

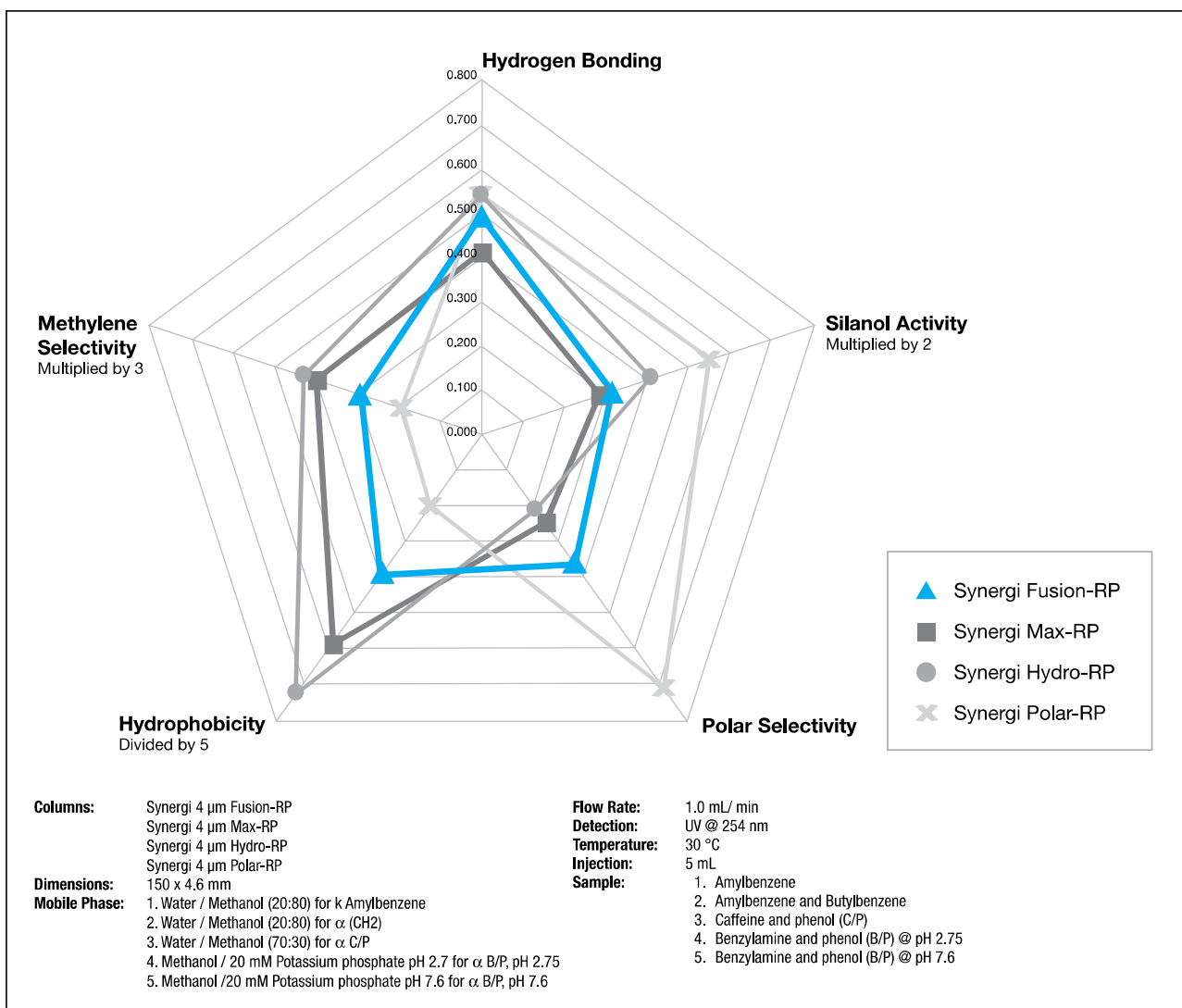
## Full Range Selectivity for Reversed Phase Separation

Many different mechanisms of retention are utilized within reversed phase chromatography in order to retain and separate target analytes. Whether your compounds are hydrophobic or polar, Synergi columns provide you with a full range of selectivity, ensuring separation of the most challenging and complex mixtures.

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

### LC Method Development

| Column    | Phase                | Mechanism of Retention                                                                     |
|-----------|----------------------|--------------------------------------------------------------------------------------------|
| Max-RP    | C12                  | Strong Hydrophobic Interactions                                                            |
| Hydro-RP  | C18, Polar Endcapped | Strong Hydrophobic Interactions<br>Slight Polar Interactions                               |
| Fusion-RP | C18, Polar Embedded  | Balanced Hydrophobic Interactions<br>Moderate Polar Interactions                           |
| Polar-RP  | Phenyl, Ether-linked | Weak Hydrophobic Interactions<br>Strong Polar Interactions<br>Strong Aromatic Interactions |



Synergi is a trademark of Phenomenex, Inc.



## Full Range Selectivity for Reversed Phase Separation

### Synergi Polar-RP

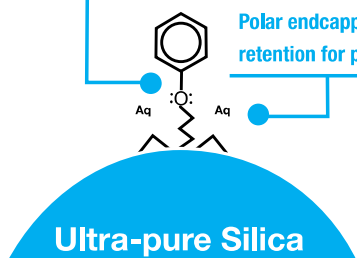
#### Phenyl

#### Ether-Linked

For polar and aromatic mixtures

Ether linkage increases aromaticity of the phenyl group and also provides  $\pi$ - $\pi$  interactions with conjugated compounds

Polar endcapping provides added retention for polar compounds



### Synergi Fusion-RP

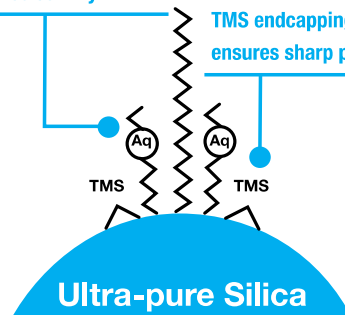
#### C18

#### Polar Embedded

Balanced non-polar and polar performance

Embedded polar group complements C18 ligand with balanced polar selectivity

TMS endcapping ensures sharp peaks



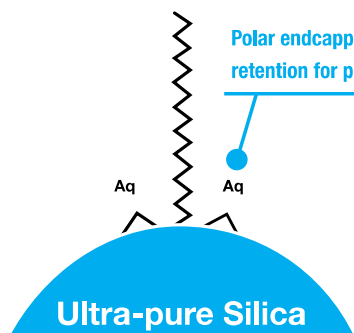
### Synergi Hydro-RP

#### C18

#### Polar Endcapped

Strong non-polar and polar retention

Polar endcapping provides added retention for polar compounds



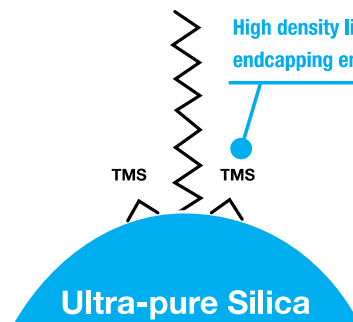
### Synergi Max-RP

#### C12

#### TMS Endcapped

Excellent for basic compounds at neutral pH

High density ligands and extensive endcapping ensure sharp peaks



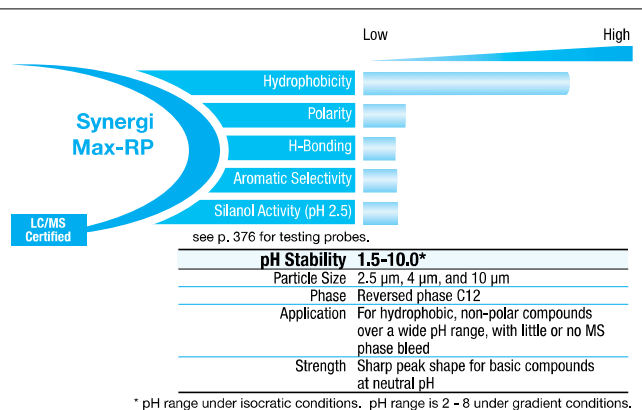
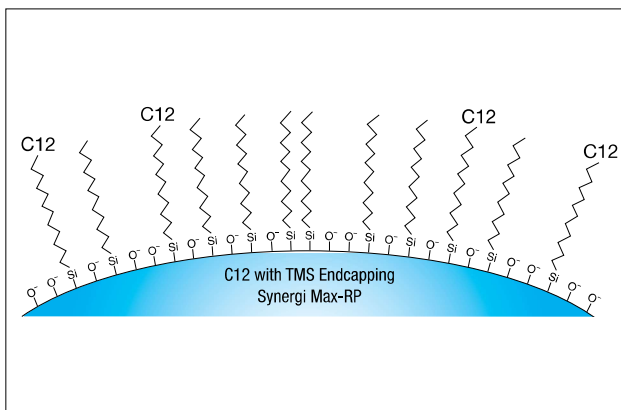
## Material Characteristics

| Packing Material  | Particle Shape/Size (μm) | Pore Size (Å) | Pore Volume (mL/g) | Surface Area (m <sup>2</sup> /g) | Carbon Load % | Calculated Bonded Phase Coverage (μmole/m <sup>2</sup> ) | End Capping |
|-------------------|--------------------------|---------------|--------------------|----------------------------------|---------------|----------------------------------------------------------|-------------|
| Synergi Max-RP    | Spher. 2.5               | 100           | —                  | 400                              | 17            | —                                                        | TMS         |
| Synergi Hydro-RP  | Spher. 2.5               | 100           | —                  | 400                              | 19            | —                                                        | Hydrophilic |
| Synergi Polar-RP  | Spher. 2.5               | 100           | —                  | 400                              | 11            | —                                                        | Hydrophilic |
| Synergi Fusion-RP | Spher. 2.5               | 100           | —                  | 400                              | 12            | —                                                        | TMS         |
| Synergi Max-RP    | Spher. 4, 10             | 80            | 1.05               | 475                              | 17            | 3.21                                                     | TMS         |
| Synergi Hydro-RP  | Spher. 4, 10             | 80            | 1.05               | 475                              | 19            | 2.45                                                     | Hydrophilic |
| Synergi Polar-RP  | Spher. 4, 10             | 80            | 1.05               | 475                              | 11            | 3.15                                                     | Hydrophilic |
| Synergi Fusion-RP | Spher. 4, 10             | 80            | 1.05               | 475                              | 12            | N/A                                                      | TMS         |

## Synergi Max-RP

### A Reversed Phase C12 Column

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



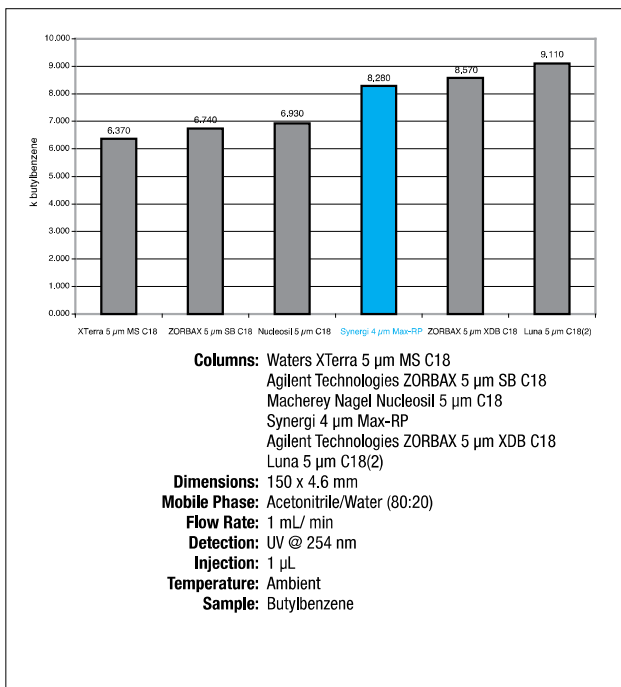
#### Sample Challenge:

You need to retain compounds based on hydrophobic selectivity exclusively, but cannot accomplish peak separation with C18 column.

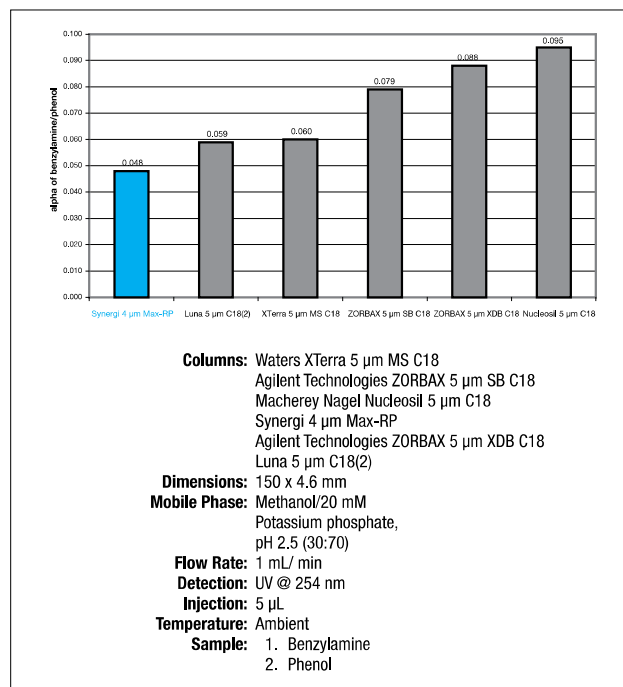
#### Selectivity Solution:

The C12 ligands on Synergi Max-RP give a hydrophobic selectivity that may separate peaks where C18 columns cannot.

#### Hydrophobic Retention: Synergi Max-RP (C12) Performs Like a C18\*



#### Silanol Activity at Low pH: C12 vs. C18 Phases

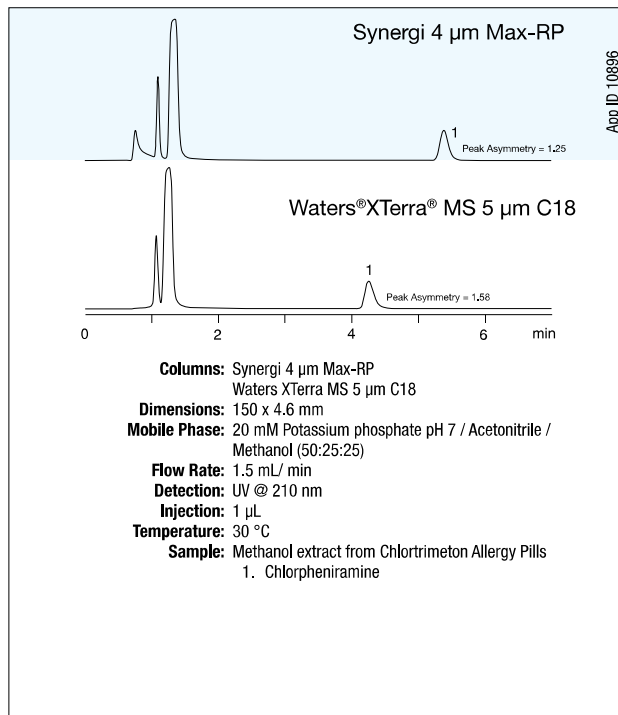
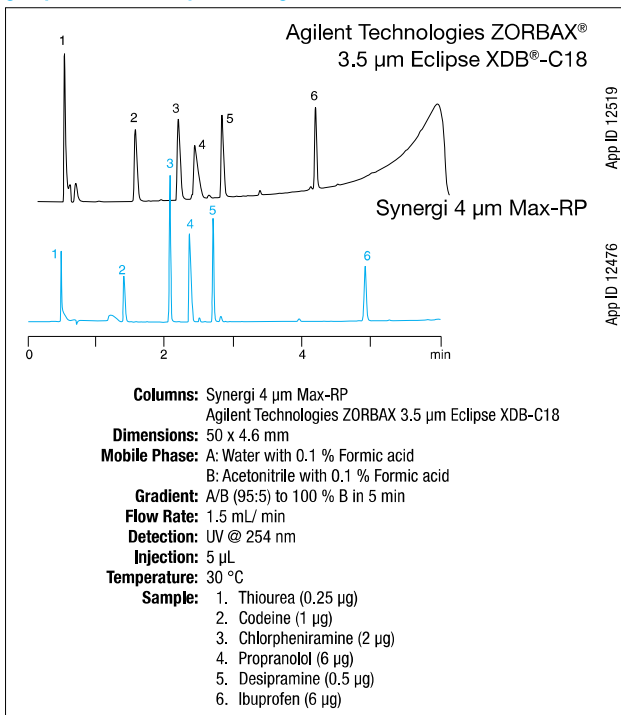


\*See p. 264 for disclaimer information. Comparative separations may not be representative of all applications.

## Synergi Max-RP (cont'd)

### Sharper Peaks

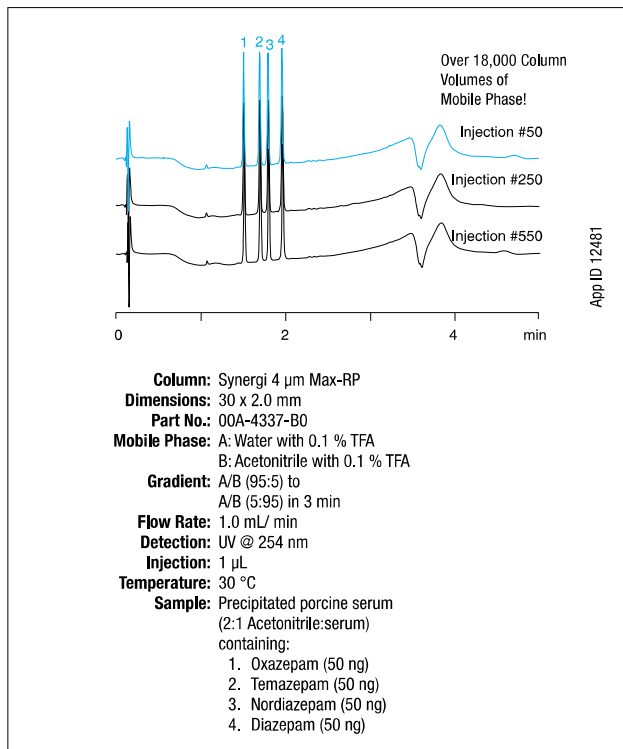
The Synergi Max-RP C12 ligands are densely bound to silica surface, significantly decreasing the number of active silanol groups, which cause peak tailing



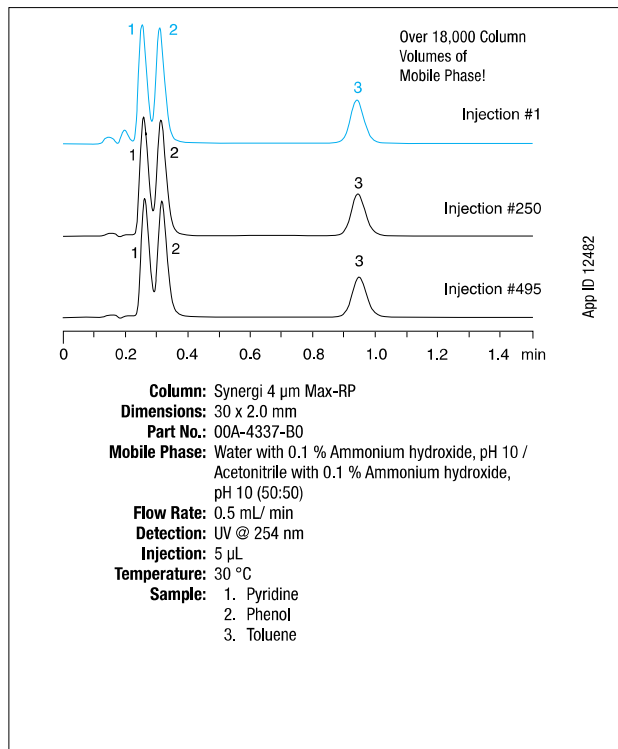
\*See p. 264 for disclaimer information. Comparative separations may not be representative of all applications.

## Achieve Reproducibility and Long Column Lifetimes Even at pH Extremes with Synergi Max-RP

### Stability @ pH 1.5



### Stability @ pH 10.0



## Fast LC Solutions

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

### Ordering Information

| 2.5 µm High Speed Technology (HST) Columns (mm) |             |             |             |             |             |             |
|-------------------------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Phases                                          | 30 x 2.0    | 50 x 2.0    | 100 x 2.0   | 50 x 3.0    | 100 x 3.0   | 50 x 4.6    |
| Max-RP                                          | 00A-4372-B0 | 00B-4372-B0 | 00D-4372-B0 | 00B-4372-Y0 | 00D-4372-Y0 | 00B-4372-E0 |
| Hydro-RP                                        | 00A-4387-B0 | 00B-4387-B0 | 00D-4387-B0 | 00B-4387-Y0 | 00D-4387-Y0 | 00B-4387-E0 |
| Polar-RP                                        | 00A-4371-B0 | 00B-4371-B0 | 00D-4371-B0 | 00B-4371-Y0 | 00D-4371-Y0 | 00B-4371-E0 |
| Fusion-RP                                       | 00A-4423-B0 | 00B-4423-B0 | 00D-4423-B0 | 00B-4423-Y0 | 00D-4423-Y0 | 00B-4423-E0 |



For information about HST Columns, contact your Phenomenex technical consultant or local distributor.

### Ordering Information

| 2.5 µm MercuryMS LC/MS Cartridges (mm) |                |                |                |                | Columns (mm) |             |
|----------------------------------------|----------------|----------------|----------------|----------------|--------------|-------------|
| Phases                                 | 10 x 2.0       | 10 x 4.0       | 20 x 2.0       | 20 x 4.0       | 20 x 2.0     | 20 x 4.0    |
| Max-RP                                 | 00N-4372-B0-CE | 00N-4372-D0-CE | 00M-4372-B0-CE | 00M-4372-D0-CE | 00M-4372-B0  | 00M-4372-D0 |
| Hydro-RP                               | 00N-4387-B0-CE | 00N-4387-D0-CE | 00M-4387-B0-CE | 00M-4387-D0-CE | 00M-4387-B0  | 00M-4387-D0 |
| Polar-RP                               | —              | 00N-4371-D0-CE | 00M-4371-B0-CE | 00M-4371-D0-CE | 00M-4371-B0  | 00M-4371-D0 |
| Fusion-RP                              | 00N-4423-B0-CE | 00N-4423-D0-CE | 00M-4423-B0-CE | 00M-4423-D0-CE | 00M-4423-B0  | 00M-4423-D0 |

## Mercury MS™ Cartridge Holders



Direct-Connect Holder

Standard Holder

### Ordering Information

#### Direct-Connect Cartridge Holders

| Part No. | Description                 | Price |
|----------|-----------------------------|-------|
| CH0-7187 | 10 mm direct-connect holder |       |
| CH0-7188 | 20 mm direct-connect holder |       |

#### Standard Cartridge Holders

| Part No. | Description           | Price |
|----------|-----------------------|-------|
| CH0-5846 | 10 mm standard holder |       |
| CH0-5845 | 20 mm standard holder |       |

## Mercury MS™ Screening Kits

These convenient screening kits allow quick, easy and economical evaluation of multiple phases. Each kit contains one cartridge of each available phase and a standard holder. Available in either 3 µm or 5 µm Luna with 2.5 µm Synergi.



### Ordering Information

#### Screening Kits

|                                   | 20 x 2.0 mm Kit | 20 x 4.0 mm Kit |
|-----------------------------------|-----------------|-----------------|
| Kit A includes 1 ea of:           | KH0-7333        | KH0-7334        |
| Luna 3 µm C18(2) Cartridge        |                 |                 |
| Luna 3 µm C8(2) Cartridge         |                 |                 |
| Synergi 2.5 µm Max-RP Cartridge   |                 |                 |
| Synergi 2.5 µm Hydro-RP Cartridge |                 |                 |
| 20 mm Standard Cartridge Holder   |                 |                 |
| Kit B includes 1 ea of:           | KH0-7335        | KH0-7336        |
| Luna 5 µm C18(2) Cartridge        |                 |                 |
| Luna 5 µm C8(2) Cartridge         |                 |                 |
| Synergi 2.5 µm Max-RP Cartridge   |                 |                 |
| Synergi 2.5 µm Hydro-RP Cartridge |                 |                 |
| 20 mm Standard Cartridge Holder   |                 |                 |

## Capillary Columns

### Ordering Information

| 4 µm Synergi Capillary Columns (mm) |             |             |             |             |             |             | 4 µm Synergi Capillary Guard Columns (mm) |             |             |
|-------------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------------------------------------|-------------|-------------|
| Phases                              | 50 x 0.30   | 150 x 0.30  | 250 x 0.30  | 50 x 0.50   | 150 x 0.50  | 250 x 0.50  | Phases                                    | 20 x 0.30   | 20 x 0.50   |
| Max-RP                              | 00B-4337-AC | 00F-4337-AC | —           | —           | 00F-4337-AF | 00G-4337-AF | Max-RP                                    | 03M-4337-AC | 03M-4375-AF |
| Hydro-RP                            | 00B-4375-AC | 00F-4375-AC | 00G-4375-AC | 00B-4375-AF | 00F-4375-AF | 00G-4375-AF | Hydro-RP                                  | 03M-4375-AC | 03M-4375-AF |
| Fusion-RP                           | 00B-4424-AC | 00F-4424-AC | —           | 00B-4424-AF | 00F-4424-AF | 00G-4424-AF | Fusion-RP                                 | 03M-4424-AC | —           |



For Fused Silica Capillary Adapter, see p. 349

## HPLC Columns

### Ordering Information

| 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 |                                | AJO-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 |                                | AJO-7510 |
| Polar-RP                                 | 00B-4336-A0 | 00F-4336-A0 | —           | 00A-4336-B0 | 00B-4336-B0 | 00C-4336-B0 | 00F-4336-B0 | 00G-4336-B0 |                                | AJO-6075 |
| Fusion-RP                                | 00B-4424-A0 | 00F-4424-A0 | —           | 00A-4424-B0 | 00B-4424-B0 | 00C-4424-B0 | 00F-4424-B0 | 00G-4424-B0 |                                | AJO-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 |                                | AJO-6073 |
| Hydro-RP                      | 00A-4375-Y0 | 00B-4375-Y0 | 00F-4375-Y0 | 00G-4375-Y0 |                                | AJO-7510 |
| Polar-RP                      | 00A-4336-Y0 | 00B-4336-Y0 | 00F-4336-Y0 | 00G-4336-Y0 |                                | AJO-6075 |
| Fusion-RP                     | 00A-4424-Y0 | 00B-4424-Y0 | 00F-4424-Y0 | 00G-4424-Y0 |                                | AJO-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 |                                | AJO-6074 |
| Hydro-RP                     | 00A-4375-E0 | 00B-4375-E0 | 00C-4375-E0 | 00F-4375-E0 | 00G-4375-E0 |                                | AJO-7511 |
| Polar-RP                     | 00A-4336-E0 | 00B-4336-E0 | 00C-4336-E0 | 00F-4336-E0 | 00G-4336-E0 |                                | AJO-6076 |
| Fusion-RP                    | 00A-4424-E0 | 00B-4424-E0 | 00C-4424-E0 | 00F-4424-E0 | 00G-4424-E0 |                                | AJO-7557 |

for ID: 3.2-8.0 mm

## Preparative Columns

### Ordering Information

| 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                                  |                |                |                |                | /ea                            |
| Max-RP                                | 00B-4337-P0-AX | 00D-4337-P0-AX | 00F-4337-P0-AX | 00G-4337-P0-AX | AJO-7842                       |
| Hydro-RP                              | 00B-4375-P0-AX | 00D-4375-P0-AX | 00F-4375-P0-AX | 00G-4375-P0-AX | AJO-7843                       |
| Polar-RP                              | 00B-4336-P0-AX | 00D-4336-P0-AX | 00F-4336-P0-AX | 00G-4336-P0-AX | AJO-7845                       |
| Fusion-RP                             | 00B-4424-P0-AX | 00D-4424-P0-AX | 00F-4424-P0-AX | 00G-4424-P0-AX | AJO-7844                       |
| 10 µm                                 |                |                |                |                | /ea                            |
| Max-RP                                | —              | 00D-4350-P0-AX | Inquire        | 00G-4350-P0-AX | AJO-7842                       |
| Hydro-RP                              | —              | —              | Inquire        | 00G-4376-P0-AX | AJO-7843                       |
| Polar-RP                              | —              | —              | Inquire        | 00G-4351-P0-AX | AJO-7845                       |
| Fusion-RP                             | —              | —              | Inquire        | 00G-4425-P0-AX | AJO-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                                            |                |                |                |                | /ea                            |
| Max-RP                                          | 00B-4337-U0-AX | 00C-4337-U0-AX | 00D-4337-U0-AX | 00G-4337-U0-AX | AJO-8304                       |
| Hydro-RP                                        | 00B-4375-U0-AX | 00C-4375-U0-AX | 00D-4375-U0-AX | 00G-4375-U0-AX | AJO-8305                       |
| Polar-RP                                        | 00B-4336-U0-AX | 00C-4336-U0-AX | 00D-4336-U0-AX | 00G-4336-U0-AX | AJO-8307                       |
| Fusion-RP                                       | —              | —              | 00D-4424-U0-AX | 00G-4424-U0-AX | AJO-8306                       |
| 10 µm                                           |                |                |                |                | /ea                            |
| Max-RP                                          | 00B-4350-U0-AX | —              | 00D-4350-U0-AX | 00G-4350-U0-AX | AJO-8304                       |
| Hydro-RP                                        | 00B-4376-U0-AX | —              | —              | 00G-4376-U0-AX | AJO-8305                       |
| Polar-RP                                        | 00B-4351-U0-AX | —              | 00D-4351-U0-AX | 00G-4351-U0-AX | AJO-8307                       |
| Fusion-RP                                       | —              | —              | 00D-4425-U0-AX | 00G-4425-U0-AX | AJO-8306                       |

for ID: 30-49 mm

## Pilot Scale Columns and Bulk Material

### Ordering Information

| 10 µm Analytical and Semi-Prep Columns (mm) |             |             |          | SecurityGuard™ Cartridges (mm) |
|---------------------------------------------|-------------|-------------|----------|--------------------------------|
| Phases                                      | 250 x 4.6   | 250 x 10    | 4 x 3.0* | 10 x 10†                       |
|                                             |             |             | /10pk    | /3pk                           |
| Max-RP                                      | 00G-4350-E0 | 00G-4350-N0 | AJO-6074 | AJO-7275                       |
| Hydro-RP                                    | 00G-4376-E0 | 00G-4376-N0 | AJO-7511 | AJO-7512                       |
| Polar-RP                                    | 00G-4351-E0 | 00G-4351-N0 | AJO-6076 | AJO-7276                       |
| Fusion-RP                                   | 00G-4425-E0 | 00G-4425-N0 | AJO-7557 | AJO-7558                       |

for ID: 3.2-8.0 mm

9-16 mm

| 10 µm Bulk Packings |          |          |          |
|---------------------|----------|----------|----------|
| Phases              | 100 g    | 1 kg     | 5 kg     |
| Max-RP              | 04G-4350 | 04K-4350 | 04L-4350 |
| Hydro-RP            | 04G-4376 | 04K-4376 | 04L-4376 |
| Polar-RP            | 04G-4351 | 04K-4351 | 04L-4351 |
| Fusion-RP           | 04G-4425 | 04K-4425 | 04L-4425 |

Larger quantities of bulk media available upon request.

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

### Ordering Information

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

for ID: 9-16 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



For more dimensions and phases of Axia packed preparative columns, see pp. 310-311, or contact your Phenomenex Technical Consultant

## Synergi Bulk Media

Beyond our largest preparative column dimensions, Synergi phases are available in bulk quantities for HPLC purification at the process, pilot, and commercial scale. These medias offer a complementary selectivity to the standard C18, C8, or Silica phases traditionally employed in larger scale HPLC. Additionally, due to the diverse chemical properties of each of the Synergi phases, dramatic differences in chromatographic parameters such as retention time, selectivity, and resolution are often observed. For those challenging purifications where chromatography still makes the most sense, the Synergi family offers an excellent alternative to evaluate! Get your Synergi preparative scout column(s) and evaluate these phases today!

