraction SLE 96 Well Plates | | |
|---|---|---|
| **Part No.** | **Description** | **Unit** |
| 8E-S138-FGA | Novum SLE MINI 96-Well Plate | 1/pk |
| 8E-S138-5GA | Novum SLE MAX 96-Well Plate | 1/pk |

| Novum Simplified Liquid Extraction SLE Tubes | | |
|---|---|---|
| **Part No.** | **Description** | **Unit** |
| 8B-S138-FAK | Novum SLE 1 cc Tubes | 100/pk |

| Presston 100 Positive Pressure Manifold | |
|---|---|
| **Part No.** | **Description** |
| AH0-9334 | Presston 100 Positive Pressure Manifold, 96-Well Plate |
| AH0-9342 | Presston 100 Positive Pressure Manifold, 1 mL Tube Complete Assembly |
| AH0-9347 | Presston 100 Positive Pressure Manifold, 3 mL Tube Complete Assembly |
| AH0-9343 | Presston 100 Positive Pressure Manifold, 6 mL Tube Complete Assembly |

presston™100

| Vacuum Manfolds | | |
|---|---|---|
| **Part No.** | **Description** | **Unit** |
| AH0-6023 | 12-Position Tube Vacuum Manifold Set | ea |
| AH0-6024 | 24-Position Tube Vacuum Manifold Set | ea |
| AH0-8950 | 96-Well Plate Manifold, Universal with Vacuum Gauge | ea |

**The Presston 100 96-Well Positive Pressure Manifold can also process 1, 3, and 6 mL tubes using the following adapter kits**

| Presston 100 Tube Adapter Kits (for AH0-9334) | |
|---|---|
| **Part No.** | **Description** |
| AH0-9344 | 1 mL Tube Adapter Kit |
| AH0-9345 | 3 mL Tube Adapter Kit |
| AH0-9346 | 6 mL Tube Adapter Kit |

| Strata-X Polymer-Based Sorbents 96-Well Plates (2/box)‡ | | | |
|---|---|---|---|
| **Phase** | **10 mg** | **30 mg** | **60 mg** |
| Strata-X-AW | 8E-S038-AGB | 8E-S038-TGB | 8E-S038-UGB |
| Strata-X-A | 8E-S123-AGB | 8E-S123-TGB | 8E-S123-UGB |
| Strata-X | 8E-S100-AGB | 8E-S100-TGB | 8E-S100-UGB |
| Strata-X-C | 8E-S029-AGB | 8E-S029-TGB | 8E-S029-UGB |
| Strata-X-CW | 8E-S035-AGB | 8E-S035-TGB | 8E-S035-UGB |
| Strata-XL-AW | – | 8E-S051-TGB | – |
| Strata-XL-A | – | 8E-S053-TGB | – |
| Strata-XL | – | 8E-S043-TGB | – |
| Strata-XL-C | – | 8E-S044-TGB | – |
| Strata-XL-CW | – | 8E-S052-TGB | – |

| Strata-X Microelution Plates 96-Well Plates (ea) | |
|---|---|
| **Phase** | **2 mg** |
| Strata-AW | 8M-S038-4GA |
| Strata-A | 8M-S123-4GA |
| Strata-X | 8M-S100-4GA |
| Strata-X-C | 8M-S029-4GA |
| Strata-X-CW | 8M-S035-4GA |

| Phree™ Phospholipid Removal Products‡ | | |
|---|---|---|
| **Part No.** | **Description** | **Unit** |
| 8E-S133-TGB | Phree Phospholipid Removal 96-Well Plates | 2/pk |

| 96-Well Plate Accessories | | |
|---|---|---|
| **Part No.** | **Description** | **Unit** |
| **Collection Plates (deep well, polypropylene)** | | |
| AH0-7192 | 96-Well Collection Plate, 350 µL/well | 50/pk |
| AH0-7193 | 96-Well Collection Plate, 1 mL/well | 50/pk |
| AH0-7194 | 96-Well Collection Plate, 2 mL/well | 50/pk |
| AH0-8635 | 96-Well Collection Plate, 2 mL/well Square/Round-Conical | 50/pk |
| AH0-8636 | 96-Well Collection Plate, 2 mL/well Round/Round, 8 mm | 50/pk |
| AH0-7279 | 96-Well Collection Plate, 1 mL/well Round, 7 mm | 50/pk |
| **Sealing Mats** | | |
| AH0-8597 | Sealing Mats, Pierceable, 96-Square Well, Silicone | 50/pk |
| AH0-8598 | Sealing Mats, Pre-Slit, 96-Square Well, Silicone | 50/pk |
| AH0-8631 | Sealing Mats, Pierceable, 96-Round Well 7 mm, Silicone | 50/pk |
| AH0-8632 | Sealing Mats, Pre-Slit, 96-Round Well 7 mm, Silicone | 50/pk |
| AH0-8633 | Sealing Mats, Pierceable, 96-Round Well 8 mm, Silicone | 50/pk |
| AH0-8634 | Sealing Mats, Pre-Slit, 96-Round Well 8 mm, Silicone | 50/pk |
| AH0-7362 | Sealing Tape Pad | 10/pk |

guarantee

If Phenomenex sample preparation products do not perform as well or better than your current sample preparation products of similar phase, mass and size, return the product with comparative data within 45 days for a FULL REFUND.

Phenomenex warrants that for a period of 12 months following delivery, the Presston 100 Positive Pressure Manifold you have purchased will perform in accordance with the published specifications and will be free from defects in materials or workmanship. In the event that the Presston 100 Positive Pressure Manifold does not meet this warranty, Phenomenex will repair or replace defective parts. Please visit **www.phenomenex.com/Presston** for complete warranty information.

# SecurityCAP

SecurityCAP™ LC SOLVENT SAFETY PRODUCTS



## Starter Kits

| SecurityCAP Mobile Phase (Eluent) Safety Starter Kits | |
|---|---|
| **Part No.** | **Description** |
| AC2-1245 | 2-port GL45 Cap and 6-month Safety Filter |
| AC2-4245 | 2-port GL45 Caps (x4) and 6-month Safety Filters (x4) |
| AC2-4240 | 2-port Merck S40 Caps (x4) and 6-month Safety Filters (x4) |
| AC2-1345 | 3-port GL45 Cap and 6-month Safety Filter |
| AC2-4345 | 3-port GL45 Caps (x4) and 6-month Safety Filters (x4) |
| AC2-4445 | 4-port GL45 Cap (x1) and 2-port Caps (3x) and 6-month Safety Filters (x4) |
| AC2-1445 | 4-port GL45 Cap and 6-month Safety Filter |
| AC2-1545 | 5-port GL45 Cap and 6-month Safety Filter |
| AC2-1561 | 5-port S60/S61 Cap and 6-month Safety Filter |

| SecurityCAP Waste Safety Starter Kits | | |
|---|---|---|
| **Part No.** | **Description** | **Unit** |
| AC1-1245 | 2-port GL/DIN45 Cap and 6-month Exhaust Filter and Barbed Connector | ea |
| AC1-1545 | 5-port GL/DIN45 Cap and 6-month Exhaust Filter | ea |
| AC1-1551 | 5-port DIN51 Cap and 6-month Exhaust Filter | ea |
| AC1-1561 | 5-port S61 Cap and 6-month Exhaust Filter | ea |


## Replacement Filters

| SecurityCAP Mobile Phase Safety Filters | | |
|---|---|---|
| **Part No.** | **Description** | **Unit** |
| AC2-0161 | 6-month Capacity, ¼ in.-28 Threads | ea |
| AC2-0961 | 6-month Capacity, ¼ in.-28 Threads | 10/pk |



## Replacement Filters

| SecurityCAP Waste Safety Filters | | |
|---|---|---|
| **Part No.** | **Description** | **Unit** |
| AC1-0161 | 6-month Exhaust Filter for SecurityCAP, ¼ in.-28 Threads | ea |
| AC1-0361 | 6-month Exhaust Filter for SecurityCAP, ¼ in.-28 Threads | 3/pk |
| AC1-0162 | 6-month Exhaust Filter for Wide-port Caps, GL14 Threads | ea |
| AC1-0362 | 6-month Exhaust Filter for Wide-port Caps, GL14 Threads | 3/pk |

## Fittings and Accessories

| SecurityCAP™ Fittings | | |
|---|---|---|
| **Part No.** | **Description** | **Unit** |
| AC3-1101 | for 1/16 in. or 2.0 mm ID Tubing, ¼ in.-28 Threads (POM), blue | ea |
| AC3-1201 | for 2.3-2.6 mm ID Tubing, ¼ in.-28 Threads (POM), white | ea |
| AC3-2101 | for ⅛ in. ID Tubing, ¼ in.-28 Threads (POM), black | ea |

| SecurityCAP Connectors | | |
|---|---|---|
| **Part No.** | **Description** | **Unit** |
| AC3-1001 | Barbed Connector, for 5-8 mm ID Tubing (PTFE), white | ea |
| AC3-1301 | Y-connector, for 6-8 mm ID Tubing (POM), white | ea |

| SecurityCAP Adapter | | |
|---|---|---|
| **Part No.** | **Description** | **Unit** |
| AC2-1138 | Cap Thread Adapter, PTFE, GPI/GL 38 Female to GL45 Male | ea |

| SecurityCAP Sealing Plug | | |
|---|---|---|
| **Part No.** | **Description** | **Unit** |
| AC3-2001 | ¼ in.-28 Threads (POM), white | ea |

POM = polyoxymethylene
PTFE = polytetrafluoroethylene (Teflon®)

## SecurityCAP Waste Safety Compatibility Table

| | Phenomenex SecurityCAP Filters | |
|---|---|---|
| **Supplier** | **ea** | **3/pk** |
| SCAT® Safety Waste Caps | AC1-0162 | AC1-0362 |
| AIT® SmartCaps™ | AC1-0162 | AC1-0362 |
| Agilent® InfinityLab Stay Safe Caps | AC1-0162 | AC1-0362 |
| VICI® Waste Caps | AC1-0161 | AC1-0361 |
| Canary-Safe™ Safety Caps | AC1-0162 | AC1-0362 |
| DURAN® DG Safety Caps | AC1-0162 | AC1-0362 |

guarantee

If SecurityCAP Safety Products do not perform as well or better than your current solvent safety products of similar type, dimensions, and material, return the product with comparative data within 45 days for a FULL REFUND.

# Phenex™ Syringe Filters


| Membrane Type/Size | 4mm Diameter for ≤2mL sample volumes Part No. | Unit | 15mm Diameter for 2–10mL sample volumes Part No. | Unit | 25–28mm Diameter for 10–100mL sample volumes Part No. | Unit |
|---|---|---|---|---|---|---|
| **0.20µm** | | | | | | |
| **Phenex-RC** (Regenerated Cellulose) | AF0-3203-12 | 100/pk | AF0-2203-12 | 100/pk | AF0-8203-12 [5] | 100/pk |
| | AF0-3203-52 | 500/pk | AF0-2203-52 | 500/pk | AF0-8203-52 [5] | 500/pk |
| **Phenex-PES** [3] (Polyethersulfone) | — | — | — | — | AF0-8208-12 [7] | 100/pk |
| | — | — | — | — | AF0-8208-52 [7] | 500/pk |
| **Phenex-PTFE** [6] (Polytetrafluoroethylene) | AF0-3202-12 | 100/pk | AF0-2202-12 | 100/pk | AF0-1202-12 | 100/pk |
| | AF0-3202-52 | 500/pk | AF0-2202-52 | 500/pk | AF0-1202-52 | 500/pk |
| **Phenex-NY** (Nylon) | AF3-3207-12 | 100/pk | AF0-2207-12 | 100/pk | AF0-1207-12 | 100/pk |
| | AF3-3207-52 | 500/pk | AF0-2207-52 | 500/pk | AF0-1207-52 | 500/pk |
| **Phenex-GF/NY** (Glass Fiber/Nylon) | An integrated syringe filter unit containing an inert borosilicate glass fiber prefilter and a Nylon (NY) membrane. Excellent for filtration of particle-laden samples, such as foods and beverages, environmental, biofuels, and dissolution samples. Use less hand pressure to filter even the most difficult samples. Outlet connection is luer lock. | | | | AF0-1A47-12 [7] | 100/pk |
| | | | | | AF0-1A47-52 [7] | 500/pk |
| **Phenex-PVDF** (Polyvinylidene Fluoride) | — | — | AF6-5206-12 | 100/pk | AF6-6206-12 | 100/pk |
| | — | — | AF6-5206-52 | 500/pk | AF6-6206-52 | 500/pk |
| **Phenex-GF/PVDF** (Glass Fiber/Polyvinylidene Fluoride) | An integrated syringe filter unit containing an inert borosilicate glass fiber prefilter and a PVDF membrane. The hydrophilic PVDF membrane provides high flow rates and throughput, low extractables and broad chemical compatibility. This membrane binds less protein than nylon or PTFE membranes. | | | | AF6-6C06-12 | 100/pk |
| | | | | | AF6-6C06-52 | 500/pk |
| **Phenex-CA** [4] (Cellulose Acetate) | — | — | — | — | AF0-8204-12 [7] | 100/pk |
| | — | — | — | — | AF0-8204-52 [7] | 500/pk |
| **Phenex-GF/CA** [2,3,4] (Glass Fiber/Cellulose Acetate) | An integrated syringe filter unit containing an inert borosilicate glass fiber prefilter and a CA membrane. Excellent for filtration of tissue culture media, general biological sample filtration and clarification. Outlet connection is luer lock. | | | | AF0-8A09-12 [7] | 100/pk |
| | | | | | AF0-8A09-52 [7] | 500/pk |
| **0.45µm** | | | | | | |
| **Phenex-RC** (Regenerated Cellulose) | AF0-3103-12 | 100/pk | AF0-2103-12 | 100/pk | AF0-8103-12 [5] | 100/pk |
| | AF0-3103-52 | 500/pk | AF0-2103-52 | 500/pk | AF0-8103-52 [5] | 500/pk |
| **Phenex-PES** [3] (Polyethersulfone) | — | — | — | — | AF0-8108-12 [7] | 100/pk |
| | — | — | — | — | AF0-8108-52 [7] | 500/pk |
| **Phenex-PTFE** [6] (Polytetrafluoroethylene) | AF0-3102-12 | 100/pk | AF0-2102-12 | 100/pk | AF0-1102-12 | 100/pk |
| | AF0-3102-52 | 500/pk | AF0-2102-52 | 500/pk | AF0-1102-52 | 500/pk |
| **Phenex-NY** (Nylon) | AF3-3107-12 | 100/pk | AF0-2107-12 | 100/pk | AF0-1107-12 | 100/pk |
| | AF3-3107-52 | 500/pk | AF0-2107-52 | 500/pk | AF0-1107-52 | 500/pk |
| **Phenex-GF/NY** (Glass Fiber/Nylon) | An integrated syringe filter unit containing an inert borosilicate glass fiber prefilter and a Nylon (NY) membrane. Excellent for filtration of particle-laden samples, such as foods and beverages, environmental, biofuels, and dissolution samples. Use less hand pressure to filter even the most difficult samples. Outlet connection is luer lock. | | | | AF0-1B47-12 [7] | 100/pk |
| | | | | | AF0-1B47-52 [7] | 500/pk |
| **Phenex-PVDF** (Polyvinylidene Fluoride) | — | — | AF6-5106-12 | 100/pk | AF6-6106-12 | 100/pk |
| | — | — | AF6-5106-52 | 500/pk | AF6-6106-52 | 500/pk |
| **Phenex-GF/PVDF** (Glass Fiber/Polyvinylidene Fluoride) | An integrated syringe filter unit containing an inert borosilicate glass fiber prefilter and a PVDF membrane. The hydrophilic PVDF membrane provides high flow rates and throughput, low extractables and broad chemical compatibility. This membrane binds less protein than nylon or PTFE membranes. | | | | AF6-6D06-12 | 100/pk |
| | | | | | AF6-6D06-52 | 500/pk |
| **Phenex-GF/CA** [2,3,4] (Glass Fiber/Cellulose Acetate) | An integrated syringe filter unit containing an inert borosilicate glass fiber prefilter and a CA membrane. Excellent for filtration of tissue culture media, general biological sample filtration and clarification. Outlet connection is luer lock. | | | | AF0-8B09-12 [7] | 100/pk |
| | | | | | AF0-8B09-52 [7] | 500/pk |
| **1.20µm** | | | | | | |
| **Phenex-GF** [2,3] (Glass Fiber) | Prefiltration of heavily contaminated or highly viscous samples. When used in-line preceding a membrane filter, clogging of the membrane filter is prevented and sample clean up is optimized. Outlet connection is luer lock. | | | | AF0-8515-12 [7] | 100/pk |
| | | | | | AF0-8515-52 [7] | 500/pk |

Above syringe filters are non-sterile. Housing is made of medical-grade polypropylene (PP). Luer lock inlet/slip outlet connections unless otherwise indicated.

1. Larger quantity purchases at significant savings are available.
2. Glass fiber filters are 28mm diameter and made of borosilicate. They will remove 90% of all particles > 1.2µm.
3. Housing material is methacrylate butadiene styrene (MBS) polymerisate. Also known as Cyrolite®.
4. Cellulose acetate is surfactant-free.
5. 26mm diameter.
6. Hydrophobic membrane. Can be made hydrophilic by pre-wetting with IPA.
7. 28mm diameter.
8. Additional dimensions and membrane types are available, including sterile filters. Please contact your local Phenomenex technical consultant or distributor for availability or assistance.

| Part No. | Description | Capacity (mL) | Unit |
|---|---|---|---|
| AS0-8408 | Plastic Disposable Syringes, Luer-lock | 3 | 100/pk |
| AS0-8409 | Plastic Disposable Syringes, Luer-lock | 5 | 100/pk |
| AS0-8410 | Plastic Disposable Syringes, Luer-lock | 10 | 100/pk |
| AS0-8411 | Plastic Disposable Syringes, Luer-lock | 20 | 100/pk |

* Choose larger volume syringe to reduce force on syringe filter membrane. 10 mL or larger syringe is recommended.

guarantee

If Phenex Syringe Filters do not perform as well or better than your current syringe filter product of similar membrane, diameter and pore size, send in your comparative data within 45 days for a FULL REFUND.

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