

# VertiSep™ GES

## VertiSep™ GES HPLC Columns

- High purity silica offer high stability, efficiency, reproducibility
- Moderate pore size and surface area are perfect for general purpose
- High carbon loading C18 offers high degree of hydrophobicity for high resolution of organic compounds that have similar structures
- Fully endcapped to improve peak symmetry
- Polymeric bonding offers high stability and longer column lifetime
- Economic Price

VertiSep™ GES packings are high purity silica which contains less amounts of metal ions and sulfate contaminants offer high stability at pH 1.5-10.0\*, efficiency, column-to-column reproducibility.

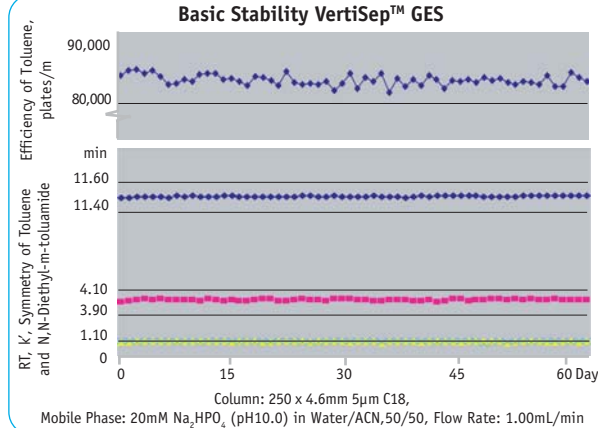
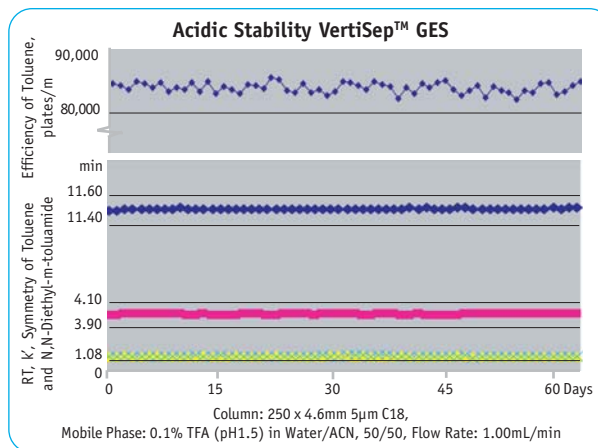
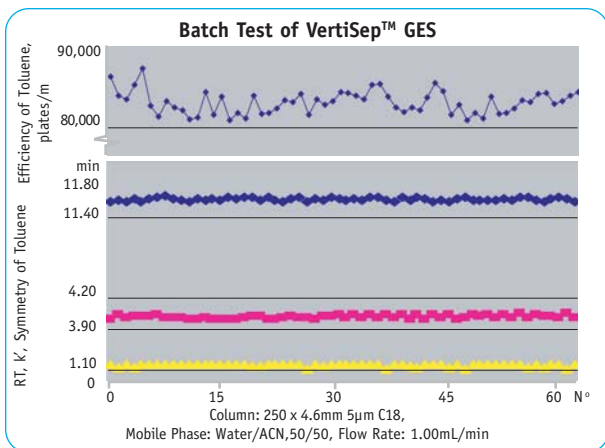
VertiSep™ GES packings are moderate pore size and surface area proving general purpose separations of variety of compounds.

VertiSep™ GES reverse phase C18 packings are high carbon loading of 17% offering the high degree of hydrophobicity for high resolution of organic compounds that have similar structures such as polynuclear aromatic hydrocarbons, benzidines, vitamins D2, D3, PTH amino acids.

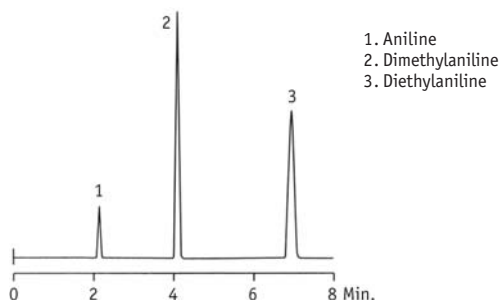


### VertiSep™ GES Packing Specifications

Packing	Particle Size (µm)	Carbon Load (%)	Pore Size (Å)	Pore Volume (mL/g)	Surface Area (m <sup>2</sup> /g)	End Capped
C18	3,5,10	17	120	1.0	300	Yes
C8	3,5,10	13	120	1.0	300	Yes
Ph	3,5,10	8	120	1.0	300	Yes
C4	3,5,10	6	120	1.0	300	Yes
CN	3,5,10	3.5	120	1.0	300	Yes
NH2	3,5,10	3	120	1.0	300	No
Si	3,5,10	-	120	1.0	300	No
SAX	5	4	120	1.0	300	No
SCX	5	4	120	1.0	300	No



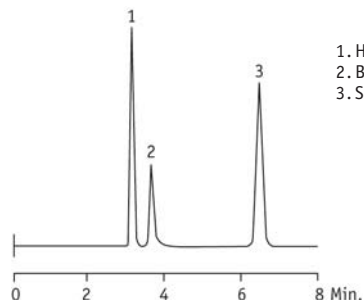
### Aromatic Bases



1. Aniline
2. Dimethylaniline
3. Diethylaniline

Column: VertiSep™ GES C18 5µm 150x4.6mm  
 Mobile Phase: Acetonitrile:Water:TEA (65:34:1)  
 Flow Rate: 1.0mL/min  
 Detection: UV254nm

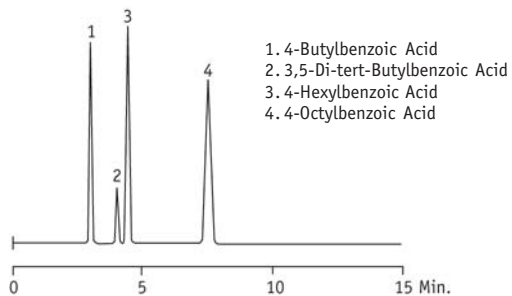
### Aromatic Acid



1. Homovanilic Acid
2. Benzoic Acid
3. Salicylic Acid

Column: VertiSep™ GES C18 5µm 150x4.6mm  
 Mobile Phase: 0.05M KH<sub>2</sub>PO<sub>4</sub>, pH3.2:Methanol (60:40)  
 Flow Rate: 1.0mL/min  
 Detection: UV254nm

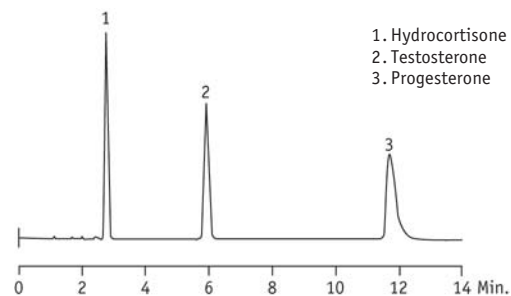
### Alkyl Benzoic Acids



1. 4-Butylbenzoic Acid
2. 3,5-Di-tert-Butylbenzoic Acid
3. 4-Hexylbenzoic Acid
4. 4-Octylbenzoic Acid

Column: VertiSep™ GES C18 5µm 150x4.6mm  
 Mobile Phase: Acetonitrile:Water:Acetic (65:34:1)  
 Flow Rate: 1.0mL/min  
 Detection: UV254nm

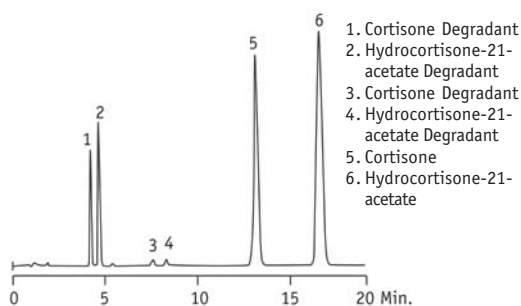
### Steroids



1. Hydrocortisone
2. Testosterone
3. Progesterone

Column: VertiSep™ GES C18 5µm 150x4.6mm  
 Mobile Phase: Methanol:Water (70:30)  
 Flow Rate: 1.0mL/min  
 Detection: UV254nm

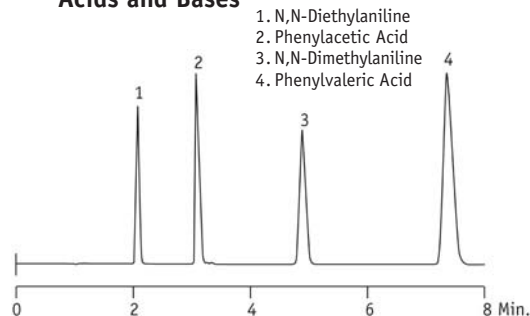
### Steroids



1. Cortisone Degradant
2. Hydrocortisone-21-acetate Degradant
3. Cortisone Degradant
4. Hydrocortisone-21-acetate Degradant
5. Cortisone
6. Hydrocortisone-21-acetate

Column: VertiSep™ GES C18 5µm 150x4.6mm  
 Mobile Phase: 50mM KH<sub>2</sub>PO<sub>4</sub>, pH2.75:Acetonitrile (65:35)  
 Flow Rate: 1.0mL/min  
 Detection: UV252nm

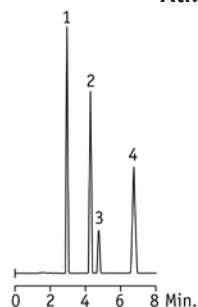
### Acids and Bases



1. N,N-Diethylaniline
2. Phenylacetic Acid
3. N,N-Dimethylaniline
4. Phenylvaleric Acid

Column: VertiSep™ GES C18 5µm 150x4.6mm  
 Mobile Phase: Acetonitrile:0.05M Potassium Phosphate Buffer, pH3.0 (45:55)  
 Flow Rate: 1.0mL/min  
 Detection: UV254nm

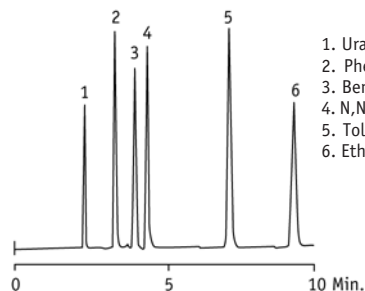
### Alkyl Benzoic Acids



1. 4-Butylbenzoic Acid
2. 3,5,-di-tert-Butylbenzoic Acid
3. 4-Hexylbenzoic Acid
4. 4-Octylbenzoic Acid

Column: VertiSep™ GES C8 5µm 4.6x150mm  
 Mobile Phase: Acetonitrile:Water:Acetic Acid (65:34:1)  
 Flow Rate: 1.0mL/min  
 Detection: UV254nm

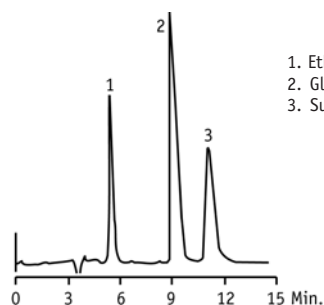
### Base/Neutral Mix



1. Uracil
2. Phenol
3. Benzaldehyde
4. N,N-Diethyl-m-toluidine
5. Toluene
6. Ethylbenzene

Column: VertiSep™ GES C18 5µm 4.6x250mm  
 Mobile Phase: Acetonitrile:Water (65:35)  
 Flow Rate: 1.0mL/min  
 Detection: UV254nm

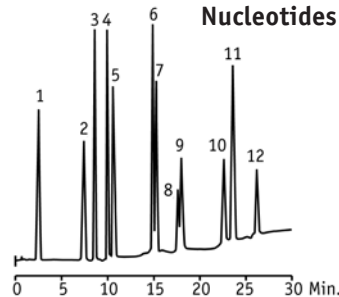
### Carbohydrates from Wine



1. Ethanol
2. Glucose
3. Sucrose

Column: VertiSep™ GES NH2 10µm 4.6x250mm  
 Mobile Phase: Acetonitrile:Water (75:25)  
 Flow Rate: 3.0mL/min  
 Detection: RI

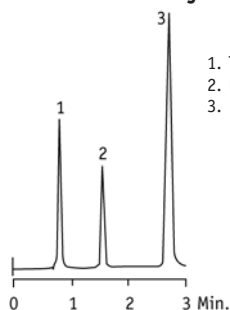
### Nucleotides



1. CMP
2. AMP
3. UMP
4. GMP
5. CDP
6. ADP
7. UDP
8. CTP
9. GDP
10. ATP
11. UTP
12. GTP

Column: VertiSep™ GES SAX 5µm 4.6x250mm  
 Mobile Phase: A: 5mM NH<sub>4</sub>H<sub>2</sub>PO<sub>4</sub>, pH2.8  
 B: 750mM NH<sub>4</sub>H<sub>2</sub>PO<sub>4</sub>, pH 3.7  
 Gradient: Time/%B, 0/0, 3/100  
 Flow Rate: 1.0mL/min  
 Detection: UV254nm

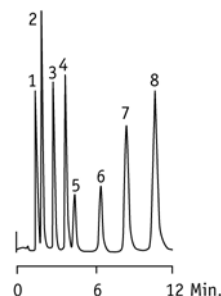
### Aromatic Hydrocarbons



1. Toluene
2. Nitrobenzene
3. 2,6-Dinitrotoluene

Column: VertiSep™ GES CN 5µm 4.6x100mm  
 Mobile Phase: 1% Ethyl Acetate in Hexane  
 Flow Rate: 2.0mL/min  
 Detection: UV254nm

### Aromatic Ketones



1. Benzamide
2. Benzyl Alcohol
3. Acetophenone
4. Methyl Benzoate
5. Phenetole
6. Naphthalene
7. Benzophenone
8. Biphenyl

Column: VertiSep™ GES PH 5µm 4.6x100mm  
 Mobile Phase: Methanol:Water (60:40)  
 Flow Rate: 1.0mL/min  
 Detection: UV254nm

VertiSep™ GES Columns				
Packing	Particle Size (µm)	Formats	I.D. Length (mm)	Part No.
C18	3	Ultra-Fast	2.1 x 10	03AA-B111
	3	Ultra-Fast	2.1 x 20	03AA-B611
	3	Ultra-Fast	2.1 x 50	03AA-B211
	3	LC/MS	2.1 x 100	03AA-B311
	3	LC/MS	2.1 x 150	03AA-B411
	3	LC/MS	3.2 x 100	03AA-C311
	3	LC/MS	3.2 x 150	03AA-C411
	3	Analytical	4.0 x 100	03AA-D311
	3	Analytical	4.0 x 150	03AA-D411
	3	Analytical	4.6 x 100	03AA-E311
	3	Analytical	4.6 x 150	03AA-E411
	3	Fast	7.8 x 50	03AA-G211
	3	Analytical	7.8 x 100	03AA-G311
	5	LC/MS	2.1 x 100	03AA-B321
	5	LC/MS	2.1 x 150	03AA-B421
	5	LC/MS	3.2 x 100	03AA-C321
	5	LC/MS	3.2 x 150	03AA-C421
	5	Analytical	4.0 x 100	03AA-D321
	5	Analytical	4.0 x 150	03AA-D421
	5	Analytical	4.0 x 250	03AA-D521
	5	Analytical	4.6 x 100	03AA-E321
	5	Analytical	4.6 x 125	03AA-EC21
	5	Analytical	4.6 x 150	03AA-E421
	5	Analytical	4.6 x 250	03AA-E521
	5	Analytical	7.8 x 100	03AA-G321
	5	Prep	10.0 x 150	03AA-H421
	5	Prep	10.0 x 250	03AA-H521
	5	Prep	21.2 x 150	03AA-I421
	5	Prep	21.2 x 250	03AA-I521
	10	Prep	10.0 x 150	03AA-H431
	10	Prep	10.0 x 250	03AA-H531
	10	Prep	21.2 x 150	03AA-I431
	10	Prep	21.2 x 250	03AA-I531
	10	Prep	30.0 x 150	03AA-J431
	10	Prep	30.0 x 250	03AA-J531
	10	Prep	50.0 x 150	03AA-K431
	10	Prep	50.0 x 250	03AA-K531

VertiSep™ GES Columns				
Packing	Particle Size (µm)	Formats	I.D. Length (mm)	Part No.
C8	3	Ultra-Fast	2.1 x 10	03AB-B111
	3	Ultra-Fast	2.1 x 20	03AB-B611
	3	Ultra-Fast	2.1 x 50	03AB-B211
	3	LC/MS	2.1 x 100	03AB-B311
	3	LC/MS	2.1 x 150	03AB-B411
	3	LC/MS	3.2 x 100	03AB-C311
	3	LC/MS	3.2 x 150	03AB-C411
	3	Analytical	4.0 x 100	03AB-D311
	3	Analytical	4.0 x 150	03AB-D411
	3	Analytical	4.6 x 100	03AB-E311
	3	Analytical	4.6 x 150	03AB-E411
	3	Fast	7.8 x 50	03AB-G211
	3	Analytical	7.8 x 100	03AB-G311
	5	LC/MS	2.1 x 100	03AB-B321
	5	LC/MS	2.1 x 150	03AB-B421
	5	LC/MS	3.2 x 100	03AB-C321
	5	LC/MS	3.2 x 150	03AB-C421
	5	Analytical	4.0 x 100	03AB-D321
	5	Analytical	4.0 x 150	03AB-D421
	5	Analytical	4.0 x 250	03AB-D521
	5	Analytical	4.6 x 100	03AB-E321
	5	Analytical	4.6 x 125	03AB-EC21
	5	Analytical	4.6 x 150	03AB-E421
	5	Analytical	4.6 x 250	03AB-E521
	5	Analytical	7.8 x 100	03AB-G321
	5	Prep	10.0 x 150	03AB-H421
	5	Prep	10.0 x 250	03AB-H521
	5	Prep	21.2 x 150	03AB-I421
	5	Prep	21.2 x 250	03AB-I521
	10	Prep	10.0 x 150	03AB-H431
	10	Prep	10.0 x 250	03AB-H531
	10	Prep	21.2 x 150	03AB-I431
	10	Prep	21.2 x 250	03AB-I531
	10	Prep	30.0 x 150	03AB-J431
	10	Prep	30.0 x 250	03AB-J531
	10	Prep	50.0 x 150	03AB-K431
	10	Prep	50.0 x 250	03AB-K531

# VertiSep™ GES

VertiSep™ GES Columns				
Packing	Particle Size (µm)	Formats	I.D. Length (mm)	Part No.
Ph	3	Ultra-Fast	2.1 x 10	03AD-B111
	3	Ultra-Fast	2.1 x 20	03AD-B611
	3	Ultra-Fast	2.1 x 50	03AD-B211
	3	LC/MS	2.1 x 100	03AD-B311
	3	LC/MS	2.1 x 150	03AD-B411
	3	LC/MS	3.2 x 100	03AD-C311
	3	LC/MS	3.2 x 150	03AD-C411
	3	Analytical	4.0 x 100	03AD-D311
	3	Analytical	4.0 x 150	03AD-D411
	3	Analytical	4.6 x 100	03AD-E311
	3	Analytical	4.6 x 150	03AD-E411
	3	Fast	7.8 x 50	03AD-G211
	3	Analytical	7.8 x 100	03AD-G311
	5	LC/MS	2.1 x 100	03AD-B321
	5	LC/MS	2.1 x 150	03AD-B421
	5	LC/MS	3.2 x 100	03AD-C321
	5	LC/MS	3.2 x 150	03AD-C421
	5	Analytical	4.0 x 100	03AD-D321
	5	Analytical	4.0 x 150	03AD-D421
	5	Analytical	4.0 x 250	03AD-D521
	5	Analytical	4.6 x 100	03AD-E321
	5	Analytical	4.6 x 125	03AD-EC21
	5	Analytical	4.6 x 150	03AD-E421
	5	Analytical	4.6 x 250	03AD-E521
	5	Analytical	7.8 x 100	03AD-G321
	5	Prep	10.0 x 150	03AD-H421
	5	Prep	10.0 x 250	03AD-H521
	5	Prep	21.2 x 150	03AD-I421
	5	Prep	21.2 x 250	03AD-I521
	10	Prep	10.0 x 150	03AD-H431
	10	Prep	10.0 x 250	03AD-H531
	10	Prep	21.2 x 150	03AD-I431
	10	Prep	21.2 x 250	03AD-I531
	10	Prep	30.0 x 150	03AD-J431
	10	Prep	30.0 x 250	03AD-J531
	10	Prep	50.0 x 150	03AD-K431
	10	Prep	50.0 x 250	03AD-K531

VertiSep™ GES Columns				
Packing	Particle Size (µm)	Formats	I.D. Length (mm)	Part No.
C4	3	Ultra-Fast	2.1 x 10	03AC-B111
	3	Ultra-Fast	2.1 x 20	03AC-B611
	3	Ultra-Fast	2.1 x 50	03AC-B211
	3	LC/MS	2.1 x 100	03AC-B311
	3	LC/MS	2.1 x 150	03AC-B411
	3	LC/MS	3.2 x 100	03AC-C311
	3	LC/MS	3.2 x 150	03AC-C411
	3	Analytical	4.0 x 100	03AC-D311
	3	Analytical	4.0 x 150	03AC-D411
	3	Analytical	4.6 x 100	03AC-E311
	3	Analytical	4.6 x 150	03AC-E411
	3	Fast	7.8 x 50	03AC-G211
	3	Analytical	7.8 x 100	03AC-G311
	5	LC/MS	2.1 x 100	03AC-B321
	5	LC/MS	2.1 x 150	03AC-B421
	5	LC/MS	3.2 x 100	03AC-C321
	5	LC/MS	3.2 x 150	03AC-C421
	5	Analytical	4.0 x 100	03AC-D321
	5	Analytical	4.0 x 150	03AC-D421
	5	Analytical	4.0 x 250	03AC-D521
	5	Analytical	4.6 x 100	03AC-E321
	5	Analytical	4.6 x 125	03AC-EC21
	5	Analytical	4.6 x 150	03AC-E421
	5	Analytical	4.6 x 250	03AC-E521
	5	Analytical	7.8 x 100	03AC-G321
	5	Prep	10.0 x 150	03AC-H421
	5	Prep	10.0 x 250	03AC-H521
	5	Prep	21.2 x 150	03AC-I421
	5	Prep	21.2 x 250	03AC-I521
	10	Prep	10.0 x 150	03AC-H431
	10	Prep	10.0 x 250	03AC-H531
	10	Prep	21.2 x 150	03AC-I431
	10	Prep	21.2 x 250	03AC-I531
	10	Prep	30.0 x 150	03AC-J431
	10	Prep	30.0 x 250	03AC-J531
	10	Prep	50.0 x 150	03AC-K431
	10	Prep	50.0 x 250	03AC-K531

VertiSep™ GES Columns				
Packing	Particle Size (µm)	Formats	I.D. Length (mm)	Part No.
CN	3	Ultra-Fast	2.1 x 10	03AE-B111
	3	Ultra-Fast	2.1 x 20	03AE-B611
	3	Ultra-Fast	2.1 x 50	03AE-B211
	3	LC/MS	2.1 x 100	03AE-B311
	3	LC/MS	2.1 x 150	03AE-B411
	3	LC/MS	3.2 x 100	03AE-C311
	3	LC/MS	3.2 x 150	03AE-C411
	3	Analytical	4.0 x 100	03AE-D311
	3	Analytical	4.0 x 150	03AE-D411
	3	Analytical	4.6 x 100	03AE-E311
	3	Analytical	4.6 x 150	03AE-E411
	3	Fast	7.8 x 50	03AE-G211
	3	Analytical	7.8 x 100	03AE-G311
	5	LC/MS	2.1 x 100	03AE-B321
	5	LC/MS	2.1 x 150	03AE-B421
	5	LC/MS	3.2 x 100	03AE-C321
	5	LC/MS	3.2 x 150	03AE-C421
	5	Analytical	4.0 x 100	03AE-D321
	5	Analytical	4.0 x 150	03AE-D421
	5	Analytical	4.0 x 250	03AE-D521
	5	Analytical	4.6 x 100	03AE-E321
	5	Analytical	4.6 x 125	03AE-EC21
	5	Analytical	4.6 x 150	03AE-E421
	5	Analytical	4.6 x 250	03AE-E521
	5	Analytical	7.8 x 100	03AE-G321
	5	Prep	10.0 x 150	03AE-H421
	5	Prep	10.0 x 250	03AE-H521
	5	Prep	21.2 x 150	03AE-I421
	5	Prep	21.2 x 250	03AE-I521
	10	Prep	10.0 x 150	03AE-H431
	10	Prep	10.0 x 250	03AE-H531
10	Prep	21.2 x 150	03AE-I431	
10	Prep	21.2 x 250	03AE-I531	
10	Prep	30.0 x 150	03AE-J431	
10	Prep	30.0 x 250	03AE-J531	
10	Prep	50.0 x 150	03AE-K431	
10	Prep	50.0 x 250	03AE-K531	

VertiSep™ GES Columns				
Packing	Particle Size (µm)	Formats	I.D. Length (mm)	Part No.
NH2	3	Ultra-Fast	2.1 x 10	03AF-B111
	3	Ultra-Fast	2.1 x 20	03AF-B611
	3	Ultra-Fast	2.1 x 50	03AF-B211
	3	LC/MS	2.1 x 100	03AF-B311
	3	LC/MS	2.1 x 150	03AF-B411
	3	LC/MS	3.2 x 100	03AF-C311
	3	LC/MS	3.2 x 150	03AF-C411
	3	Analytical	4.0 x 100	03AF-D311
	3	Analytical	4.0 x 150	03AF-D411
	3	Analytical	4.6 x 100	03AF-E311
	3	Analytical	4.6 x 150	03AF-E411
	3	Fast	7.8 x 50	03AF-G211
	3	Analytical	7.8 x 100	03AF-G311
	5	LC/MS	2.1 x 100	03AF-B321
	5	LC/MS	2.1 x 150	03AF-B421
	5	LC/MS	3.2 x 100	03AF-C321
	5	LC/MS	3.2 x 150	03AF-C421
	5	Analytical	4.0 x 100	03AF-D321
	5	Analytical	4.0 x 150	03AF-D421
	5	Analytical	4.0 x 250	03AF-D521
	5	Analytical	4.6 x 100	03AF-E321
	5	Analytical	4.6 x 125	03AF-EC21
	5	Analytical	4.6 x 150	03AF-E421
	5	Analytical	4.6 x 250	03AF-E521
	5	Analytical	7.8 x 100	03AF-G321
	5	Prep	10.0 x 150	03AF-H421
	5	Prep	10.0 x 250	03AF-H521
	5	Prep	21.2 x 150	03AF-I421
	5	Prep	21.2 x 250	03AF-I521
	10	Prep	10.0 x 150	03AF-H431
	10	Prep	10.0 x 250	03AF-H531
10	Prep	21.2 x 150	03AF-I431	
10	Prep	21.2 x 250	03AF-I531	
10	Prep	30.0 x 150	03AF-J431	
10	Prep	30.0 x 250	03AF-J531	
10	Prep	50.0 x 150	03AF-K431	
10	Prep	50.0 x 250	03AF-K531	