Raptor™ LC Columns

NEW!

SPP speed.
USLC® resolution.

A new species of column.

Restek is excited to announce the evolution of superficially porous particles with the introduction of Raptor™ LC columns and guards.

Superficially porous particles (commonly referred to as SPP or "core-shell" particles) changed the world of LC by dramatically boosting column efficiency and reducing analysis times, but they were only the beginning. With Raptor™ LC columns, Restek chemists have combined the speed of SPP with the resolution of highly selective USLC® technology. This new species of chromatographic column allows you to more easily achieve peak separation and faster analysis times without expensive UHPLC instrumentation.

- Higher efficiency for drastically faster analysis times.
- Better selectivity for substantially improved resolution.
- Increased sample throughput with existing HPLC instrumentation.
- Long-lasting ruggedness for dependable reproducibility.

Selectivity Accelerated

Put Raptor™ LC columns and guards to the test on your most challenging workflows!

Dissecting the Raptor™ LC Column

Larger 2 µm Frit
Prevents clogging better than commonly used 0.5 µm frits; boosts column lifetime and helps maintain optimal pressures.

Rugged Label
Clearly identifies both flow direction and column; resists solvents and tearing to last as long as your column does.

Proprietary Column-Packing Technique
Provides greater pressure stability (600 bar for 2.7 µm; 400 bar for 5 µm); achieves higher linear velocities without sacrificing efficiency or lifetime.

Raptor™ SPP Particles

Robust 2.7 and 5 µm Particles
Let you run high-speed analyses without UHPLC.

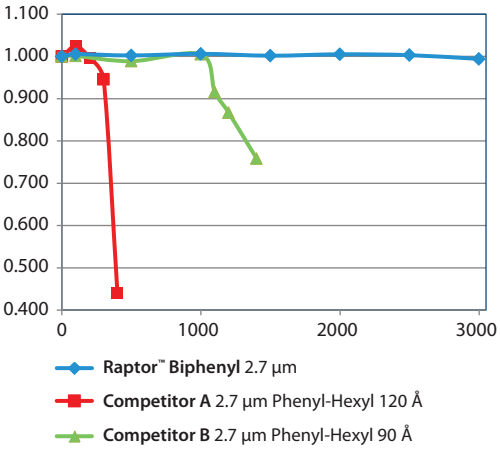
Narrow Silica Distribution
Ensures high efficiency and consistent flows.

Updated Bonding and QC
Guarantee retention time stability, run to run and column to column.

Pressure Stability

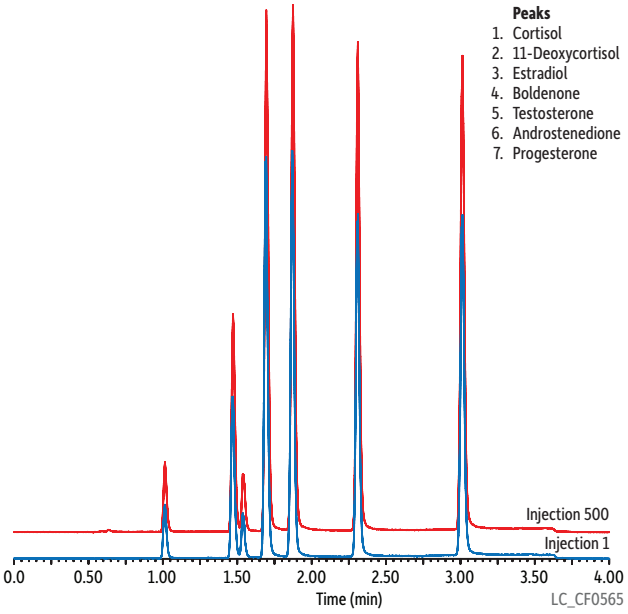
At high pressures, competitor phenyl-hexyl columns experience a quick and sharp drop-off in efficiency, but Raptor™ columns are unaffected to at least 3,000 injections.

% Efficiency vs # of Injections
Raptor™ 2.7 µm Column vs Competitor
50 x 2.1 mm Phenyl-Hexyls @ 600 bar



Reproducibility

Even after hundreds of injections, a Raptor™ column will provide consistent, reliable data.



Column: Raptor™ Biphenyl (cat.# 9309A1E); Dimensions: 100 mm x 3.0 mm ID; Particle Size: 2.7 µm; Pore Size: 90 Å; Temp.: 30 °C; **Sample:** Diluent: initial mobile phase; Conc.: 50 ng/mL; Inj. Vol.: 5 µL **Mobile Phase:** A: 0.1% formic acid in water, B: 0.1% formic acid in acetonitrile; **Gradient (%B):** 0.00 min (40%), 3.00 min (80%), 3.01 min (40%), 5.00 min (40%); **Flow:** 0.700 mL/min; **Detector:** Waters Xevo TQ-S; Ion Mode: ESI+; **Instrument:** Waters.

Raptor™ EXP® Guard Column

To help protect your investment and further extend the life of our already-rugged Raptor™ LC columns, we have mated our new superficially porous particles with patent-pending guard column hardware developed by Optimize Technologies. A Raptor™ LC guard column cartridge in an EXP® direct connect holder is the ultimate in column protection.

Patented Titanium Hybrid Ferrules

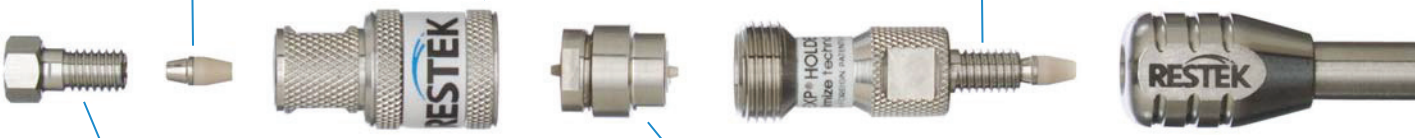
Can be installed repeatedly without compromising high-pressure seal.

Free-Turn® Architecture

Allows you to change cartridges without breaking inlet/outlet fluid connections—and without tools.

Auto-Adjusting Connection

Provides ZDV (zero dead volume) connection to any 10-32 female port.



Flexible Design

Replace nut with longer or even tool-free options to best suit your needs.

Unidirectional Raptor™ Cartridge

In-Tandem Development
Made to pair perfectly with Raptor™ LC columns.

Superior Packing Technique
Withstands 600 bar (2.7 µm) / 400 bar (5 µm) operating pressures.

Restek® Quality
Backed by the manufacturing and QC systems you trust.

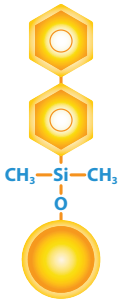
Raptor™ Biphenyl LC Columns (USP L11)

NEW!

Chromatographic Properties

The innovative Biphenyl is Restek's most popular LC stationary phase because it is particularly adept at separating compounds that are hard to resolve or that elute early on C18 and other phenyl chemistries. As a result, the rugged Raptor™ Biphenyl column is extremely useful for fast separations in bioanalytical testing applications like drug and metabolite analyses, especially those that require a mass spectrometer (MS). Increasing retention of early-eluting compounds can limit ionization suppression, and the heightened selectivity helps eliminate the need for complex mobile phases that are not well-suited for MS detection.

Length	2.1 mm cat.#	3.0 mm cat.#	4.6 mm cat.#
2.7 µm Columns			
30 mm	9309A32	9309A3E	9309A35
50 mm	9309A52	9309A5E	9309A55
100 mm	9309A12	9309A1E	9309A15
150 mm	9309A62	9309A6E	9309A65
5 µm Columns			
30 mm	—	930953E	—
50 mm	9309552	930955E	9309555
100 mm	9309512	930951E	9309515
150 mm	9309562	930956E	9309565
250 mm	—	—	9309575



Column Characteristics:

Stationary Phase Category: Phenyl (L11)
Ligand Type: Biphenyl
Particle: 2.7 µm or 5 µm superficially porous silica (SPP or "core-shell")
Pore Size: 90 Å
Surface Area: 150 m^2/g (2.7 µm) or 100 m^2/g (5 µm)
Recommended Usage:
pH range: 1.5–8.0
Maximum Temperature: 80 °C
Maximum Pressure: 600 bar / 8,700 psi (2.7 µm) or 400 bar / 5,800 psi (5 µm)

Properties:

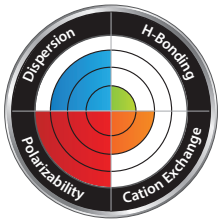
- Increased retention for dipolar, unsaturated, or conjugated solutes.
- Enhanced selectivity when used with methanolic mobile phase.
- Ideal for increasing sensitivity and selectivity in LC-MS analyses.

Switch to a Biphenyl when:

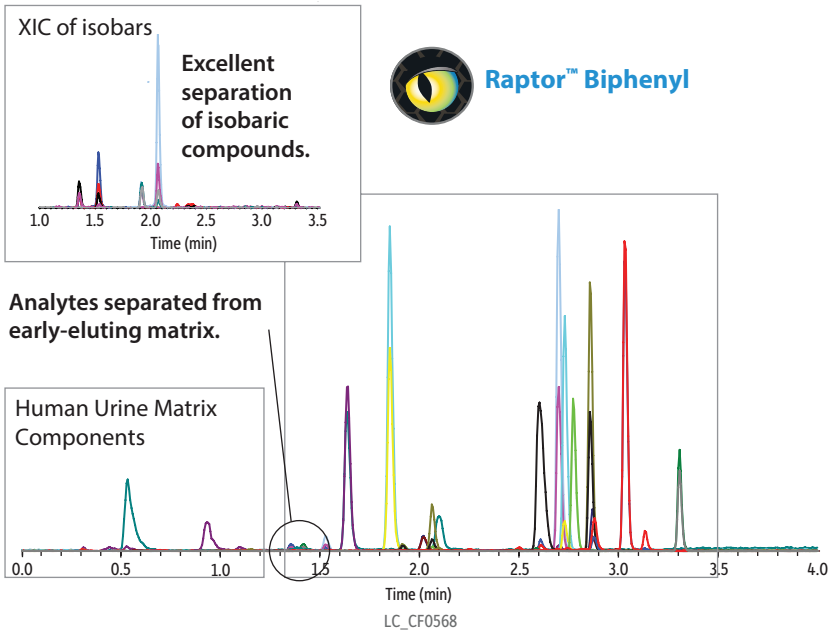
- Limited selectivity is observed on a C18.
- You need to increase retention of hydrophilic aromatics.

USLC® Column Interaction Profile

(See page 161 for more information.)



Pain Panel in Urine on Raptor™ Biphenyl (50 x 3.0 mm) by LC-MS/MS



For compound listing including isobars, visit **www.restek.com** and search for LC_CF0568.

Column	Raptor™ Biphenyl (cat.# 9309A5E)
Dimensions:	50 mm x 3.0 mm ID
Particle Size:	2.7 µm
Temp.:	30 °C
Sample	
Diluent:	Urine:mobile phase A:mobile phase B (17:76:7)
Conc.:	10-100 ng/mL
Inj. Vol.:	10 µL
Mobile Phase	
A:	Water + 0.1% formic acid
B:	Methanol + 0.1% formic acid

Time (min)	Flow (mL/min)	%A	%B
0.00	0.6	90	10
1.50	0.6	55	45
2.50	0.6	0	100
3.70	0.6	0	100
3.71	0.6	90	10
5.00	0.6	90	10

Detector	AB SCIEX API 4000™ MS/MS
Ion Source:	TurboIonSpray®
Ion Mode:	ESI+
Instrument	API LC-MS/MS
Notes	Lorazepam was prepared at 100 ng/mL; all other analytes are 10 ng/mL.

Raptor™ ARC-18 LC Columns (USP L1)

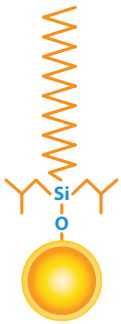
NEW!

Chromatographic Properties

Designed and intended specifically for use on LC-MS/MS systems, the Raptor™ ARC-18 column offers a well-balanced retention profile without the drawbacks of using an ordinary C18 in the harsh, acidic mobile phases needed for mass spectrometry (MS). Even after extended use in these low-pH (≤ 2.0) conditions, the sterically protected ARC-18 offers consistent retention, peak shape, and response for charged bases, neutral acids, small polar compounds, and more. For the rapid analysis of large, multiclass assays by LC-MS/MS, the acid-resistant Raptor™ ARC-18 truly is *ahead of the curve*.

Column Characteristics:

Stationary Phase Category: C18, octadecylsilane (L1)
Ligand Type: Sterically protected C18
Particle: 2.7 µm or 5 µm superficially porous silica (SPP or "core-shell")
Pore Size: 90 Å
Surface Area: 150 m^2/g (2.7 µm) or 100 m^2/g (5 µm)
Recommended Usage:
pH range: 1.0–8.0
Maximum Temperature: 80 °C
Maximum Pressure: 600 bar / 8,700 psi (2.7 µm) or 400 bar / 5,800 psi (5 µm)



Properties:

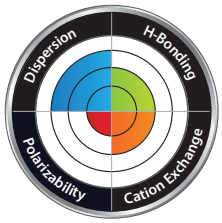
- Well-balanced retention profile.
- Sterically protected and acid-resistant to resist harsh, low-pH mobile phases.
- Ideal for use with sensitive detectors like mass spec.

Switch to an ARC-18 when:

- You are analyzing large, multiclass lists by LC-MS/MS.
- Strongly acidic (pH 1–3) mobile phases are required.

USLC® Column Interaction Profile

(See page 161 for more information.)



Length	2.1 mm cat.#	3.0 mm cat.#	4.6 mm cat.#
2.7 µm Columns			
30 mm	9314A32	9314A3E	9314A35
50 mm	9314A52	9314A5E	9314A55
100 mm	9314A12	9314A1E	9314A15
150 mm	9314A62	9314A6E	9314A65
5 µm Columns			
30 mm	—	931453E	—
50 mm	9314552	931455E	9314555
100 mm	9314512	931451E	9314515
150 mm	9314562	931456E	9314565
250 mm	—	—	9314575

Raptor™ C18 LC Columns (USP L1)

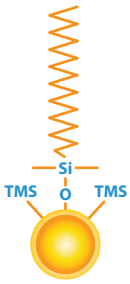
NEW!

Chromatographic Properties

When you need a general-purpose LC column, don't just grab any C18. Choose the speed, efficiency, and long-lasting ruggedness of the Raptor™ C18. This traditional end-capped C18 offers the highest hydrophobic retention of any Raptor™ phase, and it is compatible with a wide range of mobile phases from moderately acidic to neutral (pH 2–8). Whether for food safety or environmental or bioanalytical analyses, this phase offers consistently excellent data quality in less time across myriad reversed-phase applications, matrices, and compound classes. To lower costs and improve profitability, you need columns to last longer, data to be reproducible, and existing HPLC instrumentation to run faster. Get there with the only general-purpose C18 that gives you *Selectivity Accelerated*.

Column Characteristics:

Stationary Phase Category: C18, octadecylsilane (L1)
Ligand Type: End-capped C18
Particle: 2.7 µm or 5 µm superficially porous silica (SPP or "core-shell")
Pore Size: 90 Å
Surface Area: 150 m^2/g (2.7 µm) or 100 m^2/g (5 µm)
Recommended Usage:
pH range: 2.0–8.0
Maximum Temperature: 80 °C
Maximum Pressure: 600 bar / 8,700 psi (2.7 µm) or 400 bar / 5,800 psi (5 µm)



Properties:

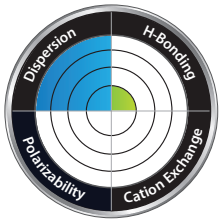
- Compatible with moderately acidic to neutral mobile phases (pH 2–8).
- Excellent data quality in food, environmental, bioanalytical, and other applications.

Switch to a C18 when:

- You need a general-purpose column for reversed-phase chromatography.
- You need to increase retention of hydrophobic compounds.

USLC® Column Interaction Profile

(See page 161 for more information.)



Length	2.1 mm cat.#	3.0 mm cat.#	4.6 mm cat.#
2.7 µm Columns			
30 mm	9304A32	9304A3E	9304A35
50 mm	9304A52	9304A5E	9304A55
100 mm	9304A12	9304A1E	9304A15
150 mm	9304A62	9304A6E	9304A65
5 µm Columns			
30 mm	—	930453E	—
50 mm	9304552	930455E	9304555
100 mm	9304512	930451E	9304515
150 mm	9304562	930456E	9304565
250 mm	—	—	9304575

Raptor™ EXP® Guard Column Cartridges

- Free-Turn® architecture lets you change cartridges by hand without breaking inlet/outlet fluid connections—no tools needed.
- Patented titanium hybrid ferrules can be installed repeatedly without compromising high-pressure seal.
- Auto-adjusting design provides ZDV (zero dead volume) connection to any 10-32 female port.
- Guard column cartridges require EXP® direct connect holder (cat.# 25808).
- Pair with EXP® hand-tight fitting (cat.# 25937–25939) for tool-free installation.

To help protect your investment and further extend the life of our already-rugged LC columns, Restek offers the patent-pending guard column hardware developed by Optimize Technologies. A Restek® LC guard cartridge in an EXP® direct connect holder is the ultimate in column protection.

NEW!

Raptor™ EXP® Guard Column Cartridge

Learn more about the Raptor™ EXP® guard column on page 156!

Description	Particle Size	qty.	5 x 2.1 mm cat.#	5 x 3.0 mm cat.#	5 x 4.6 mm cat.#
Raptor ARC-18 EXP Guard Column Cartridge	2.7 µm	3-pk.	9314A0252	9314A0253	9314A0250
Raptor ARC-18 EXP Guard Column Cartridge	5 µm	3-pk.	931450252	931450253	931450250
Raptor Biphenyl EXP Guard Column Cartridge	2.7 µm	3-pk.	9309A0252	9309A0253	9309A0250
Raptor Biphenyl EXP Guard Column Cartridge	5 µm	3-pk.	930950252	930950253	930950250
Raptor C18 EXP Guard Column Cartridge	2.7 µm	3-pk.	9304A0252	9304A0253	9304A0250
Raptor C18 EXP Guard Column Cartridge	5 µm	3-pk.	930450252	930450253	930450250

Maximum cartridge pressure: 600 bar / 8,700 psi (2.7 µm) or 400 bar / 5,800 psi (5 µm)

EXP® Direct Connect Holder

Description	qty.	cat.#
EXP Direct Connect Holder for EXP Guard Cartridges (includes hex-head fitting & 2 ferrules)	ea.	25808

Maximum holder pressure: 20,000 psi (1,400 bar)

NEW!

25808
EXP® Direct Connect Holder

also available

Hand-Tight Nut (cat.# 25937–25939)
Upgrade the supplied nut to install your Raptor™ EXP® guard column by hand—no tools needed.

Long Hex-Head Nut (cat.# 25934)
Extend the nut on your Raptor™ EXP® guard column for easier access in tight spaces—no more bumped knuckles.

EXP® Hand-Tight Coupler (cat.# 25940)
Achieve tool-free 8,700+ psi (600 bar) seals anywhere in your LC system with EXP® hand-tight couplers and connectors.

See **page 335** for more EXP® hex-head fittings, couplers, replacement parts, and more.