

ZORBAX Rapid Resolution High Definition (RRHD) 1.8 μm

- High pressure (1200 bar) columns for optimum results with the 1290 Infinity LC or other UHPLC instruments
- 1.8 μm particles deliver maximum resolution for the most defined separations
- Available in 12 ZORBAX phases, including Eclipse Plus C18 for superior peak shape, ZORBAX StableBond C18 for low pH stability, Bonus-RP, Eclipse PAH, Eclipse Plus Phenyl-Hexyl and Extend-C18
- Also available in HILIC Plus
- Achieve the same selectivity on 3.5 and 5 μm ZORBAX columns with the same bonded phase for compatibility with any LC

ZORBAX Rapid Resolution High Definition (RRHD) columns are an expansion of the ZORBAX 1.8 μm particle column line. The new RRHD columns use improved packing processes to achieve stability up to 1200 bar for use with the Agilent 1290 Infinity LC or other UHPLC instruments. RRHD 1.8 μm columns are available in 50, 100 and 150 mm lengths for fast or high resolution – truly high definition – separations of your most complex samples.

ZORBAX RRHD Column Specifications

Bonded Phase	Pore Size	Surface Area	pH Range	Endcapped	Temp Limit
ZORBAX Eclipse Plus C18	95Å	160 m ² /g	2.0-9.0	Double	60 °C
ZORBAX Eclipse Plus C8	95Å	160 m ² /g	2.0-9.0	Double	60 °C
ZORBAX Eclipse Plus Phenyl-Hexyl	95Å	160 m ² /g	2.0-9.0	Double	60 °C
ZORBAX Eclipse XDB-C18	80Å	180 m ² /g	2.0-9.0	Double	60 °C
ZORBAX Extend-C18	80Å	180 m ² /g	2.0-11.5**	Double	60 °C
ZORBAX Bonus RP	80Å	180 m ² /g	2.0-9.0	Triple	60 °C
ZORBAX StableBond SB-C18	80Å	180 m ² /g	1.0-8.0*	No	80 °C
ZORBAX StableBond SB-C8	80Å	180 m ² /g	1.0-8.0*	No	80 °C
ZORBAX StableBond SB-Phenyl	80Å	180 m ² /g	1.0-8.0*	No	80 °C
ZORBAX StableBond SB-CN	80Å	180 m ² /g	1.0-8.0*	No	80 °C
ZORBAX StableBond SB-Aq	80Å	180 m ² /g	1.0-8.0*	No	80 °C
ZORBAX Eclipse PAH	95Å	160 m ² /g	2.0-8.0	No	60 °C
ZORBAX HILIC Plus	95Å	160 m ² /g	0.0-8.0	No	60 °C
ZORBAX StableBond 300SB-C8	300Å	45 m ² /g	1.0-8.0*	No	80 °C
ZORBAX StableBond 300SB-C18	300Å	45 m ² /g	1.0-8.0*	No	80 °C
ZORBAX StableBond 300SB-C3	300Å	45 m ² /g	1.0-8.0*	No	80 °C
ZORBAX 300-Diphenyl	300Å	45 m ² /g	1.0-8.0*	No	80 °C

* StableBond columns are designed for optimal use at low pH. At pH >6, highest column stability for all silica based columns is obtained by operating at temperatures <40 °C and using lower buffer concentrations – 10-20 mM or organic buffers. 300SB-C18 may be used up to 90 °C. For pH 6-8, select the Eclipse Plus C18 column.

** Temperature limits are 60 °C up to pH 8, 40 °C from pH 8-11.5.



ZORBAX Rapid Resolution High Definition (RRHD) 1.8 μm Columns

Separation of licorice root on RRHD columns

Column A: ZORBAX RRHD SB-C18
857700-902
2.1 x 50 mm, 1.8 μm

Column B: 858700-902
2.1 x 100 mm, 1.8 μm

Column C: 859700-902
2.1 x 150 mm, 1.8 μm

Mobile Phase: 10-100% B/30 min
A: 0.1% Formic acid (fa)
B: Acetonitrile with 0.1% fa

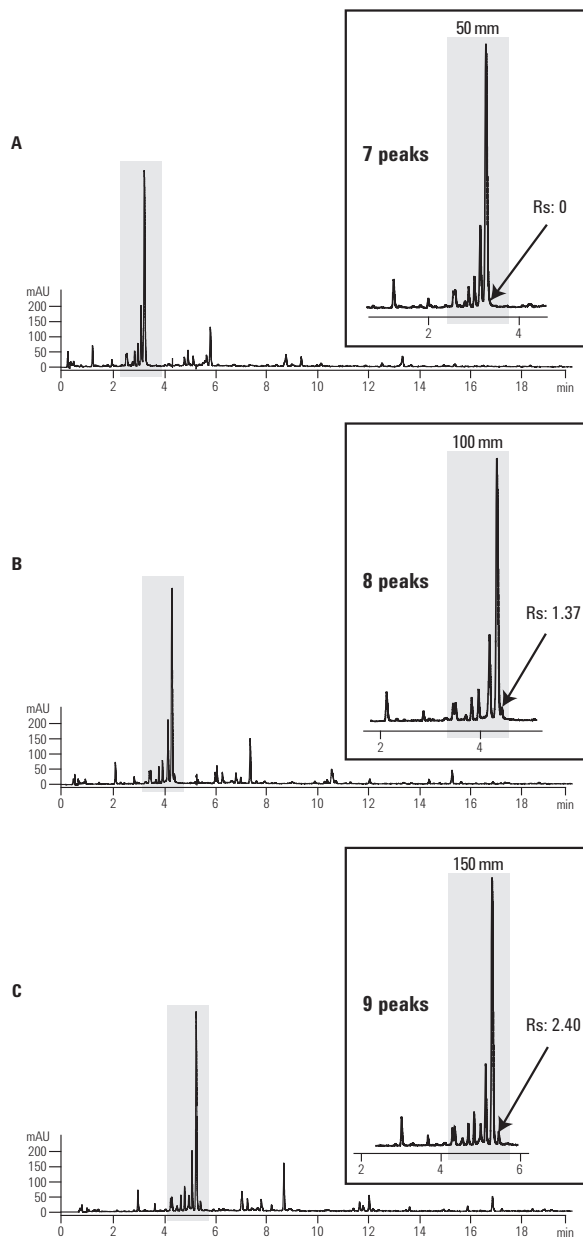
Flow Rate: F = 0.4 mL/min

Gradient: 30 minute gradient on each length

Temperature: Ambient

Detector: 280 nm UV

Instrument: 1290 Infinity LC



Sub 1 minute separations with RRHD columns

Column: ZORBAX RRHD SB-C18
857700-902
2.1 x 50 mm, 1.8 µm

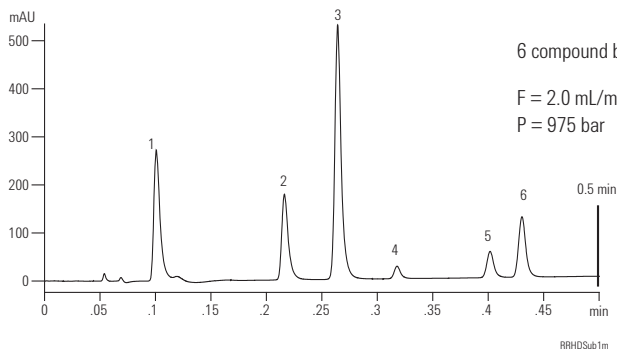
Gradient: H₂O (0.05% trifluoroacetic acid)/10-40% ACN/1 min

Temperature: 60 °C

Injection Volume: 0.5 µL x 100 ppm each

Detector: UV, 275 nm

Data Rate: 160 Hz



1. 2-methyl-4-isothiazolin-3-one
2. 5-chloro-2-methyl-4-isothiazolin-3-one
3. Carbendazim
4. Benzisothiazol-3(2H)-one
5. 2-phenoxyethanol
6. Methylparaben

New levels of sensitivity and resolution

Column A: ZORBAX RRHD Eclipse Plus C18
959758-302
3.0 x 100 mm, 1.8 µm

Ion Source: 360 °C, 12 L/min, 50 psi, 3500 V.

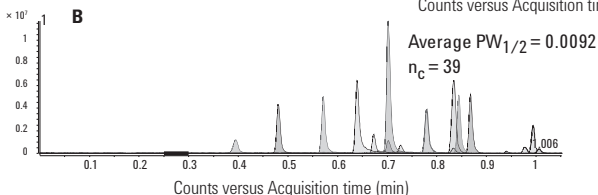
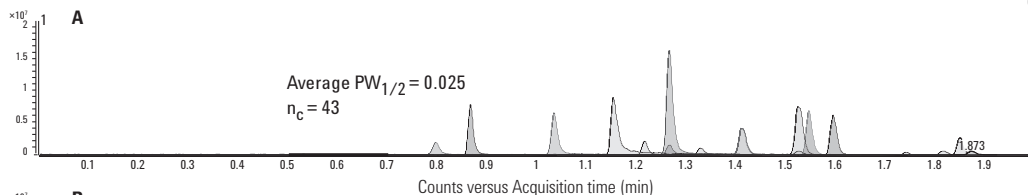
Temperature: Ambient, no temperature control (approx 24 °C)

Column B: ZORBAX RRHD Eclipse Plus C18
959757-302
3.0 x 50 mm, 1.8 µm

Mobile Phase: A: 0.2% Formic acid in water
B: ACN

Detector: Agilent 1290 Infinity LC with 6410 MS/MS

Sample: 20 µL (10 µL for 50 mm column) of 1 µg/mL standard



Compounds (in elution order) with identifying mass:

1. Acetaminophen, m/z 109
2. Caffeine, m/z 194
3. 2-acetamidophenol, m/z 109
4. Acetanilide, m/z 135
5. Acetylsalicylic acid, m/z 120
6. Phenacetin, m/z 179
7. Salicylic acid, m/z 120
8. Sulindac, m/z 356
9. Piroxicam, m/z 332
10. Tolmetin, m/z 257
11. Ketoprofen, m/z 254
12. Diflunisal, m/z 332
13. Diclofenac, m/z 235
14. Celecoxib, m/z 351
15. Ibuprofen, m/z 160

By transferring your method to an Agilent RRHD column, you can enhance resolution for difficult analyses – allowing you to save time by using shorter columns without compromising performance.

The RRHD column saves analytical time without sacrificing performance.

Selectivity comparison: C18 columns

Column A: ZORBAX RRHD Eclipse Plus C18
959758-902
2.1 x 100 mm, 1.8 µm

Column B: ZORBAX RRHD Eclipse XDB-C18
981758-902
2.1 x 100 mm, 1.8 µm

Column C: ZORBAX RRHD Extend-C18
758700-902
2.1 x 100 mm, 1.8 µm

Column D: ZORBAX RRHD SB-C18
858700-902
2.1 x 100 mm, 1.8 µm

Mobile Phase: A: 0.1% HCOOH in H₂O (30%)
B: 0.1% HCOOH in CH₃CN (70%)

Flow Rate: 1 mL/min, isocratic

Temperature: 30 °C

Sample: 1 µL

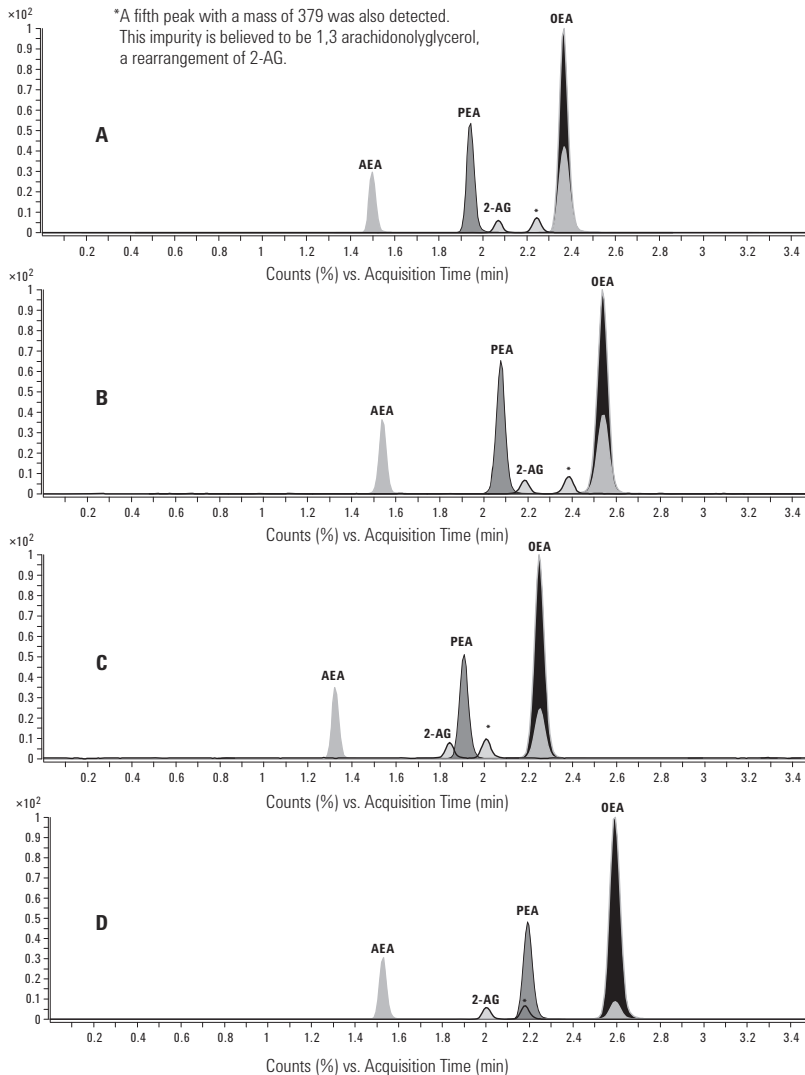
MS2 Scan: 290-390, ESI positive mode,
scan time: 500, fragmentor:
135 V; drying gas: 12 L/min, 325 °C;
nebulizer pressure: 35 psig;
capillary voltage: 3000

Selectivity differences are due to subtle, yet important variations, such as bonding type, endcapping, or the amount and type of silanols on the silica. Other factors that influence selectivity include mobile phase composition, temperature, and pH. (Note that these factors are identical in the following example.)

Here we compared the selectivity of four Agilent ZORBAX RRHD C18 columns using an endocannabinoid analysis method.

1. Anandamine (AEA), m/z 348
2. Palmitoylethanolamide (PEA), m/z PEA
3. 2-arachinoylglycerol (2-AG), m/z 379*
4. Oleoylethanolamide (OEA), m/z 326

*A fifth peak with a mass of 379 was also detected. This impurity is believed to be 1,3 arachidonoylglycerol, a rearrangement of 2-AG.



TIPS & TOOLS

For full details, see Agilent publication 5990-7166EN, www.agilent.com/chem/library

**Selectivity comparison:
Phenyl and other columns**

Column A: ZORBAX RRHD Eclipse Plus C18
959758-902
2.1 x 100 mm, 1.8 μ m

Column B: ZORBAX RRHD Eclipse Plus Phenyl-Hexyl
959758-912
2.1 x 100 mm, 1.8 μ m

Column C: ZORBAX RRHD SB-Aq
858700-914
2.1 x 100 mm, 1.8 μ m

Column D: ZORBAX RRHD SB-Phenyl
858700-912
2.1 x 100 mm, 1.8 μ m

Mobile Phase: A: 5% HCOOH in H₂O
B: CH₃CN

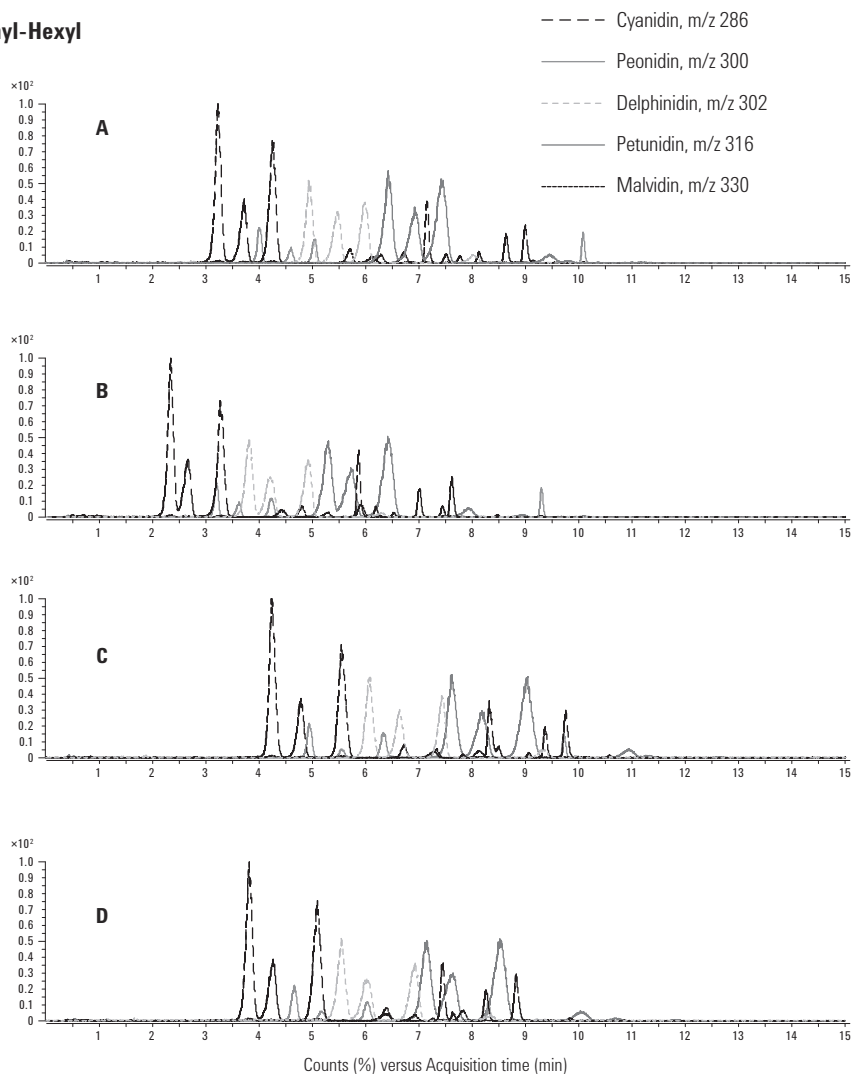
Flow Rate: 0.65 mL/min

Gradient: 10-50% B in 15 min

Temperature: 30 °C

MS2 Scan: ESI +, 200-1000

Extracted ion chromatograms from LC/MS scan data of
blueberry anthocyanins.


TIPS & TOOLS

For full details, see Agilent publication 5990-8470EN, www.agilent.com/chem/library



Rapid Resolution High Definition (RRHD) Columns for High Pressure Use (Maximum Pressure: 1200 bar)

Hardware	Description	Size (mm)	Particle Size (µm)	Eclipse Plus C18 USP L1	Eclipse Plus C8 USP L7	Eclipse Plus Phenyl-Hexyl USP L11	Eclipse PAH USP L1
	Solvent Saver RRHD, 1200 bar	3.0 x 150	1.8	959759-302	959759-306		
	Solvent Saver RRHD, 1200 bar	3.0 x 100	1.8	959758-302	959758-306	959758-312	959758-318
	Solvent Saver RRHD, 1200 bar	3.0 x 50	1.8	959757-302	959757-306	959757-312	959757-318
UG	UHPLC Guard, 1200 bar, 3/pk	3.0 x 5	1.8	823750-901			
	Narrow Bore RRHD, 1200 bar	2.1 x 150	1.8	959759-902	959759-906	959759-912	959763-918
	Narrow Bore RRHD, 1200 bar	2.1 x 100	1.8	959758-902	959758-906	959758-912	959764-918
	Narrow Bore RRHD, 1200 bar	2.1 x 50	1.8	959757-902	959757-906	959757-912	959741-918
UG	UHPLC Guard, 1200 bar, 3/pk	2.1 x 5	1.8	821725-901			

Rapid Resolution High Definition (RRHD) Columns for High Pressure Use (Maximum Pressure: 1200 bar)

Hardware	Description	Size (mm)	Particle Size (µm)	SB-C18 USP L1	SB-C8 USP L7	SB-CN USP L10	SB-Phenyl USP L11	SB-Aq
	Solvent Saver RRHD, 1200 bar	3.0 x 150	1.8	859700-302	859700-306			
	Solvent Saver RRHD, 1200 bar	3.0 x 100	1.8	858700-302	858700-306	858700-305	858700-905	858700-314
	Solvent Saver RRHD, 1200 bar	3.0 x 50	1.8	857700-302	857700-306	857700-305	857700-312	857700-314
UG	UHPLC Guard, 1200 bar, 3/pk	3.0 x 5	1.8	823750-902	823750-904			
	Narrow Bore RRHD, 1200 bar	2.1 x 150	1.8	859700-902	859700-906	859700-905	859700-912	859700-914
	Narrow Bore RRHD, 1200 bar	2.1 x 100	1.8	858700-902	858700-906	858700-905	858700-912	858700-914
	Narrow Bore RRHD, 1200 bar	2.1 x 50	1.8	857700-902	857700-906	857700-905	857700-912	857700-914
UG	UHPLC Guard, 1200 bar, 3/pk	2.1 x 5	1.8	821725-902	821725-904			

Rapid Resolution High Definition (RRHD) Columns for High Pressure Use (Maximum Pressure: 1200 bar)

Hardware	Description	Size (mm)	Particle Size (µm)	Extend-C18 USP L1	Eclipse XDB-C18 USP L1	Bonus-RP USP L60	HILIC Plus
	Solvent Saver RRHD, 1200 bar	3.0 x 150	1.8	759700-302	981759-302		
	Solvent Saver RRHD, 1200 bar	3.0 x 100	1.8	758700-302	981758-302		959758-301
	Solvent Saver RRHD, 1200 bar	3.0 x 50	1.8	757700-302	981757-302		959757-301
UG	UHPLC Guard, 1200 bar, 3/pk	3.0 x 5	1.8		823750-903		
	Narrow Bore RRHD, 1200 bar	2.1 x 150	1.8	759700-902	981759-902	859768-901	959759-901
	Narrow Bore RRHD, 1200 bar	2.1 x 100	1.8	758700-902	981758-902	858768-901	959758-901
	Narrow Bore RRHD, 1200 bar	2.1 x 50	1.8	757700-902	981757-902	857768-901	959757-901
UG	UHPLC Guard, 1200 bar, 3/pk	2.1 x 5	1.8		821725-903		

ZORBAX RRHD columns are also available in 300Å configurations for biomolecules. Turn to page 364.

ZORBAX RRHD 300-HILIC will be available in 2013.

ZORBAX Rapid Resolution High Throughput (RRHT) 1.8 μm

- High pressure (600 bar) columns for ultra high speed or maximum resolution analyses with Rapid Resolution HT columns packed with totally porous, 1.8 μm packings
- Carefully engineered particles deliver maximum resolution at 25% less pressure than other sub-2 μm materials
- Reduce analysis time by up to 95%
- Develop HPLC methods more quickly
- Securely transfer conventional methods with over 140 RRHT column choices
- Analyze complex samples on shorter columns faster and maximize peak capacity
- Matching selectivity in 3.5, 5 and 7 μm particle sizes for complete method scalability
- Short (50 mm long and less) column can be used on some conventional LCs

Agilent ZORBAX Rapid Resolution HT (1.8 μm) columns use a totally porous, 1.8 μm particle to provide maximum resolution in fast, ultra-fast and high resolution analyses. You can reduce analysis time by up to 95% in comparison to 250 mm length columns. With more than 140 RRHT column choices, including the high performance ZORBAX Eclipse Plus and many other ZORBAX column choices (Eclipse XDB, StableBond, Extend, Bonus-RP), methods can be developed quickly or securely transferred to a smaller particle size column with no loss in resolution. The small particle size provides double the efficiency of a 3.5 μm column in the same column length, providing the highest efficiency and resolution possible. This permits the analysis of complex samples on shorter columns with the highest resolution and peak capacity. The 1.8 μm Rapid Resolution HT columns take high-speed, high-resolution HPLC to a new level.

The 600 bar columns can be used with the Agilent 1260 Infinity LC System up to this high pressure limit. In addition, the shorter columns can be used on many other LC's, including the Agilent 1200 Rapid Resolution LC System.



ZORBAX Rapid Resolution High Throughput (RRHT) 1.8 μm Columns

Rapid Resolution HT (RRHT) provides double the efficiency of Rapid Resolution columns

Column A: ZORBAX Rapid Resolution SB-C18
835975-902
4.6 x 50 mm, 3.5 µm

Column B: ZORBAX RRHT SB-C18
827975-902
4.6 x 50 mm, 1.8 µm

Mobile Phase: 25% Water, 75% MeOH

Flow Rate: 1.5 mL/min

Temperature: Ambient

Detector: UV, 254 nm

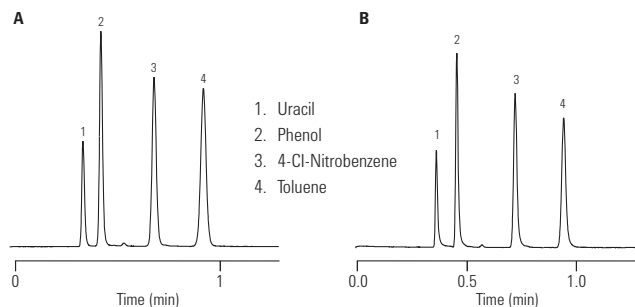
This figure shows that Rapid Resolution HT columns can provide double the efficiency of a 3.5 µm column in the same column length. This high efficiency can be used for very high-resolution, high throughput analyses.

Plates (N)

- 1. 3476
- 2. 4585
- 3. 5673
- 4. 6180

Plates (N)

- 1. 6560
- 2. 8958
- 3. 11508
- 4. 12266



LCRR002

Increase peak capacity with RRHT columns

Column A: Eclipse RRHT XDB-C8
928700-906
2.1 x 100 mm, 1.8 µm

Column B: Eclipse XDB-C18
961753-902
2.1 x 100 mm, 3.5 µm

Mobile Phase: A: H₂O
B: ACN

Peak capacity: A: 461
B: 343

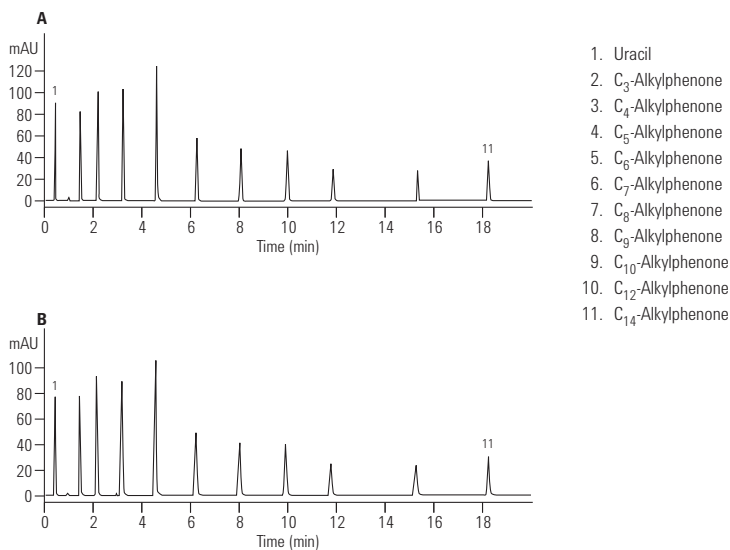
Flow Rate: 0.5 mL/min

Gradient: 0.0 min 50% B
20.0 min 100% B

Temperature: 40 °C

Detector: UV, 254 nm

Sample: Alkylphenones



LCRR004

Reduce analysis time dramatically with Rapid Resolution HT columns

Column A: Eclipse XDB-C18
990967-902
4.6 x 250 mm, 5 µm

Column B: Eclipse XDB-C18
963967-902
4.6 x 150 mm, 3.5 µm

Column C: Eclipse XDB-C18
966967-902
4.6 x 75 mm, 3.5 µm

Column D: ZORBAX Eclipse XDB-C18
935967-902
4.6 x 50 mm, 3.5 µm

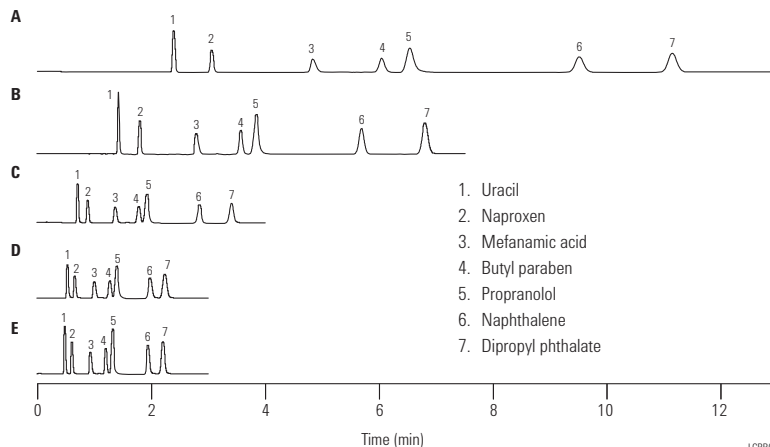
Column E: Eclipse RRHT XDB-C18
925975-902
4.6 x 50 mm, 1.8 µm

Mobile Phase: 73% MeOH:27% 20 mM Phosphate Buffer, pH 7.0

Flow Rate: 1 mL/min

Temperature: Ambient

Detector: UV, 254 nm



LCRR003

This figure shows the dramatic reduction in analysis time made possible by using Rapid Resolution HT columns. Chromatogram A shows a separation that takes 11.5 minutes on a 25 cm, 5 µm column. Rapid Resolution (3.5 µm) columns, shown in chromatogram B and C, reduce analysis time substantially, but with a slight compromise in resolution. The Rapid Resolution HT column reduces analysis time to 2.2 minutes, an 80% reduction, while still maintaining baseline resolution.

Long lifetime of RRHT columns at elevated temperatures

Column: ZORBAX RRHT SB-C18
827700-902
2.1 x 50 mm, 1.8 µm

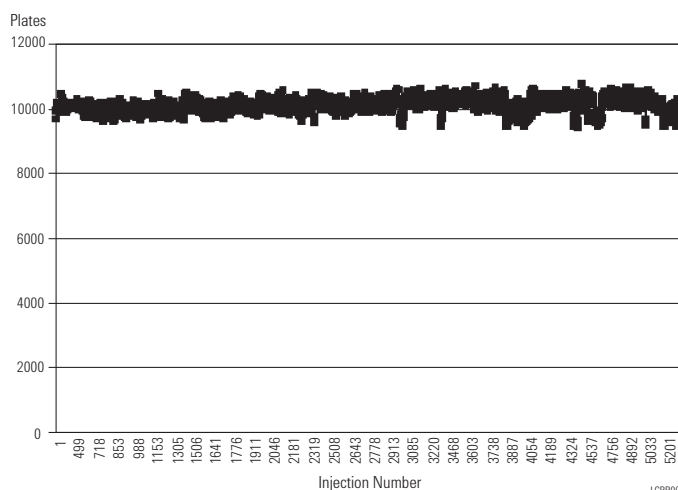
Mobile Phase: A: 60% H₂O
B: 40% ACN

Flow Rate: 1 mL/min

Temperature: 80 °C

Detector: UV, 254 nm

Sample: QC test mix



LCRR005

Comparison of efficiencies – Rapid Resolution High Definition (RRHD)/RRHT (1.8 µm) and Rapid Resolution (3.5 µm) columns

Column Length (mm)	Poroshell 120	Resolving Power N (3.5 µm)*	Resolving Power N (1.8 µm)
High Resolution			
150	32,000	21,000	32,500
100	21,000	14,000	24,000
75	16,000	10,500	17,000**
Ultra Fast			
50	11,000	7,000	12,000
30	5,500	4,200	6,000
20	—	—	3,500
15	—	2,100	2,500
Resolution $\propto N^{1/2}$			

*5 µm HPLC columns of the same length have 40% fewer plates (N-value); 4.6 mm id

**Available as a custom column

Data is based on 4.6 mm id columns

TIPS & TOOLS






The LC Rack from Agilent can help you reduce capillary lengths and minimize extra-column volume. It also protects your instrument and enables you to switch out modules as needed.






Agilent rack for LC systems, 5001-3726

Rapid Resolution HT Columns for High Pressure Use (Maximum Pressure: 600 bar, 9000 psi)

Hardware	Description	Size (mm)	Particle Size (µm)	Eclipse Plus C18 USP L1	Eclipse Plus C8 USP L7	Eclipse Plus Phenyl-Hexyl USP L11	Eclipse PAH USP L1	Eclipse XDB-C18 USP L1	Eclipse XDB-C8 USP L7	Eclipse Extend-C18 USP L1
	Rapid Resolution HT, 600 bar	4.6 x 150	1.8	959994-902						
	Rapid Resolution HT, 600 bar	4.6 x 100	1.8	959964-902	959964-906	959964-912	959964-918	928975-902		728975-902
	Rapid Resolution HT, 600 bar	4.6 x 75	1.8	959951-902						
	Rapid Resolution HT, 600 bar	4.6 x 50	1.8	959941-902	959941-906	959941-912	959941-918	927975-902	927975-906	727975-902
	Rapid Resolution HT, 600 bar	4.6 x 30	1.8	959931-902	959931-906	959931-912	959931-918	924975-902	924975-906	724975-902
	Rapid Resolution HT, 600 bar	4.6 x 20	1.8					926975-902	926975-906	726975-902
	UHPLC Guard, 600 bar, 3/pk	4.6 x 5	1.8	820750-901				820750-903		
	Solvent Saver HT, 600 bar	3.0 x 100	1.8	959964-302	959964-306	959964-312		928975-302		728975-302
	Solvent Saver HT, 600 bar	3.0 x 50	1.8	959941-302	959941-306	959941-312		927975-302	927975-306	727975-302
	Solvent Saver HT, 600 bar	3.0 x 30	1.8					924975-302	924975-306	724975-302
	Solvent Saver HT, 600 bar	3.0 x 20	1.8					926975-302	926975-306	726975-302
	UHPLC Guard, 1200 bar, 3/pk	3.0 x 5	1.8	823750-901				823750-903		
	Narrow Bore RRHT, 600 bar	2.1 x 150	1.8	959794-902						
	Narrow Bore RRHT, 600 bar	2.1 x 100	1.8	959764-902	959764-906	959764-912	959764-918	928700-902	928700-906	728700-902
	Narrow Bore RRHT, 600 bar	2.1 x 50	1.8	959741-902	959741-906	959741-912	959741-918	927700-902	927700-906	727700-902
	Narrow Bore RRHT, 600 bar	2.1 x 30	1.8	959731-902	959731-906	959731-912		924700-902	924700-906	724700-902
	Narrow Bore RRHT, 600 bar	2.1 x 20	1.8					926700-902	926700-906	726700-902
	UHPLC Guard, 1200 bar, 3/pk	2.1 x 5	1.8	821725-901				821725-903		

Rapid Resolution HT Columns for High Pressure Use (Maximum Pressure: 600 bar, 9000 psi)

Hardware	Description	Size (mm)	Particle Size (µm)	SB-C18 USP L1	SB-C8 USP L7	SB-Phenyl USP L11	SB-CN USP L10	SB-Aq	Rx-SIL USP L3	Bonus-RP USP L60
	Rapid Resolution HT, 600 bar	4.6 x 150	1.8	829975-902	829975-906	829975-912	829975-905	829975-914		
	Rapid Resolution HT, 600 bar	4.6 x 100	1.8	828975-902	828975-906	828975-912	828975-905	828975-914	828975-901	828668-901
	Rapid Resolution HT, 600 bar	4.6 x 75	1.8		830975-906					830668-901
	Rapid Resolution HT, 600 bar	4.6 x 50	1.8	827975-902	827975-906	827975-912	827975-905	827975-914	827975-901	827668-901
	Rapid Resolution HT, 600 bar	4.6 x 30	1.8	824975-902	824975-906	824975-912	824975-905	824975-914		
	Rapid Resolution HT, 600 bar	4.6 x 20	1.8	826975-902	826975-906					
	UHPLC Guard, 600 bar, 3/pk	4.6 x 5	1.8	820750-902	820750-904					
	Solvent Saver HT, 600 bar	3.0 x 150	1.8	829975-302	829975-306	829975-312	829975-305			
	Solvent Saver HT, 600 bar	3.0 x 100	1.8	828975-302	828975-306	828975-312	828975-305	828975-314	828975-301	828668-301
	Solvent Saver HT, 600 bar	3.0 x 50	1.8	827975-302	827975-306	827975-312	827975-305	827975-314	827975-301	827668-301
	Solvent Saver HT, 600 bar	3.0 x 30	1.8	824975-302	824975-306		824975-305			
	Solvent Saver HT, 600 bar	3.0 x 20	1.8	826975-302	826975-306					
	UHPLC Guard, 1200 bar, 3/pk	3.0 x 5	1.8	823750-902	823750-904					
	Narrow Bore RRHT, 600 bar	2.1 x 150	1.8	820700-902	820700-906	820700-912	820700-905			
	Narrow Bore RRHT, 600 bar	2.1 x 100	1.8	828700-902	828700-906	828700-912	828700-905	828700-914	828700-901	828768-901
	Narrow Bore RRHT, 600 bar	2.1 x 50	1.8	827700-902	827700-906	827700-912	827700-905	827700-914	827700-901	827768-901
	Narrow Bore RRHT, 600 bar	2.1 x 30	1.8	824700-902	824700-906	824700-912	824700-905	824700-914		
	Narrow Bore RRHT, 600 bar	2.1 x 20	1.8	826700-902	826700-906					
	UHPLC Guard, 1200 bar, 3/pk	2.1 x 5	1.8	821725-902	821725-904					



Rapid Resolution HT Columns and Cartridges (Maximum Pressure: 400 bar, 6000 psi)

Hardware	Description	Size (mm)	Particle Size (µm)	Eclipse XDB-C18 USP L1	Eclipse XDB-C8 USP L7	SB-C18 USP L1	SB-C8 USP L7	Extend-C18 USP L1
	Rapid Resolution HT, 400 bar	4.6 x 50	1.8	922975-902	922975-906	922975-902	822975-906	722975-902
	Rapid Resolution HT, 3/pk, 400 bar	4.6 x 50	1.8	922975-932		922975-932		
	Narrow Bore RRHT, 400 bar	2.1 x 50	1.8	922700-902		922700-902		
	Narrow Bore RRHT, 3/pk, 400 bar	2.1 x 50	1.8	922700-932		922700-932		
Rapid Resolution HT Cartridges (require hardware kit 820555-901)								
RR	Rapid Resolution HT Cartridge	4.6 x 50	1.8	925975-902		825975-902		
RR	Rapid Resolution HT Cartridge, 3/pk	4.6 x 50	1.8	925975-932		825975-932		
RR	Rapid Resolution HT Cartridge	2.1 x 50	1.8	925700-902		825700-902		
RR	Rapid Resolution HT Cartridge, 3/pk	2.1 x 50	1.8	925700-932		825700-932		
RR	Rapid Resolution HT Cartridge	4.6 x 30	1.8	923975-902		823975-902		
RR	Rapid Resolution HT Cartridge, 3/pk	4.6 x 30	1.8	923975-932		823975-932		
RR	Rapid Resolution HT Cartridge	2.1 x 30	1.8	923700-902		823700-902		
RR	Rapid Resolution HT Cartridge, 3/pk	2.1 x 30	1.8	923700-932		823700-932		
RR	Rapid Resolution HT Cartridge	4.6 x 15	1.8	921975-902		821975-902		
RR	Rapid Resolution HT Cartridge, 3/pk	4.6 x 15	1.8	921975-932		821975-932		
RR	Rapid Resolution HT Cartridge	2.1 x 15	1.8	921700-902		821700-902		
RR	Rapid Resolution HT Cartridge, 3/pk	2.1 x 15	1.8	921700-932		821700-932		
RR	Hardware Kit for RR and RRHT Cartridges			820555-901		820555-901		



UHPLC Guard, 1200 bar, 821725-903

Agilent Fast Guards for UHPLC




- High performance guard columns for Fast LC columns
- Two formats – one for Poroshell 120 columns, stable to 600 bar, RRHD columns, 1.8 μm (stable to 1200 bar), and RRHT columns, 1.8 μm (stable to 600 bar)

Agilent UHPLC Guards are high performance guards designed by Agilent for its Fast LC columns families. Agilent UHPLC Guards use easy-to-install hardware that fits directly on the end of the column; no extra hardware is needed. They are sold in packages of three.




Agilent UHPLC Guards extend the lifetime of analytical columns without diminishing performance.

Fast Guards for UHPLC

ZORBAX RRHD columns, 1.8 μm (1200 bar), and ZORBAX RRHT columns, 1.8 μm (600 bar)

Hardware	Description	Size (mm)	Particle Size (μm)	Eclipse Plus C18 USP L1	Eclipse XDB-C18 USP L1	SB-C18 USP L1	SB-C8 USP L7
	UHPLC Guard, 1200 bar, 3/pk	2.1 x 5	1.8	821725-901	821725-903	821725-902	821725-904
	UHPLC Guard, 1200 bar, 3/pk	3.0 x 5	1.8	823750-901	823750-903	823750-902	823750-904
	UHPLC Guard, 600 bar, 3/pk	4.6 x 5	1.8	820750-901	820750-903	820750-902	820750-904

Poroshell 120 columns, 2.7 μm (600 bar)

Hardware	Description	Size (mm)	Particle Size (μm)	EC-C18 USP L1	EC-C8 USP L7	SB-C18 USP L1	Phenyl-Hexyl USP L11
	UHPLC Guard, 600 bar, 3/pk	2.1 x 5	2.7	821725-911	821725-913	821725-912	821725-914
	UHPLC Guard, 600 bar, 3/pk	3.0 x 5	2.7	823750-911	823750-913	823750-912	823750-914
	UHPLC Guard, 600 bar, 3/pk	4.6 x 5	2.7	820750-911	820750-913	820750-912	820750-914



TIPS & TOOLS

Learn about Fast Guards for UHPLC – an easy way to extend the life of your analytical Fast LC column without losing performance. www.agilent.com/chem/fastguardsvideo



Other Columns for Reversed-Phase Analytical HPLC

Achieve excellent peak shape and resolution every time — leveraging the industry's broadest selection of reversed-phase columns

Whether you are using Fast LC or working with more conventional HPLC applications, Agilent's LC family offers you a range of phases and selectivities to help you perfect your separation.

The ZORBAX Family of phases scales readily to Fast LC columns in the Rapid Resolution High Throughput (RRHT) and Rapid Resolution High Definition (RRHD) families and Poroshell 120 columns, see previous section, page 227.

In this section, we'll provide overviews of other key analytical columns from Agilent:

ZORBAX Rapid Resolution, 3.5 μm , configurations are an ideal choice for initial method development, providing increased sample throughput for any application when compared to 5 μm columns.

ZORBAX Solvent Saver 3.0 mm id column configurations provide 60% mobile phase reduction over 4.6 mm id columns.

ZORBAX Eclipse Plus HPLC columns are designed to reliably produce superior peak shapes for basic compounds, and are available across all ZORBAX column configurations.

More than 13 additional ZORBAX phases including StableBond, Eclipse PAH, Eclipse XDB, ZORBAX Rx, Extend-C18, Bonus-Rx and Original ZORBAX columns — in total, more than 1400 configurations for reliable scalability and method transfer.

ZORBAX Method Development kits contain three columns for the price of two! Each as a different bonded phase for optimizing selectivity.

ZORBAX Method Validation kits — choose as many columns as you need (or as few) to make method validation easier and less expensive.

Pursuit, Pursuit XRs and Pursuit XRs Ultra columns provide alternate selectivities to the ZORBAX family.

Polaris Columns provide polar-modified phases for routine polar applications.

Other Columns for Reversed-Phase Analytical HPLC.



ZORBAX Eclipse Plus Columns

ZORBAX Eclipse Plus

- The ideal column for method development – excellent results for a wide range of compounds
- High level of performance – peak shape, efficiency, resolution, and lifetime – with all sample types: acids, bases and neutrals
- Superior reproducibility with more rigorous QA/QC testing
- Improved, patented silica manufacturing with start-to-finish product control
- Available in 1.8, 3.5, and 5 μm particle sizes for all analytical, high resolution, and fast LC analyses

Agilent ZORBAX Eclipse Plus columns provide the ultimate in performance for silica-based columns. Peak shape is excellent for the most challenging basic compounds, improving efficiency and resolution with these sample types. These results are achieved by improvements in the silica manufacturing and bonding technology, which is completely controlled by Agilent.

Because of their high level of performance, Eclipse Plus columns are the ideal first choice for method development of all samples. If you need to achieve fast method development and superior productivity, then choose a column with high-resolution 1.8 μm particles. For standard methods, conventional 5 μm and Rapid Resolution 3.5 μm columns are your best choice. With all particle sizes, easy method transfer is possible.

With more rigorous QA and QC testing, column lot-to-lot reproducibility is also improved, resulting in long-term reliable results for all analyses.

Column Specifications

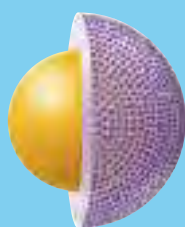
Bonded Phase	Pore Size	Surface Area	Temp. Limits	pH Range*	Endcapped	Carbon Load
ZORBAX Eclipse Plus C18	95Å	160 m ² /g	60 °C	2.0-9.0	Double	9%
ZORBAX Eclipse Plus C8	95Å	160 m ² /g	60 °C	2.0-9.0	Double	7%
ZORBAX Eclipse PAH	95Å	160 m ² /g	60 °C	2.0-8.0	No	14%
ZORBAX Eclipse Plus Phenyl-Hexyl	95Å	160 m ² /g	60 °C	2.0-8.0	Double	9%

Specifications represent typical values only.

*Column lifetime will be reduced significantly at pH >7 and temperature >40 °C. At pH 6-9, highest column stability for all silica based columns is obtained by operating at temperatures <40 °C and using lower buffer concentrations in range of 0.01-0.02 M, especially with phosphate and carbonate buffers.



TIPS & TOOLS



The EC-C18, EC-C8 and Phenyl-Hexyl phases on Poroshell 120 are very similar to Eclipse Plus C18, Eclipse Plus C8 and Eclipse Plus Phenyl-Hexyl phases.

Turn to page 228.

ZORBAX Eclipse Plus: Best peak shape in the industry without tailing

Column: Eclipse Plus C18
959996-902
4.6 x 100 mm, 5 µm

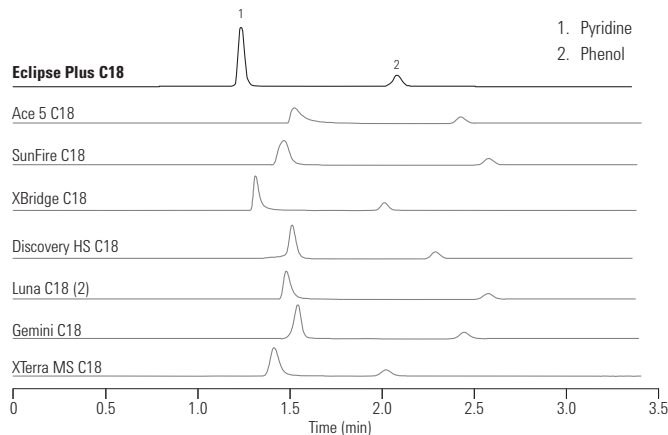
Mobile Phase: A: 60% Water
B: 40% Acetonitrile

Flow Rate: 1.0 mL/min

Temperature: Ambient

Detector: UV, 254 nm

Sample: Pyridine, Phenol



LCEC001

Peak shape and efficiency are better with ZORBAX Eclipse Plus

Column A: XBridge C18, 4.6 x 150 mm, 5 µm

Column B: Eclipse Plus C18
959993-902
4.6 x 150 mm, 5 µm

Mobile Phase: A: 0.1% Formic acid
B: 0.1% Formic acid in ACN

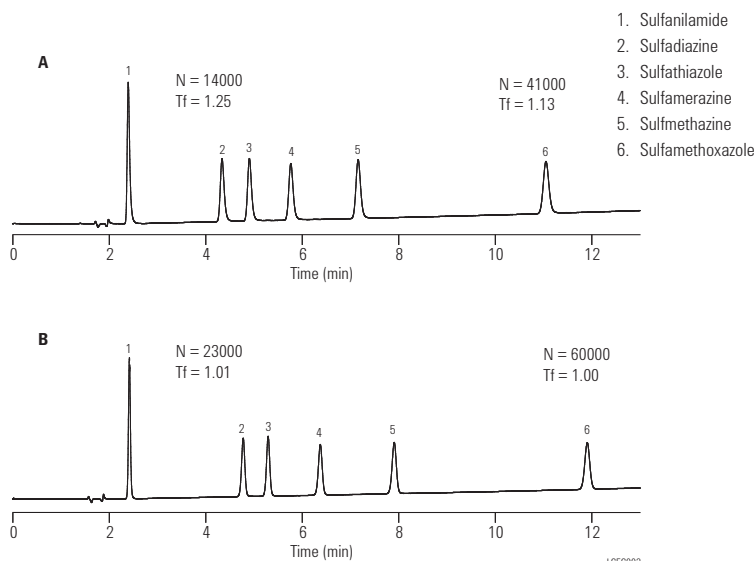
Flow Rate: 1.0 mL/min

Gradient: 0.0 min 10% B
15 min 30% B

Temperature: 40 °C

Detector: UV, 254 nm

Sample: Sulfonamides



LCEC003

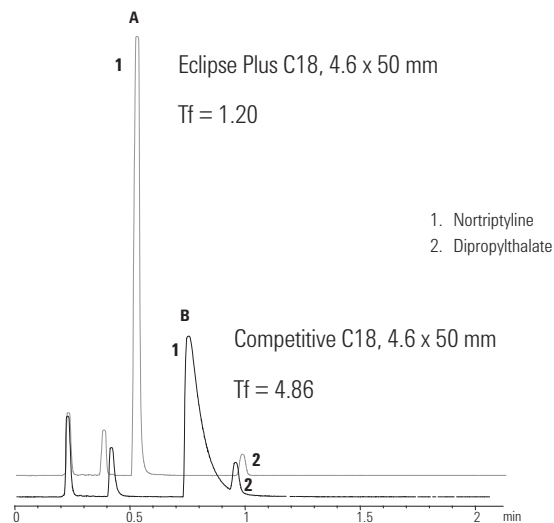
Eliminate tailing and maximize resolution with Eclipse Plus Columns

Column A: Eclipse Plus C18, 4.6 x 50 mm

Column B: Competitive C18, 4.6 x 50 mm

Mobile Phase: 65% ACN:35% 25 mM phosphate buffer (pH 7.4)

Superior peak shape and better selectivity with Eclipse Plus means more resolution, easier quantitation and better results in your separations.



- 1. Nortriptyline
- 2. Dipropylthalate

Eclipse Plus C18 vs. C8

**Column A: Eclipse Plus C18
4.6 x 50 mm, 5 µm**

**Column B: Eclipse Plus C8
4.6 x 50 mm, 5 µm**

Mobile Phase: Water: acetonitrile (30:70)

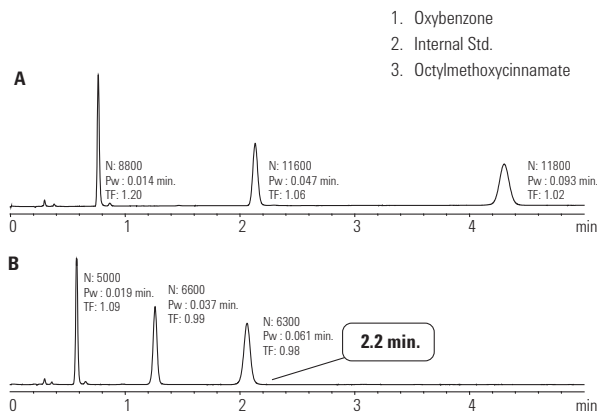
Flow Rate: 2.0 mL/min

Temperature: 30 °C

Detector: UV, 230 nm

Sample: Lip balm extract in ACN
(melted at 100 °C, cooled and 0.45 µm filtered)

Less retention can save significant time – the C8 is a good choice here.



- 1. Oxybenzone
- 2. Internal Std.
- 3. Octylmethoxycinnamate

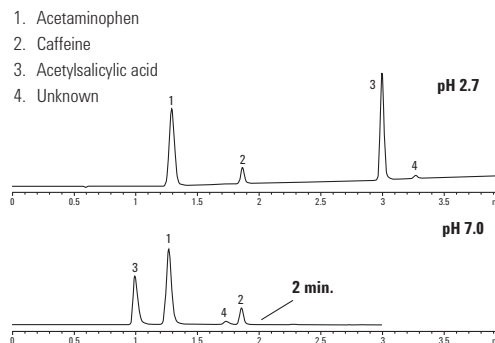
Rapid analysis of an analgesic tablet, selectivity differences at pH 2 and pH 7

**Column: Eclipse Plus C8
959946-906
4.6 x 50 mm, 5 µm**

Gradient: 10-60% B/3 min
pH 2.7: A: 0.1% Formic acid B: 0.1% fa in ACN
pH 7.0: A: 20 mM Na phosphate B: ACN

Sample: generic Excedrin tablet

Both Eclipse Plus C18 and C8 can be used over a wide pH range to optimize selectivity or analysis time.



- 1. Acetaminophen
- 2. Caffeine
- 3. Acetylsalicylic acid
- 4. Unknown

Eclipse Plus C8 is less retentive than Eclipse Plus C18

Column A: Eclipse Plus C8
959996-906
4.6 x 100 mm, 5 µm

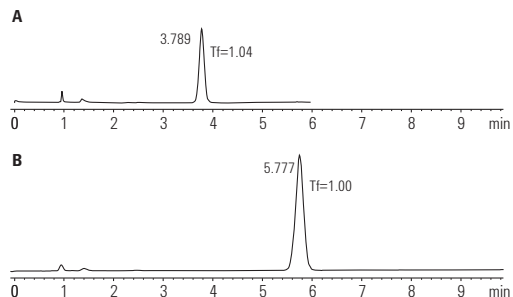
Column B: Eclipse Plus C18
959996-902
4.6 x 100 mm, 5 µm

Mobile Phase: 80% Methanol 8 mM (total) K₂HPO₄ pH 7

Flow Rate: 1.0 mL/min

Detector: UV, 215 nm

Sample: Amitriptyline 0.05 µg/µL (0.5 µL injection)



A C8 column is typically selected because it will retain less than a C18 column, reducing analysis time.

The Eclipse Plus C8 column shows the same behavior with excellent peak shape on difficult basic compounds.

Fast and ultra-fast analysis of basic compounds on Eclipse Plus

Column A: Eclipse Plus C18
959941-902
4.6 x 50 mm, 1.8 µm

Column B: Eclipse Plus C18
959993-902
4.6 x 150 mm, 5 µm

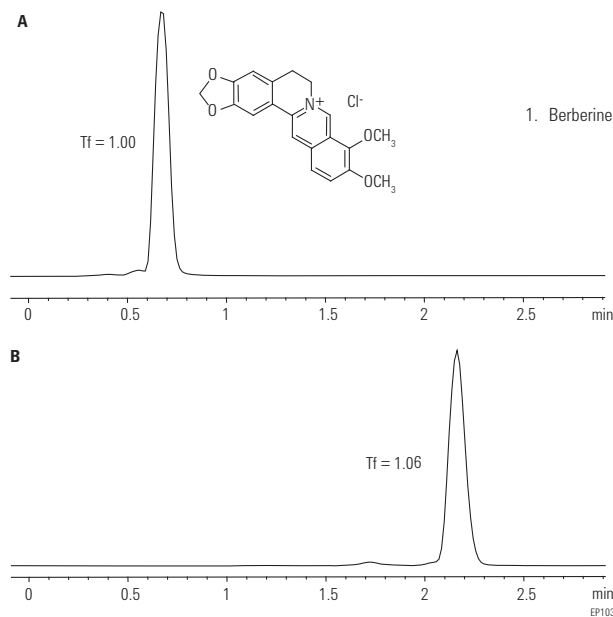
Mobile Phase: A: 50% 8 mM K₂HPO₄, pH 7
B: 50% ACN

Flow Rate: 1.0 mL/min

Temperature: Ambient


Detector: UV, 254 nm

Sample: Berberine, 0.4 mg/mL, 2 µL



ZORBAX Eclipse Plus Columns






ZORBAX Eclipse Plus

Hardware	Description	Size (mm)	Particle Size (µm)	Eclipse Plus C18 USP L1	Eclipse Plus C8 USP L7	Eclipse Plus Phenyl-Hexyl USP L11	Eclipse PAH USP L1
	Analytical	4.6 x 250	5	959990-902	959990-906	959990-912	959990-918
	Analytical	4.6 x 150	5	959993-902	959993-906	959993-912	959993-918
	Analytical	4.6 x 100	5	959996-902	959996-906	959996-912	959996-918
	Analytical	4.6 x 50	5	959946-902	959946-906		
	Rapid Resolution	4.6 x 150	3.5	959963-902	959963-906	959963-912	959963-918
	Rapid Resolution	4.6 x 100	3.5	959961-902	959961-906	959961-912	959961-918
	Rapid Resolution	4.6 x 75	3.5	959933-902	959933-906	959933-912	
	Rapid Resolution	4.6 x 50	3.5	959943-902	959943-906	959943-912	959943-918
	Rapid Resolution	4.6 x 30	3.5	959936-902	959936-906	959936-912	
	Rapid Resolution HT, 600 bar	4.6 x 100	1.8	959964-902	959964-906	959964-912	959964-918
	Rapid Resolution HT, 600 bar	4.6 x 75	1.8	959951-902			
	Rapid Resolution HT, 600 bar	4.6 x 50	1.8	959941-902	959941-906	959941-912	959941-918
	Rapid Resolution HT, 600 bar	4.6 x 30	1.8	959931-902	959931-906	959931-912	959931-918
	UHPLC Guard, 600 bar, 3/pk	4.6 x 5	1.8	820750-901			
	Solvent Saver	3.0 x 250	5				959990-318
	Solvent Saver	3.0 x 150	5	959993-302	959993-306		
	Solvent Saver Plus	3.0 x 150	3.5	959963-302	959963-306	959963-312	
	Solvent Saver Plus	3.0 x 100	3.5	959961-302	959961-306	959961-312	
	Solvent Saver RRHD, 1200 bar	3.0 x 150	1.8	959759-302	959759-306		
	Solvent Saver RRHD, 1200 bar	3.0 x 100	1.8	959758-302	959758-306		
	Solvent Saver RRHD, 1200 bar	3.0 x 50	1.8	959757-302	959757-306		
	Solvent Saver HT, 600 bar	3.0 x 100	1.8	959964-302	959964-306	959964-312	
	Solvent Saver HT, 600 bar	3.0 x 50	1.8	959941-302	959941-306	959941-312	

(Continued)

Agilent HILIC Plus uses the same manufacturing processes as the Eclipse Plus family. See information about ZORBAX HILIC Plus on page 324.

ZORBAX Eclipse Plus

Hardware	Description	Size (mm)	Particle Size (µm)	Eclipse Plus C18 USP L1	Eclipse Plus C8 USP L7	Eclipse Plus Phenyl-Hexyl USP L11	Eclipse PAH USP L1
	UHPLC Guard, 1200 bar, 3/pk	3.0 x 5	1.8	823750-901			
	Narrow Bore	2.1 x 250	5				959790-918
	Narrow Bore	2.1 x 150	5	959701-902	959701-906	959701-912	959701-918
	Narrow Bore	2.1 x 50	5	959746-902	959746-906		
	Narrow Bore RR	2.1 x 150	3.5	959763-902	959763-906	959763-912	
	Narrow Bore RR	2.1 x 100	3.5	959793-902	959793-906	959793-912	959793-918
	Narrow Bore RR	2.1 x 50	3.5	959743-902	959743-906	959743-912	
	Narrow Bore RR	2.1 x 30	3.5	959733-902	959733-906	959733-912	
	Narrow Bore RRHD, 1200 bar	2.1 x 150	1.8	959759-902	959759-906		
	Narrow Bore RRHD, 1200 bar	2.1 x 100	1.8	959758-902	959758-906		
	Narrow Bore RRHD, 1200 bar	2.1 x 50	1.8	959757-902	959757-906		
	Narrow Bore RRHT, 600 bar	2.1 x 100	1.8	959764-902	959764-906	959764-912	959764-918
	Narrow Bore RRHT, 600 bar	2.1 x 50	1.8	959741-902	959741-906	959741-912	959741-918
	Narrow Bore RRHT, 600 bar	2.1 x 30	1.8	959731-902	959731-906	959731-912	
	UHPLC Guard, 1200 bar, 3/pk	2.1 x 5	1.8	821725-901			
	Guard Cartridges, 4/pk	4.6 x 12.5	5	820950-936	820950-937	820950-938	820950-939
	Guard Cartridges, 4/pk	2.1 x 12.5	5	821125-936	821125-937	821125-938	821125-939
	Guard Hardware Kit			820999-901	820999-901	820999-901	820999-901



ZORBAX Eclipse PAH Columns

ZORBAX Eclipse PAH

- High resolution separation of 16 PAHs in EPA Method 610
- Extensive range of particle sizes (1.8, 3.5 and 5 μm) and sizes for fast and high resolution separations
- Each batch of material is specifically tested with PAHs for maximum reproducibility under expected operating conditions
- Excellent performance using the high quality, improved silica of Eclipse Plus columns
- Good for applications requiring "shape selectivity" or the separation of geometric isomers

Agilent ZORBAX Eclipse PAH columns are recommended for the separation of polycyclic aromatic hydrocarbons. PAHs are considered priority pollutants and the analysis of these potentially carcinogenic compounds in water, soil and food is of major importance. Eclipse PAH columns separate all 16 PAHs in EPA method 610 quickly and with high resolution.

Column Specifications

Bonded Phase	Pore Size	Surface Area	Temp. Limits	pH Range	Endcapped	Carbon Load
ZORBAX Eclipse PAH	95Å	160 m ² /g	60 °C	2.0-8.0	No	14%

Specifications represent typical values only.

High resolution and fast analysis on RRHT Eclipse PAH column

Column: Eclipse PAH
959941-918
4.6 x 50 mm, 1.8 μm

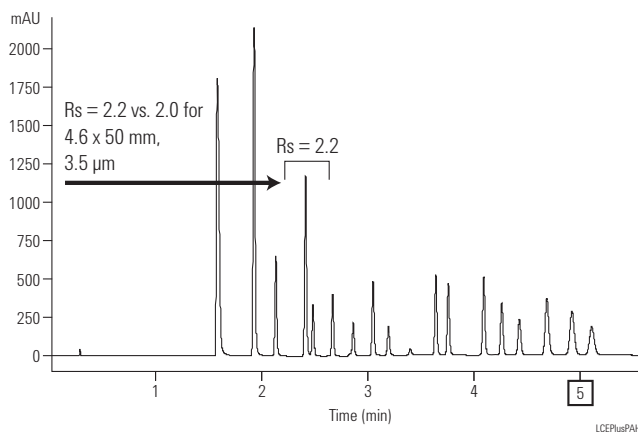
Mobile Phase: A: Water; B: Acetonitrile

Gradient:	Time (Min)	% B
	0.00	40
	3.5	100
	5.2	100
	5.5	40
	6.5	40

Flow Rate: 2.0 mL/min

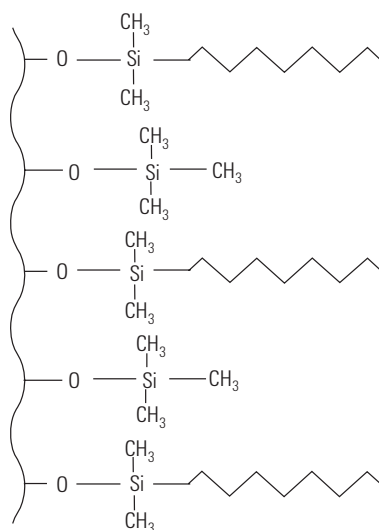
Temperature: 25 °C

Detector: DAD 220, 4 nm No Ref. DAD Stop Time = 6.0 min
Stop Time = 7.0



ZORBAX Eclipse PAH

Hardware	Description	Size (mm)	Particle Size (µm)	Eclipse PAH USP L1
	Analytical	4.6 x 250	5	959990-918
	Analytical	4.6 x 150	5	959993-918
	Analytical	4.6 x 100	5	959996-918
	Rapid Resolution	4.6 x 150	3.5	959963-918
	Rapid Resolution	4.6 x 100	3.5	959961-918
	Rapid Resolution	4.6 x 50	3.5	959943-918
	Rapid Resolution HT, 600 bar	4.6 x 100	1.8	959964-918
	Rapid Resolution HT, 600 bar	4.6 x 50	1.8	959941-918
	Rapid Resolution HT, 600 bar	4.6 x 30	1.8	959931-918
	Solvent Saver	3.0 x 250	5	959990-318
	Narrow Bore	2.1 x 250	5	959790-918
	Narrow Bore	2.1 x 150	5	959701-918
	Narrow Bore RR	2.1 x 100	3.5	959793-918
	Narrow Bore RRHT, 600 bar	2.1 x 100	1.8	959764-918
	Narrow Bore RRHT, 600 bar	2.1 x 50	1.8	959741-918
ZGC	Guard Cartridges, 4/pk	4.6 x 12.5	5	820950-939
ZGC	Guard Cartridges, 4/pk	2.1 x 12.5	5	821125-939
ZGC	Guard Hardware Kit			820999-901



eXtra Densely Bonded and Double Endcapped Eclipse XDB Bonded Phase

ZORBAX Eclipse XDB

- Four selectivity choices for method development optimization
- Good peak shape for basic, acidic and neutral compounds
- High performance over a wide pH range – pH 2-9
- Particle sizes from 1.8 to 7 μm
- Long lifetime with eXtra Dense Bonding and double endcapping

Agilent ZORBAX Eclipse XDB columns – C18, C8, Phenyl and CN – provide four bonded phase choices for method development optimization. These columns provide good peak shape over a wide pH range (2-9) for additional method development flexibility with one family of columns. Eclipse XDB columns can be used for method development at low pH (2-3) and the same column can be used for method development in the mid pH (6-8) region. In the mid pH region residual silanols are more active and tailing interactions are more likely. To overcome these interactions, Eclipse XDB columns are eXtra Densely Bonded and double endcapped through a proprietary process to cover as many active silanols as possible. The result is superior peak shape of basic compounds from pH 2-9. Eclipse XDB columns are available in 1.8, 3.5, 5 and 7 μm particle sizes for high speed, high resolution, analytical and prep scale separations.

Column Specifications

Bonded Phase	Pore Size	Surface Area	Temp. Limits	pH Range*	Endcapped	Carbon Load
ZORBAX Eclipse XDB-C18	80Å	180 m ² /g	60 °C	2.0-9.0	Double	10%
ZORBAX Eclipse XDB-C8	80Å	180 m ² /g	60 °C	2.0-9.0	Double	7.6%
ZORBAX Eclipse XDB-Phenyl	80Å	180 m ² /g	60 °C	2.0-9.0	Double	7.2%
ZORBAX Eclipse XDB-CN	80Å	180 m ² /g	60 °C	2.0-8.0	Double	4.3%

Specifications represent typical values only

*Eclipse XDB columns are designed for operation over a wide pH range. At pH 6-9, highest columns stability for all silica based columns is achieved by operating at temperatures <40 °C and using low buffer concentrations in the range of 0.01-0.02 M.



TIPS & TOOLS

Poroshell 120 EC-CN is very similar to ZORBAX XDB-CN. Page 228

Good peak shape over a wide pH range with ZORBAX Eclipse XDB

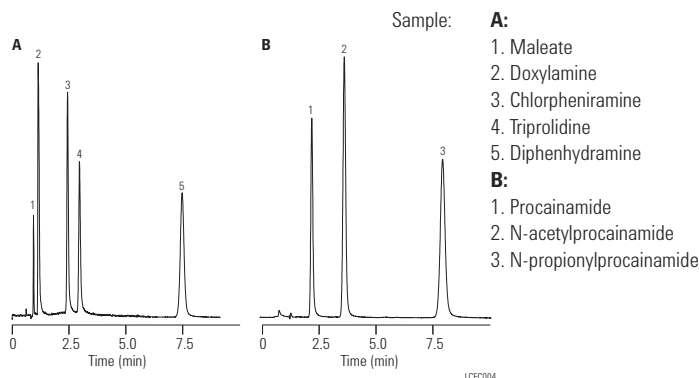
Column: Eclipse XDB-C8
993967-906
4.6 x 150 mm, 5 µm

Mobile Phase: A: pH 3.0 75% 25 mM phosphate buffer 25% ACN
 B: pH 7.0 90% 20 mM phosphate 10% ACN

Flow Rate: 1.5 mL/min

Temperature: 40 °C

ZORBAX Eclipse XDB columns provide good peak shape over a wide pH range and are an excellent choice for method development from pH 2-9.



Column stability testing at pH 3 and 60 °C

Column: ZORBAX SB-C8
883975-906
4.6 x 150 mm, 5 µm

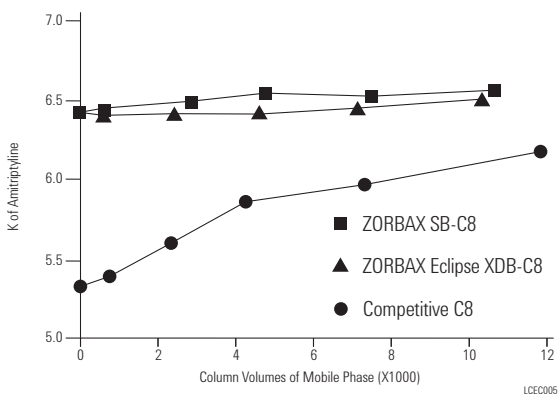
Column: Eclipse XDB-C8
993967-906
4.6 x 150 mm, 5 µm

Mobile Phase: Purge Conditions:
 70% 50 mM NaAc-HCl, pH 3.0
 30% ACN
 Retention Test Conditions:
 65% Methanol
 35% Water

Flow Rate: 1.0 mL/min

Temperature: 60 °C

Sample: Tricyclic antidepressants



Eclipse XDB columns are stable over a wide pH range. At low pH an Eclipse endcapped column is extremely stable and shows equivalent stability to a non-endcapped column, SB-C8, at pH 3. The columns were purged with a pH 3 mobile phase at 60 °C. Then they were tested with a strongly basic compound to determine if the endcapping or bonded phase had been hydrolyzed from the silica surface. The Eclipse XDB column was very stable, as shown by the consistency of the retention of amitriptyline over the 12,000 column volumes of the test. Another endcapped column shows less stability under these same conditions.

Column stability testing at pH 7.0

Column A: Competitive C8
SIL-type
After 1826 column volumes

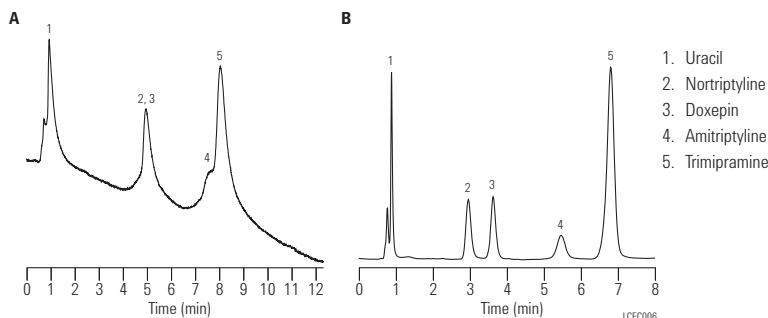
Column B: Eclipse XDB-C8
993967-906
4.6 x 150 mm, 5 µm
Sol-type
After 1843 column volumes

Mobile Phase: 60% ACN
40% 250 mM Phosphate Buffer, pH 7.0

Flow Rate: 1.5 mL/min

Temperature: 60 °C

Sample: Tricyclic antidepressants



Double endcapping, dense bonding and the durable Rx-Sil particles (sol-type) combine to provide long lifetime at pH 7 when compared to single endcapped sil-gel columns used here. The conditions used for this test – high temperature (60 °C) and high salt concentration (250 mM), accelerate the dissolution of silica, causing premature failure of the sil-gel type column.

Selectivity changes for basic compounds with Eclipse XDB and StableBond

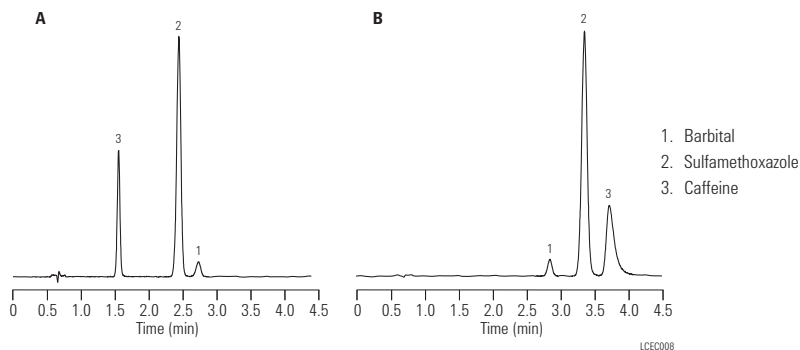
Column A: Eclipse XDB-C8
966967-906
4.6 x 75 mm, 3.5 µm

Column B: ZORBAX Rx/SB-C8
866953-906
4.6 x 75 mm, 3.5 µm

Mobile Phase: 70% 25 mM NaH₂PO₄, pH 3.0
30% Methanol

Flow Rate: 1.0 mL/min

Temperature: 35 °C



Eclipse XDB and StableBond columns are based on the same silica but have different bonding and endcapping. Therefore, they can have very different selectivity for the same sample under the same conditions, as this example shows.

Optimize separations with Eclipse XDB selectivity options

Column A: Eclipse XDB-Phenyl
963967-912
4.6 x 150 mm, 3.5 μ m

Column B: Eclipse XDB-C8
963967-906
4.6 x 150 mm, 3.5 μ m

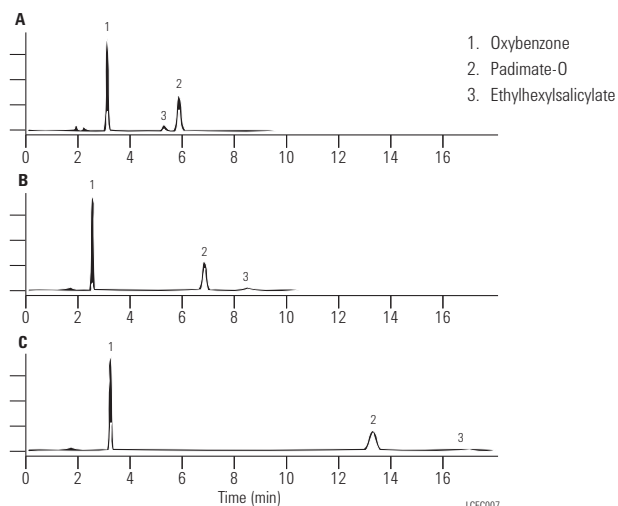
Column C: Eclipse XDB-C18
963967-902
4.6 x 150 mm, 3.5 μ m

Mobile Phase: 15% H₂O:85% MeOH

Flow Rate: 1.0 mL/min

Temperature: 35 °C

Sample: Sunscreens



This separation of sunscreens on all three Eclipse XDB bonded phases – C18, C8 and Phenyl – shows that different bonded phases can be used to optimize a separation. While all three bonded phases provide an adequate separation, the Eclipse XDB-Phenyl provides a different peak elution order and a much shorter overall analysis time. All three bonded phases also provide excellent peak shape with no mobile phase additives.

Selectivity for urea pesticides

Column A: Eclipse XDB-C18
993967-902
4.6 x 150 mm, 5 μ m

Column B: Eclipse XDB-CN
993967-905
4.6 x 150 mm, 5 μ m

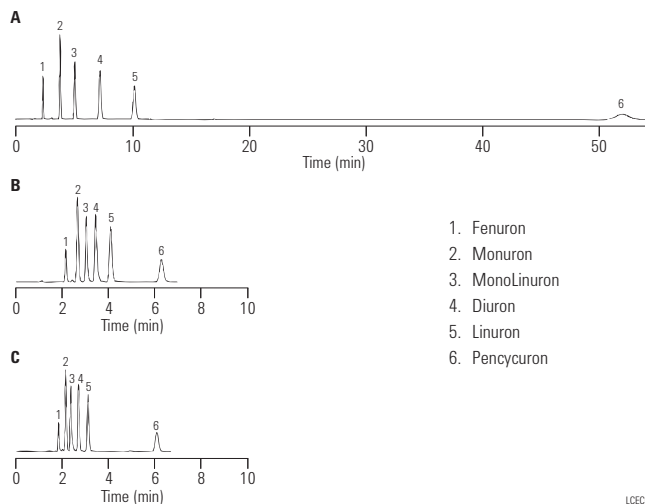
Column C: Eclipse XDB-C18
993967-902
4.6 x 150 mm, 5 μ m

Mobile Phase: A. 60:40 MeOH:Water
B. 60:40 MeOH:Water
C. 77:23 MeOH:Water

Flow Rate: 1.0 mL/min



Temperature: 25 °C

Sample: Urea pesticides



The Eclipse XDB-CN column reduces retention time and provides good selectivity for Urea pesticides when compared to an Eclipse XDB-C18 column.

ZORBAX Eclipse XDB















Hardware Description	Size (mm)	Particle Size (µm)	Eclipse XDB-C18 USP L1	Eclipse XDB-C8 USP L7	Eclipse XDB-Phenyl USP L11	Eclipse XDB-CN USP L10
Standard Columns (no special hardware required)						
Semi-Preparative	9.4 x 250	5	990967-202	990967-206		
Analytical	4.6 x 250	5	990967-902	990967-906	990967-912	990967-905
Analytical	4.6 x 150	5	993967-902	993967-906	993967-912	993967-905
Analytical	4.6 x 50	5	946975-902	946975-906		
Rapid Resolution	4.6 x 150	3.5	963967-902	963967-906	963967-912	963967-905
Rapid Resolution	4.6 x 100	3.5	961967-902	961967-906		961967-905
Rapid Resolution	4.6 x 75	3.5	966967-902	966967-906	966967-912	966967-905
Rapid Resolution	4.6 x 50	3.5	935967-902	935967-906	935967-912	
Rapid Resolution	4.6 x 30	3.5	934967-902	934967-906		
Rapid Resolution	4.6 x 20	3.5	932967-902	932967-906		
 UHPLC Guard, 1200 bar, 3/pk	4.6 x 5	1.8	820750-903			
Rapid Resolution HT, 600 bar	4.6 x 100	1.8	928975-902	928975-906		
Rapid Resolution HT, 600 bar	4.6 x 50	1.8	927975-902	927975-906		
Rapid Resolution HT, 600 bar	4.6 x 30	1.8	924975-902	924975-906		
Rapid Resolution HT, 600 bar	4.6 x 20	1.8	926975-902	926975-906		
Solvent Saver	3.0 x 250	5	990967-302	990967-306	990967-312	990967-305
Solvent Saver	3.0 x 150	5	993967-302	993967-306	993967-312	993967-305
Solvent Saver Plus	3.0 x 150	3.5	963954-302	963954-306	963954-312	963954-305
Solvent Saver Plus	3.0 x 100	3.5	961967-302	961967-306	961967-312	
Solvent Saver Plus	3.0 x 75	3.5	966954-302			
Solvent Saver RRHD, 1200 bar	3.0 x 150	1.8	981759-302			
Solvent Saver RRHD, 1200 bar	3.0 x 100	1.8	981758-302			
Solvent Saver RRHD, 1200 bar	3.0 x 50	1.8	981757-302			
Solvent Saver HT, 600 bar	3.0 x 100	1.8	928975-302	928975-306		
Solvent Saver HT, 600 bar	3.0 x 50	1.8	927975-302	927975-306		
Solvent Saver HT, 600 bar	3.0 x 30	1.8	924975-302	924975-306		
Solvent Saver HT, 600 bar	3.0 x 20	1.8	926975-302	926975-306		
 UHPLC Guard, 1200 bar, 3/pk	3.0 x 5	1.8	823750-903			
Narrow Bore	2.1 x 150	5	993700-902	993700-906	993700-912	993700-905
Narrow Bore	2.1 x 50	5	960967-902	960967-906	960967-912	960967-905
Narrow Bore RR	2.1 x 150	3.5	930990-902	930990-906		

Unless indicated, column pressure limit is 400 bar.

*These columns are packed with Eclipse XDB-C18, 5 µm.

(Continued)

ZORBAX Eclipse XDB

Hardware Description	Size (mm)	Particle Size (µm)	Eclipse XDB-C18 USP L1	Eclipse XDB-C8 USP L7	Eclipse XDB-Phenyl USP L11	Eclipse XDB-CN USP L10
Standard Columns (no special hardware required)						
Narrow Bore RR	2.1 x 100	3.5	961753-902	961753-906		961753-905
Narrow Bore RR	2.1 x 75	3.5	966735-902			
Narrow Bore RR	2.1 x 50	3.5	971700-902	971700-906		
Narrow Bore RR	2.1 x 30	3.5	974700-902	974700-906		
Narrow Bore RR	2.1 x 20	3.5	972700-902	972700-906		
Narrow Bore RRHD, 1200 bar	2.1 x 150	1.8	981759-902			
Narrow Bore RRHD, 1200 bar	2.1 x 100	1.8	981758-902			
Narrow Bore RRHD, 1200 bar	2.1 x 50	1.8	981757-902			
Narrow Bore RRHT, 600 bar	2.1 x 100	1.8	928700-902	928700-906		
Narrow Bore RRHT, 600 bar	2.1 x 50	1.8	927700-902	927700-906		
Narrow Bore RRHT, 600 bar	2.1 x 30	1.8	924700-902	924700-906		
Narrow Bore RRHT, 600 bar	2.1 x 20	1.8	926700-902	926700-906		
 UHPLC Guard, 1200 bar, 3/pk	2.1 x 5	1.8	821725-903			
MicroBore RR	1.0 x 150	3.5	963600-902	963600-906		
MicroBore RR	1.0 x 50	3.5	965600-902	965600-906		
MicroBore RR	1.0 x 30	3.5	961600-902	961600-906		
MicroBore Guard, 3/pk	1.0 x 17	5	5185-5921	5185-5921		
 Guard Cartridge	9.4 x 15	5	820675-112*	820675-112*	820675-112*	820675-112*
 Guard Cartridges, 4/pk	4.6 x 12.5	5	820950-925	820950-926	820950-927	820950-935
 Guard Cartridges, 4/pk	2.1 x 12.5	5	821125-926	821125-926	821125-926	821125-935
 Guard Hardware Kit			840140-901	840140-901	840140-901	840140-901
 Guard Hardware Kit			820999-901	820999-901	820999-901	820999-901
PrepHT Cartridge Columns (require endfittings kit 820400-901)						
 PrepHT Cartridge	21.2 x 250	7	977250-102	977250-106		
 PrepHT Cartridge	21.2 x 150	7	977150-102	977150-106		
 PrepHT Cartridge	21.2 x 150	5	970150-902	970150-906		
 PrepHT Cartridge	21.2 x 100	5	970100-902	970100-906		
 PrepHT Cartridge	21.2 x 50	5	970050-902	970050-906		
 PrepHT Guard Cartridge	17.0 x 7.5	5	820212-925	820212-926		
 Guard Cartridge Hardware			820444-901	820444-901		
 PrepHT Endfittings, 2/pk			820400-901	820400-901		

Unless indicated, column pressure limit is 400 bar.

*These columns are packed with Eclipse XDB-C18, 5 µm.

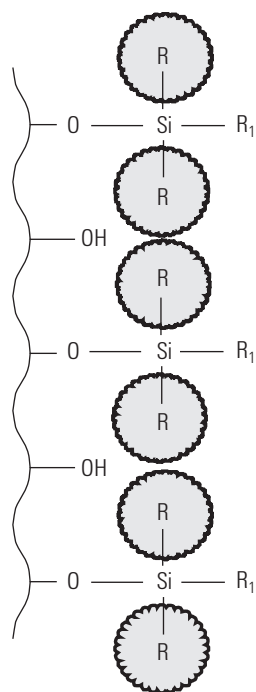
ZORBAX Eclipse XDB

Hardware	Description	Size (mm)	Particle Size (µm)	Eclipse XDB-C18 USP L1	Eclipse XDB-C8 USP L7
Agilent Cartridge Columns (require hardware kit 5021-1845)					
AC	Analytical	4.6 x 250	5	7995118-585	7995108-585
AC	Analytical	4.6 x 150	5	7995118-595	7995108-595
AC	Rapid Resolution	4.6 x 75	3.5	7995118-344	7995108-344
AC	Solvent Saver Plus	3.0 x 75	3.5	7995230-344	
AC	Guard Cartridges, 10/pk	4.0 x 4	5	7995118-504	7995118-504
AC	Cartridge Holder			5021-1845	5021-1845
Standard Columns (no special hardware required)					
	Rapid Resolution HT, 400 bar	4.6 x 50	1.8	922975-902	922975-906
	Rapid Resolution HT, 3/pk, 400 bar	4.6 x 50	1.8	922975-932	
	Narrow Bore RRHT, 400 bar	2.1 x 50	1.8	922700-902	
	Narrow Bore RRHT, 3/pk, 400 bar	2.1 x 50	1.8	922700-932	
Rapid Resolution HT Cartridges (require hardware kit 820555-901)					
RR	Rapid Resolution Cartridge	4.6 x 30	3.5	933975-902	933975-906
RR	Rapid Resolution Cartridge, 3/pk	4.6 x 30	3.5	933975-932	933975-936
RR	Rapid Resolution Cartridge	4.6 x 15	3.5	931975-902	931975-906
RR	Rapid Resolution Cartridge, 3/pk	4.6 x 15	3.5	931975-932	931975-936
RR	Rapid Resolution Cartridge	2.1 x 30	3.5	973700-902	973700-906
RR	Rapid Resolution Cartridge, 3/pk	2.1 x 30	3.5	973700-932	973700-936
RR	Rapid Resolution Cartridge	2.1 x 15	3.5	975700-902	975700-906
RR	Rapid Resolution Cartridge, 3/pk	2.1 x 15	3.5	975700-932	975700-936
RR	Rapid Resolution HT Cartridge, 400 bar	4.6 x 50	1.8	925975-902	
RR	Rapid Resolution HT Cartridge, 3/pk, 400 bar	4.6 x 50	1.8	925975-932	
RR	Rapid Resolution HT Cartridge, 400 bar	4.6 x 30	1.8	923975-902	
RR	Rapid Resolution HT Cartridge, 3/pk, 400 bar	4.6 x 30	1.8	923975-932	

(Continued)

ZORBAX Eclipse XDB

Hardware	Description	Size (mm)	Particle Size (µm)	Eclipse XDB-C18 USP L1	Eclipse XDB-C8 USP L7
Rapid Resolution HT Cartridges (require hardware kit 820555-901)					
RR	Rapid Resolution HT Cartridge, 400 bar	4.6 x 15	1.8	921975-902	
RR	Rapid Resolution HT Cartridge, 3/pk, 400 bar	4.6 x 15	1.8	921975-932	
RR	Rapid Resolution HT Cartridge, 400 bar	2.1 x 50	1.8	925700-902	
RR	Rapid Resolution HT Cartridge, 3/pk, 400 bar	2.1 x 50	1.8	925700-932	
RR	Rapid Resolution HT Cartridge, 400 bar	2.1 x 30	1.8	923700-902	
RR	Rapid Resolution HT Cartridge, 3/pk, 400 bar	2.1 x 30	1.8	923700-932	
RR	Rapid Resolution HT Cartridge, 400 bar	2.1 x 15	1.8	921700-902	
RR	Rapid Resolution HT Cartridge, 3/pk, 400 bar	2.1 x 15	1.8	921700-932	
RR	Hardware Kit for RR and RRHT Cartridges			820555-901	
Capillary Glass-lined Columns					
	Capillary	0.5 x 250	5	5064-8286	
	Capillary	0.5 x 150	5	5064-8287	
	Capillary RR	0.5 x 150	3.5	5064-8288	
	Capillary RR	0.5 x 35	3.5	5064-8298	
	Capillary	0.3 x 250	5	5064-8269	
	Capillary	0.3 x 150	5	5064-8291	
	Capillary RR	0.3 x 150	3.5	5064-8271	
	Capillary	0.5 x 35	5	5064-8296	
	Capillary	0.3 x 35	5	5064-8297	



Sterically Protected StableBond Bonded Phase

ZORBAX 80Å StableBond

- Longest column lifetime and best reproducibility for low pH separations – down to pH 1
- Patented stable column chemistry allows use at high temperature and low pH without degradation
- Six different bonded phases provide broad selectivity – SB-C18, SB-C8, SB-CN, SB-Phenyl, SB-C3, and SB-Aq
- High purity (Type B) silica for good peak shape

Agilent ZORBAX StableBond columns use patented, unique, nonfunctional silanes with bulky diisobutyl (SB-C18) or diisopropyl (SB-C8, SB-C3, SB-Phenyl, SB-CN, and SB-Aq) side chain groups that sterically protect the key siloxane bond to the silica surface from hydrolytic attack at low pH. StableBond packing materials are not endcapped in order to provide exceptional stability and to maximize lifetime and reproducibility under acidic mobile phase conditions. The high purity, low acidity silica provides excellent peak shape with acidic, basic and neutral compounds making StableBond columns an excellent choice for low pH method development. ZORBAX StableBond columns are compatible with all common mobile phases, including very high aqueous mobile phases.

Column Specifications

Bonded Phase	Pore Size	Surface Area	Temp. Limits*	pH Range*	Endcapped	Carbon Load
ZORBAX SB-C18	80Å	180 m ² /g	90 °C	0.8-8.0	No	10%
ZORBAX SB-C8	80Å	180 m ² /g	80 °C	1.0-8.0	No	5.5%
ZORBAX SB-C3	80Å	180 m ² /g	80 °C	1.0-8.0	No	4%
ZORBAX SB-Phenyl	80Å	180 m ² /g	80 °C	1.0-8.0	No	5.5%
ZORBAX SB-CN	80Å	180 m ² /g	80 °C	1.0-8.0	No	4%
ZORBAX SB-Aq	80Å	180 m ² /g	80 °C	1.0-8.0	No	proprietary

Specifications represent typical values only

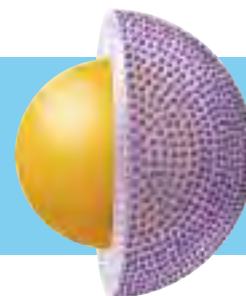
*StableBond columns are designed for optimal use at low pH. At pH 6-8, highest column stability for all silica-based columns is obtained by operating at temperatures <40 °C and using lower buffer concentrations in the range of 0.01-0.02 M. At mid-range pH, Eclipse Plus, Eclipse XDB and Bonus-RP are recommended.

TIPS & TOOLS



ZORBAX StableBond SB-C18, SB-C8 and SB-Aq phases are also available on Poroshell 120.

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StableBond SB-C18 shows excellent stability at low pH and high temperature (pH 0.8, 90 °C)

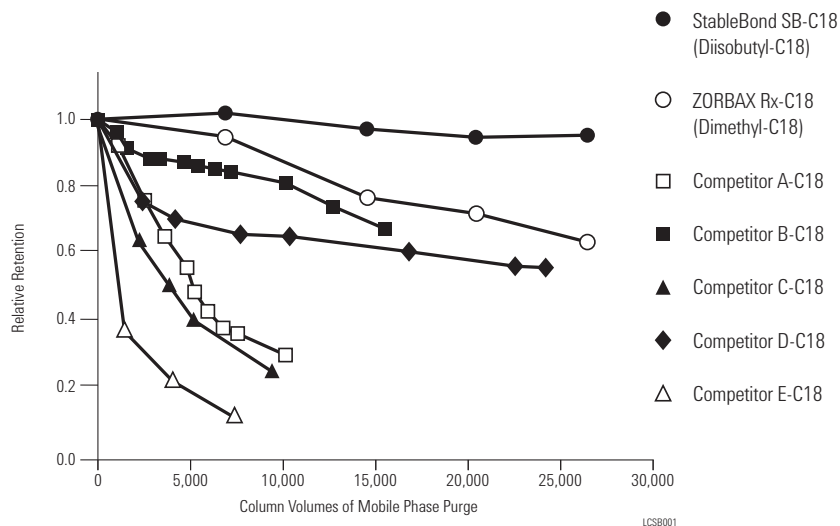
Column: ZORBAX SB-C18
883975-902
4.6 x 150 mm, 5 µm

Column: ZORBAX Rx-C18
883967-902
4.6 x 150 mm, 5 µm

Mobile Phase: 50% Methanol/50% Water with 1.0% TFA
Test Solute: Toluene

Temperature: 90 °C

As an indicator of column breakdown, retention time of toluene was measured after purging the column with mobile phase. Only the StableBond SB-C18 is unchanged after three working months of use under these very low pH (0.8) and high temperature (90 °C) conditions. ZORBAX Rx-C18 also provides a stable matrix, and can be used as an alternative selectivity to StableBond SB-C18.



Shorter chain ZORBAX SB-CN is also stable at low pH (pH 2.0, 50 °C)

Column: ZORBAX SB-CN
883975-905
4.6 x 150 mm, 5 µm

Mobile Phase: 0.1% TFA, pH 2:ACN

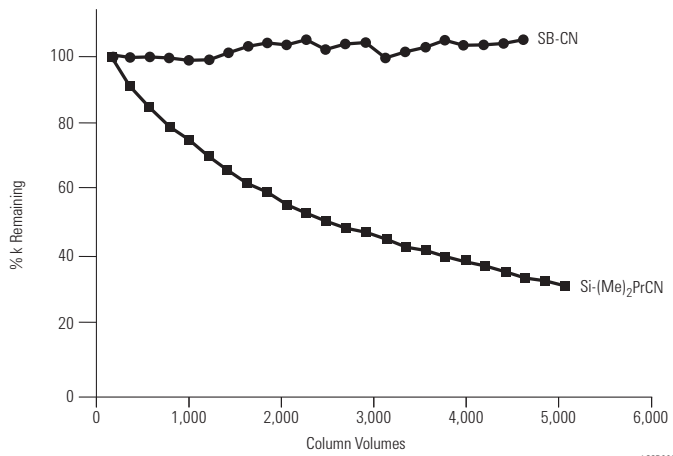
Flow Rate: 1 mL/min

Gradient: 0-100% ACN

Temperature: 50 °C

Sample: 1-phenylheptane @ 50% AC/50% water with 0.1% TFA

ZORBAX StableBond SB-CN and other short chain StableBond bonded phases are also exceptionally stable at low pH. Conventional dimethyl CN and similar bonded phases lack this stability.



SB-CN optimizes retention and resolution

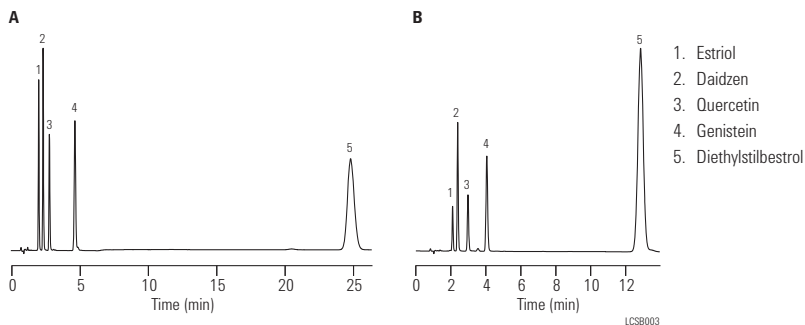
Column A: ZORBAX SB-C18
866953-902
4.6 x 75 mm, 3.5 µm

Column B: ZORBAX SB-CN
866953-905
4.6 x 75 mm, 3.5 µm

Mobile Phase: 30% ACN
70% 25mM NaH₂PO₄, pH 2.5

Flow Rate: 1.0 mL/min

Temperature: 35 °C



The SB-CN column is used here to reduce analysis time by 50%. The retention of the most hydrophobic analyte is cut in half. At the same time, retention of the more polar, early eluting peaks increases slightly.

Five different bonded phases provide selectivity options

Column A: ZORBAX SB-C18
883975-902
4.6 x 150 mm, 5 µm

Column B: ZORBAX SB-C8
883975-906
4.6 x 150 mm, 5 µm

Column C: ZORBAX SB-C3
883975-909
4.6 x 150 mm, 5 µm

Column D: ZORBAX SB-Phenyl
883975-912
4.6 x 150 mm, 5 µm

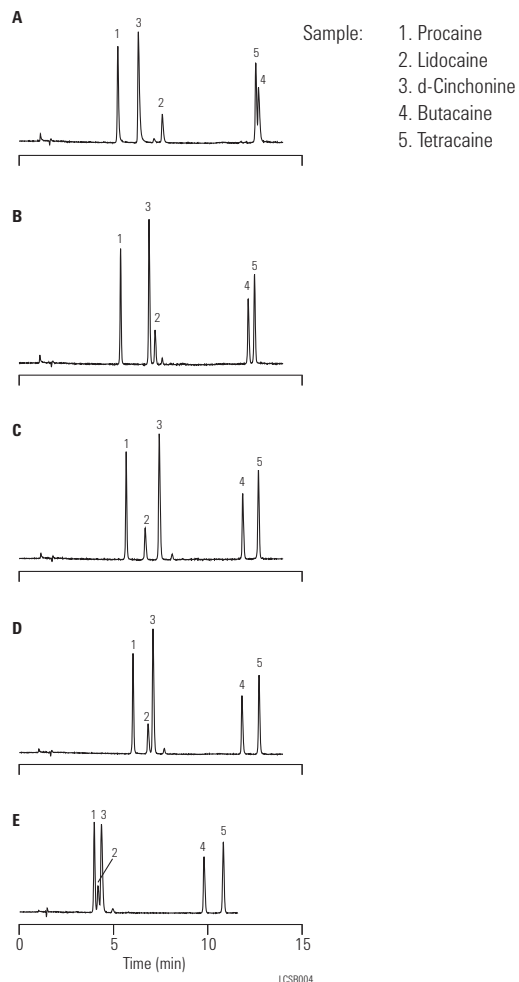
Column E: ZORBAX SB-CN
883975-905
4.6 x 150 mm, 5 µm

Mobile Phase: 0-100% B in 18.8 min
A: 50 mM NaH₂PO₄, pH 2.5 in 95% H₂O / 5% ACN
B: 50 mM NaH₂PO₄, pH 2.5 in 47% H₂O / 53% ACN

Flow Rate: 1.0 mL/min


Temperature: 26 °C

Detector: 254 nm



SB-C3 is just one of the five different StableBond selectivity choices. In this example, optimum resolution is obtained with SB-C3. All are based on the same high purity Rx-SIL. Selectivity changes are therefore dependent only on the bonded phases, making method development more reliable.


ZORBAX 80Å StableBond

Hardware Description	Size (mm)	Particle Size (µm)	SB-C18 USP L1	SB-C8 USP L7	SB-CN USP L10	SB-C3 USP L56	SB-Phenyl USP L11	SB-Aq
Standard Columns (no special hardware required)								
Semi-Preparative	9.4 x 250	5	880975-202	880967-201	880975-205	880975-209	880975-212	
Semi-Preparative	9.4 x 150	5	883975-202					
Semi-Preparative	9.4 x 100	5	884975-202					
Semi-Preparative	9.4 x 50	5	846975-202					
Analytical	4.6 x 250	5	880975-902	880975-906	880975-905	880975-909	880975-912	880975-914
Analytical	4.6 x 150	5	883975-902	883975-906	883975-905	883975-909	883975-912	883975-914
Analytical	4.6 x 50	5	846975-902	846975-906				846975-914
Rapid Resolution	4.6 x 250	3.5	884950-567					
Rapid Resolution	4.6 x 150	3.5	863953-902	863953-906	863953-905		863953-912	863953-914
Rapid Resolution	4.6 x 100	3.5	861953-902	861953-906	861953-905		861953-912	861953-914
Rapid Resolution	4.6 x 75	3.5	866953-902	866953-906	866953-905		866953-912	866953-914
Rapid Resolution	4.6 x 50	3.5	835975-902	835975-906	835975-905		835975-912	835975-914
Rapid Resolution	4.6 x 30	3.5	834975-902	834975-906				
Rapid Resolution	4.6 x 20	3.5	832975-902	832975-906				
Rapid Resolution HT, 600 bar	4.6 x 150	1.8	829975-902	829975-906	829975-905		829975-912	829975-914
Rapid Resolution HT, 600 bar	4.6 x 100	1.8	828975-902	828975-906	828975-905		828975-912	828975-914
Rapid Resolution HT, 600 bar	4.6 x 75	1.8		830975-906				
Rapid Resolution HT, 600 bar	4.6 x 50	1.8	827975-902	827975-906	827975-905		827975-912	827975-914
Rapid Resolution HT, 600 bar	4.6 x 30	1.8	824975-902	824975-906	824975-905		824975-912	824975-914
Rapid Resolution HT, 600 bar	4.6 x 20	1.8	826975-902	826975-906				
 UHPLC Guard, 600 bar, 3/pk	4.6 x 5	1.8	820750-902	820750-904				
Solvent Saver	3.0 x 250	5	880975-302	880975-306	880975-305	880975-309	880975-312	880975-314
Solvent Saver	3.0 x 150	5	883975-302	883975-306	883975-305	883975-309	883975-312	883975-314
Solvent Saver Plus	3.0 x 150	3.5	863954-302	863954-306	863954-305		863954-312	863954-314
Solvent Saver Plus	3.0 x 100	3.5	861954-302	861954-306	861954-305	861954-309	861954-312	861954-314
Solvent Saver Plus	3.0 x 75	3.5	866953-302					

Unless indicated, column pressure limit is 400 bar.

(Continued)

ZORBAX 80Å StableBond













Hardware	Description	Size (mm)	Particle Size (µm)	SB-C18 USP L1	SB-C8 USP L7	SB-CN USP L10	SB-C3 USP L56	SB-Phenyl USP L11	SB-Aq
Standard Columns (no special hardware required)									
	Solvent Saver RRHD, 1200 bar	3.0 x 150	1.8	859700-302	859700-306				
	Solvent Saver RRHD, 1200 bar	3.0 x 100	1.8	858700-302	858700-306	858700-305		858700-312	
	Solvent Saver RRHD, 1200 bar	3.0 x 50	1.8	857700-302	857700-306	857700-305		857700-312	
	Solvent Saver HT, 600 bar	3.0 x 150	1.8	829975-302	829975-306	829975-305		829975-312	
	Solvent Saver HT, 600 bar	3.0 x 100	1.8	828975-302	828975-306	828975-305	828975-309	828975-312	828975-314
	Solvent Saver HT, 600 bar	3.0 x 50	1.8	827975-302	827975-306	827975-305			
	Solvent Saver HT, 600 bar	3.0 x 30	1.8	824975-302	824975-306	824975-305		827975-312	827975-314
	Solvent Saver HT, 600 bar	3.0 x 20	1.8	826975-302	826975-306				
	UHPLC Guard, 1200 bar, 3/pk	3.0 x 5	1.8	823750-902	823750-904				
	Narrow Bore	2.1 x 150	5	883700-922	883700-906	883700-905	883700-909	883700-912	
	Narrow Bore	2.1 x 50	5	860975-902	860975-906	860975-905	860975-909	860975-912	860975-914
	Narrow Bore RR	2.1 x 150	3.5	830990-902	830990-906				830990-914
	Narrow Bore RR	2.1 x 100	3.5	861753-902	861753-906	861753-905		861753-912	861753-914
	Narrow Bore RR	2.1 x 75	3.5	866735-902					
	Narrow Bore RR	2.1 x 50	3.5	871700-902	871700-906				871700-914
	Narrow Bore RR	2.1 x 30	3.5	874700-902	874700-906				
	Narrow Bore RR	2.1 x 20	3.5	872700-902	872700-906				
	Narrow Bore RRHD, 1200 bar	2.1 x 150	1.8	859700-902	859700-906	859700-905		859700-912	
	Narrow Bore RRHD, 1200 bar	2.1 x 100	1.8	858700-902	858700-906	858700-905		858700-912	
	Narrow Bore RRHD, 1200 bar	2.1 x 50	1.8	857700-902	857700-906	857700-905		857700-912	

Unless indicated, column pressure limit is 400 bar.

(Continued)



ZORBAX 80Å StableBond

Hardware	Description	Size (mm)	Particle Size (µm)	SB-C18 USP L1	SB-C8 USP L7	SB-CN USP L10	SB-C3 USP L56	SB-Phenyl USP L11	SB-Aq
Standard Columns (no special hardware required)									
	Narrow Bore RRHT, 600 bar	2.1 x 150	1.8	820700-902	820700-906	820700-905		820700-912	
	Narrow Bore RRHT, 600 bar	2.1 x 100	1.8	828700-902	828700-906	828700-905		828700-912	828700-914
	Narrow Bore RRHT, 600 bar	2.1 x 50	1.8	827700-902	827700-906	827700-905		827700-912	827700-914
	Narrow Bore RRHT, 600 bar	2.1 x 30	1.8	824700-902	824700-906	824700-905		824700-912	824700-914
	Narrow Bore RRHT, 600 bar	2.1 x 20	1.8	826700-902	826700-906				
	UHPLC Guard, 1200 bar, 3/pk	2.1 x 5	1.8	821725-902	821725-904				
	MicroBore RR	1.0 x 150	3.5	863600-902	863600-906	863600-905			
	MicroBore RR	1.0 x 50	3.5	865600-902	865600-906				
	MicroBore RR	1.0 x 30	3.5	861600-902	861600-906				
	MicroBore Guard, 3/pk	1.0 x 17	5	5185-5920	5185-5920				
	Guard Cartridge, 2/pk	9.4 x 15	7	820675-115	820675-115	820675-124	820675-124	820675-115	
	Guard Cartridge, 4/pk	4.6 x 12.5	5	820950-920	820950-915	820950-916	820950-922	820950-917	820950-933
	Guard Cartridge, 4/pk	2.1 x 12.5	5	821125-915	821125-915	821125-924	821125-924	821125-915	821125-933
	Guard Hardware Kit	9.4 x 15	0	840140-901	840140-901	840140-901	840140-901	840140-901	
	Guard Hardware Kit			820999-901	820999-901	820999-901	820999-901	820999-901	820999-901
PrepHT Cartridge Columns (require endfittings kit 820400-901)									
	PrepHT Cartridge	21.2 x 250	7	877250-102	877250-106	877250-105		877250-112	877250-114
	PrepHT Cartridge	21.2 x 150	7	877150-102	877150-106				877150-114
	PrepHT Cartridge	21.2 x 150	5	870150-902	870150-906				870150-914
	PrepHT Cartridge	21.2 x 100	5	870100-902	870100-906				870100-914
	PrepHT Cartridge	21.2 x 50	5	870050-902	870050-906				870050-914
	PrepHT Guard Cartridge, 2/pk	17.0 x 7.5	5	820212-920	820212-915	820212-915		820212-915	820212-933
	Guard Cartridge Hardware			820444-901	820444-901	820444-901	820444-901	820444-901	820444-901
	PrepHT Endfittings, 2/pk			820400-901	820400-901	820400-901	820400-901	820400-901	820400-901

Unless indicated, column pressure limit is 400 bar.

ZORBAX 80Å StableBond

Hardware	Description	Size (mm)	Particle Size (µm)	SB-C18 USP L1	SB-C8 USP L7	SB-Phenyl USP L11
Agilent Cartridge Columns (require hardware kit 5021-1845)						
AC	Analytical	4.6 x 250	5	7995218-585	7995208-585	
AC	Analytical	4.6 x 150	5	7995218-595	7995208-595	
AC	Rapid Resolution	4.6 x 75	3.5	7995218-344	7995208-344	
AC	Guard Cartridges, 10/pk	4.0 x 4	5	7995118-504	7995118-504	
AC	Cartridge Holder			5021-1845	5021-1845	
Standard Columns (no special hardware required)						
	Rapid Resolution HT	4.6 x 50	1.8	822975-902	822975-906	
	Rapid Resolution HT, 3/pk	4.6 x 50	1.8	822975-932		
	Narrow Bore RRHT	2.1 x 50	1.8	822700-902		
	Narrow Bore RRHT, 3/pk	2.1 x 50	1.8	822700-932		
Rapid Resolution Cartridges (require hardware kit 820555-901)						
RR	Rapid Resolution Cartridge	4.6 x 30	3.5	833975-902	833975-906	833975-912
RR	Rapid Resolution Cartridge, 3/pk	4.6 x 30	3.5	833975-932	833975-936	
RR	Rapid Resolution Cartridge	4.6 x 15	3.5	831975-902	831975-906	
RR	Rapid Resolution Cartridge, 3/pk	4.6 x 15	3.5	831975-932	831975-936	
RR	Rapid Resolution Cartridge	2.1 x 30	3.5	873700-902	873700-906	
RR	Rapid Resolution Cartridge, 3/pk	2.1 x 30	3.5	873700-932	873700-936	
RR	Rapid Resolution Cartridge	2.1 x 15	3.5	875700-902	875700-906	
RR	Rapid Resolution Cartridge, 3/pk	2.1 x 15	3.5	875700-932	875700-936	
Rapid Resolution HT Cartridges (require hardware kit 820555-901)						
RR	Rapid Resolution HT Cartridge	4.6 x 50	1.8	825975-902		
RR	Rapid Resolution HT Cartridge, 3/pk	4.6 x 50	1.8	825975-932		
RR	Rapid Resolution HT Cartridge	4.6 x 30	1.8	823975-902		
RR	Rapid Resolution HT Cartridge, 3/pk	4.6 x 30	1.8	823975-932		
RR	Rapid Resolution HT Cartridge	4.6 x 15	1.8	821975-902		
RR	Rapid Resolution HT Cartridge, 3/pk	4.6 x 15	1.8	821975-932		
RR	Rapid Resolution HT Cartridge	2.1 x 50	1.8	825700-902		
RR	Rapid Resolution HT Cartridge, 3/pk	2.1 x 50	1.8	825700-932		
RR	Rapid Resolution HT Cartridge	2.1 x 30	1.8	823700-902		
RR	Rapid Resolution HT Cartridge, 3/pk	2.1 x 30	1.8	823700-932		
RR	Rapid Resolution HT Cartridge	2.1 x 15	1.8	821700-902		
RR	Rapid Resolution HT Cartridge, 3/pk	2.1 x 15	1.8	821700-932		
RR	Hardware Kit for RR and RRHT Cartridges			820555-901		

ZORBAX 80Å StableBond

Description	Size (mm)	Particle Size (µm)	SB-C18 USP L1
Capillary Glass-lined Columns			
Capillary	0.5 x 250	5	5064-8258
Capillary	0.5 x 150	5	5064-8256
Capillary	0.5 x 35	5	5064-8254
Capillary RR	0.5 x 150	3.5	5064-8262
Capillary RR	0.5 x 35	3.5	5064-8260
Capillary	0.3 x 250	5	5064-8257
Capillary	0.3 x 150	5	5064-8255
Capillary	0.3 x 35	5	5064-8253
Capillary RR	0.3 x 150	3.5	5064-8261

ZORBAX Rx

- Recommended for alternate selectivity at low pH relative to Eclipse Plus C18, Eclipse XDB-C18 and StableBond SB-C18; for higher temperature applications, StableBond is recommended
- Higher carbon load than SB-C18 columns (12% vs. 10%)
- High stability and good peak shape for low pH applications (up to pH 8)
- Manufactured using dimethyloctadecylsilane and non-encapped
- ZORBAX Rx-C8 is the same product as SB-C8

Column Specifications

Bonded Phase	Pore Size	Surface Area	Temp. Limits	pH Range*	Encapped	Carbon Load
ZORBAX Rx-C18	80Å	180 m ² /g	60 °C	2.0-8.0	No	12%
ZORBAX Rx-C8	80Å	180 m ² /g	80 °C	1.0-8.0	No	5.5%

Specifications represent typical values only

*At pH 6-9 highest column stability for all silica based columns is obtained by operating at temperatures <40 °C and using lower buffer concentrations in the range of 0.01-0.02 M.

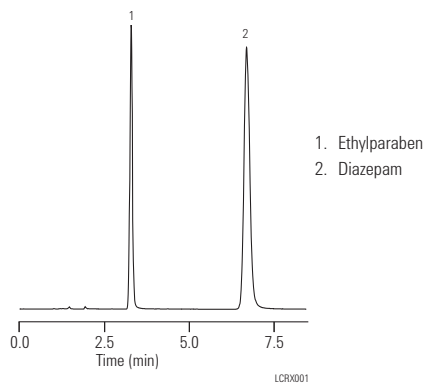
Analysis of diazepam on Rx-C18

Column: ZORBAX Rx-C18
880967-302
3.0 x 250 mm, 5 µm

Mobile Phase: 35% H₂O:65% MeOH

Flow Rate: 0.5 mL/min

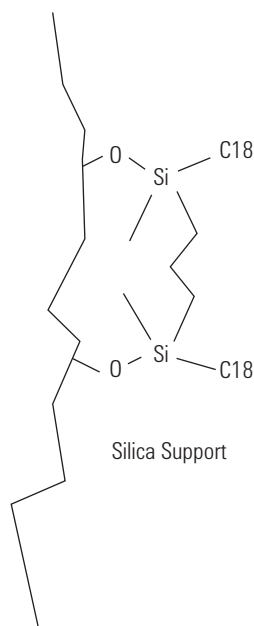
An Rx-C18 column is used for this USP analysis of diazepam and the internal standard ethylparaben. The Solvent Saver 3.0 mm id Rx-C18 column reduces solvent usage by 60% over what would be used if the analysis was done on a 4.6 x 250 mm column.



ZORBAX Rx

Hardware	Description	Size (mm)	Particle Size (µm)	Rx-C18 USP L1	Rx-C8 USP L7*
	Semi-Preparative	9.4 x 250	5	880967-202	880967-201
	Analytical	4.6 x 250	5	880967-902	880967-901
	Analytical	4.6 x 150	5	883967-902	883967-901
	Rapid Resolution	4.6 x 150	3.5	863967-902	
	Rapid Resolution	4.6 x 100	3.5	861967-902	
	Rapid Resolution	4.6 x 75	3.5	866967-902	
	Solvent Saver	3.0 x 250	5	880967-302	
	Solvent Saver	3.0 x 150	5	883967-302	
	Solvent Saver Plus	3.0 x 150	3.5	863967-302	
	Solvent Saver Plus	3.0 x 100	3.5	861967-302	
	Narrow Bore	2.1 x 150	5	883700-902	
	Narrow Bore RR	2.1 x 100	3.5	861767-902	
P	Guard Cartridge, 2/pk	9.4 x 15	7	820675-115	820675-115
ZGG	Guard Cartridge, 4/pk	4.6 x 12.5	5	820950-914	820950-913
ZGG	Guard Cartridge, 4/pk	2.1 x 12.5	5	821125-915	821125-915
P	Guard Hardware Kit	9.4 x 15		840140-901	840140-901
ZGG	Guard Hardware Kit			820999-901	820999-901
PrepHT Cartridge Columns (require endfittings kit 820400-901)					
A	PrepHT Cartridge	21.2 x 250	7	877967-102	877250-106
A	PrepHT Cartridge	21.2 x 150	7		877150-106
A	PrepHT Cartridge	21.2 x 150	5		870150-906
A	PrepHT Cartridge	21.2 x 100	5		870100-906
A	PrepHT Cartridge	21.2 x 50	5		870050-906
A	PrepHT Guard Cartridge, 2/pk		5	820212-914	820212-915
A	Guard Cartridge Hardware			820444-901	820444-901
A	PrepHT Endfittings, 2/pk			820400-901	820400-901

*Rx-C8 is the same product as SB-C8. For other sizes and configurations, see the ZORBAX StableBond section, page 264.



ZORBAX 80Å Extend-C18

- High efficiency and long life at high pH – up to pH 11.5
- Unique bidentate bonding and double endcapping provides high pH stability
- More efficiency and better peak shape than polymer-based columns
- Improve retention, resolution and peak shape of basic compounds
- High sensitivity for LC/MS separations of peptides

The Agilent ZORBAX Extend-C18 column uses a novel bidentate C18-C18 bonding technology to make it possible to develop high-resolution separations at high pH with a silica-based column. At high pH, non-charged basic compounds will not interact with the underlying silica. The result is high efficiency separations with superior peak shape and improved resolution. High pH separations are also the best choice for compounds that are more stable or more soluble in high pH solutions. Some of the mobile phase buffer options for high pH include triethylamine, pyrrolidine, glycine, borate and ammonium hydroxide. Ammonium hydroxide at pH 10.5 is an excellent mobile phase modifier for the LC/MS of peptides and small molecules with improved sensitivity compared with TFA containing mobile phase at low pH. The Extend-C18 column is stable from pH 2-11.5 with good peak shape for all types of compounds. Extend-C18 columns also provide an additional selectivity choice at low pH.



TIPS & TOOLS

Always use Agilent Certified Lamps for Best LC Performance

Agilent detector lamps are built to the tightest specifications and quality standards. They are designed to increase light intensity and decrease noise, which improves chromatographic results. Agilent rigorously tests its lamps for lowest lamp-to-lamp variability. Trust Agilent lamps for robust, long-lasting performance and lower cost of ownership. To learn more, visit www.agilent.com/chem/lamps



Column Specifications

Bonded Phase	Pore Size	Surface Area	Temp. Limits*	pH Range**	Endcapped	Carbon Load
ZORBAX Extend-C18	80Å	180 m ² /g	60 °C	2.0-11.5	Double	12.5%

Specifications represent typical values only.

*Temperature limits are 60 °C up to pH 8, 40 °C from pH 8-11.5.

**Above pH 6 highest column stability for all silica based columns is obtained by reducing the operating temperature to 40 °C or below and using lower buffer concentrations (0.01-0.02 M) or organic buffers.

Basic antihistamines on Extend-C18 at high pH

Column: ZORBAX Extend-C18
773450-902
4.6 x 150 mm, 5 µm

Mobile Phase: pH 7:
30% 20 mM Na₂HPO₄ 70% MeOH
pH 11:
30% 20 mM TEA 70% MeOH

Flow Rate: 1.0 mL/min

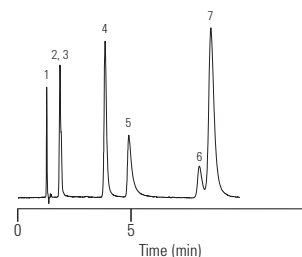
Temperature: Ambient

Detector: 254 nm

Sample: Antihistamines

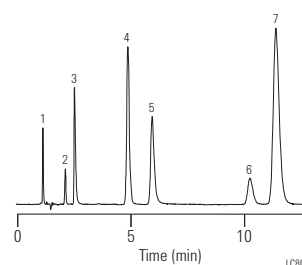
Pseudoephedrine and scopolamine are difficult to retain at low and mid pH. Pseudoephedrine is often analyzed by ion exchange methods. The Extend-C18 column retains these compounds in a noncharged form at high pH and improves resolution.

pH 7



1. Maleate
2. Scopolamine
3. Pseudoephedrine
4. Doxylamine
5. Chlorpheniramine
6. Triprolidine
7. Diphenhydramine

pH 11



Long life at high pH with Extend-C18

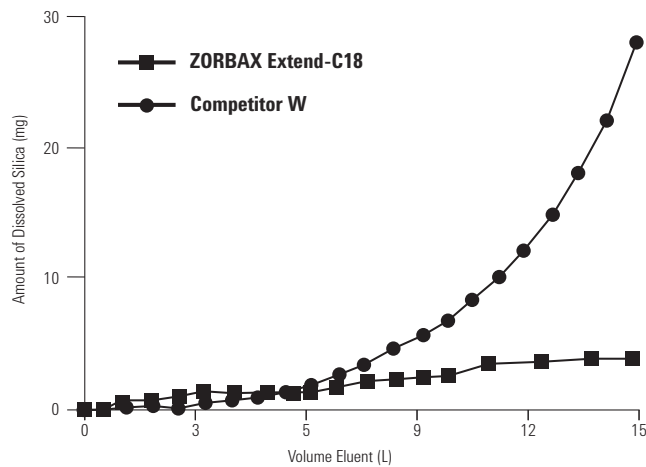
Column: ZORBAX Extend-C18
773450-902
4.6 x 150 mm, 5 µm

Mobile Phase: 20% Methanol
80% 0.1 M Carbonate buffer, pH 10.0

Flow Rate: 1.0 mL/min

Temperature: Ambient

At high pH, columns will fail due to silica dissolution. The example here shows extended lifetime of ZORBAX Extend-C18 at high pH in comparison to competitor W. This was measured by the amount of dissolved silica.



Extend-C18 provides good peak shape at low pH

Column: ZORBAX Extend-C18
773450-902
4.6 x 150 mm, 5 µm

Mobile Phase: 80% 25 mM NaH₂PO₄, pH 3.0
20% Methanol

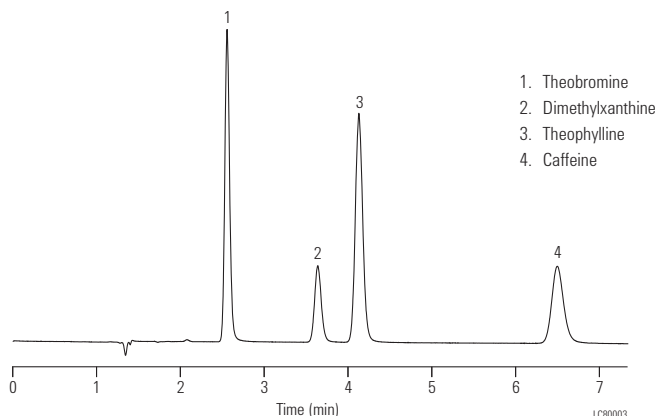
Flow Rate: 1.0 mL/min

Temperature: 35 °C

Detector: UV, 254 nm

Sample: Basic compounds

These basic compounds are separated on the Extend-C18 at low pH with excellent peak shape. The Extend-C18 column can be used at high and low pH.












ZORBAX 80Å Extend-C18

Hardware Description	Size (mm)	Particle Size (µm)	Extend-C18 USP L1
Standard Columns (no special hardware required)			
Analytical	4.6 x 250	5	770450-902
Analytical	4.6 x 150	5	773450-902
Analytical	4.6 x 50	5	746450-902
Rapid Resolution	4.6 x 150	3.5	763953-902
Rapid Resolution	4.6 x 100	3.5	764953-902
Rapid Resolution	4.6 x 75	3.5	766953-902
Rapid Resolution	4.6 x 50	3.5	735953-902
Rapid Resolution HT, 600 bar	4.6 x 100	1.8	728975-902
Rapid Resolution HT, 600 bar	4.6 x 50	1.8	727975-902
Rapid Resolution HT, 600 bar	4.6 x 30	1.8	724975-902
Rapid Resolution HT, 600 bar	4.6 x 20	1.8	726975-902
Solvent Saver	3.0 x 250	5	770450-302
Solvent Saver	3.0 x 150	5	773450-302
Solvent Saver Plus	3.0 x 150	3.5	763954-302
Solvent Saver Plus	3.0 x 100	3.5	764953-302
Solvent Saver Plus	3.0 x 50	3.5	735954-302

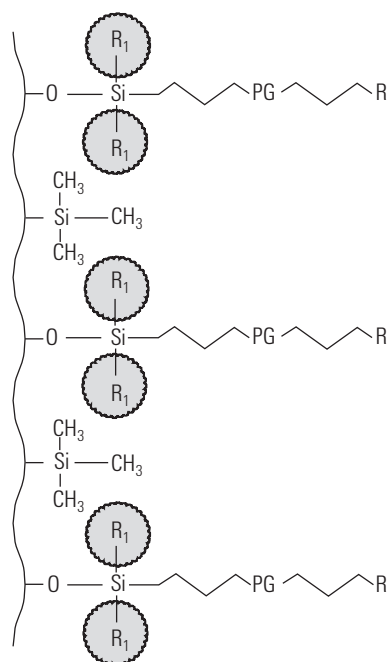
Unless indicated, column pressure limit is 400 bar.

(Continued)

ZORBAX 80Å Extend-C18

Hardware Description	Size (mm)	Particle Size (µm)	Extend-C18 USP L1
Standard Columns (no special hardware required)			
Solvent Saver RRHD, 1200 bar	3.0 x 100	1.8	758700-302
Solvent Saver RRHD, 1200 bar	3.0 x 50	1.8	757700-302
Solvent Saver HT, 600 bar	3.0 x 100	1.8	728975-302
Solvent Saver HT, 600 bar	3.0 x 50	1.8	727975-302
Solvent Saver HT, 600 bar	3.0 x 30	1.8	724975-302
Solvent Saver HT, 600 bar	3.0 x 20	1.8	726975-302
Narrow Bore	2.1 x 150	5	773700-902
Narrow Bore	2.1 x 50	5	760450-902
Narrow Bore RR	2.1 x 100	3.5	761753-902
Narrow Bore RR	2.1 x 50	3.5	735700-902
Narrow Bore RRHD, 1200 bar	2.1 x 150	1.8	759700-902
Narrow Bore RRHD, 1200 bar	2.1 x 100	1.8	758700-902
Narrow Bore RRHD, 1200 bar	2.1 x 50	1.8	757700-902
Narrow Bore RRHT, 600 bar	2.1 x 100	1.8	728700-902
Narrow Bore RRHT, 600 bar	2.1 x 50	1.8	727700-902
Narrow Bore RRHT, 600 bar	2.1 x 30	1.8	724700-902
Narrow Bore RRHT, 600 bar	2.1 x 20	1.8	726700-902
MicroBore RR	1.0 x 150	3.5	763600-902
MicroBore RR	1.0 x 50	3.5	765600-902
MicroBore RR	1.0 x 30	3.5	761600-902
MicroBore Guard, 3/pk	1.0 x 17	5	5185-5923
 Guard Cartridge, 4/pk	4.6 x 12.5	5	820950-930
 Guard Cartridge, 4/pk	2.1 x 12.5	5	821125-930
 Guard Hardware Kit			820999-901
PrepHT Cartridge Columns (require endfittings kit 820400-901)			
 PrepHT Cartridge	21.2 x 150	5	770150-902
 PrepHT	21.2 x 100	5	770100-902
 PrepHT	21.2 x 50	5	770050-902
 PrepHT Endfittings, 2/pk			820400-901
 PrepHT Guard Cartridge, 2/pk	17.0 x 7.5	5	820212-930
 Guard Cartridge Hardware			820444-901

Unless indicated, column pressure limit is 400 bar.



Unique, Polar Alkyl Bonus-RP Bonded Phase

ZORBAX Bonus-RP

- Excellent peak shape for challenging basic compounds at low and mid pH
- Unique reversed-phase selectivity
- Novel bonding technology with embedded polar group and steric protection
- Usable in 100% aqueous mobile phases

The Agilent ZORBAX Bonus-RP column has a polar amide group embedded in a long alkyl chain. This novel bonding reduces interactions between basic compounds and the silica support, improving peak shape for the most difficult basic compounds. Peak shape and column lifetime are further improved by triple endcapping. In addition, diisopropyl side groups provide steric protection against acid hydrolysis for good lifetime at low pH. The Bonus-RP column provides an alternate selectivity to C18 and C8 alkyl bonded phases.

Column Specifications

Bonded Phase	Pore Size	Surface Area	Temp. Limits*	pH Range	Endcapped	Carbon Load
ZORBAX Bonus-RP	80Å	180 m ² /g	60 °C	2.0-9.0	Triple	9.5%

Specifications represent typical values only.

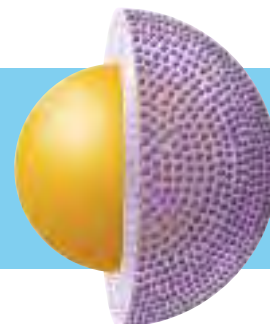
*Temperature limits are 60 °C up to pH 8, 40 °C from pH 8-9.

TIPS & TOOLS



ZORBAX Bonus-RP is also available on Poroshell 120.

Turn page 228



Improved peak shape of basic compounds using Bonus-RP

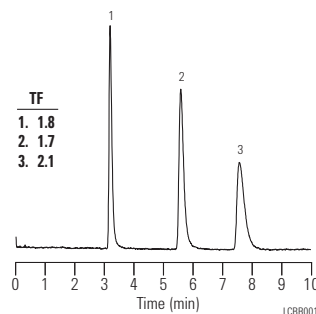
Column: Alkyl-C8
4.6 x 150 mm, 5 μ m

Mobile Phase: 75% 25 mM NH₄OAc, pH 5.5
25% ACN

Flow Rate: 1.5 mL/min

Temperature: 40 °C

Detector: 254 nm



1. Doxylamine
2. Chlorpheniramine
3. Triprolidine

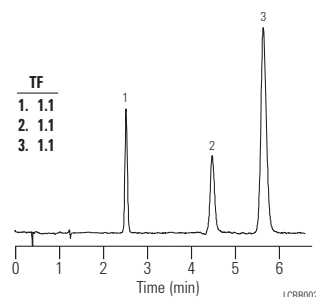
Column: ZORBAX Bonus-RP
883668-901
4.6 x 150 mm, 5 μ m

Mobile Phase: 80% 25 mM NH₄OAc, pH 5.5
20% ACN

Flow Rate: 1.5 mL/min

Temperature: 40 °C

Detector: 254 nm



1. Doxylamine
2. Chlorpheniramine
3. Triprolidine

Bonus-RP eliminates peak tailing of these basic compounds in comparison to a typical alkyl C8 bonded phase. In the mid-pH region, residual silanols can interact more strongly with basic compounds to cause peak tailing. The polar group in the Bonus-RP bonded phase eliminates peak tailing of these basic compounds by reducing interactions with residual silanols.

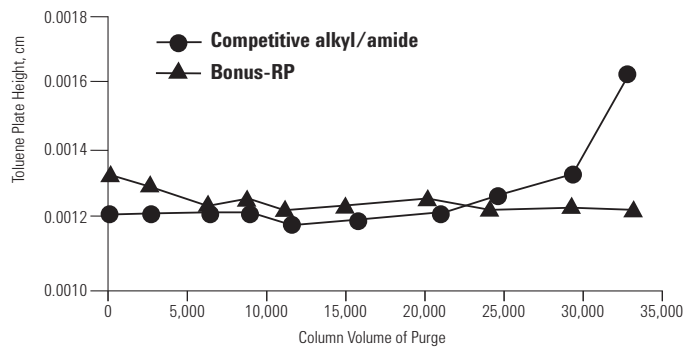
ZORBAX Bonus-RP is stable at low and mid pH

Column: ZORBAX Bonus-RP
883668-901
4.6 x 150 mm, 5 μ m

Mobile Phase: 60% 25 mM
Phosphate Buffer,
pH 7.0:40% ACN

Flow Rate: 1.5 mL/min

Temperature: 23 °C



Triple endcapping of Bonus-RP enhances stability at pH 7. Each 10,000 column volume is equivalent to approximately one working month.

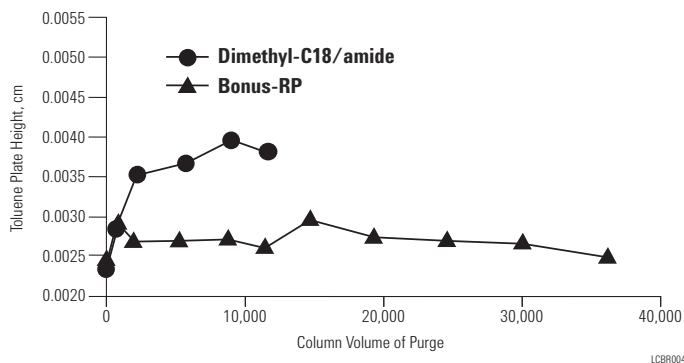
Dimethyl-C18/amide, Bonus-RP

Column: ZORBAX Bonus-RP
883668-901
4.6 x 150 mm, 5 µm

Mobile Phase: Aging:
50% MeOH
50% 0.1% TFA
Test:
80% MeOH
20% H₂O

Flow Rate: 1.0 mL/min

Temperature: Aging:
60 °C
Test:
23 °C



Sterically protecting side groups provide good low pH stability and longer column lifetime than similar polar alkyl bonded phases.

ZORBAX Bonus-RP provides unique selectivity

Column A: ZORBAX Bonus-RP
883668-901
4.6 x 150 mm, 5 µm

Column B: Eclipse XDB-C8
993967-906
4.6 x 150 mm, 5 µm

Mobile Phase: 75% 25 mM Na Citrate, pH 6
25% MeOH

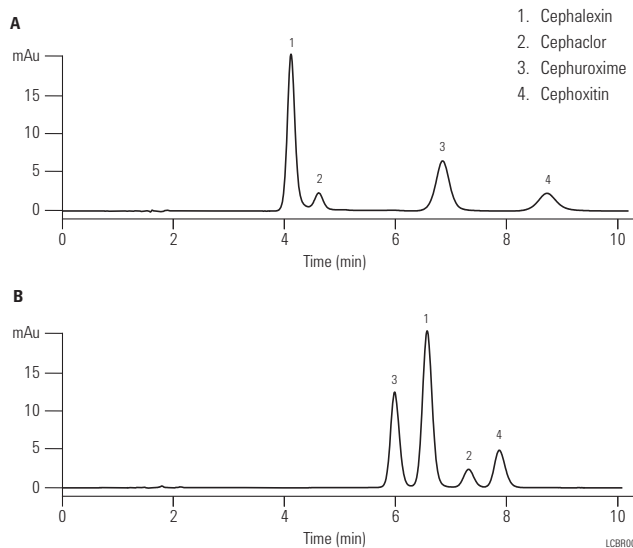
Flow Rate: 1.0 mL/min

Temperature: Ambient

Detector: 254 nm

Sample: 3 µL
Cephalosporins

Peak elution order can change dramatically when using Bonus-RP. In this example, the elution order of the first three peaks changes.



ZORBAX Bonus-RP












Hardware Description	Size (mm)	Particle Size (µm)	Bonus-RP USP L60
Standard Columns (no special hardware required)			
Analytical	4.6 x 250	5	880668-901
Analytical	4.6 x 150	5	883668-901
Rapid Resolution	4.6 x 250	3.5	884950-577
Rapid Resolution	4.6 x 150	3.5	863668-901
Rapid Resolution	4.6 x 100	3.5	864668-901
Rapid Resolution	4.6 x 75	3.5	866668-901
Rapid Resolution	4.6 x 50	3.5	835668-901
Rapid Resolution HT, 600 bar	4.6 x 100	1.8	828668-901
Rapid Resolution HT, 600 bar	4.6 x 75	1.8	830668-901
Rapid Resolution HT, 600 bar	4.6 x 50	1.8	827668-901
Solvent Saver	3.0 x 250	5	880668-301
Solvent Saver	3.0 x 150	5	883668-301
Solvent Saver Plus	3.0 x 150	3.5	863668-301
Solvent Saver Plus	3.0 x 100	3.5	864668-301
Solvent Saver HT, 600 bar	3.0 x 100	1.8	828668-301
Solvent Saver HT, 600 bar	3.0 x 50	1.8	827668-301
Rapid Resolution HD, 1200 bar	2.1 x 150	1.8	859768-901
Rapid Resolution HD, 1200 bar	2.1 x 100	1.8	858768-901
Rapid Resolution HD, 1200 bar	2.1 x 50	1.8	857768-901
Narrow Bore	2.1 x 150	5	883725-901
Narrow Bore	2.1 x 50	5	861971-901

Unless indicated, column pressure limit is 400 bar.

(Continued)

ZORBAX Bonus-RP bonding is also available on Poroshell 120 columns. Turn to page 228.

ZORBAX Bonus-RP

Hardware Description	Size (mm)	Particle Size (µm)	Bonus-RP USP L60
Standard Columns (no special hardware required)			
Narrow Bore RR	2.1 x 150	3.5	863700-901
Narrow Bore RR	2.1 x 100	3.5	861768-901
Narrow Bore RR	2.1 x 50	3.5	861700-901
Narrow Bore RRHT, 600 bar	2.1 x 100	1.8	828768-901
Narrow Bore RRHT, 600 bar	2.1 x 50	1.8	827768-901
MicroBore RR	1.0 x 150	3.5	863608-901
MicroBore RR	1.0 x 50	3.5	865608-901
MicroBore RR	1.0 x 30	3.5	861608-901
MicroBore Guard, 3/pk	1.0 x 17	5	5185-5922
 Guard Cartridge, 4/pk	4.6 x 12.5	5	820950-928
 Guard Cartridge, 4/pk	2.1 x 12.5	5	821125-928
 Guard Hardware Kit			820999-901
PrepHT Cartridge Columns (require endfittings kit 820400-901)			
 PrepHT Cartridge	21.2 x 250	7	878250-101
 PrepHT Cartridge	21.2 x 150	7	878150-101
 PrepHT Cartridge	21.2 x 150	5	868150-901
 PrepHT Cartridge	21.2 x 100	5	868100-901
 PrepHT Cartridge	21.2 x 50	5	868050-901
 PrepHT Endfittings, 2/pk			820400-901
 PrepHT Guard Cartridge, 2/pk	17.0 x 7.5	5	820212-928
 Guard Cartridge Hardware			820444-901

Unless indicated, column pressure limit is 400 bar.

TIPS & TOOLS



Watch LC troubleshooting videos featuring Agilent chromatographic experts at www.agilent.com/chem/lctroubleshooting









ZORBAX Original Reversed-Phase Columns

Agilent Original ZORBAX columns are made with Type A silica and are useful for many applications of acidic or neutral compounds. These columns have a higher activity level and are therefore useful for separating isomers (e.g. cis-trans, geometric) or other compounds where silanol activity enhances selectivity. These columns are used in many established methods.

Column Specifications

Bonded Phase	Pore Size	Surface Area	Temp Limit	pH Range	Endcapped	Carbon Load
ZORBAX C18	70Å	300 m ² /g	60 °C	2.0 - 8.0	Yes/No	20%
ZORBAX C8	70Å	300 m ² /g	60 °C	2.0 - 8.0	Yes	12%
ZORBAX-Phenyl	70Å	300 m ² /g	60 °C	2.0 - 8.0	Yes	12%
ZORBAX CN	70Å	300 m ² /g	60 °C	2.0 - 8.0	N/A	7%
ZORBAX-TMS	70Å	300 m ² /g	60 °C	2.0 - 7.0	N/A	4%

ZORBAX Original Reversed-Phase Columns

Hardware	Description	Size (mm)	Particle Size (µm)	ODS (C18) USP L1	C8 USP L7	Phenyl USP L11	CN USP L10	TMS USP L13
Standard Columns (no special hardware required)								
	Semi-Preparative	9.4 x 250	5	880952-202	880952-206			
	Analytical (Endcapped)	4.6 x 250	5	880952-702	880952-706	880952-712	884950-507	880952-710
	Analytical (Non-endcapped)	4.6 x 250	5	884950-543				
	Analytical	4.6 x 150	5	883952-702	883952-706	883952-712	884950-526	883952-710
	Solvent Saver	3.0 x 250	5	880952-302				
	Solvent Saver	3.0 x 150	5	883952-302				
Guard Columns (hardware required)								
	Guard Cartridge, 2/pk	9.4 x 15	7	820675-115	820675-115	820675-115	820675-124	
	Guard Cartridge, 4/pk	4.6 x 12.5	5	820950-902	820950-906	820950-912	820950-905	820950-924
	Guard Hardware Kit			840140-901	840140-901	840140-901	840140-901	840140-901
	Guard Hardware Kit			820999-901	820999-901	820999-901	820999-901	820999-901
PrepHT Cartridge Columns (require endfittings kit 820400-901)								
	PrepHT Cartridge	21.2 x 250	7	877952-102	877952-106		877952-105	
	PrepHT Endfittings, 2/pk			820400-901	820400-901		820400-901	



ZORBAX Method Development Kits

Kits for Analytical HPLC

ZORBAX Method Development Kits

Agilent offers a series of kits that allow for fast method development at an attractive price. Each kit contains 3 columns. Six new kits have been added and are recommended for use with the new Agilent Automated Method Development LC. Several of these kits contain Rapid Resolution HT (1.8 μm) columns in a variety of bonded phases for easy method optimization and several kits contain Rapid Resolution (3.5 μm) columns in the same variety of bonded phases. These kits contain some of the Eclipse Plus family of columns for excellent peak shape and optimum performance with a wide variety of compounds.

ZORBAX Method Development Kits



Recommended for use with the Agilent Automated Method Development LC System

Description	Part No.
Rapid Resolution HT (RRHT) Selectivity Method Development Kit, 2.1 mm id Includes 2.1 x 50 mm, 1.8 μm , 600 bar columns: one each Eclipse Plus C18, Eclipse Plus Phenyl-Hexyl and Bonus-RP	5190-1431
Rapid Resolution HT (RRHT) pH Method Development Kit, 2.1 mm id Includes 2.1 x 50 mm, 1.8 μm , 600 bar columns: one each Eclipse Plus C18, SB-C18 and Extend-C18	5190-1432
Rapid Resolution HT (RRHT) Selectivity Method Development Kit, 4.6 mm id Includes 4.6 x 50 mm, 1.8 μm , 600 bar columns: one each Eclipse Plus C18, Eclipse Plus Phenyl-Hexyl and Bonus-RP	5190-1433
Rapid Resolution HT (RRHT) pH Method Development Kit, 4.6 mm id Includes 4.6 x 50 mm, 1.8 μm , 600 bar columns: one each Eclipse Plus C18, SB-C18 and Extend-C18	5190-1434
Rapid Resolution Selectivity Method Development Kit, 4.6 mm id Includes 4.6 x 100 mm, 3.5 μm columns: one each Eclipse Plus C18, Eclipse Plus Phenyl-Hexyl and Bonus-RP	5190-1435
Rapid Resolution pH Method Development Kit, 4.6 mm id Includes 4.6 x 100 mm, 3.5 μm columns: one each Eclipse Plus C18, SB-C18 and Extend-C18	5190-1436

ZORBAX Method Development Kits

Description	Part No.
StableBond Method Development Kit Includes 4.6 x 150 mm, 5 µm columns; one each: SB-C18, SB-CN and SB-Phenyl phases	5183-4624
Fast StableBond Method Development Kit Includes 4.6 x 75 mm, 3.5 µm columns; one each: SB-C18, SB-CN and SB-Phenyl phases	5183-4625
Eclipse XDB Method Development Kit Includes 4.6 x 150 mm, 5 µm columns; one each: XDB-C18, XDB-C8, XDB-Phenyl phases	5183-4626
Fast Eclipse XDB Method Development Kit Includes 4.6 x 75 mm, 3.5 µm columns; one each: XDB-C18, XDB-C8 and XDB-Phenyl phases	5183-4627
pH Method Development Kit Includes 4.6 x 150 mm, 5 µm columns; one each: SB-C18, XDB-C18 and Extend-C18 phases	5185-5807
Fast pH Method Development Kit Includes 4.6 x 75 mm, 3.5 µm columns; one each: SB-C18, XDB-C18 and Extend-C18 phases	5185-5808
Aqueous Method Development Kit Includes 4.6 x 150 mm, 5 µm columns; one each: SB-Aq, Bonus RP and SB-C18	5185-5809
Fast Aqueous Method Development Kit Includes 4.6 x 75 mm, 3.5 µm columns; one each: SB-Aq, Bonus RP and SB-C18	5185-5810

ZORBAX Cartridge Column Starter Kits

Hardware	Description	Part No.
	ZORBAX C18 Kit Includes one 4.6 x 150 mm, 5 µm Eclipse XDB-C18 column; one 4.6 x 150 mm, 5 µm StableBond C18 column; cartridge holder; mounting tool; replacement filter (2/pk); and open-end wrench	5183-2021
	ZORBAX C8 Kit Includes one 4.6 x 150 mm, 5 µm Eclipse XDB-C8 column; one 4.6 x 150 mm, 5 µm StableBond C8 column; cartridge holder; mounting tool; replacement filter (2/pk); and open-end wrench	5183-2022

ZORBAX Method Validation Kits

ZORBAX Method Validation Kits are supplied to customers who need the same HPLC column type (bonded phase, particle size, configuration) but from different manufacturing lots. To request columns from different lots, contact Agilent Technologies or your local Agilent Authorized Distributor using the following procedure:

- Request Validation Kits (columns from different lots) by using Part Number 899999-888
- Indicate the Part Number of the current column you are using
- Indicate the Lot Number of the current column you are using
- Indicate the number of additional columns needed from different lots (example: you have a current column and may need two additional lots)
- Please fax your request to **(302) 993-5354** (United States and Canada) or email to **cag_sales-na@agilent.com**. You will receive a quote from your Customer Service Representative within 1-2 business days. Delivery of your method validation kit is usually 3 weeks or less from the time your order is placed, depending on lot availability.

Custom HPLC Column Ordering

Columns not listed can be easily ordered using the following procedure:

- Request a Special Products Quotation (SPQ) using Part Number 899999-999
- Indicate column dimensions (example: 4.6 x 50 mm); bonded phase type (example: StableBond C3); particle size (example: 5 μm); and pore size (example: 80Å)
- Please fax your request to **(302) 993-5354** (United States and Canada) or email to **cag_sales-na@agilent.com**. You will receive a quote from your Customer Service Representative within 1-2 business days. Delivery of your custom column is usually 3 weeks or less from the time your order is placed, depending on lot availability.

Custom columns are priced with a minimal surcharge over the price of stocked columns.



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