

Stationary Phase: **FluoroPhenyl**

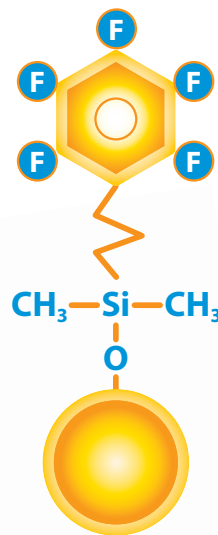
# Raptor

LC Columns

*Selectivity Accelerated*

## Get the Power of HILIC and RP Modes in One LC Column

Reversed-phase (RP) analysis on a C18 column is a common approach, but it isn't always the best strategy. You can do more with a Raptor FluoroPhenyl LC column—a rugged, reliable fluorinated phenyl that allows you to operate with confidence in either HILIC or RP mode.



**RESTEK**

Pure Chromatography

[www.restek.com/raptor](http://www.restek.com/raptor)

# Raptor FluoroPhenyl Columns

- Powerful performance for both reversed-phase and HILIC separations.
- Ideal for increasing sensitivity and selectivity in LC-MS analyses.
- Offers increased retention for charged bases compared to a C18.
- Rugged and reliable—fluorophenyl chemistry that gives reproducible results.

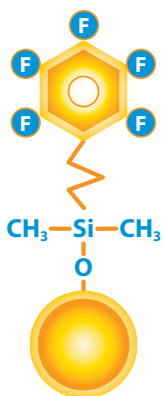
Switch to a Raptor FluoroPhenyl LC column when you need more retention and selectivity for basic and hydrophilic compounds than you can achieve on a C18.

Order yours today at [www.restek.com/raptor](http://www.restek.com/raptor)

**Part of Restek's Raptor LC column line featuring 1.8, 2.7, and 5  $\mu\text{m}$  SPP core-shell silica:**

- Higher efficiencies and resolution for drastically faster analysis times, especially for traditional HPLC instruments.
- Faster analyses mean increased sample throughput.
- Long-lasting ruggedness for dependable reproducibility.

## Column Description:



### Stationary Phase Category:

Pentafluorophenyl propyl (L43)

### Ligand Type:

Fluorophenyl

### Particle:

1.8  $\mu\text{m}$ , 2.7  $\mu\text{m}$ , or 5  $\mu\text{m}$  superficially porous silica (SPP or "core-shell")

### Pore Size:

90 Å

### Surface Area:

125  $\text{m}^2/\text{g}$  (1.8  $\mu\text{m}$ ), 130  $\text{m}^2/\text{g}$  (2.7  $\mu\text{m}$ ), or 100  $\text{m}^2/\text{g}$  (5  $\mu\text{m}$ )

### Recommended Usage:

pH Range: 2.0–8.0

Maximum Temperature: 80 °C

Maximum Pressure: 1,034 bar/15,000 psi\* (1.8  $\mu\text{m}$ ), 600 bar/8,700 psi (2.7  $\mu\text{m}$ ); 400 bar/5,800 psi (5  $\mu\text{m}$ )

\* For maximum lifetime, recommended maximum pressure for 1.8  $\mu\text{m}$  particles is 830 bar/12,000 psi.

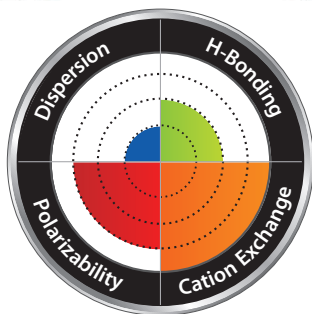
### Properties:

- Capable of both reversed-phase and HILIC separations.
- Ideal for increasing sensitivity and selectivity in LC-MS analyses.
- Offers increased retention for charged bases.

### Switch to a Raptor FluoroPhenyl LC column when:

- You observe limited retention and selectivity on a C18 for basic compounds.
- You need increased retention of hydrophilic compounds.

## Column Interaction Profile:



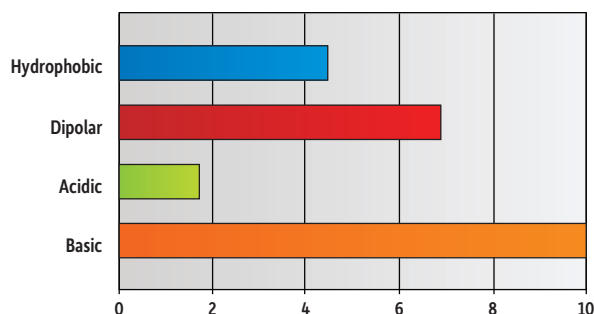
### Defining Solute Interactions:

- Cation exchange

### Complementary Solute Interaction:

- Polarizability
- Dispersion

## Solute Retention Profile:



### Target Analyte Structures:

- Nitrogen-containing

### Target Analyte Functionalities:

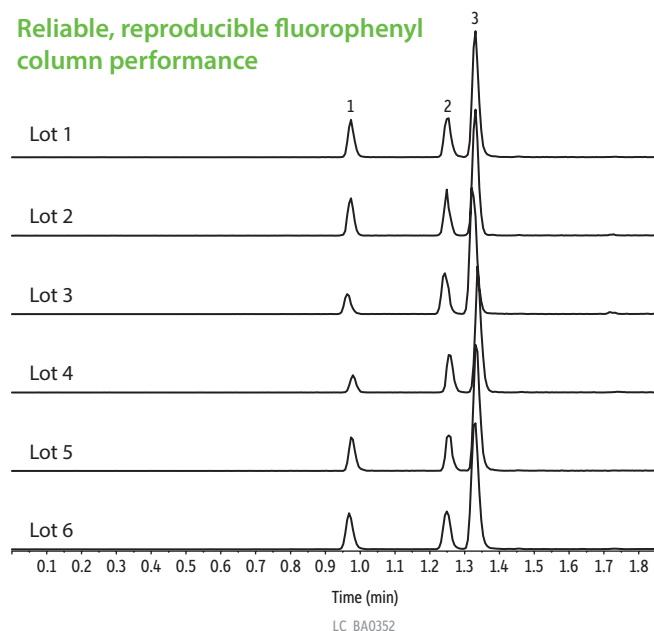
- Protonated amines
- Quaternary ammonium compounds
- Positively charged moieties
- Lewis bases

# Get the Power of HILIC and RP Modes in One Raptor FluoroPhenyl Column

**Figure 1:** Strict quality control ensures Raptor FluoroPhenyl columns are exceptionally reproducible, ensuring you get predictable performance from every column.

Peaks	t <sub>R</sub> (min)	Precursor Ion	Product Ion 1	Product Ion 2
1. Baccatin III	0.97	587.0	405.1	105.0
2. Docetaxel	1.25	808.1	527.3	226.1
3. Paclitaxel	1.33	854.1	569.3	286.2

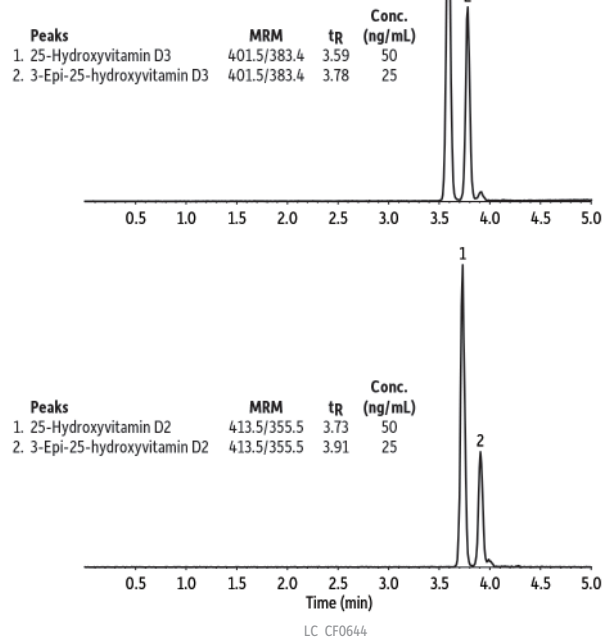
Reliable, reproducible fluorophenyl column performance



**Column:** Raptor FluoroPhenyl (cat.# 931955E); Dimensions: 50 mm x 3 mm ID, Particle Size: 5 µm; Temp.: 35 °C; **Sample:** Diluent: Water; Conc.: 100 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 (25% B), 2.00 (95% B), 2.01 (25% B), 3.50 (25% B); **Flow:** 0.8 mL/min; **Detector:** MS/MS; Ion Mode: ESI+; Mode: MRM; **Instrument:** UHPLC.

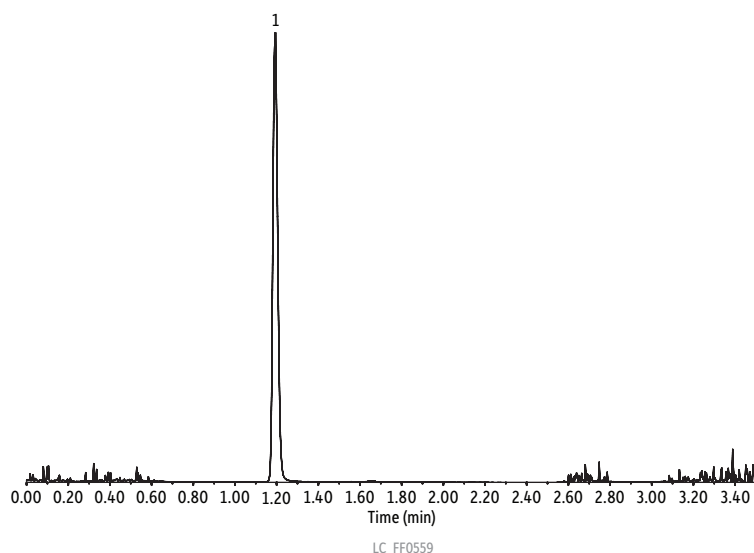
**Figure 2:** Raptor FluoroPhenyl columns have the retention and selectivity you need to quickly and easily separate compounds that coelute on a C18, such as the epimeric forms of 25-hydroxyvitamin D2 and D3.

Easily separate compounds that coelute on a C18



**Column:** Raptor FluoroPhenyl (cat.# 9319A1E); Dimensions: 100 mm x 3 mm ID, Particle Size: 2.7 µm; Pore Size: 100 Å; Temp.: 30 °C; **Sample:** Diluent: Water:methanol (50:50); Conc.: 25–50 ng/mL; Inj. Vol.: 5 µL; **Mobile Phase:** A: 0.1% Formic acid in water; B: Methanol; **Gradient (%B):** 0.00 min (75% B), 4.00 (85% B), 4.10 (100% B), 5.00 (100% B); 5.01 (75% B), 7.00 (75% B); **Flow:** 0.6 mL/min; **Detector:** MS/MS; Ion Mode: ESI+; Mode: MRM; **Instrument:** HPLC.

**Figure 3:** Sometimes, adequate retention just can't be obtained in reversed-phase mode. The Raptor FluoroPhenyl column lets you operate in either HILIC or RP mode, so you have options when you need to analyze compounds like caramel coloring byproduct 4-methylimidazole (4-MEI).




Raptor FluoroPhenyl columns give you the flexibility to work in both reversed-phase and HILIC modes

Peaks	t <sub>R</sub> (min)	Precursor Ion	Product Ion
1. 4-Methylimidazole (4-MEI)	1.19	83	56

**Column:** Raptor FluoroPhenyl (cat.# 9319A52); Dimensions: 50 mm x 2.1 mm ID, Particle Size: 2.7 µm; Temp.: 35 °C; **Sample:** Diluent: Acetonitrile; Conc.: 100 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 (95% B), 2.00 (30% B), 2.01 (95% B), 3.50 (95% B); **Flow:** 0.6 mL/min; **Detector:** MS/MS; Ion Mode: ESI+; Mode: MRM; **Instrument:** UHPLC.

# Dependable Raptor FluoroPhenyl Columns Give You the Flexibility to Use Both HILIC and RP Modes

## Raptor FluoroPhenyl LC Columns



Length	2.1 mm cat.#	3.0 mm cat.#	4.6 mm cat.#
<b>1.8 µm Columns</b>			
30 mm	9319232	—	—
50 mm	9319252	931925E	—
100 mm	9319212	931921E	—
150 mm	9319262	—	—
<b>2.7 µm Columns</b>			
30 mm	9319A32	9319A3E	9319A35
50 mm	9319A52	9319A5E	9319A55
100 mm	9319A12	9319A1E	9319A15
150 mm	9319A62	9319A6E	9319A65
<b>5 µm Columns</b>			
30 mm	—	931953E	—
50 mm	9319552	931955E	9319555
100 mm	9319512	931951E	9319515
150 mm	9319562	931956E	9319565
250 mm	—	—	9319575

## EXP Reusable Fittings for HPLC & UHPLC for 10-32 fittings and 1/16" tubing

Effortlessly achieve 8,700+ psi HPLC seals by hand! (Wrench tighten to 20,000+ psi.) Hybrid titanium/PEEK seal can be installed repeatedly without compromising your seal.

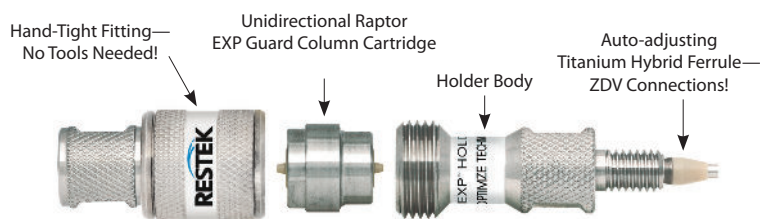


Description	qty.	cat.#
EXP Hand-Tight Fitting (Nut w/Ferrule)	ea.	25937
EXP Hand-Tight Fitting (Nut w/Ferrule)	10-pk.	25938
EXP Hand-Tight Nut (w/o Ferrule)	ea.	25939

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.

Experience *Selectivity Accelerated*.  
Order the Raptor FluoroPhenyl today  
at [www.restek.com/raptor](http://www.restek.com/raptor)

## Raptor EXP Guard Cartridges—for All Raptor Columns



Protect your investment, extend the life of our already-rugged LC columns, and change guard column cartridges by hand without breaking fluid connections—no tools needed! 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.

### 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)

### Raptor EXP Guard Column Cartridges

Description	Particle Size	qty.	5 x 2.1 mm cat.#	5 x 3.0 mm cat.#	5 x 4.6 mm cat.#
Raptor FluoroPhenyl EXP Guard Column Cartridge	UHPLC	3-pk.	9319U0252	9319U0253	
Raptor FluoroPhenyl EXP Guard Column Cartridges	2.7 µm	3-pk.	9319A0252	9319A0253	9319A0250
Raptor FluoroPhenyl EXP Guard Column Cartridges	5 µm	3-pk.	931950252	931950253	931950250

1,034 bar/15,000 psi\* (UHPLC), 600 bar/8,700 psi (2.7 µm); 400 bar/5,800 psi (5 µm).

\* For maximum lifetime, recommended maximum pressure for 1.8 µm particles is 830 bar/12,000 psi.

Raptor SPP LC columns combine the speed of SPP with the resolution of USLC technology.  
Learn more at [www.restek.com/raptor](http://www.restek.com/raptor)

## UltraShield UHPLC PreColumn Filter—for 1.8 µm Raptor Columns

Pair 1.8 µm Raptor columns with an UltraShield filter instead of a guard cartridge to protect against particulates, minimize extra column volume, and maximize UHPLC sample throughput when using SPE, SLE, or other extensive sample preparations.

Description	Filter Porosity	qty.	cat.#
UltraShield UHPLC PreColumn Filter	0.2 µm frit	ea.	25809
		5-pk.	25810
		10-pk.	25811



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