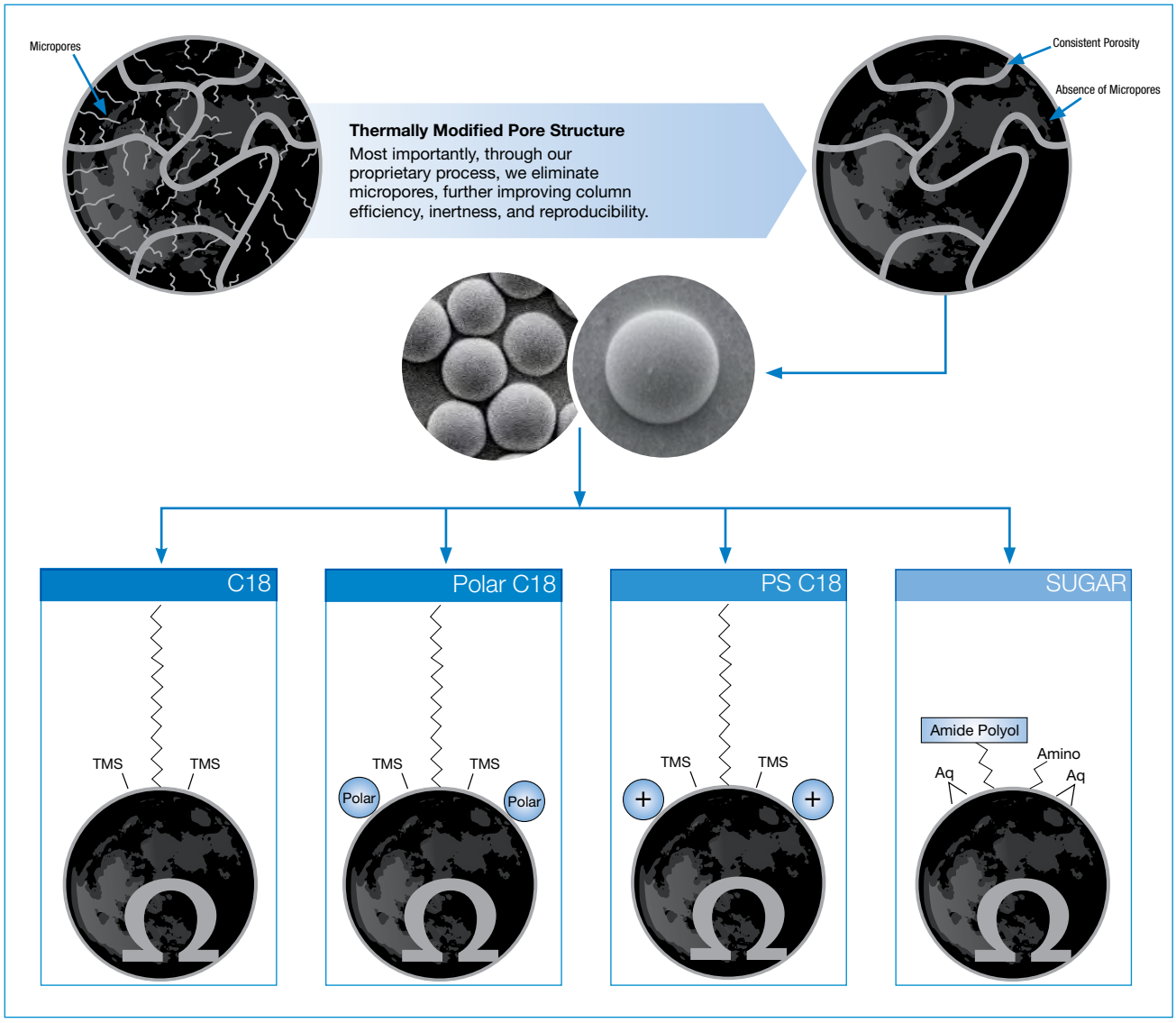
Luna Omega Silica

The Luna Omega 1.6µm, 3µm, and 5µm particles build upon the Luna legacy with an innovative yet rugged UHPLC and HPLC silica particle architecture. The novel manufacturing process implements a proprietary processing technique to gain greater particle inertness, a stronger particle morphology, and more consistent porosity.

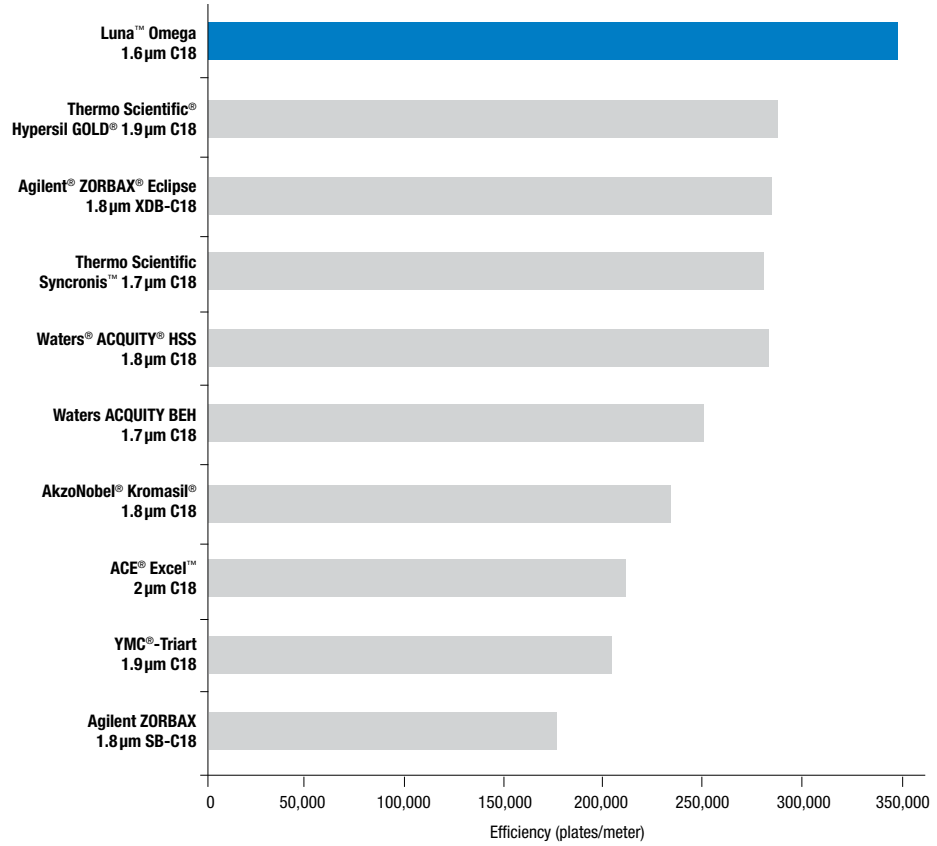
Thermally Modified Fully Porous Particle Technology



Astounding Performance

The undeniably high efficiency levels found in each Luna Omega UHPLC column provide you with the potential of huge gains in method performance. While traditional silica and hybrid fully porous particles claim high performance, when compared to Luna Omega 1.6µm, they fall drastically short and prevent UHPLC scientists from reaching their UHPLC potential.

UHPLC Efficiency Comparison



Conditions for all columns:

Dimensions: 50 x 2.1 mm
Mobile Phase: Acetonitrile/Water (65:35)
Flow Rate: 0.5 mL/min
Temperature: Ambient
Detection: UV @ 254 nm
System: ACQUITY UPLC®
Sample: Naphthalene*

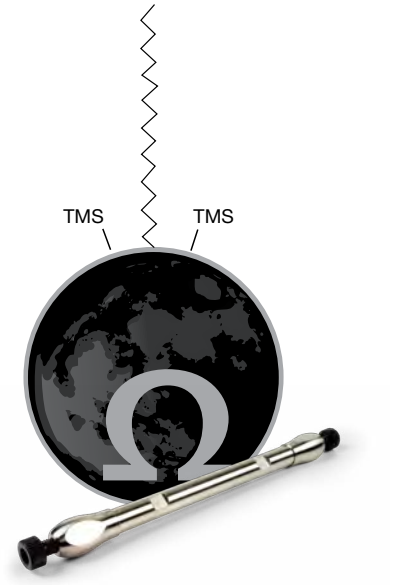
Comparative separations may not be representative of all applications.

*Efficiency (plates/meter) comparison is based on peak performance associated with the compound naphthalene for all columns.

Increase lab safety with HPLC / UHPLC solvent protection, see SecurityCAP™ products on pp. 417-418

Luna Omega C18

Luna Omega C18 is an excellent first choice for chromatographers who are just starting method development or attempting to improve upon existing chromatographic results with other C18s. With its higher performance potential, excellent retention profile, and greater inertness, the Luna Omega C18 was designed to be the new all-purpose UHPLC to HPLC to PREP LC solution with next level scalable reproducibility for industries all over the world.



Materials Characteristics

Phase	Particle Sizes (µm)	Pore Size (Å)	Surface Area (m^2/g)	Carbon Load (%)	pH Stability	Pressure Limit (bar)	USP Column Classification
C18	1.6, 3, 5	100	260	11	1.5 - 8.5*	1034/600**	L1

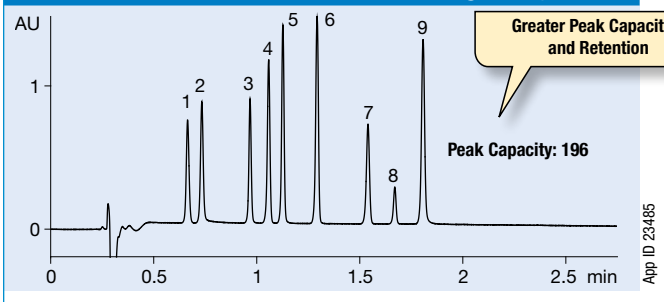
*pH stability under gradient conditions. pH stability is 1.5-10 under isocratic conditions.

**1.6 µm Luna Omega columns are pressure stable up to 1034 bar and 3 or 5 µm are stable up to 600 bar.

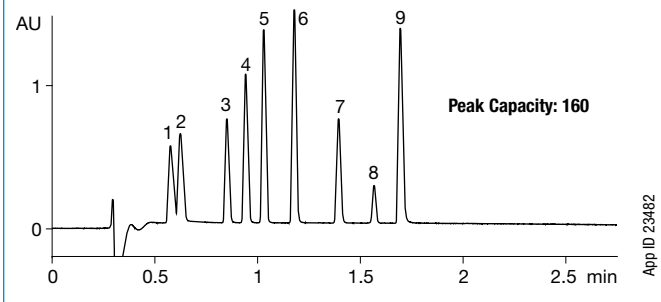
Greater Retention and Better Results

Higher efficiency levels in combination with excellent stationary phase coverage and greater particle inertness, translates to improved separation power for you. Now you can utilize the greater retention of Luna Omega C18 to tackle both easy and difficult separations.

Luna Omega 1.6 µm C18



Waters® ACQUITY® BEH 1.7 µm C18



Conditions for all columns:

Columns: Luna Omega 1.6 µm C18
ACQUITY BEH 1.7 µm C18

Dimensions: 50 x 2.1 mm

Mobile Phase: A: 0.1 % Formic Acid in Water
B: 0.1 % Formic Acid in Acetonitrile

Gradient:

Time (min)	% B
0	10
3	55
3.5	55
3.51	10
5	10

Flow Rate: 0.4 mL/min

Temperature: Ambient

Detection: UV @ 205 nm

Sample:
1. Acetaminophen
2. 4-Aminobenzoic Acid
3. 4-Hydroxybenzoic Acid
4. 2-Acetaminophenol
5. 3-Hydroxybenzoic Acid
6. Salicylicamide
7. Phenol
8. Benzoic Acid
9. Salicylic Acid

Comparative separations may not be representative of all applications.

Luna™ Omega

Generating the Next Level Of Reliability Through Advanced Process Optimization

Over the past few years, our scientists and engineers with the help of customers and Danaher colleagues, have optimized our processes to provide products that deliver very high levels of performance and newly achievable levels of reliability and reproducibility.

Reproducible and Scalable

By setting a new standard for reliability, the Luna Omega C18 spans UHPLC and HPLC with a scalable range of high-performance particle sizes that will ensure that your developed methods are easily transferred. From single compound identification to complex impurity profiles, the Luna Omega C18 will serve as a pillar for your lab to count on day in and day out.

Batch-to-Batch Reproducibility Study

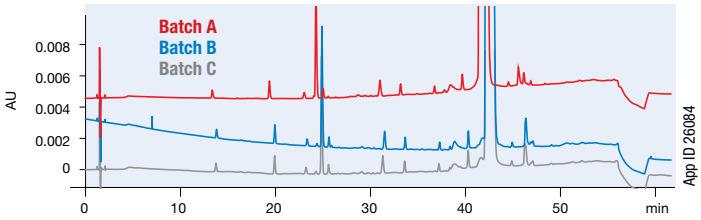
In this example, we compared three batches of Luna Omega C18 using all three different particle sizes on a complex QC Pharmaceutical representative sample.

Conditions for all columns:

Mobile Phase: A: Water with 0.1 % Formic Acid
B: Acetonitrile with 0.1 % Formic Acid
Temperature: 30 °C
Detection: UV @ 254 nm
Injection Volume: 5 µL
Sample: 5 mg/mL of Chlorhexidine and Related Substances

Luna Omega 5 µm C18

Impurity Profile 3 Batch Comparison

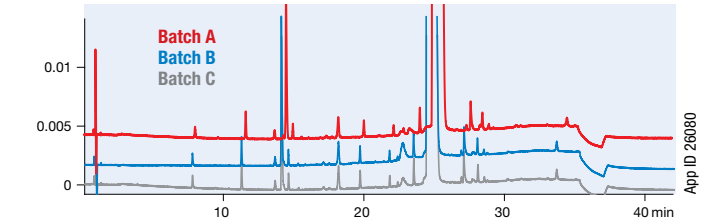


Column: Luna Omega 5 µm C18
Dimension: 250 x 4.6 mm
Part No.: 00G-4785-E0

Gradient: Time (min)	% B
0	2
2.5	2
52.5	35
55	35
57.5	2
62.5	2

Luna Omega 3 µm C18

Impurity Profile 3 Batch Comparison

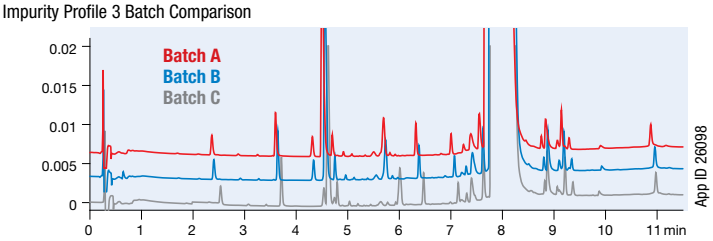


Column: Luna Omega 3 µm C18
Dimension: 150 x 4.6 mm
Part No.: 00F-4784-E0

Gradient: Time (min)	% B
0	2
1.5	2
31.5	35
34.5	35
36	2
42	2

Luna Omega 1.6 µm C18

Impurity Profile 3 Batch Comparison

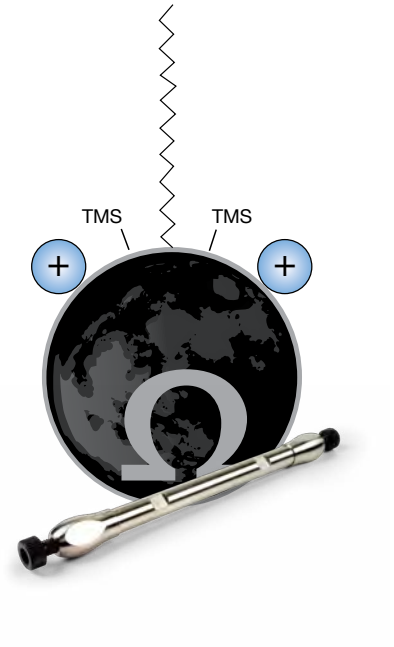


Column: Luna Omega 1.6 µm C18
Dimension: 50 x 2.1 mm
Part No.: 00B-4742-AN

Gradient: Time (min)	% B
0	2
0.5	2
10.5	35
11.5	35
12	2
14	2

Luna Omega PS C18

Luna Omega PS C18 is a unique mixed-mode stationary phase that provides incredibly useful polar and non-polar retention. The surface of the PS C18 contains a positive charge which aids in the retention of acidic compounds and better peak shape for bases through ionic interactions, while the C18 ligand promotes general reversed phase retention. This mixed-mode selectivity allows for greater separation between compounds with varying functional groups.



Materials Characteristics

Phase	Particle Sizes (µm)	Pore Size (Å)	Surface Area (m^2/g)	Carbon Load (%)	pH Stability	Pressure Limit (bar)	USP Column Classification
PS C18	1.6, 3, 5	100	260	9	1.5 - 8.5*	1034/600**	L1

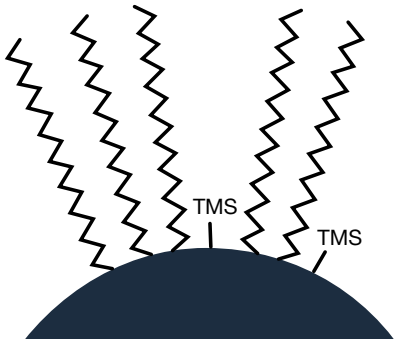
*pH stability under gradient conditions. pH stability is 1.5-10 under isocratic conditions.

**1.6 µm Luna Omega columns are pressure stable up to 1034 bar and 3 or 5 µm are stable up to 600 bar.

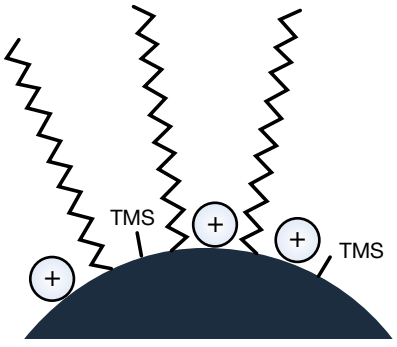
A C18, But More Positive

Luna Omega PS C18 has been fine-tuned and manufactured by Phenomenex to provide a mixed selectivity that is highly useful for method development involving either combinations of polars and non-polars, or just one single compound class with small changes in functional groups.

Luna Omega C18 silica surface



Luna Omega PS C18 silica surface

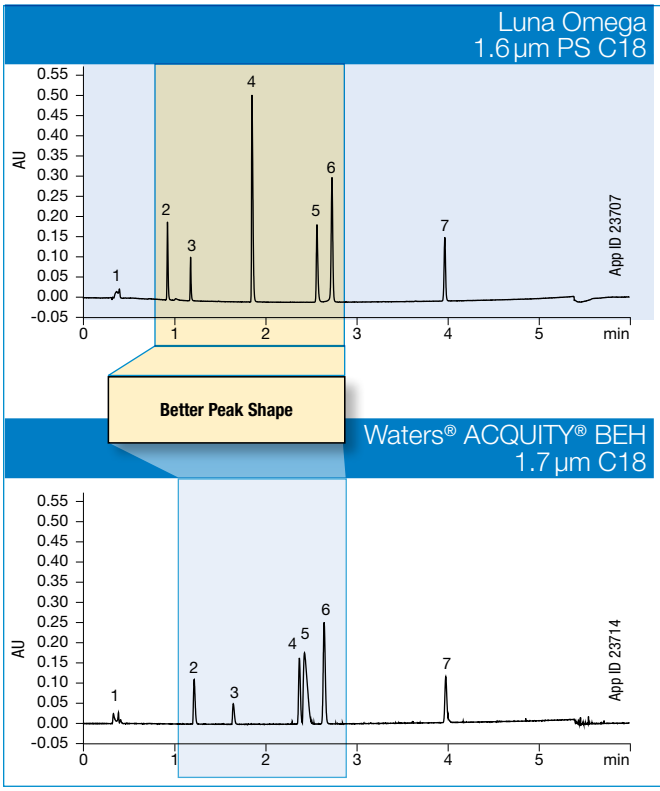


Luna Omega PS C18 *(cont'd)*

Better Peak Shape for Bases

While traditional alkyl phases are prone to show tailing for basic compounds because of secondary interactions occurring at the silica surface, the surface of the Luna Omega PS C18 was designed with positive charges that serve to repel strong basic species and consistently display sharp peak shape.

Pharmaceutical Compound Mixture



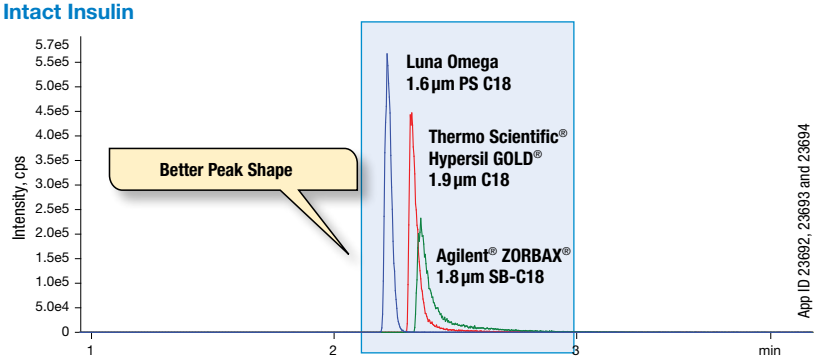
Conditions for all columns:

Columns: Luna Omega 1.6 µm PS C18
ACQUITY BEH 1.7 µm C18
Dimensions: 50 x 2.1 mm
Mobile Phase: A: Water with 0.1 % Formic Acid
B: Acetonitrile with 0.1 % Formic Acid

Gradient:	**Time (min)**	**% B**
	0	5
	5	95
	5.1	5
	8	5

Flow Rate: 0.4 mL/min
Temperature: 22 °C
Detection: MS/MS (SCIEX® API 4000™)
Detector: SCIEX® API 4000™
Sample: 1. Uracil
2. Pindolol
3. Chlorpheniramine
4. Nortriptyline
5. 3-Methyl-4-nitrobenzoic acid
6. 5-Methyl salicylaldehyde
7. Hexanophenone

Intact Insulin



Conditions for all columns:

Columns: Luna Omega 1.6 µm PS C18
Hypersil GOLD 1.9 µm C18
ZORBAX 1.8 µm SB-C18
Dimensions: 50 x 2.1 mm
Mobile Phase: A: Water with 0.1 % Formic Acid
B: Acetonitrile with 0.1 % Formic Acid

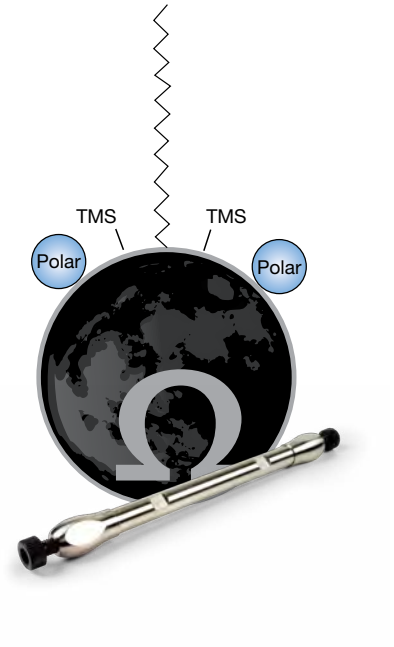
Gradient:	**Time (min)**	**% B**
	0	3
	3	80
	3.1	3
	5	3

Flow Rate: 0.5 mL/min
Temperature: 22 °C
Detection: MS/MS (SCIEX API 4000)
Detector: SCIEX® API 4000™
Sample: Insulin

Comparative separations may not be representative of all applications.

Luna Omega Polar C18

Luna Omega Polar C18 is a novel UHPLC stationary phase capable of providing a unique selectivity within a wide elution window and increased retention for both polar and non-polar analytes. The all-purpose C18 ligand provides hydrophobic interactions while a polar modified particle surface provides enhanced polar retention and also aqueous stability. These attributes make the Luna Omega Polar C18 an excellent choice for balanced retention of polar and hydrophobic compounds as well as to enhance retention of highly polar compounds.



Materials Characteristics

Phase	Particle Sizes (µm)	Pore Size (Å)	Surface Area (m^2/g)	Carbon Load (%)	pH Stability	Pressure Limit (bar)	USP Column Classification
Polar C18	1.6, 3, 5	100	260	9	1.5 - 8.5*	1034/600**	L1

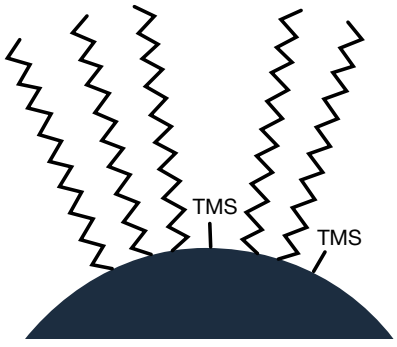
*pH stability under gradient conditions. pH stability is 1.5-10 under isocratic conditions.

**1.6 µm Luna Omega columns are pressure stable up to 1034 bar and 3 or 5 µm are stable up to 600 bar.

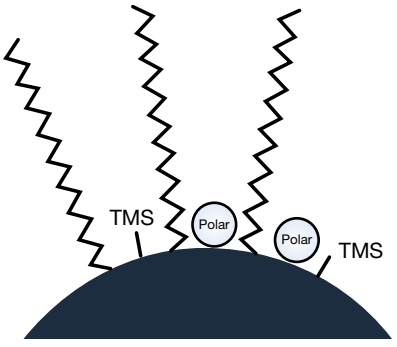
A C18, But Different

Luna Omega Polar C18 is a uniquely modified C18-based chemistry that has been optimized to improve the performance of polar analyses. This new particle surface chemistry makes the Polar C18 applicable to all industries that utilize UHPLC for mixtures of polar and non-polar compounds.

Luna Omega C18 silica surface



Luna Omega Polar C18 silica surface

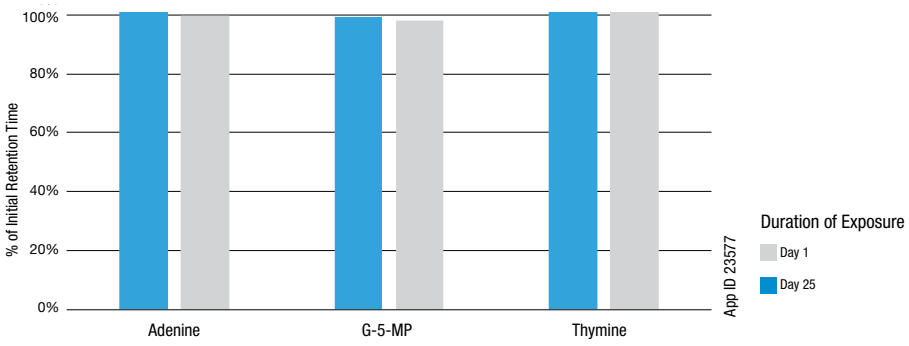


Luna Omega Polar C18 *(cont'd)*

No Stationary Phase Collapse

Traditional C18 phases are known to collapse under 100 % aqueous conditions, causing retention loss of compounds and method development headaches. That is why an advanced proprietary bonding technology was used for the Luna Omega Polar C18 in order to ensure aqueous stability. The graph below displays the excellent stability of Polar C18 in 100 % aqueous buffer conditions for over 2 weeks.

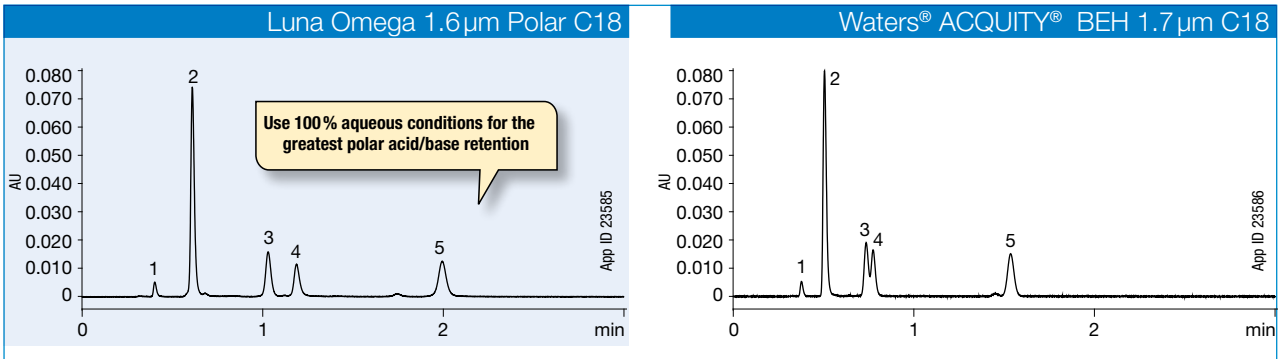
Aqueous Stability of Luna Omega Polar C18



Conditions for all columns:

Columns: Luna Omega 1.6 µm Polar C18
Dimension: 50 x 2.1 mm
Part No.: 00B-4748-AN
Mobile Phase: 10 mM Ammonium Formate with 0.1 % Formic Acid
Flow Rate: 0.4 mL/min
Temperature: 22 °C
Detection: UV @ 254 nm
Sample: 1. Adenine
2. Guanosine-5-Monophosphate
3. Thymine

Nucleosides in 100 % Aqueous Conditions



Conditions for all columns:

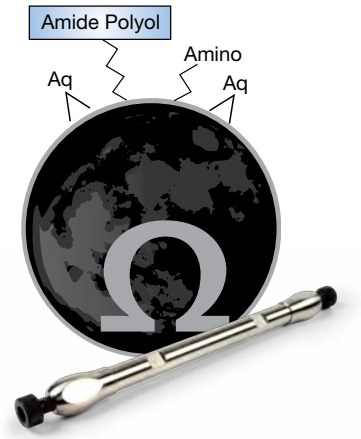
Columns: Luna Omega 1.6 µm Polar C18
ACQUITY BEH 1.7 µm C18
Dimension: 50 x 2.1 mm
Mobile Phase: 20 mM Ammonium Formate pH 3.0
Flow Rate: 0.4 mL/min
Temperature: 22 °C
Detection: UV @ 285 nm
Sample: 1. Thiourea
2. 5-Fluorocytosine
3. Guanosine-5-Monophosphate
4. Adenine
5. Thymine

Comparative separations may not be representative of all applications.

Luna Omega SUGAR

Luna Omega SUGAR breaks ground as it combines the performance benefits of thermally modified fully porous particles with a novel HILIC stationary phase that excels at polar compound retention and selectivity.

- **Improved carbohydrate retention and separation with multi-functional selectivity that contains amide/amino stationary phase and polar endcapping**
- **Enhanced lifetime with highly robust and efficient thermally modified fully porous particle**
- **QC tested for sugars to ensure reliable quality**



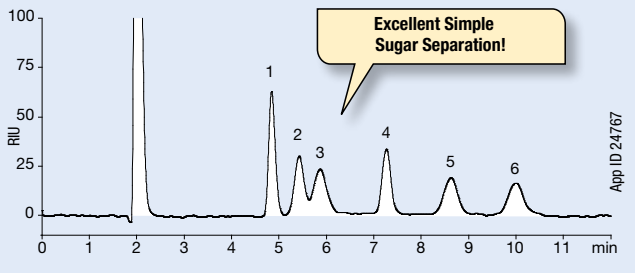
Materials Characteristics

Phase	Particle Sizes (µm)	Pore Size (Å)	Surface Area (m^2/g)	Carbon Load (%)	pH Stability	Pressure Limit (bar)	USP Column Classification
Luna Omega SUGAR	3	100	260	<2	2.0-7.0	345	L8

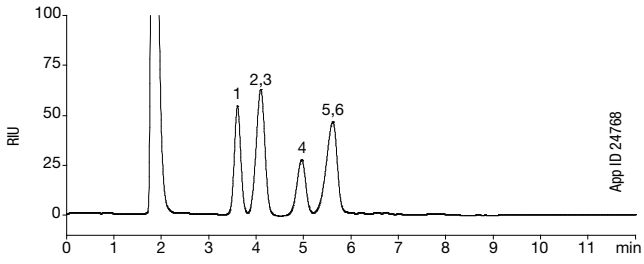
Exceptional Retention and Separation

Luna Omega SUGAR greatly improves upon the retention and separation capabilities of traditional fully porous, core-shell, and hybrid materials, while also allowing for greater peak response! All this while also ensuring that customers do not need to depend on buffers or ion-pair agents to get adequate separation at the cost of losing signal.

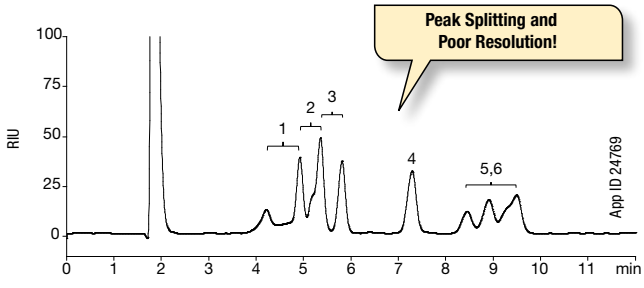
Luna Omega 3 µm SUGAR



Fully Porous 3 µm NH_2



Hybrid Fully Porous 3.5 µm Amide



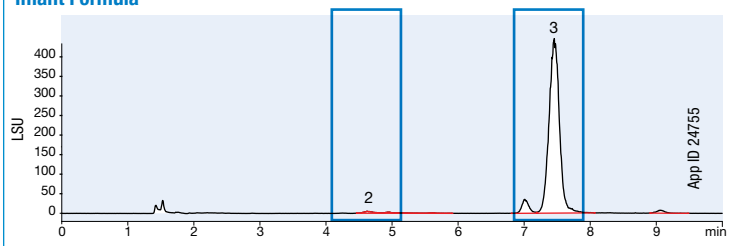
Conditions for all columns:

Columns: Luna Omega 3 µm SUGAR
Fully Porous 3 µm NH_2
Hybrid Fully Porous 3.5 µm Amide
Dimensions: 150 x 4.6 mm
Mobile Phase: Acetonitrile/Water (75:25)
Flow Rate: 1 mL/min
Temperature: 25 °C
Detection: RI
Sample: 1. Fructose
2. Glucose
3. Galactose
4. Sucrose
5. Maltose
6. Lactose

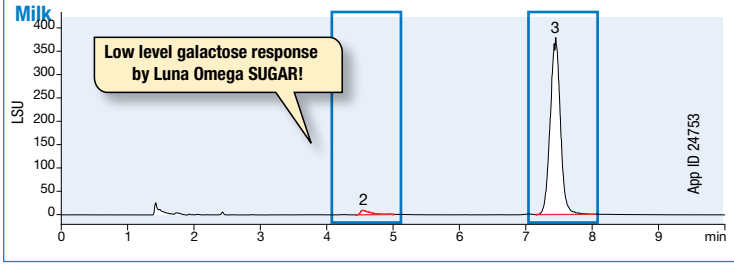
Comparative separations may not be representative of all applications.

Luna Omega SUGAR *(cont'd)*

Infant Formula



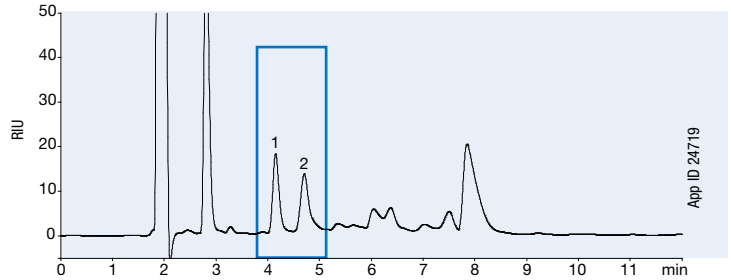
2% Fat Milk



Conditions for both samples:

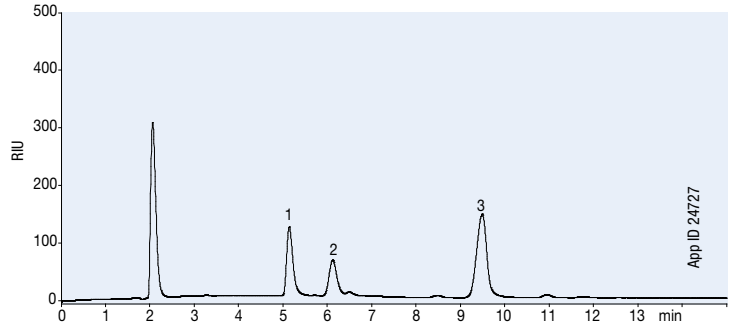
Column: Luna Omega 3 µm SUGAR
Dimension: 150 x 4.6 mm
Part No.: 00F-4775-E0
Mobile Phase: Acetonitrile/Water (75:25)
Flow Rate: 1 mL/min
Temperature: 35 °C
Detection: ELSD
Sample: 1. Glucose
2. Galactose
3. Lactose

Merlot



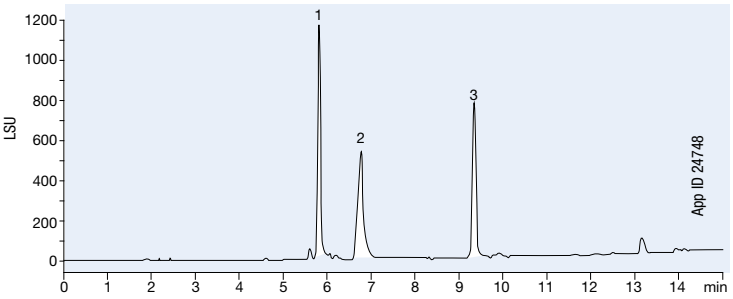
Column: Luna Omega 3 µm SUGAR
Dimension: 150 x 4.6 mm
Part No.: 00F-4775-E0
Mobile Phase: Acetonitrile/Water (75:25)
Flow Rate: 1 mL/min
Temperature: 40 °C
Detection: RI
Sample: 1. Fructose
2. Glucose

Orange Juice



Column: Luna Omega 3 µm SUGAR
Dimension: 150 x 4.6 mm
Part No.: 00F-4775-E0
Mobile Phase: Acetonitrile/Water (80:20)
Flow Rate: 1 mL/min
Temperature: 40 °C
Detection: RI
Sample: 1. Fructose
2. Glucose
3. Sucrose

Animal Feed and Molasses



Column: Luna Omega 3 µm SUGAR
Dimension: 150 x 4.6 mm
Part No.: 00F-4775-E0
Mobile Phase: A: Water
B: Acetonitrile/Isopropanol/Water (90:5:5)

Gradient:

Time (min)	% B
0	90
0.5	90
15.5	70
17	70
18	90
20	90

Flow Rate: 1 mL/min
Temperature: 35 °C
Injection Volume: 5 µL
Detection: ELSD
Sample: 1. Fructose
2. Glucose
3. Sucrose

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
PS C18	—	00D-4752-A0	—
C18	00B-4742-A0	00D-4742-A0	00F-4742-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 Micro LC Columns (mm)							Trap Column
Phases	**50 x 0.30**	**100 x 0.30**	**150 x 0.30**	**50 x 0.50**	**100 x 0.50**	**150 x 0.50**	**20 x 0.30**
Polar C18	00B-4760-AC	00D-4760-AC	00F-4760-AC	00B-4760-AF	00D-4760-AF	00F-4760-AF	—
PS C18	00B-4758-AC	00D-4758-AC	00F-4758-AC	00B-4758-AF	00D-4758-AF	00F-4758-AF	05M-4758-AC

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* /10 pk**
Polar C18	00A-4760-AN	00B-4760-AN	00D-4760-AN	00F-4760-AN	AJ0-7600
PS C18	00A-4758-AN	00B-4758-AN	00D-4758-AN	00F-4758-AN	AJ0-7605
C18	—	00B-4784-AN	00D-4784-AN	00F-4784-AN	AJ0-7611
SUGAR	—	00B-4775-AN	00D-4775-AN	00F-4775-AN	AJ0-4496

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* /10 pk**
Polar C18	00B-4760-Y0	00D-4760-Y0	00F-4760-Y0	AJ0-7600
PS C18	00B-4758-Y0	00D-4758-Y0	00F-4758-Y0	AJ0-7605
C18	00B-4784-Y0	00D-4784-Y0	00F-4784-Y0	AJ0-7611
SUGAR	—	—	00F-4775-Y0	AJ0-4496

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
C18	00B-4784-E0	00D-4784-E0	00F-4784-E0	00G-4784-E0	AJ0-7612
SUGAR	—	00D-4775-E0	00F-4775-E0	00G-4775-E0	AJ0-4495

for ID: 3.2-8.0 mm

For 5 µm Luna Omega Micro LC Columns, Traps, and Fittings, see p. 361

5 µm Minibore and MidBore™ Columns (mm)							SecurityGuard Cartridges (mm)
Phases	**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	00B-4754-AN	00D-4754-AN	00F-4754-AN	00B-4754-Y0	00D-4754-Y0	00F-4754-Y0	AJ0-7600
PS C18	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
C18	00B-4785-E0	00D-4785-E0	00F-4785-E0	00G-4785-E0	AJ0-7612

for ID: 3.2-8.0 mm

5 µm Semi-Preparative Columns (mm)		SecurityGuard Cartridges (mm)
Phases	**250 x 10**	**10 x 10** /3 pk**
Polar C18	00G-4754-N0	AJ0-9519
PS C18	00G-4753-N0	AJ0-9520

for ID: 9-16 mm

5 µm 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** /ea**
Polar C18	00B-4754-P0-AX	00D-4754-P0-AX	00F-4754-P0-AX	00G-4754-P0-AX	AJ0-7603
PS C18	00B-4753-P0-AX	00D-4753-P0-AX	00F-4753-P0-AX	00G-4753-P0-AX	AJ0-7608
C18	—	—	—	00G-4785-P0-AX	—

for ID: 18-29 mm

5 µm Axia™ Packed Preparative Columns (mm) (cont'd)					SecurityGuard Cartridges (mm)
Phases	**100 x 30**	**150 x 30**	**250 x 30**	**250 x 50**	**15 x 30.0♦ /ea**
Polar C18	00D-4754-U0-AX	00F-4754-U0-AX	00G-4754-U0-AX	00G-4754-V0-AX	AJ0-7604
PS C18	00D-4753-U0-AX	00F-4753-U0-AX	00G-4753-U0-AX	00G-4753-V0-AX	AJ0-7609

for ID: 30-49 mm

‡ SecurityGuard ULTRA Cartridges require holder, Part No.: AJ0-9000
* SecurityGuard Analytical Cartridges require holder, Part No.: KJ0-4282
***SemiPREP SecurityGuard Cartridges require holder, Part No.: AJ0-9281
**PREP SecurityGuard Cartridges require holder, Part No.: AJ0-8223
♦PREP SecurityGuard Cartridges require holder, Part No.: AJ0-8277