

One of the World's Leading HPLC Columns

Develop or Improve your HPLC Method

- Exceptionally rugged USP phases
- Easy method scalability with 3, 5, 10, 10-PREP and 15 µm media
- Extensive batch traceability and reproducibility data supplied with every column

If Luna 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, send in your comparative data within 45 days and keep the Luna column for FREE.



Material Characteristics

Packing Material	Particle Shape/Size (µm)	Pore Size (Å)	Surface Area (m ² /g)	Carbon Load %	Calculated Bonded Phase Coverage (µmole/m ²)	End Capping	pH Stability
Luna Silica(2)	Spher. 3, 5, 10, 10-PREP, 15	100	400	0	–	No	2.0 - 7.5
Luna C5	Spher. 5, 10	100	440	12.5	7.85	Yes	1.5 - 9.0*
Luna C8(2)	Spher. 3, 5, 10, 10-PREP, 15	100	400	13.5	5.50	Yes	1.5 - 9.0*
Luna C18(2)	Spher. 2.5, 3, 5, 10, 10-PREP, 15	100	400	17.5	3.00	Yes	1.5 - 9.0*
Luna Phenyl-Hexyl	Spher. 3, 5, 10, 10-PREP, 15	100	400	17.5	4.00	Yes	1.5 - 9.0*
Luna CN	Spher. 3, 5, 10	100	400	7.0	3.80	Yes	1.5 - 7.0
Luna NH ₂	Spher. 3, 5, 10	100	400	9.5	5.80	No	1.5 - 11
Luna SCX	Spher. 5, 10	100	400	Binding Capacity: 0.15 meq/g		No	2.0 - 7.0
Luna HILIC	Spher. 3, 5	200	200	5.7	4.30	No	1.5 - 8.0
Luna PFP(2)	Spher. 3, 5	100	400	11.5	2.20	Yes	1.5 - 8.0

* pH range is 1.5 - 10 under isocratic conditions. pH range is 1.5 - 9 under gradient conditions.

USP Phases for Virtually Every Application

Luna Bonded Phase Selectivity Chart

USP Column Classification	Phase	Description	Common Applications
L1	C18(2)	2.5, 3, 5, 10, 10-PREP, 15 µm C18 phase. Excellent efficiency, peak shape and resolution. Slightly lower carbon load than original Luna C18.	Acetaminophen, Aspirin, Caffeine, Albuterol, Amitriptyline Hydrochloride, Amoxicillin, Atenolol, Cephalexin, Cephadrine capsules, Chloramphenicol, Cortisone Acetate, Dextromethorphan, Diphenhydramine, Pseudoephedrine, Dopamine, Estradiol, Guafenesin, Ibuprofen, Sterile Imipenem, Imipramine, Lidocaine, Lorazepam, Minoxidil, Naproxen, Phenylephrine Hydrochloride, Phenylpropanolamine, Prednisone oral solution, Procainamide, Propoxyphene, Reserpine
L3	Silica(2)	3, 5, 10 µm Ultra-pure silica with high column bed stability enhanced by particle shape uniformity.	Alprazolam, Hydrocodone bitartrate, Hydrocortisone, Fat Soluble Vitamins, Phthalates, Fatty Acids, Lutein, Lycopene, Estradiol
L7	C8(2)	3, 5, 10, 10-PREP, 15 µm C8 phase for excellent efficiency, peak shape and resolution. Significantly improved performance over traditional C8 phases due to high surface coverage.	Doxepine, Doxylamine succinate, Fluoxetine, Glyburide, Ibuprofen Oral Suspension, Propranolol, Levonorgestrel, Ethinyl estradiol, Melengestrol acetate, Glucosamine
L8	NH ₂	3, 5, 10 µm Amino phase. Can be used in reversed or normal phase modes. Stable from pH 1.5 to 11.0 and under 100% aqueous conditions. High performance silica and bonding techniques produces a rugged, highly reproducible column.	Simple sugars, Carboplatin, Lactulose concentrate, Levocarnitine tablets
L9	SCX	5, 10 µm A Benzene Sulfonic Acid bonded phase is used to make this Strong Cation Exchange (SCX) column. Offers great peak shape and resolution.	Cough and cold compounds, Raclopride, Sodium Acetate, Erythromycin
L10	CN	3, 5, 10 µm Cyano phase. Can be used as reversed- or normal-phase material. The use of Luna base silica results in overall phase reproducibility and performance.	Benzalkonium Chloride, Nortriptyline HCl Capsules, Prednisolone, Tetracaine, Quinapril tablets
L11	Phenyl-Hexyl	3, 5, 10, 10-PREP, 15 µm A phenyl phase which employs a hexyl alkyl linker as opposed to the traditional propyl chain. Offers great stability as well as alternative selectivity.	Oxacillin, Captopril, Chlorpheniramine, Pseudoephedrine, Methadone Hydrochloride Oral Concentration
L20	HILIC	3, 5 µm HILIC phase that provides excellent selectivity for polar compounds; and improved MS sensitivity with low bleed.	Drug metabolites, Water soluble vitamins, Melamine, Cyanuric acid, Metanephrine, Normetanephrine
L43	PFP(2)	3, 5 µm A pentafluorophenyl phase that provides excellent selectivity for aromatic compounds from influence of fluorine substitution on phenyl ring. Multiple retention mechanisms. Orthogonal selectivity to traditional C18 phases.	Positional isomers, Geometric isomers, Taxanes, Aflatoxins



Try Gemini for even longer column lifetimes (see page 187).

Luna Silica

A Backbone and Phase Designed for Long Column Lifetimes

Luna columns' excellent performance is not simply the result of ultra-pure metal-free silica (99.99% purity). Meticulous care is given to the quality control of surface smoothness, pore structure and pore consistency to ensure particles of uniform structure and enhanced mechanical strength. Either bonded or unbonded, Luna silica produces highly advanced HPLC columns:

- Low percentage of "fines" from damaged silica leading to lower backpressures and enhanced column performance and lifetimes
- High column bed stability enhanced by particle shape uniformity

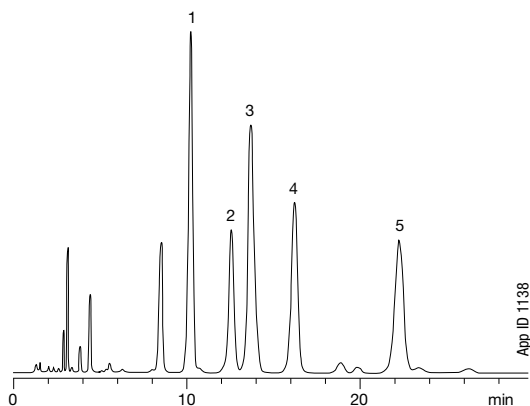
Incredible Silica Smoothness

Luna silica is extremely smooth and spherical. For bonded phases, this provides a uniform bonding surface for consistent and even bonded phase coverage. The likelihood of silica particle shearing and breakage during bonding and packing is very low; thus, Luna columns have high efficiencies and long column lifetimes.

- Recommended for preparative and bulk packing into DAC systems, see page 356 for more information

Natural Products (Kava Kava)

Column: Luna 5 µm Silica(2)
Dimensions: 150 x 4.6 mm
Part No.: 00F-4274-E0
Mobile Phase: Hexane/Dioxane (85:15)
Flow Rate: 1.5 mL/min
Detection: UV @ 230 nm
Sample: 1. Dihydrokavain
 2. Yangonin
 3. Kavain
 4. Dihydromethysticin
 5. Methysticin

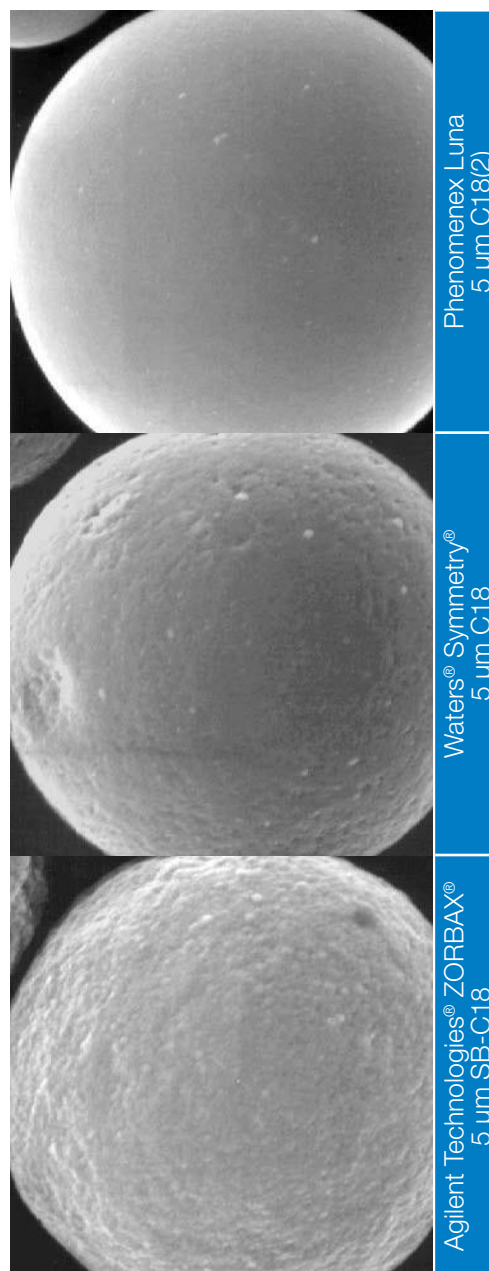


Luna Silica(2)

USP: L3

pH Stability: 2.0 – 7.5
Particle Size: 3 µm, 5 µm, 10 µm, 10 µm-PREP, and 15 µm
Phase: Unbonded silica
Application: Polar compounds

Compare Surface Smoothness



Phenomenex Luna
5 µm C18(2)

Waters® Symmetry®
5 µm C18

Agilent Technologies® ZORBAX®
5 µm SB-C18



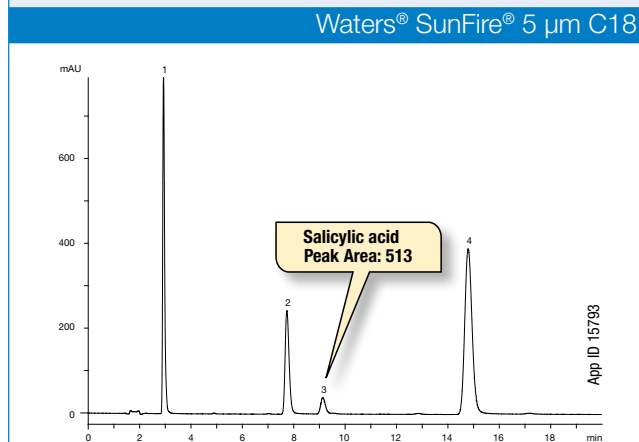
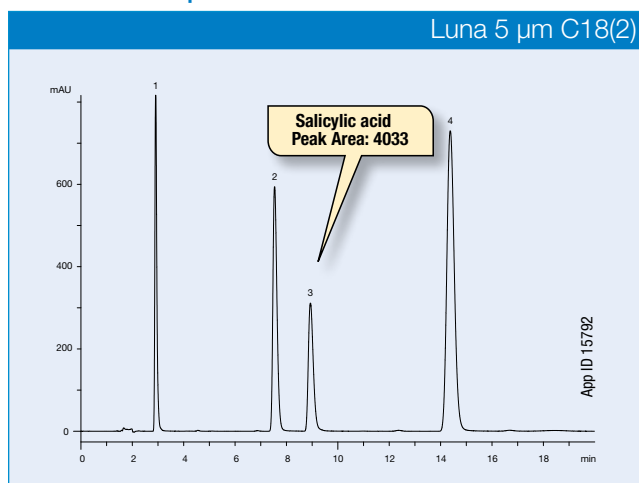
Luna C18(2), C8(2), C5

Your Starting Point for Reversed Phase Methods

The Luna column has found a place as one of the world's top reversed phase columns because it provides a measurable improvement over many HPLC columns for two important chromatographic properties: resolution and peak shape. The high efficiencies and bonded phase surface coverage provide for sharp peaks. The result:

- Free exposed silanols virtually eliminated by complete bonding and endcapping
- Sharp peak shape for good method sensitivity
- pH stable from 1.5 to 10.0 for over 10000 hours

C18 Column Comparison**



Aromatic Acids

Columns: Luna 5 µm C18(2) 100 Å
SunFire 5 µm C18 100 Å

Conditions for all columns:

Dimensions: 150 x 4.6 mm

Mobile Phase: 20 mM Phosphate buffer, pH 2.5 / Acetonitrile (75:25)

Flow Rate: 1.0 mL/min

Detection: UV @ 254 nm

Sample: 1. p-Hydroxybenzoic acid 3. Salicylic acid
2. Benzoic acid 4. p-Toluic acid

Luna C18(2)

USP: L1

LC/MS Certified

pH Stability: 1.5-9.0*

Particle Size: 2.5 µm, 3 µm, 5 µm, 10 µm, 10 µm-*PREP*, and 15 µm

Phase: C18, endcapped

Application: Small molecules

Strength: Wide pH stability provides longer column lifetime and greater method flexibility

Luna C8(2)

USP: L7

LC/MS Certified

pH Stability: 1.5-9.0*

Particle Size: 3 µm, 5 µm, 10 µm, 10 µm-*PREP*, and 15 µm

Phase: C8, endcapped

Application: Small molecules when less retention and greater speed is desired

Strength: Lower silanol activity than C18(2) phase plus wide pH stability for longer column life and greater method flexibility

Luna C5

LC/MS Certified

pH Stability: 1.5-9.0*

Particle Size: 5 µm, 10 µm

Phase: C5, endcapped

Application: Small molecules when less retention and greater speed is desired

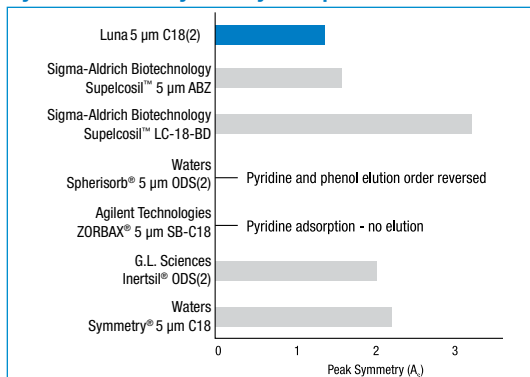
Strength: Greater hydrolytic and pH stability compared to most C4 phases

* pH range is 1.5-10 under isocratic conditions. pH range is 1.5-9 under gradient conditions.



HPLC | LUNA

Pyridine Peak Asymmetry Comparison**



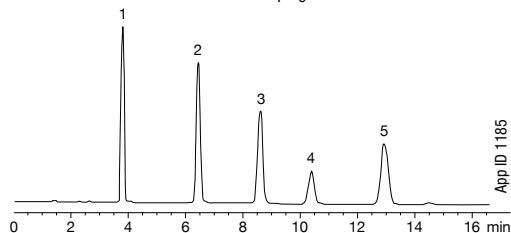
Comparison of 7 different 5 µm reversed phase columns. This survey measures the degree of silanol activity on the surface of each silica. In this survey, Luna 5 µm C18(2) material demonstrates the lowest silanol activity.

** The comparative data presented here may not be representative for all applications.

Luna C18(2), C8(2), C5 (cont'd)

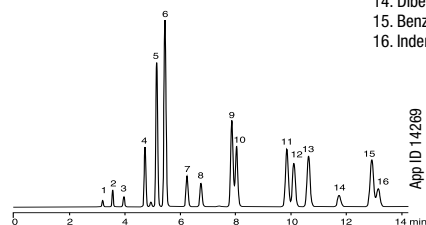
Steroids

Column: Luna 5 µm C18(2)
Dimensions: 150 x 4.6 mm
Part No.: 00F-4252-E0
Mobile Phase: 0.1% H₃PO₄/Acetonitrile/Methanol (54:35:11)
Flow Rate: 0.75 mL/min
Detection: UV @ 254 nm
Sample: 1. Hydrocortisone 3. 11- α -Hydroxyprogesterone
 2. Corticosterone 4. Cortisone Acetate
 5. 11-Ketoprogesterone



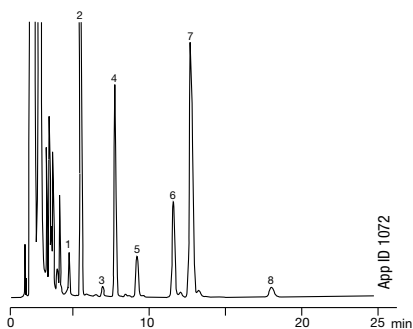
Polynuclear Aromatic Hydrocarbons: EPA Method 8310

Column: Luna 5 µm C18 (2)
Dimensions: 250 x 4.6 mm
Part No.: 00G-4252-E0
Mobile Phase: A: Water
 B: Acetonitrile
Gradient: A/B (25:75) to 100% B in 25 min
Flow Rate: 2.0 mL/min
Temperature: 22 °C
Detection: UV @ 254 nm
Sample: 1. Naphthalene 5. Anthracene 9. Chrysene
 2. Acenaphthylene 6. Fluoranthene 10. Benzo[e]pyrene
 3. Fluorene 7. Pyrene 11. Benzo[b]fluoranthene
 4. Phenanthrene 8. Benz[a]anthracene 12. Benzo[k]fluoranthene
 13. Benzo[a]pyrene
 14. Dibenzo[a,h]anthracene
 15. Benzo[g,h,i]perylene
 16. Indeno[1,2,3-c,d]pyrene



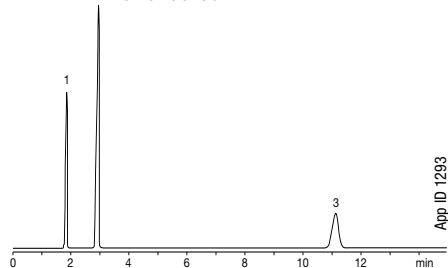
Saw Palmetto Berry, p-Bromophenacyl Esters

Column: Luna 3 µm C8(2)
Dimensions: 150 x 4.6 mm
Part No.: 00F-4248-E0
Mobile Phase: Acetonitrile/Water (87:13)
Flow Rate: 1.5 mL/min
Temperature: 25 °C
Detection: UV @ 254 nm
Sample: 1. Capric Acid 5. Linoleic Acid
 2. Lauric Acid 6. Palmitic Acid
 3. Linolenic Acid 7. Oleic Acid
 4. Myristic Acid 8. Stearic Acid



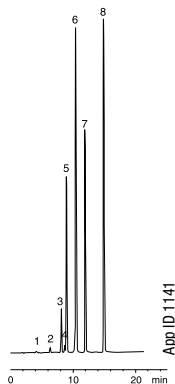
Acetaminophen, USP Method

Column: Luna 5 µm C18(2)
Dimensions: 150 x 4.6 mm
Part No.: 00F-4252-E0
Mobile Phase: Water/Methanol/Acetic Acid (69:28:3)
Flow Rate: 1.5 mL/min
Detection: UV @ 275 nm
Sample: 1. Acetaminophen
 2. Caffeine
 3. Benzoic Acid



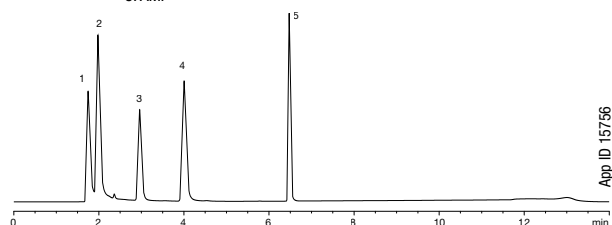
Pharmaceutical Preservatives

Column: Luna 5 µm C5
Dimensions: 150 x 4.6 mm
Part No.: 00F-4043-E0
Mobile Phase: A: 0.5% Acetic acid in water/acetonitrile (80:20)
 B: 0.5% Acetic acid in water/acetonitrile (20:80)
Gradient: A/B (100:0) to A/B (0:100) in 30 min
Flow Rate: 1 mL/min
Temperature: 25 °C
Detection: UV @ 254 nm
Sample: 1. Propylparaben impurity
 2. Benzyl alcohol
 3. Phenol
 4. Benzoic acid
 5. Methylparaben
 6. Benzaldehyde
 7. Ethylparaben
 8. Propylparaben



Adenine Family

Column: Luna 5 µm C18(2)
Dimensions: 150 x 4.6 mm
Part No.: 00F-4252-E0
Mobile Phase: A: 20 mM Ammonium acetate, pH 4.5
 B: Acetonitrile
Gradient: A/B (97:3) to (60:40) in 10 min
Flow Rate: 1 mL/min
Temperature: Ambient
Detection: UV @ 260 nm
Sample: 1. ATP 4. Adenine
 2. ADP 5. Adenosine
 3. AMP



Luna Phenyl-Hexyl Engineered for Stability

Luna Phenyl-Hexyl columns provide separations not achievable on C18 or C8 columns; such as increased retention for polar, aromatic compounds as well as reversals in analyte elution order. Luna Phenyl-Hexyl columns are a reproducible, extremely stable phenyl phase. Most phenyl phases use a short propyl (3 carbon) linker, which limits phase stability. The Phenyl-Hexyl bonded phase employs a phenyl ring with a hexyl (6 carbon) linker and is densely bonded to Luna silica surface, reducing bonded phase hydrolysis and increasing chemical stability. The result:

- **Highly reproducible and stable phenyl phase**
- **Dual selectivity of both phenyl phase and a short alkyl phase (C5 or C8)**
- **Excellent retention of aromatic and polar, amine compounds**
- **Recommended for US EPA Method 8330B for explosives analysis**
- **1.5 to 10 pH stability for over 10000 hours**

Luna Phenyl-Hexyl

USP: L11

LC/MS
Certified

pH Stability: 1.5-9.0*

Particle Size: 3 µm, 5 µm, 10 µm, 10 µm-*PREP*, and 15 µm

Phase: Phenyl with Hexyl (C6) linker, endcapped

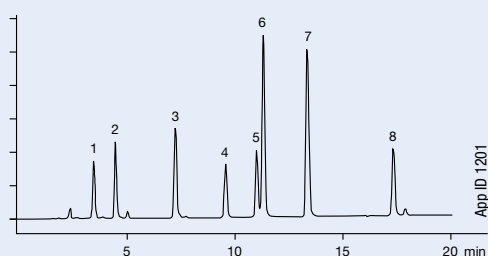
Application: Non-polar compounds

Strength: Aromatic selectivity enhanced by higher hydrophobicity due to hexyl linker

* pH range is 1.5-10 under isocratic conditions.
pH range is 1.5-9 under gradient conditions.

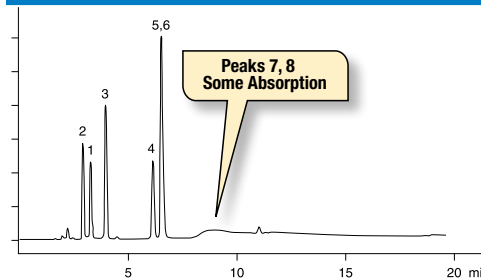
Chromatographic Comparisons of Phenyl Columns**

Luna 5 µm Phenyl-Hexyl



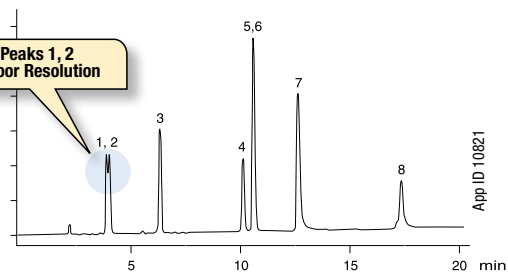
App ID 1201

Waters[®] Spherisorb[®] 5 µm Phenyl



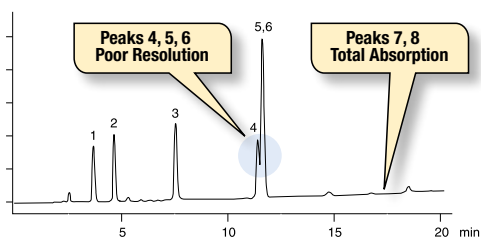
App ID 10822

Agilent Technologies[®] ZORBAX[®] 5 µm SB-Phenyl



App ID 10821

Agilent Technologies ZORBAX 5 µm Phenyl



App ID 10823

Antibacterials

Conditions for all columns:

Dimensions: 150 x 4.6 mm

Mobile Phase: A: 20 mM KH_2PO_4 , pH 2.5

B: Acetonitrile

Gradient: Start A/B (80:20) to A/B (75:25) in 5 min, go to A/B (55:45) in 15 min

Flow Rate: 1.0 mL/min

Detection: UV @ 254 nm

Sample:

1. Carbadox	4. Oxolinic Acid	7. Nalidixic Acid
2. Thiamphenicol	5. Sulfadimethoxine	8. Piromidic Acid
3. Furazolidone	6. Sulfaquinoxaline	

**The comparative data presented here may not be representative for all applications.

Luna CN (cyano)

Proven Reproducibility

For carboxyl, carbonyl and amine containing compounds, Luna CN columns offer a unique polar selectivity in reversed phase and normal phase mode. Luna CN columns provide sharp peaks and great reproducibility run-to-run, column-to-column and batch-to-batch. The smooth silica allows for a more uniform bonding with improved resistance to bonded phase hydrolysis to produce one of the most stable CN phases. The result:

- Improved peak shapes
- One of the most stable CN columns under reversed phase or normal phase conditions.
- pH stable from 1.5 to 7.0

Luna CN

USP: L10

pH Stability: 1.5-7.0

Particle Size: 3 µm, 5 µm, and 10 µm

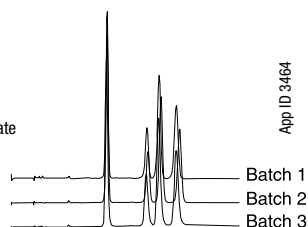
Phase: Cyano, endcapped

Application: Compounds with COOH, CO, NH₂, NHR₂, or NR₂

Strength: Improved reproducibility for more consistent results run-to-run, column-to-column, batch-to-batch

Batch-to-Batch Reproducibility

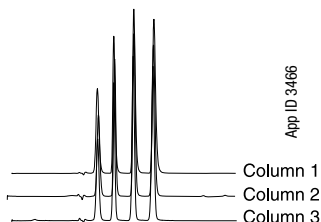
Column: Luna 5 µm CN
Dimensions: 150 x 4.6 mm
Mobile Phase: A: Hexane, B: Methylene chloride/Methanol(80:20), A/B (80:20)
Flow Rate: 2.0 mL/min
Detection: UV @ 254 nm
Injection: 1.0 µL
Temperature: Ambient
Sample: 1. Hydrocortisone
 2. Prednisone
 3. Cortisone
 4. Hydrocortisone Acetate



App ID 3464

Column-to-Column Reproducibility

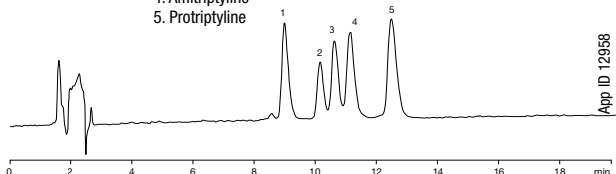
Column: Luna 5 µm CN
Dimensions: 150 x 4.6 mm
Mobile Phase: A: Hexane, B: Methylene chloride/Methanol(80:20), A/B (95:5)
Flow Rate: 1.0 mL/min
Injection: 5 µL
Detection: UV @ 254 nm
Temperature: Ambient
Sample: 1. Dimethyl phthalate
 2. Diethyl phthalate
 3. Dibutyl phthalate
 4. Dioctyl phthalate



App ID 3466

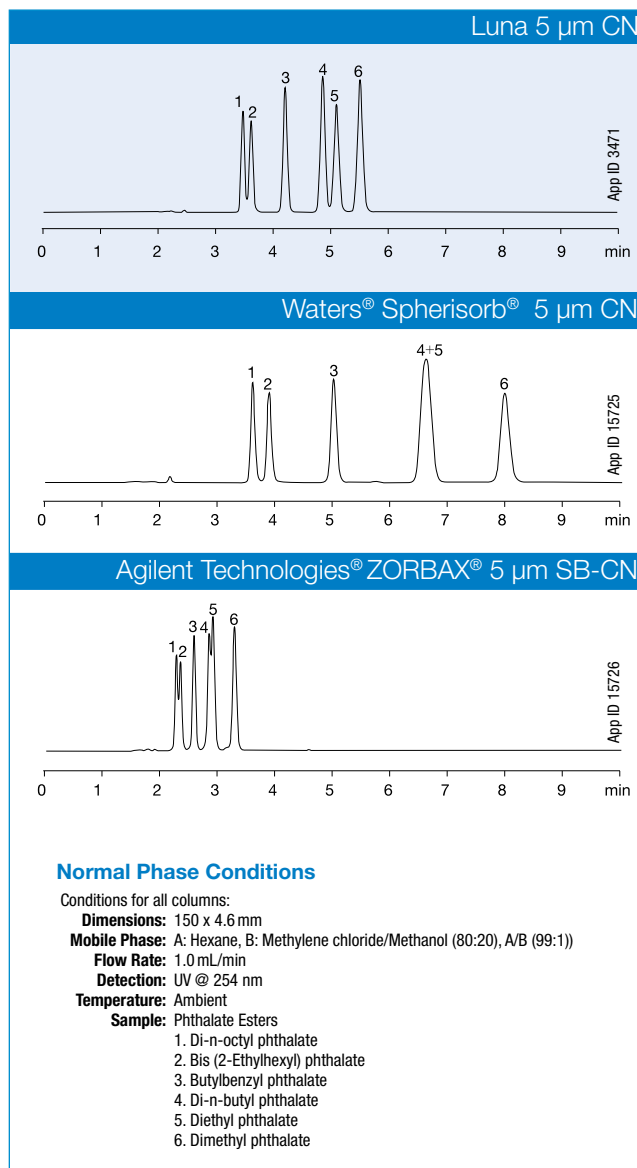
Reversed Phase Conditions

Column: Luna 5 µm CN
Dimensions: 150 x 4.6 mm
Mobile Phase: A: Acetonitrile, B: 20 mM Potassium phosphate pH 4.0, A/B (35:65)
Flow Rate: 1.0 mL/min
Detection: UV @ 210 nm
Sample: Tricyclic Antidepressants
 1. Doxepin
 2. Desipramine
 3. Nortriptyline
 4. Amitriptyline
 5. Protriptyline



App ID 12958

CN Column Comparison**



**The comparative data presented here may not be representative for all applications.



Luna NH₂ (amino)

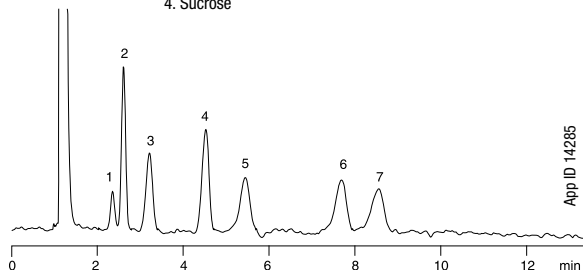
Developed for Ruggedness

Luna NH₂ columns retain hydrogen-bonding compounds under three separation modes: Reversed Phase, Normal Phase, and Ion-Exchange. Luna NH₂ columns provide reproducible retention and selectivity with improved column lifetime. Amino columns can be problematic as the bonded phase easily hydrolyses off the silica, shortening retention time over the life of the column. The bonded phase stability of Luna NH₂ columns are illustrated by 1.5 to 11.0 pH stability and 100 % aqueous mobile phase stability. The result:

- Increased bonded phase stability improves reproducibility and column lifetime
- Excellent retention of simple sugars, complex sugars, sugar alcohols and other hydrogen-bonding compounds under reversed phase, normal phase, ion-exchange conditions
- pH stable from 1.5 to 11.0
- Stable in 100 % aqueous mobile phases

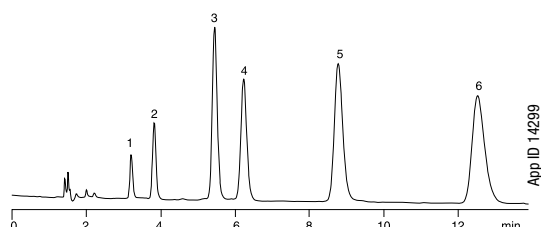
Simple Sugars

Column: Luna 5 µm NH₂
Dimensions: 250 x 4.6 mm
Part No.: 00G-4378-E0
Mobile Phase: Acetonitrile/Water (80:20)
Flow Rate: 3 mL/min
Temperature: 40 °C
Detection: RI
Sample: 1. Xylose 5. Maltose
 2. Fructose 6. Melezitose
 3. Glucose 7. Raffinose
 4. Sucrose



Steroids

Column: Luna 5 µm NH₂
Dimensions: 250 x 4.6 mm
Part No.: 00G-4378-E0
Mobile Phase: Hexane/Ethanol (85:15)
Flow Rate: 2 mL/min
Temperature: 22 °C
Detection: UV @ 240 nm
Sample: 1. 11-Ketoprogesterone 4. Prednisolone 21-Acetate
 2. 11-Hydroxyprogesterone 5. Cortisone
 3. Cortisone Acetate 6. Prednisolone



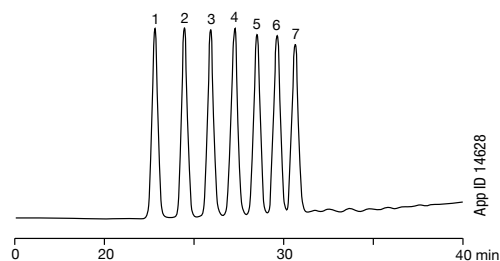
Luna NH₂

USP: L8

pH Stability:	1.5-11.0
Particle Size:	3 µm, 5 µm, and 10 µm
Phase:	Amino
Application:	Compounds with COOH, CO, NH ₂ , NHR ₂ , or NR ₂
Strength:	Sugars by reversed phase, steroids by normal phase, oligonucleotides by ion exchange

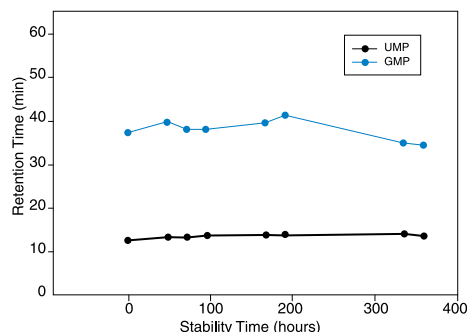
12-18mer poly-DT Oligonucleotide

Column: Luna 5 µm NH₂
Dimensions: 150 x 4.6 mm
Part No.: 00F-4378-E0
Mobile Phase: A: 20 mM Sodium Phosphate, 10% Acetonitrile, pH 7.0
 B: 20 mM Sodium Phosphate, 10% Acetonitrile, 1 M Sodium Chloride, pH 7.0
Gradient: A/B (75:25) to A/B (5:95) in 50 minutes
Flow Rate: 1 mL/min
Temperature: 40 °C
Detection: UV @ 260 nm
Sample: 12-18mer poly-DT oligonucleotide standard



Stability in 100 % Aqueous Mobile Phase

Column: Luna 5 µm NH₂
Dimensions: 250 x 4.6 mm
Part No.: 00G-4378-E0
Mobile Phase: 20 mM Potassium Phosphate Buffer pH 2.7
Flow Rate: 1.5 mL/min
Detector: UV @ 254 nm
Temperature: Ambient
Injection: 2.5 µL
Conditions: Continuously flushed at 1.0 mL/min using 100% 20 mM Potassium Phosphate Buffer pH 2.7 between injections



Luna SCX (strong cation exchange) Develop Robust Methods

Luna SCX columns provide excellent resolution and peak shape of basic, cationic compounds. However, most SCX columns show poor peak shape and bad resolution causing many chromatographers to ignore this important phase for small molecule method development, until now. Luna SCX columns contain a benzene sulfonic acid ligand providing ion-exchange, reversed phase, and aromatic interactions. Such interactions make Luna SCX columns great as a first dimension for 2D LC applications as well as improved resolution for small molecules. The result:

- Resolving power and sharp peak shape to separate complex cationic/basic and nitrogen containing compounds
- 5 and 10 µm columns and bulk media for analytical through preparative separations
- Benzene sulfonic acid ligand provides mixed-mode interaction improving separation for 2D peptide applications

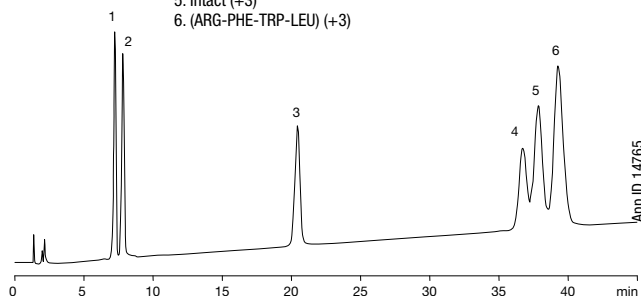
Luna SCX

USP: L9

pH Stability:	2.0-7.0
Particle Size:	5 µm and 10 µm
Phase:	Benzene Sulfonic Acid, Strong Cation Exchange
Application:	Amine and polyamine containing compounds
Strength:	Guaranteed to provide sharper peak shape and better resolution compared to traditional SCX columns

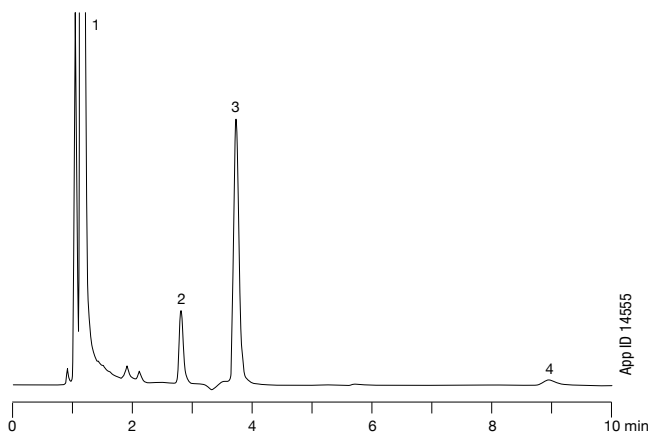
Peptides

Column: Luna 5 µm SCX
Dimensions: 150 x 4.6 mm
Part No.: OOF-4398-E0
Mobile Phase: A: 20 mM Potassium Phosphate, 25% Acetonitrile, pH 2.5
 B: 20 mM Potassium Phosphate, 25% Acetonitrile, 400 mM Potassium Chloride, pH 2.5
Gradient: A/B (95:5) to A/B (10:90) in 45 minutes
Flow Rate: 1 mL/min
Temperature: 35 °C
Detection: UV @ 215 nm
Injection Volume: 2 µL (5 µg on column)
Sample: Peptide Mixture - Substance P
 1. Fragment 5-11 (+1)
 2. Fragment 4-11 (+1)
 3. Fragment 2-11 (+2)
 4. Fragment 1-9 (+3)
 5. Intact (+3)
 6. (ARG-PHE-TRP-LEU) (+3)



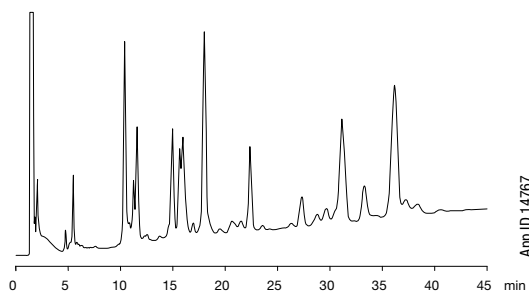
Childrens Tylenol Cold Syrup

Column: Luna 5 µm SCX
Dimensions: 150 x 4.6 mm
Part No.: OOF-4398-E0
Mobile Phase: 50 mM KH₂PO₄, pH 2.5/Acetonitrile (35:65)
Injection Volume: 1 µL
Flow Rate: 1.5 mL/min
Detection: UV @ 210 nm
Sample Prep: Dissolve 1 part Childrens Tylenol Cold in 10 parts Methanol
Sample: 1. Acetaminophen
 2. Pseudoephedrine
 3. Dextromethorphan
 4. Chlorpheniramine



Tryptic Digest of Bovine Cytochrome c

Column: Luna 5 µm SCX
Dimensions: 150 x 4.6 mm
Part No.: OOF-4398-E0
Mobile Phase: A: 20 mM Potassium Phosphate, pH 2.5 / 25% Acetonitrile
 B: 20 mM Potassium Phosphate, pH 2.5 / 25% Acetonitrile / 350 mM Potassium Chloride
Gradient: 100% A to 100% B in 50 minutes
Flow Rate: 1 mL/min
Temperature: 35 °C
Detection: UV @ 215 nm
Injection Volume: 50 µL (20 µg on column)
Sample: Bovine Cytochrome c trypsin digest



SCX Method Development and pH: The standard operating pH range for Luna SCX columns is 2.0 to 7.0. Most SCX methods are typically run between pH 2.0 and 5.0 for optimal performance. This ensures that nitrogen-containing analytes, especially those with adjacent conjugated system are protonated. Running in highly acidic (pH < 2.0) or basic (pH > 7.0) mobile phases may cause this phase to undergo degradation, as is common for all silica-based SCX phases.



Luna HILIC

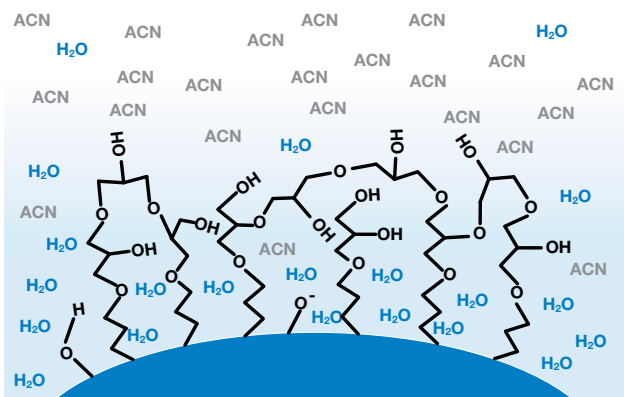
Increase MS Sensitivity and Retention for Polar Compounds

Luna HILIC columns retain a water-enriched layer on the surface of the silica. This water layer facilitates the transfer of polar compounds onto the stationary phase for increased retention.

Hydrophilic Interaction Liquid Chromatography (HILIC) is a separation mode where the partitioning of polar solutes from the high concentration, water-miscible, organic mobile phase into the hydrophilic surface environment creates separations. Polar solutes exhibit increased retention and elute in the order of increasing hydrophilicity.

Finally, reproducible, robust HILIC separations!

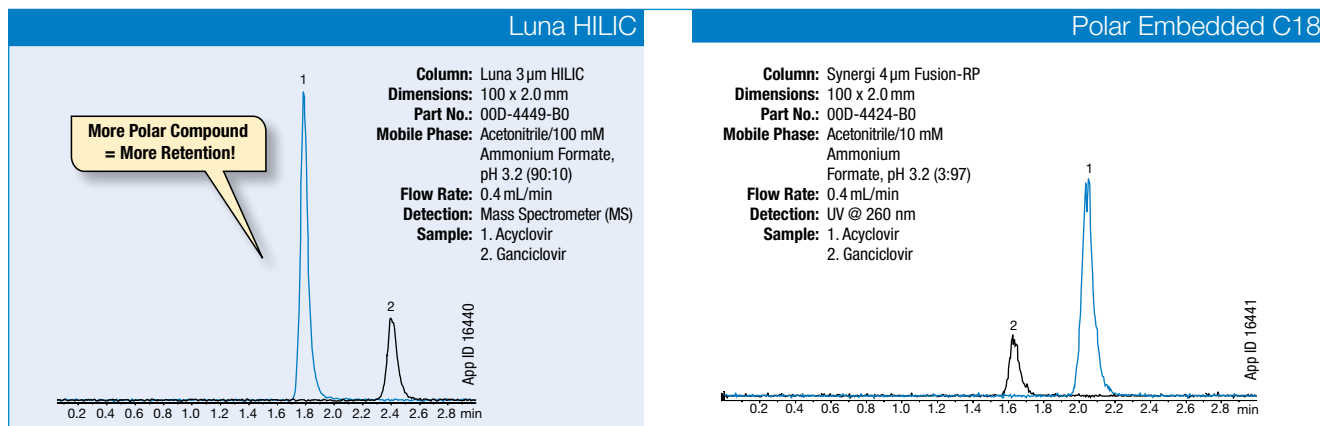
- Made for retention of polar compounds
- Increase mass spectrometry sensitivity
- Increase laboratory throughput and productivity



Ganciclovir & Acyclovir on Luna HILIC

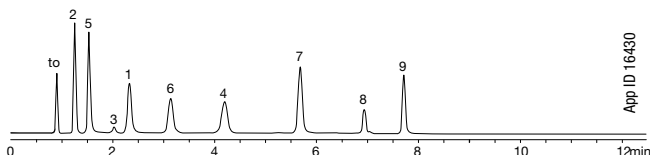
HILIC uses a solvent system that is the reverse of what is common in reversed phase, thus peak elution order is reversed on the Luna HILIC column.

Polar / Hydrophilic compounds that are particularly difficult to retain, even on polar-embedded reversed phase columns, will enjoy maximum retention on Luna HILIC columns.



Vitamin Mix on Luna HILIC

Vitamins provide an excellent platform to demonstrate the benefits of HILIC. The effect of increased polar compound retention can be easily seen in this application.



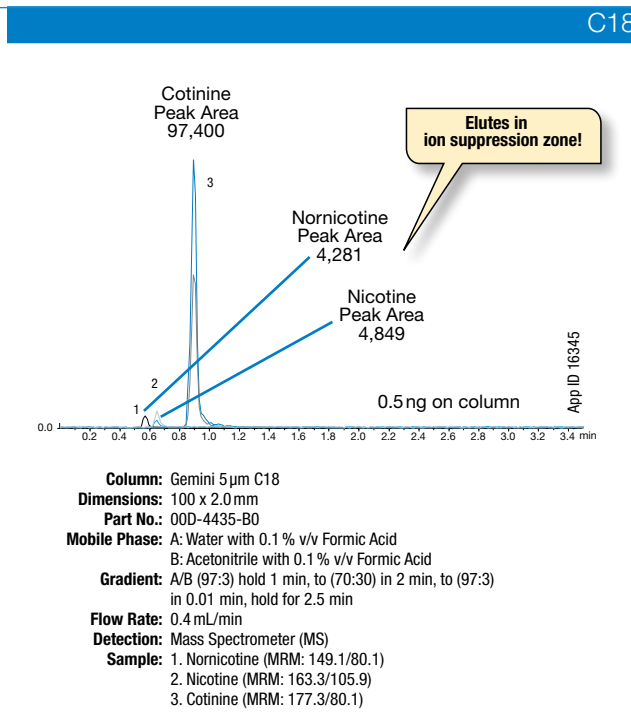
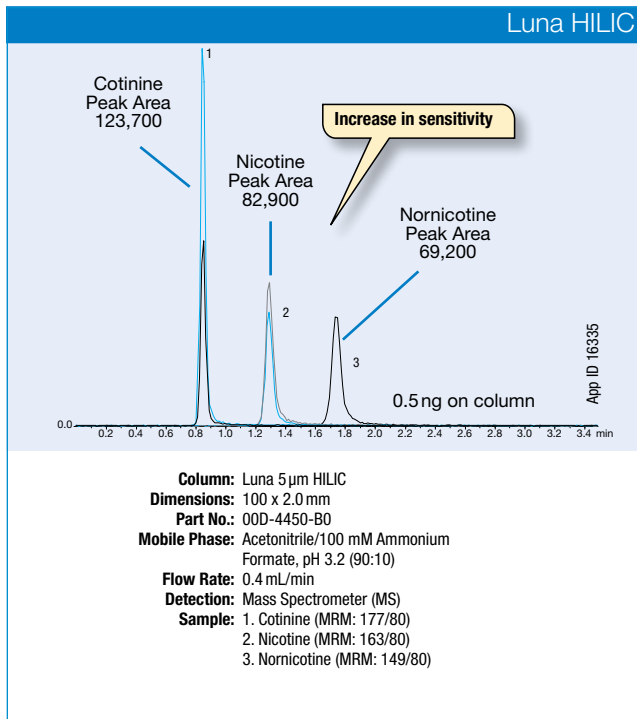
Column: Luna 5 μ m HILIC
Dimensions: 150 x 4.6 mm
Part No.: 00F-4450-E0
Mobile Phase: A: Acetonitrile
 B: Water
 C: 100 mM Ammonium Acetate, pH 5.8
Gradient: A/B/C (90:5:5) for 2.5 min to A/B/C (50:45:5) in 7.5 min, hold for 2.5 min. Re-equilibrate @ A/B/C (90:5:5) for 7.5 min
Flow Rate: 2.0 mL/min
Detection: UV @ 260 nm
Sample: 1. p-Aminobenzoic Acid pK_a 4.7, H^+ pK_a 2.7 logP 0.83
 2. Nicotinamide H^+ pK_a 3.35 logP -0.37
 3. Riboflavin pK_a 10.2 logP -1.46
 4. Nicotinic Acid pK_a 4.7, H^+ pK_a 3.0 logP 0.36
 5. Pyridoxine H^+ pK_a 5.6, pK_a 8.6 logP -0.77
 6. Thiamine H^+ pK_a 5.5 logP -4.6
 7. Ascorbic Acid pK_a 4.1, 11.2 logP -1.85
 8. Cyanocobalamin pK_a 1.59 logP -0.90
 9. Folic Acid pK_a 2.7, 4.1, 8.9 logP -0.02



Luna HILIC (cont'd) Improved MS Sensitivity

The increased retention in HILIC allows elution of the analytes outside the suppression region and thus increases detector sensitivity. In addition, the Luna HILIC column also resolves the compounds with the reverse order of that seen in reversed phase LC.

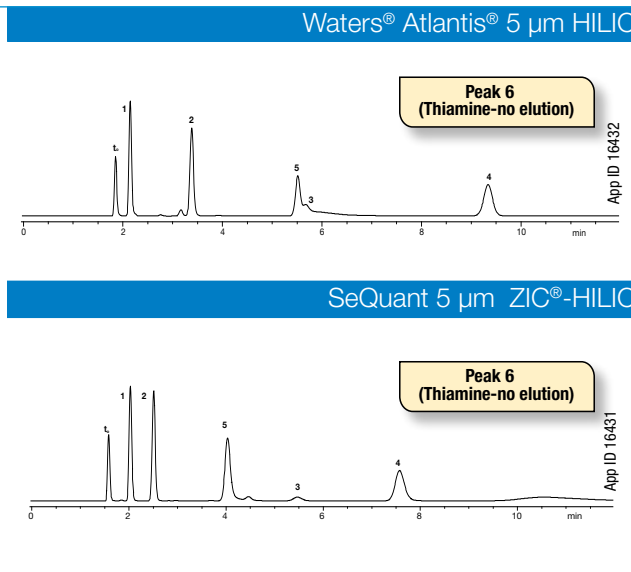
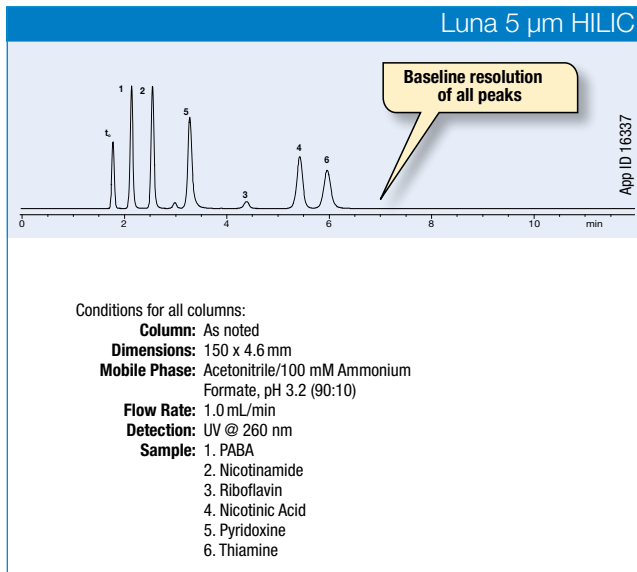
Nicotine and Metabolites



Unique HILIC Selectivity

Not all HILIC columns are alike, Luna HILIC columns deliver on the exacting standards you have come to trust from the Luna product line.

HILIC Column Comparison**



** The comparative data presented here may not be representative for all applications.

Luna PFP(2)

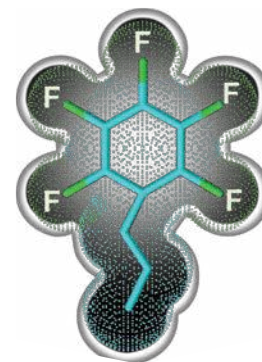
Powerful Selectivity for Reversed Phase Methods

Luna PFP(2) columns provide remarkable selectivity for highly polar compounds, complex natural products, isomers, and other closely related compounds. This is achieved by using a pentafluorophenyl with a propyl linkage which provides multiple retention mechanisms different to other reversed phase media.

- Achieve excellent selectivity using four mechanisms of solute/stationary phase interactions
- Extremely discerning for halogenated, aromatic and conjugated compounds
- Provides orthogonal selectivity even using traditional reversed phase mobile phase systems

Luna PFP(2) Selectivity is achieved through 4 of the 5 mechanisms of interaction

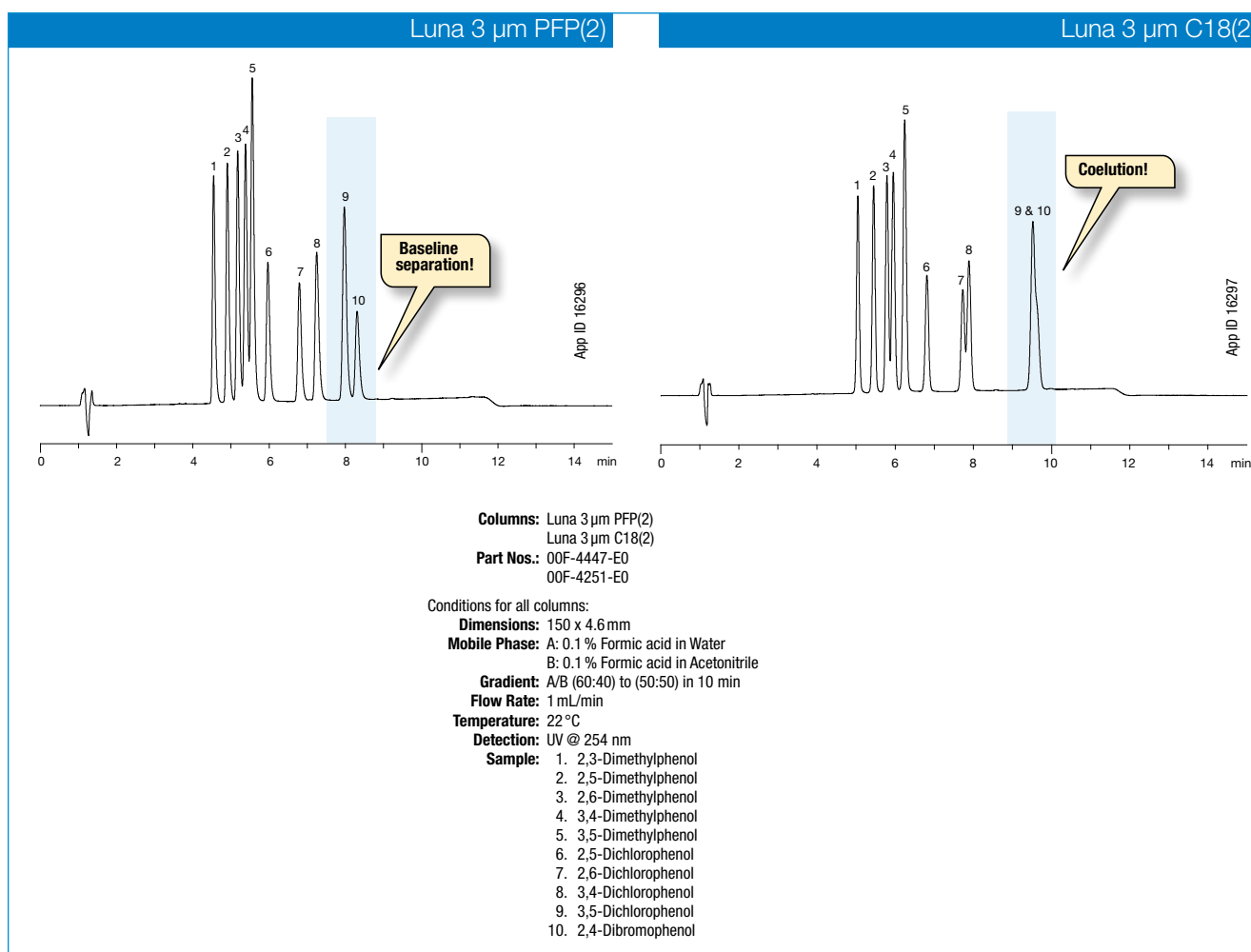
- Hydrogen Bonding
- Dipole-Dipole Interactions
- Aromatic and π - π Interactions
- Hydrophobic



A typical alkyl phase (C18, C8) achieves selectivity through only 1 mechanism of interaction.

Positional Isomers of Halogenated Phenols

Halogens can radically increase the polarity of a compound, thus decreasing typical retention characteristics. Luna PFP(2) columns retain, discriminate, and separate halogens easily.



Ordering Information

2.5 µm High Speed Technology (HST) Columns (mm)					
Phase	30 x 2.0	50 x 2.0	100 x 2.0	50 x 3.0	100 x 3.0
Luna 2.5 µm C18(2)-HST	00A-4446-B0	00B-4446-B0	00D-4446-B0	00B-4446-Y0	00D-4446-Y0



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

3 µm and 5 µm Capillary Columns (mm)							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	20 x 0.30	20 x 0.50
3 µm C8(2)	00B-4248-AC	00F-4248-AC	—	00B-4248-AF	00F-4248-AF	—	03M-4248-AC	03M-4248-AF
3 µm C18(2)	00B-4251-AC	00F-4251-AC	00G-4251-AC	00B-4251-AF	00F-4251-AF	00G-4251-AF	03M-4251-AC	03M-4251-AF
5 µm C8(2)	—	00F-4249-AC	00G-4249-AC	—	00F-4249-AF	—	03M-4249-AC	03M-4249-AF
5 µm C18(2)	00B-4252-AC	00F-4252-AC	00G-4252-AC	00B-4252-AF	00F-4252-AF	00G-4252-AF	03M-4252-AC	03M-4252-AF
5 µm Phenyl-Hexyl	00B-4257-AC	—	—	00B-4257-AF	—	—	—	—



For Fused Silica Capillary Adapter, see p. 367

MercuryMS™ LC/MS Cartridges (mm)						Columns (mm)	
3 µm	Phase	10 x 2.0	10 x 4.0	20 x 2.0	20 x 4.0	20 x 2.0	20 x 4.0
Luna	C18(2)	00N-4251-B0-CE	00N-4251-D0-CE	00M-4251-B0-CE	00M-4251-D0-CE	00M-4251-B0	00M-4251-D0
Luna	C8(2)	00N-4248-B0-CE	00N-4248-D0-CE	00M-4248-B0-CE	00M-4248-D0-CE	00M-4248-B0	00M-4248-D0
5 µm	Phase	10 x 2.0	—	20 x 2.0	20 x 4.0	—	—
Luna	C18(2)	00N-4252-B0-CE	—	00M-4252-B0-CE	00M-4252-D0-CE	—	—
Luna	C8(2)	00N-4249-B0-CE	—	00M-4249-B0-CE	00M-4249-D0-CE	—	—



MercuryMS™ Cartridge Holders



Direct-Connect Holder

Standard Holder

Ordering Information

Direct-Connect Cartridge Holders		
Part No.	Description	Price
CHO-7187	10 mm direct-connect holder	
CHO-7188	20 mm direct-connect holder	
Standard Cartridge Holders		
Part No.	Description	Price
CHO-5846	10 mm standard holder	
CHO-5845	20 mm standard holder	

MercuryMS™ 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: 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		KHO-7333	KHO-7334
Kit B includes 1 ea of: 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		KHO-7335	KHO-7336

*SecurityGuard™ Analytical Cartridges require holder, Part No.: KJ0-4282

Ordering Information

3 µm Microbore and Minibore Columns (mm)							SecurityGuard Cartridges (mm)
Phases	50 x 1.0	150 x 1.0	30 x 2.0	50 x 2.0	100 x 2.0	150 x 2.0	4 x 2.0*
Silica(2)	—	—	00A-4162-B0	00B-4162-B0	00D-4162-B0	00F-4162-B0	AJO-4347
C8(2)	00B-4248-A0	00F-4248-A0	00A-4248-B0	00B-4248-B0	00D-4248-B0	00F-4248-B0	AJO-4289
C18(2)	00B-4251-A0	00F-4251-A0	00A-4251-B0	00B-4251-B0	00D-4251-B0	00F-4251-B0	AJO-4286
CN	—	—	00A-4254-B0	00B-4254-B0	00D-4254-B0	00F-4254-B0	AJO-4304
Phenyl-Hexyl	00B-4256-A0	—	00A-4256-B0	00B-4256-B0	00D-4256-B0	00F-4256-B0	AJO-4350
NH ₂	—	00F-4377-A0	00A-4377-B0	00B-4377-B0	00D-4377-B0	00F-4377-B0	AJO-4301
HILIC	—	—	—	00B-4449-B0	00D-4449-B0	00F-4449-B0	AJO-8328
PPP(2)	—	—	00A-4447-B0	00B-4447-B0	00D-4447-B0	00F-4447-B0	AJO-8326

for ID: 2.0-3.0 mm

Ordering Information

3 µm Narrow Bore and Analytical Columns (mm)									SecurityGuard™ Cartridges (mm)	
Phases	30 x 3.0	50 x 3.0	150 x 3.0	30 x 4.6	50 x 4.6	75 x 4.6	100 x 4.6	150 x 4.6	4 x 2.0*	4 x 3.0*
									/10pk	/10pk
Silica(2)	—	—	00F-4162-YO	—	00B-4162-EO	—	00D-4162-EO	00F-4162-EO	AJO-4347	AJO-4348
C8(2)	00A-4248-YO	00B-4248-YO	00F-4248-YO	00A-4248-EO	00B-4248-EO	00C-4248-EO	00D-4248-EO	00F-4248-EO	AJO-4289	AJO-4290
C18(2)	00A-4251-YO	00B-4251-YO	00F-4251-YO	00A-4251-EO	00B-4251-EO	00C-4251-EO	00D-4251-EO	00F-4251-EO	AJO-4286	AJO-4287
CN	—	00B-4254-YO	00F-4254-YO	00A-4254-EO	00B-4254-EO	00C-4254-EO	00D-4254-EO	00F-4254-EO	AJO-4304	AJO-4305
Phenyl-Hexyl	—	00B-4256-YO	00F-4256-YO	00A-4256-EO	00B-4256-EO	00C-4256-EO	00D-4256-EO	00F-4256-EO	AJO-4350	AJO-4351
NH ₂	—	00B-4377-YO	00F-4377-YO	—	00B-4377-EO	—	00D-4377-EO	00F-4377-EO	AJO-4301	AJO-4302
HILIC	—	00B-4449-YO	00F-4449-YO	—	—	—	00D-4449-EO	00F-4449-EO	AJO-8328	AJO-8329
PPF(2)	—	00B-4447-YO	00F-4447-YO	—	00B-4447-EO	—	00D-4447-EO	00F-4447-EO	AJO-8326	AJO-8327

for ID: 2.0-3.0 mm 3.2-8.0 mm

5 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	150 x 2.0	250 x 2.0	4 x 2.0*	
								/10pk	
Silica(2)	—	—	—	—	00B-4274-BO	00F-4274-BO	00G-4274-BO	AJO-4347	
C5	—	—	—	00A-4043-BO	00B-4043-BO	00F-4043-BO	—	AJO-4292	
C8(2)	00B-4249-AO	00F-4249-AO	—	00A-4249-BO	00B-4249-BO	00F-4249-BO	00G-4249-BO	AJO-4289	
C18(2)	00B-4252-AO	00F-4252-AO	00G-4252-AO	00A-4252-BO	00B-4252-BO	00F-4252-BO	00G-4252-BO	AJO-4286	
CN	—	—	—	00A-4255-BO	00B-4255-BO	00F-4255-BO	00G-4255-BO	AJO-4304	
Phenyl-Hexyl	00B-4257-AO	—	00G-4257-AO	00A-4257-BO	00B-4257-BO	00F-4257-BO	00G-4257-BO	AJO-4350	
NH ₂	—	00F-4378-AO	—	00A-4378-BO	00B-4378-BO	00F-4378-BO	00G-4378-BO	AJO-4301	
PPF(2)	—	—	—	00A-4448-BO	00B-4448-BO	00F-4448-BO	—	AJO-8326	

for ID: 2.0-3.0 mm



5 µm Narrow Bore and Analytical Columns (mm)								SecurityGuard™ Cartridges (mm)	
Phases	30 x 3.0	50 x 3.0	150 x 3.0	250 x 3.0	30 x 4.6	50 x 4.6	75 x 4.6	4 x 2.0*	4 x 3.0*
								/10pk	/10pk
Silica(2)	—	—	—	—	—	00B-4274-EO	—	AJO-4347	AJO-4348
C5	—	—	00F-4043-YO	—	—	00B-4043-EO	—	AJO-4292	AJO-4293
C8(2)	—	00B-4249-YO	00F-4249-YO	00G-4249-YO	00A-4249-EO	00B-4249-EO	00C-4249-EO	AJO-4289	AJO-4290
C18(2)	00A-4252-YO	00B-4252-YO	00F-4252-YO	00G-4252-YO	00A-4252-EO	00B-4252-EO	00C-4252-EO	AJO-4286	AJO-4287
CN	—	00B-4255-YO	00F-4255-YO	00G-4255-YO	00A-4255-EO	00B-4255-EO	00C-4255-EO	AJO-4304	AJO-4305
Phenyl-Hexyl	00A-4257-YO	00B-4257-YO	00F-4257-YO	00G-4257-YO	00A-4257-EO	00B-4257-EO	00C-4257-EO	AJO-4350	AJO-4351
NH ₂	—	00B-4378-YO	00F-4378-YO	00G-4378-YO	00A-4378-EO	00B-4378-EO	00C-4378-EO	AJO-4301	AJO-4302
SCX	—	—	—	—	—	00B-4398-EO	—	AJO-4307	AJO-4308
HILIC	—	—	00F-4450-YO	—	—	—	—	AJO-8328	AJO-8329
PPF(2)	—	00B-4448-YO	00F-4448-YO	—	—	00B-4448-EO	—	AJO-8326	AJO-8327

for ID: 2.0-3.0 mm 3.2-8.0 mm

5 µm Analytical and Semi-Prep Columns (mm)						SecurityGuard™ Cartridges (mm)	
Phases	100 x 4.6	150 x 4.6	250 x 4.6	250 x 10	250 x 15	4 x 3.0*	10 x 10 [‡]
						/10pk	/3pk
Silica(2)	00D-4274-EO	00F-4274-EO	00G-4274-EO	00G-4274-NO	—	AJO-4348	AJO-7223
C5	00D-4043-EO	00F-4043-EO	00G-4043-EO	—	—	AJO-4293	AJO-7372
C8(2)	00D-4249-EO	00F-4249-EO	00G-4249-EO	00G-4249-NO	—	AJO-4290	AJO-7222
C18(2)	00D-4252-EO	00F-4252-EO	00G-4252-EO	00G-4252-NO	00G-4252-AK	AJO-4287	AJO-7221
CN	00D-4255-EO	00F-4255-EO	00G-4255-EO	00G-4255-NO	—	AJO-4305	AJO-7313
Phenyl-Hexyl	00D-4257-EO	00F-4257-EO	00G-4257-EO	00G-4257-NO	—	AJO-4351	AJO-7314
NH ₂	00D-4378-EO	00F-4378-EO	00G-4378-EO	00G-4378-NO	—	AJO-4302	AJO-7364
SCX	00D-4398-EO	00F-4398-EO	00G-4398-EO	00G-4398-NO	—	AJO-4308	AJO-7369
HILIC	00D-4450-EO	00F-4450-EO	00G-4450-EO	00G-4450-NO	—	AJO-8329	AJO-8902
PPF(2)	00D-4448-EO	00F-4448-EO	00G-4448-EO	00G-4448-NO	—	AJO-8327	AJO-8376

for ID: 3.2-8.0 mm 9-16 mm

*SecurityGuard™ Analytical Cartridges require holder, Part No.: KJO-4282
[‡]SemiPrep SecurityGuard™ Cartridges require holder, Part No.: AJO-7220

If Luna 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, send in your comparative data within 45 days and keep the Luna column for FREE.

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	50 x 30	100 x 30	250 x 30	15 x 21.2**	15 x 30 *
								/ea	/ea
5 μm									
Silica(2)	00B-4274-P0-AX	00D-4274-P0-AX	00F-4274-P0-AX	00G-4274-P0-AX	00B-4274-U0-AX	00D-4274-U0-AX	00G-4274-U0-AX	AJO-7229	AJO-8312
C5	—	—	00F-4043-P0-AX	—	—	—	—	—	—
C8(2)	00B-4249-P0-AX	00D-4249-P0-AX	00F-4249-P0-AX	—	00B-4249-U0-AX	00D-4249-U0-AX	—	AJO-7840	AJO-8302
C18(2)	00B-4252-P0-AX	00D-4252-P0-AX	00F-4252-P0-AX	00G-4252-P0-AX	00B-4252-U0-AX	00D-4252-U0-AX	00G-4252-U0-AX	AJO-7839	AJO-8301
CN	00B-4255-P0-AX	—	00F-4255-P0-AX	00G-4255-P0-AX	—	00D-4255-U0-AX	—	AJO-8220	AJO-8311
Phenyl-Hexyl	00B-4257-P0-AX	00D-4257-P0-AX	00F-4257-P0-AX	—	00B-4257-U0-AX	00D-4257-U0-AX	—	AJO-7841	AJO-8303
NH ₂	—	00D-4378-P0-AX	00F-4378-P0-AX	00G-4378-P0-AX	—	—	—	AJO-8162	AJO-8309
PFP(2)	00B-4448-P0-AX	00D-4448-P0-AX	00F-4448-P0-AX	00G-4448-P0-AX	00B-4448-U0-AX	00D-4448-U0-AX	00G-4448-U0-AX	AJO-8377	AJO-8378
HILIC	00B-4450-P0-AX	00D-4450-P0-AX	00F-4450-P0-AX	00G-4450-P0-AX	—	—	00G-4450-U0-AX	—	—
								for ID: 18-29 mm	30-49 mm

Axia™ Packed Preparative Columns (mm) (continued)								SecurityGuard Cartridges (mm)	
Phases	50 x 21.2	100 x 21.2	250 x 21.2	50 x 30	250 x 30	50 x 50	250 x 50	15 x 21.2**	15 x 30 *
								/ea	/ea
10 μm									
Silica(2)	—	—	00G-4091-P0-AX	—	00G-4091-U0-AX	—	—	AJO-7229	AJO-8312
C5	—	00D-4092-P0-AX	00G-4092-P0-AX	—	—	—	00G-4092-V0-AX	—	—
C8(2)	00B-4250-P0-AX	—	00G-4250-P0-AX	00B-4250-U0-AX	—	—	00G-4250-V0-AX	AJO-7840	AJO-8302
C18(2)	00B-4253-P0-AX	00D-4253-P0-AX	00G-4253-P0-AX	00B-4253-U0-AX	00G-4253-U0-AX	00B-4253-V0-AX	00G-4253-V0-AX	AJO-7839	AJO-8301
CN	—	—	00G-4300-P0-AX	—	—	—	—	AJO-8220	AJO-8311
Phenyl-Hexyl	—	—	00G-4285-P0-AX	—	00G-4285-U0-AX	—	—	AJO-7841	AJO-8303
NH ₂	—	—	00G-4379-P0-AX	—	—	—	—	AJO-8162	AJO-8309
								for ID: 18-29 mm	30-49 mm

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*
			/10 pk	/3 pk
Silica(2)	00G-4091-E0	00G-4091-N0	AJO-4348	AJO-7223
C5	00G-4092-E0	00G-4092-N0	AJO-4293	AJO-7372
C8(2)	00G-4250-E0	00G-4250-N0	AJO-4290	AJO-7222
C18(2)	00G-4253-E0	00G-4253-N0	AJO-4287	AJO-7221
CN	00G-4300-E0	00G-4300-N0	AJO-4305	AJO-7313
Phenyl-Hexyl	00G-4285-E0	00G-4285-N0	AJO-4351	AJO-7314
NH ₂	00G-4379-E0	00G-4379-N0	AJO-4302	AJO-7364
SCX	00G-4401-E0	00G-4401-N0	AJO-4308	AJO-7369
			for ID: 3.2-8.0 mm	9-16 mm

15 μm Pilot Scale Columns (mm)	
Phases	250 x 4.6
Silica(2)	00G-4271-E0
C8(2)	00G-4272-E0
C18(2)	00G-4273-E0
Phenyl-Hexyl	00G-4286-E0

*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



See our latest developments in High-throughput Purifications starting on page 346
 For more dimensions and phases of Axia packed preparative columns, see pp. 354-355
 For SecurityGuard Cartridge Holders and Cartridges, see p. 254
 For Bulk Media, see p. 356



Method development column kits and method validation column kits are available. Contact Phenomenex for details.
 Improve analyte sensitivity and reduce baseline noise with Strata SPE tubes and well plates, see p. 50 for more information

