

MetaSil® HPLC Columns

- Excellent peak shape for basic analytes
- Exceptionally high surface coverage
- Improved polar compound retention
- Enhanced selectivity
- Also available in our Direct Connect LC/MS columns

MetaSil™ AQ and MetaSil™ Basic

These Varian-developed unique materials offer superior performance to standard compounds such as C18 by enabling activities such as improved retention, increased interaction between samples and the bonded phase, and improved base-deactivated properties.

MetaSil AQ

MetaSil AQ materials are based on silica that is highly coated with hydrophobic alkyl chains interspersed with hydrophilic short-chain end-capping groups. The material is prepared by bonding a highly reactive octadecylsilane reagent followed by addition of a polar end-capping group. The resultant packing material contains a surface that is easily "wetted" with polar mobile phases. Standard C18 columns often suffer from "phase collapse" when used in combination with highly aqueous phases. MetaSil AQ columns remain fully extended in aqueous phases, allowing increased interaction between samples and the bonded phase.

MetaSil Basic

MetaSil Basic materials are prepared by monomerically bonding a controlled mixture of several short-chain alkyl groups to the surface of highly pure silica containing "neutral" silanol groups. This unique silane blending process creates a material with exceptionally high surface coverage and excellent performance characteristics for polar and basic (amine containing) pharmaceuticals. MetaSil Basic tends to retain polar compounds better than standard phases, often showing improved retention for compounds that elute in the void volume on standard alkyl phases. MetaSil Basic columns are recommended for use at pH 2-7.5.

Did you know that reducing the particle size from 5µm to 3 µm allows you to use 40% shorter columns (e.g. 15 cm instead of 25 cm) that in turn reduce run times by 40% for the same resolution, and reduce solvent consumption and cost by 40%?

MetaSil® Basic

MetaSil Basic 3 and 5 µm Particle Size Conventional Columns

Spherical particles. 100Å Pore size.

ID (mm)	Length (cm)	3 µm	5 µm
1	5	A0516050X010	A0517050X010
	7.5	A0516075X010	A0517075X010
	10	A0516100X010	A0517100X010
	15	A0516150X010	A0517150X010
2	25	A0516250X010	A0517250X010
	2	A0516020X020	A0517020X020
	3	A0516030X020	A0517030X020
	5	A0516050X020	A0517050X020
	7.5	A0516075X020	A0517075X020
2.1	10	A0516100X020	A0517100X020
	15	A0516150X020	A0517150X020
	25	A0516250X020	A0517250X020
	3	A0516030X021	A0517030X021
	5	A0516050X021	A0517050X021
3	7.5	A0516075X021	A0517075X021
	10	A0516100X021	A0517100X021
	15	A0516150X021	A0517150X021
	25	A0516250X021	A0517250X021
	3	A0516030X030	A0517030X030
3.2	5	A0516050X030	A0517050X030
	7.5	A0516075X030	A0517075X030
	10	A0516100X030	A0517100X030
	15	A0516150X030	A0517150X030
3.9	25	A0516250X030	A0517250X030
	5	A0516050X032	A0517050X032
3.9	15	A0516150X032	A0517150X032
	30	A0516300X039	A0517300X039
4	15	A0516150X039	A0517150X039
	5		A0517050X040
	7.5	A0516075X040	A0517075X040
	10	A0516100X040	A0517100X040
	12.5	A0516125X040	A0517125X040
4.6	15	A0516150X040	A0517150X040
	25	A0516250X040	A0517250X040
	3	A0516030X046	A0517030X046
	5	A0516050X046	A0517050X046
	7.5	A0516075X046	A0517075X046
	10	A0516100X046	A0517100X046
	12.5	A0516125X046	A0517125X046
6	15	A0516150X046	A0517150X046
	20	A0516200X046	A0517200X046
	25	A0516250X046	A0517250X046
	5	A0516050X060	
	8		A0517080X062
10	3	A0516030X100	
	5		A0517050X100
	10	A0516100X100	
	25	A0516250X100	A0517250X100
21.2	5	A0516050X212	A0517050X212
	10	A0516100X212	A0517100X212
	15		A0517150X212
	25		A0517250X212
30	5		A0517050X300

MetaSil Basic 10 µm Particle Conventional Columns

Spherical particles. 100Å Pore size.

ID (mm)	Length (cm)	10 µm
2	3	A0518030X020
21.2	25	A0518250X212
30	5	A0518050X300
	15	A0518150X300
	25	A0518250X300

MetaSil Basic Conventional Guard Columns

Spherical particles. 100Å Pore size.

ID (mm)	Length (cm)	5 µm	10 µm	Quantity
10	5	A0517050G100		1
21.2	5		A0518050G212	1
30	5		A0518050G300	1

MetaSil® Basic Si

MetaSil Basic Si Conventional Columns

Spherical particles. 100Å Pore size.

ID (mm)	Length (cm)	5 µm
1	5	A0507050X010
	7.5	A0507075X010
	10	A0507100X010
	15	A0507150X010
	25	A0507250X010
2	3	A0507030X020
	5	A0507050X020
	7.5	A0507075X020
	10	A0507100X020
	15	A0507150X020
2.1	25	A0507250X020
	3	A0507030X021
	5	A0507050X021
	7.5	A0507075X021
	10	A0507100X021
3	15	A0507150X021
	25	A0507250X021
	3	A0507030X030
	5	A0507050X030
	7.5	A0507075X030
3.2	10	A0507100X030
	15	A0507150X030
	25	A0507250X030
	5	A0507050X032
3.9	15	A0507150X039
	30	A0507300X039
4	7.5	A0507075X040
	10	A0507100X040
	12.5	A0507125X040
	15	A0507150X040
	25	A0507250X040
4.6	3	A0507030X046
	5	A0507050X046
	7.5	A0507075X046
	10	A0507100X046
	12.5	A0507125X046
	15	A0507150X046
	20	A0507200X046
	25	A0507250X046
10	25	A0507250X100
21.2	25	A0507250X212

MetaSil® AQ C18

MetaSil AQ C18 3 µm Particle Size Conventional Columns

Spherical particles. 100Å Pore size.

ID (mm)	Length (cm)	3 µm
1	5	A0520050X010
	7.5	A0520075X010
	10	A0520100X010
	15	A0520150X010
	25	A0520250X010
2	3	A0520030X020
	5	A0520050X020
	7.5	A0520075X020
	10	A0520100X020
	15	A0520150X020
2.1	25	A0520250X020
	3	A0520030X021
	5	A0520050X021
	7.5	A0520075X021
	10	A0520100X021
3	15	A0520150X021
	25	A0520250X021
	3	A0520030X030
	5	A0520050X030
	7.5	A0520075X030
	10	A0520100X030
	12.5	A0520125X030
3.2	15	A0520150X030
	20	A0520200X030
	25	A0520250X030
3.9	5	A0520050X032
	15	A0520150X032
4	15	A0520150X039
	30	A0520300X039
	7.5	A0520075X040
4.6	10	A0520100X040
	12.5	A0520125X040
	15	A0520150X040
	25	A0520250X040
	3	A0520030X046
	5	A0520050X046
	7.5	A0520075X046
10	10	A0520100X046
	12.5	A0520125X046
	15	A0520150X046
	20	A0520200X046
	25	A0520250X046
21.2	30	A0520300X046
	25	A0520250X100
30	15	A0520150X212
	25	A0520250X212
50	25	A0520250X300
	25	A0520250X500

HPLC Columns

MetaSil AQ C18 5 µm Particle Size Conventional Columns

Spherical particles. 120Å Pore size.

ID (mm)	Length (cm)	5 µm
0.32	15	A0530150U320
1	5	A0530050X010
	7.5	A0530075X010
	10	A0530100X010
	15	A0530150X010
	25	A0530250X010
2	2	A0530020X020
	3	A0530030X020
	5	A0530050X020
	7.5	A0530075X020
	10	A0530100X020
	15	A0530150X020
	20	A0530200X020
2.1	25	A0530250X020
	3	A0530030X021
	5	A0530050X021
	7.5	A0530075X021
	10	A0530100X021
3	15	A0530150X021
	25	A0530250X021
	3	A0530030X030
	5	A0530050X030
	7.5	A0530075X030
	10	A0530100X030
3.2	15	A0530150X030
	25	A0530250X030
3.9	5	A0530050X032
	15	A0530150X032
4	15	A0530150X039
	30	A0530300X039
	7.5	A0530075X040
	10	A0530100X040
	12.5	A0530125X040
4.6	15	A0530150X040
	25	A0530250X040
	3	A0530030X046
	5	A0530050X046
	7.5	A0530075X046
	10	A0530100X046
	12.5	A0530125X046
6	15	A0530150X046
	20	A0530200X046
	25	A0530250X046
	15	A0530150X060
	10	A0530050X100
15	25	A0530250X100
	5	A0530050X150
21.2	10	A0530100X150
	5	A0530050X212
	15	A0530150X212
30	25	A0530250X212
	5	A0530050X300

MetaSil AQ C18 10 µm Particle Size Conventional Columns

Spherical particles. 120Å Pore size.

ID (mm)	Length (cm)	10 µm
4.6	15	A0532150X046
	25	A0532250X046
10	10	A0532100X100
	15	A0532150X100
	25	A0532250X100
21.2	5	A0532050X212
	10	A0532100X212
	15	A0532150X212
	25	A0532250X212
30	5	A0532050X300
50	25	A0532250X500

Did you know that a thermostatically controlled HPLC column gives you more reproducible retention times and response factors?

MetaSil AQ C18 Guard Columns

Spherical particles

ID (mm)	Length (cm)	Pore (Å)	5 µm	10 µm	Quantity
10	5	120	A0530050G100	A0532050G100	1
21.2	3	120	A0530030G212		1
	5	120	A0530050G212	A0532050G212	1

MetaSil® AQ Si

MetaSil AQ Si 3 µm Particle Size Conventional Columns

Spherical particles. 80Å Pore size.

ID (mm)	Length (cm)	3 µm	
1	5	A0508050X010	
	7.5	A0508075X010	
	10	A0508100X010	
	15	A0508150X010	
	25	A0508250X010	
2	3	A0508030X020	
	5	A0508050X020	
	7.5	A0508075X020	
	10	A0508100X020	
	15	A0508150X020	
2.1	3	A0508030X021	
	5	A0508050X021	
	7.5	A0508075X021	
	10	A0508100X021	
	15	A0508150X021	
2.1	25	A0508250X021	
	3	3	A0508030X030
		5	A0508050X030
		7.5	A0508075X030
		10	A0508100X030
15		A0508150X030	
3.2	25	A0508250X030	
	5	A0508050X032	
3.2	15	A0508150X032	
	3.9	15	A0508150X039
30		A0508300X039	
4	5	A0508050X040	
	7.5	A0508075X040	
	10	A0508100X040	
	12.5	A0508125X040	
	15	A0508150X040	
	25	A0508250X040	
4.6	3	A0508030X046	
	5	A0508050X046	
	7.5	A0508075X046	
	10	A0508100X046	
	12.5	A0508125X046	
	15	A0508150X046	
	20	A0508200X046	
25	A0508250X046		
10	25	A0508250X100	
21.2	25	A0508250X212	

MetaSil AQ Si 5 µm Particle Size Conventional Columns

Spherical particles. 120Å Pore size.

ID (mm)	Length (cm)	5 µm	
1	5	A0502050X010	
	7.5	A0502075X010	
	10	A0502100X010	
	15	A0502150X010	
	25	A0502250X010	
2	3	A0502030X020	
	5	A0502050X020	
	7.5	A0502075X020	
	10	A0502100X020	
	15	A0502150X020	
2.1	25	A0502250X020	
	3	A0502030X021	
	5	A0502050X021	
	7.5	A0502075X021	
	10	A0502100X021	
2.1	15	A0502150X021	
	25	A0502250X021	
	3	3	A0502030X030
		5	A0502050X030
		7.5	A0502075X030
10		A0502100X030	
15		A0502150X030	
3.2	25	A0502250X030	
	5	A0502050X032	
3.2	15	A0502150X032	
	3.9	15	A0502150X039
30		A0502300X039	
4	7.5	A0502075X040	
	10	A0502100X040	
	12.5	A0502125X040	
	15	A0502150X040	
	25	A0502250X040	
4.6	3	A0502030X046	
	5	A0502050X046	
	7.5	A0502075X046	
	10	A0502100X046	
	12.5	A0502125X046	
	15	A0502150X046	
	20	A0502200X046	
25	A0502250X046		
10	25	A0502250X100	
21.2	25	A0502250X212	

HPLC Columns

MetaSil AQ Si 10 µm Particle Size Conventional Columns

Spherical particles. 120Å Pore size.

ID (mm)	Length (cm)	10 µm
4.6	25	A0533250X046
50	25	A0533250X500

MonoChrom® HPLC Columns

- Excellent peak shape for basic analytes
- Exceptionally high surface coverage
- Improved polar compound retention
- Enhanced selectivity
- Also available in our Direct Connect LC/MS columns

MonoChrom

Advanced silica production and silane bonding techniques allow for the production of material with exceptional base-deactivated characteristics. Varian MonoChrom columns provide excellent chromatography of organic amines, organic acids, amphoteric compounds, and neutral compounds. MonoChrom was developed to complement the selectivity of Varian's other base deactivated columns while improving the base-deactivated properties.

MonoChrom MS

The MonoChrom MS column is bonded with a unique fluorinated phenyl phase that retains basic compounds by either reverse phase or normal phase mode. This phase was specifically designed for ESI/MS detection where high organic eluent (i.e. normal phase) result in increased retention of bases. Sensitivity for ESI/MS is greatly enhanced under these eluent conditions. Common organic solvents (acetonitrile, methanol, etc.) used in HPLC have lower surface tension and higher volatility than aqueous solvents. The lower surface tension and higher volatility produces higher MS signals due to more efficient desolvation in ESI. For optimum MS signal, mobile phases with high organic/aqueous ratios are needed for a more efficient desolvation process, thereby enhancing sensitivity, resolution and mass accuracy.

MonoChrom® C18

MonoChrom C18 Conventional Columns

Spherical particles. 110Å Pore size.

ID (mm)	Length (cm)	3 µm	5 µm	10 µm
1	5	A0400050X010	A0505050X010	A0504050X010
	7.5	A0400075X010	A0505075X010	A0504075X010
	10	A0400100X010	A0505100X010	A0504100X010
	15	A0400150X010	A0505150X010	A0504150X010
	25	A0400250X010	A0505250X010	A0504250X010
1.5	5		A0505050X015	
2	2	A0400020X020	A0505020X020	
	3	A0400030X020	A0505030X020	A0504030X020
	5	A0400050X020	A0505050X020	A0504050X020
	7.5	A0400075X020	A0505075X020	A0504075X020
	10	A0400100X020	A0505100X020	A0504100X020
	15	A0400150X020	A0505150X020	A0504150X020
2.1	25	A0400250X020	A0505250X020	A0504250X020
	3	A0400030X021	A0505030X021	A0504030X021
	5	A0400050X021	A0505050X021	A0504050X021
	7.5	A0400075X021	A0505075X021	A0504075X021
	10	A0400100X021	A0505100X021	A0504100X021
	15	A0400150X021	A0505150X021	A0504150X021
3	25	A0400250X021	A0505250X021	A0504250X021
	3	A0400030X030	A0505030X030	A0504030X030
	5	A0400050X030	A0505050X030	A0504050X030
	7.5	A0400075X030	A0505075X030	A0504075X030
	10	A0400100X030	A0505100X030	A0504100X030
	15	A0400150X030	A0505150X030	A0504150X030
3.2	25	A0400250X030	A0505250X030	A0504250X030
	5	A0400050X032	A0505050X032	A0504050X032
	15	A0400150X032	A0505150X032	A0504150X032
3.9	15	A0400150X039	A0505150X039	A0504150X039
	30	A0400300X039	A0505300X039	A0504300X039

Table continued on next page.

MonoChrom C18 Conventional Columns (continued)

Spherical particles. 110Å Pore size.

ID (mm)	Length (cm)	3 µm	5 µm	10 µm
4	7.5	A0400075X040	A0505075X040	A0504075X040
	10	A0400100X040	A0505100X040	A0504100X040
	12.5	A0400125X040	A0505125X040	A0504125X040
	15	A0400150X040	A0505150X040	A0504150X040
	25	A0400250X040	A0505250X040	A0504250X040
	30			A0504300X040
4.6	3	A0400030X046	A0505030X046	A0504030X046
	5	A0400050X046	A0505050X046	A0504050X046
	7.5	A0400075X046	A0505075X046	A0504075X046
	10	A0400100X046	A0505100X046	A0504100X046
	12		A0505120X046	
	12.5	A0400125X046	A0505125X046	A0504125X046
	15	A0400150X046	A0505150X046	A0504150X046
	20	A0400200X046	A0505200X046	A0504200X046
25	A0400250X046	A0505250X046	A0504250X046	
6	15	A0400150X060		
10	3		A0505030X100	
	5	A0400050X100	A0505050X100	
	6		A0505060X100	
	8		A0505080X100	
	10		A0505100X100	
	25	A0400250X100	A0505250X100	A0504250X100
21.2	3		A0505030X212	
	5	A0400050X212	A0505050X212	A0504050X212
	10	A0400100X212	A0505100X212	A0504100X212
	15		A0505150X212	A0504150X212
	25		A0505250X212	A0504250X212
50	5			A0504050X500
	10			A0504100X500
	25			A0504250X500

MonoChrom Conventional Guard Columns

Spherical particles. 110Å Pore size.

For additional guard columns, see our MetaGuard guard columns.

ID (mm)	Length (cm)	5 µm	10 µm	Quantity
10	3	A0505030G100		1 Each
	5	A0505050G100		1 Each
21.2	3	A0505030G212	A0504030G212	1 Each
	5	A0505050G212	A0504050G212	1 Each
30	5		A0504050G300	1 Each
50	5		A0504050G500	1 Each

MonoChrom® MS

MonoChrom MS Conventional Columns

Spherical particles. 110Å Pore size.

For guard columns, see our MetaGuard guard columns.

ID (mm)	Length (cm)	5 µm
1	5	A2080050X010
	7.5	A2080075X010
	10	A2080100X010
	15	A2080150X010
	25	A2080250X010
2	2	A2080020X020
	3	A2080030X020
	5	A2080050X020
	7.5	A2080075X020
	10	A2080100X020
	15	A2080150X020
	25	A2080250X020
2.1	3	A2080030X021
	5	A2080050X021
	7.5	A2080075X021
	10	A2080100X021
	15	A2080150X021
3	25	A2080250X021
	3	A2080030X030
	5	A2080050X030
	7.5	A2080075X030
	10	A2080100X030
3.2	15	A2080150X030
	25	A2080250X030
	5	A2080050X032
	15	A2080150X032
3.9	15	A2080150X039
	30	A2080300X039
4	7.5	A2080075X040
	10	A2080100X040
	12.5	A2080125X040
	15	A2080150X040
4.6	25	A2080250X040
	3	A2080030X046
	5	A2080050X046
	7.5	A2080075X046
	10	A2080100X046
	12.5	A2080125X046
	15	A2080150X046
20	A2080200X046	
25	A2080250X046	
10	25	A2080250X100
21.2	25	A2080250X212

MonoChrom® C8

Conventional Columns

Spherical particles. 110Å Pore size.

For guard columns, see our MetaGuard guard columns.

ID (mm)	Length (cm)	3 µm
1	5	A3006050X010
	7.5	A3006075X010
	10	A3006100X010
	15	A3006150X010
	25	A3006250X010
2	2	A3006020X020
	3	A3006030X020
	5	A3006050X020
	7.5	A3006075X020
	10	A3006100X020
	15	A3006150X020
	25	A3006250X020
2.1	3	A3006030X021
	5	A3006050X021
	7.5	A3006075X021
	10	A3006100X021
	15	A3006150X021
3	25	A3006250X021
	3	A3006030X030
	5	A3006050X030
	7.5	A3006075X030
	10	A3006100X030
3.2	15	A3006150X030
	25	A3006250X030
	5	A3006050X032
	15	A3006150X032
3.9	15	A3006150X039
	30	A3006300X039
4	7.5	A3006075X040
	10	A3006100X040
	12.5	A3006125X040
	15	A3006150X040
	25	A3006250X040
4.6	3	A3006030X046
	5	A3006050X046
	7.5	A3006075X046
	10	A3006100X046
	12.5	A3006125X046
	15	A3006150X046
	20	A3006200X046
25	A3006250X046	
10	5	A3006050X100
21.2	5	A3006050X212
	10	A3006100X212

MonoChrom® CN

MonoChrom CN Conventional Columns

Spherical particles. 110Å Pore size.

For guard columns, see our MetaGuard guard columns.

ID (mm)	Length (cm)	3 µm	5 µm	10 µm
1	3		A0509030X010	
	5	A0541050X010		A0506050X010
	7.5	A0541075X010		A0506075X010
	10	A0541100X010		A0506100X010
	15	A0541150X010		A0506150X010
2	25	A0541250X010		A0506250X010
	2	A0541020X020	A0509020X020	
	3	A0541030X020		A0506030X020
	5	A0541050X020	A0509050X020	A0506050X020
	7.5	A0541075X020		A0506075X020
	10	A0541100X020	A0509100X020	A0506100X020
2.1	15	A0541150X020	A0509150X020	A0506150X020
	25	A0541250X020		A0506250X020
	3	A0541030X021		A0506030X021
	5	A0541050X021		A0506050X021
	7.5	A0541075X021		A0506075X021
	10	A0541100X021	A0509100X021	A0506100X021
3	15	A0541150X021		A0506150X021
	25	A0541250X021		A0506250X021
	3	A0541030X030		A0506030X030
	5	A0541050X030	A0509050X030	A0506050X030
	7.5	A0541075X030		A0506075X030
	10	A0541100X030	A0509100X030	A0506100X030
3.2	15	A0541150X030	A0509150X030	A0506150X030
	25	A0541250X030	A0509250X030	A0506250X030
	5	A0541050X032		A0506050X032
	15	A0541150X032		A0506150X032
3.9	15	A0541150X039		A0506150X039
	30	A0541300X039		A0506300X039
4	5	A0541050X040		
	7.5	A0541075X040		A0506075X040
	10	A0541100X040		A0506100X040
	12.5	A0541125X040		A0506125X040
	15	A0541150X040		A0506150X040
	25	A0541250X040	A0509250X040	A0506250X040
4.6	3	A0541030X046		A0506030X046
	5	A0541050X046	A0509050X046	A0506050X046
	7.5	A0541075X046		A0506075X046
	10	A0541100X046	A0509100X046	A0506100X046
	12.5	A0541125X046		A0506125X046
	15	A0541150X046	A0509150X046	A0506150X046
	20	A0541200X046	A0509200X046	A0506200X046
6	25	A0541250X046	A0509250X046	A0506250X046
	5		A0509050X060	
10	5	A0541050X100		
	25			A0506250X100
15	5		A0509050X150	
	10		A0509100X150	
	15		A0509150X150	
21.2	5	A0541050X212	A0509050X212	
	10	A0541100X212		
	15	A0541150X212	A0509150X212	
	20	A0541200X212		
30	25		A0509250X212	A0506250X212
	25		A0509250X300	A0506250X300
50	25			A0506250X500

HPLC Columns

MonoChrom® Diol

MonoChrom Diol 3 and 5 µm Particle Size
Conventional Columns

Spherical particles. 110Å Pore size.

ID (mm)	Length (cm)	3 µm	5 µm
1	3		A0536030X010
	5	A0542050X010	A0536050X010
	7.5	A0542075X010	A0536075X010
	10	A0542100X010	A0536100X010
	15	A0542150X010	A0536150X010
	25	A0542250X010	A0536250X010
2	2	A0542020X020	A0536020X020
	3	A0542030X020	A0536030X020
	5	A0542050X020	A0536050X020
	7.5	A0542075X020	A0536075X020
	10	A0542100X020	A0536100X020
	15	A0542150X020	A0536150X020
2.1	25	A0542250X020	A0536250X020
	3	A0542030X021	A0536030X021
	5	A0542050X021	A0536050X021
	7.5	A0542075X021	A0536075X021
	10	A0542100X021	A0536100X021
	15	A0542150X021	A0536150X021
3	25	A0542250X021	A0536250X021
	3	A0542030X030	A0536030X030
	5	A0542050X030	A0536050X030
	7.5	A0542075X030	A0536075X030
	10	A0542100X030	A0536100X030
	15	A0542150X030	A0536150X030
3.2	25	A0542250X030	A0536250X030
	5	A0542050X032	A0536050X032
	15	A0542150X032	A0536150X032
3.9	15	A0542150X039	A0536150X039
	30	A0542300X039	A0536300X039
4	5	A0542050X040	A0536050X040
	7.5	A0542075X040	A0536075X040
	10	A0542100X040	A0536100X040
	12.5	A0542125X040	A0536125X040
	15	A0542150X040	A0536150X040
	25	A0542250X040	A0536250X040
4.6	3	A0542030X046	A0536030X046
	5	A0542050X046	A0536050X046
	7.5	A0542075X046	A0536075X046
	10	A0542100X046	A0536100X046
	12.5	A0542125X046	A0536125X046
	15	A0542150X046	A0536150X046
6	20	A0542200X046	A0536200X046
	25	A0542250X046	A0536250X046
	5		A0536050X060
	10	A0542050X100	A0536050X100
21.2	25	A0536250X100	A0536250X100
	5	A0542050X212	A0536050X212
	10	A0542100X212	A0536100X212
	15		A0536150X212
30	25		A0536250X212
	8		A0536080X300
	25		A0536250X300

MonoChrom Diol 10 µm Particle Size
Conventional Columns

Spherical particles. 110Å Pore size.

ID (mm)	Length (cm)	10 µm
4.6	25	A0537250X046
30	25	A0537250X300
50	25	A0537250X500

MonoChrom Diol Conventional Guard Columns

Spherical particles. 110Å Pore size.

For additional guard columns, see our MetaGuard guard columns.

ID (mm)	Length (cm)	5 µm	Quantity
10	5	A0536050G100	1

MonoChrom® Si

MonoChrom Si Conventional Columns

Spherical particles. 110Å Pore size.

For guard columns, see our MetaGuard guard columns.

ID (mm)	Length (cm)	3 µm	5 µm
1	5	A0511050X010	A0501050X010
	7.5	A0511075X010	A0501075X010
	10	A0511100X010	A0501100X010
	15	A0511150X010	A0501150X010
	25	A0511250X010	A0501250X010
2	3	A0511030X020	A0501030X020
	5	A0511050X020	A0501050X020
	7.5	A0511075X020	A0501075X020
	10	A0511100X020	A0501100X020
2.1	15	A0511150X020	A0501150X020
	25	A0511250X020	A0501250X020
	3	A0511030X021	A0501030X021
	5	A0511050X021	A0501050X021
3	7.5	A0511075X021	A0501075X021
	10	A0511100X021	A0501100X021
	15	A0511150X021	A0501150X021
	25	A0511250X021	A0501250X021
3.2	3	A0511030X030	A0501030X030
	5	A0511050X030	A0501050X030
	7.5	A0511075X030	A0501075X030
	10	A0511100X030	A0501100X030
	15	A0511150X030	A0501150X030
3.9	25	A0511250X030	A0501250X030
	5	A0511050X032	A0501050X032
	15	A0511150X032	A0501150X032
4	15	A0511150X039	A0501150X039
	30	A0511300X039	A0501300X039
	7.5	A0511075X040	A0501075X040
4.6	10	A0511100X040	A0501100X040
	12.5	A0511125X040	A0501125X040
	15	A0511150X040	A0501150X040
	25	A0511250X040	A0501250X040
	3	A0511030X046	A0501030X046
10	5	A0511050X046	A0501050X046
	7.5	A0511075X046	A0501075X046
	10	A0511100X046	A0501100X046
	12.5	A0511125X046	A0501125X046
	15	A0511150X046	A0501150X046
	20	A0511200X046	A0501200X046
	25	A0511250X046	A0501250X046
25	A0511250X100	A0501250X100	
21.2	25	A0511250X212	A0501250X212

OmniSpher™ C18

- Ultra-high purity silica backbone
- Excellent column stability
- Easy to scale up

OmniSpher is an ultra-high bonded silica designed for the analysis of mixtures containing either acidic or basic functionality that would normally tail on more traditional columns.

The base silica for this column is made from ultra-high purity silica where metal ion and salt concentration is typically below 3 ppm. This low concentration of ion means that secondary interactions that normally contribute to peak tailing are eliminated. That makes the Varian OmniSpher C18 column ideal for the separation of neutral, polar, acidic, and basic compounds.

Unsurpassed Performance

The ultra-high purity silica in the Varian OmniSpher C18 column is a spherical particle with a very narrow particle distribution. These spherical particles allow the packing of high efficiency columns with excellent permeability and good mechanical strength.

Varian's single step derivatization procedure in the chemical bonding of monofunctional C18 groups to the silica surface forms a uniform non-polar surface layer, contributing to the unsurpassed performance of the Varian OmniSpher C18.

Excellent Column Stability

The chromatographic stability of Varian OmniSpher C18 has been extensively tested using 4 different batches in a number of packed columns. This endurance test was performed by continuously pumping freshly prepared mobile phases of methanol / 20 mmol phosphate buffer = 50 / 50 (v/v) at three different pH values (7.0, 2.1 and 8.0). A mixture containing tricyclic antidepressants was used to test the performance (plate count, retention factor, selectivity factor and peak symmetry) after every 5,000 column volumes of pumped eluent and this was continued up to 20,000 column volumes.

The neutral endurance test showed no significant changes in performance. Acidic and basic mobile phases showed some degradation of efficiency and peak symmetry. However retention factors and selectivity coefficients for both test mixtures did not change significantly, indicating a good chemical stability.

Universal Column Inertness

The wide solvent pH range tolerance (pH 2.0 - 8.0) of Varian OmniSpher makes it ideally suitable for the elution of neutral, polar, acidic, and basic compounds.

Basic compounds are always selected for column tests to study the inertness of the stationary phase. Varian OmniSpher C18 shows excellent performance with Procainamide and N-acetylprocainamide used as test probes. A representative mixture of basic solutes (tricyclic antidepressants) has been chosen as test probes. Typically, these are difficult to elute with a good peak shape. Yet the symmetry factor, A_s , of amitriptyline (USP tailing factor) using the OmniSpher C18 is only 1.2, which is excellent under these mild mobile phase conditions. This symmetry makes the Varian OmniSpher C18 phase an excellent choice for the analysis of basic drugs.

Easy to Scale Up

To make the transition from the analytical conditions to preparative purifications simple, Varian OmniSpher offers analytical to preparative columns packed with exactly the same material in particle diameter and pore size. The key to simple preparative HPLC is use of the linear scale-up factor as you move from analytical to preparative diameter columns. Linear scale-up is only applicable if the stationary phase is the same material in both columns.

Originally developed in 3 and 5 μm particles for analytical HPLC applications, Varian OmniSpher is now provided in 10 μm material. Varian OmniSpher columns with 5 or 10 μm particles are available in both analytical and preparative dimensions.

OmniSpher C18 Conventional Columns

Spherical particles. 110Å Pore size.

ID (mm)	Length (cm)	3 µm	5 µm
2	10	CP27806	
	15		CP27836
	25		CP27834
4.6	10	CP27813	CP27833
	15		CP27831
	25		CP27835

OmniSpher C18 ChromSep Columns

Spherical particles. 110Å Pore size.

ID (mm)	Length (cm)	Complete System 3 µm	Complete System 5 µm	Complete System 10 µm	Replacement	Replacement 3/Pk	Guard
2	2	CP27851			CP27852	CP27853	CP28141
	3	CP27854			CP27855	CP27856	CP28141
	5	CP27832			CP27837	CP27838	CP28141
	10	CP27839			CP27840	CP27841	CP28141
	15		CP28148		CP28149	CP28150	CP28141
3	3	CP27857			CP27858	CP27859	CP28141
	5	CP27860			CP27861	CP27862	CP28141
	10	CP27842			CP27843	CP27844	CP28141
			CP27810		CP27811	CP27824	CP28141
	15		CP27808		CP27818	CP27822	CP28141
	25		CP27809		CP27812	CP27829	CP28141
4.6	5	CP27845			CP27846	CP27847	CP28141
	10	CP27804			CP27814	CP27821	CP28141
			CP27801		CP27820	CP27825	CP28151
	15		CP27802		CP27817	CP27826	CP28151
	25		CP27803		CP27819	CP27823	CP28151
			CP28281		CP28282	CP28283	CP28151

Antiepileptic

Application 1549 - HPLC

Gradient elution of antiepileptic drugs

OmniSpher 5 C18 successfully separates 7 antiepileptic drugs using an acetonitrile/water gradient without buffer or other additives in the mobile phase. If the separation of phenobarbital and carbamazepine-epoxide is not relevant, the analysis can be completed with a 10 cm column within a few minutes.

Analysis technique : HPLC

Column : OmniSpher 5 C18
150 mm x 4.6 mm, dp = 5 µm
Cat. no. 27831

Mobile phase : acetonitrile/water

Gradient : 0-2 min acetonitrile/water = 15/85 (v/v)
2-10 min acetonitrile/water = 30/70 (v/v)
10-15 min acetonitrile/water = 30/70 (v/v)

Flow rate : 1.0 ml/min

Temperature : ambient

Injector : valve

Detector : UV, 205 nm

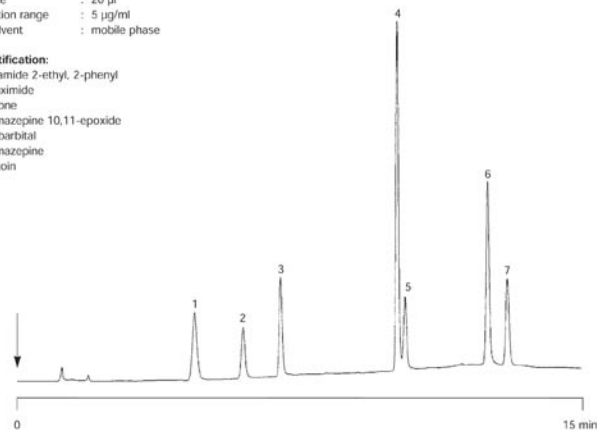
Sample size : 20 µl

Concentration range : 5 µg/ml

Sample solvent : mobile phase

Peak identification:

- malonamide 2-ethyl, 2-phenyl
- ethosuximide
- primidone
- carbamazepine 10,11-epoxide
- phenobarbital
- carbamazepine
- phenytoin



Steroids

Application 1552 - HPLC

Selective separation of corticosteroids

Using a non-buffered eluent, a mixture of 6 corticosteroids is separated on a 15 cm OmniSpher 5 C18 column. Selectivity, column efficiency and peakshape meet the standards of HPLC with state-of-the-art column technology.

Analysis technique : HPLC

Column : OmniSpher 5 C18
150 mm x 4.6 mm, dp = 5 µm
Cat. no. 27831

Mobile phase : acetonitrile/water = 50 / 50 (v/v)

Flow rate : 2 ml/min

Temperature : 35 °C

Injector : valve

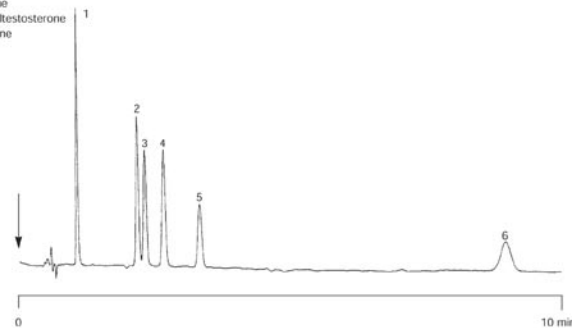
Detector : UV, 254 nm

Sample size : 5 µl

Courtesy : Th. Welsch and A. Köhne,
University of Ulm,
Germany

Peak identification:

- hydrocortisone
- nortestosterone
- 1-dehydro-17α-methyltestosterone
- testosterone
- 17α-methyltestosterone
- progesterone



Ginsenosides

Application 1604 - HPLC

Analysis of Ginsenosides (Saponins) in Panax Ginseng powdered extracts

An improved separation is obtained on the OmniSpher 5 C18 column for all the Ginsenosides in a herbal extract (liquid/liquid extraction with ethanol/water = 1/1 and sonicate at 50 °C for 30 minutes), especially for the separation of Rb1 from closely eluting matrix compounds. The quantitative results for this assay with real samples are very accurate and precise. Overlays of samples to standard mixtures are perfect.

Analysis technique : HPLC

Column : OmniSpher 5 C18
250 mm x 4.6 mm, dp = 5 µm
Cat. no. CP27835

Reference : Panax and American Ginseng
Assay by HPLC,
Institute for Nutraceutical
Advancement (INA),
Denver, CO, USA

Mobile phase : A: ACN/water (15/85);
B: ACN/water (80/20)

Courtesy : Lorraine C. Rosenberry,
Green Laboratories LLC,
Windham, Maine, USA

Gradient : 100% A to 30% B in 85 min;
hold 5 min
Column conditioning for
20 minutes with 100% methanol

Flow rate : 1.0 ml/min

Temperature : 20 °C

Injector : valve

Detector : UV, 205 nm

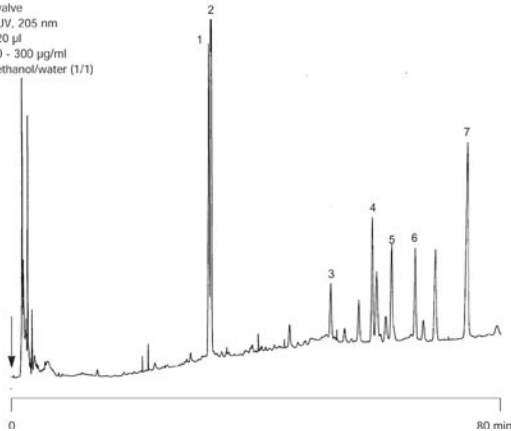
Sample size : 20 µl

Concentration range : 0 - 300 µg/ml

Sample solvent : ethanol/water (1/1)

Peak identification:

1. ginsenoside Rg1
2. ginsenoside Re
3. ginsenoside Rf
4. ginsenoside Rb1
5. ginsenoside Rc
6. ginsenoside Rb2
7. ginsenoside Rd



Drugs

Application 1607 - HPLC

Ephedrine sulfate in cough mixture

Analysis technique : HPLC

Column : OmniSpher 5 C18
150 x 4.6 mm ChromSep stainless steel
Cat. no. CP27802

Mobile phase : potassium phosphate buffer(*)/acetonitrile (82/18)
(*)Buffer: 0.025 M potassium phosphate with 7.7 mM hexylamine and
10 mM heptane sulfonic acid sodium salt, adjust pH to 3 by phosphoric acid

Flow rate : 1.00 ml/min

Temperature : ambient

Pressure : 8.3 MPa (83 bar, 1200 psi)

Detector : UV-detector, λ = 210 nm

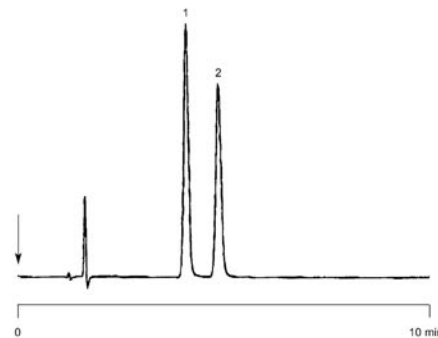
Sample size : 10 µl

Concentration range : 0.2 mg/l

Solvent sample : water

Peak identification:

1. phenylpropanolamine
2. ephedrine



Antiseptics

Application 1580 - HPLC

Determination of related substances in chlorhexidine according to the British and European Pharmacopoeia methods

The eluent composition is optimized to ensure good separation of chlorhexidine from several related impurities in the EP CRS (European Pharmacopoeia Chemical Reference Substance) test standard. Each EP CRS standard comes with a test chromatogram showing minimum separation required (see British and European Pharmacopoeia).

NOTE: The method may also be used for quantitative determination of chlorhexidine gluconate (or other salts) in finished products (BP 1993, page 825 and 980). Concentration range 4-8 mg as chlorhexidine gluconate in 25 ml of test solution. Sample preparation: for 5000 ppm chlorhexidine gluconate product - dilute 0.9-1.0 g in 25 ml mobile phase. Repeatability better than 1% RSD and linearity coefficient over range 0.999.

Analysis technique : HPLC

Column : OmniSpher 5 C18
250 mm x 4.6 mm, dp = 5 µm
Cat. no. 27835

Mobile phase : methanol/water/acetic acid (plus 2g sodium octanesulphonate) = 800 : 200 : 130 (v/v/v)

Flow rate : 1 ml/min

Temperature : 35 °C

Pressure : 102 bar (1500 psi)

Injector : valve

Detector : UV, 254 nm

Sample size : 20 µl loop

Concentration range : see Ph Eur

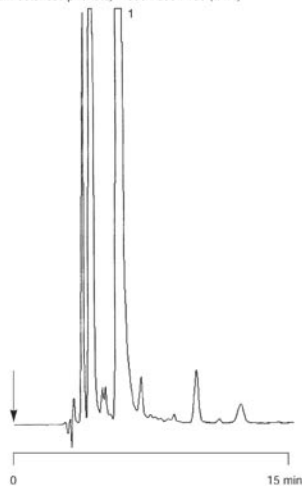
Sample solvent : mobile phase

Reference : BP 1993; BP 1999

Courtesy : J. Barberio,
Agrosolve Ltd.,
Warminster, Wiltshire, UK

Peak identification:

1. chlorhexidine 12.8 mg/25 ml



Did you know that you can increase HPLC column lifetime by turning the injection valve as fast as possible to minimize column damaging pressure pulses?

MetaCarb

- Superior carbohydrate separations
- Wide range of column selectivities
- Patented "Enhanced Sulfonation" bonding technique for high resolving power

The MetaCarb™ line of carbohydrate columns provides high resolution columns for applications requiring high performance Carbohydrate and Organic Acid Analysis.

MetaCarb 87C, 87H, and 87P are equivalent to the Bio Rad Aminex series but offer superior performance. MetaCarb columns contain sulfonated polystyrene resins in the Calcium (87C), Hydrogen (87H), and Lead (87P) forms, and provide a wide range of selectivities for carbohydrate and organic analysis. Column selectivities are virtually identical to those provided by Bio Rad Aminex columns, yet provide superior reproducibility and durability. The MetaCarb 87 series is based on an 8-10µ, 8% cross-linked styrene divinylbenzene (SDVB) resin. The columns are very rugged, operate at low backpressure, and provide outstanding column lifetime.

Higher Resolution Power

If you're searching for columns with increased resolution, we recommend the MetaCarb 67C columns and the MetaCarb Plus series. The MetaCarb Plus series contains a specially formulated styrene divinylbenzene resin modified by a patented "enhanced sulfonation" bonding technique to provide columns with higher resolving power than the standard 87 series.

The MetaCarb 67C column contains a 9 µm, 6% cross-linked sulfonated SDVB in the calcium form. This column provides excellent resolution of monosaccharides and sugar alcohols, particularly mannitol and sorbitol, and has set the standard for column reproducibility. The MetaCarb Ca Plus column contains an 8µ, highly cross-linked, sulfonated SDVB resin in the calcium form. We recommend this column for analysis of monosaccharides, disaccharides, and sugar alcohols.

Easy Regeneration for Extended Column Life

The column is widely used in the food and beverage industries for analysis of sweeteners, corn and cane sugars, fruit juices, soft drinks, beer, and dairy products. It is also used to analyze sugar substitutes such as maltitol, xylitol, palatinitol, lactitol, mannitol, and sorbitol. Organic mixtures are used with the MetaCarb Ca Plus column, as well as simple eluents such as deionized water, a dilute solution of calcium EDTA in deionized water, or simple water. The primary separation mechanism is ligand exchange as the calcium groups interact with hydroxyl groups in the sample. The MetaCarb Ca Plus column can be regenerated with a solution of calcium nitrate to extend column life.

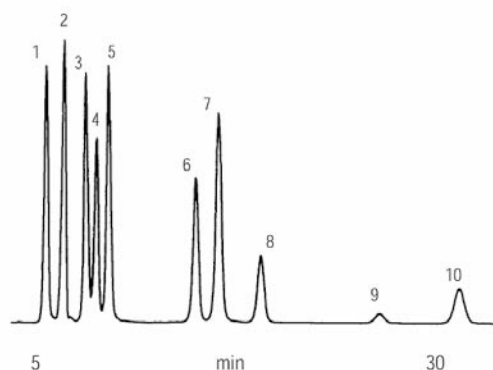
The MetaCarb H Plus column contains an 8 µm highly cross-linked, SDVB resin in the hydrogen form. This column is useful for analysis of samples containing monosaccharides in combination with organic acids, alcohols, ketones, fatty acids, or other neutral compounds. The primary separation mechanisms include ligand-exchange, ion-exclusion, and adsorption.

Sugars, Organic Acids, Alcohols

Column: MetaCarb 87H Plus, 300 x 7.8mm
 Order No.: A5215
 Eluent: 0.1N H2SO4
 Flow: 0.5 ml/min
 Detection: RI,
 Temp: Ambient

Sample:

1. citric acid
2. tartaric acid
3. glucose
4. malic acid
5. fructose
6. lactic acid
7. glycerol
8. acetic acid
9. methanol
10. ethanol



Wide Range of Columns Selectivities Available

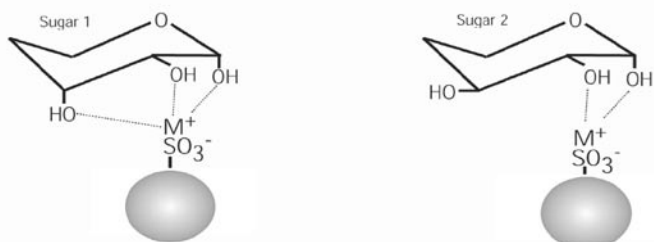
The MetaCarb Pb Plus column contains an 8 µm highly cross-linked, sulfonated SDVB resin in the lead ionic form. This column is designed for analysis of monosaccharides and sugar alcohols. Cellobiose, glucose, xylose, arabinose, mannose and rhamnose, as well as other pentoses and hexoses found in cellulose products can be separated with ease. The MetaCarb Pb Plus is typically used with deionised water as the mobile phase.

Ideal for sugar alcohol analysis according to USP procedures, the MetaCarb USP L-19 Carbohydrate column resolves sugar alcohols such as sorbitol and mannitol using simple isocratic eluents at low temperatures.

Also available are columns for oligosaccharide analysis (MetaCarb 47N), and columns in the sodium (MetaCarb 87N) and potassium (MetaCarb 87K) forms for different carbohydrate selectivities.

Three columns are available for analysis of amino acids on the Beckman 6300/7300 and System Gold amino acid analyzers. These are MetAmino, MetAmino Na, and MetAmino Gold.

Mechanisms of Carbohydrate Separations



Carbohydrates are separated by ion-exchange, ligand-exchange, and ion-exclusion mechanisms. In this example, sugar 1 would be retained longer than sugar 2 because it has more hydroxyls available for simultaneous interaction with the stationary phase metal ion.

MetaCarb Conventional Columns

Phase	USP Type	ID (mm)	Length (cm)	Part No.
64H		7.8	30	A5209
67C		6.5	30	A5235
67H		6.5	30	A5244
87C	L19	4.6	25	A5203
		7.8	30	A5200
87H	L17/ L22	4.6	25	A5210250X046
		6.5	30	A5214
	L17 / L22	7.8	15	A5210150X078
		30		A5210
87H/ AL-1		7.8	15	A5213
87K		7.8	30	A5095
87N		7.8	30	A5041
87P	L34	7.8	30	A5220
		21.2	25	A5220250X212
87P, MetaCarb	L34	7.8	15	A5225
AR AC		4.6	10	A5246
Ag		7.8	30	A5223
Ca Plus	L19	7.8	10	A5205100X078
			30	A5205
H Plus	L17/ L22	7.8	10	A5218
			30	A5215
NaCa		7.8	30	A5245
Oligo		7.8	30	A5238
PAD		6.5	15	A5232
Pb Plus		7.8	30	A5241
USP L17	L17	7.8	10	A5059
USP L19	L19	4	25	A5092

MetaCarb Guard Columns

4.6 mm ID x 5 cm

Phase	USP Type	Part No.	Quantity
87C	L19	A5201	1 Each
87H	L17 / L22	A5211	1 Each
87P	L34	A5221	1 Each
AR AC		A5247	1 Kit
Ca Plus	L19	A5206	1 Each
H Plus	L17/ L22	A5216	1 Each

MetaCarb Column + Guard Kits

7.8 mm ID x 30 cm

Item Name	USP Type	Part No.	Quantity
MetaCarb H Plus Kit (A5215 col., A5216 guard, A6071 coupler)	L17/ L22	A5217	1 Kit
MetaCarb 87P Kit (A5220 col., A5221 guard, A6071 coupler)	L34	A5222	1 Kit

MetaCarb Guard Cartridges

4 mm ID x 2 cm. Order guard cartridge holder separately.

Phase	USP Type	Part No.	Quantity (/Pk)
67C		A5235GC	2
67H, MetaCarb		A5244GC	2
87C	L19	A5200GC	2
87H	L17 / L22, L17/ L22	A5210GC	2
87K		A5095GC	2
87N		A5041GC	2
87P	L34	A5220GC	2
Ag		A5223GC	2
Ca Plus	L19	A5205GC	2
H Plus	L17/ L22	A5215GC	2
Oligo		A5238GC	2
PAD		A5232GC	2
USP L19	L19	A5092GC	2

MetaCarb Guard Cartridge Holder

Item Name	Part No.	Quantity
MetaCarb Cartridge Holder	A5204	1

Did you know that an increased HPLC column temperature lowers the viscosity of the mobile phase and decreases the pressure drop at a given flow rate?

Columns for Carbohydrate and Organic Acid Analysis

Retention Times of Sugars, Polyols, and Organic Acids on MetaCarb Columns

Compound	Columns Primarily for Carbohydrates					Columns Primarily for Organic Acids				
	67C	Ca Plus	87C	Pb Plus	87P	87K	87H	H Plus	67H	Compound
Nitrate		4.57	7.37		10.37					Nitrate
Maltoheptose		4.73	7.35		11.81					Maltoheptose
Maltohexose		4.85	7.45		13.31					Maltohexose
Maltopentose		5.07	7.60		13.15					Maltopentose
Amiprylose		4.57	7.75		Ng					Amiprylose
Styachyose	5.94	5.35	7.85	11.84	13.48	6.32	6.94			Styachyose
Maltotetrose		5.44	7.87		14.14					Maltotetrose
Melezitose	5.85	8.27		13.92						Melezitose
Raffinose	6.56	5.93	8.31	12.01	14.47	6.96	7.65			Raffinose
Maltotriose	6.68	5.98	8.35	12.63	15.24	7.36	7.18	10.28	4.23	Maltotriose
Cellobiose	7.36	6.72	9.01	13.53	15.65		7.76			Cellobiose
Trehalose	7.32	6.13	9.14		16.05	8.22	8.00			Trehalose
Sucrose	7.48	6.83	9.18	13.51	15.77	8.08	N/R			Sucrose
Maltose	7.59	6.98	9.24	14.43	16.68	8.56	7.78	11.52	4.74	Maltose
Melibiose	7.67	7.07	9.43	15.25	17.70		7.88			Melibiose
Lactose	7.84	7.08	9.51	7.84	17.44	8.72	8.13	11.86	4.88	Lactose
Lactulose	8.53	7.64	10.24	8.53	20.77			12.41	5.10	Lactulose
Glucose	9.36	8.79	11.24	16.09	19.21	11.20	10.11	14.18	5.83	Glucose
Lactilol		8.62	12.24		33.30					Lactilol
Xylose	10.31	9.63	12.39	17.96	20.71	12.24	10.33			Xylose
Maltitol	9.15	8.61	12.29		30.45	8.16				Maltitol
Galactose		9.65	13.89		22.39		10.85	15.32	6.31	Galactose
Sorbose	10.22	9.12	12.93	19.45	22.45	13.16	9.90			Sorbose
Mannose	10.51	9.87	12.83	20.39	25.57	12.48	9.98			Mannose
Rhamnose		10.41	9.71	12.93	19.53	22.63	13.37	11.20		Rhamnose
Fructose	11.40	10.14	13.70	22.59	25.91	12.16	10.39	15.71	6.46	Fructose
Fucose	11.33	10.63	13.89	27.93	24.23	11.98	12.05	17.89	7.35	Fucose
Arabinose	11.63	11.00	14.00	21.73	24.02	13.44	11.23	17.02	6.99	Arabinose
Myo-inositol		10.89	14.34		35.65					Myo-inositol
Digitoxose	10.33	14.27		21.02						Digitoxose
Ribitol		11.01	15.62		30.79					Ribitol
Tagatose		11.60	16.53		Ng					Tagatose
Mannitol	12.76	11.91	17.89	34.51	40.10	10.08		15.85	6.52	Mannitol
Arabitol	13.23	12.39	18.43	33.98	39.89	10.80				Arabitol
Xylitol	15.06	14.00	22.00	44.76	51.22	11.36	8.35			Xylitol
Galactitol		12.12	20.53		52.50					Galactitol
Sorbitol	14.91	13.71	21.41	50.76	56.63	10.64	8.32	16.17		Sorbitol
Ribose	16.46	13.91	21.99	45.59	55.00	14.16	9.21			Ribose
Glucuronic Acid							8.10	11.99	4.87	Glucuronic Acid
Galacturonic Acid								13.23	5.44	Galacturonic Acid
Oxalic Acid							6.35	9.30	3.89	Oxalic acid
Maleic Acid							7.21	10.92	4.49	Maleic Acid
Citric Acid							8.03	12.21	5.02	Citric Acid
IsoCitric Acid							8.25	12.48	5.13	IsoCitric Acid
Tartaric Acid							8.68	12.91	5.31	Tartaric Acid
Malonic Acid							8.55	14.32	5.89	Malonic Acid
Malic Acid							10.04	15.21	6.25	Malic Acid
Succinic Acid							13.11	19.85	8.16	Succinnic Acid
Lactic Acid							13.51	20.43	8.41	Lactic Acid
Formic Acid							14.74	22.32	9.13	Formic Acid
Fumaric Acid							15.40	22.21	9.18	Fumaric Acid
Acetic Acid							16.54	25.05	10.30	Acetic Acid
Adipic Acid							19.05	28.85	11.86	Adipic Acid
Propionic Acid							19.67	29.77	12.24	Propionic Acid
Butyric Acid							24.51	37.09	15.25	Butyric Acid
Glycerol							14.22	21.45	8.82	Glycerol
Ethylene Glycol							17.08	25.85	10.63	Ethylene Glycol
Diethylene Glycol							17.48	26.46	10.88	Diethylene Glycol
Methanol							20.01	30.06	12.43	Methanol
Ethanol							22.37	33.85	13.92	Ethanol
Isopropanol							24.31	36.80	15.13	Isopropanol
Propanol							28.29	42.81	17.61	Propanol
Azide							25.38	38.43	15.80	Azide

All columns operated under the recommended standard conditions of flow rate and temperature as typically recorded on the QC test data sheet.

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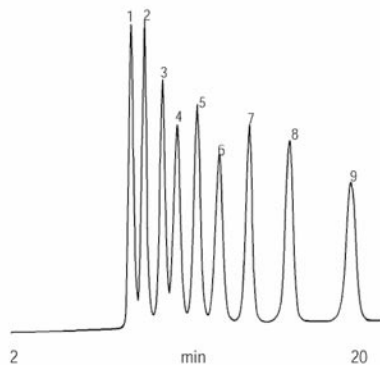
HPLC Columns

Sugars & Sugar Alcohols

Column: MetaCarb 87C, 300 x 7.8mm
 Order No.: A5200
 Eluent: Distilled H₂O
 Flow: 0.6 ml/min
 Detection: RI
 Temp: 85°C

Sample:

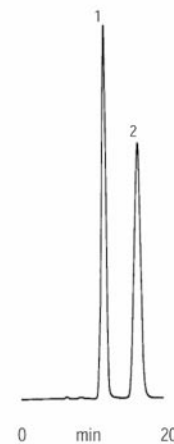
1. raffinose
2. sucrose
3. lactulose
4. glucose
5. galactose
6. fructose
7. ribitol
8. mannitol
9. sorbitol

**USP L-19 Carbohydrates**

Column: MetaCarb USP, 250 x 4.0mm
 Order No.: A5092
 Eluent: Distilled H₂O
 Flow: 0.2 ml/min
 Detection: RI
 Temp: 30°C

Sample:

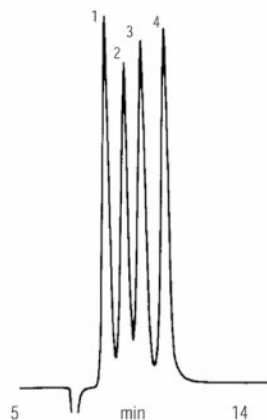
1. mannitol
2. sorbitol

**Citric Acid and Sugars**

Column: MetaCarb 87H, 300 x 7.8mm
 Order No.: A5210
 Eluent: 0.005N H₂SO₄
 Flow: 0.5 ml/min
 Detection: RI
 Temp: ambient

Sample:

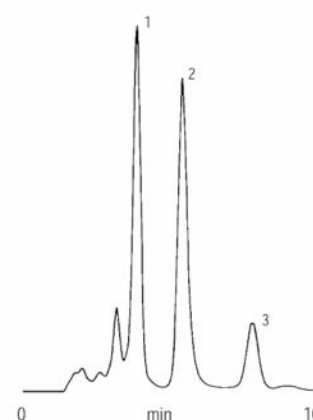
1. sucrose
2. citric acid
3. glucose
4. fructose

**Markers in Ground Beef**

Column: MetaCarb 87H, 300 x 7.8mm
 Order No.: A5210
 Eluent: 0.005N H₂SO₄
 Flow: 1.0 ml/min
 Detection: RI
 Temp: 35°C

Sample:

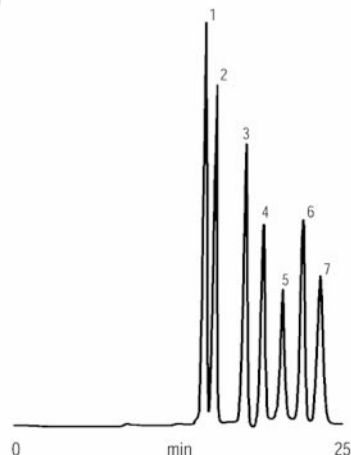
1. M1
2. M2
3. M3

**Mono and Disaccharides**

Column: MetaCarb Pb Plus, 300 x 7.8mm
 Order No.: A5242
 Eluent: Distilled H₂O
 Flow: 0.4 ml/min
 Detection: RI
 Temp: 80°C

Sample:

1. sucrose
2. maltose
3. glucose
4. xylose
5. galactose
6. arabinose
7. mannose

**Fermentation Products**

Column: MetaCarb 67C, 300 x 6.5mm
 Order No.: A5236
 Eluent: Distilled H₂O
 Flow: 0.5 ml/min
 Detection: RI
 Temp: 90°C

Sample:

1. DP4
2. DP3
3. DP2
4. ethanol

