

VertiSep™ MMS HPLC Columns

- Multifunctional silica based column
- Used in specific applications and recommended by USP
- High surface area offers high resolution for gradient elution of difficult separation compounds
- Polymeric bonding offers high stability and longer column life time
- Excellent Column-to-Column reproducibility
- Available in 5 phases : CN/NH₂, C₈/NH₂, C₈/C₁₈, C₈/SCX, and C₈/SAX



VertiSep™ MMS columns are multifunctional silica based columns used as alternative to single phase for specific applications. VertiSep™ MMS are high surface of 450 m²/g offer high capacity and high resolution for gradient elution. VertiSep™ MMS columns are manufactured to minimize lot-to-lot variation with a strict QC program to ensure excellent column-to-column reproducibility.

VertiSep™ MMS CN/NH₂ is a multifunctional phases of cyano and amino offering reversed phase, normal phase and weak anion exchange interactions for good thermal and chemical stability. Selectivity and rapid equilibrium allow a range of separation mechanisms to be used, including adsorption, reversed phase and weak anion exchange depending on mobile phase used. VertiSep™ MMS CN/NH₂ is a good choice for carbohydrate separations and recommended for USP L18.

VertiSep™ MMS C₈/NH₂ column is a multifunctional phase of C₈ and amine offering both reversed phase and normal phase interaction. VertiSep™ MMS C₈/NH₂ is used for difficult applications i.e. hydrophobic as well as ionic compounds which previously required special conditions can be developed by controlling ionization via mobile phase adjustments, buffer strength and organic modifier composition. VertiSep™ MMS C₈/NH₂ is recommended for USP L28.

VertiSep™ MMS Packing Specifications

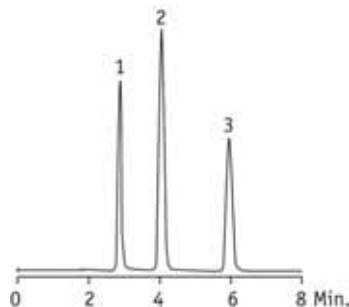
Packing	Particle Size (µm)	Carbon Load (%)	Pore Size (Å)	Pore Volume (mL/g)	Surface Area (m ² /g)	End Capped
CN/NH ₂	5	16	60	1.0	450	No
C ₈ /NH ₂	5	11	60	1.0	450	No
C ₈ /C ₁₈	5	14	60	1.0	450	Yes
C ₈ /SCX	5	9	60	1.0	450	No
C ₈ /SAX	5	9	60	1.0	450	No

VertiSep™ MMS C₈/C₁₈ column is multifunctional phase of C₈ and C₁₈ groups for the reversed phase separation of basic molecules. VertiSep™ MMS C₈/C₁₈ offers more excellent gradient separation to C₁₈ or C₈ only for applications especially pharmaceutical applications and recommended for USP L42.

VertiSep™ MMS C₈/SCX is a multifunctional phase of C₈ and SCX (Strong Cationic Exchanger) offering both reversed phase and strong cationic interactions. VertiSep™ MMS C₈/SCX is used for separation of basic drugs and metabolites from physiological fluids. VertiSep™ MMS C₈/SCX is recommended for USP L44. Difficult applications which previously required special conditions can be developed by controlling ionization via mobile phase adjustments, buffer strength and organic modifier composition.

VertiSep™ MMS C₈/SAX is multifunctional phase of C₈ and SAX (Strong Anionic Exchanger) offering both reversed phase and strong anionic interactions. VertiSep™ MMS C₈/SAX is used for acidic drugs and metabolites from physiological fluids. Difficult applications which previously required special conditions can be developed by controlling ionization via mobile phase adjustments, buffer strength and organic modifier composition.

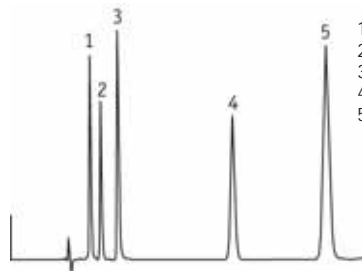
Acids



1. 4-Hydroxy-3-methoxy-mandelic Acid
2. Acetylsalicylic Acid
3. Phenol

Column: VertiSep™ MMS C8/NH₂, 5μm, 4.6 x 150mm
 Mobile Phase: 30:70 Methanol:100mM K₂HPO₄, pH 7
 Flow Rate: 1.0mL/min
 Temp: 30°C
 Detection: UV at 254nm

Acidic and basic molecules



1. Acetylsalicylic acid
2. p-Acetophenetidide
3. Salicylic acid
4. Phenylbutazone
5. Indomethacin

Column: VertiSep™ MMS C8/C18 5μm, 4.6 x 250mm
 Mobile Phase: CH₃OH:0.004M KH₂PO₄, pH 3.0 (70:30)
 Flow Rate: 1.0mL/min
 Detection:

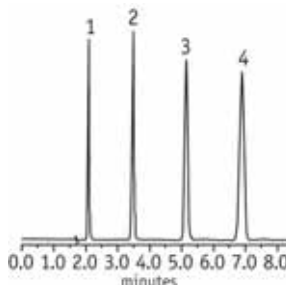
Basic drug mixture



1. Unretained peak
2. Chlorpheniramine
3. Procainamide
4. Amiloride
5. N-Acetylprocainamide

Column: VertiSep™ MMS C8/C18 5μm, 4.6 x 250mm
 Mobile Phase: CH₃CN:0.05M KH₂PO₄, pH 3.5 (10:90)
 Flow Rate: 1.0mL/min
 Detection:

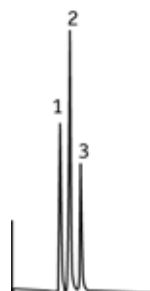
Acidic and basic molecules



1. Dimethyl phthalate
2. Toluene
3. Biphenyl
4. Phenanthrene

Column: VertiSep™ C8/C18 MMS 5μm, 4.6 x 150mm
 Mobile Phase: CH₃OH:H₂O (80:20)
 Flow Rate: 1.0mL/min
 Temp: Ambient
 Detection:

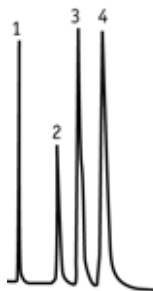
Phenylenediamine Isomers



1. p-Phenylenediamine
2. m-Phenylenediamine
3. o-Phenylenediamine

Column: VertiSep™ MMS C8/SCX 5μm, 4.6 x 150mm
 Mobile Phase: 90:10 IM H₃PO₄ adjusted to pH 3.2 with NH₄OH B-CH₃OH
 Flow Rate: 1.0mL/min
 Detection: UV254nm

Aromatic Carboxylic Acids



1. Nictotinic Acid
2. Benzoic Acid
3. o-Toluic Acid
4. m-Toluic Acid

Column: VertiSep™ MMS C18/SAX 5μm, 4.6 x 250mm
 Mobile Phase: 90% Water (pH 2.6), 10% Methanol
 Flow Rate: 1.5mL/min
 Detection: UV254nm

VertiSep™ MMS Columns				
Packing	Particle Size (µm)	Formats	I.D. Length (mm)	Part No.
CN/NH2	5	Ultra-Fast	3.2 x 50	03NR-C221
	5	LC/MS	3.2 x 100	03NR-C321
	5	LC/MS	3.2 x 150	03NR-C421
	5	Hi-Speed	4.0 x 50	03NR-D221
	5	Analytical	4.0 x 100	03NR-D321
	5	Analytical	4.0 x 150	03NR-D421
	5	Analytical	4.0 x 250	03NR-D521
	5	Ultra-Fast	4.6 x 50	03NR-E221
	5	Analytical	4.6 x 100	03NR-E321
	5	Analytical	4.6 x 150	03NR-E421
	5	Analytical	4.6 x 250	03NR-E521
	C8/NH2	5	Ultra-Fast	3.2 x 50
5		LC/MS	3.2 x 100	03NS-C321
5		LC/MS	3.2 x 150	03NS-C421
5		Hi-Speed	4.0 x 50	03NS-D221
5		Analytical	4.0 x 100	03NS-D321
5		Analytical	4.0 x 150	03NS-D421
5		Analytical	4.0 x 250	03NS-D521
5		Hi-Speed	4.6 x 50	03NS-E221
5		Analytical	4.6 x 100	03NS-E321
5		Analytical	4.6 x 150	03NS-E421
5		Analytical	4.6 x 250	03NS-E521
C8/C18		5	Ultra-Fast	3.2 x 50
	5	LC/MS	3.2 x 100	03NT-C321
	5	LC/MS	3.2 x 150	03NT-C421
	5	Hi-Speed	4.0 x 50	03NT-D221
	5	Analytical	4.0 x 100	03NT-D321
	5	Analytical	4.0 x 150	03NT-D421
	5	Analytical	4.0 x 250	03NT-D521
	5	Hi-Speed	4.6 x 50	03NT-E221
	5	Analytical	4.6 x 100	03NT-E321
	5	Analytical	4.6 x 150	03NT-E421

VertiSep™ MMS Columns				
Packing	Particle Size (µm)	Formats	I.D. Length (mm)	Part No.
C8/SCX	5	Ultra-Fast	3.2 x 50	03NU-C221
	5	LC/MS	3.2 x 100	03NU-C321
	5	LC/MS	3.2 x 150	03NU-C421
	5	Hi-Speed	4.0 x 50	03NU-D221
	5	Analytical	4.0 x 100	03NU-D321
	5	Analytical	4.0 x 150	03NU-D421
	5	Analytical	4.0 x 250	03NU-D521
	5	Hi-Speed	4.6 x 50	03NU-E221
	5	Analytical	4.6 x 100	03NU-E321
	5	Analytical	4.6 x 150	03NU-E421
	5	Analytical	4.6 x 250	03NU-E521
	C8/SAX	5	Ultra-Fast	3.2 x 50
5		LC/MS	3.2 x 100	03NV-C321
5		LC/MS	3.2 x 150	03NV-C421
5		Hi-Speed	4.0 x 50	03NV-D221
5		Analytical	4.0 x 100	03NV-D321
5		Analytical	4.0 x 150	03NV-D421
5		Analytical	4.0 x 250	03NV-D521
5		Hi-Speed	4.6 x 50	03NV-E221
5		Analytical	4.6 x 100	03NV-E321
5		Analytical	4.6 x 150	03NV-E421
5		Analytical	4.6 x 250	03NV-E521

VertiSep™ MMS Guard Cartridges*, 2/PK				
Packing	Particle Size (µm)	Formats	I.D. Length (mm)	Part No.
CN/NH2	5	Guard	3.2 x 10	03NR-C123
	5	Guard	4.6 x 10	03NR-E123
C8/NH2	5	Guard	3.2 x 10	03NS-C123
	5	Guard	4.6 x 10	03NS-E123
C8/C18	5	Guard	3.2 x 10	03NT-C123
	5	Guard	4.6 x 10	03NT-E123
C8/SCX	5	Guard	3.2 x 10	03NU-C123
	5	Guard	4.6 x 10	03NU-E123
C8/SAX	5	Guard	3.2 x 10	03NV-C123
	5	Guard	4.6 x 10	03NV-E123

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



*Guard holder required