

VertiSep™ BIO

VertiSep™ BIO HPLC Columns

- Full endcapping
- Ultimate protein and peptide application column
- Acidic and alkalic resistance for long lifetime
- 4 Phases: C30, C18, C8, and C4 chemistries
- 3µm, 5µm, 10µm particle sizes



VertiSep™ BIO packings are ultra-high purity spherical silica, full endcapping providing separation or purification of high molecular weight compounds like protein and peptide.

Because of the significant improvement of acidic and alkalic resistance, it can be use for extened period of time in acidic mobile phase condition and rinsed for recover with NaOH containing buffer.

There are 4 phases: C30, C18, C8 and C4 and 3 particle sizes: 3µm, 5µm, 10µm particle sizes

VertiSep™ BIO C30 are ideal for the separation of large molecules such as proteins and peptides, especially isomers in the carotenoid family of long chain molecules. VertiSep™ BIO C30 are a great equivalent to YMC C30 and are interchangeable with them for many applications.

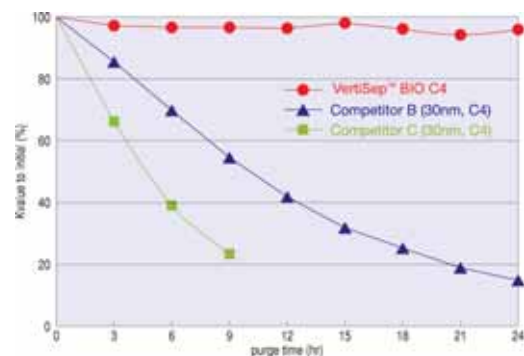
VertiSep™ BIO C18 are ideal for the separation of high molecular weight peptides and oligonucleic acids. VertiSep™ BIO C18 are designed for biopharmaceutical, biochemical and environmental applications and for separation of food compounds as well.

VertiSep™ BIO C8 have moderate hydrophobicity make them useful for separating compounds or samples in cases where separation optimization is difficult to achieve using C18 with relatively high hydrophobicity. VertiSep™ BIO C8 are used to separate many classes of compounds including pharmaceuticals, organic chemicals and biologicals.

VertiSep™ BIO C4 stationary phase surface hydrophobicity is lower than both C18 and C8. VertiSep™ BIO C4 achieve better separation than C18 or C8 for some type of samples. VertiSep™ BIO C4 effectively resolve many classes of proteins and biopolymers.

Packing	Particle Size (µm)	Carbon Load (%)	Pore Size (Å)	Pore Volume (mL/g)	Surface Area (m ² /g)	End Capped
C30	3,5	20	200	1.1	200	No
C18	5,10	8	300	0.9	100	Yes
C8	5,10	6	300	0.9	100	Yes
C4	5,10	4	300	0.9	100	Yes

Comparison of Durability in Acidic Environment

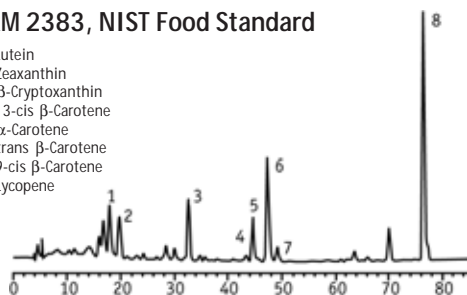


1. Urasil
2. Methyl Benzoate
3. Toluene
4. Naphthalene

Column: VertiSep™ BIO C4 5µm 4.6x250mm
Accelerated Acidic Duration Test Condition
 Mobile Phase: CH₃OH/1.0% TFA aq. (pH=1.0)=10/90
 Flow Rate: 1.0mL/min
 Temperature: 70°C
 Purge time: 3h
Chromatographic Test Condition
 Mobile Phase: CH₃OH/H₂O=35/65
 Flow Rate: 1.0mL/min
 Temperature: 40°C
 Detection: UV214nm

SRM 2383, NIST Food Standard

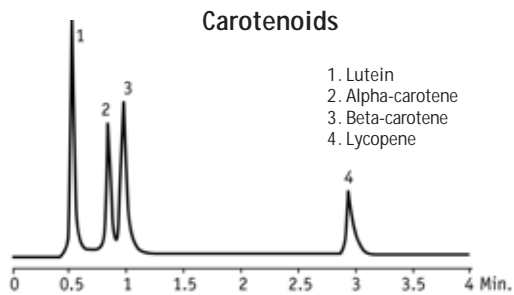
1. Lutein
2. Zeaxanthin
3. β -Cryptoxanthin
4. 13-cis β -Carotene
5. α -Carotene
6. trans β -Carotene
7. 9-cis β -Carotene
8. Lycopene



Column: VertiSep™ BIO C30 5 μ m 4.6x250mm
 Mobile Phase: A: MeOH/MTBE/H₂O = 81/15/4
 B: MeOH/MTBE/H₂O = 6/90/4
 Gradient: Time/%B, 0/0, 90/100
 Flow Rate: 1.0mL/min
 Detection: UV450nm

Carotenoids

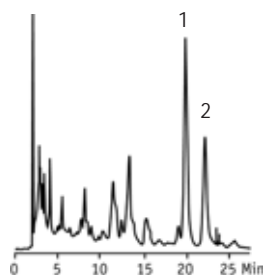
1. Lutein
2. Alpha-carotene
3. Beta-carotene
4. Lycopene



Column: VertiSep™ BIO C30 3 μ m 4.6x50mm
 Mobile Phase: A: MeOH
 B: 5.5% MeOH with 5% THF
 Gradient: Time/%B, 0/0, 3.5/100
 Flow Rate: 1.0mL/min
 Detection: UV450nm

Carotenoids (β -Carotene)

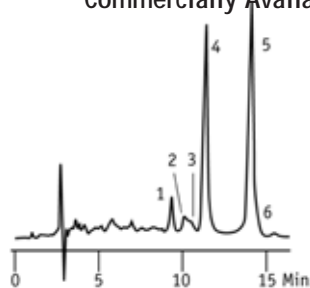
1. all-trans
2. 9-cis



Column: VertiSep™ BIO C30 3 μ m 4.6x250mm
 Mobile Phase: MeOH/TBME, 80/20 (v/v)
 Flow Rate: 1.4mL/min
 Detection: VIS450nm

Carotene Isomers From Commercially Available Capsules

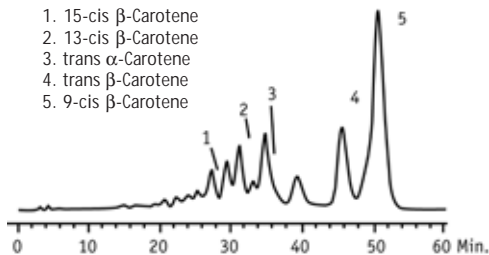
- 1: 15-cis β -Carotene
- 2: 13-cis β^2 -Carotene
- 3: 13'-cis β -Carotene
- 4: α -Carotene
- 5: β -Carotene
- 6: α -Carotene



Column: VertiSep™ BIO C30 5 μ m 4.6x250mm
 Mobile Phase: EtOH/MeOH/THF = 75/20/5
 Flow Rate: 1.0mL/min
 Detection: UV450nm

Carotenes Found In Algae

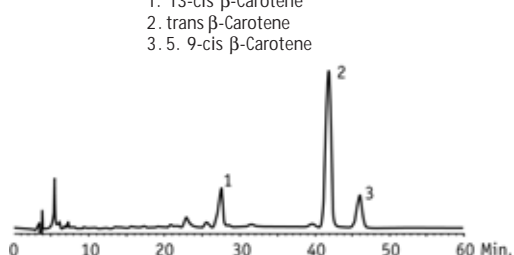
1. 15-cis β -Carotene
2. 13-cis β -Carotene
3. trans α -Carotene
4. trans β -Carotene
5. 9-cis β -Carotene



Column: VertiSep™ BIO C30 5 μ m 4.6x250mm
 Mobile Phase: MeOH/MTBE = 80/20
 Flow Rate: 2.0mL/min
 Detection: UV450nm

Carotenoids of cassava

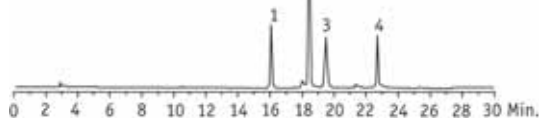
1. 13-cis β -Carotene
2. trans β -Carotene
3. 9-cis β -Carotene



Column: VertiSep™ BIO C30 3 μ m 4.6x250mm
 Mobile Phase: Methanol : Methyl-*tert*-butyl ether (80:20)
 Flow Rate: 0.8mL/min
 Detection: UV450nm

Proteins

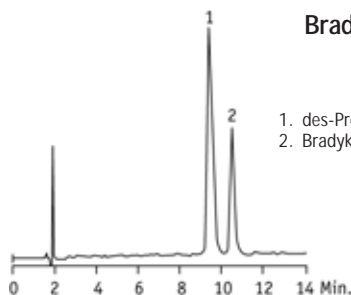
1. Ribonuclease A
2. Cytochrome C
3. Holo-transferrin
4. Apomyoglobin



Column: VertiSep™ BIO C18 4.6x250mm
 Mobile Phase: A. 0.1% TFA in H₂O B. 0.1% TFA in MeCN 5% to 70% B in 30 mins
 Flow Rate: 1.0mL/min
 Detection: UV280nm

Bradykinins

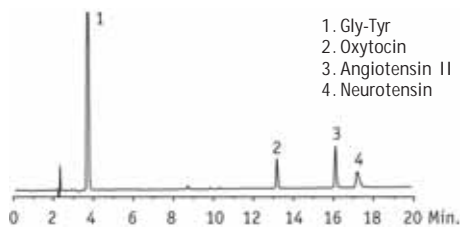
1. des-Pro²-bradykinin
2. Bradykinin



Column: VertiSep™ BIO C18 4.6x150mm
 Mobile Phase: A: 0.15% TFA in Water
 B: 0.13% TFA in Acetonitrile
 Gradient: Time/%B, 0/15, 15/25L
 Flow Rate: 1mL/min
 Detection: UV205nm

Peptides

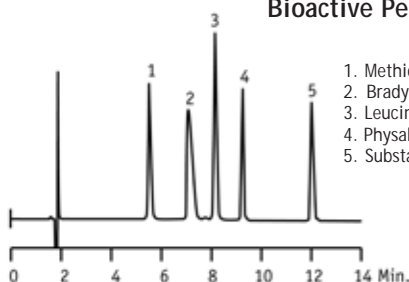
1. Gly-Tyr
2. Oxytocin
3. Angiotensin II
4. Neurotensin



Column: VertiSep™ BIO C18 4.6x250mm
 Mobile Phase: A. 0.1% TFA in H₂O B. 0.1% TFA in MeCN 10% to 40% B in 25 mins
 Flow Rate: 1.0mL/min
 Detection: UV220nm

Bioactive Peptides

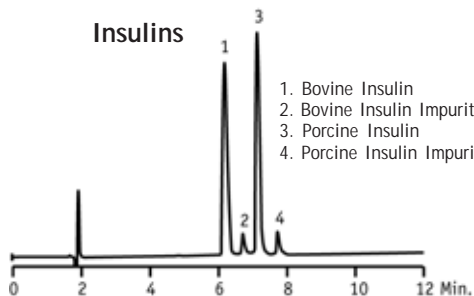
1. Methionine Enkephalin
2. Bradykinin
3. Leucine Enkephalin
4. Physalaemin
5. Substance P



Column: VertiSep™ BIO C18 4.6x150mm
 Mobile Phase: A: 0.1% TFA in Water
 B: 0.085% TFA in Acetonitrile:Water (95:5)
 Gradient: Time/%B, 0/20, 20/50
 Flow Rate: 1.0mL/min
 Detection: UV220nm

Insulins

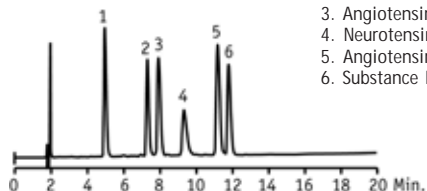
1. Bovine Insulin
2. Bovine Insulin Impurity
3. Porcine Insulin
4. Porcine Insulin Impurity



Column: VertiSep™ BIO C18 5µm 4.6x150mm
 Mobile Phase: A: 0.13% TFA in Water
 B: 0.10% TFA in Acetonitrile
 Gradient: Time/%B, 0/28, 12/38
 Flow Rate: 1.0mL/min
 Detection: UV220nm

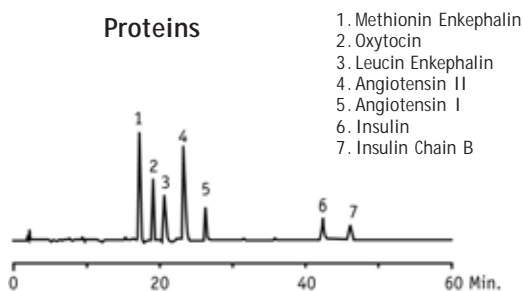
Peptide Mix

1. Methionine Enkephalin
2. Leucine Enkephalin
3. Angiotensin II
4. Neurotensin
5. Angiotensin I
6. Substance P



Column: VertiSep™ BIO C18 5µm 4.6x250mm
 Mobile Phase: A: 0.1% TFA in Water
 B: 0.08% TFA in Acetonitrile
 Gradient: Time/%B, 0/20, 20/40
 Flow Rate: 1.0mL/min
 Detection: UV220nm

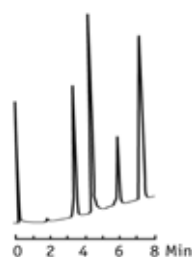
Proteins



1. Methionin Enkephalin
2. Oxytocin
3. Leucin Enkephalin
4. Angiotensin II
5. Angiotensin I
6. Insulin
7. Insulin Chain B

Column: VertiSep™ BIO C8 5µm 4.6x250mm
 Mobile Phase: A. 0.05% Formic Acid
 B. Acetonitrile/Water (90:10) (0.05% Formic Acid in Solvent B)
 Gradient: Time/%B, 0,10, 60/40
 Flow Rate: 1.0mL/min
 Detection: UV280nm

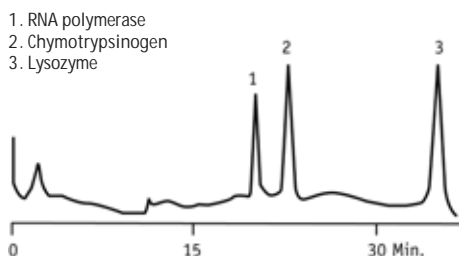
Fast protein analysis



1. Ribonuclease A
2. Insulin
3. Lysozyme
4. BSA

Column: VertiSep™ BIO C8 5µm 4.6x50mm
 Mobile Phase: A. 0.1% trifluoroacetic acid in water
 B. 0.1% trifluoroacetic acid, 4.9% Water, 95% Acetonitrile
 Gradient: Initial 75%/A/25%B Linear gradient to 35%/A/65%/B in 10 min
 Flow Rate: 2.5mL/min
 Detection: UV220nm

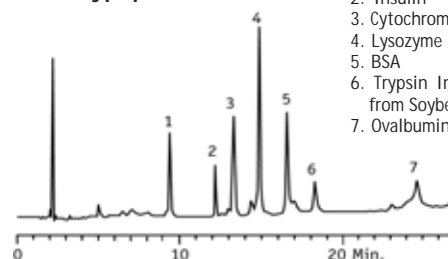
Basic Protein



1. RNA polymerase
2. Chymotrypsinogen
3. Lysozyme

Column: VertiSep™ BIO C8 5µm 4.6x100mm
 Mobile Phase: A. 0.02 M tris, pH 7.0
 B. 0.02 M tris in 0.5 M sodium acetate, pH 7.0
 Gradient: 0 to 100% B in 30 min
 Flow Rate: 1.0mL/min
 Detection: UV254nm

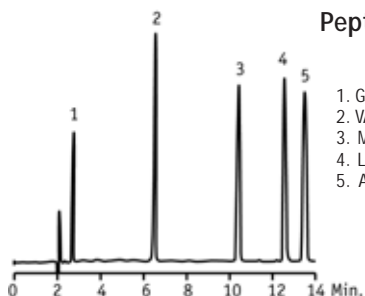
Polypeptides



1. Ribonuclease
2. Insulin
3. Cytochrome
4. Lysozyme
5. BSA
6. Trypsin Inhibitor from Soybean
7. Ovalbumin

Column: VertiSep™ BIO C8 5µm 4.6x150mm
 Mobile Phase: A: 0.1% TFA
 B: MeCN : 0.1% TFA 90 : 10
 Gradient: 20%B to 60%B in 25 min
 Flow Rate: 1.0mL/min
 Detection: UV280nm

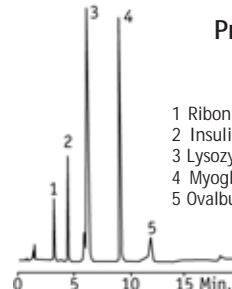
Peptides



1. GLY-TYR
2. VAL-TYR-VAL
3. Methionine Enkephalin
4. Leucine Enkephalin
5. Angiotensin II

Column: VertiSep™ BIO C8 5µm 4.6x150mm
 Mobile Phase: A: 0.15% TFA in Water
 B: 0.13% TFA in Acetonitrile
 Gradient: Time/%B, 0/10, 15,30
 Flow Rate: 1.0mL/min
 Detection: UV220nm

Proteins

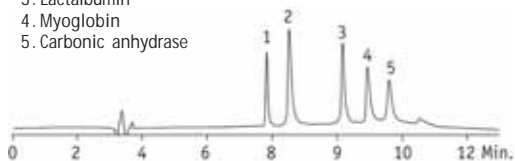


- 1 Ribonuclease A
- 2 Insulin
- 3 Lysozyme
- 4 Myoglobin
- 5 Ovalbumin

Column: VertiSep™ BIO C8 5µm 4.6x250mm
 Mobile Phase: A: 0.1% TFA in H₂O
 B: 0.1% TFA in Acetonitrile
 Gradient: 25-100%B in 30 min
 Flow Rate: 1.5mL/min
 Detection: UV at 254 nm

Proteins

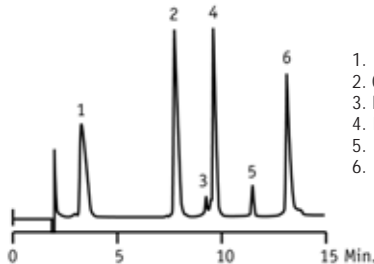
1. Insulin
2. Trypsinogen
3. Lactalbumin
4. Myoglobin
5. Carbonic anhydrase



Column: VertiSep™ BIO C4 5µm 4.6x250mm
 Mobile Phase: A: 0.01% TFA in Water
 B: 0.01% TFA in Acetonitrile
 Gradient: A/B (75:25) to A/B (5:95) in 20 min
 Flow Rate: 1.0mL/min
 Detection: UV214nm

Proteins Mix

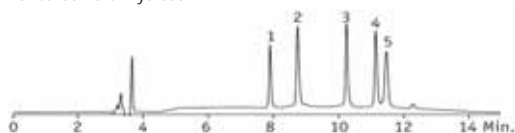
1. Ribonuclease A
2. Cytochrome C
3. Lysozyme Impurity
4. Lysozyme
5. Myoglobin Impurity
6. Myoglobin



Column: VertiSep™ BIO C4 5µm 4.6x150mm
 Mobile Phase: A: 0.15% TFA
 B: 0.13% TFA in Acetonitrile:Water (95:5)
 Gradient: Time/%B, 0/30, 15/60
 Flow Rate: 1.0mL/min
 Detection: UV220nm

Proteins

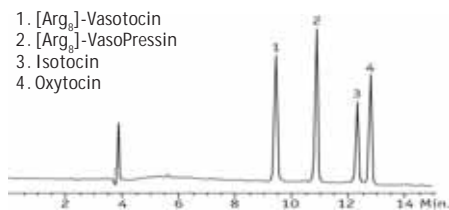
1. Insulin
2. Trypsinogen
3. Lactalbumin
4. Myoglobin
5. Carbonic anhydrase



Column: VertiSep™ BIO C4 5µm 4.6x250mm
 Mobile Phase: A: 0.1% TFA in Water
 B: 0.1% TFA in Acetonitrile
 Gradient: A/B (75:25) to A/B (5:95) in 20 min
 Flow Rate: 1.0mL/min
 Detection: UV214nm

Peptide Hormones

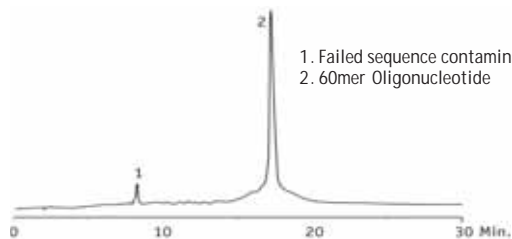
1. [Arg₈]-Vasotocin
2. [Arg₈]-VasoPressin
3. Isotocin
4. Oxytocin



Column: VertiSep™ BIO C4 5µm 4.6x250mm
 Mobile Phase: A: 0.1% TFA in Water
 B: 0.1% TFA in Acetonitrile/Water (90:10)
 Gradient: a) %B, 10 to 26 in 8 min (2% B/min)
 b) %B, 26 to 30 in 6 min (0.57% B/min)
 Flow Rate: 1.0mL/min
 Detection: UV214nm

60mer Oligonucleotide Separation

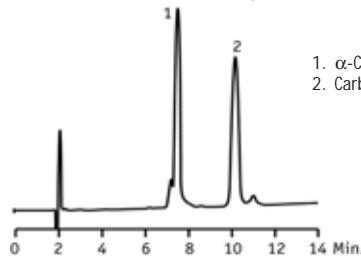
1. Failed sequence contaminant
2. 60mer Oligonucleotide



Column: VertiSep™ BIO C4 5µm 4.6x250mm
 Mobile Phase: A) 100mM TEAA in Water, pH7.0
 A) 100mM TEAA in Acetonitrile, pH7.0
 Gradient: A/B (96:4) to A/B (85:15) in 30 min
 Flow Rate: 1.0mL/min
 Detection: UV260nm

Enzymes

1. α-Chymotrypsinogen
2. Carbonic Anhydrase



Column: VertiSep™ BIO C4 5µm 4.6x150mm
 Mobile Phase: A: 0.15% TFA in Water
 B: 0.13% TFA in Acetonitrile
 Gradient: Time/%B, 0/40, 15/55
 Flow Rate: 1.0mL/min
 Detection: UV220nm

VertiSep™ BIO Columns				
Packing	Particle Size (µm)	Formats	I.D. Length (mm)	Part No.
C30	3	Ultra-Fast	2.1 x 50	03HQ-B211
	3	LC/MS	2.1 x 100	03HQ-B311
	3	LC/MS	2.1 x 150	03HQ-B411
	3	Ultra-Fast	3.2 x 50	03HQ-C211
	3	LC/MS	3.2 x 100	03HQ-C311
	3	LC/MS	3.2 x 150	03HQ-C411
	3	Fast	4.6 x 50	03HQ-E211
	3	Analytical	4.6 x 100	03HQ-E311
	3	Analytical	4.6 x 150	03HQ-E411
	5	Ultra-Fast	2.1 x 50	03HQ-B221
	5	LC/MS	2.1 x 100	03HQ-B321
	5	LC/MS	2.1 x 150	03HQ-B421
	5	LC/MS	2.1 x 250	03HQ-B521
	5	Ultra-Fast	3.2 x 50	03HQ-C221
	5	LC/MS	3.2 x 100	03HQ-C321
	5	LC/MS	3.2 x 150	03HQ-C421
	5	LC/MS	3.2 x 250	03HQ-C521
	5	Fast	4.6 x 50	03HQ-E221
5	Analytical	4.6 x 100	03HQ-E321	
5	Analytical	4.6 x 150	03HQ-E421	
5	Analytical	4.6 x 250	03HQ-E521	

VertiSep™ BIO Columns				
Packing	Particle Size (µm)	Formats	I.D. Length (mm)	Part No.
C18	5	LC/MS	2.1 x 100	03HA-B321
	5	LC/MS	2.1 x 150	03HA-B421
	5	LC/MS	3.2 x 150	03HA-C321
	5	Analytical	4.6 x 100	03HA-E321
	5	Analytical	4.6 x 150	03HA-E421
	5	Analytical	4.6 x 250	03HA-E521
	5	Prep	10.0 x 150	03HA-H421
	5	Prep	10.0 x 250	03HA-H521
	5	Prep	22.0 x 150	03HA-I421
	5	Prep	22.0 x 250	03HA-I521
	10	Analytical	4.6 x 100	03HA-E331
	10	Analytical	4.6 x 150	03HA-E431
	10	Analytical	4.6 x 250	03HA-E531
	10	Prep	10.0 x 100	03HA-H331
	10	Prep	10.0 x 150	03HA-H431
	10	Prep	10.0 x 250	03HA-H531
	10	Prep	21.2 x 100	03HA-I331
	10	Prep	21.2 x 150	03HA-I431
	10	Prep	21.2 x 250	03HA-I531
	10	Prep	30.0 x 150	03HA-J431
	10	Prep	30.0 x 250	03HA-J531
	10	Prep	50.0 x 150	03HA-K431
	10	Prep	50.0 x 250	03HA-K531

VertiSep™ BIO Columns				
Packing	Particle Size (µm)	Formats	I.D. Length (mm)	Part No.
C8	5	LC/MS	2.1 x 100	03HB-B321
	5	LC/MS	2.1 x 150	03HB-B421
	5	LC/MS	3.2 x 150	03HB-C321
	5	Analytical	4.6 x 100	03HB-E321
	5	Analytical	4.6 x 150	03HB-E421
	5	Analytical	4.6 x 250	03HB-E521
	5	Prep	10.0 x 150	03HB-H421
	5	Prep	10.0 x 250	03HB-H521
	5	Prep	22.0 x 150	03HB-I421
	5	Prep	22.0 x 250	03HB-I521
	10	Analytical	4.6 x 100	03HB-E331
	10	Analytical	4.6 x 150	03HB-E431
	10	Analytical	4.6 x 250	03HB-E531
	10	Prep	10.0 x 100	03HB-H331
	10	Prep	10.0 x 150	03HB-H431
	10	Prep	10.0 x 250	03HB-H531
	10	Prep	21.2 x 100	03HB-I331
	10	Prep	21.2 x 150	03HB-I431
	10	Prep	21.2 x 250	03HB-I531
	10	Prep	30.0 x 150	03HB-J431
	10	Prep	30.0 x 250	03HB-J531
	10	Prep	50.0 x 150	03HB-K431
	10	Prep	50.0 x 250	03HB-K531

VertiSep™ BIO Columns				
Packing	Particle Size (µm)	Formats	I.D. Length (mm)	Part No.
C4	5	LC/MS	2.1 x 100	03HC-B321
	5	LC/MS	2.1 x 150	03HC-B421
	5	LC/MS	3.2 x 150	03HC-C321
	5	Analytical	4.6 x 100	03HC-E321
	5	Analytical	4.6 x 150	03HC-E421
	5	Analytical	4.6 x 250	03HC-E521
	5	Prep	10.0 x 150	03HC-H421
	5	Prep	10.0 x 250	03HC-H521
	5	Prep	22.0 x 150	03HC-I421
	5	Prep	22.0 x 250	03HC-I521
	10	Analytical	4.6 x 100	03HC-E331
	10	Analytical	4.6 x 150	03HC-E431
	10	Analytical	4.6 x 250	03HC-E531
	10	Prep	10.0 x 100	03HC-H331
	10	Prep	10.0 x 150	03HC-H431
	10	Prep	10.0 x 250	03HC-H531
	10	Prep	21.2 x 100	03HC-I331
	10	Prep	21.2 x 150	03HC-I431
	10	Prep	21.2 x 250	03HC-I531
	10	Prep	30.0 x 150	03HC-J431
	10	Prep	30.0 x 250	03HC-J531
	10	Prep	50.0 x 150	03HC-K431
	10	Prep	50.0 x 250	03HC-K531



VertiSep BIO™ Guard Cartridges*, 2/PK

Packing	Particle Size (µm)	Formats	I.D. Length (mm)	Part No.	
C30	3	Guard	2.1 x 10	03HQ-B113	
	3	Guard	3.2 x 10	03HQ-C113	
	3	Guard	4.6 x 10	03HQ-E113	
	5	Guard	2.1 x 10	03HQ-B123	
	5	Guard	3.2 x 10	03HQ-C123	
	5	Guard	4.6 x 10	03HQ-E123	
C18	5	Guard	2.1 x 10	03HA-B123	
	5	Guard	3.2 x 10	03HA-C123	
	5	Guard	4.6 x 10	03HA-E123	
	5	Guard	10.0 x 10	03HA-H123	
	5	Guard	21.2 x 10	03HA-I123	
	10	Guard	4.6 x 10	03HA-E133	
	10	Guard	10.0 x 10	03HA-H133	
	10	Guard	21.2 x 10	03HA-I133	
C8	5	Guard	2.1 x 10	03HB-B123	
	5	Guard	3.2 x 10	03HB-C123	
	5	Guard	4.6 x 10	03HB-E123	
	5	Guard	10.0 x 10	03HB-H123	
	5	Guard	21.2 x 10	03HB-I123	
	10	Guard	4.6 x 10	03HB-E133	
	10	Guard	10.0 x 10	03HB-H133	
	10	Guard	21.2 x 10	03HB-I133	
	C4	5	Guard	2.1 x 10	03HC-B123
		5	Guard	3.2 x 10	03HC-C123
5		Guard	4.6 x 10	03HC-E123	
5		Guard	10.0 x 10	03HC-H123	
5		Guard	21.2 x 10	03HC-I123	
10		Guard	4.6 x 10	03HC-E133	
10		Guard	10.0 x 10	03HC-H133	
10		Guard	21.2 x 10	03HC-I133	

*Guard holder required

Guard Holder with Coupler

Guard Holder with Coupler	QTY	Part NO.
For column I.D. 2.1-7.8 mm	1	0300-0001
For column I.D. 10 mm	1	0300-0002
For column I.D. 21.2 mm	1	0300-0003

