

Gemini[®] pH-LC[™]



pH-LC[™]

TAKE A LOOK INSIDE

TWIN™ Technology

TWIN (Two-In-One™) Technology is what gives Gemini its superior performance edge.

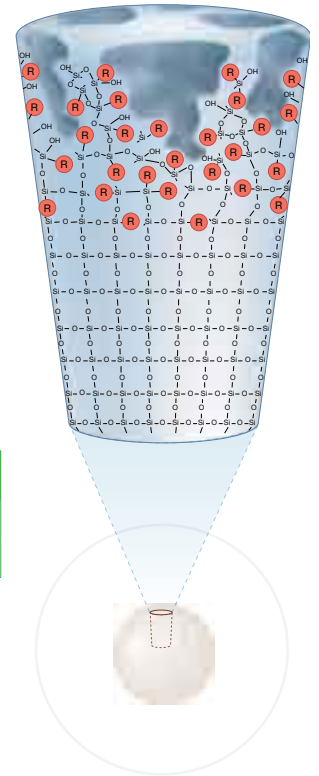
During the final stage of silica manufacturing, a unique silica-organic layer is grafted to create a completely new composite particle. Since the internal base silica is unaltered by this manufacturing process, the particle retains the mechanical strength and rigidity of silica, providing **excellent efficiency**, while the silica-organic shell protects the particle from chemical attack.

It's About Options:

- Extended pH Stability (1-12)
- Efficiency of Silica
- Mechanical Strength of Silica
- 100 % Aqueous Stable

Material Characteristics:

| Packing Material | Particle Shape/Size (µm) | Pore Size (Å) | Surface Area (m ² /g) | Carbon Load | End Capping |
|------------------|--------------------------|---------------|----------------------------------|-------------|-------------|
| Gemini C18 | Spherical 3,5,10 | 110 | 375 | 14 % | TMS |
| Gemini C6-Phenyl | Spherical 3,5 | 110 | 375 | 12 % | TMS |



FORM FOLLOWS FUNCTION

Format Options

Gemini media is available in a **variety of formats** to match your chromatographic needs, whether it's high-sensitivity narrow bore columns, superior efficiency analytical columns, or preparative scale Axia™ packed technology.

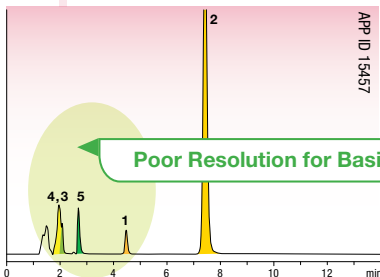


pH-LC™

Extended pH 1-12 Stability for Alternate Selectivity

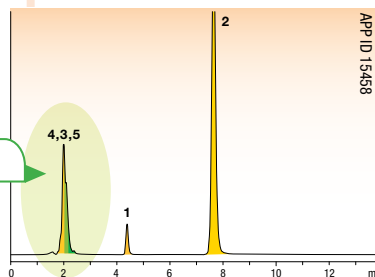
pH 1.5

1.0 % TFA in Water



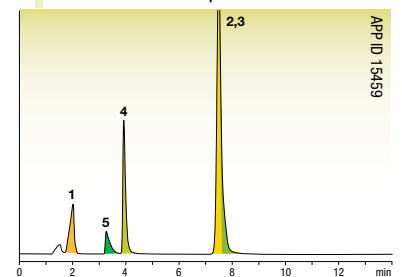
pH 4.0

20 mM Ammonium Formate



pH 7.0

20 mM Phosphate Buffer

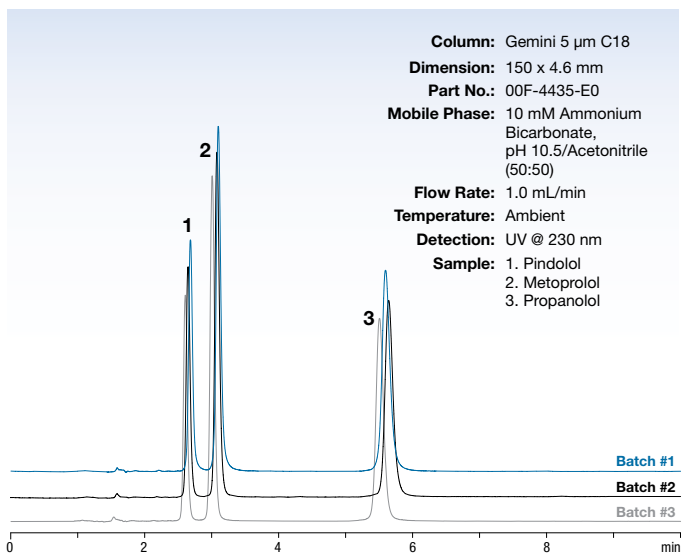


REPRODUCIBLE PHASES

From Batch-to-Batch

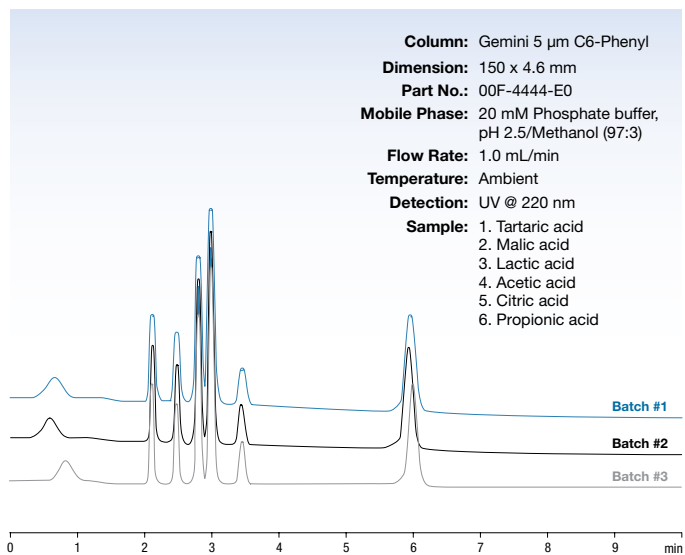
Gemini® C18

Even under low buffer conditions and at high pH, Gemini provides the **stability and reproducibility** needed for developing and transferring critical methods. With each Gemini phase and particle size, multiple batches are available for validating methods. In addition, Gemini is available and supported in 70 countries.



Gemini® C6-Phenyl

Gemini C6-Phenyl incorporates the same tightly controlled silica manufacturing procedures as our Gemini C18 phase to deliver **reproducible performance** you can depend on.



100 TIMES INCREASE IN STABILITY*

10

11

12

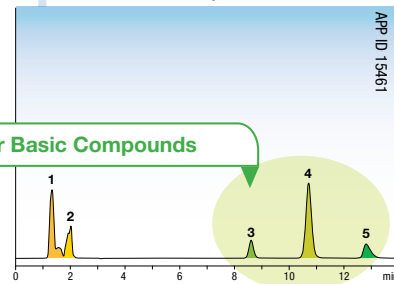
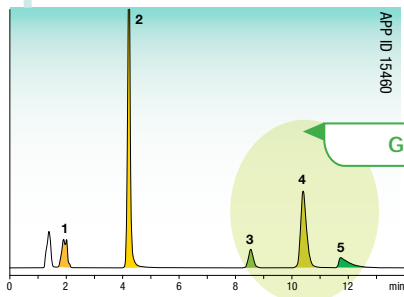
pH 10.0

10 mM Ammonium Bicarbonate Buffer

pH 12.0

20 mM Triethylamine Buffer

Column: Gemini 5 µm C18
Dimension: 150 x 4.6 mm
Part No.: 00F-4435-E0
Mobile Phase: Acetonitrile/Buffers at various pH's (see chromatograms), (50:50)
Flow Rate: 1.0 mL/min
Temperature: 22 °C
Detection: UV @ 254 nm
Sample: 1. Chlorpropamide (pK_a 5.0), 2. Butylparaben, 3. Lidocaine (pK_a 7.9), 4. Tripropilidone (pK_a 6.5), 5. Dextromethorphan (pK_a 9.2)



Good Resolution for Basic Compounds

*Compared to a traditional column with a pH 1-10 range.

Did you know that by modifying the mobile phase pH, **alternative selectivity** can be achieved with ionizable compounds? Acidic compounds will typically have an increase in retention at a pH below their pK_a value, while basic compounds will typically have a increase

in retention when the pH is above their pK_a value. Shown above is an example of this behavior and how, by modifying the pH, one can **modify selectivity**.

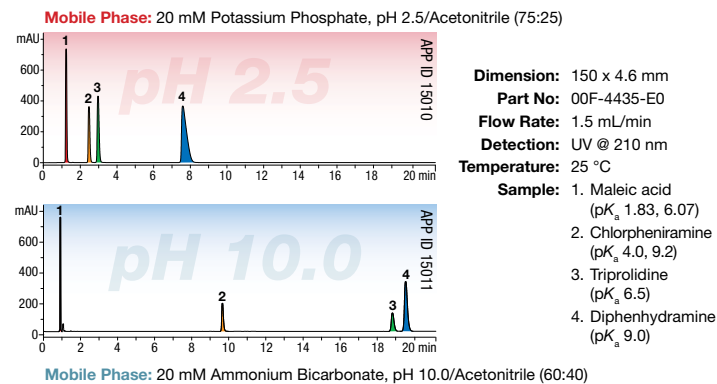
Contact any Phenomenex office for additional support on **pH Method Development!**

pH SELECTIVITY

Because the majority of pharmaceutically active compounds are ionizable (the uncharged species exhibit longer retention on reversed phase media), modifying the mobile phase pH is a powerful tool for **manipulating retention and selectivity**.

Cold Products

Gemini C18



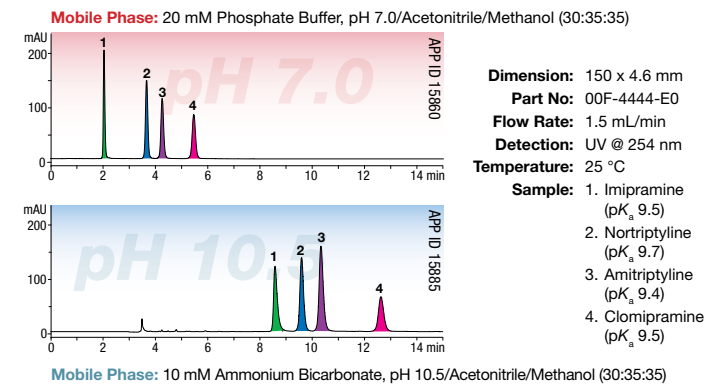
Operating at these conditions:

- For Acidic Compounds: Operate 2 pH units **below** pK_a
- For Basic Compounds: Operate 2 pH units **above** pK_a

Improve Peak Shape & Increase Retention

Tricyclic Antidepressants

Gemini C6-Phenyl

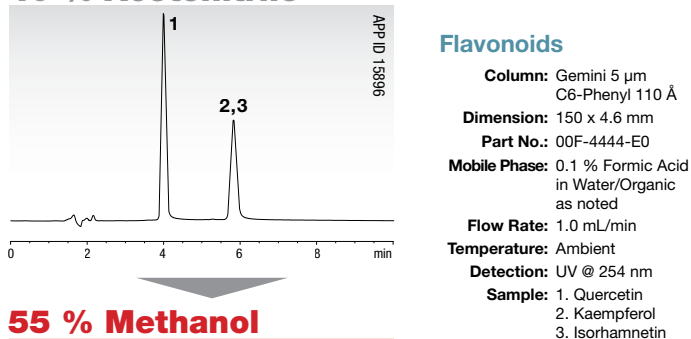


AROMATIC SELECTIVITY

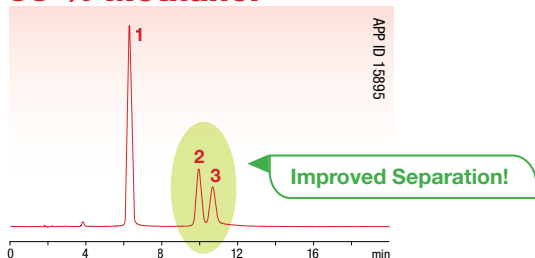
Phenyl phases offer another group of **selectivity options**. π - π interactions between aromatic groups can influence retention order of aromatic compounds. Varying the organic mobile phase can modulate such interactions:

- Acetonitrile **Reduces** Aromatic Interactions
- Methanol **Increases** Aromatic Interactions

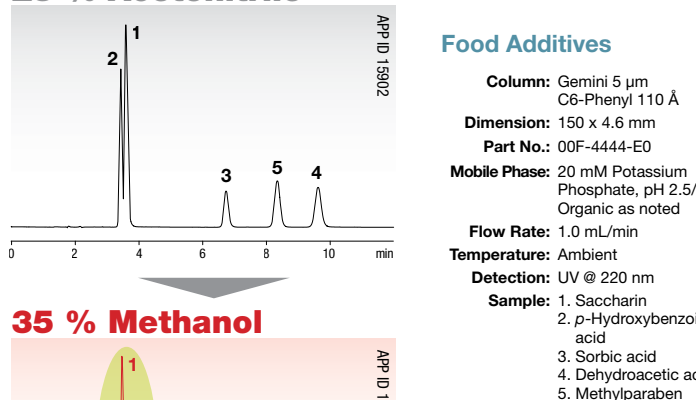
40 % Acetonitrile



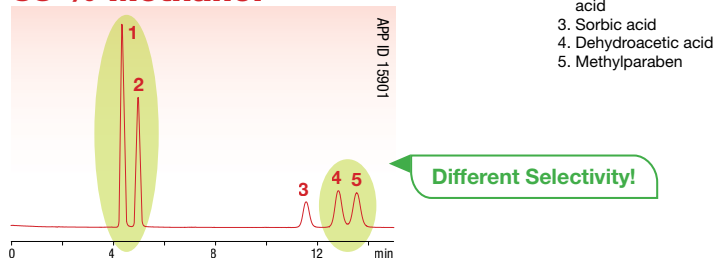
55 % Methanol



25 % Acetonitrile



35 % Methanol



ORDERING INFORMATION



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

| 3 µm Microbore, Minibore and Narrow Bore Columns (mm) | | | | | | | | | | SecurityGuard Cartridges |
|---|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|--------------------------|
| | 50 x 1.0 | 20 x 2.0 | 30 x 2.0 | 50 x 2.0 | 100 x 2.0 | 150 x 2.0 | 50 x 3.0 | 100 x 3.0 | 150 x 3.0 | 4 x 2.0 mm [†] |
| Phase | | | | | | | | | | /10 pk |
| C18 | 00B-4439-A0 | 00M-4439-B0 | 00A-4439-B0 | 00B-4439-B0 | 00D-4439-B0 | 00F-4439-B0 | 00B-4439-Y0 | 00D-4439-Y0 | 00F-4439-Y0 | AJ0-7596 |
| CS-Phenyl | 00B-4443-A0 | 00M-4443-B0 | 00A-4443-B0 | 00B-4443-B0 | 00D-4443-B0 | 00F-4443-B0 | 00B-4443-Y0 | 00D-4443-Y0 | 00F-4443-Y0 | AJ0-7914 |
| | | | | | | | | | | for ID: 2.0-3.0 mm |

| 3 µm Analytical Columns (mm) | | | | | | | SecurityGuard Cartridges |
|------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|--------------------------|
| | 20 x 4.0 | 30 x 4.6 | 50 x 4.6 | 100 x 4.6 | 150 x 4.6 | 250 x 4.6 | 4 x 3.0 mm [†] |
| Phase | | | | | | | /10 pk |
| C18 | 00M-4439-D0 | 00A-4439-E0 | 00B-4439-E0 | 00D-4439-E0 | 00F-4439-E0 | 00G-4439-E0 | AJ0-7597 |
| CS-Phenyl | 00M-4443-D0 | 00A-4443-E0 | 00B-4443-E0 | 00D-4443-E0 | 00F-4443-E0 | 00G-4443-E0 | AJ0-7915 |
| | | | | | | | for ID: 3.2-8.0 mm |

| 5 µm Microbore, Minibore and Narrow Bore Columns (mm) | | | | | | | | | | SecurityGuard Cartridges |
|---|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|--------------------------|
| | 150 x 1.0 | 30 x 2.0 | 50 x 2.0 | 150 x 2.0 | 250 x 2.0 | 50 x 3.0 | 100 x 3.0 | 150 x 3.0 | 250 x 3.0 | 4 x 2.0 mm [†] |
| Phase | | | | | | | | | | /10 pk |
| C18 | 00F-4435-A0 | 00A-4435-B0 | 00B-4435-B0 | 00F-4435-B0 | 00G-4435-B0 | 00B-4435-Y0 | 00D-4435-Y0 | 00F-4435-Y0 | 00G-4435-Y0 | AJ0-7596 |
| CS-Phenyl | Inquire | 00A-4444-B0 | 00B-4444-B0 | 00F-4444-B0 | 00G-4444-B0 | 00B-4444-Y0 | Inquire | 00F-4444-Y0 | 00G-4444-Y0 | AJ0-7914 |
| | | | | | | | | | | for ID: 2.0-3.0 mm |

| 5 µm Analytical Columns (mm) | | | | | | SecurityGuard Cartridges |
|------------------------------|-------------|-------------|-------------|-------------|-------------|--------------------------|
| | 30 x 4.6 | 50 x 4.6 | 100 x 4.6 | 150 x 4.6 | 250 x 4.6 | 4 x 3.0 mm [†] |
| Phase | | | | | | /10 pk |
| C18 | 00A-4435-E0 | 00B-4435-E0 | 00D-4435-E0 | 00F-4435-E0 | 00G-4435-E0 | AJ0-7597 |
| CS-Phenyl | 00A-4444-E0 | 00B-4444-E0 | 00D-4444-E0 | 00F-4444-E0 | 00G-4444-E0 | AJ0-7915 |
| | | | | | | for ID: 3.2-8.0 mm |



| 5 µm Semi-Prep and Preparative Columns (mm) | | | | | | | SecurityGuard Cartridges | |
|---|-------------|-------------|-------------|-------------|-------------|-------------|--------------------------|----------------------------|
| | 50 x 10 | 150 x 10 | 250 x 10 | 150 x 21.2 | 250 x 21.2 | 250 x 30 | 10 x 10 mm | 15 x 21.2 mm ^{**} |
| Phase | | | | | | | /3 pk | /ea |
| C18 | 00B-4435-N0 | 00F-4435-N0 | 00G-4435-N0 | 00F-4435-P0 | 00G-4435-P0 | 00G-4435-U0 | AJ0-7598 | AJ0-7846 |
| CS-Phenyl | Inquire | Inquire | 00G-4444-N0 | 00F-4444-P0 | 00G-4444-P0 | 00G-4444-U0 | AJ0-7314 | AJ0-7841 |
| | | | | | | | for ID: 9-16 mm | 18-30 mm |

| 5 µm Axia [®] Packed High-Throughput Columns (mm) | | | | | | SecurityGuard Cartridges |
|--|----------------|----------------|----------------|----------------|----------------|----------------------------|
| | 50 x 21.2 | 100 x 21.2 | 50 x 30 | 75 x 30 | 100 x 30 | 15 x 21.2 mm ^{**} |
| Phase | | | | | | /ea |
| C18 | 00B-4435-P0-AX | 00D-4435-P0-AX | 00B-4435-U0-AX | 00C-4435-U0-AX | 00D-4435-U0-AX | AJ0-7846 |
| CS-Phenyl | 00B-4444-P0-AX | 00D-4444-P0-AX | 00B-4444-U0-AX | 00C-4444-U0-AX | 00D-4444-U0-AX | AJ0-7841 |
| | | | | | | for ID: 18-30 mm |



| 10 µm Semi-Prep Columns (mm) | | | | | | SecurityGuard Cartridges | | |
|------------------------------|-------------|-------------|-------------|-------------|-------------|--------------------------|------------|----------------------------|
| | 250 x 4.6 | 50 x 10 | 100 x 10 | 150 x 10 | 250 x 10 | 4 x 3.0 mm [†] | 10 x 10 mm | 15 x 21.2 mm ^{**} |
| Phase | | | | | | /10 pk | /3 pk | /ea |
| C18 | 00G-4436-E0 | 00B-4436-N0 | 00D-4436-N0 | 00F-4436-N0 | 00G-4436-N0 | AJ0-7597 | AJ0-7598 | AJ0-7846 |
| | | | | | | for ID: 3.2-8.0 mm | 9-18 mm | 18-30 mm |

| 10 µm Preparative Columns (mm) | | | | | | | Guards | | SecurityGuard Cartridges | |
|--------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|--------------|--------------|----------------------------|-----|
| | 150 x 21.2 | 250 x 21.2 | 150 x 30 | 250 x 30 | 150 x 50 | 250 x 50 | 30 x 21.2 mm | 50 x 21.2 mm | 15 x 21.2 mm ^{**} | |
| Phase | | | | | | | | | | /ea |
| C18 | 00F-4436-P0 | 00G-4436-P0 | 00F-4436-U0 | 00G-4436-U0 | 00F-4436-V0 | 00G-4436-V0 | 03A-4436-P0 | 03B-4436-P0 | AJ0-7846 | |
| | | | | | | | | | for ID: 18-30 mm | |

| 10 µm Axia Packed High-Throughput Columns (mm) | | | | | SecurityGuard Cartridges |
|--|----------------|----------------|----------------|----------------|----------------------------|
| | 50 x 21.2 | 100 x 21.2 | 50 x 30 | 100 x 30 | 15 x 21.2 mm ^{**} |
| Phase | | | | | /ea |
| C18 | 00B-4436-P0-AX | 00D-4436-P0-AX | 00B-4436-U0-AX | 00D-4436-U0-AX | AJ0-7846 |
| | | | | | for ID: 18-30 mm |

[†] SecurityGuard Analytical Cartridges Require Holder, Part No.: **KJ0-4282**

^{**} Semi-Prep SecurityGuard Cartridges Require Holder, Part No.: **AJ0-7220**

^{**} PREP SecurityGuard Cartridges Require Holder, Part No.: **AJ0-8223**

Our Products Are Available Worldwide



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|--|--|--|---|---|---|
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