

# Raptor

LC Columns

*Selectivity Accelerated*

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



**RESTEK**  
Pure Chromatography

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# The Dawn of an Era

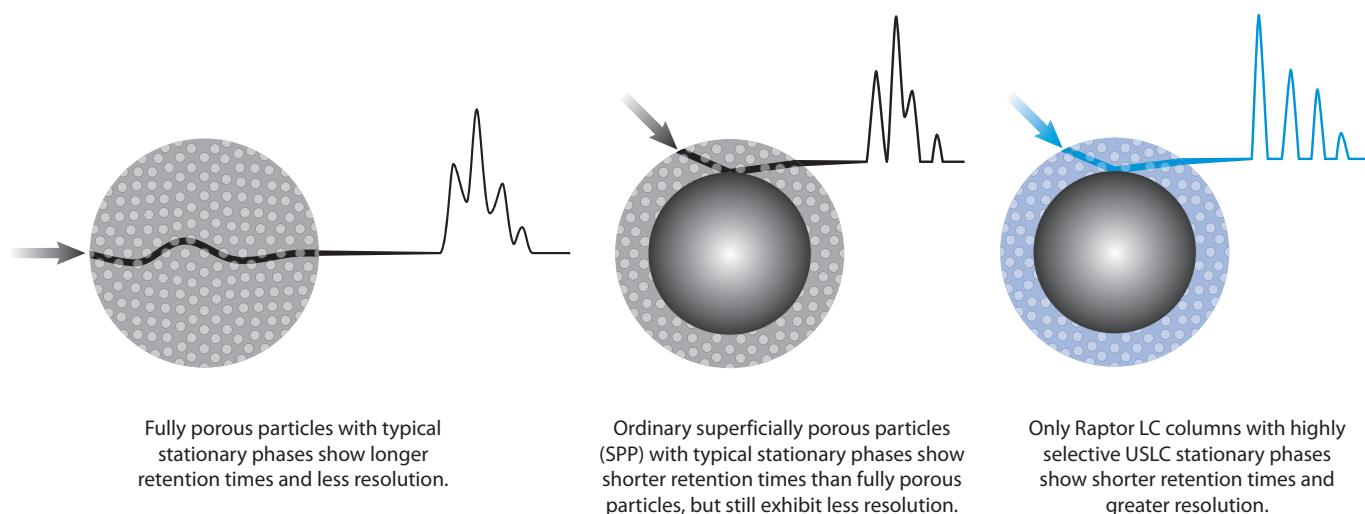
The efficiency of superficially porous particles (commonly referred to as SPP or “core-shell” particles) has been proven to provide fast separations with lower backpressures. This benefit helps customers achieve faster separations with their existing HPLC instruments. Coupled with small-particle technology, SPP also provides an efficiency boost to those running UHPLC when compared to fully porous particles. SPP particles feature a solid, impermeable core enveloped by a thin, porous layer of silica that decreases the diffusion path and reduces peak dispersion. As a result, they offer significantly higher efficiency than traditional fully porous particles of similar dimensions. Core-shell particles changed LC, but they were only the beginning....

## A New Species Has Evolved

Restek is proud to announce that SPP core-shell technology has evolved with the introduction of Raptor LC columns. Although column efficiency, which is boosted with superficially porous particles, considerably accelerates analysis time, it has little effect on resolution (i.e., peak separation). Selectivity, on the other hand, has a substantial impact on resolution, but shows minimal improvement in analysis times. Raptor LC columns bond rugged 1.8, 2.7, and 5  $\mu\text{m}$  superficially porous particles with Restek’s unique Ultra Selective Liquid Chromatography (USLC) phases to offer chromatographers the best of both worlds.

By being the first to combine the speed of SPP with the resolution of highly selective USLC technology, Raptor LC columns provide analysts with the most powerful tools available for fast and efficient method development. And, because they are from Restek, Raptor LC columns are backed by the manufacturing and quality systems you’ve come to trust along with the best Plus 1 service in the industry. Choose them for all of your valued assays to experience *Selectivity Accelerated*.

**Figure 1:** Only Raptor LC columns offer the higher efficiency of a superficially porous particle *plus* the improved resolution of USLC phases.



**Experience *Selectivity Accelerated*. Put Raptor LC columns and guards to the test today on your most challenging workflows.**

Want even better performance when analyzing mycotoxins and other metal-sensitive compounds?

Learn more at [www.restek.com/inert](http://www.restek.com/inert)



# Evolutionary Chromatography

It is only possible to fully utilize the efficiency of superficially porous particle technology when it is united with the power of USLC selectivity. With Raptor columns, you can speed up method development and enhance sample throughput. Using 2.7 and 5  $\mu\text{m}$  columns, traditional HPLC instruments gain significant efficiency and selectivity improvements without the need to upgrade, and Raptor 1.8  $\mu\text{m}$  LC columns can evolve UHPLC workflows by providing a one-two efficiency punch: superficially porous shells on small-core particles.

- Run faster and avoid lengthy gradient adjustments.
- Separate isobaric and hard-to-resolve compounds with ease.
- Avoid eluting compounds near the void volume and limit ion suppression.
- Skip the complex mobile phases and multiple method modifications.



Want even better performance when analyzing metal-sensitive compounds? Check out Inert LC columns at [www.restek.com/inert](http://www.restek.com/inert)

## Dissecting Raptor LC Columns

*A closer look at a new species*

### Adaptive Traits: Raptor LC Column

Restek's dedicated R&D group studied every aspect of superficially porous particles (commonly referred to as SPP or "core-shell" particles) to develop the bonding chemistries that are best suited to both the SPP construction and our highly selective USLC phases. But, we didn't stop there. In addition to implementing a new, proprietary column-packing technique, we upgraded our LC column hardware. By looking at not only the particles, but also the packing and hardware, we have made sure that you will get repeatable, rugged performance from each and every Raptor LC column.

#### Specially Selected Frits

Precision control over particle size allows the largest possible frit size, which prevents clogging, increases column lifetimes, 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 and achieves higher linear velocities without sacrificing efficiency or lifetime; columns hold up under the rigors of UHPLC injection cycles.



#### Raptor SPP Particles

##### A Range of Robust Particles

Accelerate traditional HPLC with 2.7 and 5  $\mu\text{m}$  particles; boost UHPLC with 1.8  $\mu\text{m}$ .

##### Narrow Silica Distribution

Ensures high efficiency and consistent flows.

##### Updated Bonding and QC

Guarantee retention time stability, run to run and column to column.

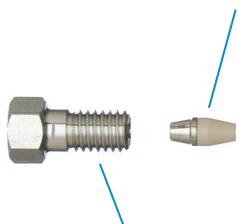
## Natural Protection

### Raptor EXP Guard Column— for All Raptor Columns

Regardless of its performance, lifespan, or frit size, the LC column is the most expensive consumable used for your chromatographic assay. 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 patented guard column hardware developed by Optimize Technologies. Great with any Raptor column to get ultimate protection from particulates and matrix contamination, especially when using dilute-and-shoot or other minimal sample preparation techniques.

#### Patented Titanium Hybrid Ferrules

Can be installed repeatedly without compromising high-pressure seal.



#### Flexible Design

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

#### 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.



#### Unidirectional Raptor Cartridge

##### In-Tandem Development

Made to pair perfectly with Raptor LC columns.

##### Superior Packing Technique

Withstands 1,034 bar (UHPLC)/600 bar (2.7  $\mu\text{m}$ )/400 bar (5  $\mu\text{m}$ ) operating pressures.

##### Restek Quality

Backed by the manufacturing and QC systems you trust.

Hybrid Ferrule U.S. Patent No. 8201854, EXP Holders U.S. Patent No. 8696902, EXP2 Wrench U.S. Patent No. D766055. Other U.S. and Foreign Patents Pending. The EXP, Free-Turn, and the Opti- prefix are registered trademarks of Optimize Technologies, Inc.

### UltraShield UHPLC PreColumn Filter— for 1.8 $\mu\text{m}$ Raptor Columns

Pair 1.8  $\mu\text{m}$  Raptor columns with an UltraShield filter instead of a guard cartridge to minimize extra column volume and maximize UHPLC sample throughput when using SPE, SLE, or other extensive sample preparations. They offer economical protection against microparticles with a negligible effect on column performance, and they are leak tight to 15,000 psi (1,034 bar). Better yet, an UltraShield filter won't contribute to system backpressure band broadening.



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Pure Chromatography

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