

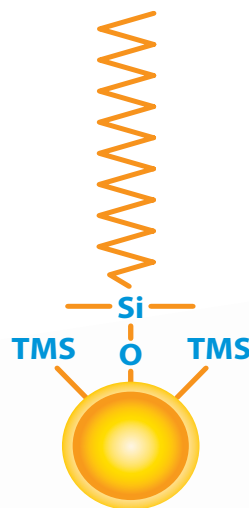
Raptor

LC Columns

Selectivity Accelerated

Raptor Speed, Efficiency,
and Ruggedness—in C18

Stationary Phase:
C18



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Pure Chromatography

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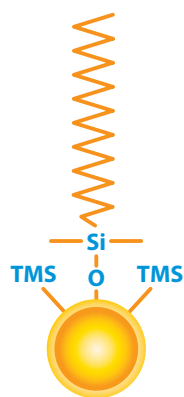
The Raptor C18 Column

With Raptor LC columns, Restek chemists became the first to combine the speed of 2.7 and 5 μm superficially porous particles (also known as SPP or “core-shell” particles) with the resolution of highly selective USLC technology, improving separations and speeding up analysis times with standard HPLC instruments. Raptor then evolved to bring that same improved speed, efficiency, and selectivity to UHPLC analyses by offering 1.8 μm particle columns. Learn more about Raptor LC columns at www.restek.com/raptor

Even though every LC lab has a cache of C18s, not all C18s are created equal. Because the chemistry tends to be similar, the silica support that carries this ubiquitous octadecylsilane phase becomes vitally important. 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 SPP LC column.

The traditional end-capped Raptor 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, environmental, or bioanalytical analyses, this phase offers consistently excellent data quality in less time across myriad reversed-phase applications, matrices, and compound classes.

Column Description:



Stationary Phase Category:

C18, octadecylsilane (L1)

Ligand Type:

End-capped C18

Particle:

1.8 μm , 2.7 μm , or 5 μm superficially porous particle (SPP or “core-shell” particle) silica

Pore Size:

90 Å

Surface Area:

125 m^2/g (1.8 μm),
130 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: 1034 bar/15,000 psi* (1.8 μm),
600 bar/8700 psi (2.7 μm); 400 bar/5800 psi (5 μm)

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

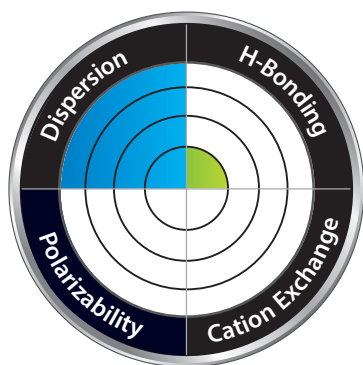
Properties:

- 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.

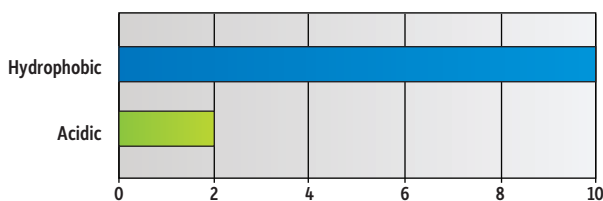
Column Interaction Profile:



Defining Solute Interaction:

- Dispersion

Solute Retention Profile:



Target Analyte Structure:

- Hydrocarbons

Target Analyte Functionalities:

- Hydrophobic compounds

Raptor C18 Performance: Speed, Efficiency, and Ruggedness in Action

Raptor C18 columns provide outstanding dependability and data quality with high efficiency and peak symmetry, and they are built to exacting specifications that make your columns exceptionally consistent and improve their lifetime. 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*.

Figure 1: Comparing 50 mm x 2.1 mm sub-2 µm C18 columns, Raptor columns maintain reliable performance past 1000 injections, consistently matching or beating the competition.

Expect consistently high performance over 1000 injections

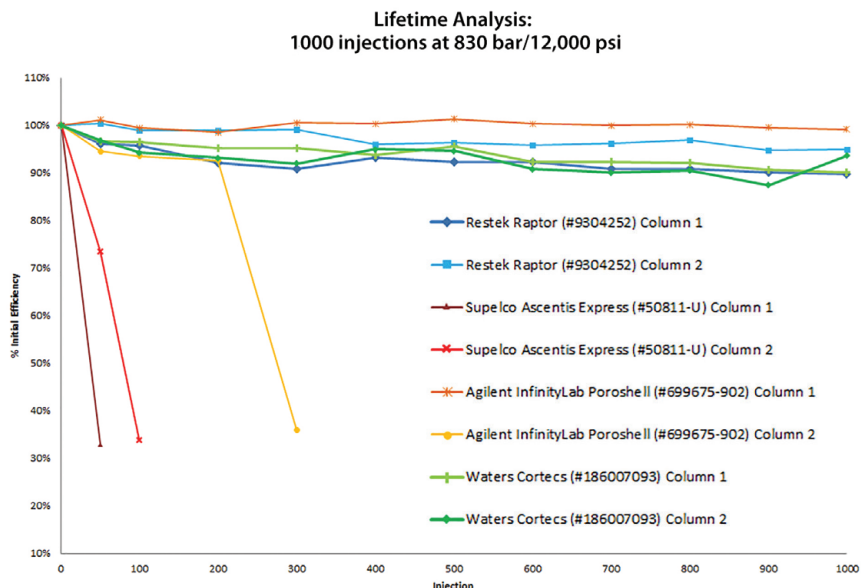
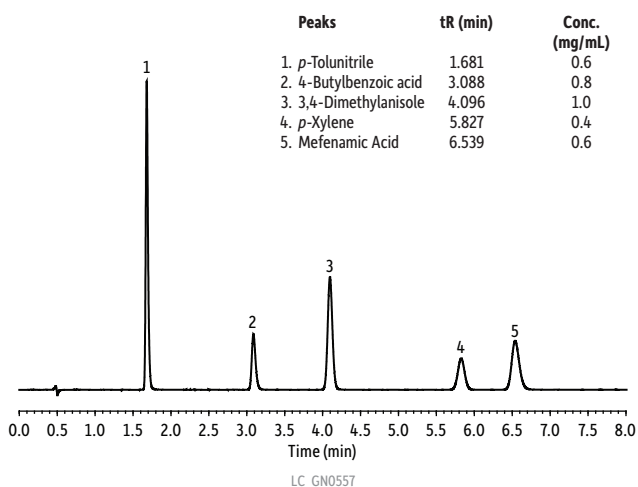


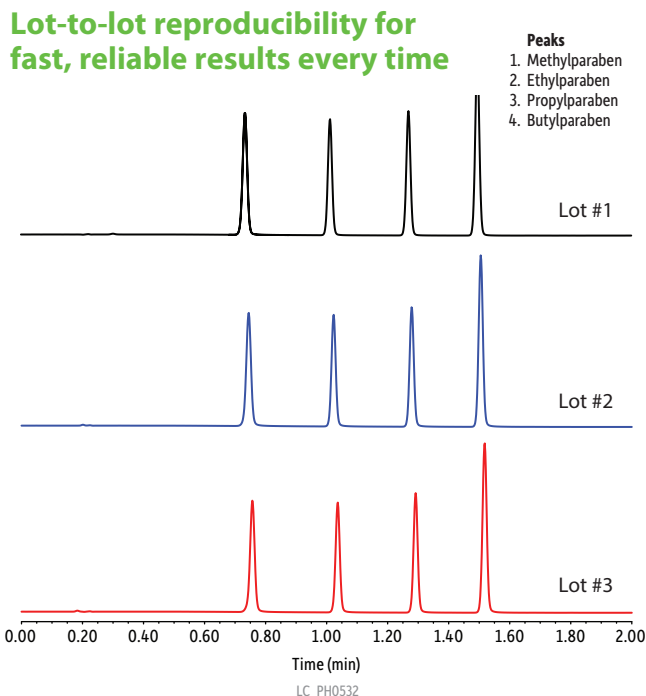
Figure 2: Raptor columns' stringent quality control (QC) specifications guarantee outstanding peak shape, even with active compounds, for superior data quality.

Outstanding peak shapes for top-notch data



Column: Raptor C18 (cat.# 9304A1E); Dimensions: 100 mm x 3 mm ID; Particle Size: 2.7 µm; Pore Size: 90 Å; Temp.: 30 °C; **Sample:** Diluent: Acetonitrile:water:phosphoric acid (65:34:1); Inj. Vol.: 1 µL; **Mobile Phase:** A: 0.05% Formic acid in water, B: 0.05% Formic acid in acetonitrile; **Gradient (%B):** 0.00 min (45% B), 8.00 min (45% B); **Flow:** 0.8 mL/min; **Detector:** UV/Vis @ 220 nm; Cell Temp.: 40 °C; **Instrument:** HPLC.

Figure 3: Lot-to-lot reproducibility is the key to keeping your productivity high and budget low. You can expect the same exceptional performance from every Raptor C18 column you purchase.



Column: Raptor C18 (cat.# 9304512); Dimensions: 100 mm x 2.1 mm ID; Particle Size: 5 µm; Temp.: 40 °C; **Sample:** Conc.: 100 µg/mL in water; Inj. Vol.: 1 µL; **Mobile Phase:** A: Water, B: Acetonitrile; **Gradient (%B):** 0.00 min (20% B), 2.00 min (80% B), 2.01 min (20% B), 3.50 min (20% B); **Flow:** 1.0 mL/min; **Detector:** PDA @ 254 nm; **Instrument:** UHPLC.

Boost Your Productivity with Raptor C18 LC Columns

When developing an assay, it is important to consider how productive your method will be. Because superficially porous, or “core-shell,” particles are well known for very high efficiency with minimal backpressure, they are ideal for decreasing analysis time (Figure 4). With its general-purpose applicability and SPP core-shell particles, the Raptor C18 column lets you quickly develop faster methods, thereby boosting your productivity.

Figure 4: SPP particles, like those in the Raptor C18 column, are one important step towards total method optimization.

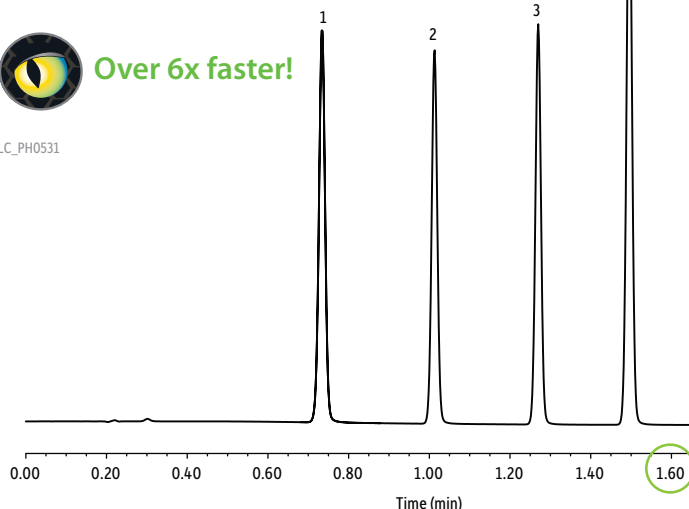
Raptor C18

Peaks	t_R (min)
1. Methylparaben	0.73
2. Ethylparaben	1.01
3. Propylparaben	1.27
4. Butylparaben	1.50



Over 6x faster!

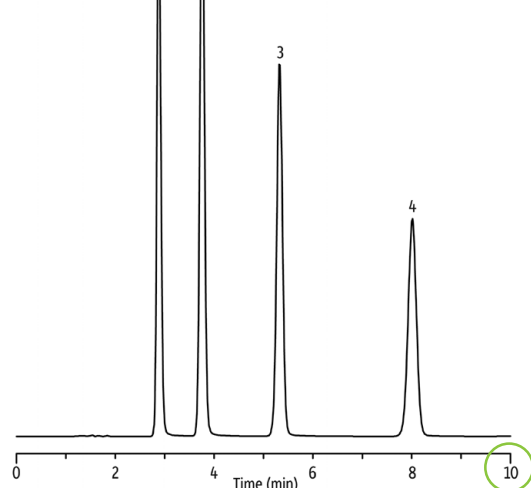
LC_PH0531



Column: Raptor C18 (cat.# 9304512); Dimensions: 100 mm x 2.1 mm ID; Particle Size: 5 μ m; Temp.: 40 $^{\circ}$ C; **Sample:** Conc.: 100 μ g/mL in water; Inj. Vol.: 1 μ L; **Mobile Phase:** A: Water B: Acetonitrile; **Gradient (%B):** 0.00 min (20% B), 2.00 min (80% B), 2.01 min (20% B), 3.50 min (20% B); **Flow:** 1.0 mL/min; **Detector:** PDA @ 254 nm; **Instrument:** UHPLC.

Fully porous C18

Peaks	t_R (min)
1. Methylparaben	2.90
2. Ethylparaben	3.77
3. Propylparaben	5.34
4. Butylparaben	8.03



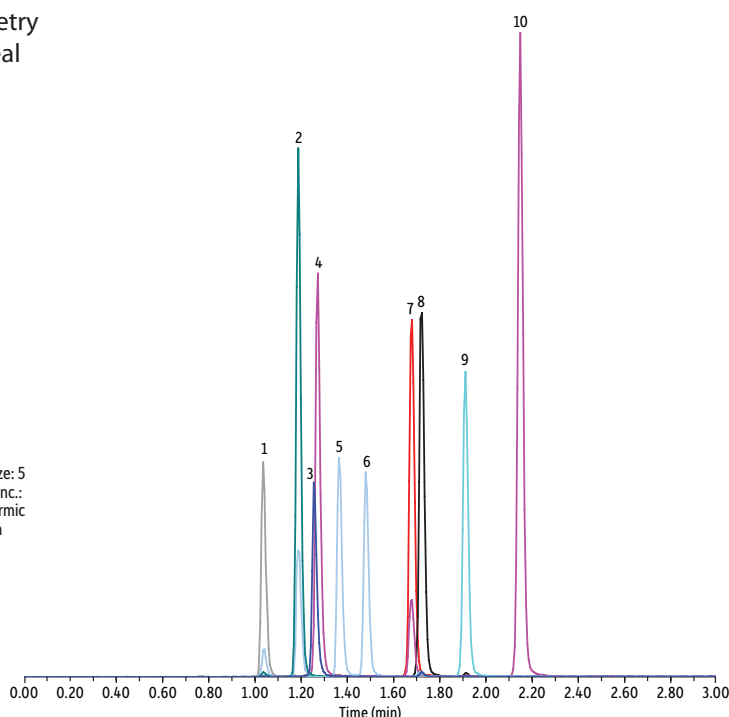
Column: Traditional fully porous C18; Dimensions: 150 mm x 4.6 mm ID; Particle Size: 5 μ m; Pore Size: 100 $\text{\AA}$; Temp.: Ambient; **Sample:** Diluent: Methanol; Conc.: 100 μ g/mL each component; Inj. Vol.: 5 μ L; **Mobile Phase:** 0.1% Acetic acid in water:acetonitrile (50:50); **Flow:** 1.0 mL/min; **Detector:** UV/Vis @ 254 nm.

Figure 5: Raptor C18s offer exceptional peak symmetry and efficiency for high sensitivity—making them ideal for high-throughput LC-MS/MS.

Peaks	t_R (min)	Precursor Ion	Product Ion
1. Rutin	1.04	611.5	303.3
2. Quercitrin	1.19	449.4	303.3
3. Myricetin	1.26	319.3	153.2
4. Fisetin	1.27	287.3	137.3
5. Morin	1.36	303.3	153.2
6. Quercetin	1.48	303.3	153.2
7. Kaempferol	1.68	287.3	153.2
8. Isorhamnetin	1.72	317.3	153.2
9. Rhamnetin	1.91	317.3	123.3
10. Galangin	2.15	271.3	153.2

Column: Raptor C18 (cat.# 9304552); Dimensions: 50 mm x 2.1 mm ID; Particle Size: 5 μ m; Pore Size: 90 $\text{\AA}$; Temp.: 40 $^{\circ}$ C; **Sample:** Diluent: 90:10 (water:acetonitrile); Conc.: 500 ng/mL; Inj. Vol.: 5 μ L; **Mobile Phase:** A: 0.1% Formic acid in water; B: 0.1% Formic acid in acetonitrile; **Gradient (%B):** 0.00 min (10% B), 2.40 min (70% B), 2.41 min (10% B), 3.50 min (10% B); **Flow:** 0.5 mL/min; **Detector:** MS/MS; Ion Mode: ESI+; **Instrument:** HPLC.

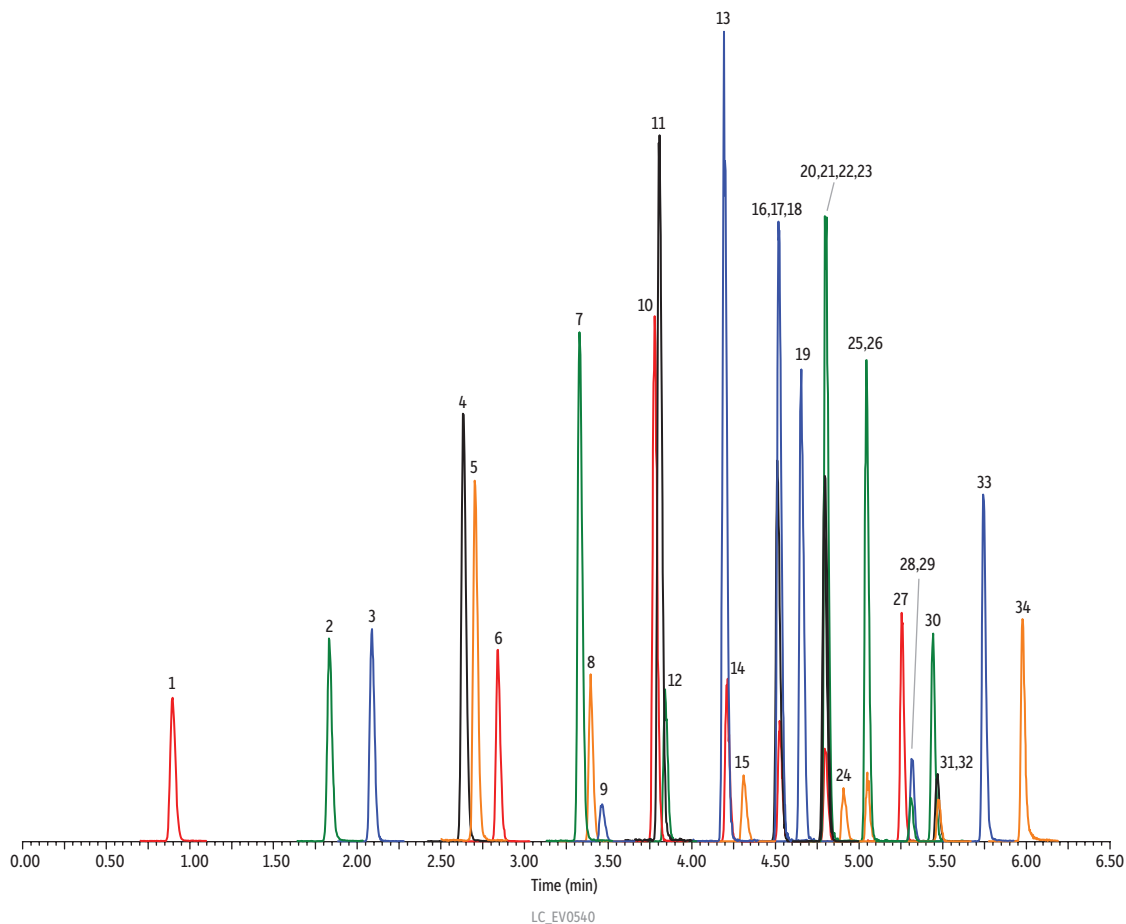
LC_FF0557



Your Go-To LC Column for Fast and Dependable Analyses on Any Instrument

C18 columns are often a method developer's first choice, not only for their trusted performance but also for their effectiveness with many types of compound and instrument. The Raptor C18 was designed to build on that foundation, offering usability, peak symmetry, efficiency, and dependability—with the unmatched reproducibility, speed, and reliability of a Raptor SPP LC column. Whether you are doing environmental, food safety, or bioanalytical work (Figures 5 and 6), you will finish your work faster if you choose the right column the first time. For general-purpose applications, the Raptor C18 is your best first choice.

Figure 6: Get the data quality and short analysis times you need with Raptor C18 columns, as shown here with perfluorinated compounds (PFCs).



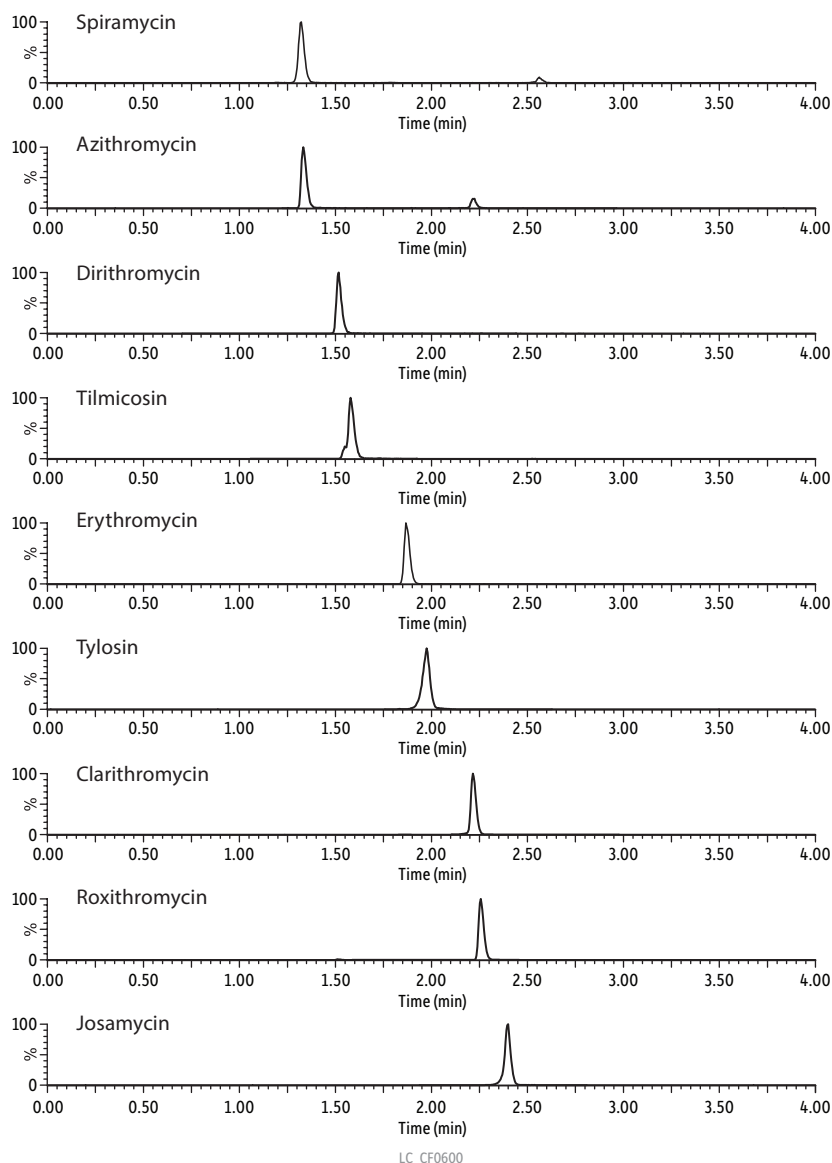
Peaks	Conc. t_R (min)	(ng/mL)	Precursor Ion	Product Ion	Peaks	Conc. t_R (min)	(ng/mL)	Precursor Ion	Product Ion
1. Perfluorobutanoic acid (PFBA)	0.90	5	213.07	169.07	18. Perfluorononane sulfonic acid (PFNS)	4.53	5	549.17	79.98
2. Perfluoropentanoic acid (PFPeA)	1.83	5	263.10	219.11	19. N-methyl perfluorooctane sulfonamidoacetic acid (N-MeFOSAA)	4.66	5	570.20	419.17
3. Perfluorobutane sulfonic acid (PFBS)	2.09	5	299.10	79.99	20. Perfluorodecane sulfonic acid (PFDS)	4.79	5	599.17	79.98
4. 1H, 1H, 2H, 2H-perfluorohexane sulfonic acid (4:2 FTS)	2.63	5	327.10	307.08	21. N-ethyl perfluorooctane sulfonamidoacetic acid (N-EtFOSAA)	4.79	5	584.20	419.18
5. Perfluorohexanoic acid (PFHxA)	2.70	5	313.10	269.12	22. Perfluorooctane sulfonamide (FOSA)	4.79	5	498.17	77.97
6. Perfluoropentane sulfonic acid (PFPeS)	2.84	5	349.10	79.98	23. Perfluoroundecanoic acid (PFUnA)	4.80	5	563.23	519.24
7. Perfluoroheptanoic acid (PFHpA)	3.33	5	363.16	319.09	24. 2-Perfluorodecyl ethanoic acid (FDEA)	4.91	250	577.23	493.18
8. Perfluorohexane sulfonic acid (PFHxS)	3.39	5	399.13	79.98	25. Perfluorododecanoic acid (PFDoA)	5.04	5	613.23	569.19
9. 2-Perfluorohexyl ethanoic acid (FHEA)	3.46	250	377.13	293.07	26. 1H, 1H, 2H, 2H-perfluorododecane sulfonic acid (10:2 FTS)	5.05	5	627.23	607.20
10. 1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	3.78	5	427.17	407.18	27. Perfluorotridecanoic acid (PFTrDA)	5.25	5	663.23	619.21
11. Perfluorooctanoic acid (PFOA)	3.81	5	413.16	369.10	28. N-methyl perfluorooctane sulfonamide (N-MeFOSA)	5.31	5	512.17	169.07
12. Perfluoroheptane sulfonic acid (PFHpS)	3.84	5	449.17	79.98	29. N-methyl perfluorooctane sulfonamidoethanol (N-MeFOSE)	5.31	50	616.27	59.11
13. Perfluorononanoic acid (PFNA)	4.19	5	463.16	419.19	30. Perfluorotetradecanoic acid (PFTeDA)	5.44	5	713.23	669.23
14. Perfluorooctane sulfonic acid (PFOS)	4.21	5	499.17	79.98	31. N-ethyl perfluorooctane sulfonamide (N-EtFOSA)	5.47	5	526.23	169.06
15. 2-Perfluorooctyl ethanoic acid (FOEA)	4.21	250	477.17	393.15	32. N-ethyl perfluorooctane sulfonamidoethanol (N-EtFOSE)	5.47	50	630.33	59.11
16. 1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	4.51	5	527.17	507.16	33. Perfluorohexadecanoic acid (PFHxDA)	5.74	5	813.30	769.28
17. Perfluorodecanoic acid (PFDA)	4.52	5	513.17	469.16	34. Perfluorooctadecanoic acid (PFODA)	5.98	5	913.30	869.32

Column: Raptor C18 (cat.# 9304252); Dimensions: 50 mm x 2.1 mm ID; Particle Size: 1.8 μ m; Pore Size: 90 Å; Temp.: 40 °C; **Sample:** Diluent: 80:20 Water:methanol; Conc.: 5-250 ng/mL; Inj. Vol.: 5 μ L; **Mobile Phase:** A: 5 mM Ammonium acetate in water; B: Methanol; **Gradient (%B):** 0.00 min (20% B), 6.00 min (95% B), 6.50 min (95% B), 6.51 min (20% B), 8.00 min (20% B); **Flow:** 0.4 mL/min; **Detector:** MS/MS; **Ion Mode:** ESI-; **Mode:** MRM; **Instrument:** UHPLC

The Perfect Complement to High-Throughput Mass Spec

Fast LC-MS/MS screens with their exacting retention time windows place severe demands on your LC column. The Raptor C18 can easily and dependably handle mass spec analysis of closely related compounds like macrolide antibiotics, which are widely used in human and veterinary medicine (Figure 7). Because it's a Raptor LC column, this C18 provides the reproducibility and consistent retention required for precise MRM analyses (see p. 3).

Figure 7: Confidently analyze closely eluting compounds, like macrolide antibiotics in this bioanalytical analysis, by LC-MS/MS.



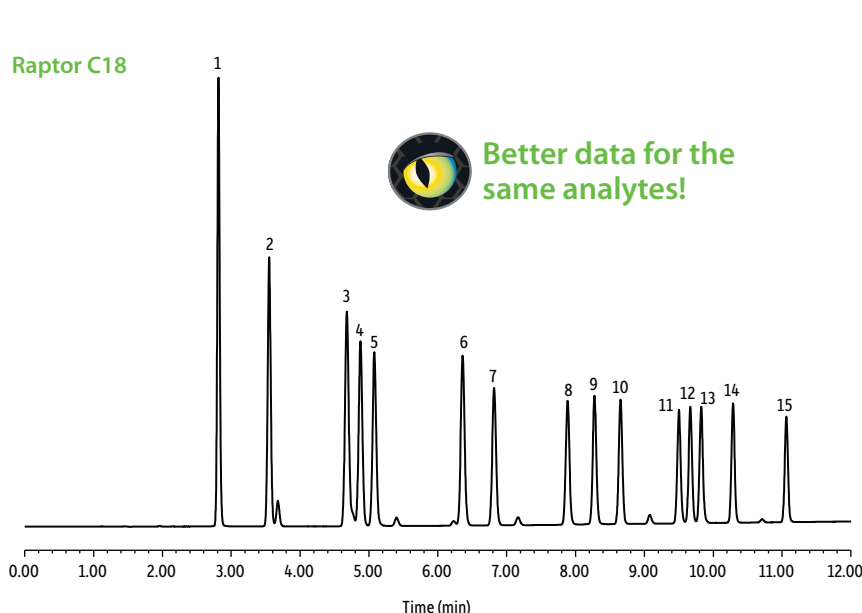
Peaks	t _R (min)	Precursor Ion	Product Ion
1. Spiramycin	1.32	844.21	174.28
2. Azithromycin	1.33	750.14	591.83
3. Dirithromycin	1.52	836.26	158.23
4. Tilmicosin	1.58	870.23	174.29
5. Erythromycin	1.87	735.09	158.23
6. Tylosin	1.98	917.26	174.28
7. Clarithromycin	2.22	749.11	158.22
8. Roxithromycin	2.26	838.21	158.23
9. Josamycin	2.40	829.15	109.18

Column: Raptor C18 (cat.# 9304512); Dimensions: 100 mm x 2.1 mm ID; Particle Size: 5 µm; Pore Size: 90 Å; Temp.: 40 °C; **Sample:** Diluent: Water:acetonitrile (50:50); 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 (20% B), 3.00 min (65% B), 3.01 min (20% B), 4.50 min (20% B). **Flow:** 0.4 mL/min; **Detector:** MS/MS; Ion Mode: ESI+; **Instrument:** UHPLC.

Improve Resolution on Your Current Methods

To quickly improve your data quality, add a Raptor C18 SPP column to your existing C18 methods. As exemplified in Figure 8 with EPA method TO-11A, which determines toxic compounds in ambient air, the Raptor C18 offers better peak separation than a traditional fully porous C18.

Figure 8: Make a good method even better with improved resolution by switching your traditional fully porous C18 for a Raptor C18 column.

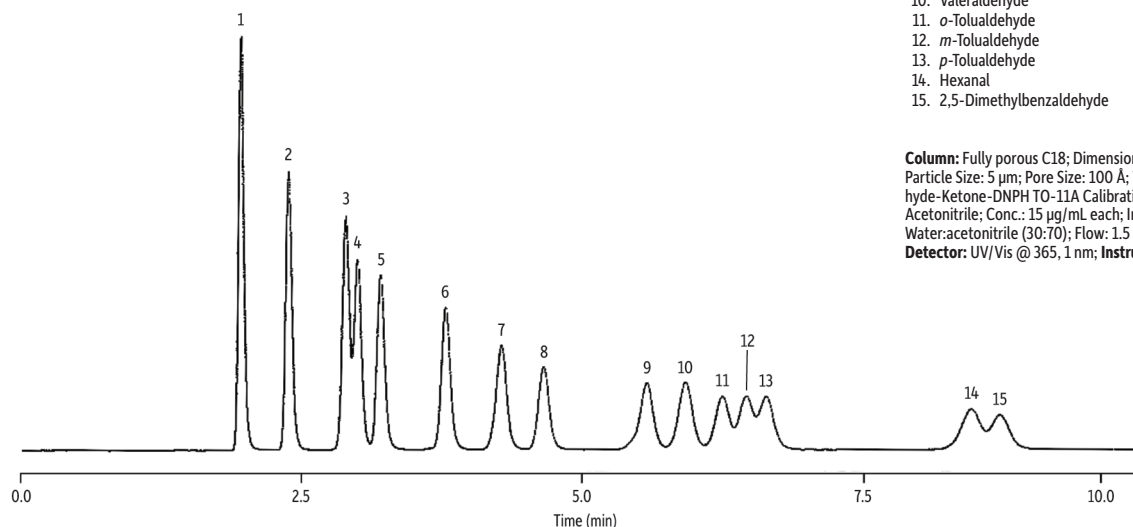


Peaks	t_r (min)
1. Formaldehyde	2.814
2. Acetaldehyde	3.551
3. Acrolein	4.678
4. Acetone	4.877
5. Propionaldehyde	5.078
6. Crotonaldehyde	6.361
7. Butyraldehyde	6.818
8. Benzaldehyde	7.884
9. Isovaleraldehyde	8.276
10. Valeraldehyde	8.653
11. <i>o</i> -Tolualdehyde	9.502
12. <i>m</i> -Tolualdehyde	9.667
13. <i>p</i> -Tolualdehyde	9.825
14. Hexanal	10.287
15. 2,5-Dimethylbenzaldehyde	11.064

Column: Raptor C18 (cat.# 9304A65); Dimensions: 150 mm x 4.6 mm ID; Particle Size: 2.7 μ m; Pore Size: 90 Å; Temp.: 30 °C; **Sample:** Aldehyde-ketone-DNPH TO-11A calibration mix (cat.# 31808); Diluent: Acetonitrile; Conc.: 15 μ g/mL; Inj. Vol.: 2 μ L; **Mobile Phase:** A: Water; B: Methanol: acetonitrile (650:50)*; **Gradient (%B)** 0.00 min (70% B), 5.00 min (75% B), 11.00 min (90% B), 11.01 min (100% B), 12.00 min (100% B), 12.01 min (70% B), 14.00 min (70% B); **Flow:** 0.8 mL/min; **Detector:** UV/Vis @ 365, 4.8 nm; **Instrument:** UHPLC; **Notes:** *Mobile phase B was prepared by combining 650 mL methanol and 50 mL acetonitrile.

LC_EV0532

Fully porous C18



Peaks	t_r (min)
1. Formaldehyde	1.954
2. Acetaldehyde	2.376
3. Acrolein	2.884
4. Acetone	2.987
5. Propionaldehyde	3.190
6. Crotonaldehyde	3.777
7. Butyraldehyde	4.273
8. Benzaldehyde	4.653
9. Isovaleraldehyde	5.572
10. Valeraldehyde	5.919
11. <i>o</i> -Tolualdehyde	6.242
12. <i>m</i> -Tolualdehyde	6.454
13. <i>p</i> -Tolualdehyde	6.634
14. Hexanal	8.450
15. 2,5-Dimethylbenzaldehyde	8.715

Column: Fully porous C18; Dimensions: 150 mm x 4.6 mm ID; Particle Size: 5 μ m; Pore Size: 100 Å; Temp.: 25 °C; **Sample:** Aldehyde-Ketone-DNPH TO-11A Calibration Mix (cat.# 31808); Diluent: Acetonitrile; Conc.: 15 μ g/mL each; Inj. Vol.: 10 μ L; **Mobile Phase:** Water:acetonitrile (30:70); Flow: 1.5 mL/min; Max Pressure: 107 bar; **Detector:** UV/Vis @ 365, 1 nm; **Instrument:** Shimadzu UFLC_{XR}.

Lower Costs and Improve Profitability with the Only General-Purpose C18 That Gives You Selectivity Accelerated

Raptor C18 LC Columns (USP L1)

ID	Length	qty.	cat.#
1.8 µm Particles Raptor C18			
2.1 mm	30 mm	ea.	9304232
	50 mm	ea.	9304252
	100 mm	ea.	9304212
3.0 mm	150 mm	ea.	9304262
	50 mm	ea.	930425E
	100 mm	ea.	930421E
2.7 µm Particles Raptor C18			
2.1 mm	30 mm	ea.	9304A32
	50 mm	ea.	9304A52
	100 mm	ea.	9304A12
	150 mm	ea.	9304A62
3.0 mm	30 mm	ea.	9304A3E
	50 mm	ea.	9304A5E
	100 mm	ea.	9304A1E
	150 mm	ea.	9304A6E
4.6 mm	30 mm	ea.	9304A35
	50 mm	ea.	9304A55
	100 mm	ea.	9304A15
	150 mm	ea.	9304A65
5 µm Particles Raptor C18			
2.1 mm	50 mm	ea.	9304552
	100 mm	ea.	9304512
	150 mm	ea.	9304562
3.0 mm	30 mm	ea.	930453E
	50 mm	ea.	930455E
	100 mm	ea.	930451E
	150 mm	ea.	930456E
4.6 mm	50 mm	ea.	9304555
	100 mm	ea.	9304515
	150 mm	ea.	9304565
	250 mm	ea.	9304575

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

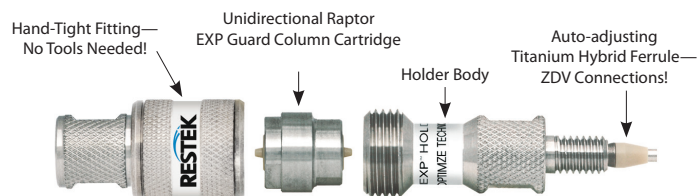
Effortlessly achieve 8700+ psi HPLC seals by hand! (Wrench tighten to 20,000+ psi.) Hybrid titanium/PEEK seal can be installed repeatedly without compromising your seal.

Description	qty.	cat.#
EXP Hand-Tight Fitting (nut w/ferrule)	ea.	25937
	10-pk.	25938

Intellectual Property: optimizetech.com/patents



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

Raptor EXP Guard Column Cartridges

Description	Particle Size	Length	ID	qty.	cat.#
Raptor C18 EXP Guard Column Cartridge	UHPLC	5 mm	2.1 mm	3-pk.	9304U0252
	UHPLC	5 mm	3.0 mm	3-pk.	9304U0253
	2.7 µm	5 mm	2.1 mm	3-pk.	9304A0252
	2.7 µm	5 mm	3.0 mm	3-pk.	9304A0253
	2.7 µm	5 mm	4.6 mm	3-pk.	9304A0250
	5 µm	5 mm	2.1 mm	3-pk.	930450252
	5 µm	5 mm	3.0 mm	3-pk.	930450253
	5 µm	5 mm	4.6 mm	3-pk.	930450250

Maximum cartridge pressure: 1034 bar/15,000 psi* (UHPLC); 600 bar/8700 psi (2.7 µm); 400 bar/5800 psi (5 µm).

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

Intellectual Property: optimizetech.com/patents

UltraShield UHPLC PreColumn Filter

Porosity	qty.	cat.#
0.5 µm frit	ea.	24995
0.5 µm frit	5-pk.	24996
0.5 µm frit	10-pk.	24997
0.2 µm frit	ea.	25809
0.2 µm frit	5-pk.	25810
0.2 µm frit	10-pk.	25811



Experience *Selectivity Accelerated*. Order the Raptor C18 LC Column today at www.restek.com/raptor

RESTEK
Pure Chromatography



Lit. Cat.# GNBR2246D-UNV



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