

APPLICATION

Choosing the Right UHPLC Column for General Pharmaceutical Screening

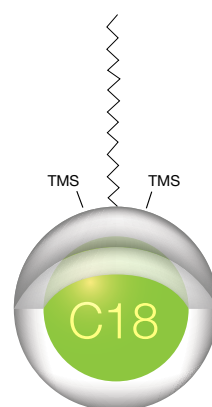
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Overview

For general-purpose small molecule UHPLC work, whether it be in an open-access screening environment or simply in early method development, an ideal LC column should exhibit several key attributes. Firstly, it should provide high efficiency to maximize sensitivity and resolution between closely eluting peaks, especially when analysts are relying upon UV detection. Secondly, the ideal column should be extremely inert to minimize unwanted secondary interactions which can lead to tailing for strongly basic molecules, as such interactions can compromise resolution and accurate quantitation. This is particularly important for methods that may ultimately be transferred to LC-MS systems that rely upon mobile phases that contain modifiers such as 0.1 % formic acid or ammonium formate that are, in general, less able to mask secondary interactions than UV compatible buffers like potassium phosphate or TFA. Lastly, the ideal candidate LC column should be scalable from sub-2 μm to 5 μm , as this allows a methodology to be adaptable across instrument platforms and also scalable to perform preparative purification, if needed.

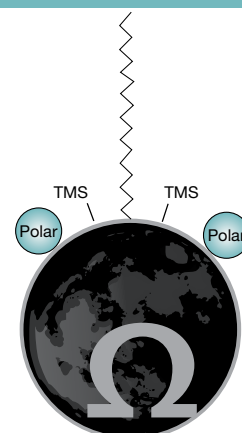
For general-purpose screening like this, we would recommend a customer evaluate both a fully porous and a core-shell product and determine which particle morphology works best for their particular needs. The fully porous Luna[®] Omega Polar 1.6 μm C18 (**Figure 2**) and Kinetex[®] core-shell 1.7 μm C18 (**Figure 3**), are both excellent candidates and provide all the benefits mentioned above. Using this simple LC-MS compatible mobile phase consisting of ammonium formate and acetonitrile and a generic mixture of acid (3-methyl-nitrobenzoic acid), neutral (hexanophenone), and strongly basic test probes (pindolol, chlorpheniramine, nortriptyline), you can see that both columns provide narrow peak widths and minimal peak tailing, with the primary difference between the two columns being absolute retention time, which is a function of their relative differences in surface area (with the Luna Omega fully porous media having a higher surface area than the Kinetex core-shell media). For this particular mixture and under these running conditions, you will note that the retention of the Luna Omega and Kinetex products bracket the retention of a hybrid sub-2 μm media column (Waters[®] ACQUITY[®] BEH 1.7 μm ; **Figure 1**), but selectivity is similar overall, with the Kinetex core-shell 1.7 μm C18 column providing a bit closer match in selectivity than the Luna Omega 1.6 μm Polar C18.



Kinetex C18

Balanced C18 phase that provides the highest degree of hydrophobic selectivity relative to the other Kinetex phases

Polar C18



Luna Omega Polar C18

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.



Figure 1.
Waters[®] ACQUITY[®] BEH 1.7 μm C18

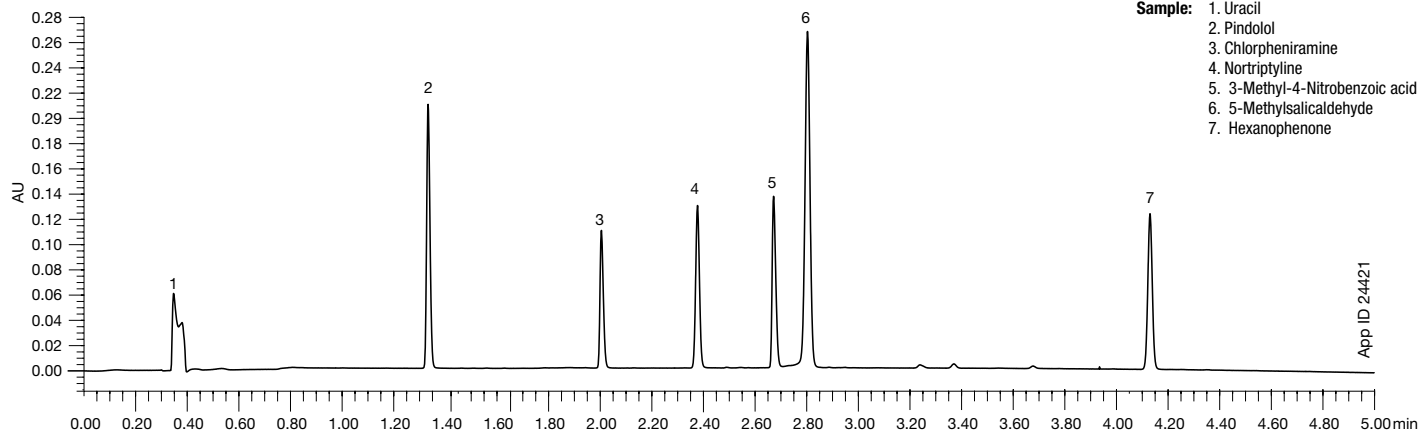


Figure 2.
Luna[®] Omega 1.6 μm Polar C18

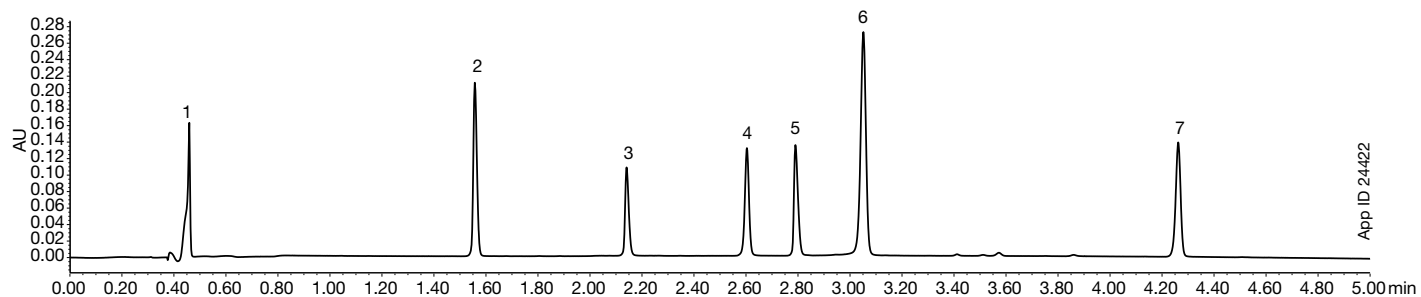
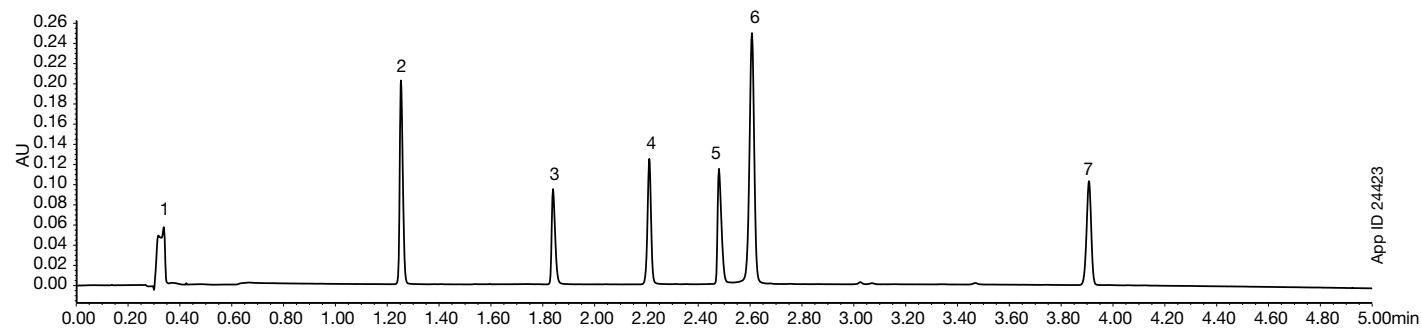


Figure 3.
Kinetex[®] 1.7 μm C18



Luna® Omega Ordering Information

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

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	AJO-9505 for 2.1 mm ID

3 µm Minibore Columns (mm)					SecurityGuard™ Cartridges (mm)
Phases	30 x 2.1	50 x 2.1	100 x 2.1	150 x 2.1	4 x 2.0*
Polar C18	00A-4760-AN	00B-4760-AN	00D-4760-AN	00F-4760-AN	AJO-7600 for ID: 2.0 - 3.0 mm

3 µm MidBore™ Columns (mm)				SecurityGuard™ Cartridges (mm)
Phases	50 x 3.0	100 x 3.0	150 x 3.0	4 x 2.0*
Polar C18	00B-4760-Y0	00D-4760-Y0	00F-4760-Y0	AJO-7600 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*
Polar C18	00B-4760-E0	00D-4760-E0	00F-4760-E0	00G-4760-E0	AJO-7601 for ID: 3.2-8.0 mm

5 µm Minibore Columns (mm)					SecurityGuard™ Cartridges (mm)
Phases	30 x 2.1	50 x 2.1	100 x 2.1	150 x 2.1	4 x 2.0*
Polar C18	00A-4754-AN	00B-4754-AN	00D-4754-AN	00F-4754-AN	AJO-7600 for ID: 2.0 - 3.0 mm

5 µm MidBore Columns (mm)				SecurityGuard™ Cartridges (mm)
Phases	50 x 3.0	100 x 3.0	150 x 3.0	4 x 2.0*
Polar C18	00B-4754-Y0	00D-4754-Y0	00F-4754-Y0	AJO-7600 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*
Polar C18	00B-4754-E0	00D-4754-E0	00F-4754-E0	00G-4754-E0	AJO-7601 for ID: 3.2-8.0 mm

5 µm Axia™ Packed Preparative Columns (mm)			SecurityGuard™ Cartridges (mm)
Phases	150 x 21.2	250 x 21.2	15 x 21.2**
Polar C18	00F-4754-P0-AX	00G-4754-P0-AX	AJO-7603 for ID: 18-29 mm

5 µm Axia Packed Preparative Columns (mm)				SecurityGuard™ Cartridges (mm)
Phases	150 x 30	250 x 30	250 x 50	15 x 30.0*
Polar C18	00F-4754-U0-AX	00G-4754-U0-AX	00G-4754-V0-AX	AJO-7604 for ID: 30-49 mm

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

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

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

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



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Kinetex[®] Ordering Information

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 MidBore™ Columns (mm)			SecurityGuard ULTRA Cartridges [†]
Phases	50 x 3.0	100 x 3.0	3/pk
C18	00B-4475-Y0	00D-4475-Y0	AJ0-8775 for 3.0 mm ID

1.7 µm Minibore Columns (mm)					SecurityGuard ULTRA Cartridges [†]
Phases	30 x 2.1	50 x 2.1	100 x 2.1	150 x 2.1	3/pk
C18	00A-4475-AN	00B-4475-AN	00D-4475-AN	00F-4475-AN	AJ0-8782 for 2.1 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
C18	00A-4462-E0	00B-4462-E0	00C-4462-E0	00D-4462-E0	00F-4462-E0	AJ0-8768 for 4.6 mm ID

2.6 µm MidBore Columns (mm)						SecurityGuard ULTRA Cartridges [†]
Phases	30 x 3.0	50 x 3.0	75 x 3.0	100 x 3.0	150 x 3.0	3/pk
C18	00A-4462-Y0	00B-4462-Y0	00C-4462-Y0	00D-4462-Y0	00F-4462-Y0	AJ0-8775 for 3.0 mm ID

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
C18	00A-4462-AN	00B-4462-AN	00C-4462-AN	00D-4462-AN	00F-4462-AN	AJ0-8782 for 2.1 mm ID

[†] SecurityGuard ULTRA Cartridges require holder, Part No.: AJ0-9000

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If Phenomenex products in this technical note do not provide at least an equivalent separation as compared to a competing product of the same phase and dimensions, return the product with comparative data within 45 days for a FULL REFUND.

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Comparative separations may not be representative of all applications. Phenomenex is not affiliated with Waters Technologies Corporation. Axia column and packing technology is patented by Phenomenex U.S. Patent No. 7, 674, 383 SecurityGuard is patented by Phenomenex. U.S. Patent No. 6,162,362.

CAUTION: this patent only applies to the analytical-sized guard cartridge holder, and does not apply to SemiPrep, PREP or ULTRA holders, or to any cartridges.
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